

**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 CMO 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 waster water. Designed for the following applications:

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

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

**Working ( $\Delta P$ ):**

	Maximum PN
DN50 to DN600	10 kg/cm <sup>2</sup>
-DN700 to DN1400	6 kg/cm <sup>2</sup>

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

**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 Tubi Valve Mechanical-Commercial Dept.

**Quality Dossier:**

- All valves are tested hydrostatically at CMO and material and test certificates can be provided.
- Body test = working pressure x 1.5.
- Seat test = working pressure x 1.1.

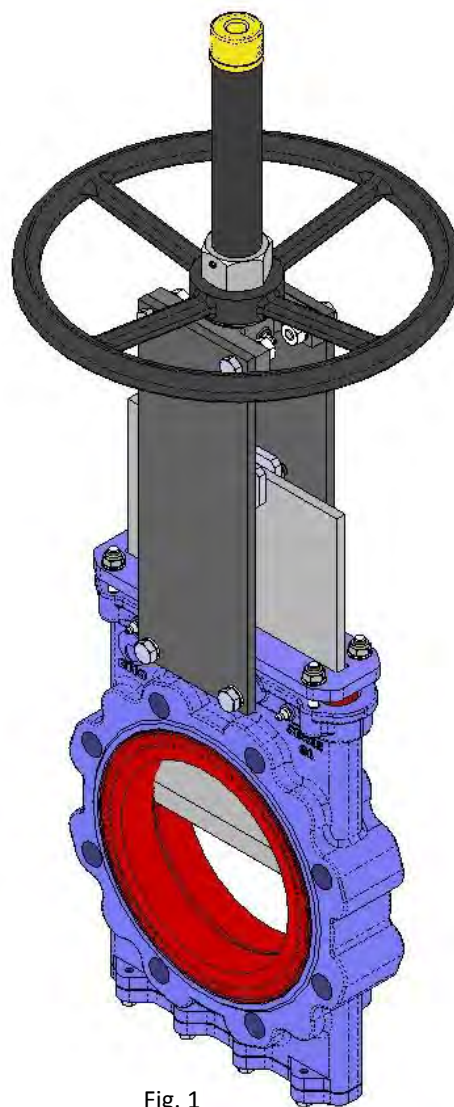


Fig. 1

### 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 CMO 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 CMO every time a seal is required.

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

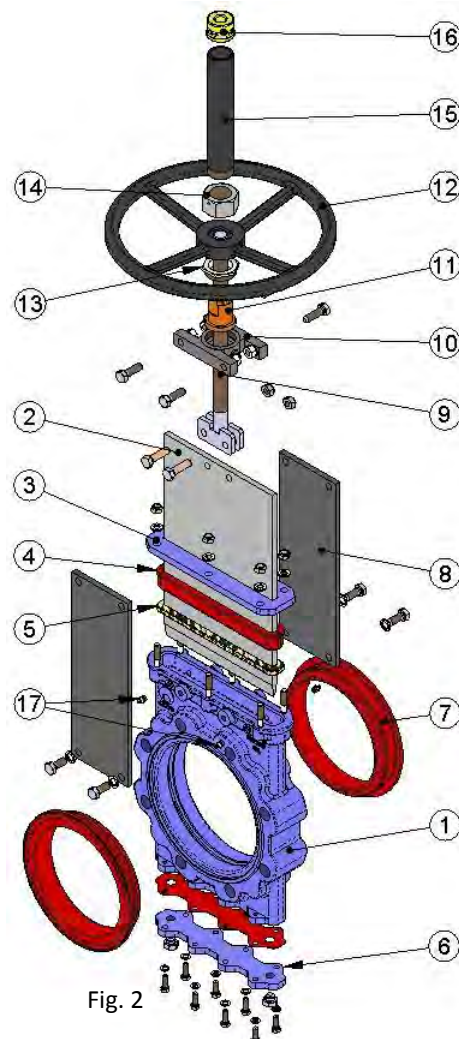


Fig. 2

**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).

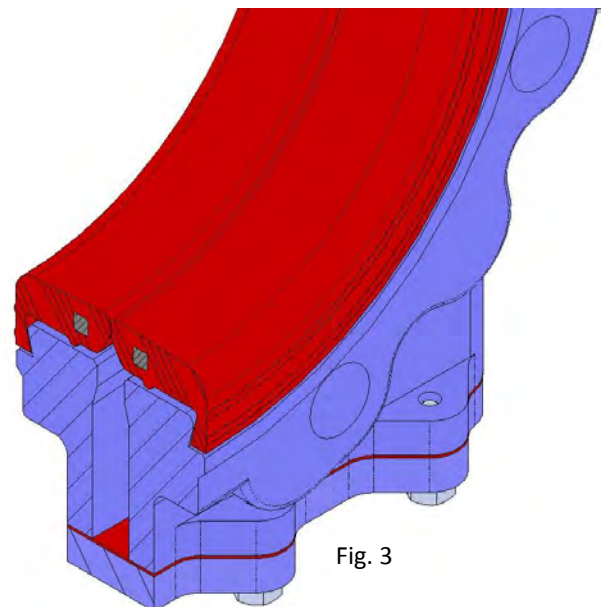


Fig. 3

**Resilient seat materials**

**NATURAL RUBBER**

This is the standard resilient seat fitted on CMO 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.

## KNIFE - GATE VALVES

## GL SERIES

### 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

CMO'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 CMO 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 CMO 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 CMO 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

