# KNIFE-GATE VALVES

## GL SERIES

09/03/2016

## BIDIRECTIONAL WAFER Knife Gate Valve

-Bidirectional wafer-design knife gate valve.
-"Monoblock" one-piece cast iron body.
-Stainless steel gate. Two rubber sleeves.
-Provides high flow rates with low pressure drop.
-Various seat materials available.
-Face-to-face dimension in accordance with **C.M.O.** standard.

**General Applications:**

-This knife gate valve is suitable for working in the mining industry, in loaded fluid transport lines, such as: water with stones, sludge, etc. and in general it is used for abrasive fluids in the chemical industry and waste water. Designed for the following applications:

-Mining
- Electrical power stations
- Energy Sector
- Sewage treatment
- Chemical plants
- Thermal power stations

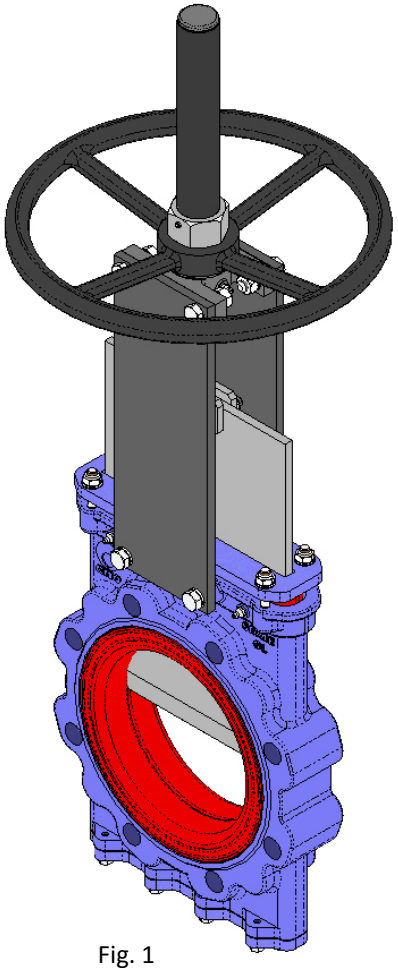


Fig. 1

**Sizes:** DN50 to DN1400 (larger sizes on request).

**Working (ΔP):**

| | Maximum ΔP |
|---|---|
| DN50 to DN600 | 10 kg/cm$^2$ |
| DN700 to DN900 | 6 kg/cm$^2$ |
| DN1000 to DN1400 | 4 kg/cm$^2$ |

- The pressures indicated in the table, can be used in either of the valve's two directions.
- Other pressures on request.

**Flange drill hole:** DIN PN10 & ANSI B16.5 (150 LB)

**Other Common Flanges:**

| | |
|---|---|
| DIN PN 16 | JIS standard |
| DIN PN 6 | Australian standard |
| DIN PN 25 | British standard |

**Directives:** Machinery Directive: **DIR 2006/42/EC (MACHINERY)**
Pressure Equipment Directive: **DIR 97/23/EC (PED) ART.3, P.3**
Potential Explosive Atmospheres Directive: **DIR 94/9/EC (ATEX) CAT.3 ZONE 2 and 22 GD** for further information on categories and zones please contact the **C.M.O.** Technical-Commercial Dept.

**Quality Dossier:** -All valves are tested hydrostatically at **C.M.O.** and material and test certificates can be provided.
-Body test = working pressure x 1.5.
-Seat test = working pressure x 1.1.

# Advantages of CMO's "Model GL"

- This knife-gate valve's main characteristic is that it provides a full continuous flow. This means that in open position it produces no cavities and there are no turbulences in the fluid.
- The **GL** valve's body is composed of one single "monoblock" piece.
- The stem protection hood is independent from the handwheel securing nut, this means the hood can be disassembled without the need to release the handwheel. This advantage allows regular maintenance operations to be performed, such as lubricating the stem, etc.
- The stem on the **C.M.O.** valve is made of 18/8 stainless steel. This is another added advantage, as some manufacturers produce it with 13% chrome and it gets rusty very quickly.
- The handwheel is made of GJS-500 nodular cast iron. Some manufacturers produce them in normal cast iron which can lead to breakages in the event of very high operating torque or knocks.
- The yoke is has a compact design with the bronze actuator nut protected in a sealed and lubricated box. This makes it possible to move the valve with a key, even without the handwheel (in other manufacturers' products this is not possible).
- The pneumatic actuator's upper and lower covers are made of GJS-500 nodular cast iron, making them highly shock resistant. This characteristic is essential in pneumatic actuators.
- The pneumatic cylinder's o-ring seals are commercial products and can be purchased worldwide. This means it is not necessary to contact **C.M.O.** every time a seal is required.

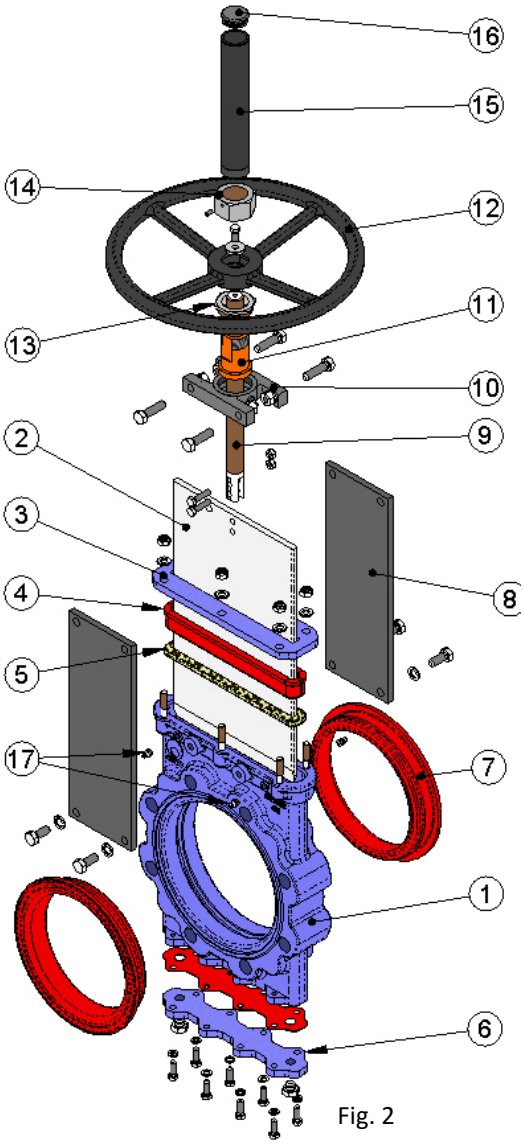


Fig. 2

| STANDARD COMPONENTS LIST | | |
|---|---|---|
| **COMPONENT** | **WATERPROOF VERSION** | **STAINLESS STEEL VERSION** |
| 1- Body | GJS-500 | CF8M |
| 2- Gate | AISI304 | AISI316 |
| 3- Packing gland | STEEL | AISI316 |
| 4- Packing seal. | NATURAL RUBBER | NATURAL RUBBER |
| 5- Packing | GREASED PACK. | GREASED PACK. |
| 6- Lower Cover | STEEL | AISI316 |
| 7- Sleeve | NATURAL RUBBER | NATURAL RUBBER |
| 8- Support plates | STEEL | STEEL |
| 9- Stem | AISI303 | AISI303 |
| 10- Yoke | GJS-500 | GJS-500 |
| 11- Stem nut | BRONZE | BRONZE |
| 12- Handwheel | GJS-500 | GJS-500 |
| 13- Stop nut | STEEL | STEEL |
| 14- Hood nut | 5.6 ZINC | 5.6 ZINC |
| 15- Hood | STEEL | STEEL |
| 16- Protec. cap | PLASTIC | PLASTIC |
| 17- Greaser (optional) | STEEL | STEEL |

Table 1

# DESIGN CHARACTERISTICS

## 1- BODY

One-piece reinforced cast iron body.
The body provides a full continuous flow. This means that in open position it produces no cavities and, therefore, there are no turbulences in the fluid and the load loss is minimal.
For diameters greater than DN600 the body is machine-welded with the necessary reinforcements to resist the maximum working pressure.
Full port designed to provide high flow rates with low pressure drop.
The body's internal design prevents any build up of solids in the seat area.
The standard manufacturing materials are GJS-500 and CF8M stainless steel. Other materials such as: A216WCB carbon steel and stainless steel alloys (AISI316Ti, Duplex, 254SMO, Uranus B6, Ni-Resist, Ductile Ni-Resist, ...) are available on request. As standard, iron or carbon steel valves are painted with an anti-corrosive protection of 80 microns of EPOXY (colour RAL 5015). Other types of anti-corrosive protections are available on request.

## 2- GATE

The standard manufacturing materials are AISI304 stainless steel in valves with GJS-500 body and AISI316 stainless steel in valves with CF8M body. Other materials or combinations can be supplied on request.
The gate is polished on both sides to provide a smooth contact surface with the resilient seat. At the same time, the sharp edges on the gate are rounded to prevent the seal from being cut. There are different degrees of polishing, anti-abrasion treatments and various options to adapt the valves to the customer's requirements.

## 3- SEAT: (watertight)

The seat on the **GL** valve is composed of two rubber sleeves, located on either side of the body symmetrically. The sleeves are made of natural rubber with a metal core which helps to keep their shape and at the same time prevents deformations. Whilst the valve is in open position, the sleeves' elasticity ensures they are joined together permanently, preventing the accumulation of solids between the two parts of the body.
The **GL** valve is designed for abrasive fluids, and therefore, the sleeves protect the entire surface of the body which would be exposed to the abrasive flow. Regarding the sleeves' maintenance, these can be replaced from outside of the valve, making operation easier. It is a seat with two symmetrical parts, below we show a diagram of the seat (fig.3).

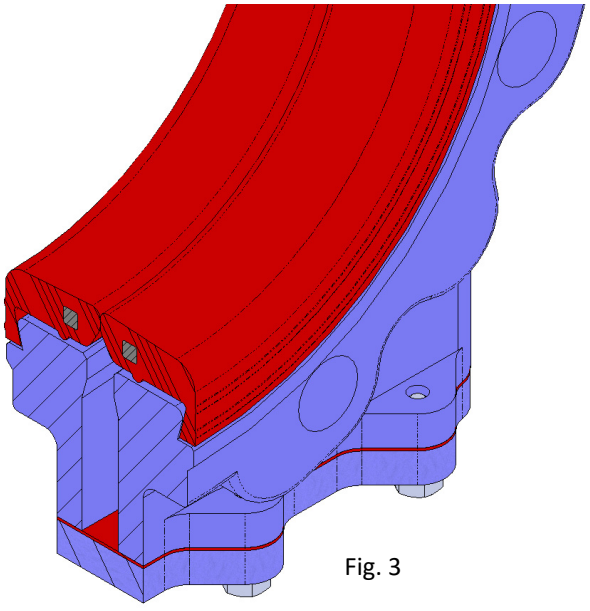


Fig. 3

**Resilient seat materials**

**NATURAL RUBBER**

This is the standard resilient seat fitted on **C.M.O. GL** model valves. It can be used in multiple applications at temperatures no higher than 90°C with abrasive products and it provides the valve with 100% watertight integrity. Application: fluids in general.

