

TECHNICAL DATA

K SERIES



ARNETT
ENGINEERED SOLUTIONS

ARNETT ENGINEERED SOLUTIONS
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UNIDIRECTIONAL KNIFE GATE VALVE

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

ND50 to ND2000.

*Others **ND** on request.

WORKING PRESSURE (ΔP)

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

The mentioned working pressures are just valid for the pressures applied on the direction of the arrow marked 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

- PN10
- ANSI B16.5 (class 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

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 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 is made of 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 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	NODULAR IRON	ST. STEEL
1 BODY	GJS500-7	CF8M
2 COVER		
3 SEAT	PA6	
4 GATE	AISI304	AISI316
5 STOP WASHER		
6 SOCKET	PA6	
7 INSIDE O-RING	NITRILE	
8 OUTSIDE O-RING	NITRILE	
9 SUPPORT PLATE	S275JR	
10 O-RING	EPDM	
11 STEM	AISI304	
12 BOLT	AISI304	
13 STEM NUT	BRONZE	
14 STOPPER NUT	ST44.2 + ZINC	
15 YOKE	GJS500-7	
16 HANDWHEEL	STEEL	
17 HOOD	STEEL	
16 SEAL	STEEL	
19 RING	AISI316	
20 SEAL	EPDM	
21 NUT	STEEL	

Table. 1

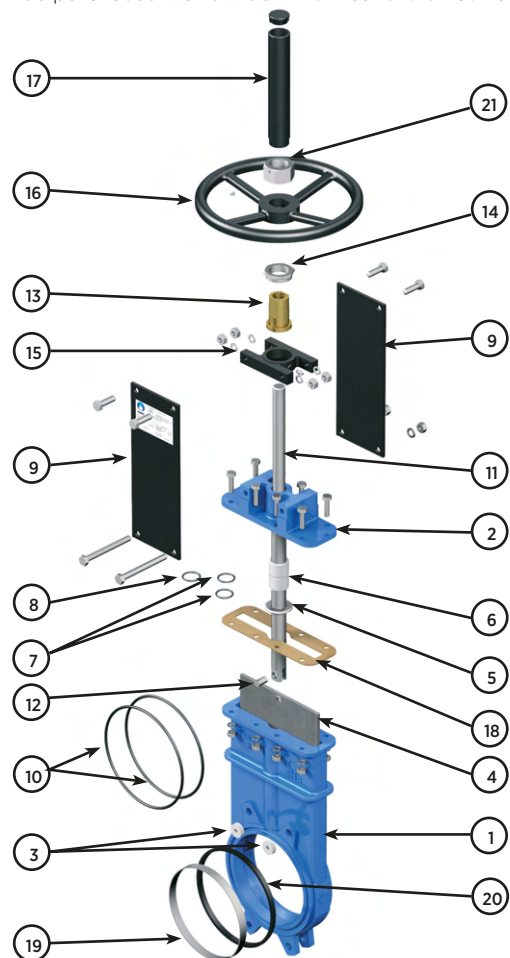


Fig. 2

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 GJL250 cast iron and CF8M stainless steel. Other materials, such as GJS500-7 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.

3. SEAT

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

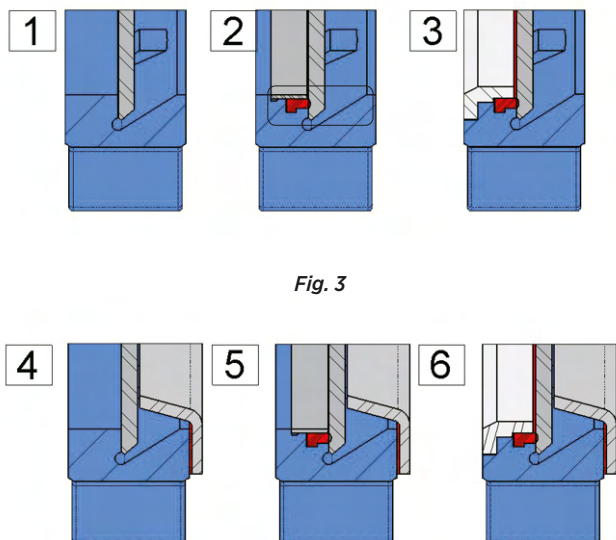


Fig. 3

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.

