

GL



## BIDIRECTIONAL WAFER KNIFE GATE VALVE

### DESCRIPTION

- Bidirectional wafer-design knife gate valve.
- “Monoblock” onepiece 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 Valves** 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:

Designed for the following applications :

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

### SIZES

DN50 a DN1500 (larger sizes on request).

### WORKING PRESSURE ( $\Delta P$ )

DN 50-600 = 10 bar 10 bar  
 DN 700-900 = 4 bar 6 bar  
 DN 1000-1500 = 2 bar 4 bar

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 6 Australian standard.  
 DIN PN 16 JIS standard.  
 DIN PN 25 British standard.

### SERIE - GL



Fig.1

### DIRECTIVES

- Pressure Equipment Directive:  
**(PED) ART 4.3 /CAT.1.**
- De atmósferas explosivas:  
**Potential Explosive Atmospheres Directive**

*\*For further information on categories and zones please contact the Technical-Commercial Dept. **CMO VALVES**.*

### QUALITY DOSSIER

All valves are tested hydrostatically at **CMO Valves**, and material and test certificates can be provided.

- Body test = working pressure x 1,5
- Seat test = working pressure x 1,1

## ADVANTAGE OF 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.

The stem on the **CMO Valves** 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 Valves** every time a seal is required.

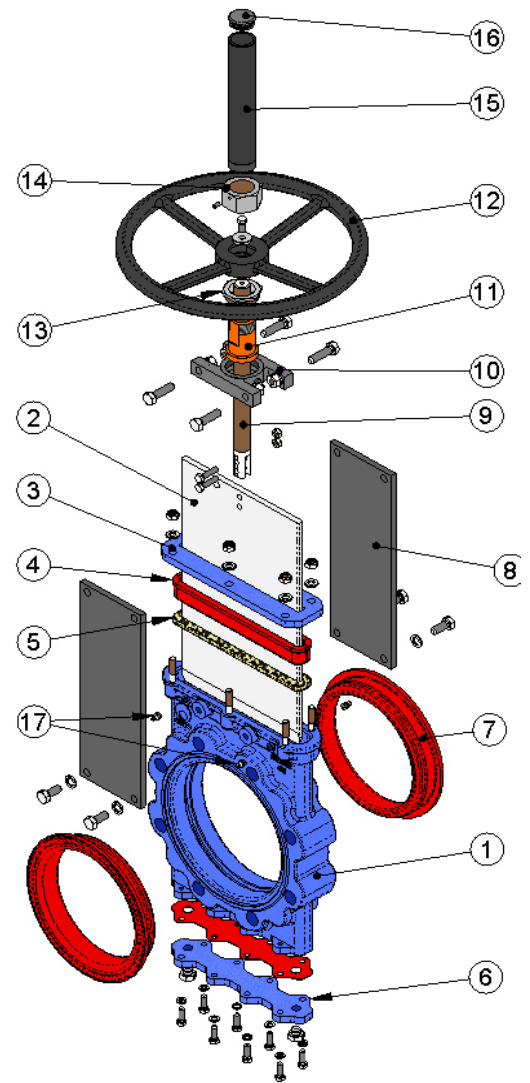


Fig.2

### STANDARD COMPONENTS LIST

COMPONENT	VERSION H° F°	STAINLESS STEEL
1 Body	GJS-500	CF8M
2 Gate	AISI304	AISI316
3 Packing gland	STEEL	AISI316
4 Packing seal.	NATURAL RUBBER	
5 Packing	GREASED PACK	
6 Lower Cover	STEEL	AISI316
7 Sleeve	NATURAL RUBBER	
8 Support plates	STEEL	STEEL
9 Stem	AISI303	AISI303
10 Yok	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

**Note:** The image numbers refer to the list of components in the table.

## 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

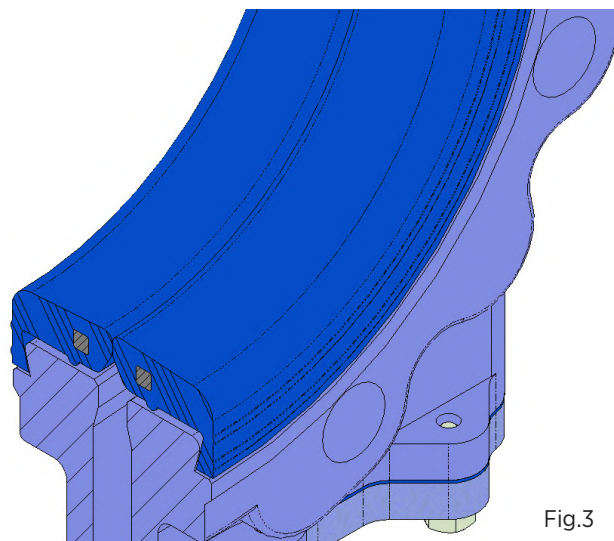


Fig.3

## RESILIENT SEAT MATERIALS

#### NATURAL RUBBER

This is the standard resilient seat fitted on **CMO Valves 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.