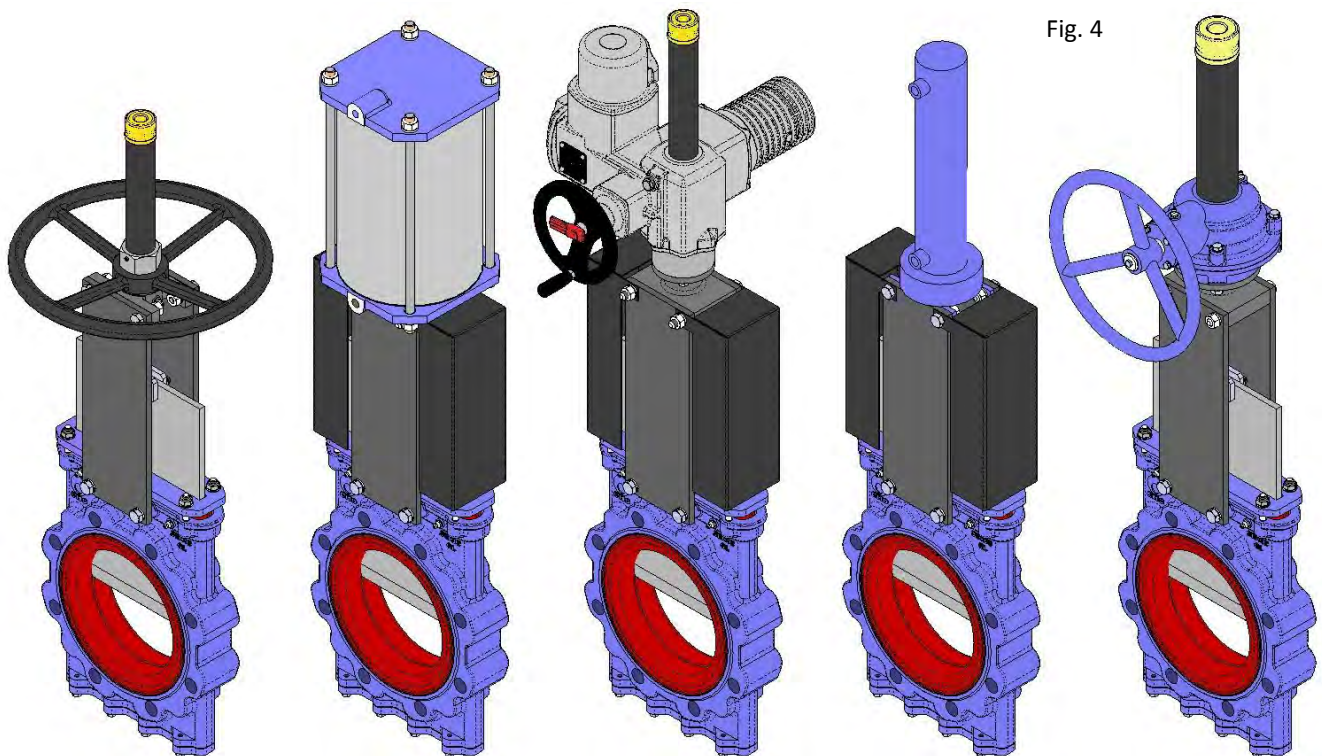


Fig. 4

Handwheel  
with rising  
stem

Pneumatic  
actuator

Electric-motor  
actuator

Hydraulic  
actuator

Handwheel  
Gear box

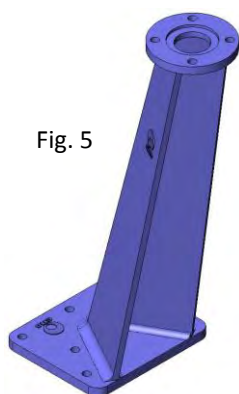


Fig. 5

**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)

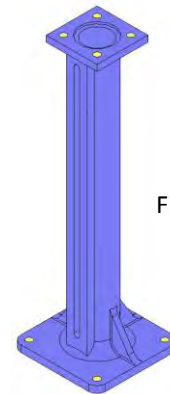


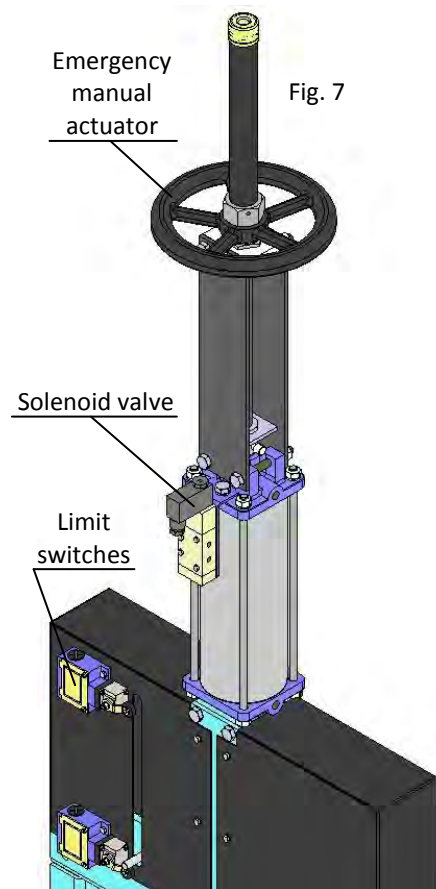
Fig. 6

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).
- **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 CMO valves are EPOXY coated, giving the valves great resistance to corrosion and an excellent finish. CMO's standard colour is blue, RAL-5015.
- **Gate Safety Protection:** In accordance with European Safety Standards ("EC" marking), CMO 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:

**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).

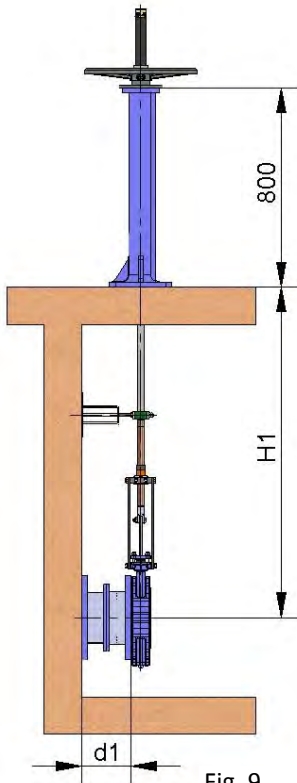


Fig. 9

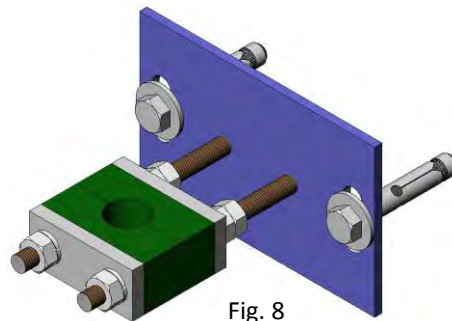


Fig. 8

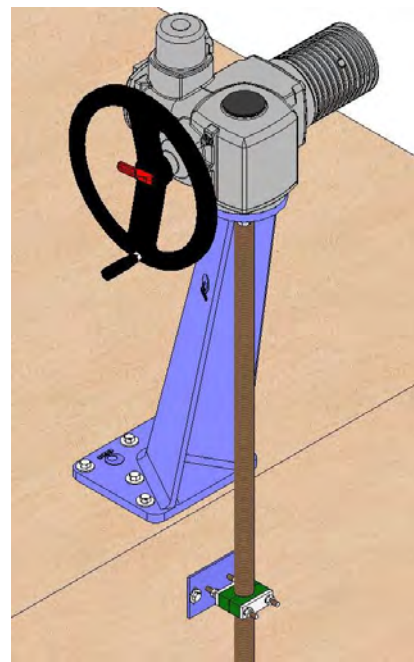


Fig. 10

**COMPONENTS LIST**

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

Table 3

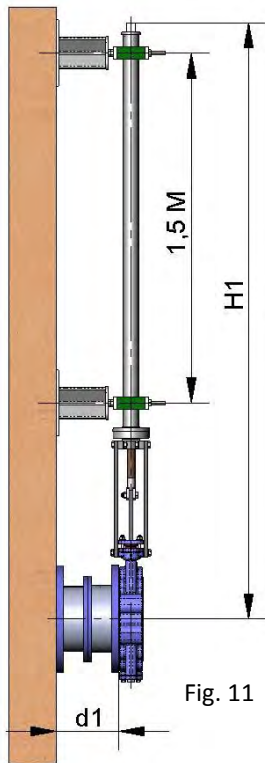


Fig. 11

**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

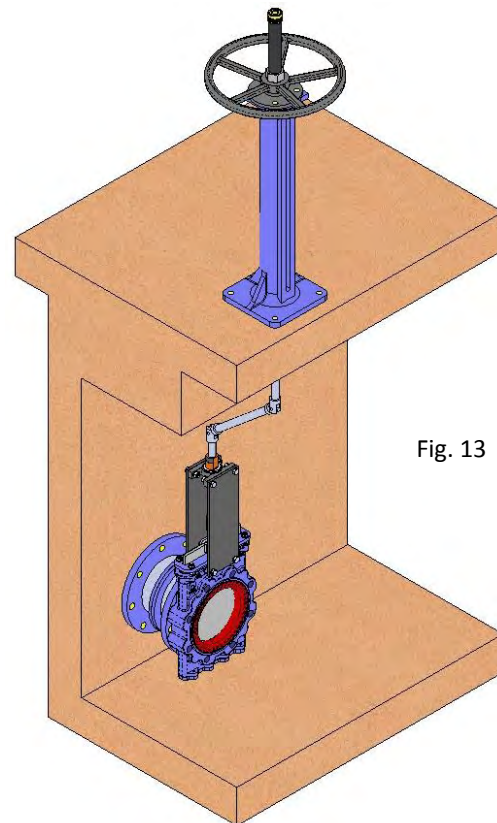
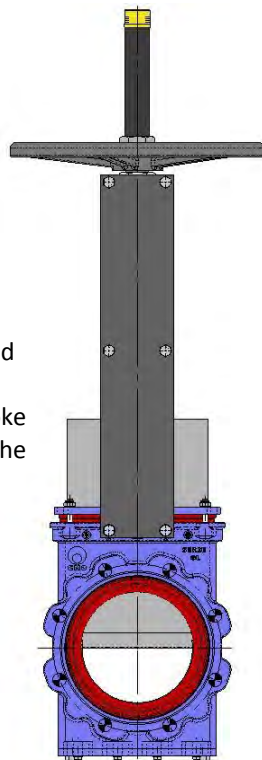


Fig. 13

**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.



**HANDWHEEL with rising stem**

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

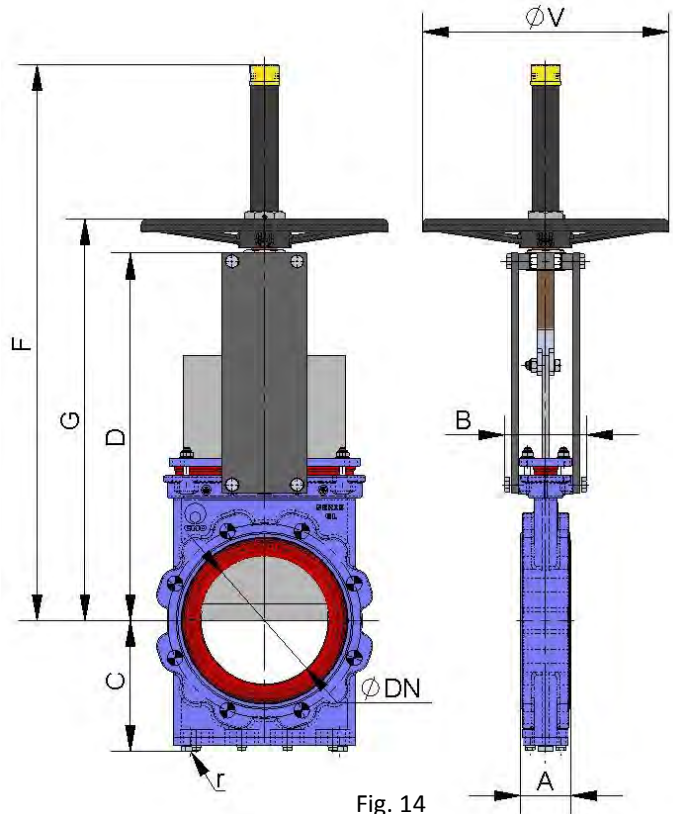


Fig. 14

DN	$\Delta P$ (Kg/cm <sup>2</sup> )	DRAW (Nw)	TORQUE (Nm)	A	B	C	D	G	F	$\phi V$	WEIGHT (Kg)	r (B.S.P.)
50	10	905,21	2,06	54	109	106	280	319	449	225	9	1/4"
65	10	1506,9	3,48	54	109	113	306	345	500	225	10	1/4"
80	10	2312,5	5,28	57	109	122	332	372	551	225	11	1/4"
100	10	3609,8	8,24	57	109	136	368	407	587	225	14	1/4"
125	10	5639,4	16,1	64	126	153	421	474	713	325	17	1/4"
150	10	8121,1	23,18	64	126	168	466	519	757	325	20	1/4"
200	10	14449	41,28	76	126	199	565	618	957	325	34	3/8"
250	10	22591	64,54	76	197	234	626	749	1125	450	50	1/2"
300	10	32569	93,05	83	197	272	739	837	1213	450	66	1/2"
350	10	44419	172,2	83	350	297	842	942	1342	--	116	1/2"
400	10	58040	224,9	96	350	330	933	1033	1483	--	144	3/4"
450	10	73382	284,5	96	350	355	1019	1119	1619	--	200	3/4"
500	10	90869	496,8	121	380	391	1156	1256	1806	--	231	3/4"
600	10	131156	717,1	121	400	461	1338	1438	2088	--	323	1"
700	6	107739	589,1	182	400	534	1425	1525	2440	--	--	1"
750	6	129527	718	188	400	559	1520	1620	2555	--	--	1"
800	6	141228	772,2	206	400	584	1615	1715	2665	--	--	1"
900	6	179489	1164	225	400	649	1823	1923	2823	--	--	1"
1000	6	221406	1436	240	440	699	1992	2092	3192	--	--	1"

Table 4

**HANDWHEEL with Non-Rising Stem**

- Suitable when no size limitations exist.
- **B = Max. width** of the valve (without actuator).  
**D = 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.

