

# K



## UNIDIRECCIONAL KNIFE GATE VALVE

### DESCRIPTION

- Unidirectional knife gate valve.
- One-piece cast body with guides to support gate and seat wedges.
- Provides high flow rates with low pressure drop.
- Various seat and packing materials available.
- Face-to-face dimension in accordance with **CMO Valves** standard.
- It has an arrow on the body indicating the flow direction.

### GENERAL APPLICATIONS

This knife gate valve is suitable for liquids that contain a maximum of 5% suspended solids. If it is used for dry solids in gravity feed applications it should be installed with the arrow on the body pointing in the opposite direction to the flow.

- Paper Industry
- Mining
- Silo emptying
- Sewage treatment
- Pumping
- Food Industry
- Chemical plants

### SIZES

DN50 a DN2000

\* Others DN on request.

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

DN50 a DN150	10 bar
DN200	8 bar
DN250 a DN300	6 bar
DN350 a 400	5 bar
DN450 a DN600	3 bar
DN700 a DN1400	2 bar

The mentioned working pressures are just valid for the pressures applied on the direction of the arrow market on the body. As the valve is designed with gate support guides, the valves **K** model are able to support a 30% of these pressures from the opposite direction without any damage on them. In these cases, the valves are not 100% water tight. To obtain total water tightness in these conditions, it is necessary to incorporate additional supports.

### FLANGES

- DIN PN10
- ANSI B16.5 (class 150)

### OTHERS

- PN6.
- PN16.
- PN25.
- BS "D" y "E".
- JIS10K.

\* Others on request



Fig. 1

### DIRECTIVES

- Pressure Equipment Directive : **(PED) ART 4.3 /CAT.1.**
- Potential Explosive Atmospheres Directive (optional) : **(ATEX) CAT.3 ZONA 2 y 22 GD.**

\* For further information on categories and zones please contact the **CMO Valves** Technical-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

## ADVANTAGES

When a knife gate valve remains open for long periods of time and the body's internal walls are parallel a very large torque is required to close it. The inside of the Model K's body is conically shaped, providing greater space. This way, when the valve is closed the solids stored inside it can be easily removed. This **K** model's valve is defined as unidirectional and these valves are normally at risk of the gate bending due to counter-pressure. This cannot happen with the **CMO Valves** valve because it contains internal guides that support the knife gate and allow it to work under counter-pressure of 30% of the maximum working pressure, without the knife gate bending.

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 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-400 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.

STANDAR COMPONENTS LIST			
COMPONENT	GJL-250	CF8M	
1	BODY	GJL-250	CF8M
2	COVER		
3	SEAT	RCH 1000	
4	GATE	AISI304	AISI316
5	STOP WASHER		
6	SOCKET	NYLON	
7	INSIDE O-RING	NITRILE	
8	OUTSIDE O-RING	NITRILE	
9	SUPPORT PLATE	S275JR	
10	SEAT SEAL	CARDBOARD	
11	O-RING	NITRILE	
12	SEAL	EPDM	
13	RING	AISI-316	

Table. 1

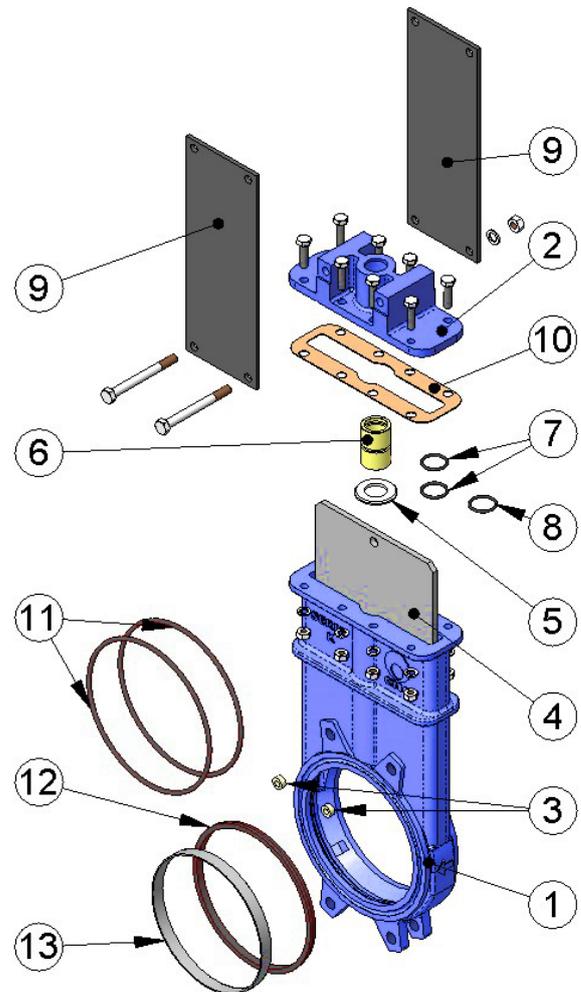


Fig. 2

## DESIGN CHARACTERISTICS

### BODY

Unidirectional knife gate valve. One-piece cast body with guides to support gate and seat wedges. For diameters greater than ND1200 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 GJL-250 cast iron and CF8M stainless steel. Other materials, such as GJS-500 nodular cast iron, A216WCB carbon steel and stainless steel alloys (AISI316Ti, Duplex, 254SMO, Uranus B6...) 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.

### GATE

The standard manufacturing materials are AISI304 stainless steel in valves with iron 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 gate is rounded to prevent the seat from being cut. Different degrees of polishing, anti-abrasion treatments and modifications are available to adapt the valves to the customer's requirements.

### RESILIENT SEAT MATERIALS

**EPDM :** This is the standard resilient seat fitted on **CMO Valves**. It can be used in many applications, however, it is generally used for water and products diluted in water at temperatures no higher than 90°C\*. It can also be used with abrasive products and it provides the valve with 100% watertight integrity.

**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.

**SILICONE :** Mainly used in the food industry and for pharmaceutical products with temperatures no higher than 200°C. It provides the valve with 100% watertight integrity.

**PTFE :** Suitable for corrosive applications and pH between 2 and 12. Does not provide the valve with 100% watertight integrity. Estimated leakage: 0.5% of the tube flow.

 **\*Note:** In some applications other types of resilient materials are used, such as hypalon, butile or natural rubber. Please contact us if you require one of these materials.

### SEAT (watertight)

Six types of seats are available according to the working application:

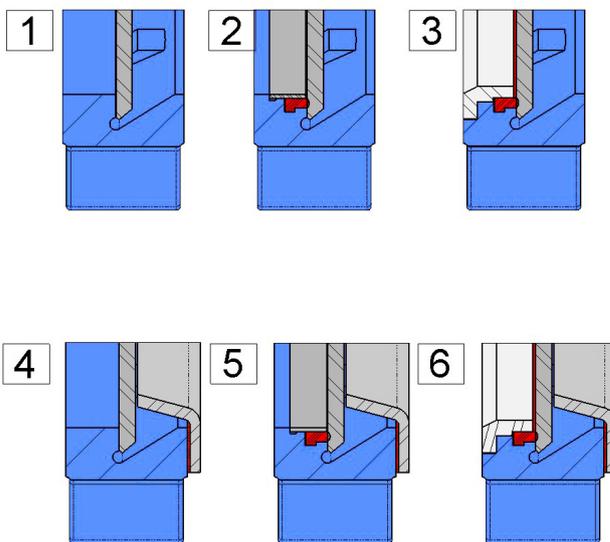


Fig. 3

#### SEAT 1

##### Metal / metal SEAT

This type of seat does not include any kind of resilient seat and the estimated leakage (considering water as the test fluid) is 1.5% of the pipe flow.

