

XB



BIDIRECTIONAL KNIFE GATE VALVE - "LUG" DESIGN

DESCRIPTION

- Bidirectional knife gate valve.
- Monoblock cast-iron body.
- Stainless steel knife gate. Polyurethane inner body liner.
- It provides high flow rates with low pressure losses.
- Face-to-face distance according to **CMO Valves** standard does not require sealing joints between the flanges as they are incorporated in the body.

GENERAL APPLICATIONS

This knife gate valve is suitable for working in the mining industry, in conveyance lines (e.g. loaded with water and stones, sludge, etc.), and generally for abrasive fluids with different concentrations of solids without discharge into the environment, such as the chemical and wastewater industries.

Designed for applications such as:

- Mining industry
- Water treatment
- Electrical power stations
- Chemical plants
- Energy sector
- Thermal power stations

SIZES

DN50 to DN600 (larger sizes on request).

The pressures shown in the table can be used in either valve direction.

WORKING PRESSURE (ΔP)

DN50 - DN600	10 bar
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* Other pressures on request.

FLANGE DRILL

DIN PN10 & ANSI B16.5 (150 LB)

OTHER COMMON STANDARDS

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



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 hydrostatically tested in accordance with **EN12266**, and material and test certificates can be supplied on request.

- Body test = working pressure x 1.5.
- Seal 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 it produces no cavities in open position and there is no turbulence in the fluid.
- The **XB valve** body is a single monoblock piece.
- The stem protection bonnet is independent from the handwheel securing nut, meaning the bonnet 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 in **CMO Valves** is made from stainless steel AISI 304. This is another additional benefit, since some manufacturers supply it with 13% chrome, which quickly rusts.
- The handwheel is manufactured in ductile cast **CARBON STEEL**. Some manufacturers supply it in common cast-iron, which can lead to breakage in the event of very high operation torque or a bang.
- The yoke has a compact design with the bronze drive nut protected in a sealed, greased box. This makes it possible to move the valve with a key, even without the handwheel (this is not possible in other manufacturers' products).
- The pneumatic drive's top and bottom bonnets are made of GJS500 ductile cast iron, making them highly shock resistant. This characteristic is essential in pneumatic drives.
- The pneumatic cylinder's sealing joints are commercial products and can be purchased worldwide. This means it is not necessary to contact **CMO Valves** every time a sealing joint is required.

STANDARD COMPONENTS LIST

COMPONENT	NODULAR IRON	ST. STEEL
1 BODY	GJS500-7	CF8M
2 KNIFE GATE	AISI304	AISI316
3 PACKING GLAND	GJS500	CF8M
4 EPDM	SEALING JOINT	
5 PACKING	SYNTH+PTFE	
6 LINER	POLYURETHANE	
7 SUPPORT PLATES	S275JR	
8 STEM	AISI303	
9 YOKE	GJS500-7	
10 STEM NUT	BRONZE	
11 HANDWHEEL	GJS500	
12 STOPPER NUT	St44.2+zinc	
13 BONNET NUT	STEEL	
14 BONNET	STEEL	
15 BONNET CAP	PLASTIC	

Table. 1

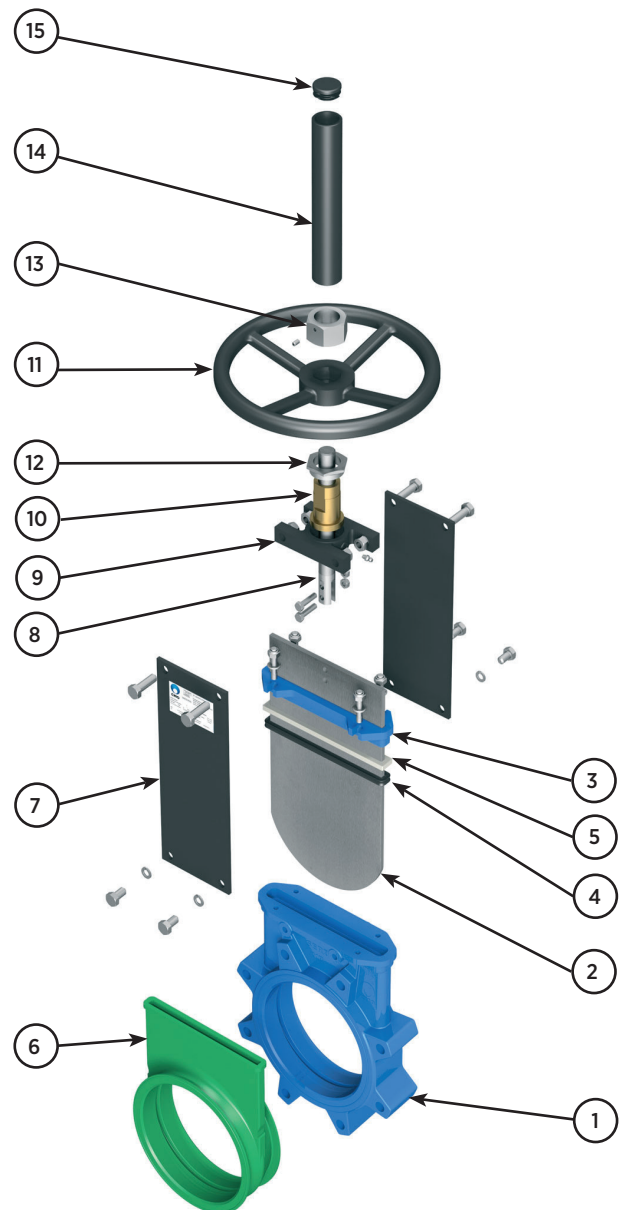


Fig. 2

*Note: The numbers of the images refer to the components list in Table 1.