**EPDM**

Recommended for temperatures no higher than 90°C*, it provides the valve with 100% watertight integrity. Application: water and acids.

**NITRILE**

It is used in fluids containing fats or oils at temperatures no higher than 90°C*. It provides the valve with 100% watertight integrity.

**VITON**

Suitable for corrosive applications and continuous high temperatures of up to 190°C and peaks of 210°C. It provides the valve with 100% watertight integrity.

| SEAT/SEALS | | |
|---|---|---|
| **Material** | **Max. T. (°C)** | **Applications** |
| Natural rubber | 90 | General |
| EPDM (E) | 90 * | Water, non-mineral acids and oils |
| Nitrile (N) | 90 * | Hydrocarbons, oils and greases |
| Viton (V) | 200 | Hydrocarbons and solvents |

Table 2

**NOTE: More details and other materials available on request.**
*** ➔ EPDM and nitrile: is possible until serving temperature Max.: 120°C under request.**

## 4- PACKING

**C.M.O.**'s standard packing is composed of a specially designed EPDM O-ring which provides watertight integrity between the body and the gate, preventing any type of leakage to the atmosphere. It also has a greased packing strip to help the valve's operation during the opening and closing functions. They are located in an easily accessible place and can be replaced without dismantling the valve from the pipeline.

## 5- STEM

The stem on the **C.M.O.** valve is made of 18/8 stainless steel. This characteristic provides high resistance and excellent corrosion-resistant properties.

The valve design can be rising stem or non-rising stem. When a rising stem is required for the valve a stem hood is supplied to protect the stem from contact with dust and dirt, besides keeping it lubricated.

## 6- PACKING GLAND

The packing gland allows uniform force and pressure to be applied to the packing to ensure watertight integrity.

As standard, valves with steel body include steel packing glands, whilst valves with stainless steel body have stainless steel packing glands.

## 7- ACTUATORS

All types of actuators can be supplied, with the advantage that the **C.M.O.** design is fully interchangeable.

This design allows the customer to change the actuators themselves and no extra assembly accessories are required. A design characteristic of **C.M.O.** valves is that all actuators are interchangeable.

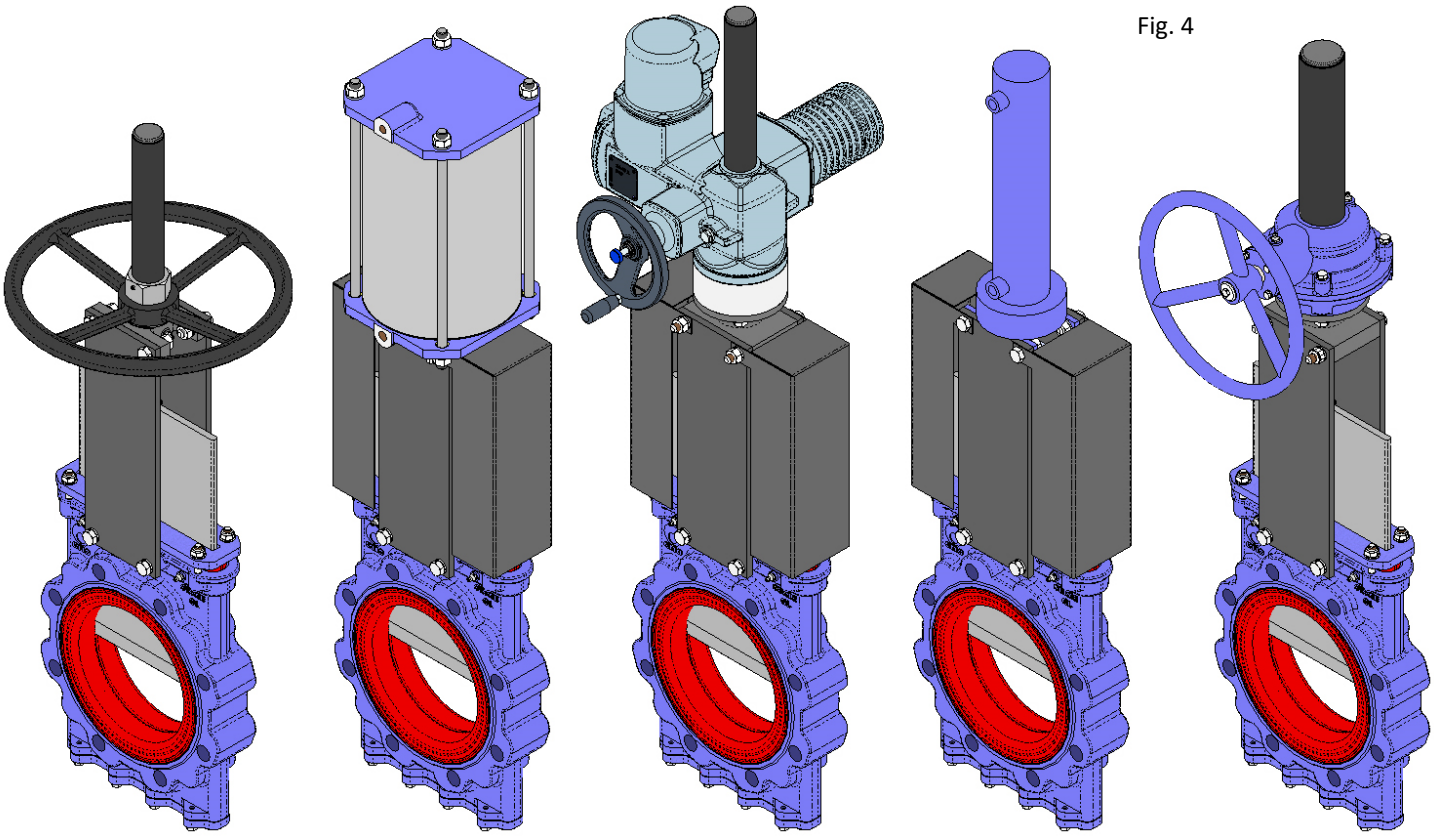
# KNIFE-GATE VALVES

## GL SERIES

**Manual:**
Handwheel with rising stem
Handwheel with non-rising stem
Chainwheel
Lever
Gear Box
Others (square nut,...)

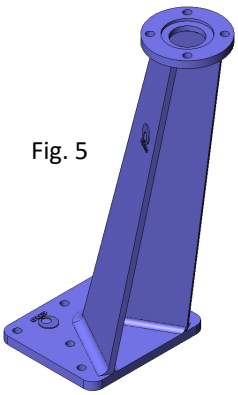
**Automatic:**
Electric actuator
Pneumatic cylinder
Hydraulic cylinder

Fig. 4



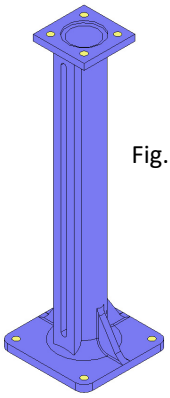
Handwheel with rising stem | Pneumatic actuator | Electric-motor actuator | Hydraulic actuator | Handwheel Gear box

Fig. 5



**Wide Range of Accessories Available:**
Mechanical stops
Locking devices
Emergency manual actuators
Solenoid valves
Positioners
Limit switches
Proximity switches
Straight floor stand (Fig. 6)
Leaning floor stand (Fig. 5)

Fig. 6



Stem extensions have also been developed, allowing the actuator to be located far away from the valve, to suit all needs. Please consult our technicians beforehand.

# ACCESSORIES AND OPTIONS

Different accessories are available to adapt the valve to specific working conditions such as:

- **Mirror Polished Gate:** The mirror polished gate is especially recommended in the food industry and, as standard, in applications in which solids can stick to the gate. It is an alternative to ensure the solids slide off and do not stick to the gate.
- **PTFE Lined Gate:** As with the mirror polished gate, it improves the valve's resistance to products that can stick to the gate.
- **Stellited Gate:** Stellite is added to the gate's internal circle to protect it from abrasion.
- **Scraper in the Packing:** Its function is to clean the gate during the opening movement and prevent possible damage to the packing.
- **Heating Jacket:** Recommended in applications in which the fluid can harden and solidify inside the valve's body. An external jacket keeps the body temperature constant, preventing the fluid from solidifying.
- **Flushing Holes in Body:** Several holes are drilled in the body to flush air, steam or other fluids out with the aim of cleaning the valve seat before sealing.
- **Solenoid valves** (Fig. 7): For air distribution to pneumatic actuators.
- **Connection boxes, wiring and pneumatic piping:** Units supplied fully assembled with all the necessary accessories.
- **Mechanical Limit Switches, Inductive Switches and Positioners:** Limit switches or inductive switches are installed to indicate precise valve position, as well as positioners to indicate continuous position (Fig. 7).

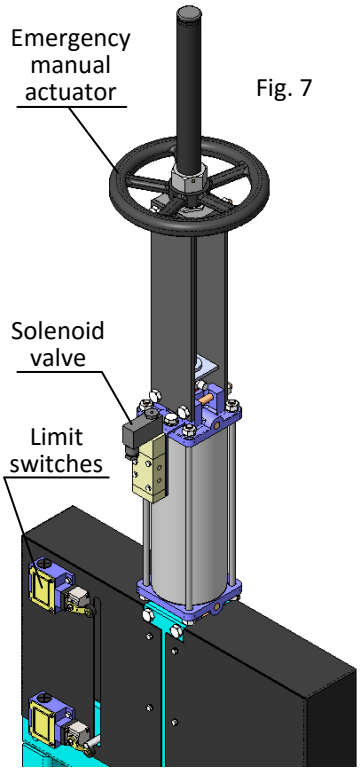


Fig. 7

- **Connection boxes, wiring and pneumatic piping:** Units supplied fully assembled with all the necessary accessories.
- **Mechanical Locking Device:** Allows the valve to be mechanically locked in a set position for long periods.
- **Stroke Limiting Mechanical Stops:** They allow the stroke to be mechanically adjusted, limiting the valve's desired run.
- **Emergency manual actuator (hand wheel /gear box)** (Fig. 7): Allows manual operation of the valve in the event of power or air failure.
- **Interchangeable actuators:** All actuators are easily interchangeable.
- **Actuator or Yoke Support:** Made of EPOXY-coated steel (or stainless steel on request), its robust design gives it great rigidity in order to resist the most adverse operation conditions.
- **Epoxy Coating:** All cast iron and carbon steel bodies and components on **C.M.O.** valves are EPOXY coated, giving the valves great resistance to corrosion and an excellent finish. **C.M.O.**'s standard colour is blue, RAL-5015.
- **Gate Safety Protection:** In accordance with European Safety Standards ("EC" marking), **C.M.O.** automated valves are equipped with gate guards, to prevent any objects from being accidentally caught in the gate.

