CMO VALVES

KNIFE GATE VALVE - A SERIES

UNIDIRECTIONAL KNIFE GATE VALVE - "WAFER" DESIGN

DESCRIPTION

- 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.
- An arrow is marked 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.

Designed for applications such as:

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

SIZES

DN50 to DN1200.

** Others* ***ND*** *on request.*

WORKING PRESSURE (ΔP)

DN50 - DN250	10 bar
DN300 - DN400	6 bar
DN450	5 bar
DN500 - DN600	4 bar
DN700 - DN1200	3 bar

** Other pressures, consult.*

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 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.

STANDARD FLANGES

- ENI092 PN10.
- ASME B16.5 (clase 150).

OTHER COMMON FLANGES

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

** Others on request*



Fig. 1

APPLICATION OF EUROPEAN DIRECTIVES

See document of European Directives applicable to **CMO Valves.**

** For category and zone information, contact technical-commercial department at* ***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

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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. Model A's body is cone-shaped inside, providing greater space. This way, when the valve is closed the solids stored inside it can be easily removed.

This 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** 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.

The stem on of the **CMO valves** is made of AISI 304 stainless steel. This is another added advantage, as some manufacturers produce it with 13% chrome and it gets rusty very quickly. The handwheel in is manufactured in CARBON STEEL. 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).

STANDARD COMPONENTS LIST

	COMPONENT	NODULAR IRON	ST.STEEL
1	BODY	GJS500-7	CF8M
2	GATE	AISI304	AISI316
3	GUIDE	PE-UHMW	
4	PACKING GLAND	GJS500-7	CF8M
5	PACKING	SINT + PTFE	
6	O-RING SEAL	EPDM	
7	SUPPORT PLATES	S275JR	
8	RING	AISI316	
9	SEAT	EPDM	
10	STEM	AISI 304	
11	YOKE	GJS500-7	
12	STEM NUT	BRONZE	
13	CHECK NUT	ST44.2 + ZINC	
14	HANDWHEEL	STEEL	
15	NUT	STEEL	
16	HOOD	STEEL	
17	TOP CAP	PLASTIC	

Table. 1

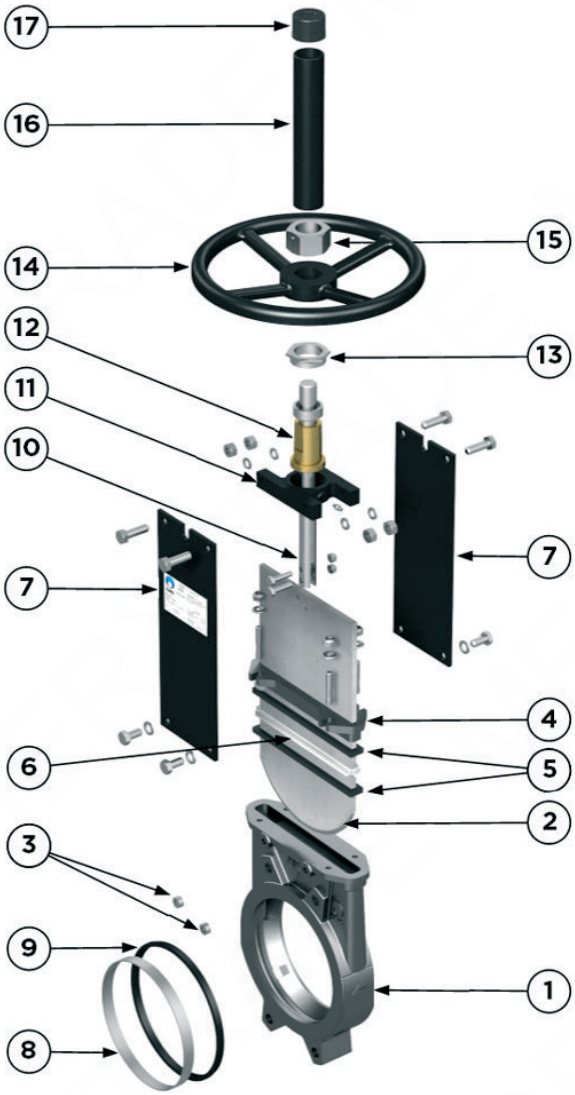


Fig. 2

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DESIGN CHARACTERISTICS

1. BODY

- Unidirectional wafer-design knife gate valve. One-piece cast body with guides to support gate and seat wedges.
- For diameters greater than DN1400 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.
- Full port designed to provide high flow rates with low pressure drop. El diseño interno del cuerpo evita el almacenaje de los sólidos en la zona del cierre.
- The standard manufacturing materials are GJS500-7 cast iron and CF8M stainless steel. Other materials, such as nodular cast iron, A216WCB carbon steel and stainless steel alloys (AISI316Ti, Duplex, 254SMO, Uranus B6...) are available on request. (AISI316Ti, Dúplex, 254SMO, Uranus B6...) están disponibles bajo consulta.
- 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, antiabrasion 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.

FPM
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.

3. SEAT

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

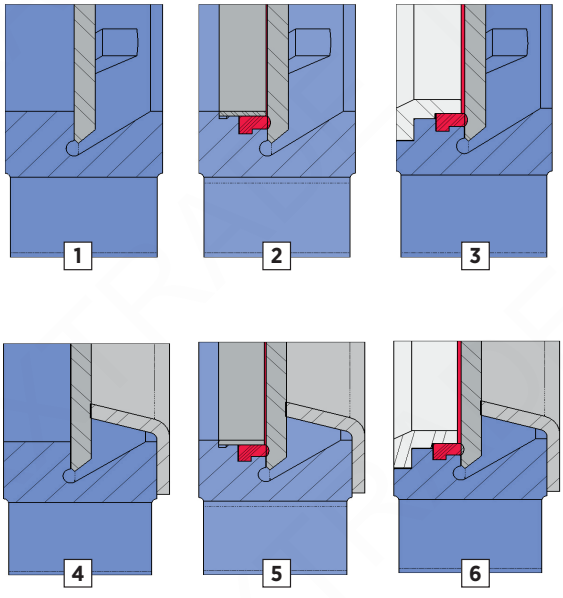


Fig. 3

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)

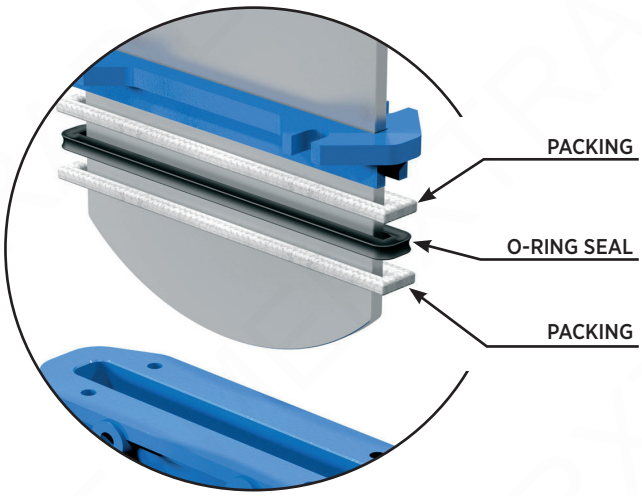
SEAT 4 / 5 / 6
The same as seats 1, 2 and 3 but including a deflector.
The deflector is a cone-shaped ring located at the valve's entrance with two functions (to protect the valve from abrasion and guide the flow to the centre of the valve).