DESIGN CHARACTERISTICS

1. BODY

Reinforced monoblock cast-iron body. The body provides a full continuous flow. This means that it produces no cavities in open position, so there is no turbulence in the fluid and load loss is minimal. For diameters greater than DN600, the body is machine-welded with the necessary reinforcements to withstand maximum working pressure. Designed with full passage to provide large flows with small losses of load.

The body's internal design prevents any build-up of solids in the gate area.

The standard manufacturing materials are GJS500-7 and CF8M stainless steel. Other materials such as A216WCB carbon steel and stainless steel alloys (AISI316Ti, Duplex, 254SMO, Uranus B6, Ni-Resist, Ductile Ni-Resist, etc.) are available to order. As standard, iron or carbon steel valves are painted with anti-corrosive protection of 150 microns of EPOXY (colour RAL 5015). Other types of anti-corrosive protections are available on request.

2. KNIFE GATE

The standard manufacturing materials are AISI304 stainless steel in valves with GJS500-7 body and AISI316 stainless steel in valves with CF8M body. Other materials or combinations can be supplied on request. The knife gate is polished on both sides to provide a smooth contact surface with the resilient seal. At the same time, the sharp edges on the knife gate are rounded to prevent the seal being cut. There are different degrees of polishing, anti-abrasion treatments and various options to adapt the valves to the customer's requirements.

3. SEAT

The seat of the **XB valve** consists of an inner liner which extends over the whole inside of the body. The liner is made of different materials. The **XB valve** is designed for abrasive fluids, meaning the coating protects all the body surface exposed to the abrasive flow.

With regards to maintenance, it should be noted that the sealing joint is permanently attached to the body in this type of compact design valves. This sealing joint must therefore be replaced by renewing the body (fig. 3).

SEALTIGHTNESS MATERIALS

POLYURETHANE

This is the standard resilient seal in **XB valves**. This can be used in multiple applications at temperatures below 90°C with abrasive products, giving the valve 100% tightness. Application: fluids in general.

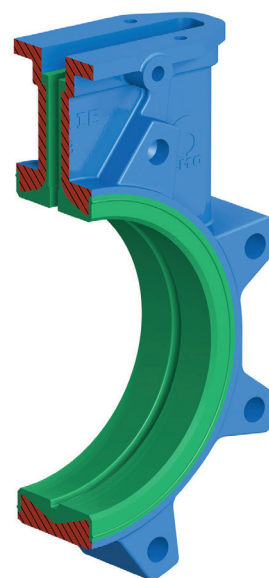
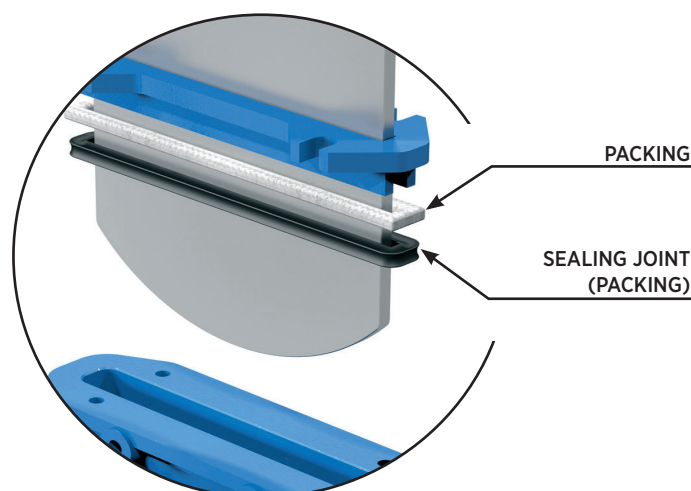


Fig. 3

4. PACKING

Standard packing in **CMO Valves** consists of a specially designed EPDM seal which provides tightness between the body and the knife gate, preventing any type of discharge to the atmosphere. It also has greased packing to help valve operation during the opening and closing functions. It is located in an easily accessible place, and can be replaced without dismantling the valve from the pipeline.



5. STEM

The stem in **CMO Valves** is made from stainless steel AISI 304. This characteristic makes it highly resistant and provides excellent properties against corrosion. The valve design can be rising stem or non-rising stem. When a rising stem is required for the valve, a stem bonnet is supplied to protect the stem from contact with dust and dirt, besides keeping it greased.

6. PACKING GLAND

The packing gland allows uniform force and pressure to be applied to the packing to ensure tightness. As standard, valves with steel body include a steel packing gland, while valves with stainless steel body have stainless steel packing glands.