#### SEAT 2

##### Standard soft-seated valve

This type of seat includes a resilient seat which is fixed to the inside of the body via an AISI316 stainless steel retaining ring

#### SEAT 3 Soft-seated valve with reinforced socket

This type of seat includes a resilient seat which is fixed to the inside of the body via an AISI316 stainless steel retaining ring with two functions (to protect the valve from abrasion and clean the gate when working with solids that can stick to it).

#### SEAT 4,5 Y 6

The same as seats 1, 2 and 3 but including a deflector. The deflector is a cone-shaped ring located at the valve's entrance with two functions (to protect the valve from abrasion and guide the flow to the centre of the valve).

 **\*Note:** Three materials are available for the reinforced socket and the deflector (CA-15 steel, CF8M and Ni-hard).

## PACKING

The packing is the area of the valve where the greatest watertight integrity must be reached to avoid leakages to the atmosphere, in the **CMO Valves K** model, this area is between the body bonnet and the rod. There are two types of packing:

**Socket with o-rings:** This packing (Fig.4) achieves watertight integrity by inserting a socket between the body and the rod. This socket is limited at the top by the cover and at the bottom by a washer, it also has two internal seals in contact with the rod and another external one in contact with the body, to ensure watertight integrity. This system is recommended for valves that operate with water. See Table 2 for the different types of seal materials.

**Standard Packing:** Is composed of three lines with a specially designed EPDM O-ring in the middle which provides watertight integrity between the body and the gate, preventing any type of leakage to the atmosphere. It is located in an easily accessible place and can be replaced without dismantling the valve from the pipeline. Below we indicate various types of packing available according to the application in which the valve is located:

**GREASED COTTON :**  
**(Recommended for hydraulic services):**

This packing is composed of braided cotton fibres soaked in grease both inside and out. It is for general use in hydraulic applications in both pumps and valves.

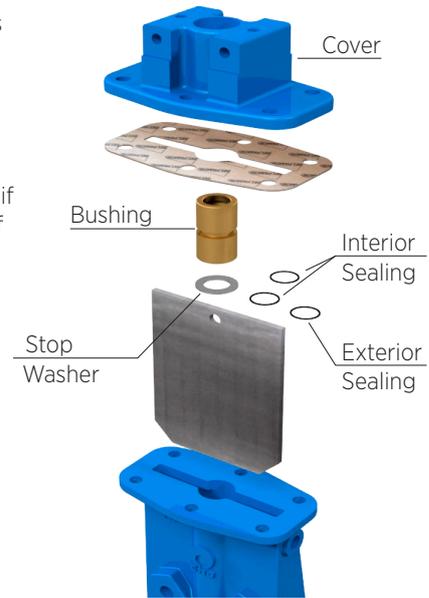
**DRY COTTON :**

This packing is composed of cotton fibres. It is for general use in hydraulic applications with solids.

**SYNTHETIC + PTFE :**

This packing is composed of braided synthetic fibres soaked in PTFE both inside and out. It is for general use in hydraulic applications in both pumps and valves and in all types of fluids, especially corrosive ones, including concentrated and oxidising oils. It is also used in liquids with solid particles in suspension.

 **Note :** In some applications other types of resilient materials are used, such as hypalon, butile or natural rubber. Please contact us if you require one of these materials.



**GRAPHITE :**

This packing is composed of high-purity graphite fibres. A diagonal braiding system is used and it is impregnated with graphite and lubricant which helps to reduce porosity and improve operation. It has a wide range of applications as graphite is resistant to steam, water, oils, solvents, alkali and most acids.

**CERAMIC FIBRE :**

This packing is composed of ceramic material fibres. Its main applications are with air or gas at high temperatures and low pressures.

**COTTON + PTFE :**

This packing is composed of braided cotton fibres soaked in PTFE both inside and out. It is for general use in hydraulic applications in both pumps and valves.

SEAT/SEALS			PACKING			
Material	Max. T. (°C)	Applications	Material	P(bar)	Max. T. (°C)	pH
Metal/Metal	>250°C	High T./Low watertight integ.	Greased cotton	10	100°C	6-8
EPDM (E)	90 *°C	Mineral acids and oils	Dry cotton (DC)	0.5	100°C	6-8
Nitrile (N)	90 *°C	Hydrocarbons, oils and greases	Cotton + PTFE	30	120°C	6-8
Viton (V)	200°C	Hydrocarbons and solvents	Synthetic + PTFE	100	-200+270°C	0-14
Silicone (S)	200°C	Food products	Graphite	40	650°C	0-14
PTFE (T)	250°C	Corrosion resistant	Ceramic Fibre	0,3	1400°C	0-14

\* ⇄ EPDM and nitrile: is possible until serving temperature Max.: 120°C under request

 **Note:** More details and other materials on request

**Table. 2**

## STEM

The **CMO valves** spindle is made of stainless steel 18/8. This characteristic makes it highly resistant and provides excellent properties against corrosion. 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.

## PACKING GLAND

The packing gland allows uniform force and pressure to be applied to the packing to ensure watertight integrity. As standard, valves with cast iron body include GJS-450 packing glands, whilst valves with stainless steel body have CF8M packing glands.

## ACTUATORS

All types of actuators can be supplied, with the advantage that, thanks to the **CMO Valves** design, they are fully interchangeable. This design allows the customer to change the actuators themselves and no extra assembly accessories are required. A design characteristic of is that all actuators are interchangeable.

### Manual Actuators

Handwheel with rising stem / **non** rising

Handwheel with non-rising stem / Chainwheel

Lever / Gear-Box / Others, (Square nut, etc )

### Automatic Actuator

Electric actuator

Pneumatic cylinder

Hydraulic cylinder

### Wide range of accessories available

Mechanical stops

Locking devices

Emergency manual actuators

Electrovalves

Positioners

Limit switches

Proximity switches

Straight floor stands (fig. 6)

Leaning floor stand (fig. 5)

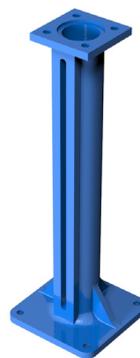


Fig. 5



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.

