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CMO VALVES

BIDIRECTIONAL KNIFE GATE VALVE

DESCRIPTION

Two-piece cast body, joined by screws, with internal guides for smooth movement of gate during operation.

Provides high flow rates with low pressure drop. Various seat and packing materials available.

Face-to-face dimension in accordance with **CMO Valves** standard.

GENERAL APPLICATIONS

This knife gate valve is suitable for liquids that contain a maximum of 20% suspended solids. It is also recommended in gravity discharge applications for solids and fine particles, because of its half-moon shape which cuts the flow and high consistency fluids.

Designed for a wide range of applications such as:

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

SIZES

ND50 to ND2000 (larger sizes on request).

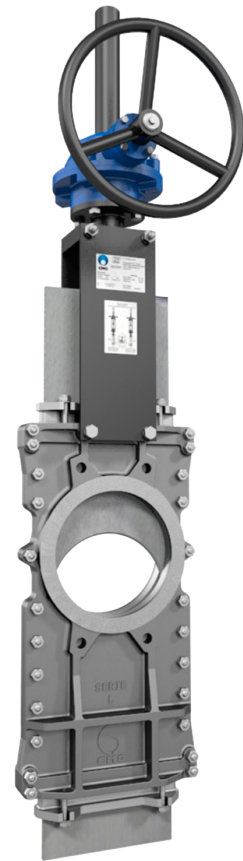
The pressures indicated in the table can be used in both directions of the valve.

WORKING PRESSURE (ΔP)

ND50 a ND150	10 bar
ND200	8 bar
ND250 a ND300	6 bar
ND350 a ND400	5 bar
ND450 a ND600	3 bar
ND700 a ND1400	2 bar

* Other pressures, upon request

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DIRECTIVES

Pressure Equipment Directive: **(PED) ART 4.3 /CAT.1.**

Potential Explosive Atmospheres Directive: **(ATEX) CAT.3 ZONA 2 y 22 GD.**

Fig. 1

* For further information on categories and zones please contact the **CMO VALVES** 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.

ADVANTAGES

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, therefore, there are no turbulences in the fluid. It is also referred to as a bidirectional through-going gate valve or through conduit knife gate valve. The valve's body is composed of two parts or halves. The internal surface of both parts is fully machined and they are assembled with screws to form a solid block.

The gate in the stainless steel version slides smoothly inside the body thanks to the nylon RCH 1000 slides inserted inside both parts of the body. 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** 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.

STANDARD COMPONENTS LIST

COMPONENT	CAST IRON VERSION	STAINLESS STEEL VERSION
1 BODY	GJL-250	CF8M
2 GATE	AISI304	AISI316
3 SEAL	CARDBOARD	
4 PACKING GLAND	GJS-500	CF8M
5 PACKING	SYNT + PTFE	
6 SEAL	EPDM	
7 SUPPORT PLATES	S275JR	
8 RING	AISI316	
9 SEAT	EPDM	
10 STEM	AISI303	
11 BRIDGE	STEEL	
12 STEM NUT	BRONZE	
13 CHECK NUT	ST44.2 + ZINC	
14 HANDWHEEL	NODULAR CAST IRON	
15 NUT	STEEL	
16 CAP	STEEL	

Table. 1

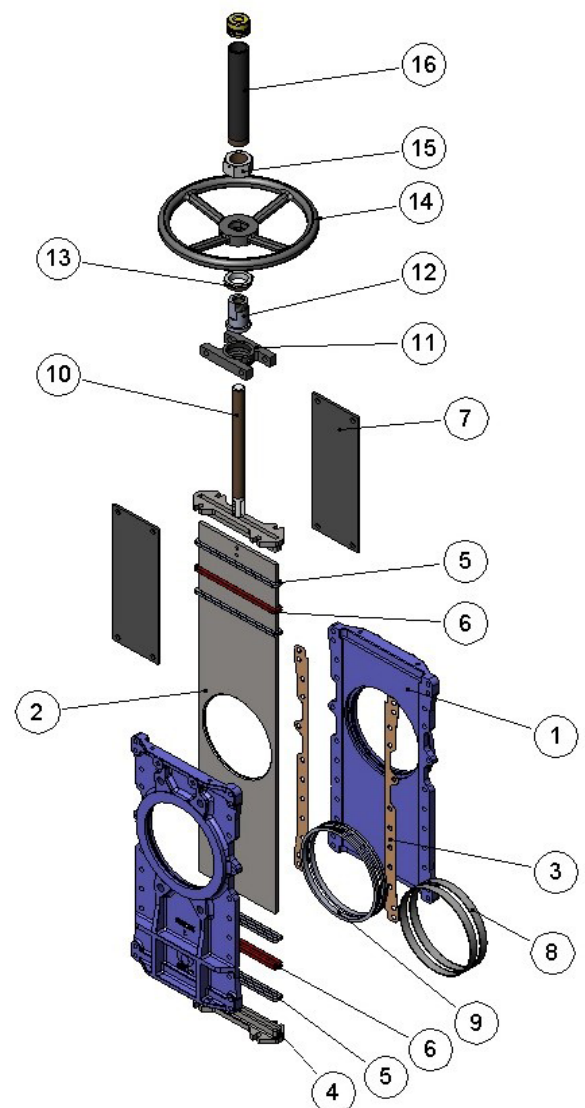


Fig. 2

Note: The stainless steel valves have slides on each side of the body to avoid friction and possible seizure of the valve, these slides are made of RCH1000.

DESIGN

1. BODY

Cast iron body with reinforcements, composed of two parts joined by screws, the stainless steel version has internal nylon RCH1000 slides for the smooth movement of the gate, the GJL-250 versions do not require slides. The internal surface of both parts is fully machined and they are assembled with screws to form a solid block. 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 ND1200 the body is machine-welded with the necessary reinforcements to resist the maximum working pressure. 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.

2. 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.

3. SEAT:

The following six types of seats are available according to the working application:

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. As this valve is bidirectional it includes two watertight seals.

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 stick to it). As this valve is bidirectional it includes two watertight seals and two reinforced rings.

Seats 4, 5 and 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's hole). Three materials are available for the reinforced socket and the deflector (CA-15 steel, CF8M and Ni-hard).