7. DRIVES

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

Manual Drives

- Handwheel (*)

- Chain handwheel (*)

- 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 pneumatic cylinder

- Hydraulic cylinder

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

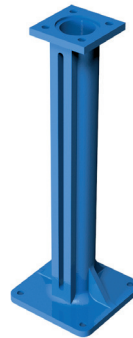


Fig. 4

STRAIGHT FLOOR STAND



Fig. 5

LEANING FLOOR STAND

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



HANDWHEEL
RISING STEM
H/A

HANDWHEEL
NON-RISING STEM
H/NA

CHAIN
HANDWHEEL
H/A
H/NA

HANDWHEEL
GEAR-BOX
H/A
H/NA

PNEUMATIC
ACTUATOR
H/A

ELECTRIC-MOTOR
ACTUATOR
H/A
H/NA

HYDRAULIC
ACTUATOR
H/A

Fig. 6

ACCESSORIES AND OPTIONS

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

MIRROR-POLISHED KNIFE GATE:

The mirror-polished knife gate is especially recommended in the food industry and, in general, in applications in which solids can stick to the gate.

PTFE-LINED KNIFE GATE:

As with the mirror-polished knife gate, it improves the valve's resistance to products that can stick to the gate.

STELLITED KNIFE GATE:

Stellite is added to the knife gate's lower edge to protect it from abrasion.

SCRAPER IN THE PACKING:

Its function is to clean the knife gate during the opening movement and prevent possible damage to the packing.

AIR INJECTIONS IN THE PACKING:

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

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 DETECTORS AND POSITIONERS:

Limit switches or detectors to indicate specific valve position, and positioners to indicate continuous position.

ELECTROVALVES:

For air distribution to pneumatic drives.

JUNCTION BOXES, PNEUMATIC PIPING AND WIRING:

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 DRIVE (HANDWHEEL / GEARED MOTOR):

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

INTERCHANGEABILITY OF THE DRIVES:

The drives are easily interchangeable.

EPOXY COATING:

All cast-iron and carbon steel valve bodies and components are EPOXY coated, making the valves hugely resistant to corrosion while giving them an excellent finish. The standard colour in **CMO Valves** is blue, RAL-5015.

SAFETY GUARDS FOR THE KNIFE GATE:

In accordance with European Safety Standards ("EC" marking), automatic valves are equipped with metal guards for protection, preventing any objects from being accidentally caught or dragged along in the knife gate's run.

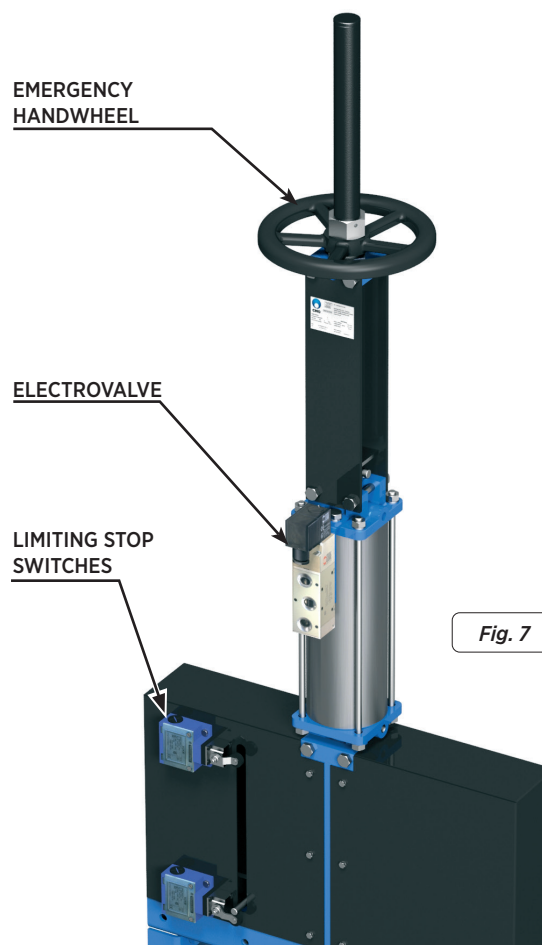


Fig. 7

TYPES OF EXTENSIONS

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

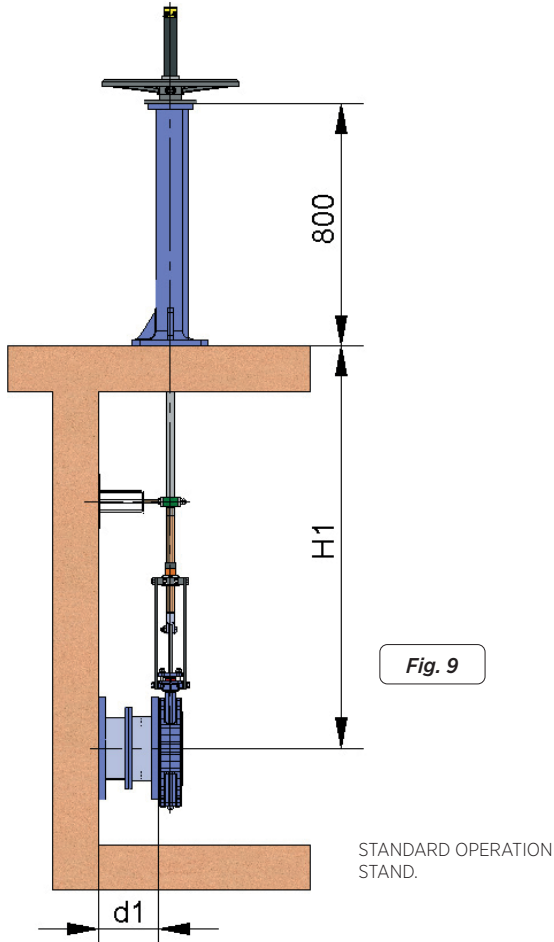


Fig. 9

STANDARD OPERATION STAND.