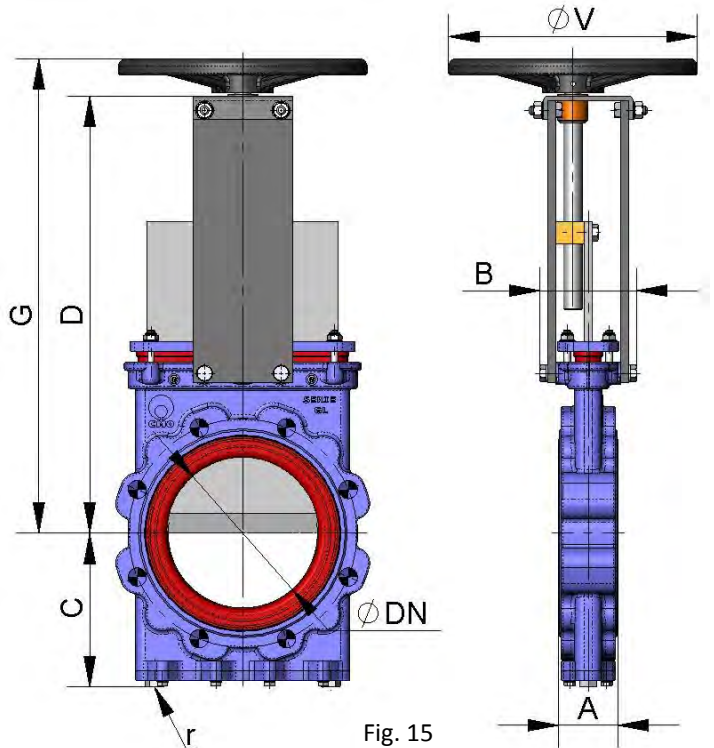


Fig. 15

DN	$\Delta P$ (Kg/cm <sup>2</sup> )	DRAW (Nw)	TORQUE (Nm)	A	B	C	D	G	$\phi V$	r (B.S.P.)
50	10	905,21	2,06	54	109	106	280	319	225	1/4"
65	10	1506,9	3,48	54	109	113	306	345	225	1/4"
80	10	2312,5	5,28	57	109	122	332	372	225	1/4"
100	10	3609,8	8,24	57	109	136	368	407	225	1/4"
125	10	5639,4	16,1	64	126	153	421	474	325	1/4"
150	10	8121,1	23,18	64	126	168	466	519	325	1/4"
200	10	14449	41,28	76	126	199	565	618	325	3/8"
250	10	22591	64,54	76	197	234	626	749	450	1/2"
300	10	32569	93,05	83	197	272	739	837	450	1/2"
350	10	44419	172,2	83	350	297	842	942	--	1/2"
400	10	58040	224,9	96	350	330	933	1033	--	3/4"
450	10	73382	284,5	96	350	355	1019	1119	--	3/4"
500	10	90869	496,8	121	380	391	1156	1256	--	3/4"
600	10	131156	717,1	121	400	461	1338	1438	--	1"
700	6	107739	589,1	182	400	534	1425	1525	--	1"
750	6	129527	718	188	400	559	1520	1620	--	1"
800	6	141228	772,2	206	400	584	1615	1715	--	1"
900	6	179489	1164	225	400	649	1823	1923	--	1"
1000	6	221406	1436	240	440	699	1992	2092	--	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).  
**D = 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.

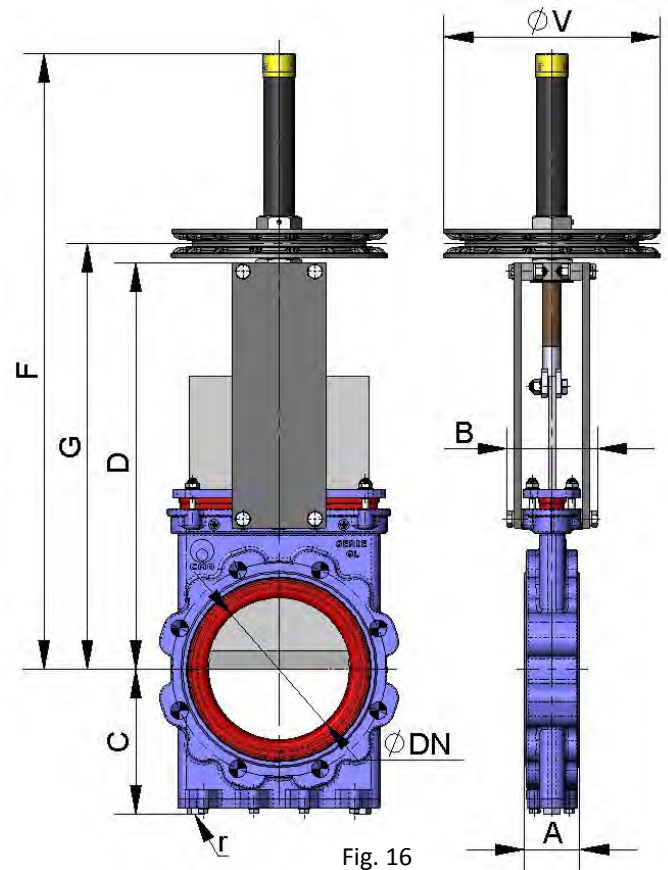


Fig. 16

DN	$\Delta P$ (Kg/cm <sup>2</sup> )	DRAW (Nw)	TORQUE (Nm)	A	B	C	D	G	F	$\phi V$	r (B.S.P.)
50	10	905,21	2,06	54	109	106	280	319	449	225	1/4"
65	10	1506,9	3,48	54	109	113	306	345	500	225	1/4"
80	10	2312,5	5,28	57	109	122	332	372	551	225	1/4"
100	10	3609,8	8,24	57	109	136	368	407	587	225	1/4"
125	10	5639,4	16,1	64	126	153	421	474	713	300	1/4"
150	10	8121,1	23,18	64	126	168	466	519	757	300	1/4"
200	10	14449	41,28	76	126	199	565	618	957	300	3/8"
250	10	22591	64,54	76	197	234	626	749	1125	402	1/2"
300	10	32569	93,05	83	197	272	739	837	1213	402	1/2"
350	10	44419	172,2	83	350	297	842	942	1342	402*	1/2"
400	10	58040	224,9	96	350	330	933	1033	1483	402*	3/4"
450	10	73382	284,5	96	350	355	1019	1119	1619	402*	3/4"
500	10	90869	496,8	121	380	391	1156	1256	1806	402*	3/4"
600	10	131156	717,1	121	400	461	1338	1438	2088	402*	1"
700	6	107739	589,1	182	400	534	1425	1525	2440	402*	1"
750	6	129527	718	188	400	559	1520	1620	2555	402*	1"
800	6	141228	772,2	206	400	584	1615	1715	2665	402*	1"
900	6	179489	1164	225	400	649	1823	1923	2823	402*	1"
1000	6	221406	1436	240	440	699	1992	2092	3192	402*	1"

Table 6

**LEVER**

- It is a fast actuator.
- **B = Max. width** of the valve (without actuator).  
**D = 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.
- \* Drive designed to maneuver to 2 Kg/cm<sup>2</sup> of differential pressure ( $\Delta P$ ).

