

## PRODUCT DESCRIPTION

Wafer style, bidirectional knife gate valve.  
One piece integral cast body with sliding wedges to provide bidirectional function.  
High flow rates with low pressure drops.  
Several seat and packing materials available.  
Face to face dimension according CMO standard.

## GENERAL APPLICATIONS

This knife gate valve is appropriate for clean liquids or liquid with a solids concentration of maximum 4%.  
Designed for a wide range of applications such us:

- Effluent handling plants.
- Chemical plants.
- Food and beverage.
- Sewage applications.

In all these applications the installation of the valve is recommended after the fluid is screened to eliminate the solids or big parts contained on it.

## TECHNICAL DATA

### Standard manufacturing sizes:

From DN50 up to DN1200 (bigger sizes under request)

### Working pressures:

From DN 50 to DN 125: 10 (kg/cm<sup>2</sup>)  
DN 150: 8 (kg/cm<sup>2</sup>)  
DN 200: 7 (kg/cm<sup>2</sup>)  
From DN 250 to DN 300: 5 (kg/cm<sup>2</sup>)  
From DN 350 to DN 400: 4 (kg/cm<sup>2</sup>)  
From DN 450 to DN 600: 3 (kg/cm<sup>2</sup>)  
From DN 700 to DN 1200: 2 (kg/cm<sup>2</sup>)



**Note:** These pressures can be applied either in one side or the other side of the valve because of its bidirectional design.

### Flange connection drillings:

The standard flange connection is according to DIN PN10.

Other flange connections such as, ANSI 150, DIN PN6 – PN16 – PN25, British Standard, Australian Standard, JIS Standard, are available under request.

### Applied Directives:

Directive 98/37/CE (machinery), **Directive 97/23/CE (PED: Group 2)**, Directive 94/9/CE (ATEX: Group II, Cat. 3 / Zones 2 and 22)

**Quality Dossier:** All valves are hydrostatically tested at CMO with water and CMO material and test certificates can be provided.

Body test pressure = Maximum rated pressure x 1,5

Seat test pressure = Maximum rated pressure x 1,1

## KNIFE GATE VALVES -- MODEL AB

DOC. AB.05/08

### ADVANTAGES OF CMO "MODEL AB" COMPARING WITH SIMILAR PRODUCTS

The main characteristic of this knife gate valve is the body design.

It is a one piece machined cast body with wedges in both sides that provides the capability to work with flow in both directions at the same pressure.

The sealing joint has an internal stainless steel wire that helps the joint to keep the body shape and avoid its dismantling. This design provides a completely flat seat with no cavities and avoids any build up of solids in the seat area.

The stem protection hood is independent from the hand wheel fixing system, so the hood can be removed without removing the hand wheel. This point allows normal maintenance operations like greasing of the spindle, etc.

The spindle (stem) of the CMO valve is made of stainless steel 18/8. This point is very important because there are manufacturers that manufacture it with 13% CR and it gets rusty in a very short time.

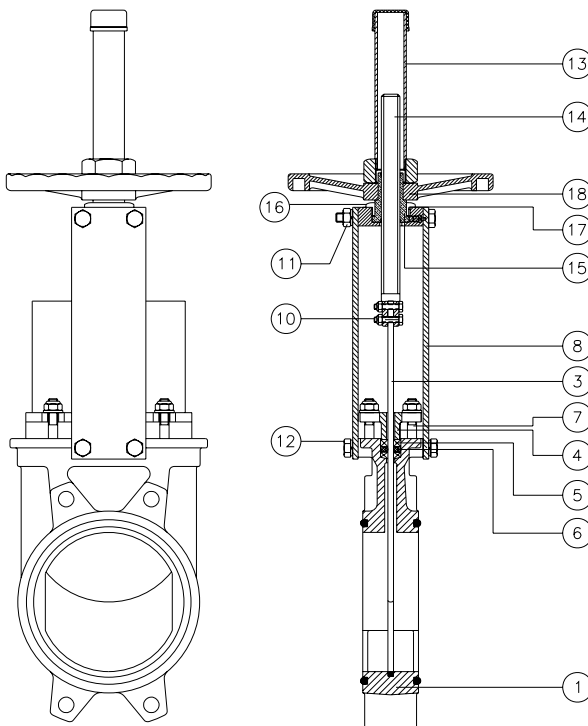
The hand wheel of the manual actuator is made of nodular iron GGG-50. Some manufacturers manufacture it on normal cast iron and they can break easily when receiving any big torque or knock.