# TYPES OF EXTENSION

When the valve needs to be operated from a distance, the following different types of actuators can be fitted:

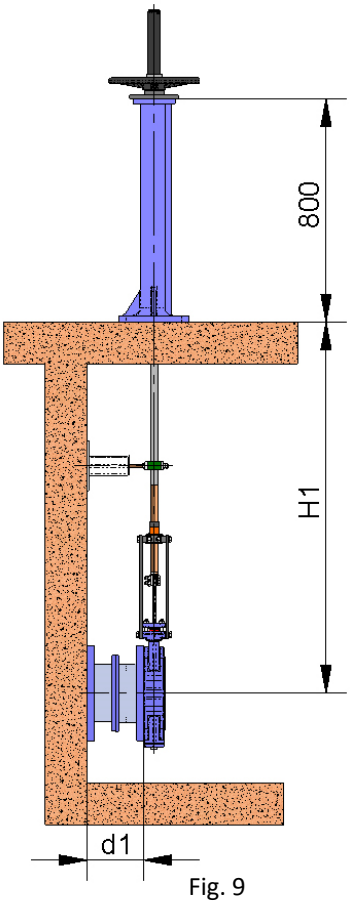



Fig. 9

**1 - Extension: Floor Stand.**

This extension is performed by coupling a rod to the stem. By defining the length of the rod, the desired extension is achieved. A floor stand is normally installed to support the actuator.

The definition variables are as follows:

**H1:** Distance from the valve's shaft to the base of the stand.

**d1:** Separation from the wall to the end of the connecting flange.

**Characteristics:**

- It can be coupled to any type of actuator.
- A stem support-guide (Fig. 8) is recommended every 1.5m.
- The standard floor stand is 800mm high (Fig. 9). Other floor stand measurements available on request.
- A position indicator can be fitted to determine the valve's percentage of opening.
- Possibility of leaning floor stand (Fig. 10).

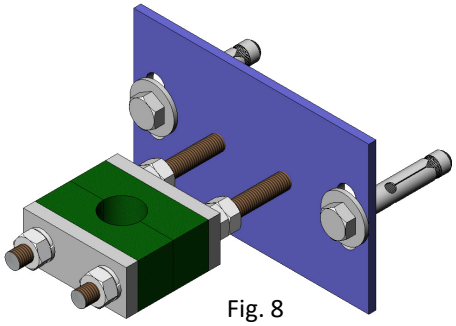


Fig. 8

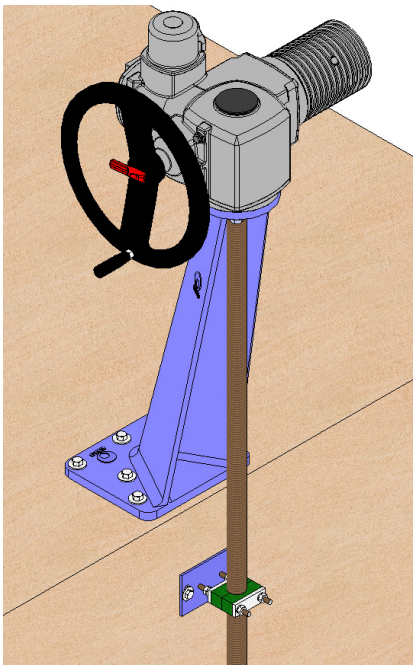


Fig. 10

| COMPONENTS LLIST | |
|---|---|
| **Component** | **Standard Version** |
| Stem | AISI 303 |
| Rod | AISI 304 |
| Support-guide | EPOXI coated carbon steel |
| Guide | Nylon |
| Stand | EPOXI coated GJS-500 |

Table 3

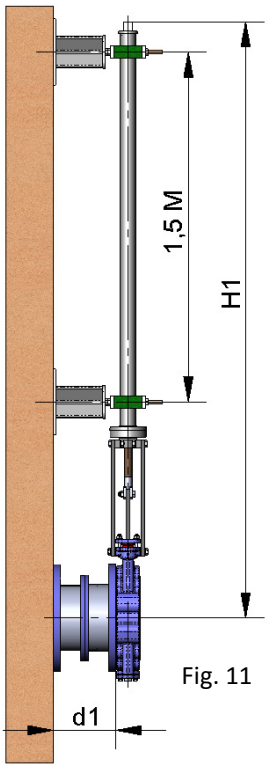



Fig. 11

**2 - Extension: Pipe (Fig. 11)**

Consists of raising the actuator. The pipe will rotate in the same direction as the handwheel when the valve is operated but it always remains at the same height.

The definition variables are as follows:
**H1:** Distance from the valve's shaft to the desired height of the actuator.
**d1:** Separation from the wall to the end of the connecting flange.

**Characteristics:**
- Standard actuators: Handwheel and "Square Nut"
- A pipe support-guide is recommended every 1.5m.
- The standard materials are: EPOXY coated carbon steel or stainless steel.

**3 - Extension: Extended Support Plates (Fig. 12)**

When a short extension is required, it can be achieved by extending the support plates. An intermediate yoke can be fitted to reinforce the support plates' structure.

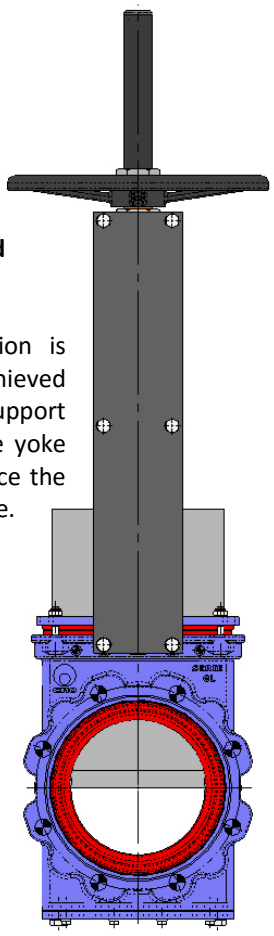


Fig. 12

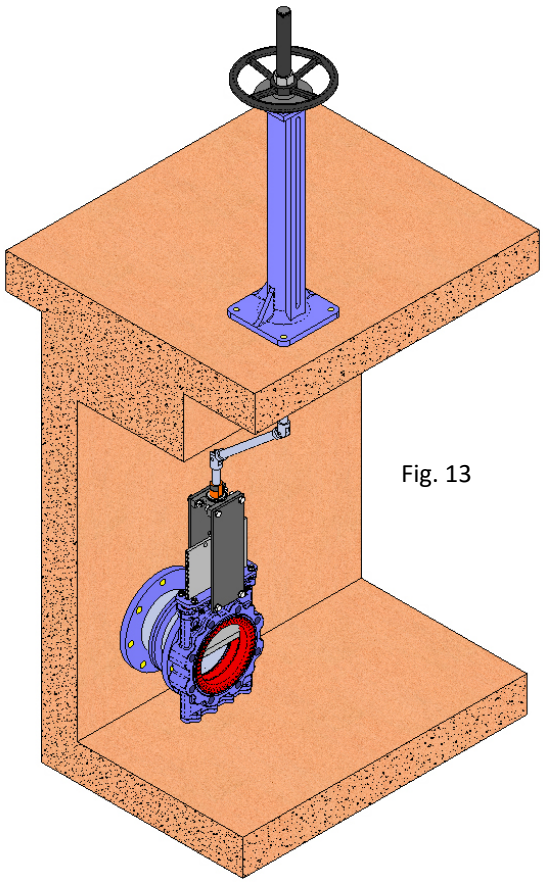


Fig. 13

**4 - Extension: Universal Joint (Fig. 13)**

If the valve and the actuator are not in correct alignment, the problem can be resolved by fitting a universal joint.

# KNIFE-GATE VALVES GL SERIES

## HANDWHEEL with rising stem

- **B = Max. width** of the valve (without actuator).
  **P = Max. height** of the valve (without actuator).

- Options:
  - Locking devices.
  - Extensions: stand, pipe, plates...
  - DN higher than those give in the table.

- Actuator including:
  - Handwheel.
  - Stem.
  - Nut.
  - Stem protection hood.

- Available: DN50 to DN1000, other DN on request.

- From DN350 (included) the actuator is with geared motor.

- Other pressures on request.

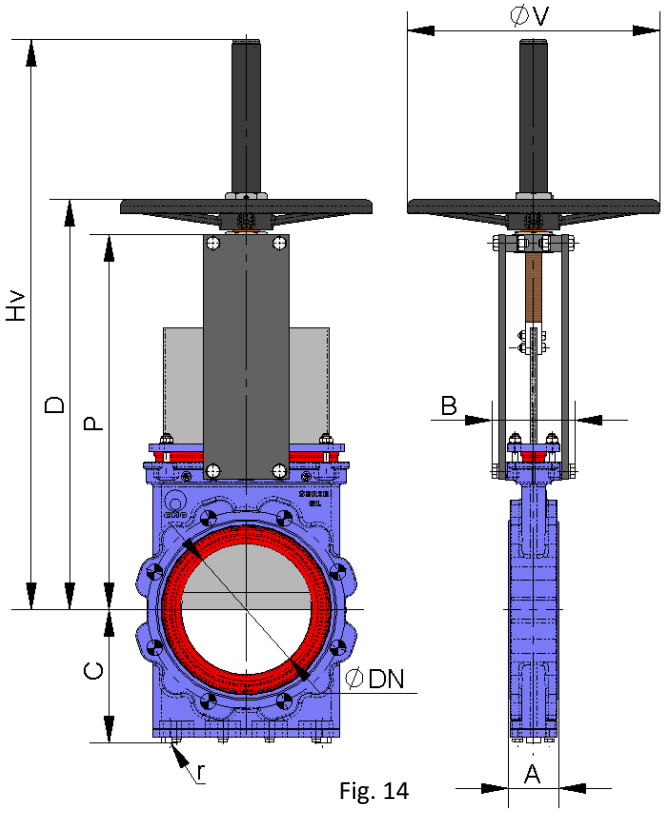


Fig. 14

| DN | ΔP (Kg/cm²) | DRAW (Nw) | TORQUE (Nm) | A | B | C | P | D | Hv | ØV | WEIGHT (Kg) | r (B.S.P.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 | 10 | 920 | 2 | 54 | 109 | 106 | 280 | 319 | 451 | 225 | 12 | 1/4” |
| 65 | 10 | 1553 | 4 | 54 | 109 | 113 | 306 | 345 | 502 | 225 | 14 | 1/4” |
| 80 | 10 | 2352 | 5 | 57 | 109 | 122 | 332 | 372 | 553 | 225 | 18 | 1/4" |
| 100 | 10 | 3674 | 8 | 57 | 109 | 136 | 368 | 407 | 589 | 225 | 21 | 1/4" |
| 125 | 10 | 5739 | 16 | 64 | 126 | 153 | 421 | 474 | 675 | 325 | 26 | 1/4" |
| 150 | 10 | 8267 | 24 | 64 | 126 | 168 | 466 | 519 | 759 | 325 | 33 | 1/4" |
| 200 | 10 | 14709 | 42 | 76 | 126 | 199 | 565 | 618 | 958 | 325 | 52 | 3/8” |
| 250 | 10 | 23001 | 89 | 76 | 197 | 234 | 626 | 750 | 1127 | 450 | 74 | 1/2" |
| 300 | 10 | 33156 | 129 | 83 | 197 | 272 | 739 | 838 | 1230 | 450 | 98 | 1/2" |
| 350 | 10 | 45198 | 175 | 83 | 350 | 297 | 842 | -- | -- | -- | -- | 1/2" |
| 400 | 10 | 59178 | 263 | 96 | 350 | 330 | 933 | -- | -- | -- | -- | 3/4" |
| 450 | 10 | 74891 | 333 | 96 | 350 | 355 | 1019 | -- | -- | -- | -- | 3/4" |
| 500 | 10 | 92469 | 506 | 121 | 380 | 391 | 1156 | -- | -- | -- | -- | 3/4" |
| 600 | 10 | 133494 | 730 | 121 | 400 | 461 | 1338 | -- | -- | -- | -- | 1” |
| 700 | 6 | 109909 | 601 | 182 | 400 | 534 | 1425 | -- | -- | -- | -- | 1” |
| 750 | 6 | 126159 | 690 | 188 | 400 | 559 | 1520 | -- | -- | -- | -- | 1” |
| 800 | 6 | 143530 | 931 | 206 | 400 | 584 | 1615 | -- | -- | -- | -- | 1” |
| 900 | 6 | 182412 | 1183 | 225 | 400 | 649 | 1823 | -- | -- | -- | -- | 1” |
| 1000 | 4 | 151073 | 980 | 240 | 440 | 699 | 1992 | -- | -- | -- | -- | 1” |