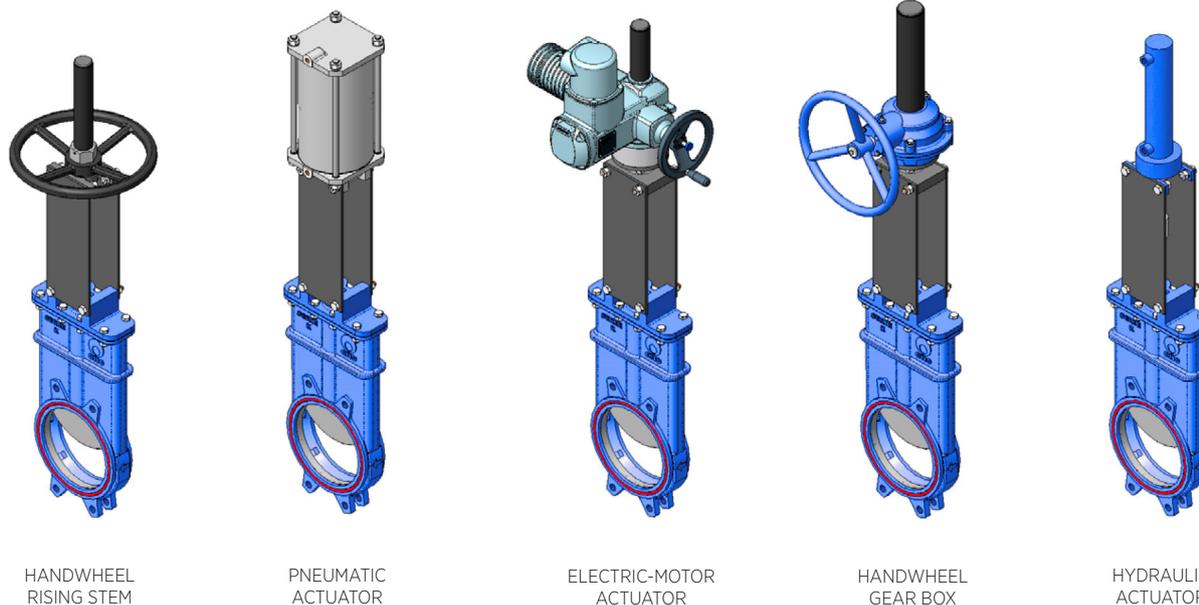


Fig. 7

HANDWHEEL  
RISING STEM

PNEUMATIC  
ACTUATOR

ELECTRIC-MOTOR  
ACTUATOR

HANDWHEEL  
GEAR BOX

HYDRAULIC  
ACTUATOR

## ACCESSORIES AND OPTIONS

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

### 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.

### AIR INJECTIONS IN THE PACKING GLAND:

By injecting air in the packing, an air chamber is created which improves the seal-tightness.

### CASED BODY :

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.

### ELECTROVALVES (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).

### MECHANICAL LOCKING SYSTEM :

Allows the valve to be mechanically locked in a set position for long periods.

### STROKE LIMITING MECHANICAL STOPS :

These allow the stroke to be mechanically adjusted, limiting the valve run.

### EMERGENCY MANUAL ACTUATOR (hand wheel / gear box) (Fig. 7):

Allows manual operation of the valve in the event of power or air failure.

### TRIANGULAR (V-NOTCH) AND PENTAGONAL DIAPHRAGM WITH INDICATION RULE :

Recommended for applications in which it is necessary to regulate the flow, it allows flow control according to the valve's opening percentage.

### INTERCHANGEABLE ACTUATORS :

All actuators are easily interchangeable.

### ACTUATOR OR YOKE SUPPORT :

Made of EPOXY-coated steel (or stainless steel to order), its robust design gives it great rigidity in order to resist the most adverse operation conditions.

### EPOXY COATING :

All carbon steel components and bodies of **CMO valves** are EPOXY coated, giving the valves great resistance to corrosion and an excellent surface finish. **CMO valves** standard colour is blue RAL-5015.

### BONNET:

Provides total seal-tightness to the outside, reducing the packing maintenance required.

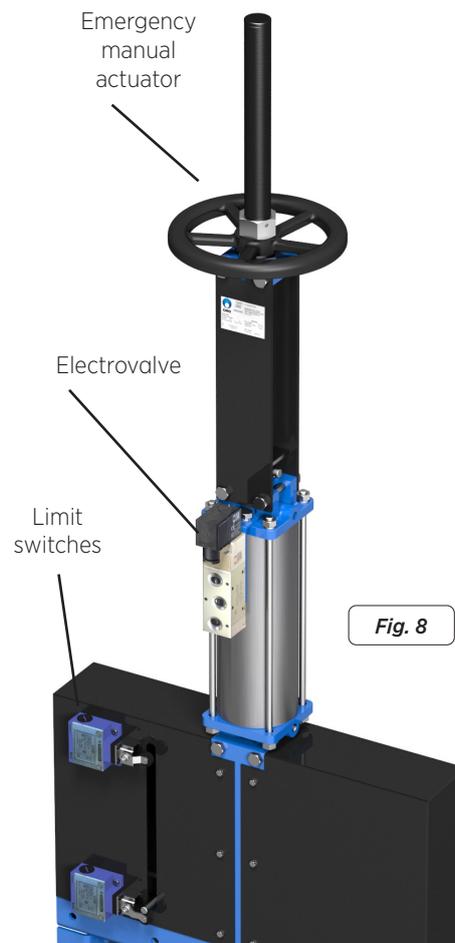


Fig. 8

## TYPES OF EXTENSION

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

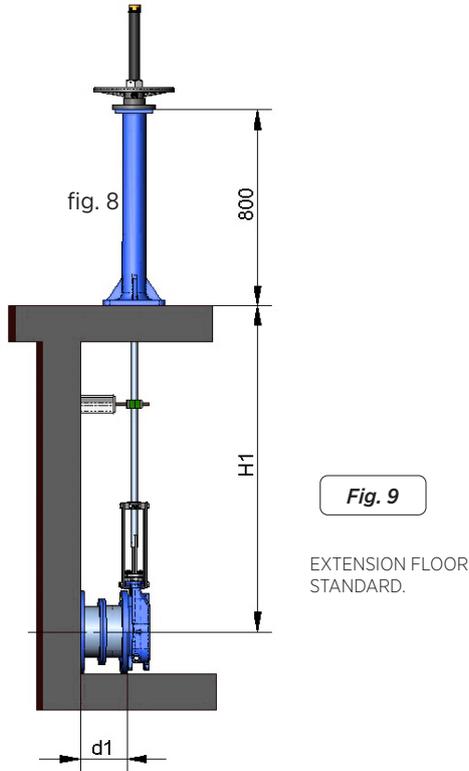


Fig. 9

EXTENSION FLOOR STANDARD.

### 1.- EXTENSION: FLOOR STAND

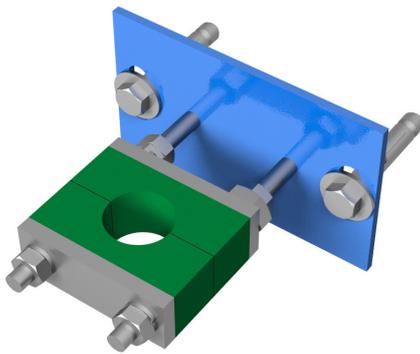
This extension is performed by coupling a rod to the stem. By defining the length of the rod, the desired extension is achieved. A floor stand is normally installed to support the actuator.