Note: In some applications other types of resilient materials are used, such as hypalon, butile or natural rubber.

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4. PACKING

CMO Valves's 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:



1. 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.

2. GREASED COTTON

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.

3. DRY COTTON

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

4. 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.

5. 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

6. CERAMIC FIBRE

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

SEAT/SEALS			PACKING			
MATERIAL	**Tª MÁX (ºC)**	**APLICATIONS**	**MATERIAL**	**P(Bar)**	**Tª. MÁX**	**pH**
Steel/Steel	>250	High temp./Low watertight integ	Greased cotton	10	100	6-8
EPDM (E)	90*	Non-mineral acids and oils	Dry cotton	0.5	100	6-8
Nitrile (N)	90*	Hydrocarbons, oils and greases	Cotton + PTFE	30	120	6-8
FPM (V)	200	Hydrocarbons and solvents	Synthetic + PTFE	100	-200+270	0-14
Silicone (S)	200	Food Products	Graphite	40	650	0-14
PTFE (T)	250	Corrosion resistant	Ceramic Fibre	0.3	1400	0-14

Note: More details and other materials on request

* **EPDM and Nitrile:** it is possible up to Tª Max: 120ºC on request

Table. 2

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5. STEM

The stem on the **CMO Valves** valve is made of AISI 304 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 GJS500-7 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 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 **CMO Valves** is that all actuators are interchangeable.

Manual Drives
Handwheel **(*)**
Chain handwheel **(*)**
Lever
Geared motor **(*)**
Others (square stem)

Availability of Accessories
Mechanical stoppers
Locking devices
Emergency manual drives
Electrovalves
Positioners
Limit switches
Proximity detectors
Straight floor stand (Fig. 4)
Leaning floor stand (Fig. 5)

Automatic Drives
Electric actuator **(*)**
D/E & S/E pneumatic cylinder
Hydraulic cylinder

(*) Available in rising and non-rising stem versions.

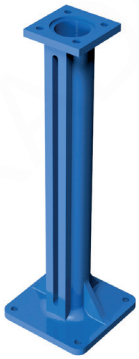


Fig. 4

LEANING FLOOR STANDS.



Fig. 5

STRAIGHT FLOOR STANDS.

Stem extensions have also been developed, allowing the drive to be located far away from the valve, to suit all needs. Please ask our engineers beforehand.

H/A = RISING STEM
H/NA = NON-RISING STEM



LEVER **H/A**
HANDWHEEL NON-RISING STEM **H/NA**
HANDWHEEL RISING STEM **H/A**
CHAIN HANDWHEEL **H/A** **H/NA**
ELECTRIC-MOTOR ACTUSTOR **H/A** **H/NA**
HANDWHEEL GEAR-BOX **H/A** **H/NA**
HYDRAULIC ACTUATOR **H/A**
PNEUMATIC ACTUATOR **H/A**
SINGLE-ACTING PNEUMATIC ACTUATOR **H/A**

Fig. 6

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ACCESSORIES AND OPTIONS

Different types of 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 lower edge 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 INJECTION IN THE PACKING GLAND
By injecting air in the packing, an air chamber is created which improves the watertight integrity.

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.

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

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.

SOLENOID VALVES
For air distribution to pneumatic actuators.

CONNECTION BOXES, WIRING AND PNEUMATIC PIPING
Fully assembled units can be supplied with all the necessary accessories.

MECHANICAL STROKE LIMITING STOP (MECHANICAL STOPPERS):
These allow the stroke to be mechanically adjusted, limiting the valve run.

MECHANICAL LOCKING DEVICE:
Allows the valve to be mechanically locked in a fixed position.

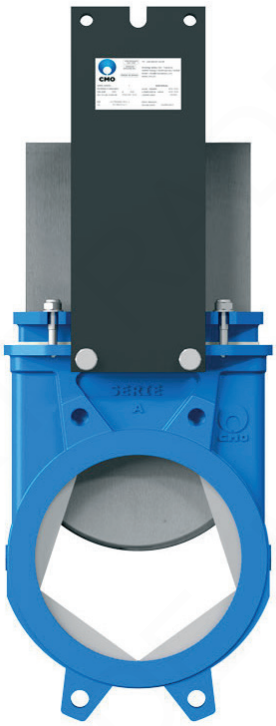
EMERGENCY MANUAL ACTUATOR (HAND WHEEL /GEAR BOX)
Allows manual operation of the valve in the event of power or air failure.

FLUSHING HOLES IN BODY
Several holes can be drilled in the body to flush air, steam or other fluids out in order to clean the valve seat before sealing.

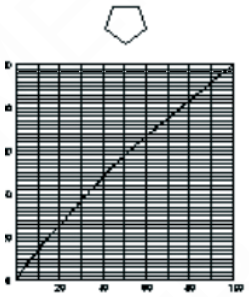


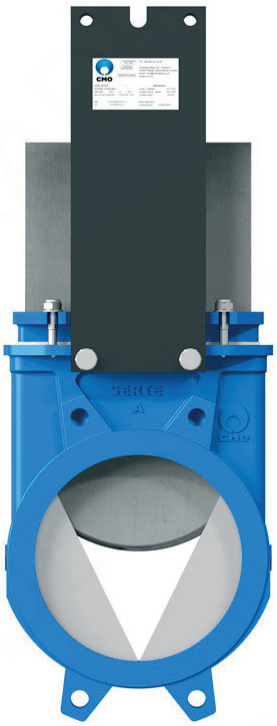
Fig. 7

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PENTAGONAL DIAPHRAGM





TRIANGULAR (V-NOTCH) DIAPHRAGM

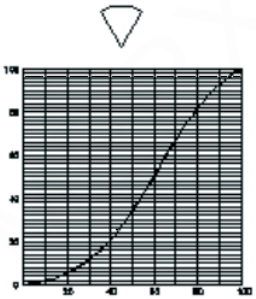


Fig. 8

VERTICAL
% MAXIMUM FLOW

HORIZONTAL
% VALVE OPENING

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

Recommended for applications in which fl ow regulation is required. Allows fl ow control according to the valve's opening percentage.