Table 4

# HANDWHEEL with Non-Rising Stem

- Suitable when no size limitations exist.
- **B = Max. width** of the valve (without actuator).
  **P = Max. height** of the valve (without actuator).
- Options:
  - Square nut.
  - Locking devices.
  - Extensions: stand, pipe, plates...
  - DN higher than those give in the table.
- Actuator including:
  - Handwheel.
  - Stem.
  - Guide bearings on the yoke.
  - Nut.
- Available: DN50 to DN1000, other DN on request.
- From DN350 (included) the actuator is with geared motor.
- Other pressures on request.

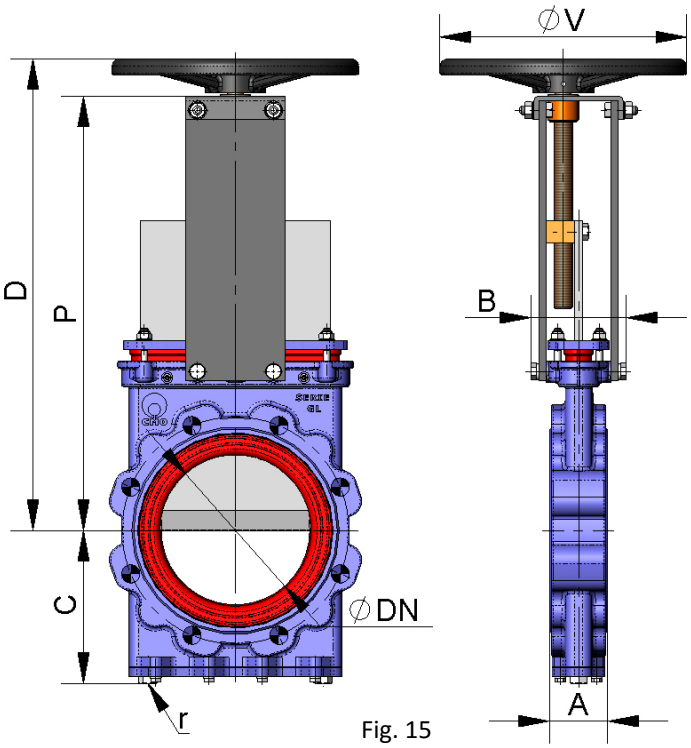



Fig. 15

| DN | ΔP (Kg/cm²) | DRAW (Nw) | TORQUE (Nm) | A | B | C | P | D | ØV | r (B.S.P.) |
|---|---|---|---|---|---|---|---|---|---|---|
| 50 | 10 | 920 | 2 | 54 | 109 | 106 | 280 | 319 | 225 | 1/4” |
| 65 | 10 | 1553 | 4 | 54 | 109 | 113 | 306 | 345 | 225 | 1/4” |
| 80 | 10 | 2352 | 5 | 57 | 109 | 122 | 332 | 372 | 225 | 1/4" |
| 100 | 10 | 3674 | 8 | 57 | 109 | 136 | 368 | 407 | 225 | 1/4" |
| 125 | 10 | 5739 | 16 | 64 | 126 | 153 | 421 | 474 | 325 | 1/4" |
| 150 | 10 | 8267 | 24 | 64 | 126 | 168 | 466 | 519 | 325 | 1/4" |
| 200 | 10 | 14709 | 42 | 76 | 126 | 199 | 565 | 618 | 325 | 3/8” |
| 250 | 10 | 23001 | 89 | 76 | 197 | 234 | 626 | 750 | 450 | 1/2" |
| 300 | 10 | 33156 | 129 | 83 | 197 | 272 | 739 | 838 | 450 | 1/2" |
| 350 | 10 | 45198 | 175 | 83 | 350 | 297 | 842 | -- | -- | 1/2" |
| 400 | 10 | 59178 | 263 | 96 | 350 | 330 | 933 | -- | -- | 3/4" |
| 450 | 10 | 74891 | 333 | 96 | 350 | 355 | 1019 | -- | -- | 3/4" |
| 500 | 10 | 92469 | 506 | 121 | 380 | 391 | 1156 | -- | -- | 3/4" |
| 600 | 10 | 133494 | 730 | 121 | 400 | 461 | 1338 | -- | -- | 1” |
| 700 | 6 | 109909 | 601 | 182 | 400 | 534 | 1425 | -- | -- | 1” |
| 750 | 6 | 126159 | 690 | 188 | 400 | 559 | 1520 | -- | -- | 1” |
| 800 | 6 | 143530 | 931 | 206 | 400 | 584 | 1615 | -- | -- | 1” |
| 900 | 6 | 182412 | 1183 | 225 | 400 | 649 | 1823 | -- | -- | 1” |
| 1000 | 4 | 151073 | 980 | 240 | 440 | 699 | 1992 | -- | -- | 1” |

Table 5

# CHAINWHEEL

- Widely used in raised installations with difficult access, the handwheel is fitted in vertical position.
- **B = Max. width** of the valve (without actuator).
  **P = Max. height** of the valve (without actuator).
- Options:
  - Locking devices.
  - Extensions: stand, pipe, plates...
  - Non-rising stem.
  - DN higher than those give in the table.
- Including:
  - Handwheel.
  - Stem.
  - Nut.
  - Hood.
- Available: DN50 to DN1000, other DN on request.
- From DN350 (inclusive), the valves are with gear box, see * in the table.
- Other pressures on request.

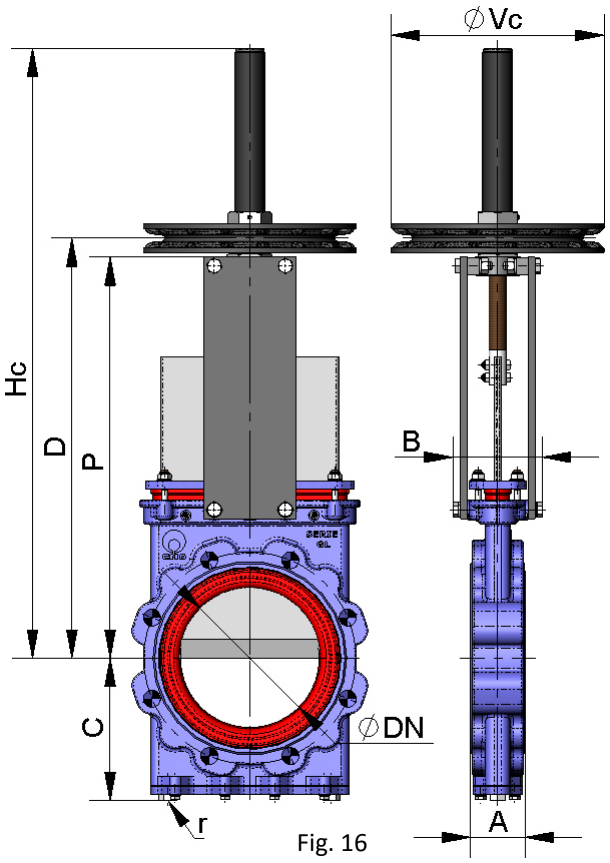



Fig. 16

| DN | ΔP (Kg/cm²) | DRAW (Nw) | TORQUE (Nm) | A | B | C | P | D | Hc | ØVc | r (B.S.P.) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 | 10 | 920 | 2 | 54 | 109 | 106 | 280 | 319 | 449 | 225 | 1/4” |
| 65 | 10 | 1553 | 4 | 54 | 109 | 113 | 306 | 345 | 500 | 225 | 1/4” |
| 80 | 10 | 2352 | 5 | 57 | 109 | 122 | 332 | 372 | 551 | 225 | 1/4" |
| 100 | 10 | 3674 | 8 | 57 | 109 | 136 | 368 | 407 | 587 | 225 | 1/4" |
| 125 | 10 | 5739 | 16 | 64 | 126 | 153 | 421 | 474 | 713 | 300 | 1/4" |
| 150 | 10 | 8267 | 24 | 64 | 126 | 168 | 466 | 519 | 757 | 300 | 1/4" |
| 200 | 10 | 14709 | 42 | 76 | 126 | 199 | 565 | 618 | 957 | 300 | 3/8” |
| 250 | 10 | 23001 | 89 | 76 | 197 | 234 | 626 | 749 | 1125 | 402 | 1/2" |
| 300 | 10 | 33156 | 129 | 83 | 197 | 272 | 739 | 837 | 1213 | 402 | 1/2" |
| 350 | 10 | 45198 | 175 | 83 | 350 | 297 | 842 | 942 | 1384 | 402* | 1/2" |
| 400 | 10 | 59178 | 263 | 96 | 350 | 330 | 933 | 1033 | 1627 | 402* | 3/4" |
| 450 | 10 | 74891 | 333 | 96 | 350 | 355 | 1019 | 1119 | 1719 | 402* | 3/4" |
| 500 | 10 | 92469 | 506 | 121 | 380 | 391 | 1156 | 1256 | 1890 | 402* | 3/4" |
| 600 | 10 | 133494 | 730 | 121 | 400 | 461 | 1338 | 1438 | 2171 | 402* | 1” |
| 700 | 6 | 109909 | 601 | 182 | 400 | 534 | 1425 | 1525 | 2440 | 402* | 1” |
| 750 | 6 | 126159 | 690 | 188 | 400 | 559 | 1520 | 1620 | 2555 | 402* | 1” |
| 800 | 6 | 143530 | 931 | 206 | 400 | 584 | 1615 | 1715 | 2665 | 402* | 1” |
| 900 | 6 | 182412 | 1183 | 225 | 400 | 649 | 1823 | 1923 | 2823 | 402* | 1” |
| 1000 | 4 | 151073 | 980 | 240 | 440 | 699 | 1992 | 2092 | 3192 | 402* | 1” |

Table 6

# LEVER

- It is a fast actuator.
- **B = Max. width** of the valve (without actuator).
  **P = Max. height** of the valve (without actuator).
- The actuator includes:
  - Lever.
  - Rod.
  - Guide bearing.
  - External limiting switches to maintain the position.
- Available: ND 50 to ND 200, other ND on request.
- Other pressures on request.