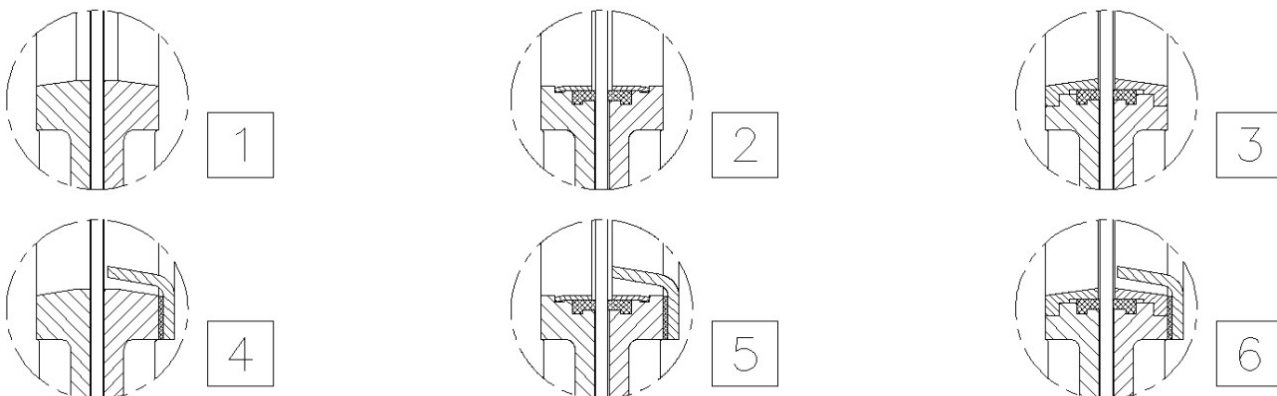


Fig. 3

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.

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.

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.

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.

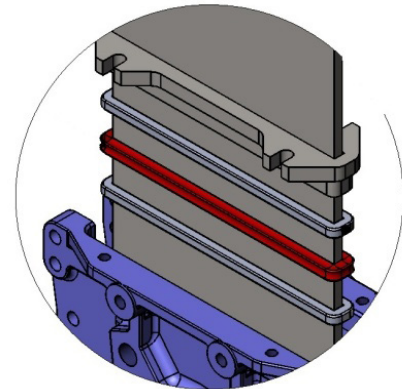
PTFE

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.

4. PACKING

The 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 in both pumps and valves.

DRY COTTON

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

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.

CERAMIC FIBRE

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

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.

GRAPHITE:

This packing is composed of high-purity graphite fibres. A diagonal braiding system is used and it's 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.

SEAT/SEALS			PACKING			
MATERIAL	Tª MÁX (°C)	APPLICATIONS	MATERIAL	P (bar)	Tª MÁX (°C)	pH
EPDM (E)	90 *°C	Mineral acids and oils	Greased cotton	0,5	100°C	6-8
Nitrile (N)	90 *°C	Hydrocarbons, oils and greases	Dry cotton (AS)	30	120°C	6-8
Vitón (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
			Ceramic Fibre	0.3	1400	0-14

* ⇄ EPDM and Nitrile: it is possible up to Max Temperature: 120°C on request.


 **Note:** More details and other materials on re-

Table. 2

5. STEM

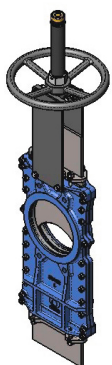
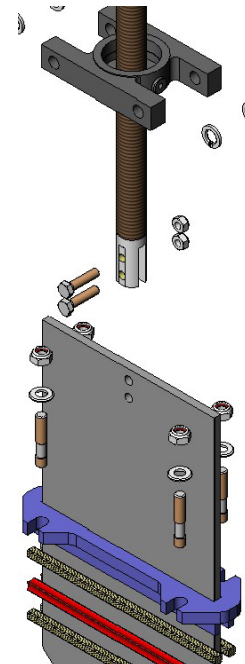
The stem on the **CMO valves** is made of 18/8 stainless steel. This characteristic provides high resistance and excellent corrosion-resistant properties. The valve design can be rising stem or non-rising stem. When rising stem is required a stem hood is supplied to protect the stem from contact with dust and dirt, as well as keeping it lubricated

6. PACKING GLAND

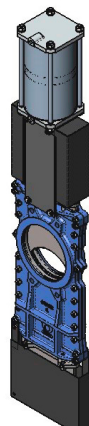
The packing gland allows uniform force and pressure to be applied to the packing to ensure watertight integrity. As standard, valves with cast iron body include GJS-450 packing glands, whilst valves with stainless steel body have CF8M packing glands.

7. ACTUATORS

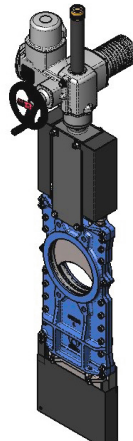
All types of actuators can be supplied, with the advantage that the design is fully interchangeable. This design allows the customer to change the actuators themselves and normally no extra assembly accessories are required. In the event any accessory is required, **CMO Valves** will supply it.



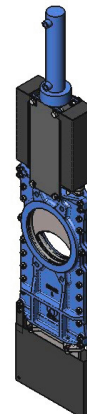
Handwheel with rising stem



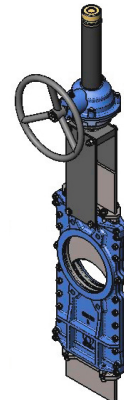
Pneumatic cylinder



Electric actuator



Hydraulic cylinder



Gear Box

The chainwheel and gear box actuators are also available with non-rising stem. The pneumatic actuators can be single or double acting, and the single acting ones can in turn be open spring or close spring.

Manual Actuators

Handwheel with rising stem / **non**-rising stem

Level / Chainwheel

Gear Box / Others, (square nut)

Automatic Actuators

Electric actuator

Pneumatic cylinder

Hydraulic cylinder

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 :

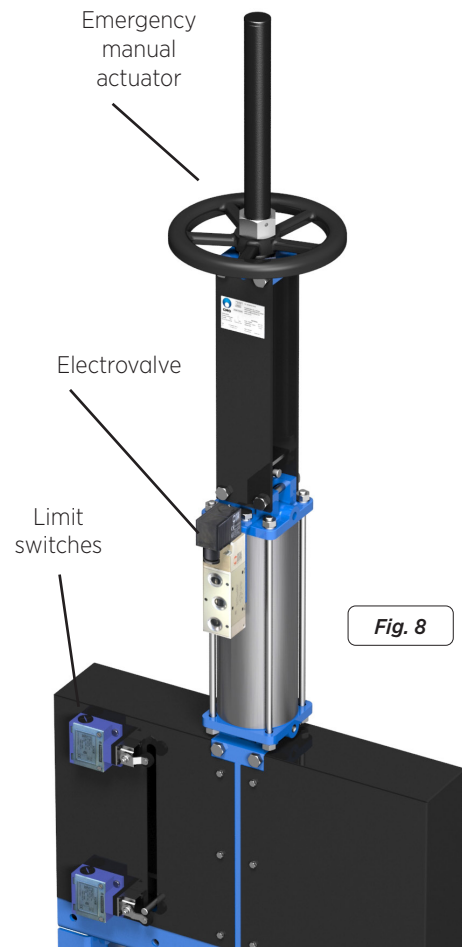
Made of EPOXY-coated steel (or stainless steel to order), its robust design gives it great rigidity in order to resist the most adverse operation conditions.