SEATS/SEALS		
MATERIAL	T° MÁX (°C)	APLICACIONES
Natural rubber	90	General
EPDM (E)	90*	Water, non mineral acids and oils
Nitrilo (N)	90*	Hydrocarbons, oils and greases
Vitón (V)	200	Hydrocarbons and solvents

Table. 2

#### 4. PACKING

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 Valves** 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 Valves** 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.

##### Manual Actuators

- Handwheel with rising stem / non-rising

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- Lever / Chainwheel

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- Gearbox / Others (square nut)

##### Accessories Available

- Mechanical stops

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- Locking devices

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- Emergency manual actuators

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- Solenoid valves

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- Positioners

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- Limit switches

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- Proximity switches

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- Straight floor stand (Fig. 5)

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- Leaning floor stand (Fig. 6)

##### Automatic

- Electric actuator

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- Pneumatic cylinder

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- Hydraulic cylinder

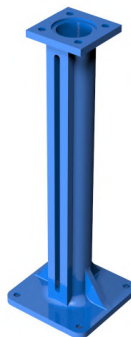
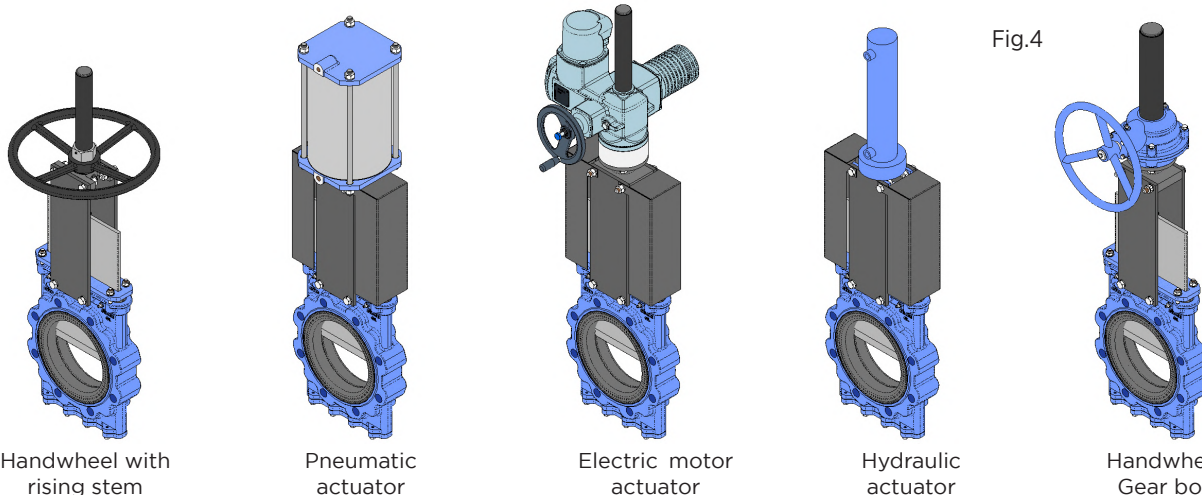


Fig.5



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.



Handwheel with rising stem

Pneumatic actuator

Electric motor actuator

Hydraulic actuator

Handwheel Gear box

Fig.4



## OPTIONS AND ACCESSORIES

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

Para distribución del aire a los accionamientos neumáticos.

### CONNECTION BOXES, WIRING AND PNEUMATIC PIPING

Units supplied fully assembled with all the necessary accessories.

### MECHANICAL LIMIT SWITCHES, INDUCTIVE SWITCHES AND POSITIONERS

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.

### LIMITADORES DE CARRERA MECÁNICOS (TOPES MECÁNICOS)

Permiten ajustar mecánicamente la carrera, limitando el recorrido de la válvula.

### EMERGENCY MANUAL ACTUATOR (HAND WHEEL /GEAR BOX)

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 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.