∗ Drive designed to maneuver to 2 Kg/cm² of differential pressure (ΔP).

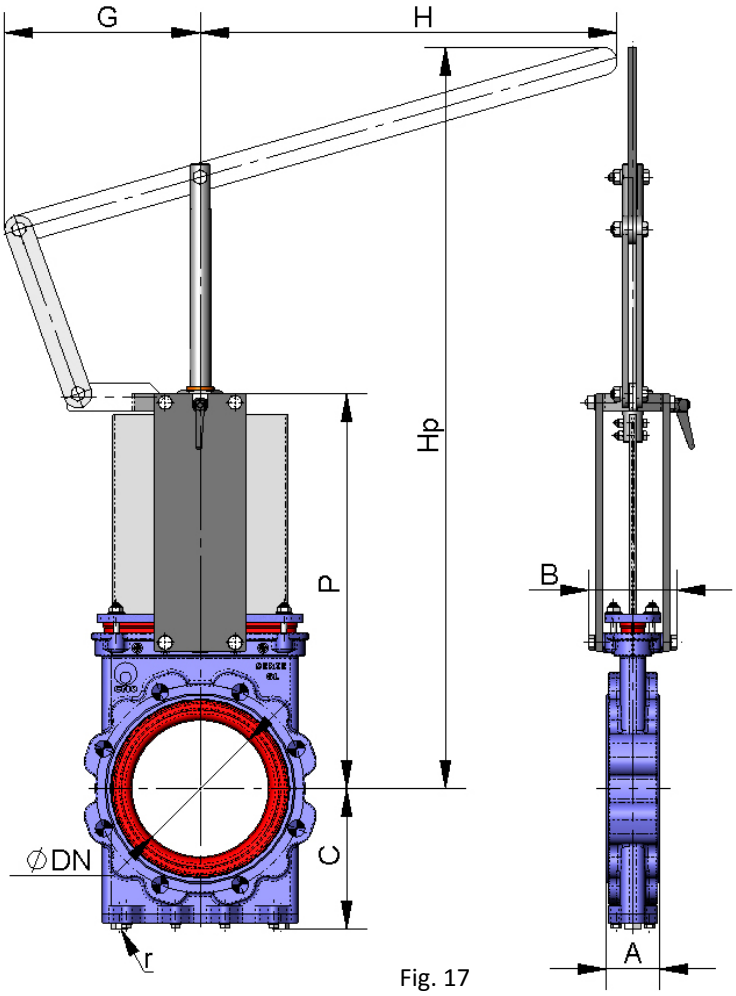



Fig. 17

| DN | ΔP (Kg/cm²) | DRAW (Nw) | A | B | C | P | Hp | G | H | r (B.S.P.) |
|---|---|---|---|---|---|---|---|---|---|---|
| 50 | 10* | 188* | 54 | 109 | 106 | 280 | 543 | 155 | 325 | 1/4” |
| 65 | 10* | 316* | 54 | 109 | 113 | 306 | 564 | 155 | 325 | 1/4” |
| 80 | 10* | 477* | 57 | 109 | 122 | 332 | 587 | 155 | 325 | 1/4" |
| 100 | 10* | 745* | 57 | 109 | 136 | 368 | 639 | 155 | 325 | 1/4" |
| 125 | 10* | 1162* | 64 | 126 | 153 | 421 | 942 | 155 | 425 | 1/4" |
| 150 | 10* | 1673* | 64 | 126 | 168 | 466 | 1002 | 155 | 425 | 1/4" |
| 200 | 10* | 2971* | 76 | 126 | 199 | 565 | 1068 | 290 | 620 | 3/8” |

Table 7

# GEAR BOX

- It is recommendable for DN greater than 350.
- **B = Max. width** of the valve (without actuator).
  **P = Max. height** of the valve (without actuator).
- Options:
  - Chainwheel.
  - Locking devices.
  - Extensions: stand, pipe, plates...
  - Non-rising stem.
- Actuator including:
  - Stem.
  - Yoke.
  - Cone-shaped gear box.
  - Handwheel.
- Standard ratio = 4 to 1.
- Available: DN50 to DN1400, other DN on request.
- Other pressures on request.

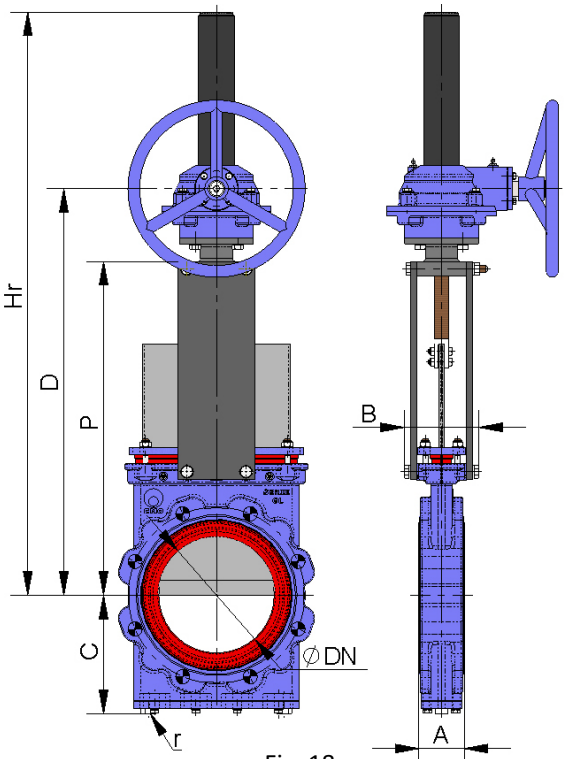



Fig. 18

| DN | ΔP (Kg/cm²) | DRAW (Nw) | TORQUE (Nm) | A | B | C | P | D | Hr | r (B.S.P.) |
|---|---|---|---|---|---|---|---|---|---|---|
| 50 | 10 | 920 | 2 | 54 | 109 | 106 | 280 | 402 | 581 | 1/4” |
| 65 | 10 | 1553 | 4 | 54 | 109 | 113 | 306 | 446 | 621 | 1/4” |
| 80 | 10 | 2352 | 5 | 57 | 109 | 122 | 332 | 454 | 633 | 1/4" |
| 100 | 10 | 3674 | 8 | 57 | 109 | 136 | 368 | 490 | 669 | 1/4" |
| 125 | 10 | 5739 | 16 | 64 | 126 | 153 | 421 | 565 | 800 | 1/4" |
| 150 | 10 | 8267 | 24 | 64 | 126 | 168 | 466 | 589 | 848 | 1/4" |
| 200 | 10 | 14709 | 42 | 76 | 126 | 199 | 565 | 689 | 948 | 3/8” |
| 250 | 10 | 23001 | 89 | 76 | 197 | 234 | 626 | 735 | 1119 | 1/2" |
| 300 | 10 | 33156 | 129 | 83 | 197 | 272 | 739 | 833 | 1217 | 1/2" |
| 350 | 10 | 45198 | 175 | 83 | 350 | 297 | 842 | 935 | 1384 | 1/2" |
| 400 | 10 | 59178 | 263 | 96 | 350 | 330 | 933 | 1028 | 1627 | 3/4" |
| 450 | 10 | 74891 | 333 | 96 | 350 | 355 | 1019 | 1120 | 1719 | 3/4" |
| 500 | 10 | 92469 | 506 | 121 | 380 | 391 | 1156 | 1275 | 1889 | 3/4" |
| 600 | 10 | 133494 | 730 | 121 | 400 | 461 | 1338 | 1457 | 2171 | 1” |
| 700 | 6 | 109909 | 601 | 182 | 400 | 534 | 1530 | 1764 | 2440 | 1” |
| 750 | 6 | 126159 | 690 | 188 | 400 | 559 | 1637 | 1860 | 2555 | 1” |
| 800 | 6 | 143530 | 931 | 206 | 400 | 584 | 1733 | 1950 | 2807 | 1” |
| 900 | 6 | 182412 | 1183 | 225 | 400 | 649 | 1954 | 2090 | 3148 | 1” |
| 1000 | 4 | 151073 | 980 | 240 | 440 | 699 | 2160 | 2233 | 3579 | 1” |
| 1100 | 4 | 183808 | 1192 | 240 | 440 | 730 | 2310 | 2446 | 3779 | 1 ½” |
| 1200 | 4 | 218843 | 1643 | 254 | 480 | 775 | 2551 | 2522 | 3807 | 1 ½” |
| 1300 | 4 | 258248 | 1939 | 254 | 480 | 805 | 2882 | 3053 | 4482 | 1 ½” |
| 1400 | 4 | 299637 | 2519 | 279 | 520 | 875 | 3250 | 3458 | 4952 | 1 ½” |

Table 8

# DOUBLE-ACTING PNEUMATIC CYLINDER

- The air supply pressure to the cylinder is a minimum of 6 Kg/cm² and a maximum of 10 Kg/cm², the air must be dry and lubricated.
- For DN50 to DN200 valves, the cylinder's jacket and covers are made of aluminium, the rod of AISI304, the piston of rubber-coated steel and the O-ring seals are made of nitrile.
- For pneumatic cylinders larger than Ø200 the covers are made of nodular cast iron or carbon steel.
- On request, we can also supply the actuator made entirely of stainless steel, especially for installation in corrosive atmospheres.
- **B = Max. width** of the valve (without actuator).
  **P = Max. height** of the valve (without actuator).
- Available: DN50 to DN700, other DN on request.
- Other pressures on request.