The bridge of the CMO manual actuator is manufactured in a compact way, with the bronze nut protected in a greased and closed box. This point gives the possibility to move it with a key even without the hand wheel (in other manufacturer valves this is not possible).

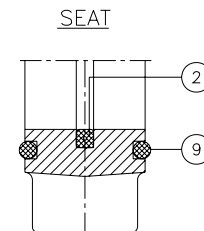
The pneumatic actuator upper and lower caps are made of nodular iron GGG-50, therefore their resistance to the knocks is very high. This characteristic is essential in this type of pneumatic cylinder. Special care must be taken with cylinders with covers in aluminium or cast iron

The sealing o-rings of the pneumatic cylinders are commercial and they can be bought all over the world, it is not needed, therefore, to contact CMO every time that these spares are needed.

### STANDARD MANUFACTURING MATERIALS (OPTIONS 1 AND 2)



POS.	DESCRIPTION	OPTION 1	OPTION 2
1	BODY	GG25	CF8M
2	JOINT	EPDM	EPDM
3	KNIFE	AISI304	AISI316
4	PACKING GLAND	ALUMINIUM	CF8M
5	PACKING	SYNTET.+PTFE	SYNTET.+PTFE
6	O-RING	EPDM	EPDM
7	STUD	STEEL+ZINC	AISI316
8	SUPPORT	STEEL	STEEL
9	O-RING	NITRILE	NITRILE
10	BOLTS	AISI304	AISI316
11	BOLST	STEEL	STEEL
12	BOLTS	STEEL	AISI316
13	HOOD	STEEL	STEEL
14	SPLINDLE	AISI303	AISI303
15	STEM NUT	BRONZE	BRONZE
16	NUT	ST 44.2+ZINC	ST 44.2+ZINC
17	YOKE	STEEL	STEEL
18	HANDWHEEL	NODULAR IRON	NODULAR IRON



## DESIGN FEATURES IN DETAIL

### 1) BODY

Wafer style, one piece mono block cast body with sliding wedges to provide bidirectional function. For sizes bigger than DN600 the construction of the body is fabricated with two bolted parts in carbon steel with reinforcement ribs to withstand the maximum rated pressure.

Full port designed to provide high flow rates with low pressure drops.

The internal design of the valve avoids any build up of solids on the sealing area.

The standard manufacturing materials are GG25 cast iron and CF8M stainless steel. Other materials like GGG50 nodular cast iron, A216WCB carbon steel and stainless steel alloys (AISI316Ti, Duplex, 254SMO, Uranus B6 ....) under request. Cast iron or steel valves are painted as standard with 80 microns anticorrosive protection of EPOXY (colour RAL 5015). Other anticorrosive protections available under request.

### 2) GATE

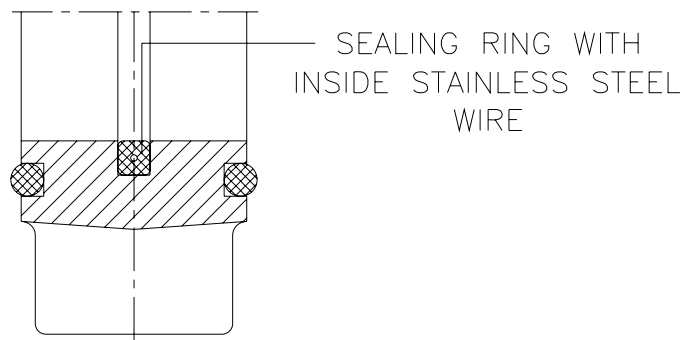
The standard manufacturing materials are AISI304 stainless steel for cast iron body valve and AISI316 stainless steel for CF8M stainless steel body valve. Other materials or combinations can be supplied under request.

The gate is polished in both sides to provide a smooth contact surface with the sealing joint. At the same time the gate wedge is rounded to avoid cutting of the sealing. Several polishing grades, anti abrasion treatments and modifications are available to adapt the valve to the customer requirements.

### 3) SEAT

There is only one type of seat design available on the knife gate valve type AB and always must be soft seated. It never can be metal to metal seated.

Following we are showing the a seat detail:



The seat of the knife gate valve type AB is a square shaped rubber joint with an inside stainless steel wire.

This rubber joint is inserted inside of the body in the way that starts in one side of the packing area, it rounds the body and it ends in the opposite side of the packing area.

This means that the sealing is not installed in all the perimeter of the valve flow passing hole. It installed taking a U shape and covering all the perimeter of the gate.