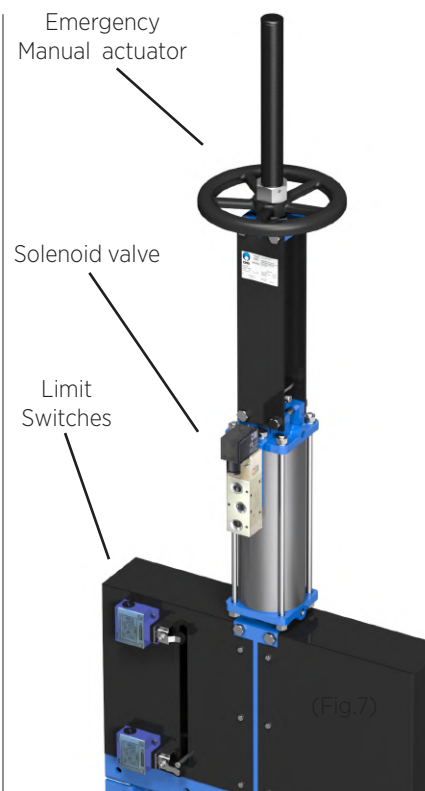
### EPOXI COATING

All cast iron and carbon steel bodies and components are EPOXY coated, giving the valves great resistance to corrosion and an excellent finish.

CMO Valves standard colour is blue, RAL-5015.

### GATE SAFETY PROTECTION

In accordance with European Safety Standards ("EC" marking), automated valves are equipped with gate guards, to prevent any objects from being accidentally caught in the gate.



(Fig.7)