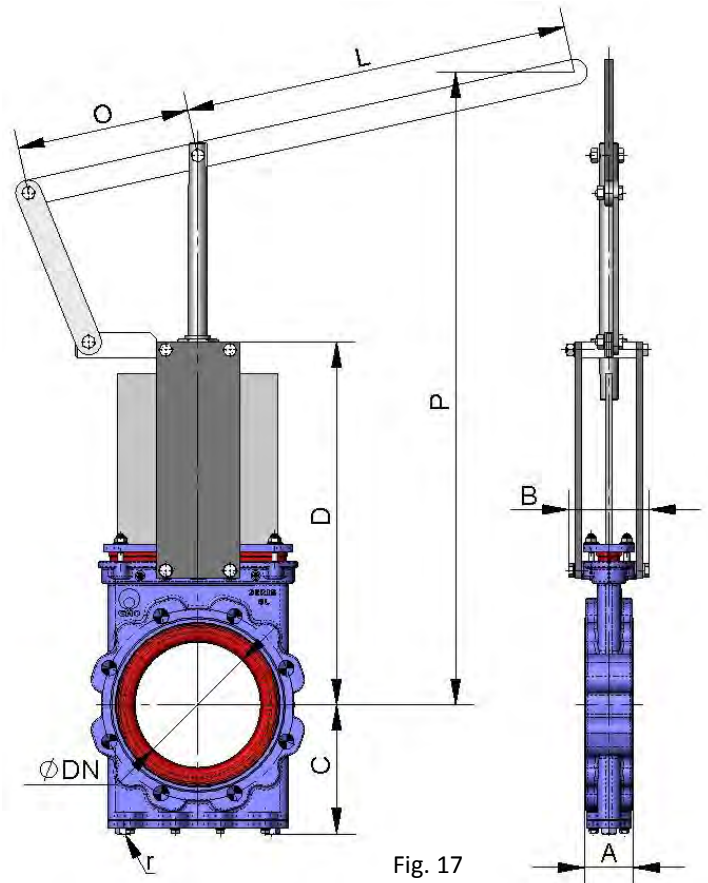


Fig. 17

DN	$\Delta P$ (Kg/cm <sup>2</sup> )	DRAW (Nw)	A	B	C	D	P	O	L	r (B.S.P.)
50	10*	227*	54	109	106	280	426	155	325	1/4"
65	10*	382*	54	109	113	306	499	155	325	1/4"
80	10*	577*	57	109	122	332	541	155	325	1/4"
100	10*	898*	57	109	136	368	582	155	325	1/4"
125	10*	1406*	64	126	153	421	701	155	425	1/4"
150	10*	2023*	64	126	168	466	898	155	425	1/4"
200	10*	3606*	76	126	199	565	1133	290	620	3/8"

Table 7



## DOUBLE-ACTING PNEUMATIC CYLINDER

- The air supply pressure to the cylinder is a minimum of 6 Kg/cm<sup>2</sup> and a maximum of 10 Kg/cm<sup>2</sup>, 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).  
**D = Max. height** of the valve (without actuator).
- Available: DN50 to DN700, other DN on request.

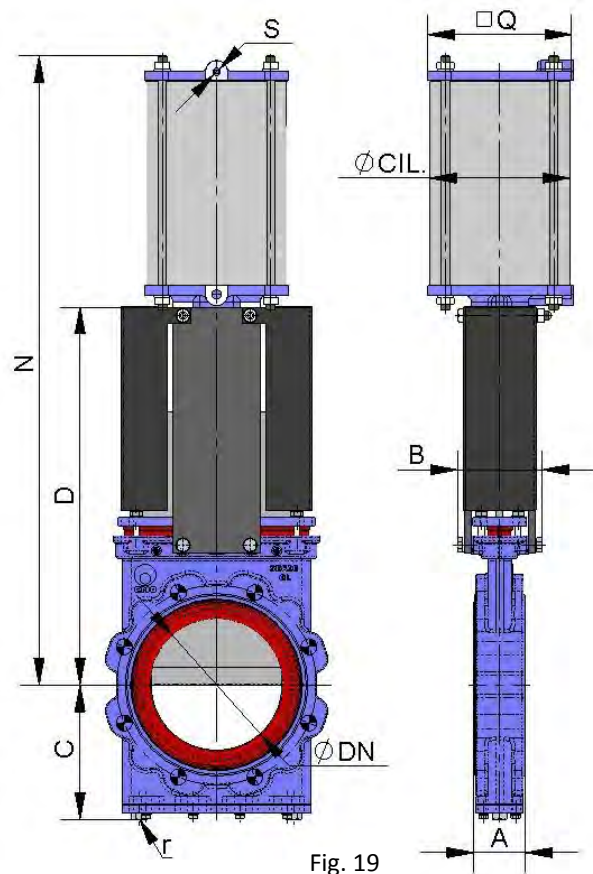


Fig. 19

DN	ΔP (*) (Kg/cm <sup>2</sup> )	DRAW (Nw)	A	B	C	D	N	Q	Ø CYL	Ø STEM	S (B.S.P.)	WEIGHT (Kg)	r (B.S.P.)
50	10	905,21	54	109	106	280	475	90	80	20	1/4"	9	1/4"
65	10	1506,9	54	109	113	306	515	90	80	20	1/4"	10	1/4"
80	10	2312,5	57	109	122	332	555	110	100	20	1/4"	11	1/4"
100	10	3609,8	57	109	136	368	620	135	125	25	1/4"	14	1/4"
125	10	5639,4	64	126	153	421	700	170	160	30	1/4"	20	1/4"
150	10	8121,1	64	126	168	466	775	170	160	30	1/4"	26	1/4"
200	10	14449	76	126	199	565	940	215	200	30	3/8"	48	3/8"
250	10	22591	76	197	234	626	1140	270	250	40	3/8"	69	1/2"
300	10	32569	83	197	272	739	1290	382	300	45	1/2"	83	1/2"
350	10	44419	83	350	297	842	1485	444	350	45	1/2"	159	1/2"
400	10	58040	96	350	330	933	1650	508	400	50	1/2"	188	3/4"
450	10	73382	96	350	355	1019	1805	552	450	50	3/4"	274	3/4"
500	10	90869	121	380	391	1156	2000	612	500	50	3/4"	318	3/4"
600	10	131156	121	400	461	1338	2200	772	585	60	1"	425	1"
700	6	107739	182	400	534	1425	2385	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/cm<sup>2</sup> and a maximum of 10 Kg/cm<sup>2</sup>, 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).  
**D = Max. height** of the valve (without actuator).
- Available: DN50 to DN200, other DN on request.
- Please see the "CMO Pneumatic Actuators" catalogue if you require further information.