EPOXY COATING :

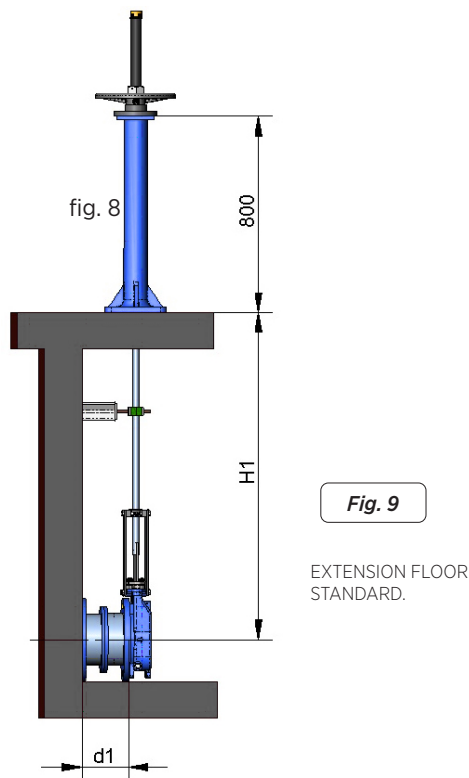
All carbon steel components and bodies of **CMO valves** are EPOXY coated, giving the valves great resistance to corrosion and an excellent surface finish. **CMO valves** standard colour is blue RAL-5015.

BONNET:

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



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.

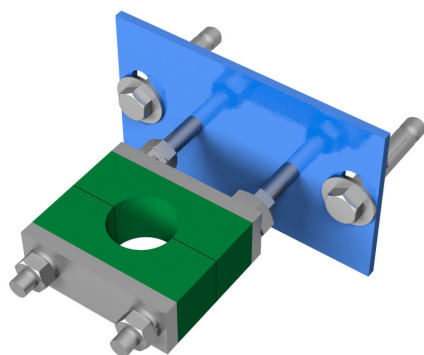
The definition variables are as follows :

H1: Distance from the valve 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



STRAIGHT FLOOR STANDS

Fig. 11

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

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.

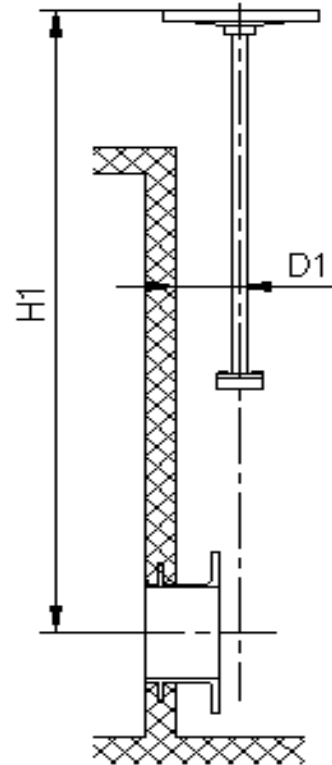
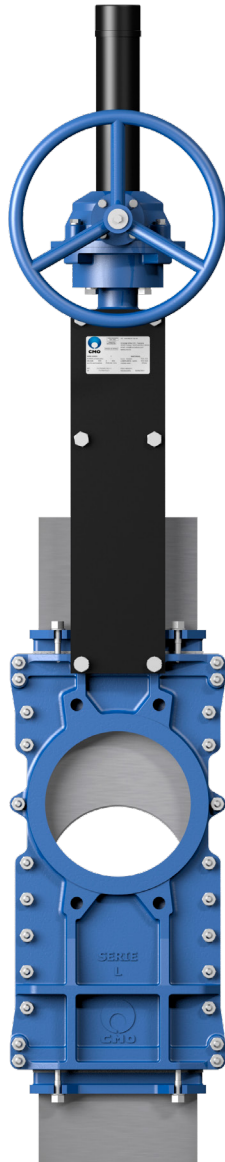


Fig. 12

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.

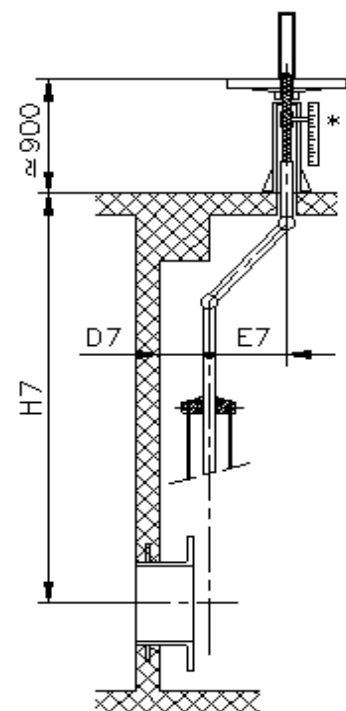
Fig. 13



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 follow:

- **B = Max. width** of the valve (without actuator).
- **D = Max. height** of the valve (without actuator).
- **C = maximum** length when the gate is centred.

OPTIONS:

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

ACTUATOR INCLUDING:

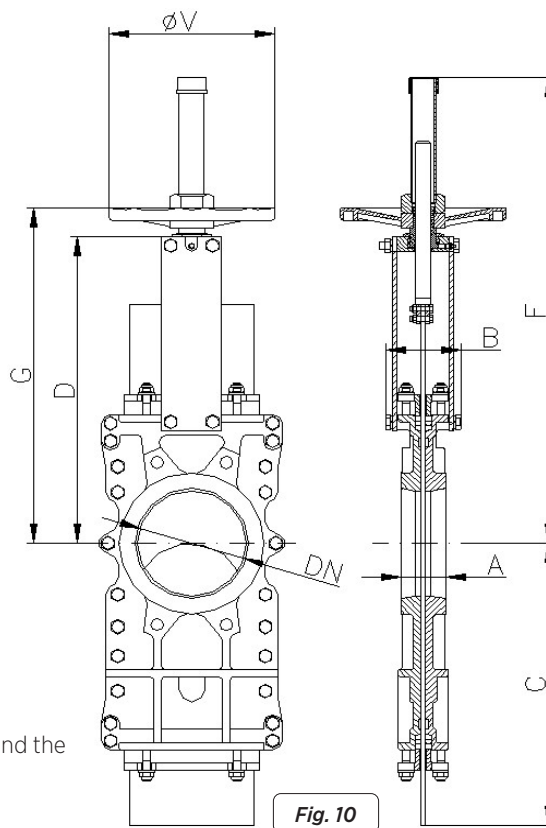
- Handwheel.
- Stem.
- Nut.
- Stem protection hood.