## TYPES OF EXTENSION

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

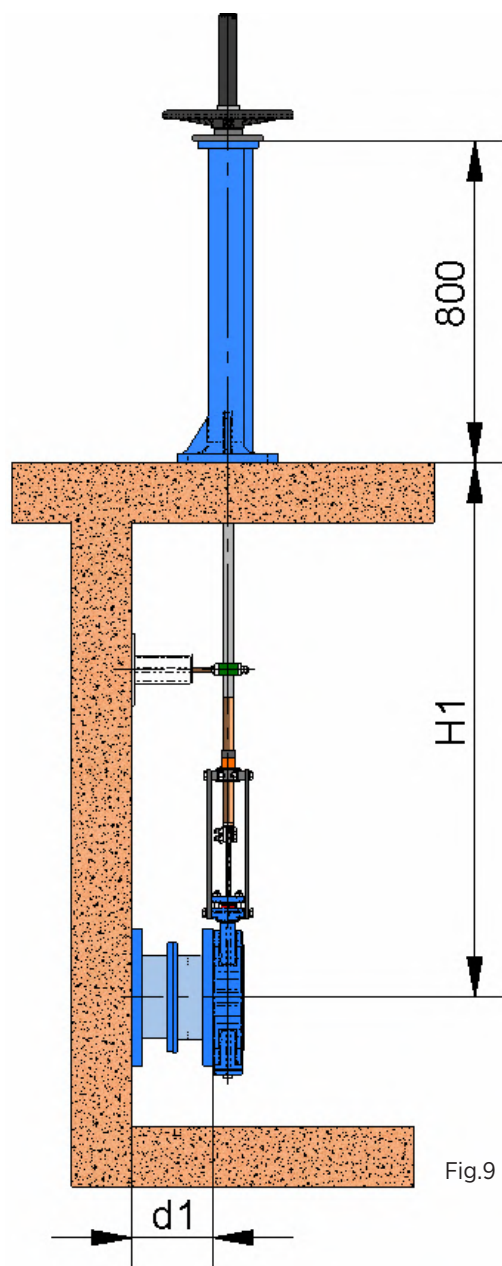


Fig.9

**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).

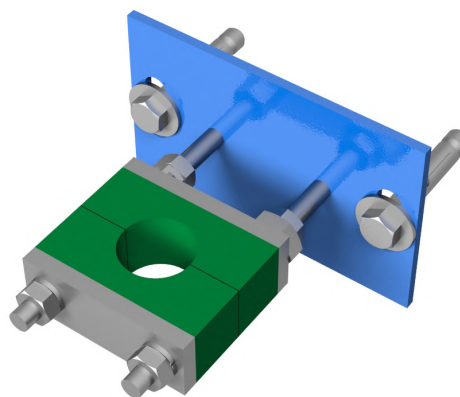


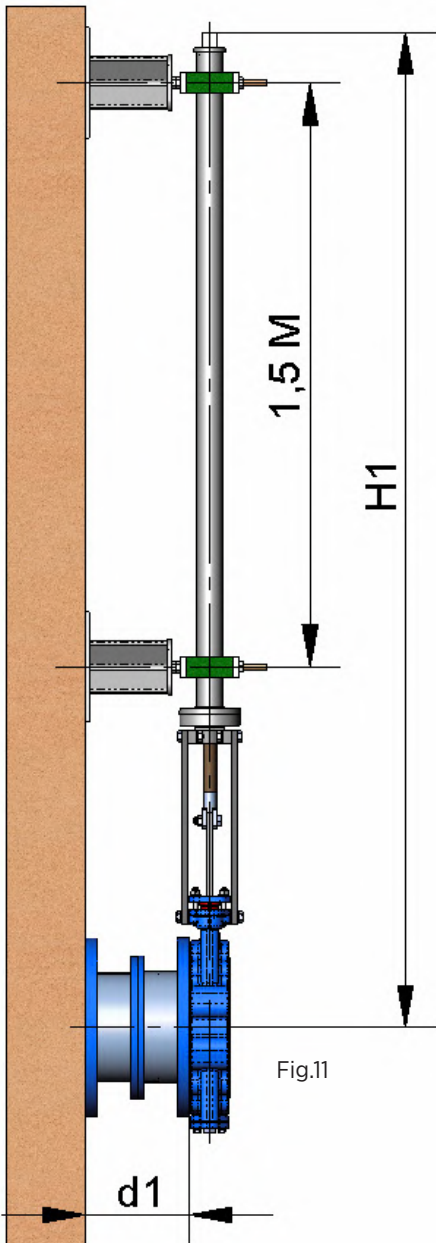
Fig.8



### COMPONENTS LIST

COMPONENT	STANDARD VERSION
Steam	AISI 304
Rod	AISI 304
Support-Guide	EPOXI coated carbon steel
Gate / Guide	Nylon
Stand	EPOXI coated GJS-500

Table. 3



**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.

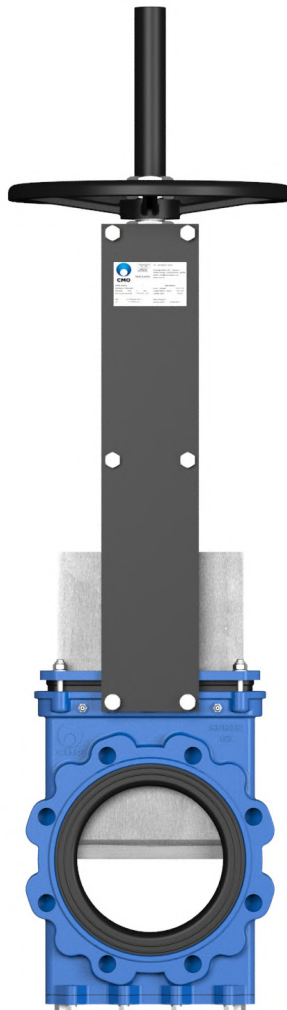


Fig.12

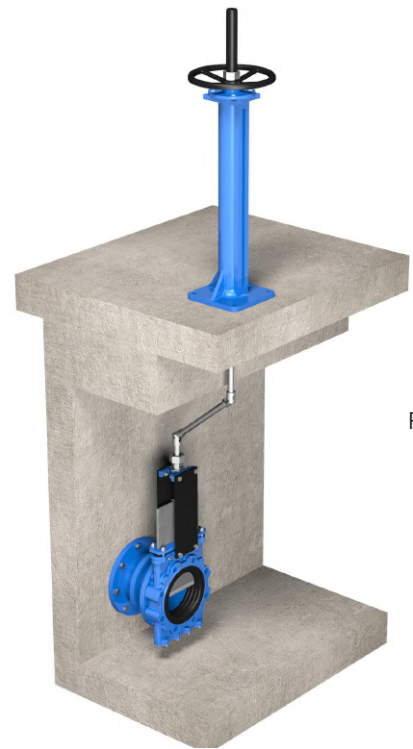


Fig.13

**4.-EXTENSIÓN:**

**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.



## DOUBLE-ACTING PNEUMATIC CYLINDER

The definition variables are as follows:

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

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

**AVAILABLE:**

- ND50 a ND700, otros ND bajo consulta.
- Other ND on request.

The air supply pressure to the cylinder is a minimum of 6 bar and a maximum of 10 bar, the air must be dry and lubricated.

For ND50 to ND200 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.