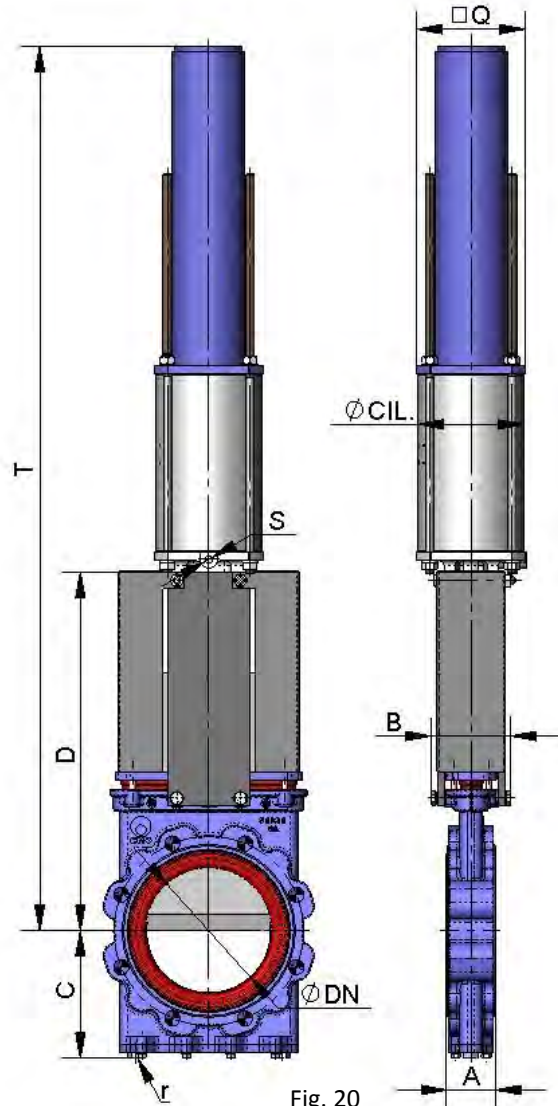


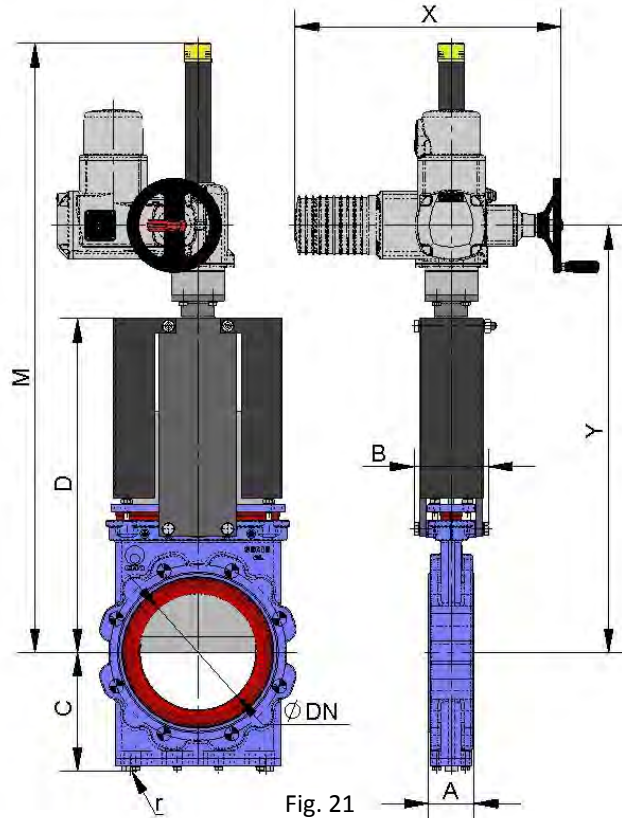
Fig. 20

DN	$\Delta P$ (Kg/cm <sup>2</sup> )	DRAW (Nw)	A	B	C	D	T	Q	$\varnothing$ CYL.	$\varnothing$ STEM	S (B.S.P.)	r (B.S.P.)
50	10	905,21	54	109	106	280	752	110	125	25	1/4"	1/4"
65	10	1506,9	54	109	113	306	794	110	125	25	1/4"	1/4"
80	10	2312,5	57	109	122	332	836	135	125	25	1/4"	1/4"
100	10	3609,8	57	109	136	368	906	170	160	30	1/4"	1/4"
125	10	5639,4	64	126	153	421	986	215	200	30	3/8"	1/4"
150	10	8121,1	64	126	168	466	1056	215	200	30	3/8"	1/4"
200	10	14449	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.



DN	$\Delta P$ (Kg/cm <sup>2</sup> )	DRAW (Nw)	TORQUE (Nm)	A	B	C	D	M	X	Y	r (B.S.P.)
50	10	905,21	2,06	54	109	106	280	631	451	418	1/4"
65	10	1506,9	3,48	54	109	113	306	683	451	470	1/4"
80	10	2312,5	5,28	57	109	122	332	719	451	506	1/4"
100	10	3609,8	8,24	57	109	136	368	775	451	559	1/4"
125	10	5639,4	16,1	64	126	153	421	819	451	604	1/4"
150	10	8121,1	23,18	64	126	168	466	1028	451	703	1/4"
200	10	14449	41,28	76	126	199	565	1116	474	766	3/8"
250	10	22591	64,54	76	197	234	626	1274	474	879	1/2"
300	10	32569	93,05	83	197	272	739	1377	631	1007	1/2"
350	10	44419	172,2	83	350	297	842	1570	631	1098	1/2"
400	10	58040	224,9	96	350	330	933	1661	631	1184	3/4"
450	10	73382	284,5	96	350	355	1019	1903	631	1321	3/4"
500	10	90869	496,8	121	380	391	1156	2185	701	1523	3/4"
600	10	131156	717,1	121	400	461	1338	2203	631	1515	1"
700	6	107739	589,1	182	400	534	1425	2428	631	1631	1"
750	6	129527	718	188	400	559	1520	2575	631	1727	1"
800	6	141228	772,2	206	400	584	1615	2723	631	1821	1"
900	6	179489	1164	225	400	649	1823	3083	631	2196	1"
1000	6	221406	1436	240	440	699	1992	3345	631	2295	1"
1100	6	269251	2021	240	440	730	2217	3670	631	2520	1 1/2"
1200	6	321856	2416	254	480	775	2351	3904	631	2654	1 1/2"
1300	6	377925	3175	254	480	805	2882	4550	631	3208	1 1/2"
1400	6	440582	3703	279	520	875	3250	5018	631	3576	1 1/2"