AVAILABLE:

- Standard ND50 a ND1200.
- Other ND on request

• The weights are approximate and vary according to the material and the valve's accessories.

• From DN600 the actuator is with gears box.



DN	ΔP (bar)	A	B	C	D	F	G	øV	Weight (kg.)
50	10	40	91	225	243	412	282	225	12
65	10	40	91	265	269	437	308	225	13
80	10	50	91	310	293	462	332	225	17
100	10	50	91	370	334	503	373	225	19
125	10	50	101	430	367	586	407	225	28
150	10	60	101	495	419	638	458	225	38
200	8	60	118	630	525	816	578	325	54
250	6	70	118	770	620	1017	679	325	88
300	6	70	118	895	704	1117	779	380	112
350	5	96	290	1050	780	1337	906	450	163
400	5	100	290	1185	855	1443	1012	450	235
450	3	106	290	1320	975	1629	1098	450	368
500	3	110	290	1455	1064	1741	1210	450	471
600	3	110	290	1720	1244	2047	1416	450	532
700	2	110	320	1995	1425	--	--	--	936
800	2	110	320	2230	1615	--	--	--	N.D.
900	2	110	320	2465	1823	--	--	--	N.D.
1000	2	110	320	2620	1992	--	--	--	N.D.
1100	2	150	340	3030	2217	--	--	--	N.D.
1200	2	150	340	3250	2351	--	--	--	N.D.

N.D.: Peso no declarado

Tabla. 4

HANDWHEEL WITH NON-RISING STEM

Suitable when no size limitations exist.

The definition variables are as follow:

- **B = Max. width** of the valve (without actuator).
- **D = Max. height** of the valve (without actuator).
- **C = maximum** length when the gate is centred.

OPTIONS:

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

ACTUATOR INCLUDING:

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

AVAILAIBLE:

- Standard ND50 a ND1200.
- Other ND on request.
- The weights are approximate and vary according to the material and the valve's accessories..
- From DN600 the actuator is with gears box.

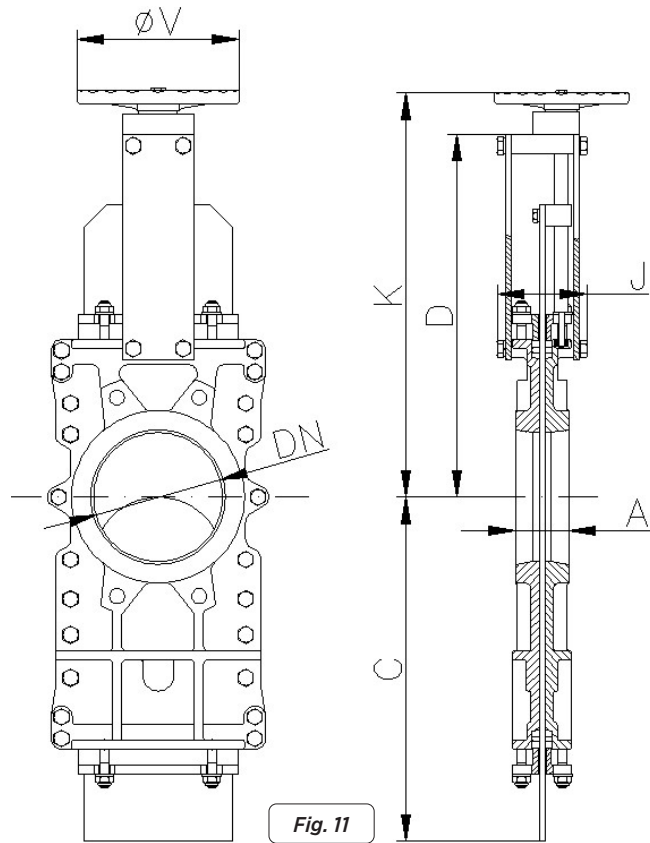


Fig. 11

DN	ΔP (bar)	A	C	D	J	K	øV	Weight (kg.)
50	10	40	225	243	101	277	225	12
65	10	40	265	269	101	304	225	13
80	10	50	310	293	101	330	225	17
100	10	50	370	334	101	370	225	19
125	10	50	430	367	111	402	225	28
150	10	60	495	419	111	454	225	38
200	8	60	630	525	128	578	325	54
250	6	70	770	620	128	679	325	88
300	6	70	895	704	128	779	380	112
350	5	96	1050	780	305	860	450	163
400	5	100	1185	855	305	981	450	235
450	3	106	1320	975	305	1067	450	368
500	3	110	1455	1064	305	1179	450	471
600	3	110	1720	1244	305	1386	450	532
700	2	110	1995	1425	335	--	--	936
800	2	110	2230	1615	335	--	--	N.D.
900	2	110	2465	1823	335	--	--	N.D.
1000	2	110	2620	1992	335	--	--	N.D.
1100	2	150	3030	2217	355	--	--	N.D.
1200	2	150	3250	2351	355	--	--	N.D.

N.D.: Peso no declarado

Tabla. 5

CHAINWHEEL

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

The definition variables are as follow:

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

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

• **C = maximum** length when the gate is centred.

OPTIONS:

- Locking devices.
- Extensions: stand, pipe, plates...
- Non-rising stem.
- ND higher than those give in the table

ACTUATOR INCLUDING:

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

AVAILABLE SIZES

- Santdard DN50 a DN1200. Otros DN bajo consulta.
- From ND 600, the valves are with gear box, see * in the table.

- The weights are approximate and vary according to the material and the valve's accessories.