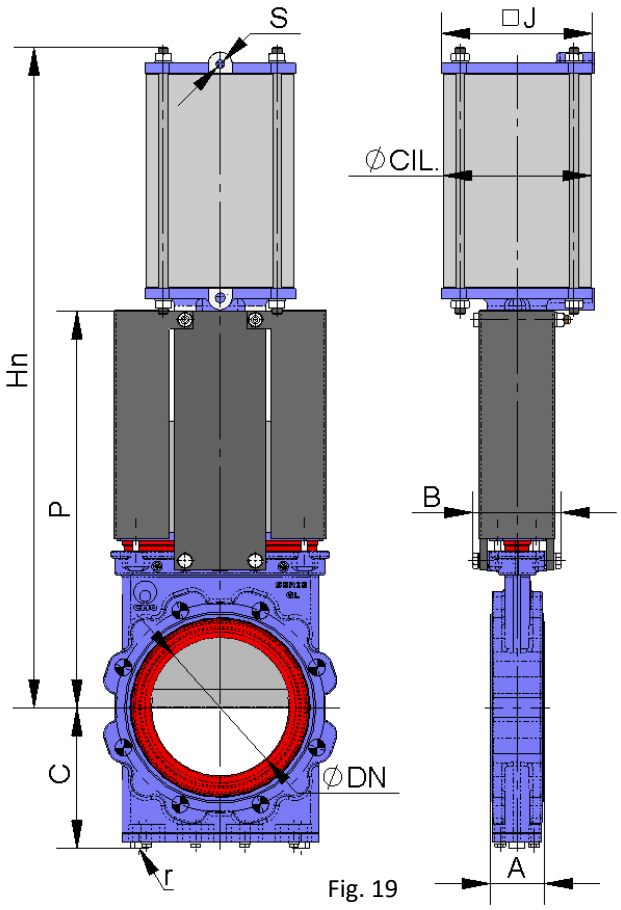



Fig. 19

| DN | ΔP (*) (Kg/cm²) | DRAW (Nw) | A | B | C | P | Hn | J | Ø CYL | Ø STEM | S (B.S.P.) | WEIGHT (Kg) | r (B.S.P.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 | 10 | 920 | 54 | 109 | 106 | 280 | 475 | 96 | 80 | 20 | 1/4" | 12 | 1/4” |
| 65 | 10 | 1553 | 54 | 109 | 113 | 306 | 515 | 96 | 80 | 20 | 1/4" | 14 | 1/4” |
| 80 | 10 | 2352 | 57 | 109 | 122 | 332 | 555 | 115 | 100 | 20 | 1/4" | 18 | 1/4" |
| 100 | 10 | 3674 | 57 | 109 | 136 | 368 | 620 | 138 | 125 | 25 | 1/4" | 23 | 1/4" |
| 125 | 10 | 5739 | 64 | 126 | 153 | 421 | 700 | 175 | 160 | 30 | 1/4" | 28 | 1/4" |
| 150 | 10 | 8267 | 64 | 126 | 168 | 466 | 775 | 175 | 160 | 30 | 1/4" | 38 | 1/4" |
| 200 | 10 | 14709 | 76 | 126 | 199 | 565 | 940 | 218 | 200 | 30 | 3/8" | 61 | 3/8” |
| 250 | 10 | 23001 | 76 | 197 | 234 | 626 | 1140 | 270 | 250 | 40 | 3/8" | 123 | 1/2" |
| 300 | 10 | 33156 | 83 | 197 | 272 | 739 | 1300 | 382 | 300 | 45 | 1/2" | 174 | 1/2" |
| 350 | 10 | 45198 | 83 | 350 | 297 | 842 | 1485 | 444 | 350 | 45 | 1/2" | 211 | 1/2" |
| 400 | 10 | 59167 | 96 | 350 | 330 | 933 | 1655 | 508 | 400 | 50 | 1/2" | 278 | 3/4" |
| 450 | 10 | 74891 | 96 | 350 | 355 | 1019 | 1805 | 552 | 450 | 50 | 3/4" | 368 | 3/4" |
| 500 | 10 | 92453 | 121 | 380 | 391 | 1156 | 2000 | 612 | 500 | 50 | 3/4" | 429 | 3/4" |
| 600 | 10 | 133494 | 121 | 400 | 461 | 1338 | 2285 | 772 | 585 | 60 | 1" | 503 | 1” |
| 700 | 6 | 109856 | 182 | 400 | 534 | 1530 | 2495 | 772 | 635 | 60 | 1" | -- | 1” |

(*)→ For lower working pressures consult Ø cylinder.

Table 9

# SINGLE-ACTING PNEUMATIC CYLINDER

- The air supply pressure to the cylinder is a minimum of 6 Kg/cm² and a maximum of 10 Kg/cm², the air must be dry and lubricated.
- Available for opening or closing in case of air supply failure (spring opening or closing).
- The jacket is made of aluminium, the covers of nodular cast iron or carbon steel, the rod of AISI304, the piston of rubber-coated steel, the O-ring seals of nitrile and the spring is made of steel.
- The **actuator** design is **spring** activated for valves with diameters **up to DN200**. For larger diameters the actuator contains a double-acting cylinder and an air tank which stores the volume of air necessary to perform the last movement in the event of a air supply failure.
- **B = Max. width** of the valve (without actuator).
  **P = Max. height** of the valve (without actuator).
- Available: DN50 to DN200, other DN on request.
- Other pressures on request.

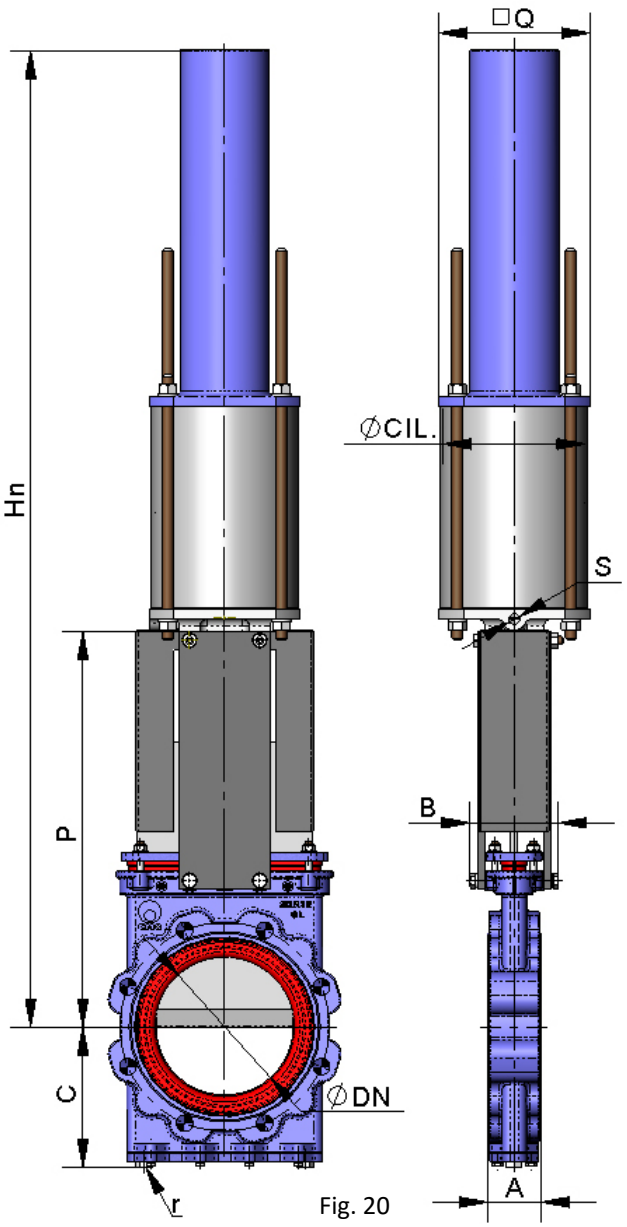



Fig. 20

| DN | ΔP (Kg/cm²) | DRAW (Nw) | A | B | C | P | Hn | J | Ø CYL. | Ø STEM | S (B.S.P.) | r (B.S.P.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 | 10 | 920 | 54 | 109 | 106 | 280 | 752 | 138 | 125 | 25 | 1/4" | 1/4” |
| 65 | 10 | 1553 | 54 | 109 | 113 | 306 | 794 | 138 | 125 | 25 | 1/4" | 1/4” |
| 80 | 10 | 2352 | 57 | 109 | 122 | 332 | 836 | 138 | 125 | 25 | 1/4" | 1/4" |
| 100 | 10 | 3674 | 57 | 109 | 136 | 368 | 906 | 175 | 160 | 30 | 1/4" | 1/4" |
| 125 | 10 | 5739 | 64 | 126 | 153 | 421 | 986 | 218 | 200 | 30 | 3/8" | 1/4" |
| 150 | 10 | 8267 | 64 | 126 | 168 | 466 | 1056 | 218 | 200 | 30 | 3/8" | 1/4" |
| 200 | 10 | 14709 | 76 | 126 | 199 | 565 | 1439 | 270 | 250 | 40 | 3/8" | 3/8” |

Table 10

# ELECTRIC ACTUATOR

- This actuator is automatic and includes the following parts:
  - Electric motor.
  - Stem.
  - Yoke.
- Options:
  - Different types and brands.
  - Non-rising stem.
- ISO 5210 / DIN 3338 Flanges.
- Available: DN50 to DN1400, other DN on request.
- From DN350 (inclusive) the motor is assisted with a gear box.
- Other pressures on request.