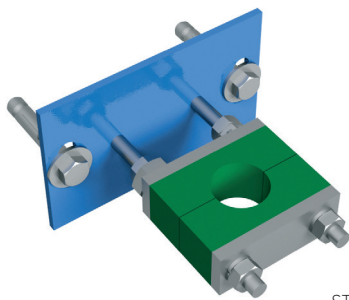


Fig. 8

STEM GUIDE BRACKET

COMPONENT LIST

COMPONENT	STANDARD VERSION
Stem	AISI 304
Spindle	AISI 304
Guide Bracket	Carbon steel with EPOXY coating
Slide	AP6
Floor 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 (Fig. 8)
- The standard floor stand is 800 mm high. (Fig.9)
- Option to use a position indicator to determine the valve's percentage of opening.
- Leaning stand available to order (Fig. 10)
- Other floor stand measurements available on request.



LEANING STAND.

Fig. 10

Note: A position indicator can be fitted in the floor 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.

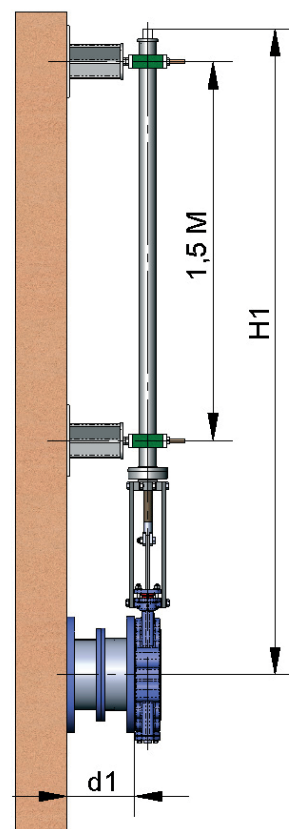


Fig. 11

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.

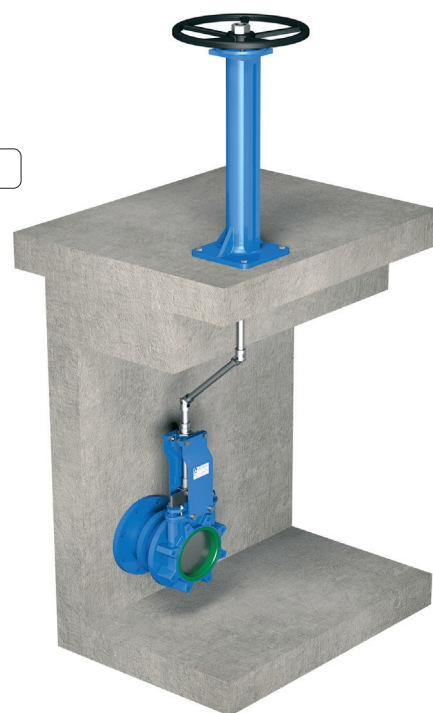
Fig. 12



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. 13



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

COMPOUND DRIVE:

- Handwheel
- Stem
- Nut
- Stem protection bonnet

AVAILABLE:

- Standard DN50 to DN350.
- Other DN's on request.
- The weights are approximate and vary according to the material and the valve's accessories.
- As of DN350, the drive is with geared motor.
- Other pressures on request