INTERCHANGEABLE ACTUATORS

All actuators are easily interchangeable, except the lever.

EPOXY COATING

All cast iron and carbon steel bodies and components on **CMO Valves** are EPOXY coated, giving the valves great resistance to corrosion and an excellent finish.
CMO Valves's standard colour is blue, RAL-5015.

GATE SAFETY PROTECTION

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

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TYPES OF EXTENSIONS

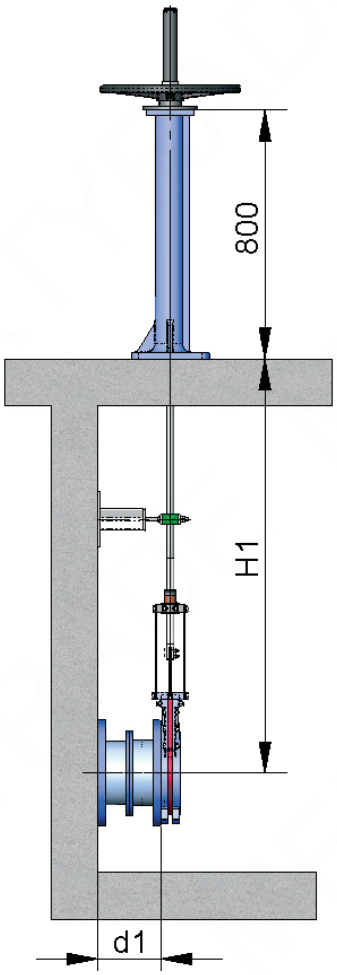


Fig. 9

STANDARD OPERATION STAND.

1- FLOOR STAND

This extension is done by coupling a spindle to the stem. The desired extension is achieved by defining the length of the spindle. A floor stand is normally installed to support the drive.

The definition variables are as follows:

H1 = Distance from valve centre to 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 drive.
- We recommend a stem guide bracket every 1.5 m
- The standard floor stand is 800 mm high.
- Option to use a position indicator to determine the valve's percentage of opening.
- Leaning stand available to order
- Other floor stand measurements available on request.

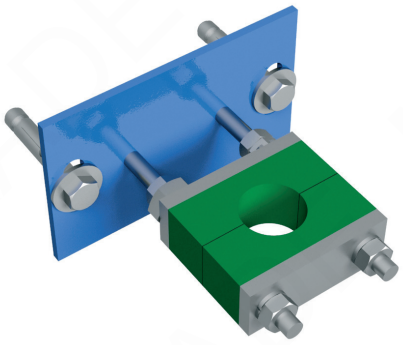


Fig. 10

STEM GUIDE BRACKET



LEANING STAND.

Fig. 11

COMPONENT LIST

COMPONENT	STANDARD VERSION
Stem	AISI 304
Rod	AISI 304
Support-Guide	Carbon steel with EPOXY coating
Guide	Nylon
Stand	GJS500-7 with EPOXY coating

Table. 3

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2.- PIPE

This consists of raising the drive. The pipe will rotate in the same direction as the wheel when the valve is operated. The valve always remains at the same height.

The definition variables are as follows:

H1 = Distance from valve centre to base of the stand

d1 = Separation from the wall to the end of the connecting flange

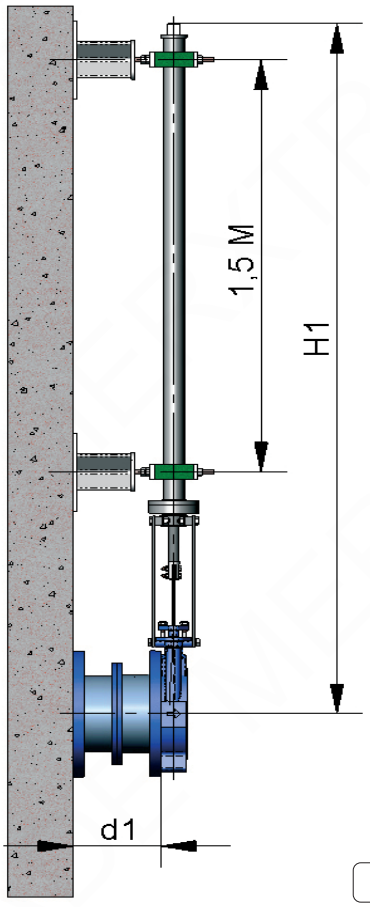


Fig. 12

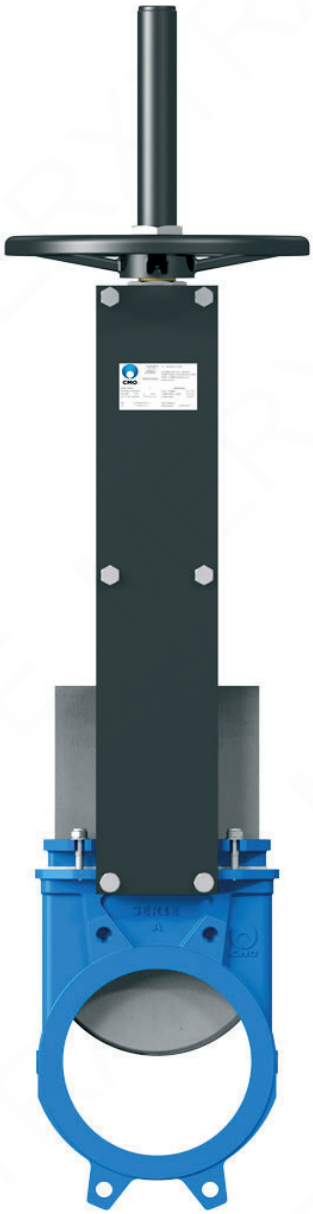
CHARACTERISTICS:

- Standard drives: handwheel and top square.
- A pipe guide bracket is recommended every 1.5 m.
- The standard materials are: EPOXY-coated carbon steel and stainless steel.

3.- ELONGATED 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.