The inside stainless steel metal wire is who helps to the sealing to keep the U shape and not to be removed from the body because of the flow when it is passing through the valve.

This design provides a completely flat seat with no cavities and avoids any build up of solids in the seat area.



### Resilient Seat Materials

#### EPDM

This is the standard resilient seat installed on CMO valves. It can be used in many applications, but generally it is used for water and products diluted in water at temperatures not higher than 90°C. The EPDM rubber can also be used for abrasive products. It provides 100% tightness.

#### NITRILE

It is used for greasy fluids or oils at temperatures not higher than 90 °C. It provides 100% tightness.

#### VITON

Appropriate for corrosive products and high temperatures up to 190°C in continuous and peaks of 210°C. It provides 100% tightness.

#### SYLICONE

The silicone is used mainly into the food industry and pharmaceutical products with temperatures not higher than 200°C. It provides 100% tightness.

**Note:** In some applications other different resilient materials are used as, for example, hypalon, butile and natural rubber. Please contact with us in case of such request.

## 4) PACKING

As standard the packing is composed by three lines with an EPDM o-ring in the middle. It provides the tightness between the body and the gate and avoids any kind of leakage to the atmosphere.

The packing is located in an easily accessible place and can be changed without dismantling the valve from the pipeline.

Several types of packing can be supplied according to the different applications in which the valve can be located as follows:

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

This packing is made with cotton threads and has impregnated both the inside and the outside with tallow. It is manufactured by the solid system. It is a packing for general use in hydraulic services for pumps as well as for valves.

P(bar) = 10 / T = 100°C PH = 6-8

### **DRY COTTON**

This packing is made with cotton threads. It is manufactured by the solid system. This is a packing only for solid products.

P(bar) = 0.5 / T = 100°C PH = 6-8

### **COTTON + P.T.F.E.**

This packing is made with cotton threads and has the inside and outside impregnated with P.T.F.E. It is manufactured by the solid system. It is a packing for general use in hydraulic services for pumps as well as for valves.

P(bar) = 30 / T = 120°C PH = 6-8

### **P.T.F.E. LUBRICATED**

It is made of PTFE filament threads which are impregnated using vacuum with a dispersion of PTFE and a special lubricant which helps the work at high speed.



It is braided by the diagonal system. Suitable for valves and pumps working with nearly all the fluids, specially the more corrosives, including concentrated oils and oxidants. It is also suitable for fluids with solid contents.

$$P(\text{bar}) = 100 / T = -200+270 \text{ } ^\circ\text{C} \quad \text{PH} = 0-14$$

### GRAPHITE FILAMENT

It is made of graphite threads of high purity. It is braided by the diagonal system and impregnated with a small quantity of graphite and lubricant which helps to reduce the porosity and makes easier the running.

It is a packing with low friction coefficient and high heat conductivity.

It has a wide range of applications, as the graphite withstands the steam, water, oils, solvents, alkalis and most of the acids.

The chemical products that attack this packing are strong oxidizers as the oleum, the fuming nitric acids, the dichromates and the oxygen.

$$P(\text{bar}) = 40 / T = 650^\circ\text{C} \quad \text{PH} = 0-14$$

### CERAMIC FIBER

It is made with ceramic threads. Its application is only for air or gas at high temperature and low pressure.

$$P(\text{bar}) = 0.3 / T = 1400^\circ\text{C} \quad \text{PH} = 0-14$$

### 5) SPINDLE (STEM)

The spindle (stem) of the CMO valve is made of stainless steel 18/8. This provides a high resistance and long corrosion resistant life.

The valve design can be with rising or non rising stem construction. When rising stem construction is manufactured a stem protection hood is supplied that protects the stem from dust and dirt and, at the same time, keeps the stem lubricated.

### 6) PACKING GLAND

The packing gland gives the possibility to apply a uniform pressing force on the packing to ensure the tightness of the packing. As standard cast iron body valves include aluminium packing gland and stainless steel body valves include CF8M stainless steel packing gland.

### 7) ACTUATORS

All kind of actuators can be supplied with the advantage that CMO design is completely interchangeable.

The design gives the possibility to the customer to change the actuators by their own. Normally there is no need of any extra mounting kit and in the cases that it is necessary CMO provides it.

## ACCESSORIES

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

### Mechanical Limit Switches, Inductive Switches and Positioners

Limit switches for punctual valve position indication and positioners for continuous valve position indication.

### Solenoid valves

For air distribution into pneumatic actuators

### Connection electrical boxes, electrical wiring and pneumatic piping

Completely assembled units with all accessories can be supplied.