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.

FKM

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.

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.

4. 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 (6) is limited at the top (2) by the cover and at the bottom by a washer (5), it also has two internal seals in contact with the rod and another external (8) one in contact with the body (1), 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:

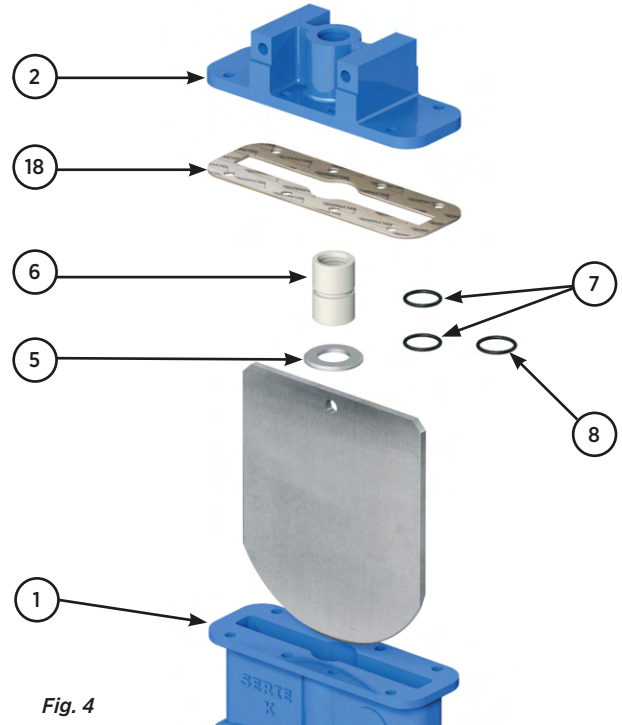


Fig. 4

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.

1. 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.

2. DRY COTTON:

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

3. 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.

4. 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.

5. CERAMIC FIBRE :

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

6. 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	T ³ MÁX (°C)	APLICACIONES	MATERIAL	P(Bar)	T ³ . 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
FKM (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 T³ Max: 120°C on request

Table. 2

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. 5)
- Leaning floor stand (Fig. 6)

Automatic Drives

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

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

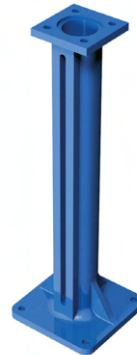


Fig. 5

LEANING FLOOR STANDS.



Fig. 6

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

Fig. 7



LEVER
H/A

HANDWHEEL
NON-RISING
STEM
H/NA

CHAIN
HANDWHEEL
H/A
H/NA

HANDWHEEL
RISING STEM
H/A

HANDWHEEL
GEAR-BOX
H/A
H/NA

PNEUMATIC
ACTUATOR
H/A

HYDRAULIC
ACTUATOR
H/A

ELECTRIC-MOTOR
ACTUATOR
H/A
H/NA

SINGLE-ACTING
PNEUMATIC
ACTUATOR
H/A

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.

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

Recommended for applications in which flow regulation is required. Allows flow 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.

BONNET

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

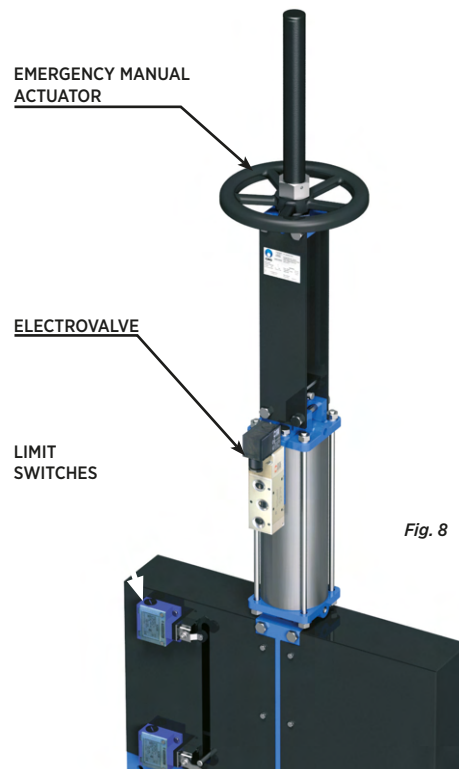


Fig. 8

TYPES OF EXTENSIONS

If there is need to operate the valve from a remote position, we can install different types of drives:

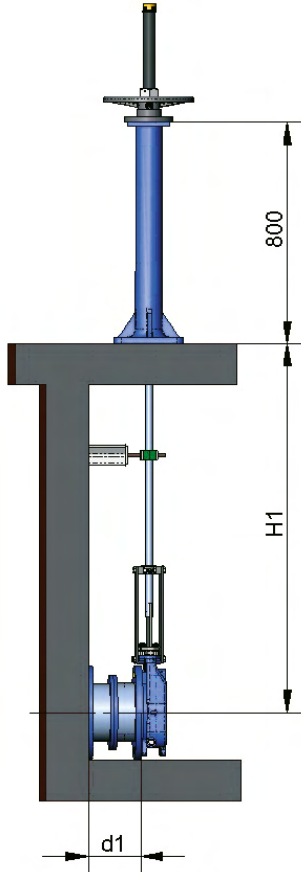


Fig. 9

STANDARD OPERATION STAND.

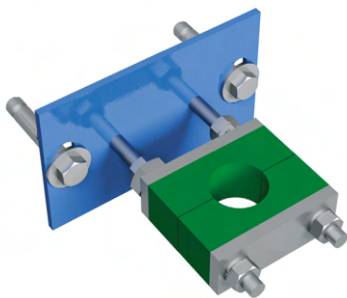


Fig. 10

STEM GUIDE BRACKET

COMPONENT LIST

COMPONENT	STANDARD VERSION
Stem	AISI 304
Rod	AISI 304
Support-Guide	Carbon steel with EPOXY coating
Guide	PA6
Stand	GJS500-7 with EPOXY coating

Table. 3

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.



LEANING STAND.

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

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.

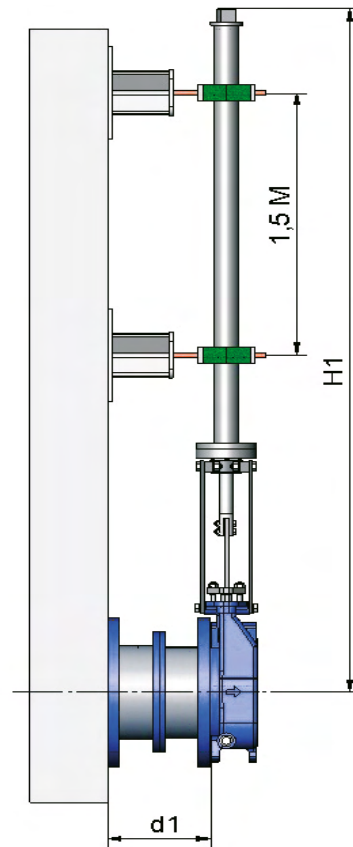


Fig. 12

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



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

AVAILABLE:

- Standard NDN50 to ND1200
- From ND600 the actuator is with gears.

* Other ND on request.

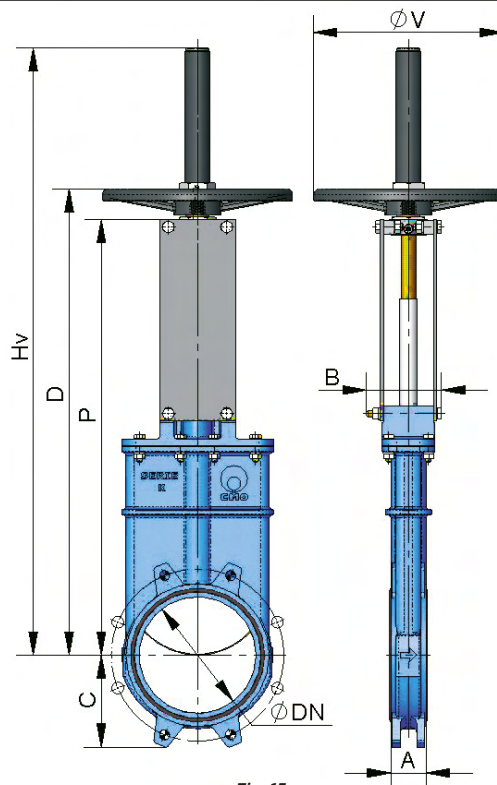


Fig. 15

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

NON-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:

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

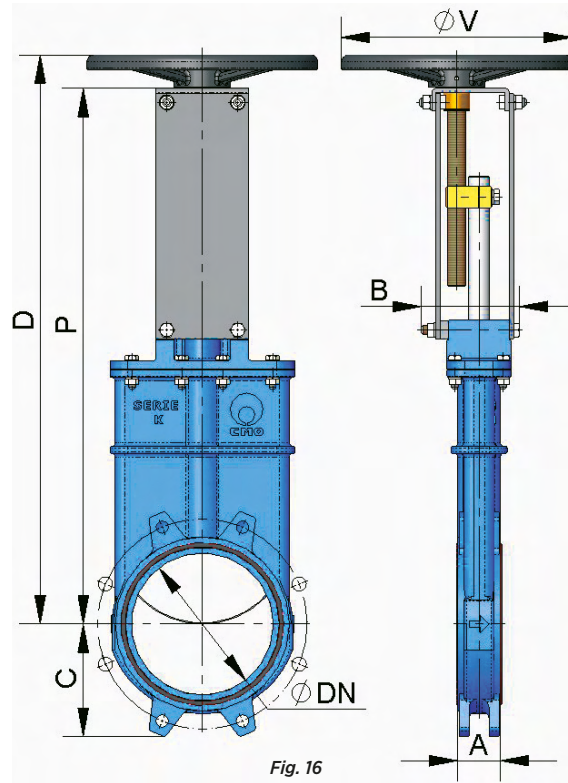
ACTUATOR:

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

AVAILABLE:

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

* Other ND on request.



DN	ΔP (bar)	A	B	C	P	D	ϕV
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

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 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: AVAILABLE:

- Handwheel
 - Stem
 - Nut
 - Hood
 - Chain
- ND50 to DN1200.
 - From ND600 the actuator is with gears.
- * Other ND on request.*

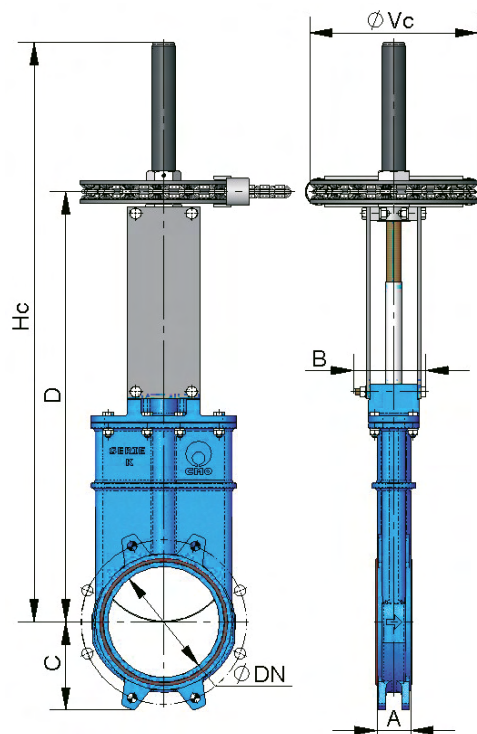


Fig. 17

DN	ΔP (bar)	A	B	C	D	Hc	$\varnothing Vc$
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 drive).

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

ACTUATOR INCLUDING

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

AVAILABLE

- Standard from DN50 to DN300

* Other ND on request.