The definition variables are as follows :

- H1:** Distance from the valve 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 is recommended (fig. 10) every 1.5 m.
- The standard floor stand is 800 mm high (fig. 9). Other floor stand measurements available to order.
- A position indicator can be fitted to determine the valve's percentage of opening.
- Possibility of leaning floor stand (fig. 11).



SUPPORT-GUIDE SPINDLE.

Fig. 10

COMPONENT LIST	
COMPONENT	STANDARD VERSION
Stem	AISI 303
Spindle	AISI 304
Support-Guide	Carbon steel with EPOXI coating
Slide	Nylon
Column	GJS-500 with EPOXY coating

Table. 3



STRAIGHT FLOOR STANDS

Fig. 11

## 2. EXTENSION: PIPE

Consists of raising the actuator. The pipe will rotate with the wheel or key when the valve is operated, although this will always remain at the same height.

The definition variables are as follows :

**H1** = Distance from the valve 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.

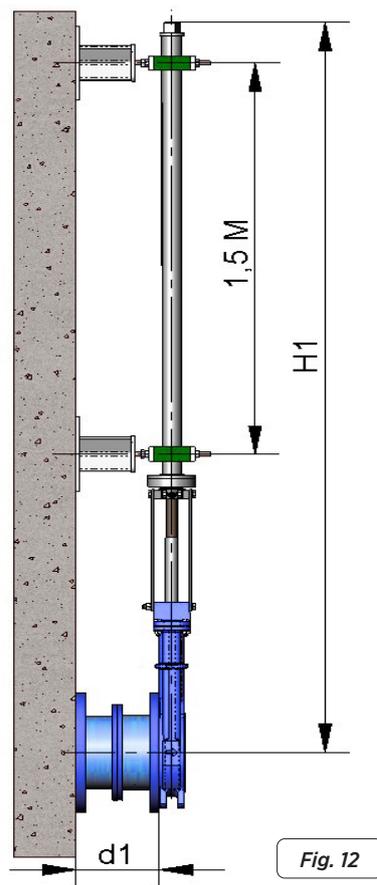


Fig. 12

## 3.- EXTENDED SUPPORT PLATES

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.

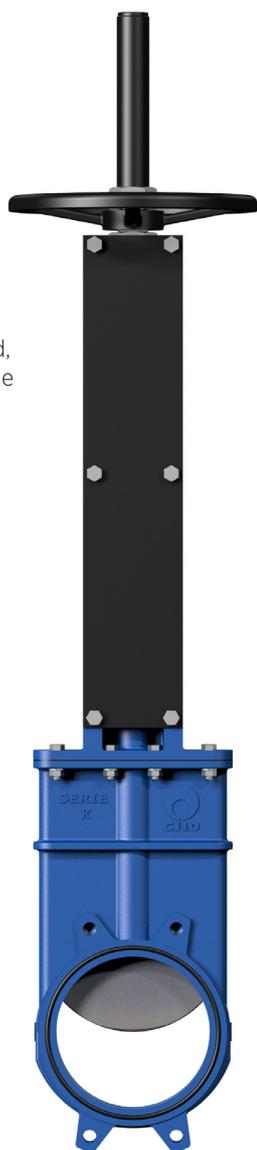


Fig. 13

## 4. EXTENSION : CARDAN JOINT

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



Fig. 14

## HANDWHEEL WITH RISING STEM

The definition variables are as follows :

**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 shown in the table.

### ACTUATOR INCLUDING:

- Handwheel.
- Stem.
- Nut.
- Stem protection hood.

### AVAILABLE:

- Standard DN50 to DN1200
- From ND600 the actuator is with geared motor.
- Other ND to order

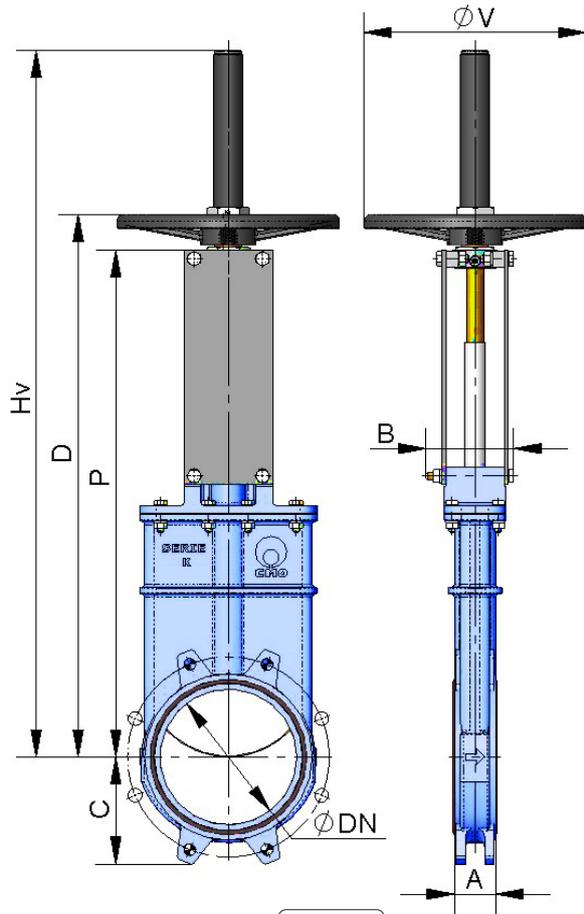


Fig. 15

DN	ΔP (bar)	A	B	C	P	D	Hv	øV
50	10	40	92	61	323	369	501	225
65	10	40	92	68	362	407	539	225
80	10	50	92	91	404	451	583	225
100	10	50	92	104	453	498	630	225
125	10	50	102	118	511	558	740	225
150	10	60	102	130	574	619	801	225
200	8	60	119	159	745	806	1046	325
250	6	70	119	196	880	938	1277	325
300	6	70	119	230	1005	1061	1401	380
350	5	96	290	254	1141	1250	1682	450
400	5	100	290	287	1266	1375	1807	450
450	3	106	290	304	1393	1502	2034	450
500	3	110	290	340	1529	1638	2170	450
600	3	110	290	398	1782	1891	2523	450
700	2	110	320	453	2105	--	--	--
800	2	110	320	503	2376	--	--	--
900	2	110	320	583	2655	--	--	--
1000	2	110	320	613	2935	--	--	--
1200	2	150	340	728	3440	--	--	--

Table. 4

## HANDWHEEL WITH NON-RISING STEM

The definition variables are as follows :