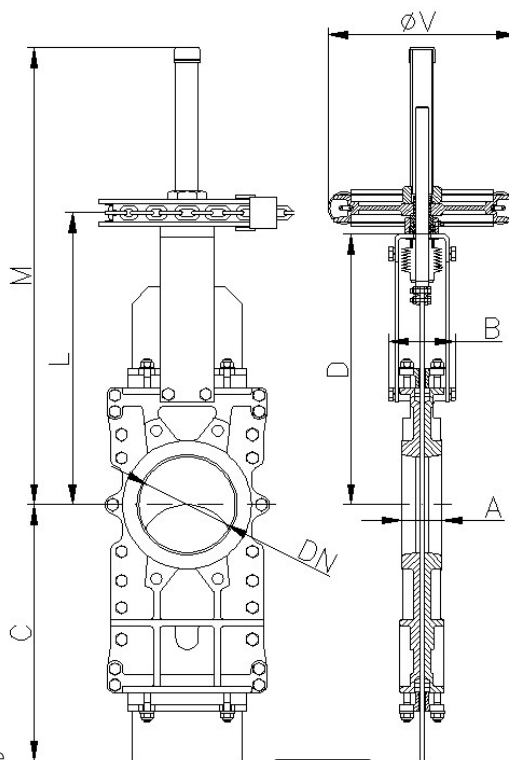


Fig. 12

DN	ΔP (bar)	A	B	C	D	L	M	ϕV	Weight (kg.)
50	10	40	91	225	243	294	437	225	12
65	10	40	91	265	269	319	464	225	13
80	10	50	91	310	293	346	490	225	17
100	10	50	91	370	334	386	530	225	19
125	10	50	101	430	367	420	613	225	28
150	10	60	101	495	419	471	665	225	38
200	8	60	118	630	525	602	849	300	54
250	6	70	118	770	620	697	1050	300	88
300	6	70	118	895	704	797	1150	300	112
350	5	96	290	1050	780	918	1398	402	163
400	5	100	290	1185	855	998	1504	402	235
450	3	106	290	1320	975	1078	1690	402	368
500	3	110	290	1455	1064	1201	1802	402	471
600	3	110	290	1720	1244	1329	2108	402	532
700	2	110	320	1995	1425	1606	2406	402*	936
800	2	110	320	2230	1615	1820	2720	402*	N.D.
900	2	110	320	2465	1823	2053	3053	402*	N.D.
1000	2	110	320	2620	1992	2257	3337	402*	N.D.
1100	2	150	340	3030	2217	2546	3676	402*	N.D.
1200	2	150	340	3250	2351	2836	4016	402*	N.D.

N.D.: Peso no declarado

Tabla. 6

LEVER

- It is a fast actuator.

The definition variables are as follow:

- A = Max. width of the valve (without actuator).
- B = Max. height of the valve (without actuator).
- C = maximum length when the gate is centred.

ACTUATOR INCLUDING:

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

- Available: ND50 to ND300, other ND on request.

- The weights are approximate and vary according to the material and the valve's accessories.

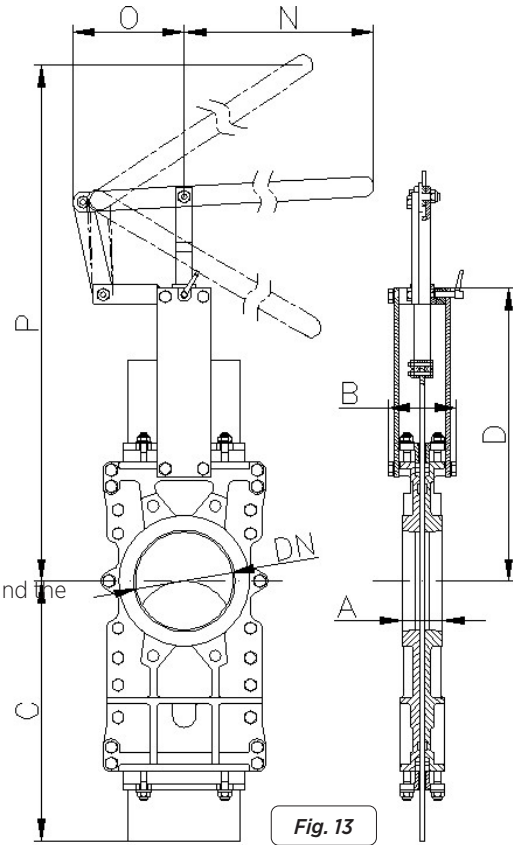


Fig. 13

DN	ΔP (bar)	A	B	C	D	N	O	P	Weight (kg.)
50	10	40	91	225	243	325	155	504	13
65	10	40	91	265	269	325	155	526	14
80	10	50	91	310	293	325	155	549	18
100	10	50	91	370	334	325	155	605	20
125	10	50	101	430	367	425	155	902	29
150	10	60	101	495	419	425	155	956	39
200	8	60	118	630	525	620	290	1027	55
250	6	70	118	770	620	620	290	1416	89
300	6	70	118	895	704	620	290	1525	113

Tabla. 7

GEARBOX

It is recommended for ND greater than 600.

The definition variables are as follow:

- **A = Max. width** of the valve (without actuator).
- **B = Max. height** of the valve (without actuator).
- **C = maximum** length when the gate is centred.

OPTIONS:

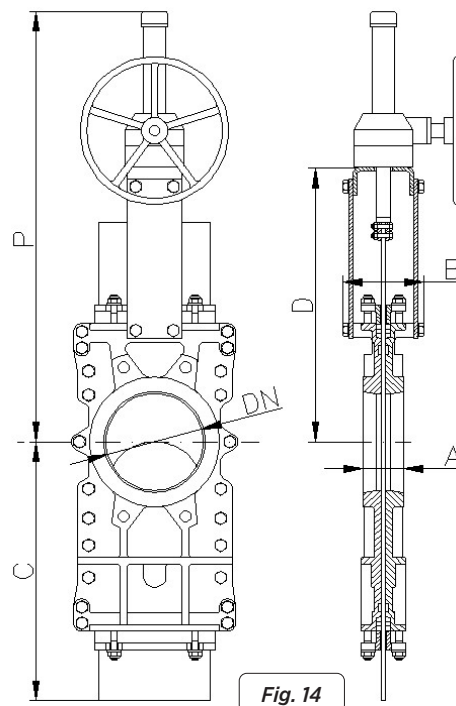
- Locking devices.
- Extensions: stand, pipe, plates...
- Non-rising stem

ACTUATOR INCLUDING:

- Cone-shaped gear box
- Stem
- Yoke
- Handwheel

AVAILABLE:

- ND50 to ND1200, other ND on request.
- The weights are approximate and vary according to the material and the valve's accessories..



DN	ΔP (bar)	A	B	C	P	D	Weight (kg.)
50	10	40	91	225	540	243	22
65	10	40	91	265	566	269	23
80	10	50	91	310	591	293	27
100	10	50	91	370	631	334	28
125	10	50	101	430	665	367	37
150	10	60	101	495	717	419	47
200	8	60	118	630	943	525	76
250	6	70	118	770	1037	620	111
300	6	70	118	895	1171	726	133
350	5	96	290	1050	1318	780	163
400	5	100	290	1185	1393	855	247
450	3	106	290	1320	1662	975	386
500	3	110	290	1455	1752	1064	495
600	3	110	290	1720	1981	1244	552
700	2	110	320	1995	2320	1425	956
800	2	110	320	2230	2610	1615	N.D.
900	2	110	320	2465	2913	1823	N.D.
1000	2	110	320	2620	3206	1992	N.D.
1100	2	150	340	3030	3777	2217	N.D.
1200	2	150	340	3250	4042	2351	N.D.
1300	2	150	390	3430	4382	2882	N.D.
1400	2	150	390	3680	4852	3250	N.D.
1500	2	170	426	3930	5217	3517	N.D.
1600	2	170	426	4272	5575	3775	N.D.
1700	2	190	440	4615	5908	4008	N.D.
1800	2	190	440	4886	6242	4242	N.D.
1900	2	210	480	5158	6490	4390	N.D.
2000	2	210	480	5430	6740	4540	N.D.