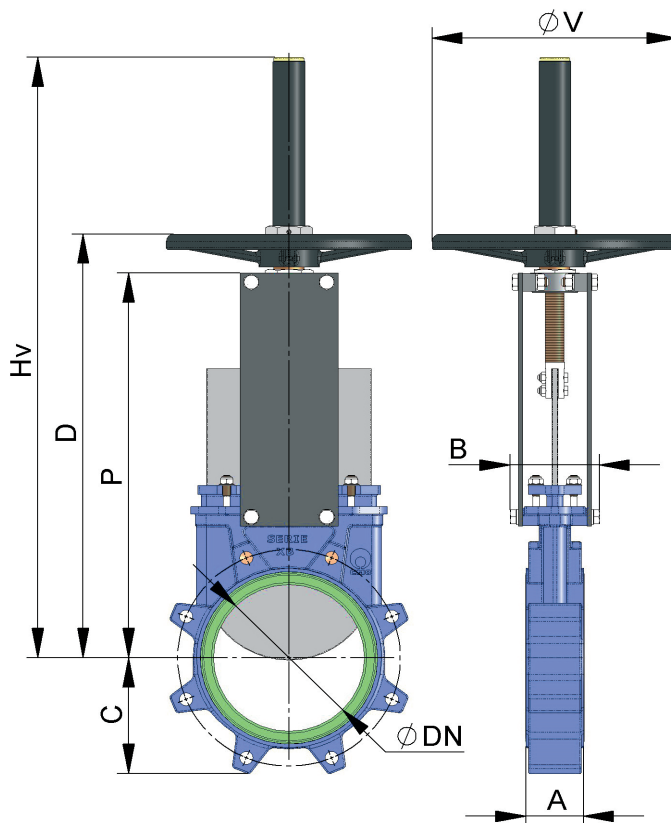


Fig. 14

DN	ΔP (bar)	A	B	C	P	D	Hv	øV	Weight (kg)
50	10	54	91	61	241	280	410	225	7
65	10	54	91	68	268	308	437	225	8
80	10	57	91	91	294	333	463	225	9
100	10	57	91	104	334	373	503	225	11
125	10	64	101	118	367	407	586	225	13
150	10	64	101	130	419	458	638	225	17
200	10	76	118	159	525	578	816	325	28
250	10	76	118	196	626	679	1017	325	40
300	10	83	118	231	726	779	1117	380	56
350	10	83	290	257	797	906	1337	450	96

Table. 4

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 stem.
- Locking devices
- Extensions: elongated plates, etc.
- DN above those given in the table

COMPOUND DRIVE:

- Handwheel
- Stem
- Nut
- Yoke guide bushings

AVAILABLE:

- Standard DN50 to DN350.
- Other DN's on request.
- The weights are approximate and vary according to the material and the valve's accessories.
- As of DN350, the drive is with geared motor.
- Other pressures on request

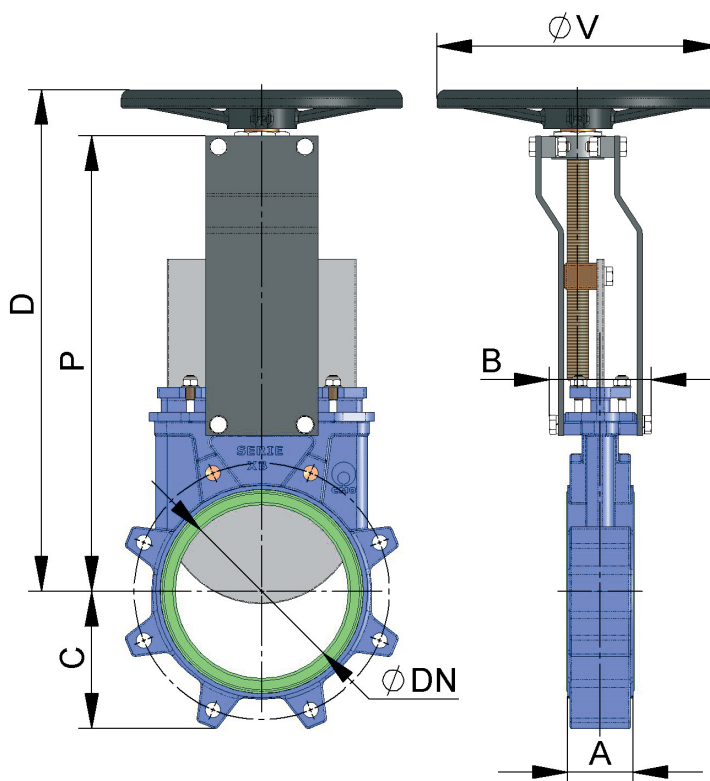


Fig. 15

DN	ΔP (bar)	A	B	C	P	D	øV	Weight (kg)
50	10	54	91	61	241	280	225	7
65	10	54	91	68	268	308	225	8
80	10	57	91	91	294	333	225	9
100	10	57	91	104	334	373	225	11
125	10	64	101	118	367	407	225	13
150	10	64	101	130	419	458	225	17
200	10	76	118	159	525	578	325	29
250	10	76	118	196	626	679	325	40
300	10	83	118	231	726	779	380	53
350	10	83	290	257	797	906	450	93

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:

- Locking devices.
- Extensions: elongated plates.
- Non-rising stem.
- DN above those given in the table

COMPOUND DRIVE:

- Handwheel
- Stem
- Nut
- Chain
- Bonnet

AVAILABLE:

- Standard DN50 to DN350.
- Other DN's on request.
- As of DN350, the drive is with geared motor.
- The weights are approximate and vary according to the material and the valve's accessories.
- Other pressures on request.