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

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

### OPTIONS

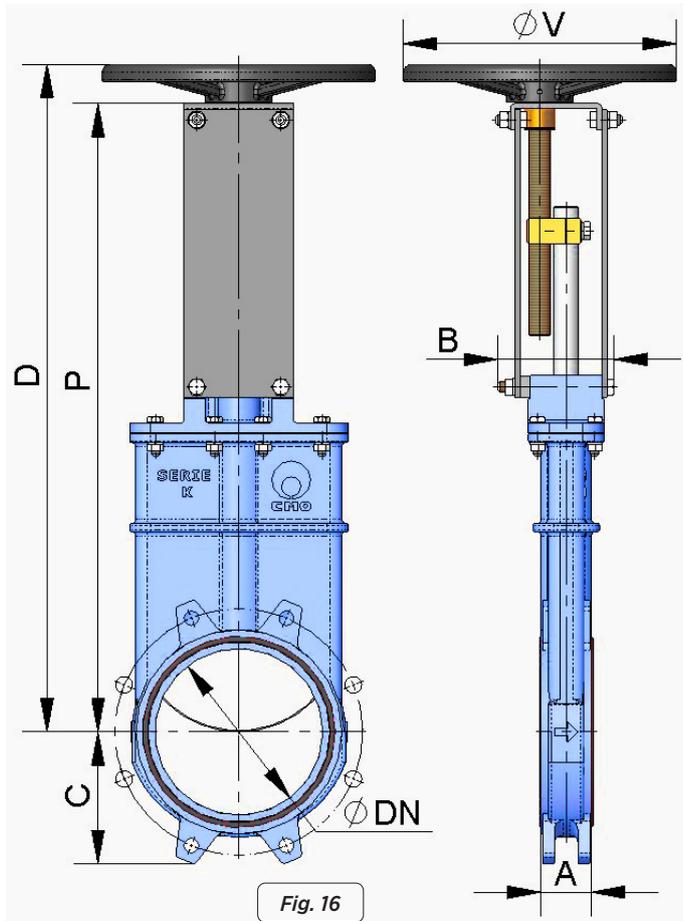
- Square nut.
- Locking devices.
- Extensions: stand, pipe, plates...
- DN higher than those give in the table.

### ACTUATOR INCLUDING

- Handwheel.
- Stem.
- Guide bearings on the yoke.
- Nut.

### AVAILABLE

- Standard DN50 to DN1200
- From ND600 the actuator is with geared motor.
- Other ND to order



DN	$\Delta P$ (bar)	A	B	C	P	D	$\phi V$
50	10	40	101	61	323	362	225
65	10	40	101	68	362	401	225
80	10	50	101	91	404	443	225
100	10	50	101	104	453	492	225
125	10	50	111	118	511	550	225
150	10	60	111	130	574	613	225
200	8	60	128	159	745	798	325
250	6	70	128	196	880	933	325
300	6	70	128	230	1005	1058	380
350	5	96	305	254	1141	1220	450
400	5	100	305	287	1266	1345	450
450	3	106	305	304	1393	1472	450
500	3	110	305	340	1529	1608	450
600	3	110	305	398	1782	1861	450
700	2	110	335	453	2105	--	--
800	2	110	335	503	2376	--	--
900	2	110	335	583	2655	--	--
1000	2	110	335	613	2935	--	--
1200	2	150	355	728	3440	--	--

Table. 5

## CHAINWHEEL

The definition variables are as follows :

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

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

Widely used in raised installations with difficult access, the handwheel is fitted in vertical position.

### 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:

- Standard DN50 to DN1200
- From ND600 the actuator is with geared motor.
- Other ND to order

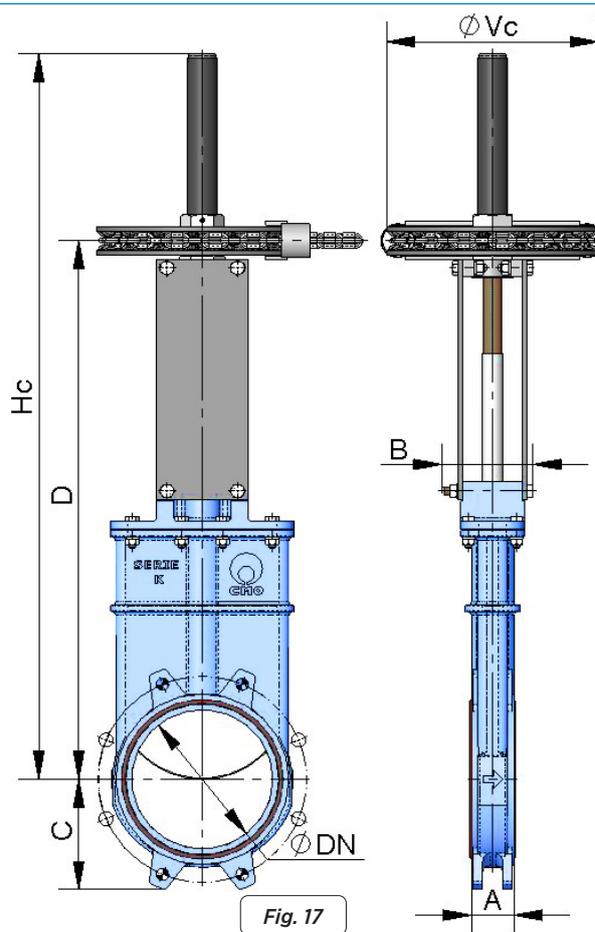


Fig. 17

DN	$\Delta P$ (bar)	A	B	C	D	Hc	$\phi VC$
50	10	40	92	61	354	501	225
65	10	40	92	68	392	539	225
80	10	50	92	91	436	583	225
100	10	50	92	104	483	630	225
125	10	50	102	118	543	740	225
150	10	60	102	130	604	801	225
200	8	60	119	159	780	1046	300
250	6	70	119	196	912	1277	300
300	6	70	119	230	1035	1401	300
350	5	96	290	254	1223	1682	402
400	5	100	290	287	1348	1807	402
450	3	106	290	304	1475	2034	402
500	3	110	290	340	1611	2170	402
600	3	110	290	398	1864	2523	402
700	2	110	320	453	2105	3035	402*
800	2	110	320	503	2376	3406	402*
900	2	110	320	583	2655	3785	402*
1000	2	110	320	613	2935	4165	402*
1200	2	150	340	728	3440	4870	402*

Table. 6

## LEVER

The definition variables are as follows :

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

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

### ACTUATOR INCLUDING

- Lever.
- Rod.
- Guide bearing.
- External limiting switches to maintain the position.