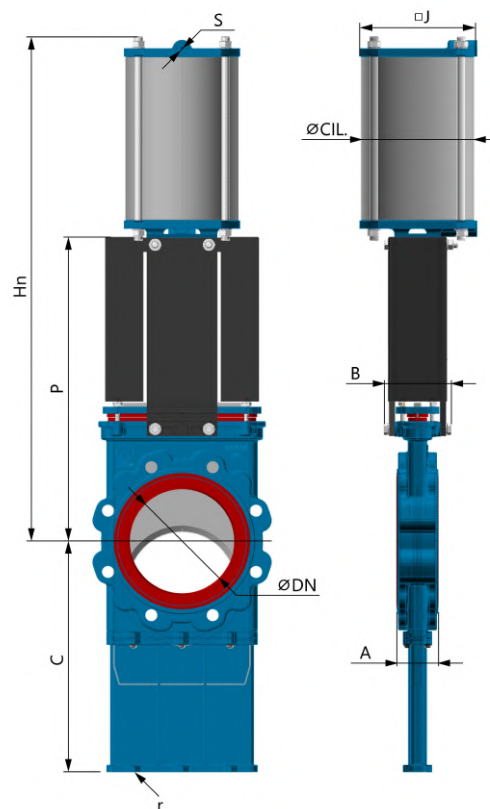


Fig.19

ND	ΔP (bar)	A	B	C	P	Hn	J	CIL	VAST	s (B.S.P.)	Weight (kg)	r (B.S.P.)
50	10	54	109	171	280	475	96	80	20	1/4"	12	1/4"
80	10	57	109	223	332	555	115	100	20	1/4"	18	1/4"
150	10	64	126	340	466	775	175	160	30	1/4"	38	1/4"
200	10	76	126	422	565	940	218	200	30	3/8"	61	3/8"
250	10	76	197	509	626	1140	270	250	40	3/8"	123	1/2"
300	10	83	197	600	739	1300	382	300	45	1/2"	174	1/2"
350	10	83	350	675	842	1485	444	350	45	1/2"	211	1/2"
400	10	96	350	762	933	1655	508	400	50	1/2"	278	3/4"
450	10	96	350	842	1019	1805	552	450	50	3/4"	368	3/4"
500	10	121	380	940	1156	2000	612	500	50	3/4"	429	3/4"
600	10	121	400	1110	1338	2285	772	585	60	1	503	1

Table. 9

(\*) -> For lower working pressures consult Ø cylinder.

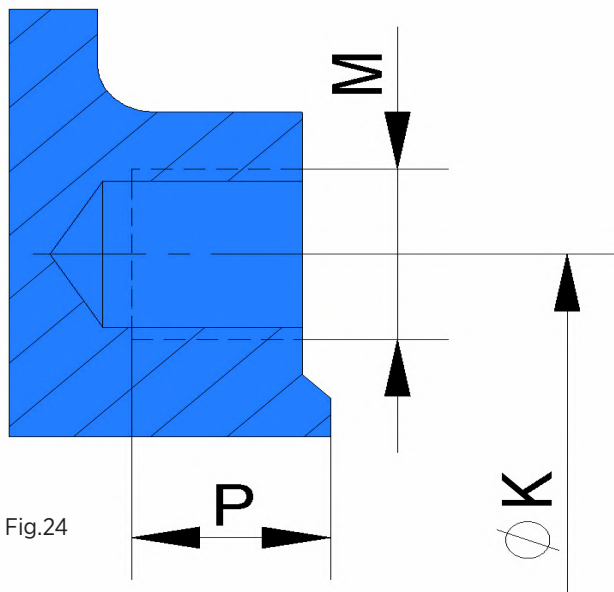


## INFORMATION ON FLANGE DIMENSIONS

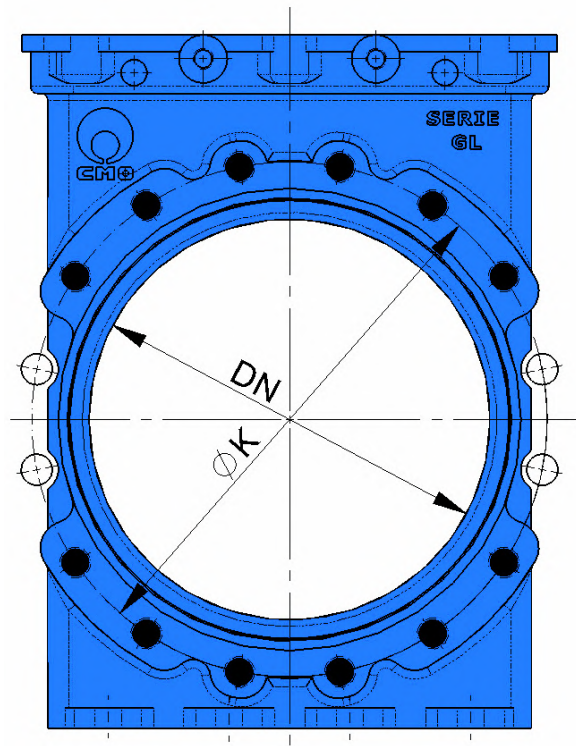
ND	•	o	Metric (M)	P	ØK
50	4	-	M 16	14	125
65	4	-	M 16	14	145
80	8	-	M 16	14	160
100	8	-	M 16	14	180
125	8	-	M 16	15	210
150	8	-	M 20	15	240
200	8	-	M 20	17	295
250	12	-	M 20	17	350
300	12	-	M 20	20	400
350	12	4	M 20	21	460
400	12	4	M 24	23	515
450	16	4	M 24	24	565
500	16	4	M 24	25	620
600	16	4	M 27	26	725
700	20	4	M 27	26	840
750	20	4	M 30	26	900
800	20	4	M 30	26	950
900	24	4	M 30	26	1050
1000	24	4	M 33	27	1160
1100	28	4	M 33	27	1270
1200	28	4	M 36	29	1380
1300	28	4	M 36	29	1490
1400	24	12	M 39	30	1590
1500	24	12	M 39	30	1700