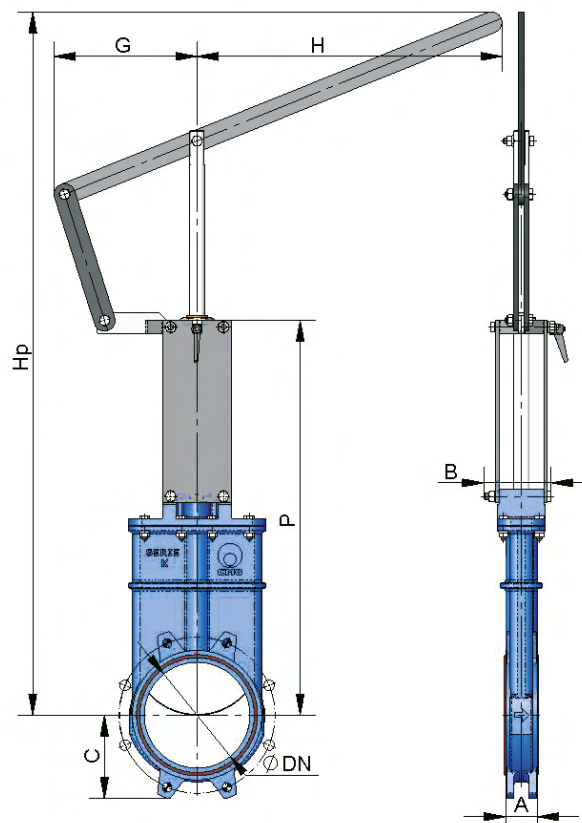


Fig. 18

DN	ΔP (bar)	A	B	C	P	H	G	Hp
50	10	40	92	61	323	325	155	596
65	10	40	92	68	362	325	155	629
80	10	50	92	91	404	325	155	663
100	10	50	92	104	453	325	155	733
125	10	50	102	118	511	425	155	1057
150	10	60	102	130	574	425	155	1113
200	8	60	119	158	745	620	290	1258
250	6	70	119	196	880	620	290	1677
300	6	70	119	230	1005	620	290	1810

Table. 7

GEARBOX

It is recommendable for DN greater than 600.

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

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

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

* Other ND on request.

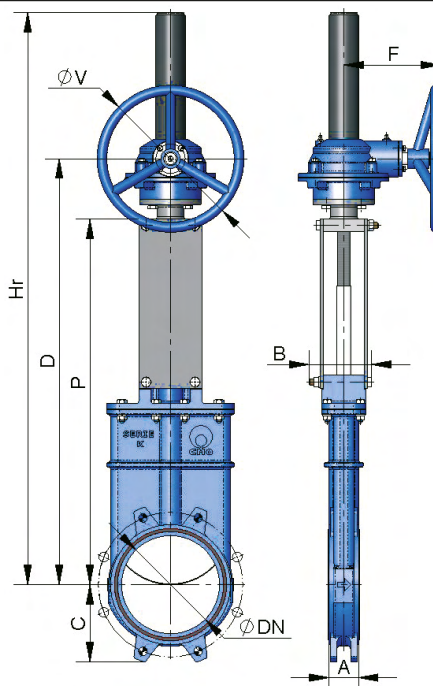


Fig. 19

DN	ΔP (bar)	A	B	C	P	D	F	øV	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
1200	2	150	340	728	3440	3584	352	850	4866

Table. 8

DOUBLE-ACTING PNEUMATIC CYLINDER

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 DN300 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 DN300 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 DN50 to DN1200

* Other ND on request.

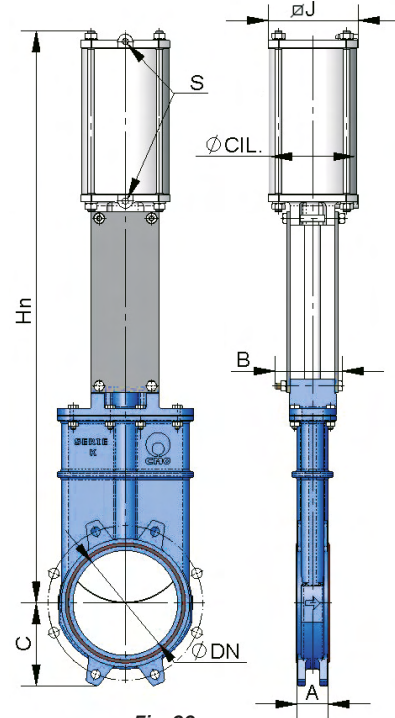


Fig. 20

DN	ΔP (bar)	A	B	C	Ø CIL	Ø VAST	J	S (B.S.P.)	Hn
50	10	40	92	61	80	20	96	1/4"	502
65	10	40	92	68	80	20	96	1/4"	555
80	10	50	92	91	80	20	96	1/4"	614
100	10	50	92	104	100	20	115	1/4"	684
125	10	50	102	118	125	25	138	1/4"	786
150	10	60	102	130	125	25	138	1/4"	872
200	8	60	119	159	160	30	175	1/4"	1098
250	6	70	119	196	200	30	218	3/8"	1292
300	6	70	119	230	200	30	218	3/8"	1465
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	2	110	320	613	400*	50	508	1/2"	4220
1100	2	150	340	670	400*	50	508	1/2"	4586
1200	2	150	340	728	400*	50	508	1/2"	4939

* Consult.