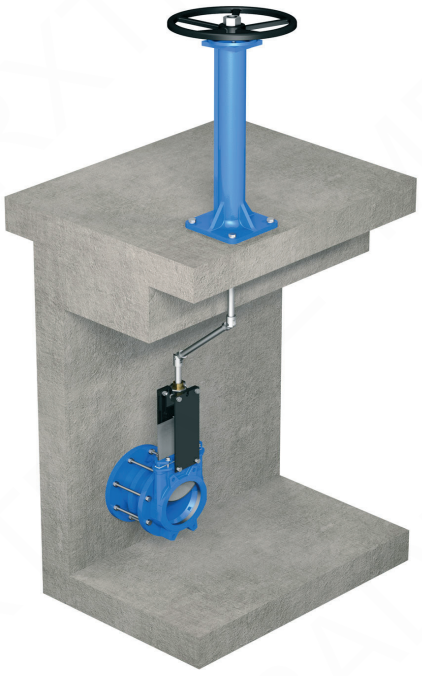
Fig. 13



4.- UNIVERSAL CARDAN JOINT

If the valve and the drive are not in correct alignment, the problem can be resolved by fitting a universal cardan joint. This option is only valid for non-rising stem drives.

Fig. 14



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RISING-STEM HANDWHEEL

The definition variables are as follows:

B = Max. width of the valve (without drive).

P = Max. height of the valve (without drive).

OPTIONS:

- Locking devices.
- Extensions: stand, pipe, plates.
- DN above those given in the table

ACTUATOR:

- Handwheel
- Stem
- Nut
- Stem protection bonnet

AVALAIBLE:

- Standard NDN50 to DN1200.
- From ND600 the actuator is with gears.

** Other ND on request.*

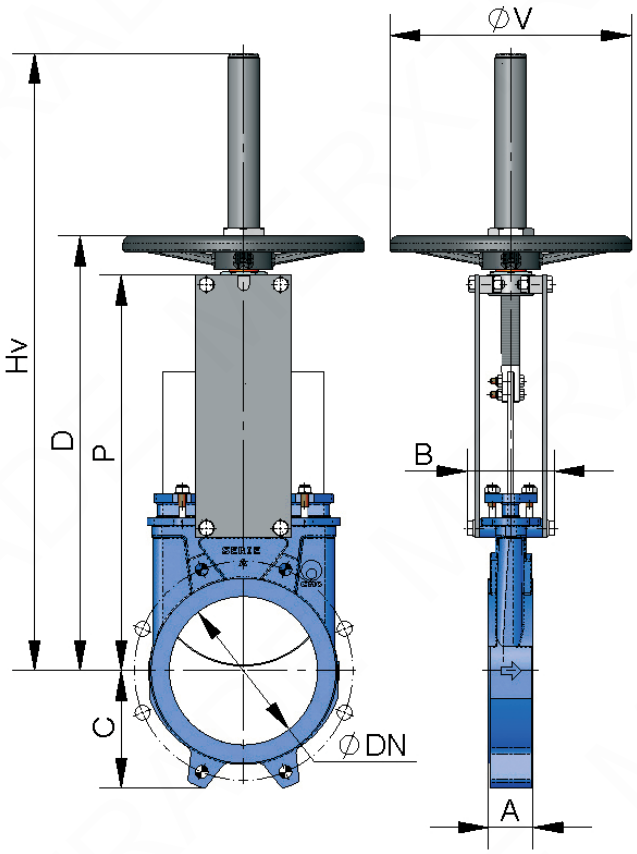


Fig. 15

ND	ΔP (bar)	A	B	C	P	Hv	D	øV	WEIGHT (kg.)
50	10	40	92	63	241	409	280	225	7
65	10	40	92	70	268	436	307	225	8
80	10	50	92	92	294	469	333	225	9
100	10	50	92	105	334	502	373	225	11
125	10	50	102	120	367	585	406	225	13
150	10	60	102	130	419	644	458	225	17
200	10	60	119	160	525	815	578	325	28
250	10	70	119	198	626	1016	679	325	40
300	6	70	119	234	726	1116	779	380	56
350	6	96	290	256	797	1336	906	450	94
400	6	100	290	292	903	1442	1012	450	116
450	5	106	290	308	989	1628	1098	450	162
500	4	110	290	340	1101	1738	1210	450	191
600	4	110	290	400	1307	2046	1416	450	264
700	3	110	320	453	1506	--	--	--	441
800	3	110	320	503	1720	--	--	--	568
900	3	110	320	583	1953	--	--	--	736
1000	3	110	320	613	2137	--	--	--	921
1200	3	150	340	728	2616	--	--	--	1350

Table. 4

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NON-RISING STEM HANDWHEEL

Suitable when no size limitations exist.

The definition variables are as follows:

B = Max. width of the valve (without drive).

P = Max. height of the valve (without drive).

OPTIONS:

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

ACTUATOR:

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

AVALAIBLE:

- ND50 to ND1200.
- From ND600 the actuator is with gears

** Other ND on request.*

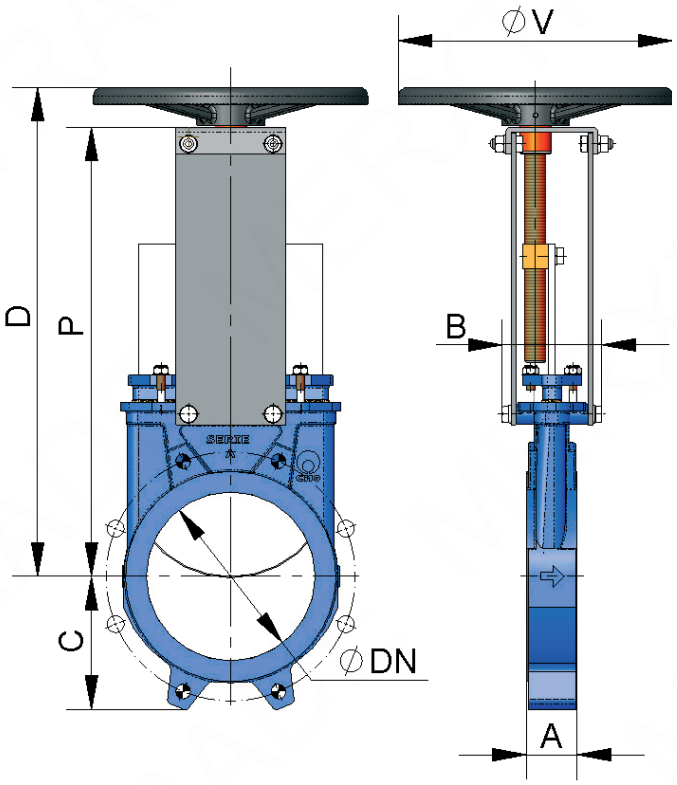


Fig. 16

ND	ΔP (bar)	A	B	C	P	D	øV	WEIGHT (kg.)
50	10	40	101	63	241	280	225	7
65	10	40	101	70	268	308	225	8
80	10	50	101	92	294	333	225	9
100	10	50	101	105	334	373	225	11
125	10	50	111	120	367	407	225	13
150	10	60	111	130	419	458	225	17
200	10	60	128	160	525	578	325	29
250	10	70	128	198	626	679	325	40
300	6	70	128	234	726	779	380	53
350	6	96	305	256	797	906	450	93
400	6	100	305	292	903	1012	450	126
450	5	106	305	308	989	1098	450	160
500	4	110	305	340	1101	1210	450	193
600	4	110	305	400	1307	1416	450	264
700	3	110	335	453	1506	--	--	435
800	3	110	335	503	1720	--	--	580
900	3	110	335	583	1953	--	--	740
1000	3	110	335	613	2137	--	--	925
1200	3	150	355	728	2616	--	--	1350

Table. 5

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CHAIN HANDWHEEL

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

The definition variables are as follows:

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

OPTIONS:

- Extensions: elongated plates...
- DN higher than those give in the table
- Non-rising stem

ACTUATOR:

- Handwheel
- Stem
- Nut
- Hood
- Chain

AVALAIBLE:

- ND50 to DN1200.
- From ND600 the actuator is with gears.

** Other ND on request.*

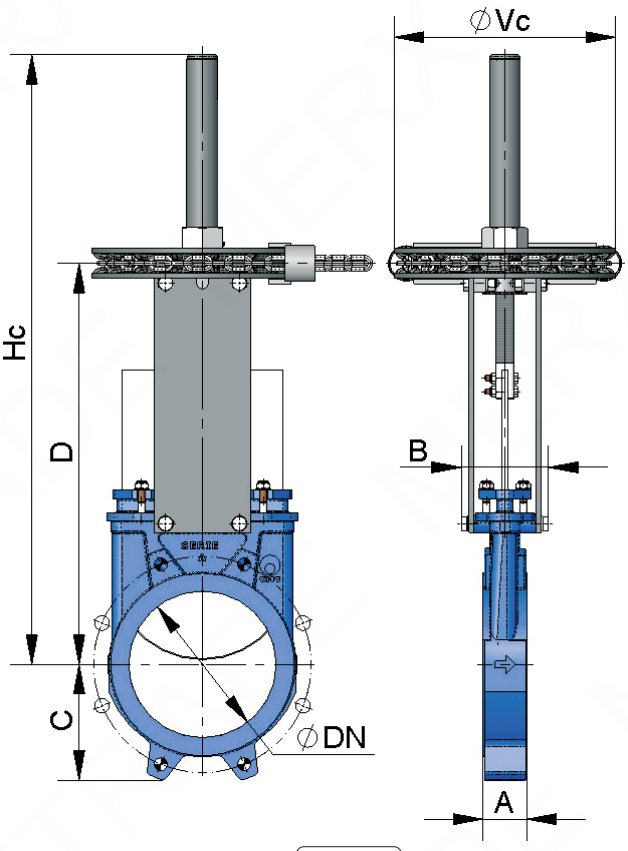


Fig. 17

ND	ΔP (bar)	A	B	C	D	Hc	øVc	WEIGHT (kg.)
50	10	40	92	63	264	409	225	7
65	10	40	92	70	291	436	225	8
80	10	50	92	92	317	469	225	9
100	10	50	92	105	357	502	225	11
125	10	50	102	120	390	585	225	13
150	10	60	102	130	442	644	225	17
200	10	60	119	160	551	815	300	29
250	10	70	119	198	652	1016	300	40
300	6	70	119	234	752	1116	300	53
350	6	96	290	256	879	1336	402	93
400	6	100	290	292	985	1442	402	126
450	5	106	290	308	1071	1628	402	160
500	4	110	290	340	1183	1738	402	193
600	4	110	290	400	1389	2046	402	264
700	3	110	320	453	1506	2406	402	435
800	3	110	320	503	1720	2790	402	580
900	3	110	320	583	1953	3130	402	740
1000	3	110	320	613	2137	3440	402	925
1200	3	150	340	728	2616	4050	402	1350

Table. 6

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LEVER

It is a fast actuator.

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: elongated plates...

ACTUATOR:

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

AVALAIBLE:

- ND50 to DN300.

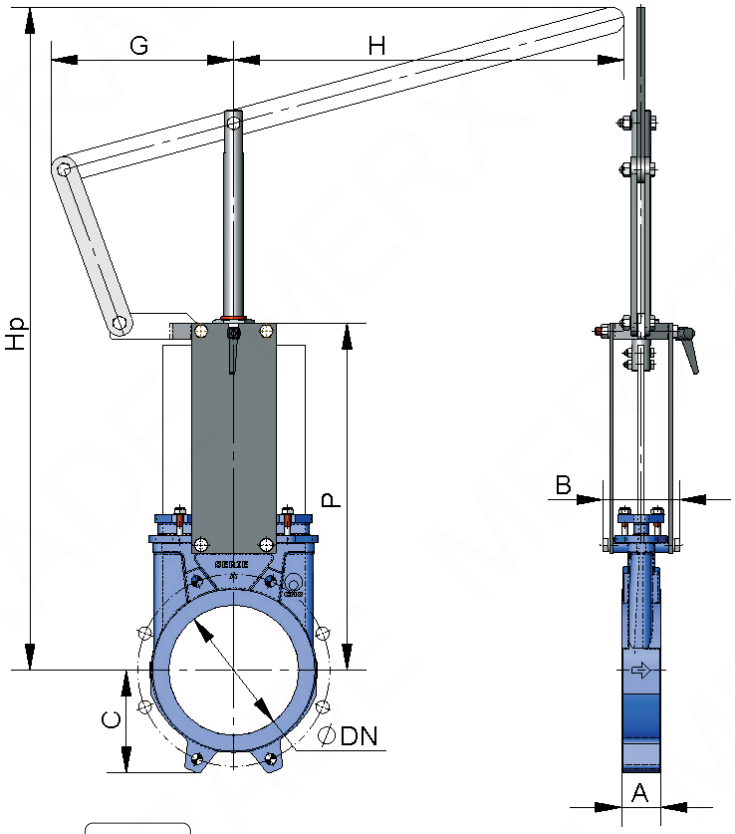


Fig. 18

ND	ΔP (bar)	A	B	C	P	G	H	Hp	WEIGHT (kg.)
50	10	40	92	63	264	155	325	504	8
65	10	40	92	70	291	155	325	526	9
80	10	50	92	92	317	155	325	549	10
100	10	50	92	105	357	155	325	605	11
125	10	50	102	120	390	155	425	902	14
150	10	60	102	130	442	155	425	956	16
200	10	60	119	160	551	290	620	1027	32
250	10	70	119	198	652	290	620	1416	54
300	6	70	119	234	752	290	620	1525	57

Table. 7

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GEAR BOX

This is recommendable for DNs greater than 600.