N.D.: Peso no declarado

Tabla. 8

DOUBLE-ACTING PNEUMATIC CYLINDER

- 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.
- 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 valves larger than ND200 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.

- **A = Max. width** of the valve (without actuator).
- **B = Max. height** of the valve (without actuator).
- **C = maximum** length when the gate is centred.

AVAILABLE:

- ND50 to ND2000, other ND on request.
The weights are approximate and vary according to the material and the valve's accessories..

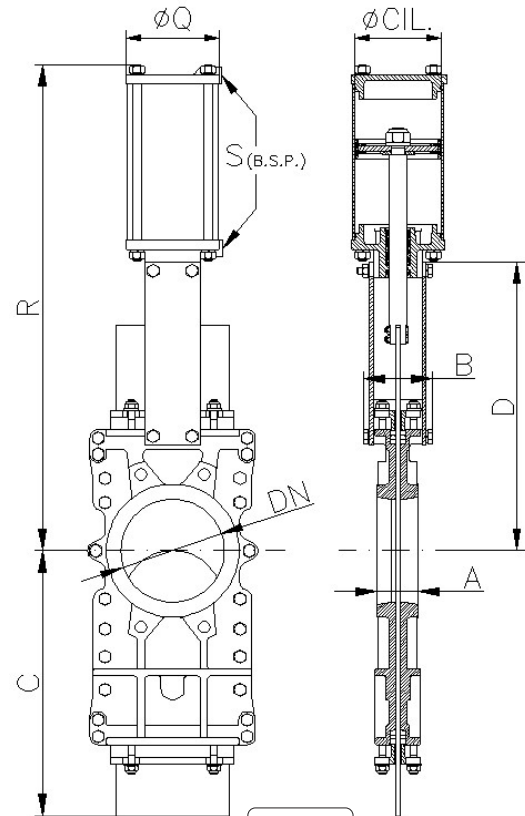


Fig. 15

DN	ΔP (bar)	A	B	C	D	R	Ø CIL	Ø Vast.	Ø Q	S (B.S.P)	Weight (kg.)
50	10	40	91	225	243	416	80	20	90	1/4"	12
65	10	40	91	265	269	456	80	20	90	1/4"	13
80	10	50	91	310	293	497	80	20	90	1/4"	19
100	10	50	91	370	334	561	100	20	110	1/4"	19
125	10	50	101	430	367	636	125	25	135	1/4"	33
150	10	60	101	495	419	717	125	25	135	1/4"	43
200	8	60	118	630	525	874	160	30	170	1/4"	65
250	6	70	118	770	620	1030	200	30	215	3/8"	104
300	6	70	118	895	704	1160	200	30	215	3/8"	126
350	5	96	290	1050	780	1364	250	40	270	3/8"	200
400	5	100	290	1185	855	1482	250	40	270	3/8"	281
450	3	106	290	1320	975	1662	300	45	382	1/2"	427
500	3	110	290	1455	1064	1802	300	45	382	1/2"	540
600	3	110	290	1720	1244	2081	300	45	444	1/2"	609
700	2	110	320	1995	1425	2400	350	45	444	1/2"	1054
800	2	110	320	2230	1615	2693	350	45	444	1/2"	N.D.
900	2	110	320	2465	1823	3037	400	50	508	1/2"	N.D.
1000	*	110	320	2620	1992	3306	400	50	508	1/2"	N.D.
1100	*	150	340	3030	2217	3587	400	50	508	1/2"	N.D.
1200	*	150	340	3250	2351	3868	400	50	508	1/2"	N.D.

* ⇨ Consultar N.D.: Peso no declarado

Tabla. 9

SINGLE-ACTING PNEUMATIC CYLINDER

- 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.
- 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 and the O-ring seals of nitrile.
- The actuator design is spring activated for valves with diameters up to ND300. 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 fault.

The definition variables are as follow:

- **A = Max. width** of the valve (without actuator).
- **B = Max. height** of the valve (without actuator).
- **C = maximum** length when the gate is centred.

AVAILABLE

- From ND50 to ND2000, other ND on request.
- The weights are approximate and vary according to the material and the valve's accessories.

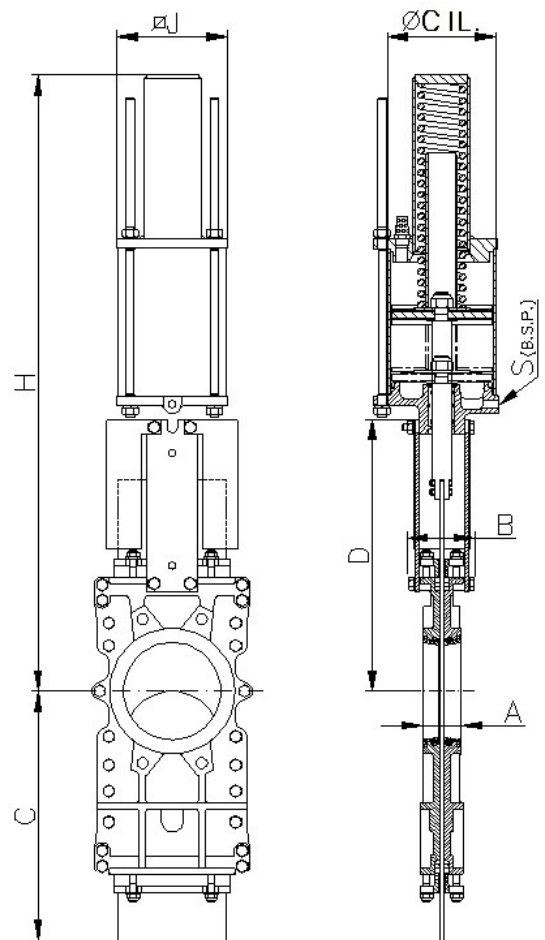


Fig. 16

 **Note:** Please see the “CMO Pneumatic Actuators” catalogue if you require further information.

DN	ΔP (bar)	A	B	C	D	H	ø J	ø C I L	ø V A S T	S (B.S.P)	Weight (kg.)
50	10	40	91	225	243	781	135	125	25	1/4"	12
65	10	40	91	265	269	806	135	125	25	1/4"	13
80	10	50	91	310	293	833	135	125	25	1/4"	19
100	10	50	91	370	334	873	170	125	25	1/4"	19
125	10	50	101	430	367	909	215	160	30	1/4"	33
150	10	60	101	495	419	960	215	160	30	1/4"	43
200	8	60	118	630	525	1355	270	200	30	3/8"	65
250	6	70	118	770	620	1844	382	250	40	3/8"	104
300	6	70	118	895	704	2005	382	250	40	3/8"	126

Tabla. 10

ELECTRIC ACTUATOR

This actuator is automatic and includes the following parts:

- Electric motor - Stem - Yoke

The electric motor includes:

- Emergency manual handwheel.
- Limit switches.
- Torque switches.