Table. 13

### ANSI B16, class 150



### EN 1092-2 PN10



- BLIND TAPPED HOLE
- o THROUGH HOLE

ND	•	o	R UNC	P	ØK
2"	4	-	5/8"	0,55"	4,75"
2 1/2"	4	-	5/8"	0,55"	5,5"
3"	4	-	5/8"	0,55"	6"
4"	8	-	5/8"	0,55"	7,5"
5"	8	-	3/4"	0,59"	8,5"
6"	8	-	3/4"	0,59"	9,5"
8"	8	-	3/4"	0,67"	11,75"
10"	12	-	7/8"	0,67"	14,25"
12"	12	-	7/8"	0,79"	17"
14"	8	4	1"	0,83"	18,75"
16"	12	4	1"	0,91"	21,25"
18"	12	4	1 1/8"	0,95"	22,75"
20"	16	4	1 1/8"	1"	25"
24"	16	4	1 1/4"	1,02"	29,5"
28"	24	4	1 1/4"	1,02"	34"
30"	24	4	1 1/4"	1,02"	36"
32"	24	4	1 1/2"	1,02"	38,5"
36"	28	4	1 1/2"	1,02"	42,75"
40"	32	4	1 1/2"	1,06"	47,25"

Table. 14

ND	•	o	Metric (M)	P	øK
50	4	-	M 16	14	125
65	4	-	M 16	14	145
80	8	-	M 16	14	160
100	8	-	M 16	14	180
125	8	-	M 16	15	210
150	8	-	M 20	15	240
200	12	-	M 20	17	295
250	12	-	M 24	17	355
300	12	-	M 24	20	410
350	12	4	M 24	21	470
400	12	4	M 27	23	525
450	16	4	M 27	24	585
500	16	4	M 30	25	650
600	16	4	M 33	26	770
700	20	4	M 33	26	840
750	20	4	M 36	26	950
800	24	4	M 36	26	1050
900	24	4	M 39	26	1170
1000	28	4	M 42	27	1370
1100	28	4	M 45	27	1390
1200	32	4	M 45	29	1490
1300	32	4	M 45	29	1590
1400	36	4	M 52	30	1710
1500	24	4	M 39	30	1700