The definition variables are as follows:

B = Max. width of the valve (without drive).

P = Max. height of the valve (without drive).

OPTIONS:

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

ACTUATOR:

- Stem
- Yoke
- Cone-shaped gear box
- Handwheel
- Standard ratio = 4 to 1.

AVALAIBLE:

- ND50 to DN1200.

** Other ND on request.*

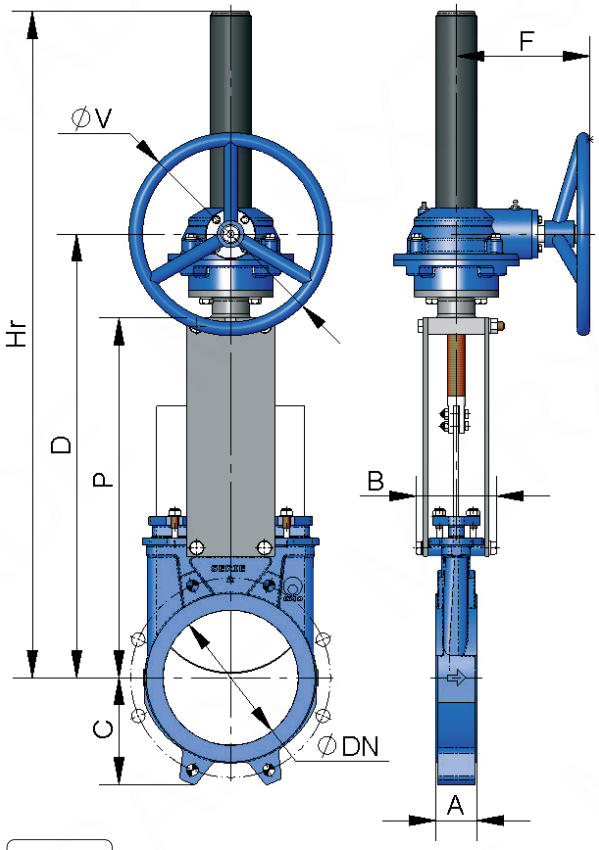


Fig. 19

ND	ΔP (bar)	A	B	C	P	D	F	øV	Hr	WEIGHT (kg.)
50	10	40	92	63	241	366	198	300	540	17
65	10	40	92	70	268	392	198	300	566	18
80	10	50	92	92	294	418	198	300	592	19
100	10	50	92	105	334	458	198	300	632	20
125	10	50	102	120	367	491	198	300	665	24
150	10	60	102	130	419	543	198	300	717	26
200	10	60	119	160	525	648	198	300	942	50
250	10	70	119	198	626	749	198	300	1043	63
300	6	70	119	234	726	850	198	300	1194	77
350	6	96	290	256	797	891	218	450	1335	106
400	6	100	290	292	903	997	218	450	1441	134
450	5	106	290	308	989	1083	218	450	1677	173
500	4	110	290	340	1101	1195	218	450	1789	216
600	4	110	290	400	1307	1401	218	450	2045	284
700	3	110	320	453	1506	1612	260	450	2401	430
800	3	110	320	503	1720	1825	288	650	2715	615
900	3	110	320	583	1953	2055	288	650	3043	768
1000	3	110	320	613	2137	2246	288	650	3351	972
1100	3	150	340	670	2375	2515	352	850	3675	1142
1200	3	150	340	728	2616	2760	352	850	4042	1298

Table. 8

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DOUBLE-ACTING PNEUMATIC CYLINDER

The definition variables are as follows:

B = Max. width of the valve (without drive).

- 10 bar is the maximum admissible air pressure. For air pressures below 6 bar please consult to **CMO Valves.**
- 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.

AVALAIBLE:

- ND50 to DN1200.