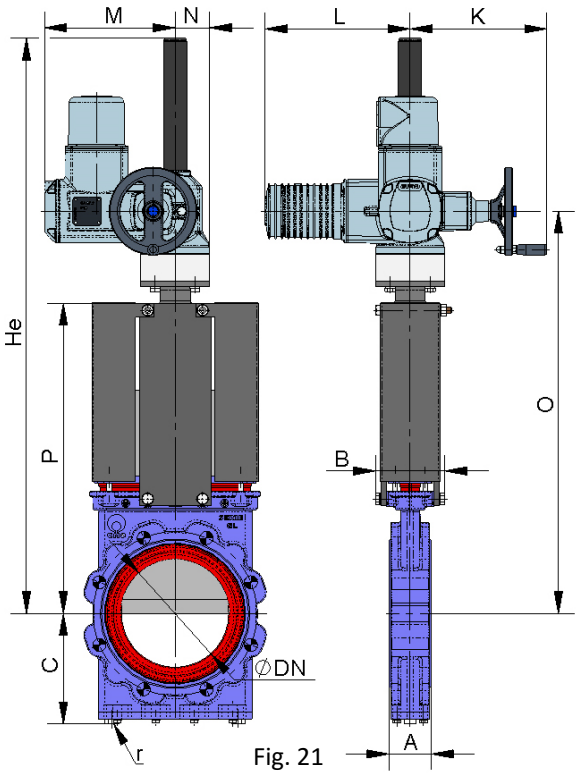



Fig. 21

| DN | ΔP (Kg/cm²) | DRAW (Nw) | TORQUE (Nm) | A | B | C | P | K | L | M | N | O | He | r (B.S.P.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 | 10 | 920 | 2 | 54 | 109 | 106 | 280 | 249 | 265 | 238 | 62 | 436 | 631 | 1/4” |
| 65 | 10 | 1553 | 4 | 54 | 109 | 113 | 306 | 249 | 265 | 238 | 62 | 462 | 657 | 1/4” |
| 80 | 10 | 2352 | 5 | 57 | 109 | 122 | 332 | 249 | 265 | 238 | 62 | 488 | 683 | 1/4" |
| 100 | 10 | 3674 | 8 | 57 | 109 | 136 | 368 | 249 | 265 | 238 | 62 | 524 | 719 | 1/4" |
| 125 | 10 | 5739 | 16 | 64 | 126 | 153 | 421 | 249 | 265 | 238 | 62 | 574 | 769 | 1/4" |
| 150 | 10 | 8267 | 24 | 64 | 126 | 168 | 466 | 249 | 265 | 238 | 62 | 624 | 819 | 1/4" |
| 200 | 10 | 14709 | 42 | 76 | 126 | 199 | 565 | 249 | 265 | 238 | 62 | 723 | 1033 | 3/8” |
| 250 | 10 | 23001 | 89 | 76 | 197 | 234 | 626 | 254 | 283 | 248 | 65 | 781 | 1121 | 1/2" |
| 300 | 10 | 33156 | 129 | 83 | 197 | 272 | 739 | 254 | 283 | 248 | 65 | 879 | 1219 | 1/2" |
| 350 | 10 | 45198 | 175 | 83 | 350 | 297 | 842 | 249 | 265 | 407 | 82 | 975 | 1384 | 1/2" |
| 400 | 10 | 59178 | 263 | 96 | 350 | 330 | 933 | 254 | 283 | 424 | 82 | 1078 | 1627 | 3/4" |
| 450 | 10 | 74891 | 333 | 96 | 350 | 355 | 1019 | 254 | 283 | 424 | 82 | 1170 | 1719 | 3/4" |
| 500 | 10 | 92469 | 506 | 121 | 380 | 391 | 1156 | 336 | 389 | 479 | 103 | 1338 | 1889 | 3/4" |
| 600 | 10 | 133494 | 730 | 121 | 400 | 461 | 1338 | 336 | 389 | 479 | 103 | 1520 | 2171 | 1” |
| 700 | 6 | 109909 | 601 | 182 | 400 | 534 | 1530 | 336 | 389 | 479 | 103 | 1831 | 2440 | 1” |
| 750 | 6 | 126159 | 690 | 188 | 400 | 559 | 1637 | 336 | 389 | 479 | 103 | 1927 | 2555 | 1” |
| 800 | 6 | 143530 | 931 | 206 | 400 | 584 | 1733 | 339 | 389 | 528 | 136 | 2017 | 2807 | 1” |
| 900 | 6 | 182412 | 1183 | 225 | 400 | 649 | 1954 | 339 | 389 | 528 | 136 | 2157 | 3148 | 1” |
| 1000 | 4 | 151073 | 980 | 240 | 440 | 699 | 2160 | 339 | 389 | 528 | 136 | 2300 | 3579 | 1” |
| 1100 | 4 | 183808 | 1192 | 240 | 440 | 730 | 2310 | 339 | 389 | 528 | 136 | 2513 | 3779 | 1 ½” |
| 1200 | 4 | 218843 | 1643 | 254 | 480 | 775 | 2551 | 336 | 389 | 659 | 170 | 2589 | 3807 | 1 ½” |
| 1300 | 4 | 258248 | 1939 | 254 | 480 | 805 | 2882 | 336 | 389 | 659 | 170 | 3120 | 4482 | 1 ½” |
| 1400 | 4 | 299637 | 2519 | 279 | 520 | 875 | 3250 | 336 | 389 | 659 | 170 | 3525 | 4952 | 1 ½” |

Table 11

# KNIFE-GATE VALVES

## GL SERIES

## HYDRAULIC ACTUATOR (Oil pressure: 135 Kg/cm$^2$)

- **B = Max. width** of the valve (without actuator).
  **P = Max. height** of the valve (without actuator).
- The hydraulic actuator includes:
  - Hydraulic cylinder.
  - Yoke.
- Available: DN50 to DN1400.
- Different types and brands available according to customer's requirements.
- Other pressures on request.

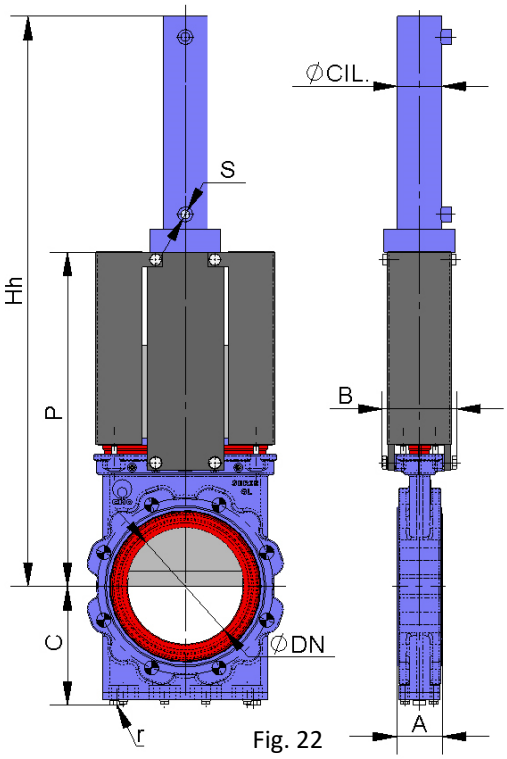



Fig. 22

| DN | ΔP (Kg/cm$^2$) | DRAW (Nw) | A | B | C | P | Hh | Ø CYL. | Ø STEM | S (B.S.P.) | Oil Cap (dm$^3$) | r (B.S.P.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 | 10 | 920 | 54 | 109 | 106 | 280 | 482 | 25 | 18 | 3/8" | 0,04 | 1/4" |
| 65 | 10 | 1553 | 54 | 109 | 113 | 306 | 524 | 25 | 18 | 3/8" | 0,05 | 1/4" |
| 80 | 10 | 2352 | 57 | 109 | 122 | 332 | 566 | 25 | 18 | 3/8" | 0,05 | 1/4" |
| 100 | 10 | 3674 | 57 | 109 | 136 | 368 | 615 | 32 | 22 | 3/8" | 0,11 | 1/4" |
| 125 | 10 | 5739 | 64 | 126 | 153 | 421 | 702 | 40 | 28 | 3/8" | 0,19 | 1/4" |
| 150 | 10 | 8267 | 64 | 126 | 168 | 466 | 789 | 50 | 28 | 3/8" | 0,36 | 1/4" |
| 200 | 10 | 14709 | 76 | 126 | 199 | 565 | 958 | 50 | 28 | 3/8" | 0,47 | 3/8" |
| 250 | 10 | 23001 | 76 | 197 | 234 | 626 | 1100 | 63 | 36 | 3/8" | 0,91 | 1/2" |
| 300 | 10 | 33156 | 83 | 197 | 272 | 739 | 1272 | 80 | 36 | 3/8" | 1,73 | 1/2" |
| 350 | 10 | 45198 | 83 | 350 | 297 | 842 | 1441 | 100 | 45 | 1/2" | 3,1 | 1/2" |
| 400 | 10 | 59178 | 96 | 350 | 330 | 933 | 1613 | 125 | 56 | 1/2" | 5,55 | 3/4" |
| 450 | 10 | 74891 | 96 | 350 | 355 | 1019 | 1766 | 125 | 56 | 1/2" | 6,22 | 3/4" |
| 500 | 10 | 92469 | 121 | 380 | 391 | 1156 | 1939 | 125 | 56 | 1/2" | 6,99 | 3/4" |
| 600 | 10 | 133494 | 121 | 400 | 461 | 1338 | 2273 | 160 | 70 | 1/2" | 12,57 | 1" |
| 700 | 6 | 109909 | 182 | 400 | 534 | 1530 | 2410 | 160 | 70 | 1/2" | 14,58 | 1" |
| 750 | 6 | 126159 | 188 | 400 | 559 | 1637 | 2576 | 160 | 70 | 1/2" | 15,58 | 1" |
| 800 | 6 | 143530 | 206 | 400 | 584 | 1733 | 2742 | 160 | 70 | 1/2" | 16,69 | 1" |
| 900 | 6 | 182412 | 225 | 400 | 649 | 1954 | 3053 | 200 | 90 | 1/2" | 29,22 | 1" |
| 1000 | 4 | 151073 | 240 | 440 | 699 | 2160 | 3322 | 160 | 70 | 1/2" | 20,81 | 1" |
| 1100 | 4 | 183808 | 240 | 440 | 730 | 2310 | 3685 | 200 | 90 | 1/2" | 35,66 | 1 ½" |
| 1200 | 4 | 218843 | 254 | 480 | 775 | 2551 | 3919 | 200 | 90 | 1/2" | 38,96 | 1 ½" |
| 1300 | 4 | 258248 | 254 | 480 | 805 | 2882 | 4565 | 200 | 90 | 1/2" | 42,1 | 1 ½" |
| 1400 | 4 | 299637 | 279 | 520 | 875 | 3250 | 5035 | 220 | 90 | 1/2" | 55,12 | 1 ½" |

Table 12

# INFORMATION ON FLANGE DIMENSIONS

## EN 1092-2 PN10

| DN | ΔP (Kg/cm²) | ● | o | Métrica | P | ØK |
|---|---|---|---|---|---|---|
| 50 | 10 | 4 | - | M 16 | 14 | 125 |
| 65 | 10 | 4 | - | M 16 | 14 | 145 |
| 80 | 10 | 8 | - | M 16 | 14 | 160 |
| 100 | 10 | 8 | - | M 16 | 14 | 180 |
| 125 | 10 | 8 | - | M 16 | 15 | 210 |
| 150 | 10 | 8 | - | M 20 | 15 | 240 |
| 200 | 10 | 8 | - | M 20 | 17 | 295 |
| 250 | 10 | 12 | - | M 20 | 17 | 350 |
| 300 | 10 | 12 | - | M 20 | 20 | 400 |
| 350 | 10 | 12 | 4 | M 20 | 21 | 460 |
| 400 | 10 | 12 | 4 | M 24 | 23 | 515 |
| 450 | 10 | 16 | 4 | M 24 | 24 | 565 |
| 500 | 10 | 16 | 4 | M 24 | 25 | 620 |
| 600 | 10 | 16 | 4 | M 27 | 26 | 725 |
| 700 | 6 | 20 | 4 | M 27 | 26 | 840 |
| 750 | 6 | 20 | 4 | M 30 | 26 | 900 |
| 800 | 6 | 20 | 4 | M 30 | 26 | 950 |
| 900 | 6 | 24 | 4 | M 30 | 26 | 1050 |
| 1000 | 6 | 24 | 4 | M 33 | 27 | 1160 |
| 1100 | 6 | 28 | 4 | M 33 | 27 | 1270 |
| 1200 | 6 | 28 | 4 | M 36 | 29 | 1380 |
| 1300 | 6 | 28 | 4 | M 36 | 29 | 1490 |
| 1400 | 6 | 24 | 12 | M 39 | 30 | 1590 |