EN 1092-2 PN16

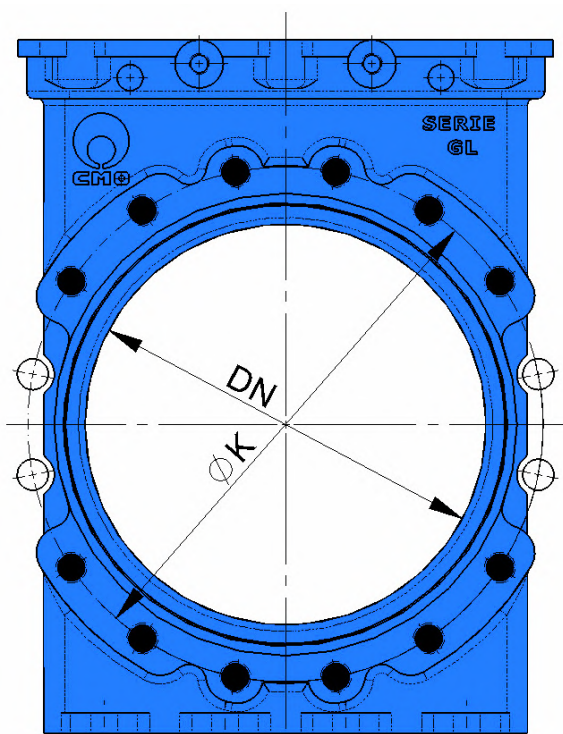


Fig.25

- BLIND TAPPED HOLE
- o THROUGH HOLE

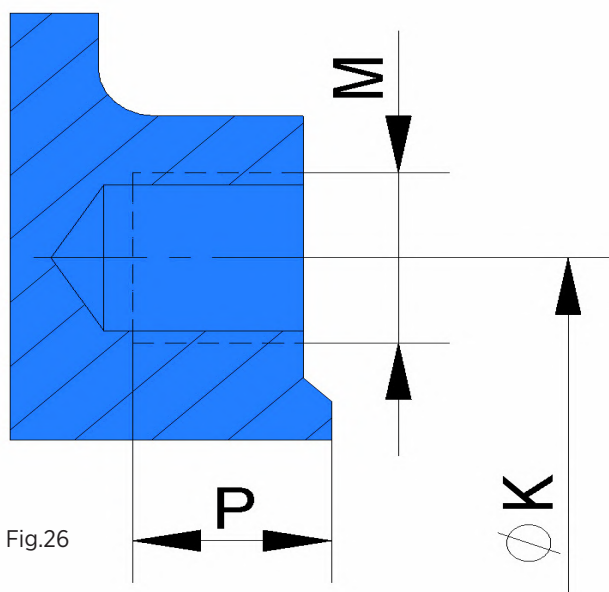
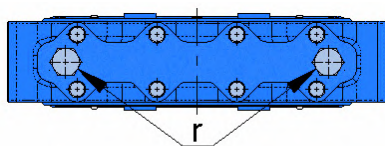
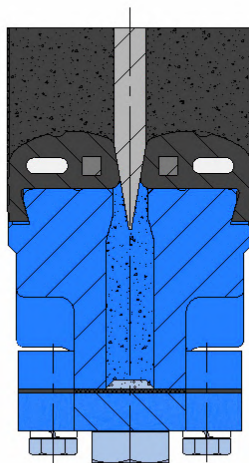
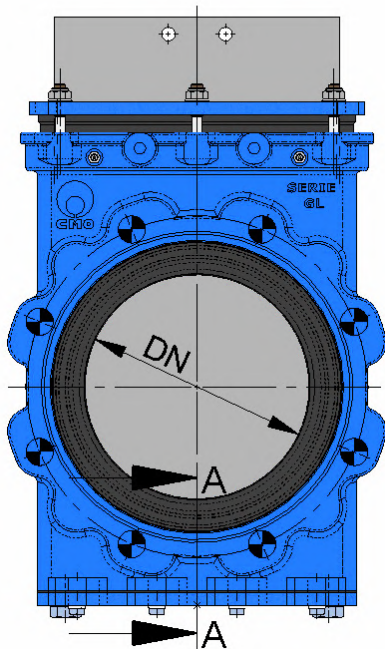


Fig.26

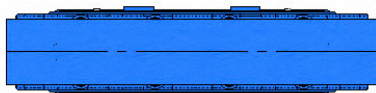


STANDAR VERSION

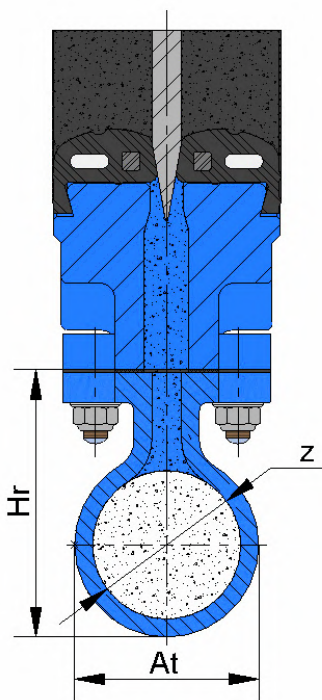
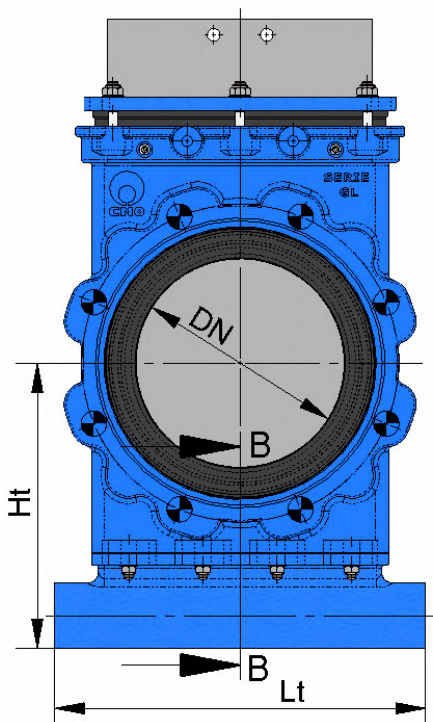