** Other ND on request.*

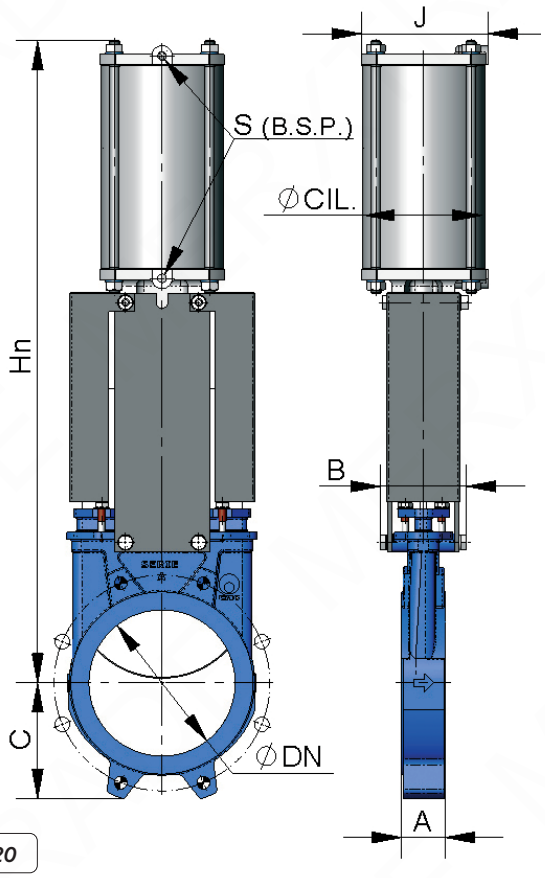


Fig. 20

ND	ΔP (bar)	A	B	C	Ø CIL.	Ø VAST	J	S (B.S.P.)	Hn	WEIGHT (kg.)
50	10	40	92	63	80	20	96	1/4"	415	7
65	10	40	92	70	80	20	96	1/4"	455	8
80	10	50	92	92	80	20	96	1/4"	498	9
100	10	50	92	105	100	20	115	1/4"	565	12
125	10	50	102	120	125	25	138	1/4"	636	18
150	10	60	102	130	125	25	138	1/4"	717	22
200	10	60	119	160	160	30	175	1/4"	874	37
250	10	70	119	198	200	30	218	3/8"	1036	58
300	6	70	119	234	200	30	218	3/8"	1182	72
350	6	96	290	256	250	40	270	3/8"	1380	130
400	6	100	290	292	250	40	270	3/8"	1530	155
450	5	106	290	308	300	45	382	1/2"	1677	225
500	4	110	290	340	300	45	382	1/2"	1839	257
600	4	110	290	400	300	45	382	1/2"	2146	340
700	3	110	320	453	350	45	426	1/2"	2481	556
800	3	110	320	503	350	45	426	1/2"	2798	679
900	3	110	320	583	400	50	508	1/2"	3167	840
1000	*Consult*	110	320	613	400	50	508	1/2"	3451	1053
1100	*Consult*	150	340	670	400	50	508	1/2"	3792	1210
1200	*Consult*	150	340	728	400	50	508	1/2"	4135	1366

Table. 9

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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.
- Available for opening or closing in case of failure.
- 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 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.

AVALAIBLE:

- ND50 to DN300.

** Other ND on request.*

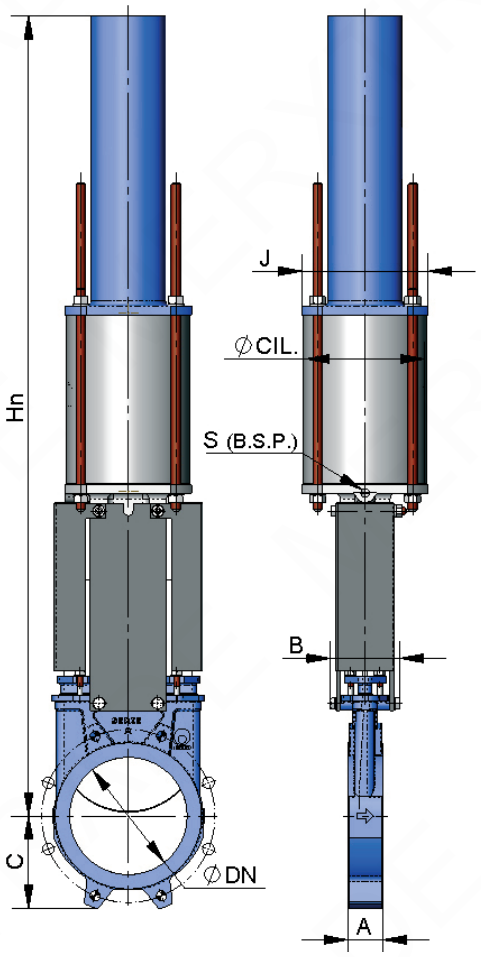


Fig. 21

ND	ΔP (bar)	A	B	C	Ø CIL.	Ø VAST	J	S (B.S.P.)	Hn	WEIGHT (kg.)
50	10	40	92	63	125	25	138	1/4"	781	19
65	10	40	92	70	125	25	138	1/4"	806	22
80	10	50	92	92	125	25	138	1/4"	833	23
100	10	50	92	105	125	25	138	1/4"	873	24
125	10	50	102	120	160	30	175	1/4"	909	35
150	10	60	102	130	160	30	175	1/4"	960	36
200	10	60	119	160	200	30	218	3/8"	1355	66
250	10	70	290	198	250	40	270	3/8"	1844	130
300	6	70	290	234	250	40	270	3/8"	2005	143

Table. 10

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ELECTRIC ACTUATOR

The definition variables are as follows:

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

This actuator is automatic and includes the following parts:

- Electric motor
- Stem
- Yoke

The electric motor include:

- Emergency manual handwheel
- Limit switches
- Torque switches

OPTIONS:

- Different types and brands
- Non-rising stem
- ISO 5210 / DIN 3338 flanges

AVALAIBLE:

- ND 50 to DN 1200
- From DN500 the motor is assisted with a gear box.

** Other ND on request.*

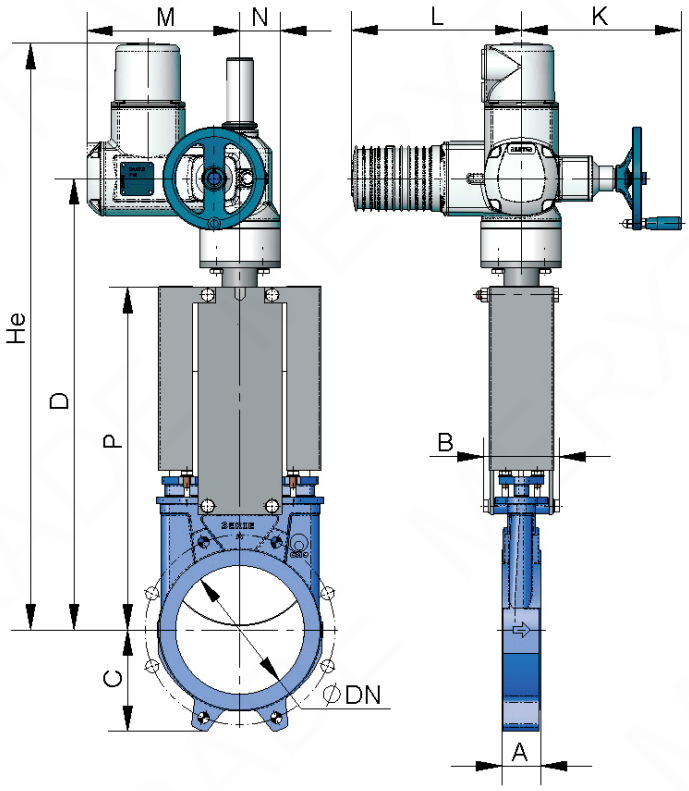


Fig. 22

ND	ΔP (bar)	A	B	C	D	K	L	M	N	P	He	WEIGHT (kg.)
50	10	40	92	63	400	249	265	238	62	241	595	24
65	10	40	92	70	426	249	265	238	62	268	622	25
80	10	50	92	92	452	249	265	238	62	294	647	26
100	10	50	92	105	492	249	265	238	62	334	687	27
125	10	50	102	120	525	249	265	238	62	367	720	30
150	10	60	102	130	577	249	265	238	62	419	772	32
200	10	60	119	160	685	249	265	238	62	525	990	42
250	10	70	119	198	785	249	265	238	62	626	1090	55
300	6	70	119	234	885	249	265	238	62	726	1190	72
350	6	96	290	256	940	254	283	248	65	797	1305	99
400	6	100	290	292	1045	254	283	248	65	903	1460	136
450	5	106	290	308	1175	336	389	286	91	989	1755	166
500	4	110	290	340	1290	336	389	286	91	1101	1870	245
600	4	110	290	400	1495	336	389	286	91	1307	2045	362
700	3	110	320	453	1661	336	389	286	91	1506	2401	432
800	3	110	320	503	1875	339	389	286	91	1720	2715	630
900	3	110	320	583	2108	339	389	286	91	1953	3043	764
1000	3	110	320	613	2292	339	389	286	91	2137	3351	998
1100	3	150	340	670	2530	339	389	286	91	2375	3675	1194
1200	3	150	340	728	2760	336	389	528	125	2616	4042	1350