Table 13

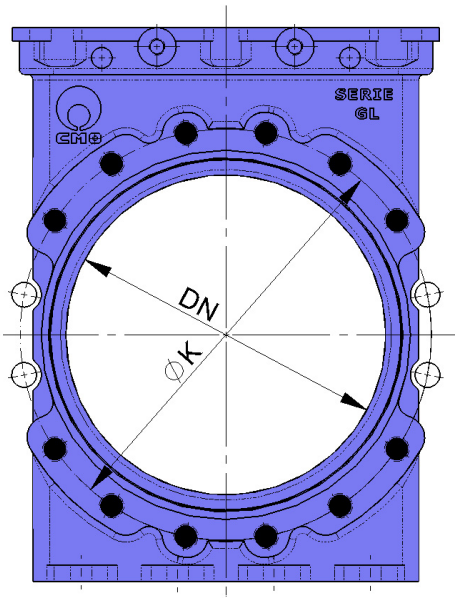



Fig. 23

● BLIND TAPPED HOLE
○ THROUGH HOLE

## ANSI B16.5, class 150

| DN | ΔP (Kg/cm²) | ● | o | R UNC | P | ØK |
|---|---|---|---|---|---|---|
| 2" | 10 | 4 | - | 5/8" | 0,55" | 4,75" |
| 2 1/2" | 10 | 4 | - | 5/8" | 0,55" | 5,5" |
| 3" | 10 | 4 | - | 5/8" | 0,55" | 6" |
| 4" | 10 | 8 | - | 5/8" | 0,55" | 7,5" |
| 5" | 10 | 8 | - | 3/4" | 0,59" | 8,5" |
| 6" | 10 | 8 | - | 3/4" | 0,59" | 9,5" |
| 8" | 10 | 8 | - | 3/4" | 0,67" | 11,75" |
| 10" | 10 | 12 | - | 7/8" | 0,67" | 14,25" |
| 12" | 10 | 12 | - | 7/8" | 0,79" | 17" |
| 14" | 10 | 8 | 4 | 1" | 0,83" | 18,75" |
| 16" | 10 | 12 | 4 | 1" | 0,91" | 21,25" |
| 18" | 10 | 12 | 4 | 1⅛" | 0,95" | 22,75" |
| 20" | 10 | 16 | 4 | 1⅛" | 1" | 25" |
| 24" | 10 | 16 | 4 | 1¼" | 1,02" | 29,5" |
| 28" | 6 | 24 | 4 | 1¼" | 1,02" | 34" |
| 30" | 6 | 24 | 4 | 1¼" | 1,02" | 36" |
| 32" | 6 | 24 | 4 | 1½" | 1,02" | 38,5" |
| 36" | 6 | 28 | 4 | 1½" | 1,02" | 42,75" |
| 40" | 6 | 32 | 4 | 1½" | 1,06" | 47,25" |

Table 14

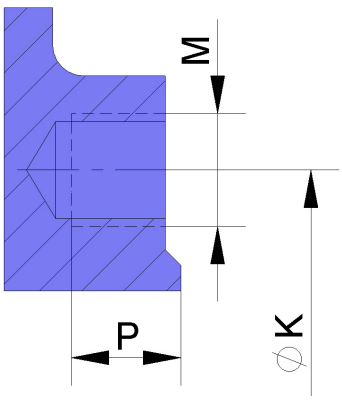
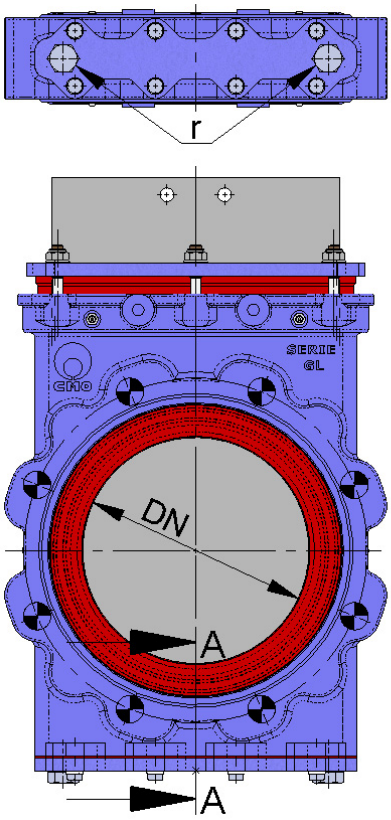


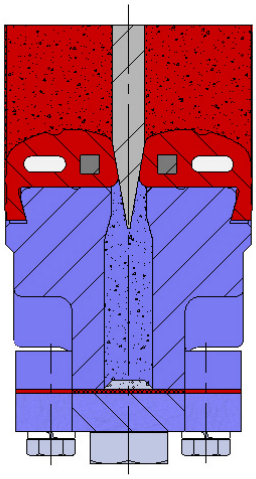

Fig. 24

# KNIFE-GATE VALVES

## GL SERIES

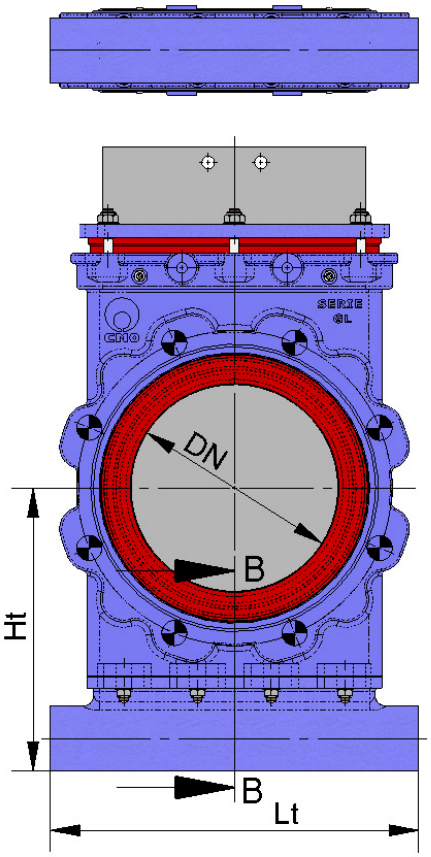



### VERSION STANDARD

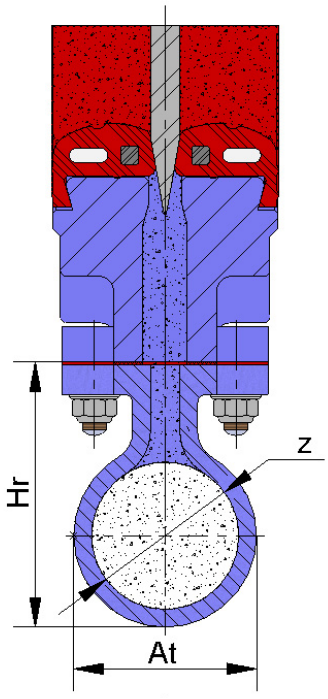


SECTION A-A

| DN | r (B.S.P.) |
|---|---|
| 50 | 1/4'' |
| 65 | 1/4'' |
| 80 | 1/4'' |
| 100 | 1/4'' |
| 125 | 1/4'' |
| 150 | 1/4'' |
| 200 | 3/8'' |
| 250 | 1/2'' |
| 300 | 1/2'' |
| 350 | 1/2'' |
| 400 | 3/4'' |
| 450 | 3/4'' |
| 500 | 3/4'' |
| 600 | 1'' |



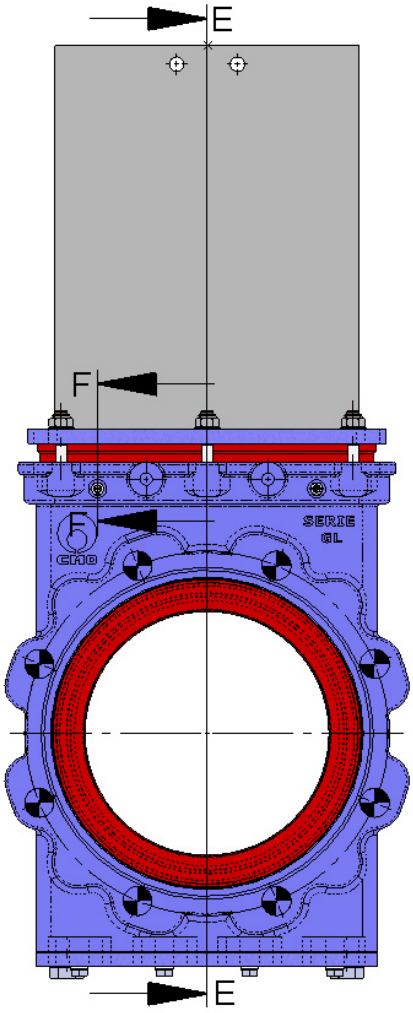

### OPTION 1

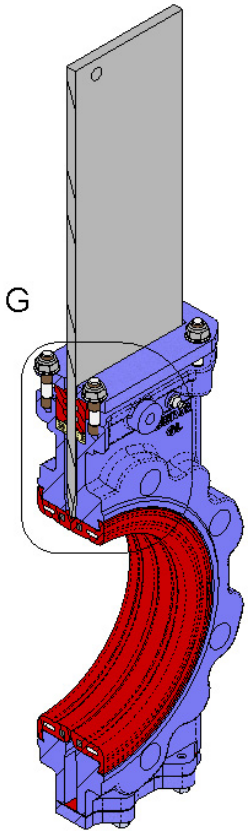



SECTION B-B

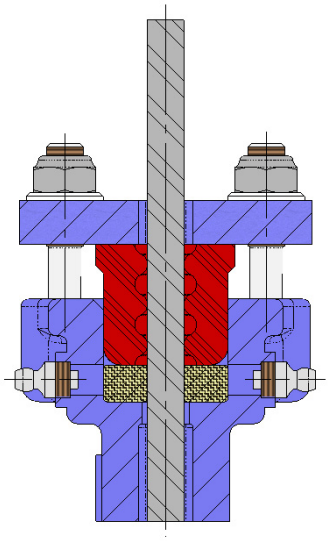
| DN | Ht | Lt | At | Hr | z (B.S.P.) |
|---|---|---|---|---|---|
| 50 | 158 | 185 | 42 | 68 | 1'' |
| 65 | 168 | 200 | 42 | 68 | 1'' |
| 80 | 174 | 220 | 42 | 68 | 1'' |
| 100 | 188 | 240 | 42 | 68 | 1'' |
| 125 | 208 | 265 | 42 | 73 | 1'' |
| 150 | 223 | 290 | 42 | 73 | 1'' |
| 200 | 272 | 350 | 62 | 93 | 1 3/4'' |
| 250 | 310 | 400 | 62 | 98 | 1 3/4'' |
| 300 | 348 | 450 | 62 | 98 | 1 3/4'' |
| 350 | 373 | 520 | 62 | 98 | 1 3/4'' |
| 400 | 403 | 560 | 62 | 98 | 1 3/4'' |
| 450 | 428 | 610 | 62 | 98 | 1 3/4'' |
| 500 | 472 | 690 | 70 | 107 | 2'' |
| 600 | 542 | 790 | 70 | 107 | 2'' |

# KNIFE-GATE VALVES GL SERIES

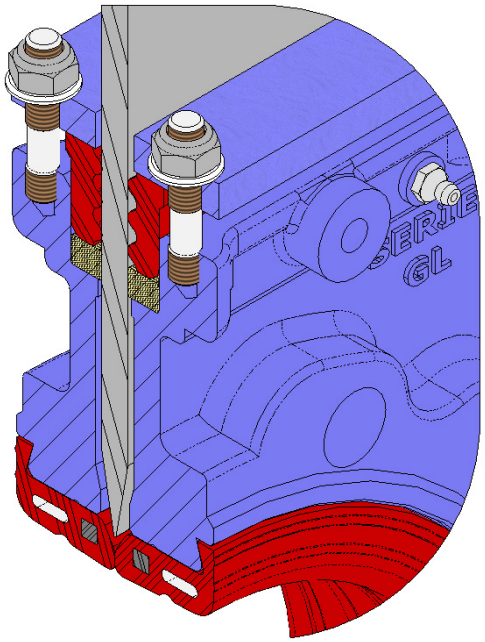



SECTION E-E



SECTION F-F




DETAIL G