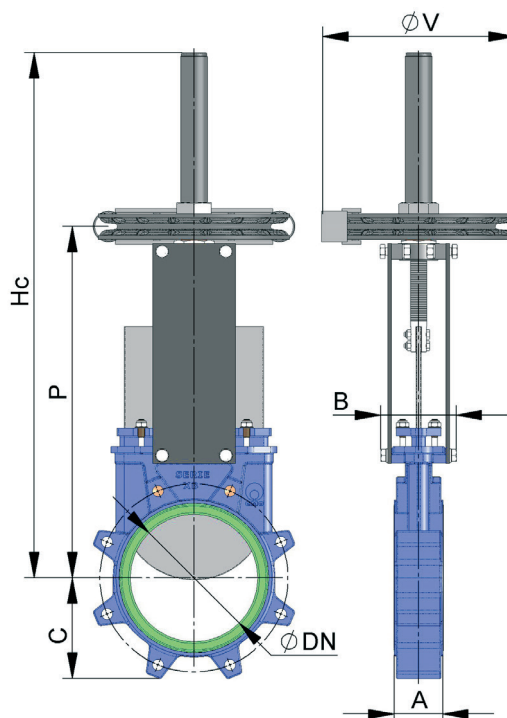


Fig. 16

DN	ΔP (bar)	A	B	C	P	Hc	ØVc	Weight (kg)
50	10	54	91	61	280	410	225	7
65	10	54	91	68	308	437	225	8
80	10	57	91	91	333	463	225	9
100	10	57	91	104	373	503	225	11
125	10	64	101	118	407	586	225	13
150	10	64	101	130	458	638	225	17
200	10	76	118	159	578	816	300	29
250	10	76	118	196	679	1017	300	40
300	10	83	118	231	779	1117	300	53
350	10	83	290	257	906	1337	402	93

Table. 6

GEARED MOTOR

This is recommendable for DN's 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.

COMPOUND DRIVE:

- Yoke
- Tapered gear
- Handwheel
- Stem
- Standard reduction ratio: 4 to 1

AVAILABLE:

- DN50 to DN600.
- Other DN's on request.
- Approximate weights, according to the material and accessories.
- Other pressures on request.

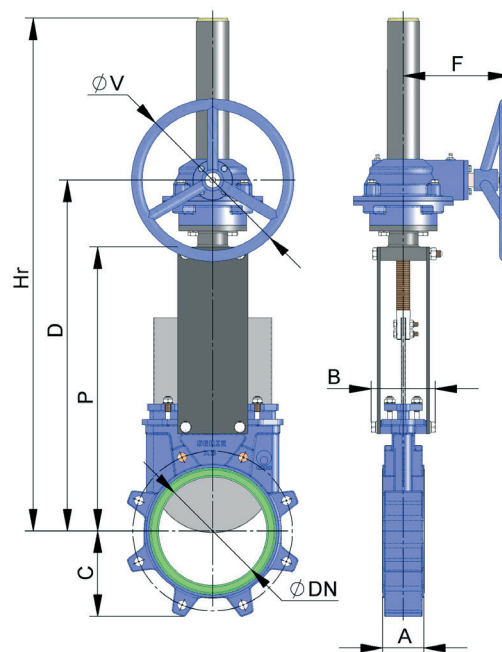


Fig. 17

DN	ΔP (bar)	A	B	C	P	D	Hr	F	ØVc	Weight (kg)
50	10	54	91	61	241	366	540	198	300	17
65	10	54	91	68	268	392	566	198	300	18
80	10	57	91	91	294	418	592	198	300	19
100	10	57	91	104	334	458	632	198	300	20
125	10	64	101	118	367	491	665	198	300	24
150	10	64	101	130	419	543	717	198	300	26
200	10	76	118	159	525	648	942	198	300	50
250	10	76	118	196	626	749	1043	198	300	63
300	10	83	118	231	726	849	1193	198	300	77
350	10	83	290	257	797	891	1335	218	450	106
400	10	96	290	290	903	997	1441	218	450	134
450	10	96	290	312	989	1083	1677	218	450	173
500	10	121	290	340	1101	1195	1789	288	650	216
600	10	121	290	398	1307	1420	2108	332	1000	284

Table. 7

DOUBLE-ACTING PNEUMATIC CYLINDER

The definition variables are as follows:

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

- The air supply pressure to the pneumatic cylinder is a minimum of 6 and a maximum of 10 bar. The air must be dry and lubricated.
- For DN50 to DN200 valves, the cylinder's casing and bonnets are made of aluminium, the spindle of AISI304, the piston of rubber-coated steel and the O-ring seals are made of nitrile.
- For valves larger than DN200, the bonnets are made of ductile cast iron or carbon steel.
- To order, the drive can also be made from stainless steel, specifically for installation in corrosive environments.

AVAILABLE:

- DN50 to DN600.
- Other DN's on request.
- Approximate weights, according to the material and accessories.
- Other pressures on request.