Table. 11

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HYDRAULIC ACTUATOR

The definition variables are as follows:

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

THE HYDRAULIC ACTUATOR INCLUDES:

- Hydraulic cylinder
- Yoke

SUPPLY PRESSURE STANDARD:

- 150 bar.

AVALAIBLE:

- ND50 to DN1200.

** Other ND on request.*

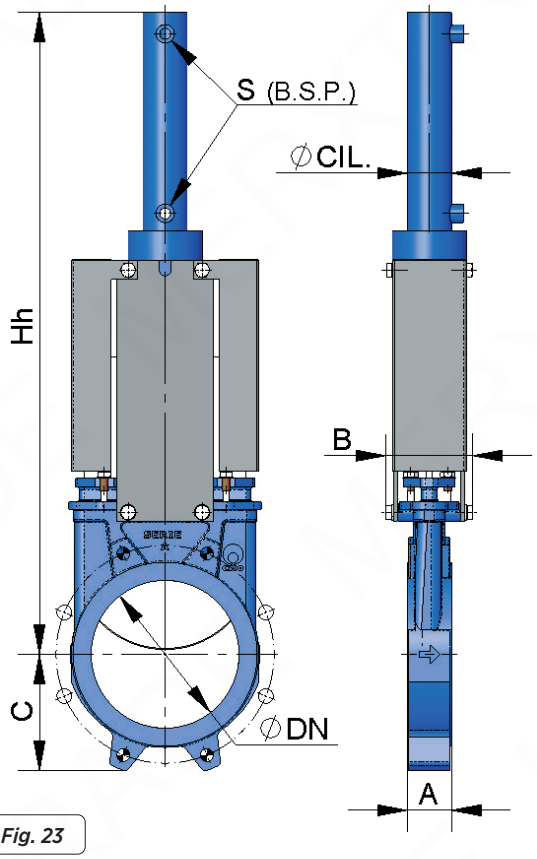


Fig. 23

ND	ΔP (bar)	A	B	C	Hh	ø CIL	S (B.S.P.)	OIL CAP. (dm³)	Ø ROD	WEIGHT (kg.)
50	10	40	92	63	460	25	3/8"	0.03	18	7
65	10	40	92	70	500	25	3/8"	0.03	18	8
80	10	50	92	92	560	25	3/8"	0.04	18	9
100	10	50	92	105	620	32	3/8"	0.09	22	12
125	10	50	102	120	683	32	3/8"	0.11	22	15
150	10	60	102	130	755	40	3/8"	0.20	28	20
200	10	60	119	160	926	50	3/8"	0.42	28	31
250	10	70	119	198	1077	50	3/8"	0.52	28	44
300	6	70	119	234	1245	50	3/8"	0.62	28	62
350	6	96	290	256	1376	50	3/8"	0.73	28	100
400	6	100	290	292	1535	63	3/8"	1.31	36	138
450	5	106	290	308	1710	63	3/8"	1.47	36	161
500	4	110	290	340	1870	63	3/8"	1.62	36	223
600	4	110	290	400	2175	80	3/8"	3.12	45	325
700	3	110	320	453	2525	80	3/8"	3.62	45	481
800	3	110	320	503	2839	100	1/2"	6.44	56	678
900	3	110	320	583	3172	100	1/2"	7.25	56	861
1000	3	110	320	613	3496	125	1/2"	10.25	70	1103
1100	3	150	340	670	3760	125	1/2"	13.56	70	1266
1200	3	150	340	728	4174	125	1/2"	15.05	70	1430

Table. 12

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FLANGE DIMENSIONS

EN 1092-2 PN10

ND	●	o	M (Metric)	P	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	22	10	M 33	20	1270
1200	20	12	M 36	22	1380

Table. 13

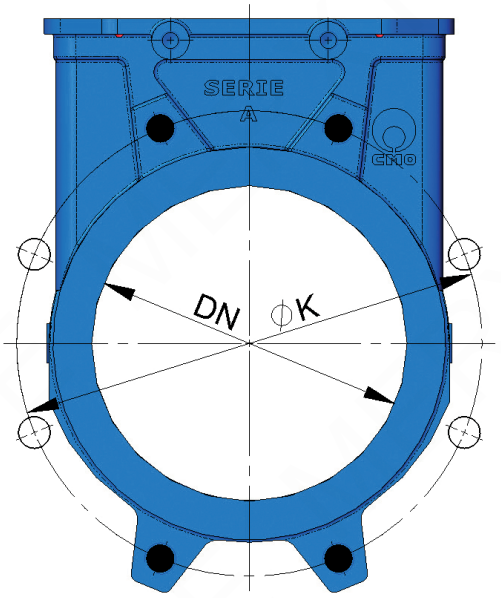


Fig. 24

● TAPPED HOLES
O THROUGH HOLE

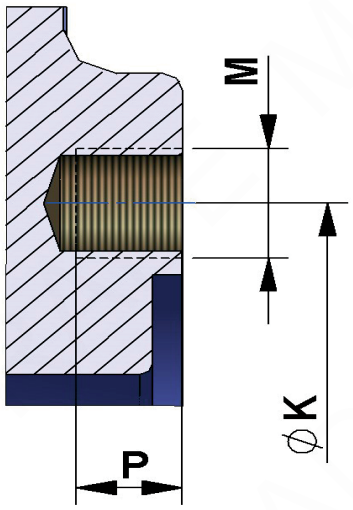


Fig. 25

ANSI B16, Class 150

ND	●	o	M (UNC)	P	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"	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"	20	8	1 1/2"	22	977,9
36"	22	10	1 1/2"	20	1085,8
40"	24	12	1 1/2"	20	1200,2

Table. 14

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