Table 11



**HYDRAULIC ACTUATOR (Oil pressure: 135 Kg/cm<sup>2</sup>)**

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

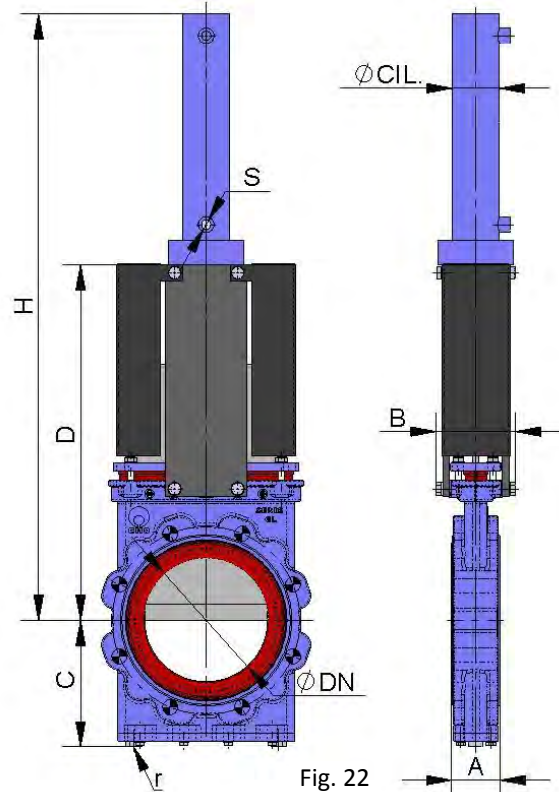


Fig. 22

DN	$\Delta P$ (Kg/cm <sup>2</sup> )	DRAW (Nw)	A	B	C	D	H	Ø CYL.	Ø STEM	S (B.S.P.)	Oil Cap (dm <sup>3</sup> )	r (B.S.P.)
50	10	905,21	54	109	106	280	527	25	18	3/8"	0,04	1/4"
65	10	1506,9	54	109	113	306	610	25	18	3/8"	0,05	1/4"
80	10	2312,5	57	109	122	332	692	25	18	3/8"	0,05	1/4"
100	10	3609,8	57	109	136	368	770	32	22	3/8"	0,11	1/4"
125	10	5639,4	64	126	153	421	847	40	28	3/8"	0,19	1/4"
150	10	8121,1	64	126	168	466	1022	50	28	3/8"	0,36	1/4"
200	10	14449	76	126	199	565	1162	50	28	3/8"	0,47	3/8"
250	10	22591	76	197	234	626	1352	63	36	3/8"	0,91	1/2"
300	10	32569	83	197	272	739	1505	80	36	3/8"	1,73	1/2"
350	10	44419	83	350	297	842	1686	100	45	1/2"	3,1	1/2"
400	10	58040	96	350	330	933	1866	125	56	1/2"	5,55	3/4"
450	10	73382	96	350	355	1019	2066	125	56	1/2"	6,22	3/4"
500	10	90869	121	380	391	1156	2430	125	56	1/2"	6,99	3/4"
600	10	131156	121	400	461	1338	2161	160	70	1/2"	13,47	1"
700	6	107739	182	400	534	1425	2410	160	70	1/2"	15,68	1"
750	6	129527	188	400	559	1520	2576	160	70	1/2"	16,79	1"
800	6	141228	206	400	584	1615	2742	160	70	1/2"	17,89	1"
900	6	179489	225	400	649	1823	3053	200	90	1/2"	31,42	1"
1000	6	221406	240	400	699	1992	3322	200	90	1/2"	34,56	1"
1100	6	269251	240	440	730	2217	3685	220	90	1/2"	45,62	1 1/2"
1200	6	321856	254	480	775	2351	3919	220	90	1/2"	49,42	1 1/2"
1300	6	377925	254	480	805	2882	4565	250	90	1/2"	68,72	1 1/2"
1400	6	440582	279	520	875	3250	5035	250	90	1/2"	73,63	1 1/2"

Table 12

**INFORMATION ON FLANGE DIMENSIONS**
**EN 1092-2 PN10**

DN	$\Delta P$ (Kg/cm <sup>2</sup> )	●	○	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

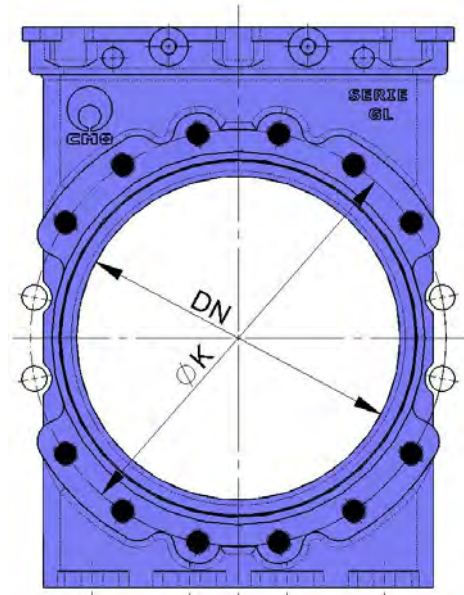


Fig. 23

- BLIND TAPPED HOLE
- THROUGH HOLE

**ANSI B16.5, class 150**

DN	$\Delta P$ (Kg/cm <sup>2</sup> )	●	○	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	1 1/8"	0,95"	22,75"
20"	10	16	4	1 1/8"	1"	25"
24"	10	16	4	1 1/4"	1,02"	29,5"
28"	6	24	4	1 1/4"	1,02"	34"
30"	6	24	4	1 1/4"	1,02"	36"
32"	6	24	4	1 1/2"	1,02"	38,5"
36"	6	28	4	1 1/2"	1,02"	42,75"
40"	6	32	4	1 1/2"	1,06"	47,25"

Table 14

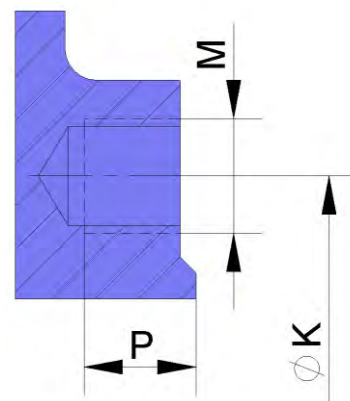
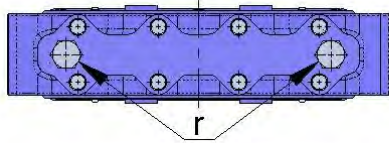


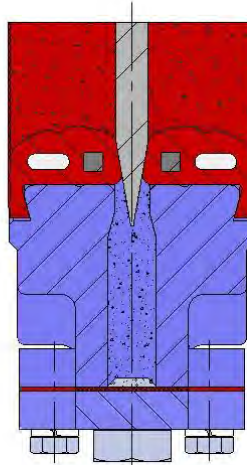
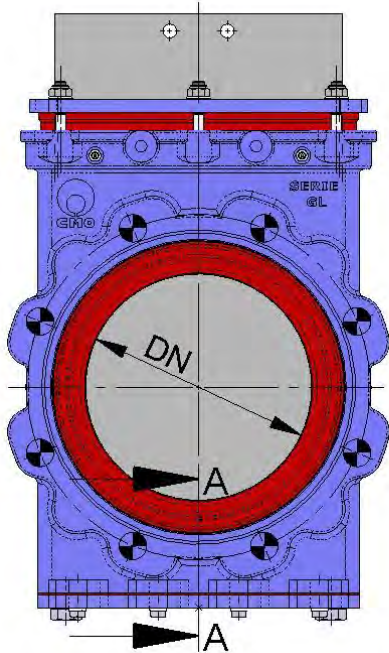
Fig. 24