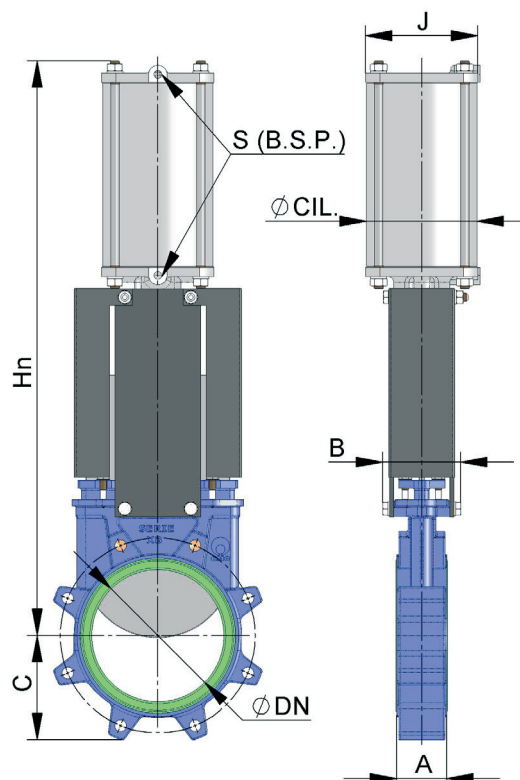


Fig. 18

DN	ΔP (bar)	A	B	C	øCIL	øStem	J	S (B.S.P.)	Hn	Weight (kg)
50	10	54	91	61	80	20	90	1/4"	416	7
65	10	54	91	68	80	20	90	1/4"	456	8
80	10	57	91	91	80	20	90	1/4"	498	9
100	10	57	91	104	100	20	110	1/4"	562	12
125	10	64	101	118	125	25	135	1/4"	636	18
150	10	64	101	130	160	30	170	1/4"	723	22
200	10	76	118	159	200	30	215	1/4"	886	37
250	10	76	118	196	250	40	270	3/8"	1133	58
300	10	83	118	231	300	45	382	1/2"	1278	72
350	10	83	290	257	350	45	444	1/2"	1383	130
400	10	96	290	290	400	50	508	1/2"	1532	155
450	10	96	290	312	*	*	*	*	*	225
500	10	121	290	340	*	*	*	*	*	257
600	10	121	290	398	*	*	*	*	*	340

* Check

Table. 9

ELECTRIC ACTUATOR

The definition variables are as follows:

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

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

This drive is automatic and includes the following parts:

- Electric motor
- Stem
- Yoke

The electric motor includes:

- Emergency manual handwheel,
- Limit switches
- Torque limiting stops

OPTIONS:

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

AVAILABLE:

- DN50 to DN1500.
- Other DN's on request.
- As of DN350, the motor has a geared motor.
- Approximate weights, according to the material and accessories.
- Other pressures on request.

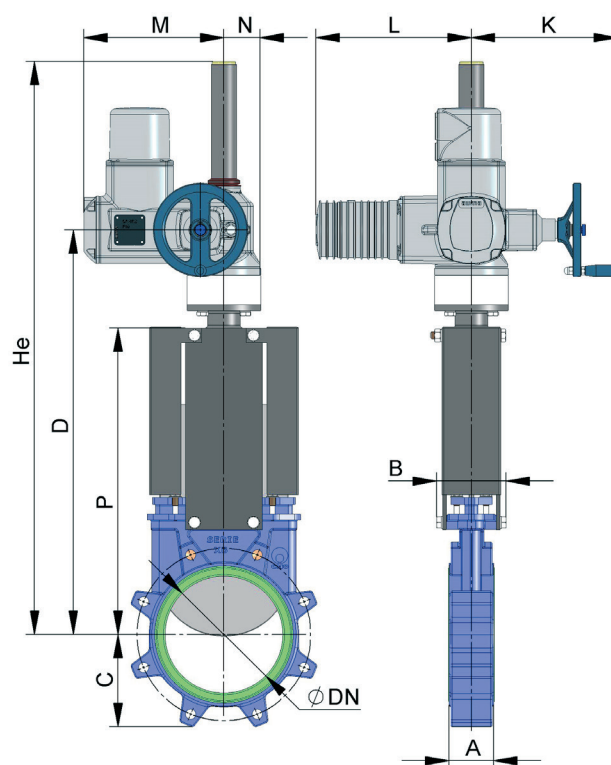


Fig. 19

DN	ΔP (bar)	A	B	C	P	D	He	K	L	M	N	Weight (kg)
50	10	54	91	61	241	400	581	250	265	238	62	24
65	10	54	91	68	268	426	607	250	265	238	62	25
80	10	57	91	91	294	452	632	250	265	238	62	26
100	10	57	91	104	334	492	672	250	265	238	62	27
125	10	64	101	118	367	525	705	250	265	238	62	30
150	10	64	101	130	419	577	757	250	265	238	62	32
200	10	76	118	159	525	683	988	250	265	238	62	42
250	10	76	118	196	626	774	1089	250	265	238	62	55
300	10	83	118	231	726	874	1189	255	282	248	65	72
350	10	83	290	257	797	931	1335	250	265	382	88	99
400	10	96	290	290	903	1037	1441	255	282	390	88	136
450	10	96	290	312	989	1123	1677	255	282	390	88	166
500	10	121	290	340	1101	1245	1789	255	282	390	88	245
600	10	121	290	398	1307	1470	2108	325	385	453	100	362

Table. 10

HYDRAULIC DRIVE

The definition variables are as follows:

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

This drive is hydraulic and is made up of the following parts:

- Hydraulic Cylinder
- Yoke

AVAILABLE:

- DN50 to DN600.
- Others on request.
- Approximate weights, according to the material and accessories.
- Different types and makes available according to the customer's requirements.
- Other pressures on request.