Table. 9

SINGLE-ACTING PNEUMATIC CYLINDER

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.

DISPONIBLE:

- Standard ND50 to ND300

* Other ND on request.

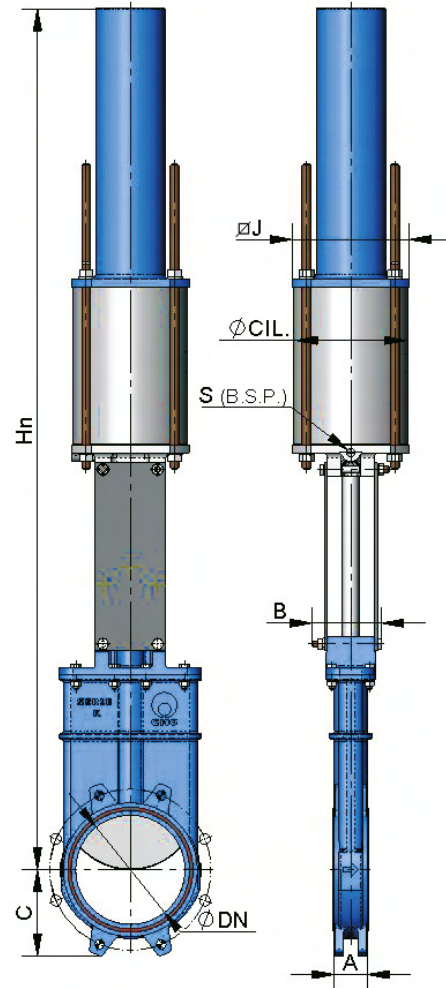


Fig. 21

DN	ΔP (bar)	A	B	C	\varnothing CIL	\varnothing VAST.	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 ND50 to ND1200
- From ND500 the actuator is with geared motor.

* Other ND on request.

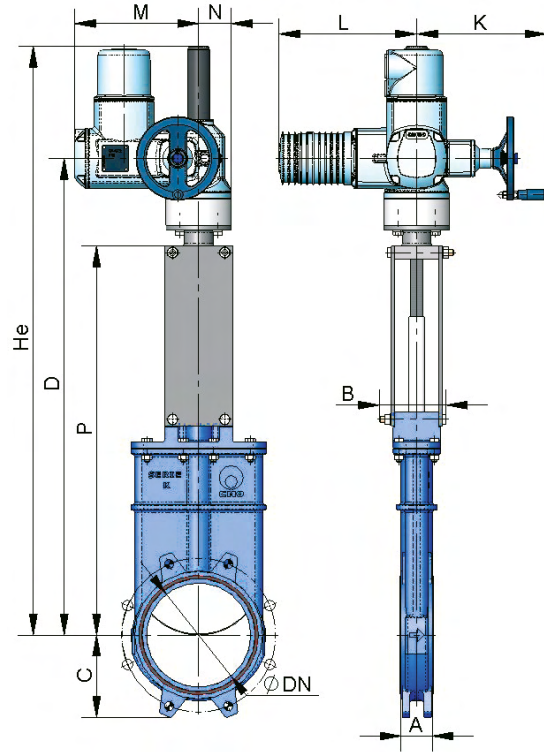


Fig. 22

DN	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

HYDRAULIC ACTUATOR

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

THE HYDRAULIC ACTUATOR INCLUDES:

- Hydraulic cylinder
- Yoke

SUPPLY PRESSURE STANDARD:

- 150 bar.