### AVAILABLE

- Standard from DN50 to DN300

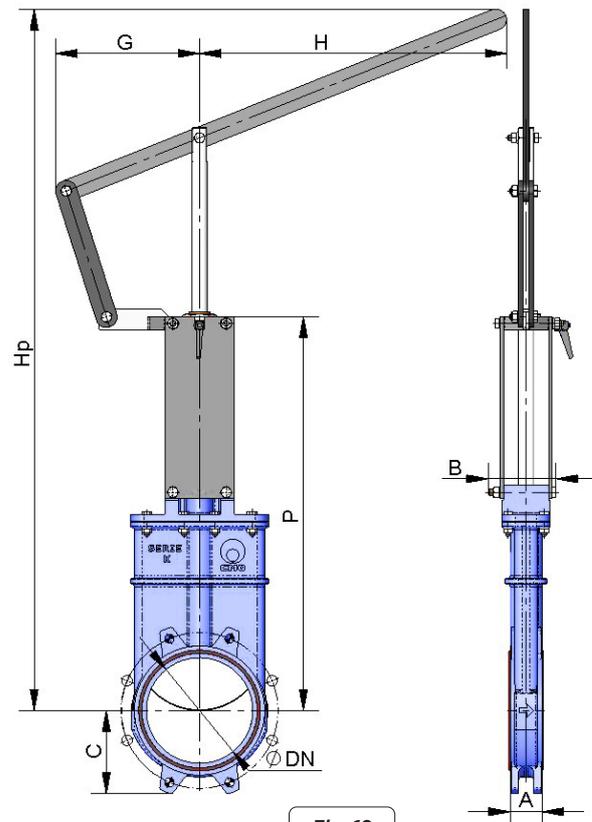


Fig. 18

DN	$\Delta P$ (bar)	A	B	C	P	G	H	Hp
50	3	60	91	61	323	325	155	586
65	3	60	91	68	362	325	155	620
80	3	64	91	91	404	325	155	659
100	3	64	91	104	453	325	155	724
125	3	70	101	118	511	425	155	1046
150	3	76	101	130	574	425	155	1111
200	2	89	118	158	745	620	290	1247
250	2	114	118	196	880	620	290	1670
300	2	114	118	230	1005	620	290	1804

Table. 7

## GEARBOX

It is recommendable for DN greater than 600.

**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

- Standard DN50 to DN1200
- From ND600 the actuator is with geared motor.
- Other ND to order

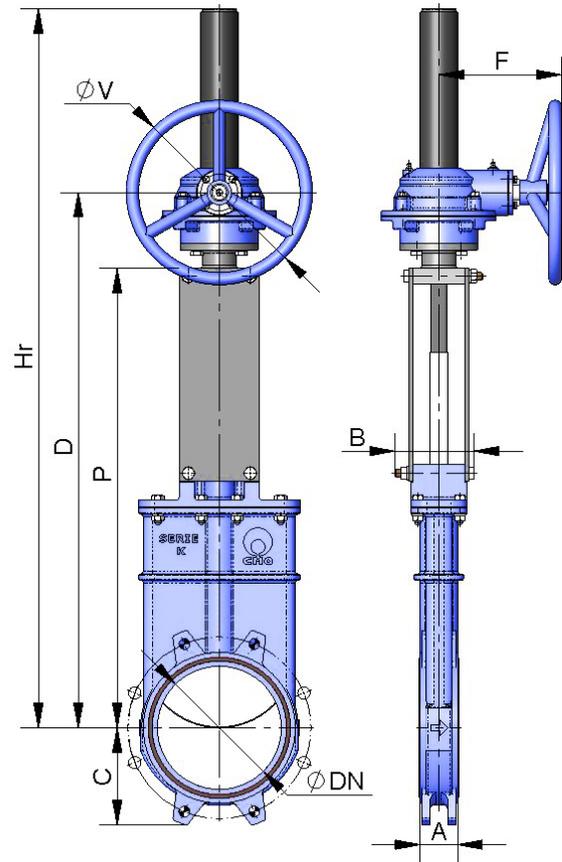


Fig. 19

DN	$\Delta P$ (bar)	A	B	C	P	D	F	$\phi V$	Hr
50	10	40	92	61	323	452	198	300	631
65	10	40	92	68	362	490	198	300	669
80	10	50	92	91	404	534	198	300	713
100	10	50	92	104	453	581	198	300	760
125	10	50	102	118	511	641	198	300	820
150	10	60	102	130	574	702	198	300	881
200	8	60	119	159	745	876	198	300	1175
250	6	70	119	196	880	1008	198	300	1307
300	6	70	119	230	1005	1131	198	300	1430
350	5	96	290	254	1141	1235	218	450	1684
400	5	100	290	287	1266	1360	218	450	1809
450	3	106	290	304	1393	1487	218	450	2086
500	3	110	290	340	1529	1623	218	450	2222
600	3	110	290	398	1782	1876	218	450	2475
700	2	110	320	453	2105	2211	260	450	3000
800	2	110	320	503	2376	2481	288	650	3371
900	2	110	320	583	2655	2757	288	650	3745
1000	2	110	320	613	2935	3044	288	650	4149
1100	2	150	340	670	3187	3327	352	850	4487

Table. 8

## DOUBLE-ACTING PNEUMATIC CYLINDER

The definition variables are as follows :

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

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

10 bar is the maximum admissible air pressure. For air pressures below 6 bar, please check with **CMO Valves**

For DN50 to DN200 valves, the cylinder's jacket and covers are made of aluminium, the spindle of AISI304, the piston of rubber-coated steel and the O-ring seals are made of nitrile.

For valves larger than DN200 the covers are made of nodular cast iron or carbon steel.

To order, we can also supply the actuator made entirely of stainless steel, especially for installation in corrosive atmospheres.

### DISPONIBLE

- Standard from DN50 to DN1200
- Other ND to order

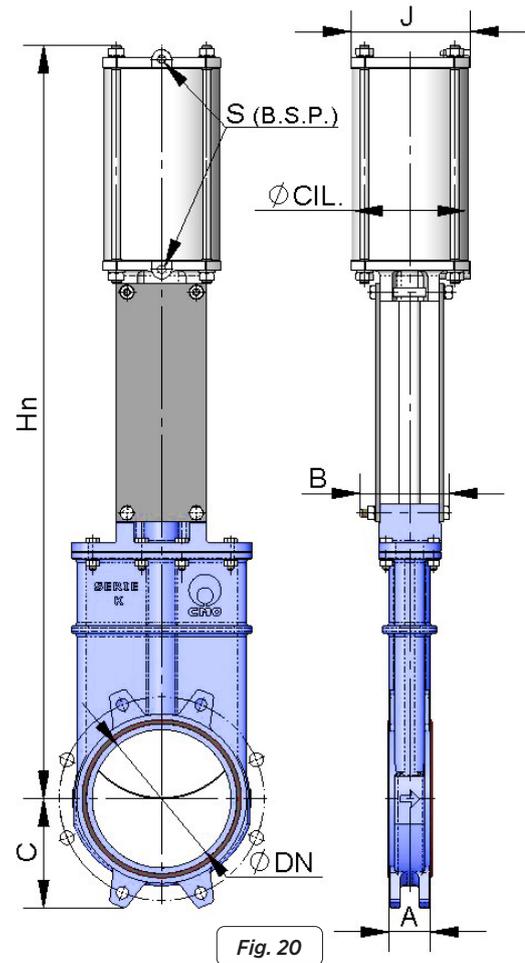


Fig. 20

DN	ΔP (bar)	A	B	C	ø CIL	Ø STEM	J	S (B.S.P.)	Hn
50	10	40	92	61	80	20	96	1/4"	498
65	10	40	92	68	80	20	96	1/4"	550
80	10	50	92	91	80	20	96	1/4"	608
100	10	50	92	104	100	20	115	1/4"	680
125	10	50	102	118	125	25	138	1/4"	774
150	10	60	102	130	125	25	138	1/4"	866
200	8	60	119	159	160	30	175	1/4"	1090
250	6	70	119	196	200	30	218	3/8"	1287
300	6	70	119	230	200	30	218	3/8"	1462
350	5	96	290	254	250	40	270	3/8"	1724
400	5	100	290	287	250	40	270	3/8"	1899
450	3	106	290	304	300	45	382	1/2"	2081
500	3	110	290	340	300	45	382	1/2"	2267
600	3	110	290	398	300	45	382	1/2"	2620
700	2	110	320	453	350	45	426	1/2"	3087
800	2	110	320	503	350	45	426	1/2"	3456
900	2	110	320	583	400	50	508	1/2"	3855
1000	*	110	320	613	400	50	508	1/2"	4220
1100	*	150	340	670	400	50	508	1/2"	4586

Table. 9

## SINGLE-ACTING PNEUMATIC CYLINDER

The definition variables are as follows :

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

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

10 bar is the maximum admissible air pressure. For air pressures below 6 bar please consult manufacturer.