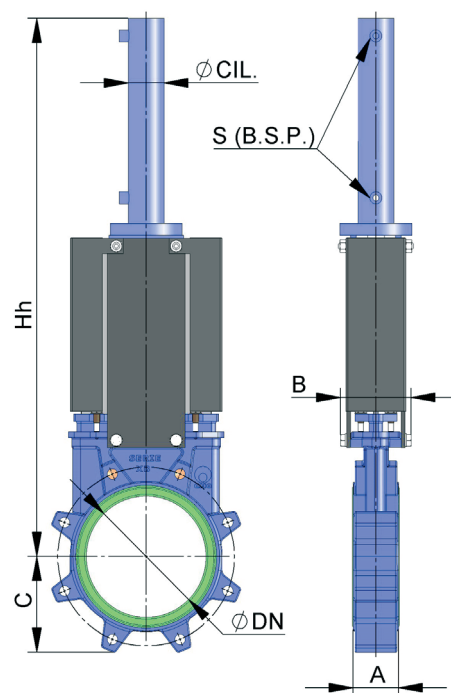


Fig. 20

DN	ΔP (bar)	A	B	C	Hh	Ø CYL	S (B.S.P)	Oil (dm ³)	Ø STEM	Weight (kg)
50	10	54	91	61	457	25	3/8"	0.03	18	7
65	10	54	91	68	500	25	3/8"	0.04	18	8
80	10	57	91	91	560	25	3/8"	0.04	18	9
100	10	57	91	104	620	32	3/8"	0.09	22	12
125	10	64	101	118	683	32	3/8"	0.11	22	15
150	10	64	101	130	755	40	3/8"	0.20	28	20
200	10	76	118	159	926	50	3/8"	0.42	28	31
250	10	76	118	196	1077	63	3/8"	0.81	36	44
300	10	83	118	231	1246	80	3/8"	1.56	36	62
350	10	83	290	257	1376	100	1/2"	2.87	56	100
400	10	96	290	290	1532	100	1/2"	3.26	56	138
450	10	96	290	312	1707	125	1/2"	5.71	70	161
500	10	121	290	340	1869	125	1/2"	6.32	70	223
600	10	121	290	398	2202	160	1/2"	12.37	70	325

Table. 10

INFORMATION ON FLANGE DIMENSIONS

EN 1092-2 PN10

DN	ΔP (bar)	●	M (Metric)	P	ØK
50	10	4	M 16	8	125
65	10	4	M 16	8	145
80	10	8	M 16	9	160
100	10	8	M 16	9	180
125	10	8	M 16	9	210
150	10	8	M 20	10	240
200	10	8	M 20	10	295
250	10	12	M 20	12	350
300	10	12	M 20	12	400
350	10	16	M 20	21	460
400	10	16	M 24	21	515
450	10	20	M 24	22	565
500	10	20	M 24	22	620
600	10	20	M 27	22	725

Table. 11

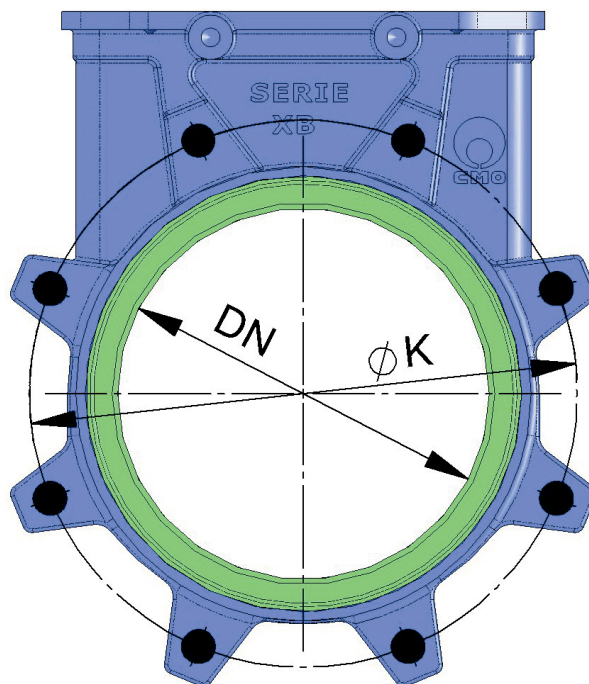


Fig. 23

● THREADED BORE

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"	8	5/8"	9	190.5
5"	8	3/4"	9	215.9
6"	8	3/4"	10	241.3
8"	8	3/4"	10	298.4
10"	12	7/8"	12	361.9
12"	12	7/8"	12	431.8
14"	12	1"	21	476.2
16"	16	1"	21	539.7
18"	16	1 ½"	22	577.8
20"	20	1 ½"	22	635
24"	20	1 ¼"	22	749.3

Table. 12

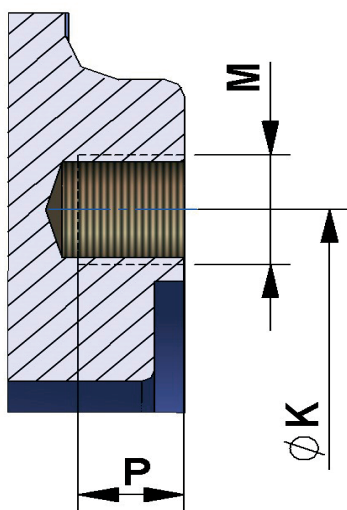


Fig. 24



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