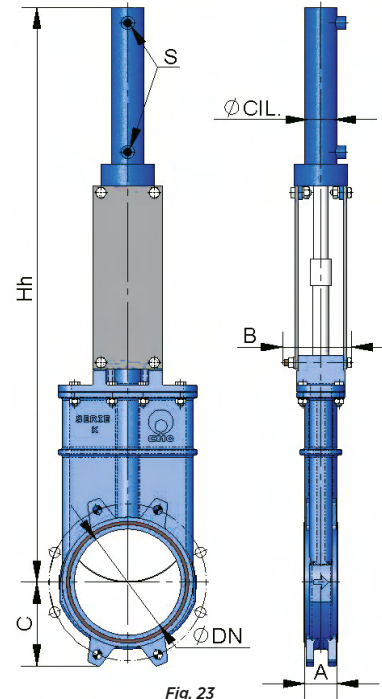
OPTIONS:

- Different types and brands available according to customer's requirements.

AVAILABLE:

- ND50 to ND1200.

* Other ND on request.



DN	ΔP (bar)	A	B	C	Hh	Ø CIL	Ø VAST	S (B.S.P.)	CAP. HULLE (dm ³)
50	10	40	92	61	539	25	18	3/8"	0.03
65	10	40	92	68	593	25	18	3/8"	0.03
80	10	50	92	91	670	25	18	3/8"	0.04
100	10	50	92	104	739	32	22	3/8"	0.09
125	10	50	102	118	827	32	22	3/8"	0.11
150	10	60	102	130	910	40	28	3/8"	0.20
200	8	60	119	159	1146	50	28	3/8"	0.42
250	6	70	119	196	1331	50	28	3/8"	0.52
300	6	70	119	230	1524	50	28	3/8"	0.62
350	5	96	290	254	1720	50	28	3/8"	0.73
400	5	100	290	287	1895	63	36	3/8"	1.31
450	3	106	290	304	2111	63	36	3/8"	1.47
500	3	110	290	340	2297	63	36	3/8"	1.62
600	3	110	290	398	2650	80	45	3/8"	3.12
700	2	110	320	453	3124	80	45	3/8"	3.62
800	2	110	320	503	3495	100	56	1/2"	6.44
900	2	110	320	583	3874	100	56	1/2"	7.25
1000	2	110	320	613	4294	125	70	1/2"	10.25
1100	2	150	340	670	4572	125	70	1/2"	13.56
1200	2	150	340	728	5000	125	70	1/2"	15.05

Table. 12

FLANGE DIMENSIONS

EN 1092-2 PN10

DN	●	○	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	20	12	M 33	20	1270
1200	32	0	M 36	22	1380

Table. 13

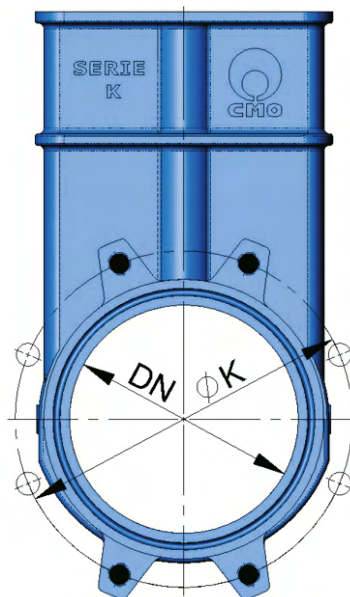
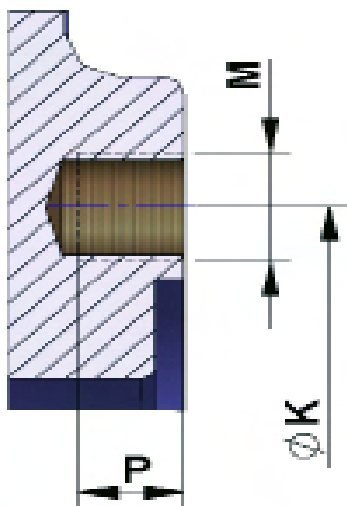


Fig. 24

- TAPPED HOLES
- THROUGH HOLE

ANSI B16, Class 150

DN	●	○	M UNC	P	ØK
2"	4	-	5/8"	8	120,6
2 ½"	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 ⅛"	22	577,8
20"	14	6	1 ⅛"	22	635
24"	14	6	1 ¼"	22	749,3
28"	20	8	1 ¼"	22	863,6
30"	20	8	1 ¼"	22	914,4
32"	18	10	1 ½"	22	977,9
36"	20	12	1 ½"	20	1085,9
40"	24	12	1 ½"	20	1200,2

Table. 14

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