SECTION A-A

ND	r (B.P.S)
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"



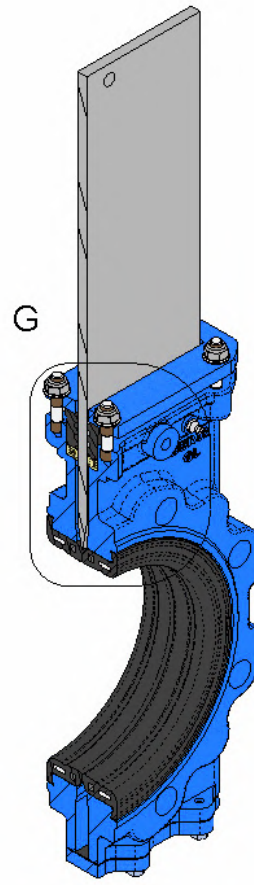
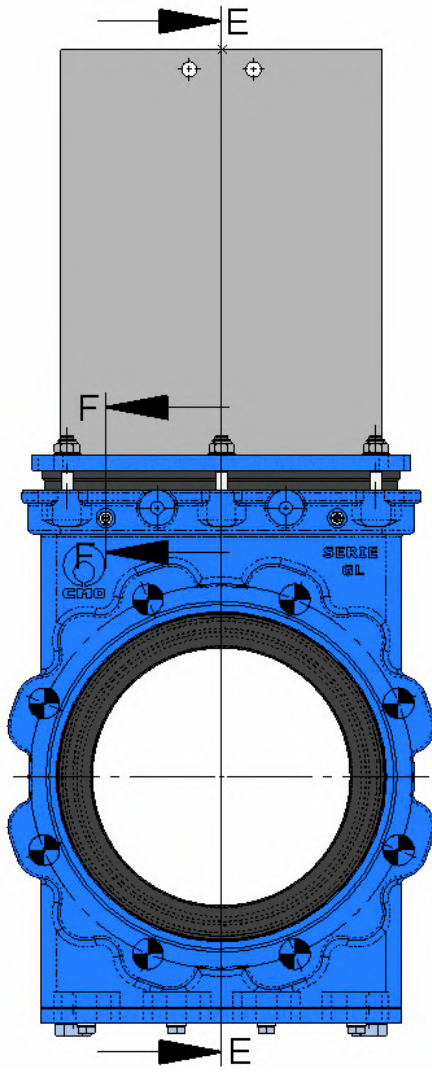
OPTION 1



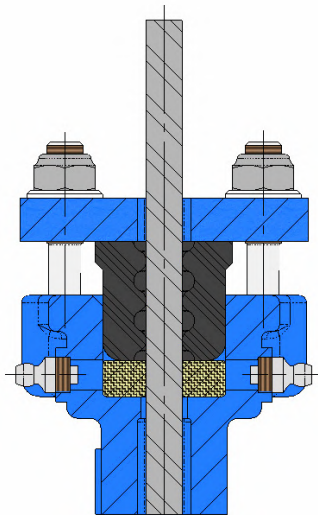
SECTION B-B

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

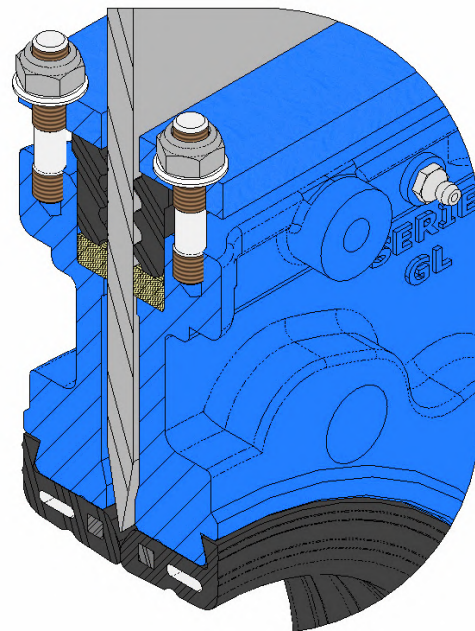




SECTION E-E



SECTION F-F



DETAIL-G