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 DN300. 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.

### AVAILABLE

- Standard from DN50 to DN300
- Other ND to order
- Please see the “**CMO Pneumatic Actuators**” catalogue if you require further information.

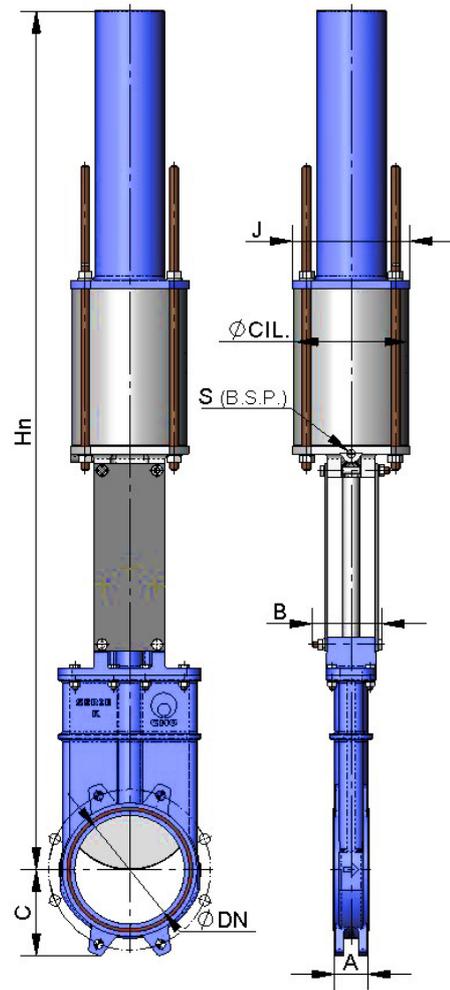


Fig. 21

DN	ΔP (bar)	A	B	C	ø CIL	Ø STEM	J	S (B.S.P.)	Hn
50	10	40	92	61	125	25	138	1/4"	868
65	10	40	92	68	125	25	138	1/4"	906
80	10	50	92	91	125	25	138	1/4"	949
100	10	50	92	104	125	25	138	1/4"	992
125	10	50	102	118	160	30	175	1/4"	1059
150	10	60	102	130	160	30	175	1/4"	1115
200	8	60	119	159	200	30	218	3/8"	1579
250	6	70	119	196	250	40	270	3/8"	2100
300	6	70	119	230	250	40	270	3/8"	2288

Table. 10

## ELECTRIC ACTUATOR

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

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

This actuator is automatic and includes the following parts:

- Electric motor.
- Stem.
- Yoke.

### THE ELECTRIC MOTOR INCLUDES :

- Emergency manual handwheel.
- Limit switches.
- Torque limiters.
- Different types and brands.
- Non-rising stem.

### AVAILABLE:

- Standard DN50 to DN1200
- From ND450 the actuator is with geared motor.
- Other ND to order

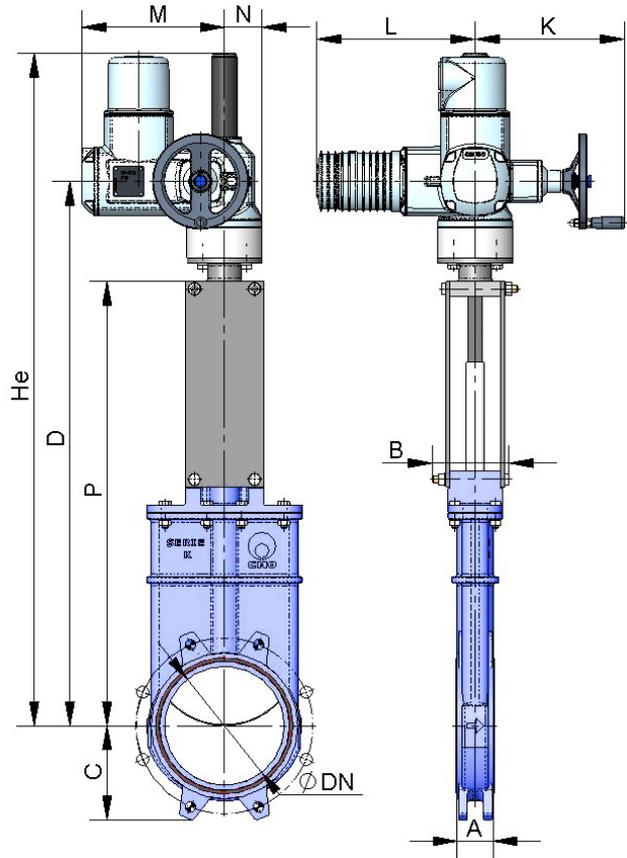


Fig. 22

DN	$\Delta P$ (bar)	A	B	C	D	K	L	M	N	P	He
50	10	40	92	61	482	249	265	238	62	323	677
65	10	40	92	68	521	249	265	238	62	362	716
80	10	50	92	91	563	249	265	238	62	404	758
100	10	50	92	104	612	249	265	238	62	453	807
125	10	50	102	118	670	249	265	238	62	511	865
150	10	60	102	130	733	249	265	238	62	574	928
200	8	60	119	159	905	249	265	238	62	745	1210
250	6	70	119	196	1040	249	265	238	62	880	1345
300	6	70	119	230	1165	249	265	238	62	1005	1470
350	5	96	290	254	1284	254	283	248	65	1141	1649
400	5	100	290	287	1410	254	283	248	65	1266	1823
450	3	106	290	304	1579	336	389	286	91	1393	2159
500	3	110	290	340	1718	336	389	286	91	1529	2298
600	3	110	290	398	1971	336	389	286	91	1782	2520
700	2	110	320	453	2260	336	389	286	91	2105	3000
800	2	110	320	503	2531	339	389	286	91	2376	3371
900	2	110	320	583	2810	339	389	286	91	2655	3745
1000	2	110	320	613	3090	339	389	286	91	2935	4149
1100	2	150	340	670	3342	339	389	286	91	3187	4487
1200	2	150	340	728	3584	336	389	528	125	3440	4866

Table. 11

## ACCIONAMIENTO HIDRAULICO (Presión de aceite: 135 bar)

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

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

10 bar is the maximum admissible air pressure. For air pressures below 6 Kg/cm<sup>2</sup> please consult manufacturer.