**KNIFE-GATE VALVES**

**GL SERIES**



**VERSION  
STANDARD**

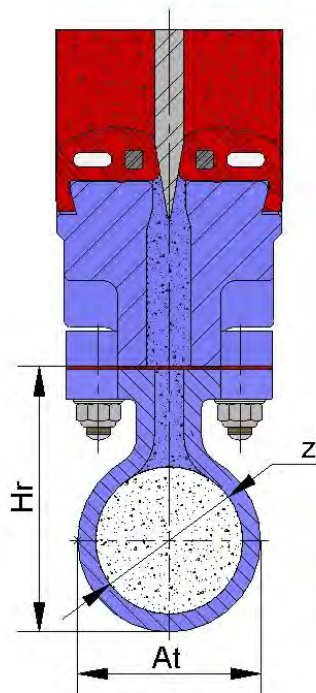
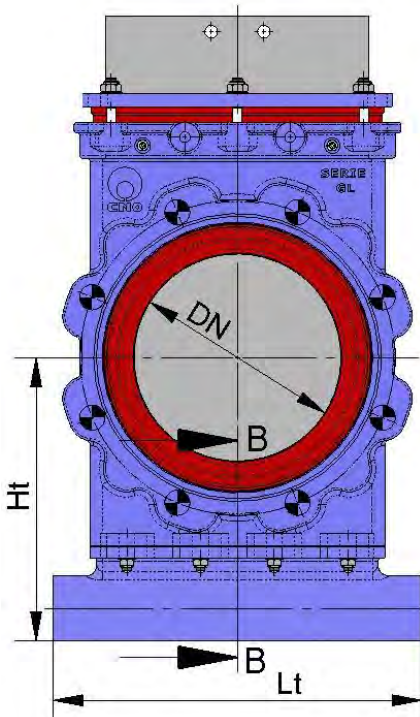


**SECTION A-A**

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**

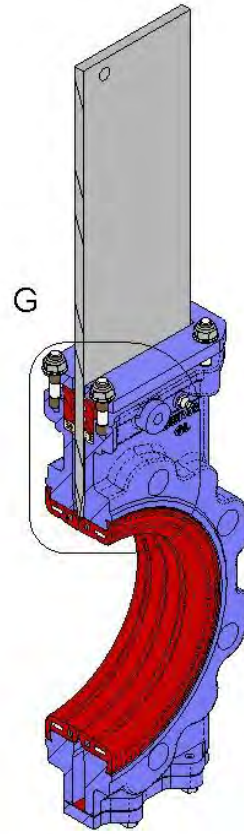
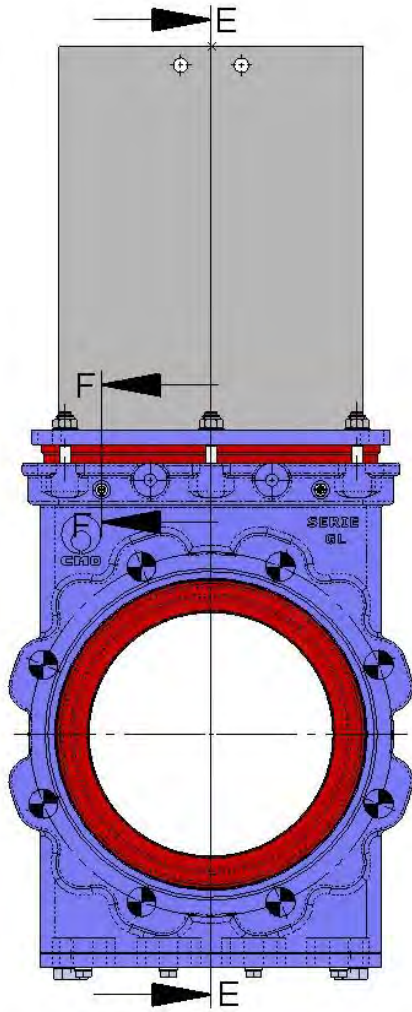


**SECTION B-B**

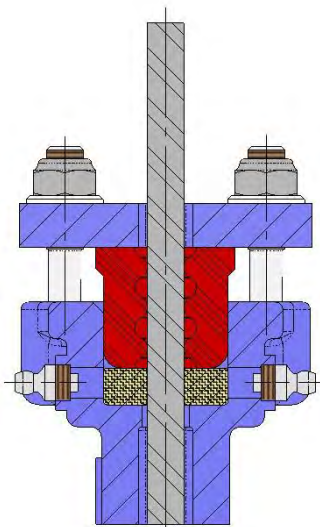
DN	Ht	Lt	At	Hr	Z (B.S.P.)
50	158	185	42	68	1"
65	168	200	42	68	1"
80	174	220	42	68	1"
100	188	240	42	68	1"
125	208	265	42	73	1"
150	223	290	42	73	1"
200	272	350	62	93	1 3/4"
250	310	400	62	98	1 3/4"
300	348	450	62	98	1 3/4"
350	373	520	62	98	1 3/4"
400	403	560	62	98	1 3/4"
450	428	610	62	98	1 3/4"
500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

**KNIFE-GATE VALVES**

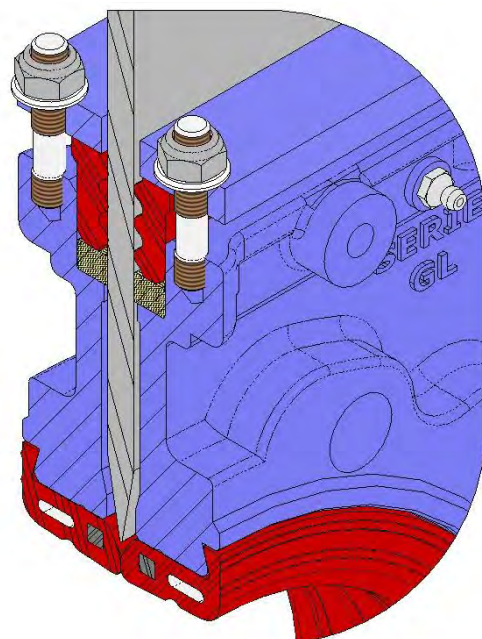
**GL SERIES**



SECTION E-E



SECTION F-F



DETAIL G