OPTIONS:

Different types and brands.

- Non-rising stem.
- ISO 5210 / DIN 3338 Flanges.

AVAILABLE: ND50 to ND2000, other ND on request

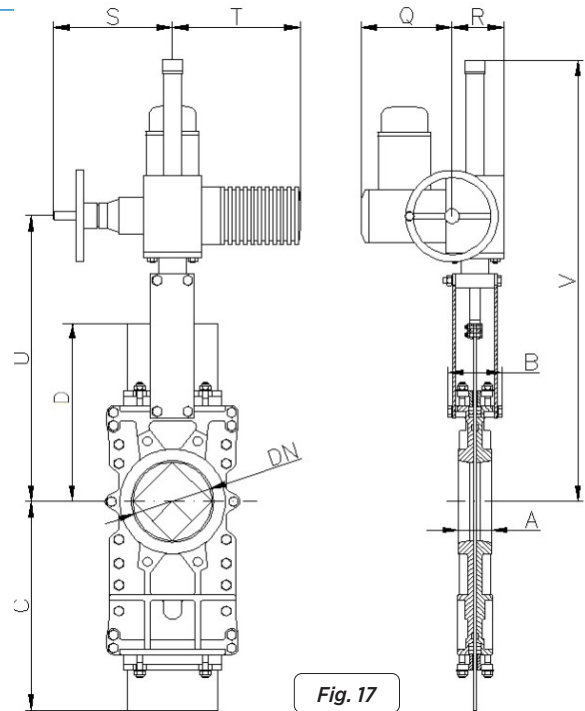
- From DN500 the motor is assisted with a gear box.

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

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

• **C = maximum** length when the gate is centred.

- The weights are approximate and vary according to the material and the valve's accessories.



DN	ΔP (bar)	A	B	C	D	Q	R	S	T	U	V	Weight (kg.)
50	10	40	91	225	243	197	102	234	265	347	587	32
65	10	40	91	265	269	197	102	234	265	374	614	33
80	10	50	91	310	293	197	102	234	265	400	640	37
100	10	50	91	370	334	197	102	234	265	440	680	39
125	10	50	101	430	367	197	102	234	265	473	713	48
150	10	60	101	495	419	197	102	234	265	525	765	58
200	8	60	118	630	525	197	102	234	265	640	880	74
250	6	70	118	770	620	197	102	234	265	741	981	108
300	6	70	118	895	726	197	102	234	265	841	1141	132
350	5	96	290	1050	780	197	115	256	282	944	1347	189
400	5	100	290	1185	855	197	115	256	282	1050	1550	261
450	3	106	290	1320	975	222	153	325	385	1147	1847	368
500	3	110	290	1455	1064	222	153	325	385	1259	1959	497
600	3	110	290	1720	1244	222	153	325	385	1465	2165	584
700	2	110	320	1995	1425	222	153	325	385	1651	2451	988
800	2	110	320	2230	1615	222	153	332	385	1865	2665	N.D.
900	2	110	320	2465	1823	222	153	332	385	2098	2998	N.D.
1000	2	110	320	2620	1992	222	153	332	385	2288	3178	N.D.
1100	2	150	340	3030	2217	227	195	355	510	2575	3675	N.D.
1200	2	150	340	3250	2351	227	195	355	510	2866	4042	N.D.
1300	2	150	390	3430	2882	227	195	355	510	3082	4382	N.D.
1400	2	150	390	3680	3250	222	153	332	385	3395	4852	N.D.
1500	2	170	426	3930	3517	222	153	332	385	3662	5217	N.D.
1600	2	170	426	4272	3775	227	195	355	510	3975	5575	N.D.
1700	2	190	440	4615	4008	227	195	355	510	1210	5908	N.D.
1800	2	190	440	4886	4242	227	195	355	510	1257	6242	N.D.
1900	2	210	480	5158	4390	227	195	355	510	4590	6490	N.D.
2000	2	210	480	5430	4540	227	195	355	510	4740	6740	N.D.

N.D.: Peso no declarado

Tabla. 11

HYDRAULIC ACTUATOR (Oil pressure: 135 bar)

The definition variables are as follow:

- **A = Max. width** of the valve (without actuator).
- **B = Max. height** of the valve (without actuator).
- **C = maximum** length when the gate is centred.

The hydraulic actuator includes:

- Hydraulic Cylinder
- Yoke

AVAILABLE:

- From ND50 to ND2000, other ND on request.
- The weights are approximate and vary according to the material and the valve's accessories.
- Different types and brands available according to customer's requirements.