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 DN300. 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.

### AVAILABLE

- Standard from DN50 to DN300
- Other ND to order
- Please see the “**CMO Pneumatic Actuators**” catalogue if you require further information.

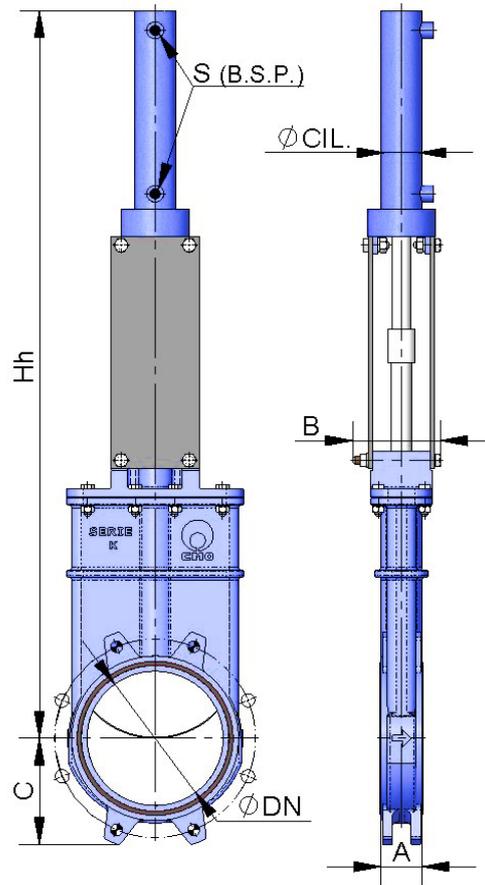


Fig. 23

DN	ΔP (bar)	A	B	C	Hh	Ø CIL	Ø VAST	S (B.S.P.)	Cap. Oil (dm <sup>3</sup> )
50	3	60	91	61	323	25	18	3/8"	0.03
65	3	60	91	68	362	25	18	3/8"	0.03
80	3	64	91	91	404	25	18	3/8"	0.04
100	3	64	91	104	453	32	22	3/8"	0.09
125	3	70	101	118	511	32	22	3/8"	0.11
150	3	76	101	130	574	40	28	3/8"	0.20
200	2	89	118	158	745	50	28	3/8"	0.42
250	2	114	118	196	880	50	28	3/8"	0.52
300	2	114	118	230	1005	50	28	3/8"	0.62
350	1,5	127	290	255	1141	50	28	3/8"	0.73
400	1,5	140	290	290	1266	63	36	3/8"	1.31
450	1	152	290	306	1393	63	36	3/8"	1.47
500	1	152	290	340	1529	63	36	3/8"	1.62
600	1	178	290	398	1782	80	45	3/8"	3.12
700	1	178	320	453	2105	80	45	3/8"	3.62
800	1	178	320	503	2376	100	56	1/2"	6.44
900	1	178	320	583	2655	100	56	1/2"	7.25
1000	1	178	320	613	2935	125	70	1/2"	10.25
1200	4	203	340	728	3440	125	70	1/2"	15.1

Table. 12

## INFORMATION ON FLANGE DIMENSIONS

### EN 1092-2 PN10

DN	•	o	METRIC	PROF.	ØK
50	4	-	M 16	8	125
65	4	-	M 16	8	145
80	4	4	M 16	9	160
100	4	4	M 16	9	180
125	4	4	M 16	9	210
150	4	4	M 20	10	240
200	4	4	M 20	10	295
250	6	6	M 20	12	350
300	6	6	M 20	12	400
350	10	6	M 20	21	460
400	10	6	M 24	21	515
450	14	6	M 24	22	565
500	14	6	M 24	22	620
600	14	6	M 27	22	725
700	16	8	M 27	22	840
800	16	8	M 30	22	950
900	20	8	M 30	20	1050
1000	20	8	M 33	20	1160
1100	20	12	M 33	20	1270

Table. 13

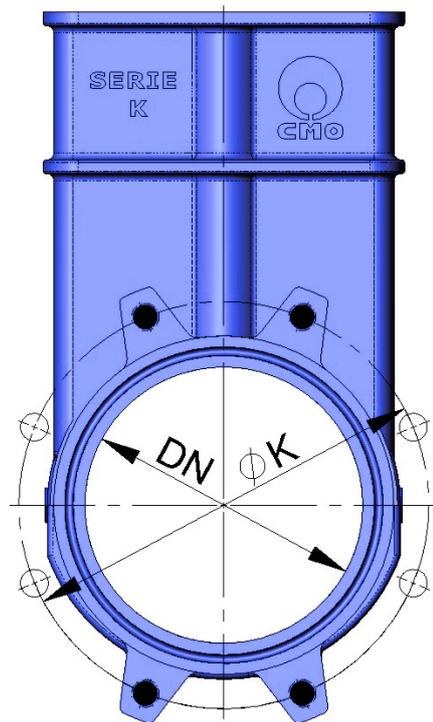


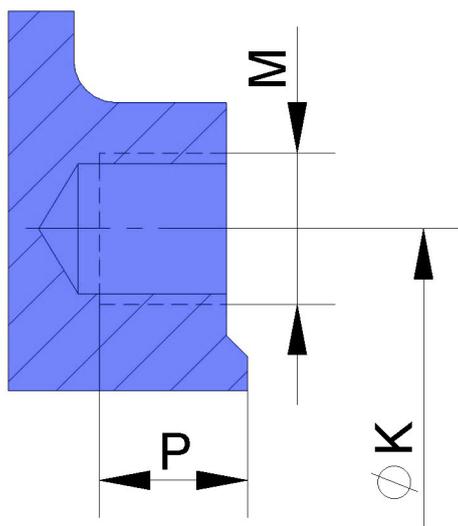
Fig. 24

• BLIND TAPPED HOLE  
o THROUGH HOLE

### ANSI B16, Class 150

DN	•	o	R UNC	PROF.	ØK
2"	4	-	5/8"	8	120,6
2 1/2"	4	-	5/8"	8	139,7
3"	4	-	5/8"	9	152,4
4"	-	-	9	152,4	190,5
4"	4	4	5/8"	9	190,5
5"	4	4	3/4"	9	215,9
6"	4	4	3/4"	10	241,3
8"	4	4	3/4"	10	298,4
10"	6	6	7/8"	12	361,9
12"	6	6	7/8"	12	431,8
14"	8	4	1"	21	476,2
16"	10	6	1"	21	539,7
18"	10	6	1 1/8"	22	577,8
20"	14	6	1 1/8"	22	635
24"	14	6	1 1/4"	22	749,3
28"	20	8	1 1/4"	22	863,6
30"	20	8	1 1/4"	22	914,4
32"	18	10	1 1/2"	22	977,9
36"	20	12	1 1/2"	20	1085,9

Table. 14



• BLIND TAPPED HOLE  
o THROUGH HOLE.

Fig. 25



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