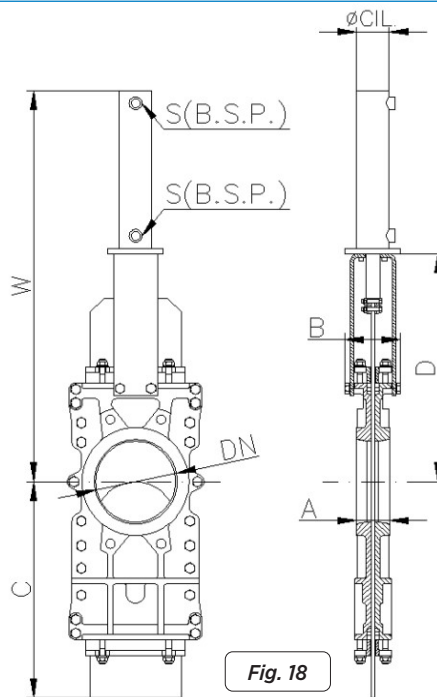


Fig. 18

DN	ΔP (bar)	A	B	C	D	W	Ø CIL	Ø VAST	S (B.S.P)	Oil (dm3)	Weight (kg.)
50	10	40	91	225	243	459	25	18	3/8"	0.03	17
65	10	40	91	265	269	500	25	18	3/8"	0.03	18
80	10	50	91	310	293	559	25	18	3/8"	0.04	22
100	10	50	91	370	334	620	32	22	3/8"	0.09	24
125	10	50	101	430	367	683	32	22	3/8"	0.11	33
150	10	60	101	495	419	755	40	28	3/8"	0.20	43
200	8	60	118	630	525	927	50	28	3/8"	0.42	61
250	6	70	118	770	620	1071	50	28	3/8"	0.52	99
300	6	70	118	895	726	1223	50	28	3/8"	0.62	131
350	5	96	290	1050	780	1360	50	28	3/8"	0.73	182
400	5	100	290	1185	855	1484	63	36	3/8"	1.31	254
450	3	106	290	1320	975	1693	63	36	3/8"	1.47	387
500	3	110	290	1455	1064	1832	63	36	3/8"	1.62	498
600	3	110	290	1720	1244	2111	80	45	3/8"	3.12	559
700	2	110	320	1995	1425	2444	80	45	3/8"	3.62	983
800	2	110	320	2230	1615	2734	100	56	1/2"	6.44	N.D.
900	2	110	320	2465	1823	3042	100	56	1/2"	7.25	N.D.
1000	2	110	320	2620	1992	3351	125	70	1/2"	10.25	N.D.
1100	2	150	340	3030	2217	3560	125	70	1/2"	13.56	N.D.
1200	2	150	340	3250	2351	3910	125	70	1/2"	15.05	N.D.
1300	2	150	390	3430	2882	4477	160	70	1/2"	26.3	N.D.
1400	2	150	390	3680	3250	4945	160	70	1/2"	28.65	N.D.
1500	2	170	426	3930	3517	5354	160	70	1/2"	30.7	N.D.
1600	2	170	426	4272	3775	5712	160	70	1/2"	32.7	N.D.
1700	2	190	440	4615	4008	6045	200	90	1/2"	53.72	N.D.
1800	2	190	440	4886	4242	6379	200	90	1/2"	57.35	N.D.
1900	2	210	480	5158	4390	6668	200	90	1/2"	60.16	N.D.
2000	2	210	480	5430	4540	6918	200	90	1/2"	63.65	N.D.

N.D.: Peso no declarado

Tabla. 12

INFORMATION ON FLANGE DIMENSIONS

DN	•	o	Métrica	Prof.	ØK
50	4	-	M16	8	125
65	4	-	M16	8	145
80	4	4	M16	9	160
100	4	4	M16	9	180
125	4	4	M16	9	210
150	4	4	M20	10	240
200	4	4	M20	10	295
250	8	4	M20	12	350
300	8	4	M20	12	400
350	12	4	M20	21	460
400	12	4	M24	21	515
450	16	4	M24	22	565
500	16	4	M24	22	620
600	16	4	M27	22	725
700	20	4	M27	22	840
800	20	4	M30	22	950
900	24	4	M30	20	1050
1000	24	4	M33	20	1160
1100	28	4	M33	20	1270
1200	28	4	M36	22	1380
1300	28	4	M36	26	1490
1400	32	4	M39	26	1590
1500	32	4	M39	35	1700
1600	36	4	M45	40	1820
1700	40	4	M45	40	1920
1800	40	4	M45	40	2020
1900	44	4	M45	45	2120
2000	44	4	M45	45	2230

Tabla. 12

ANSI B16, CLASE 150

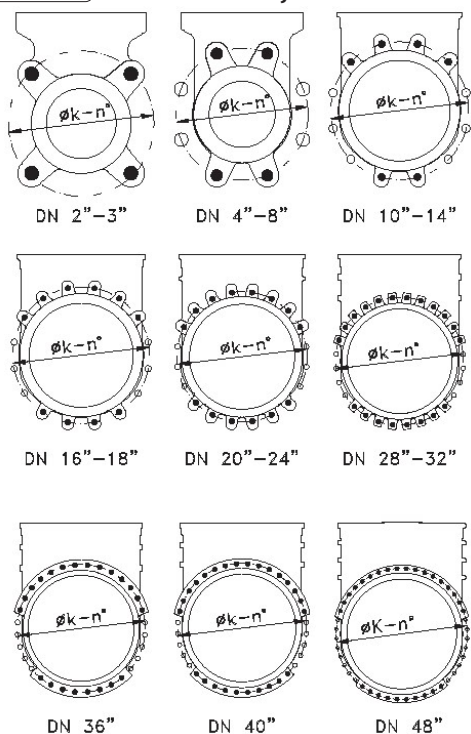
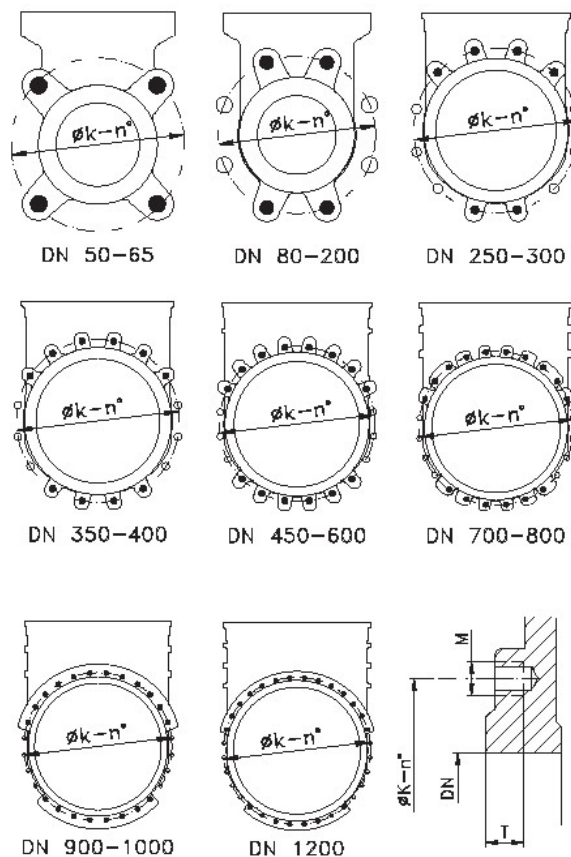


Fig. 20

EN 1092-2 PN10



- BLIND TAPED HOLES
- THROUGH HOLE

Fig. 19

ND	•	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"	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"	8	4	7/8"	12	361,9
12"	8	4	7/8"	12	431,8
14"	8	4	1"	21	476,2
16"	12	4	1"	21	539,7
18"	12	4	1 1/8"	22	577,8
20"	16	4	1 1/8"	22	635
24"	16	4	1 1/4"	22	749,3
28"	24	4	1 1/4"	22	863,6
30"	24	4	1 1/4"	22	914,4
32"	24	4	1 1/2"	22	977,9
36"	28	4	1 1/2"	20	1085,9
40"	32	4	1 1/2"	20	1200,2

Tabla. 13



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