### Stroke limiting mechanical stops

### Mechanical locking device

Allows the locking of the valve in a fixed position during long periods

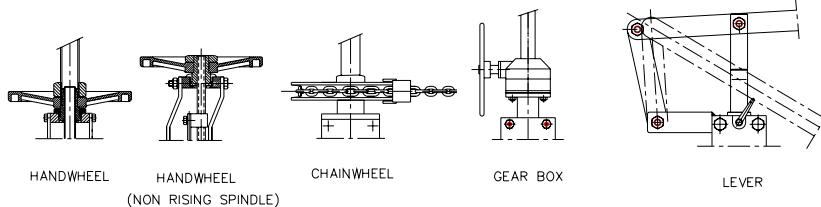
### Emergency manual actuator (hand wheel /gear box)

For emergency operation of the valve in case of power failure

## ACTUATORS

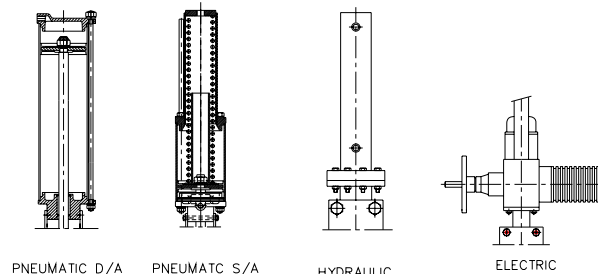
The following actuators are available:

### MANUAL ACTUATORS



(\*NOTE: CHAINWHEEL AND GEAR BOX ALSO AVAILABLE  
NON RISING STEM DESIGN

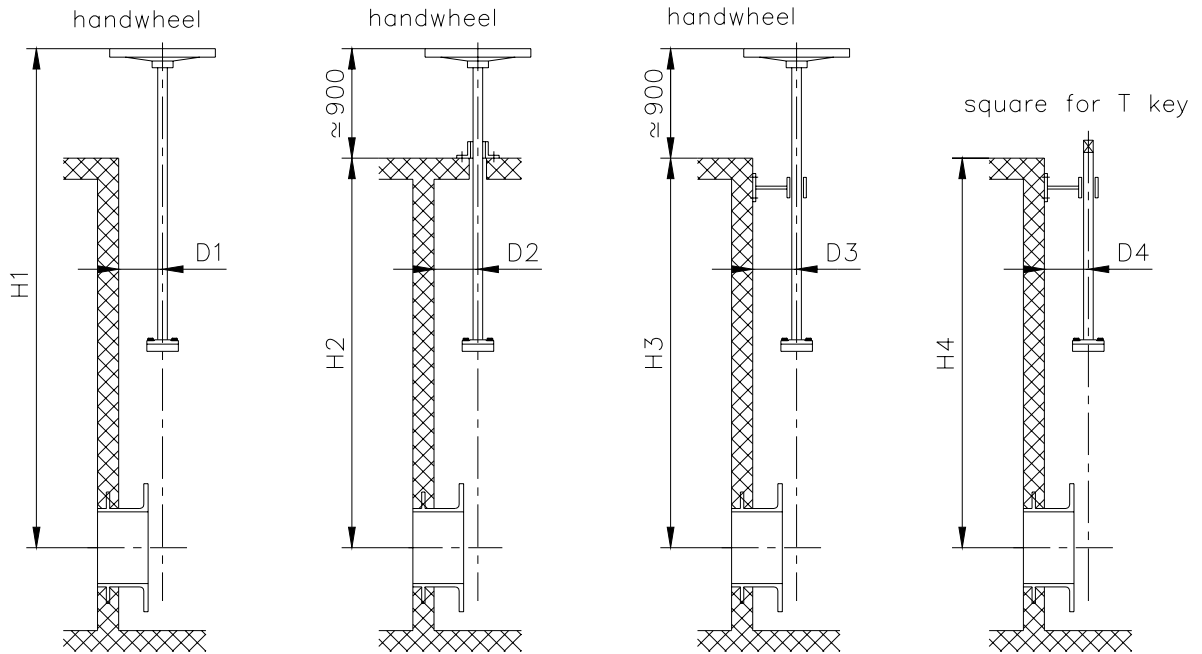
### OTHER TYPES OF ACTUATORS



(\*NOTE: SINGLE ACTING ACTUATOR AVAILABLE WITH  
WITH SPRING TO CLOSE OR SPRING TO OPEN  
DESIGN.

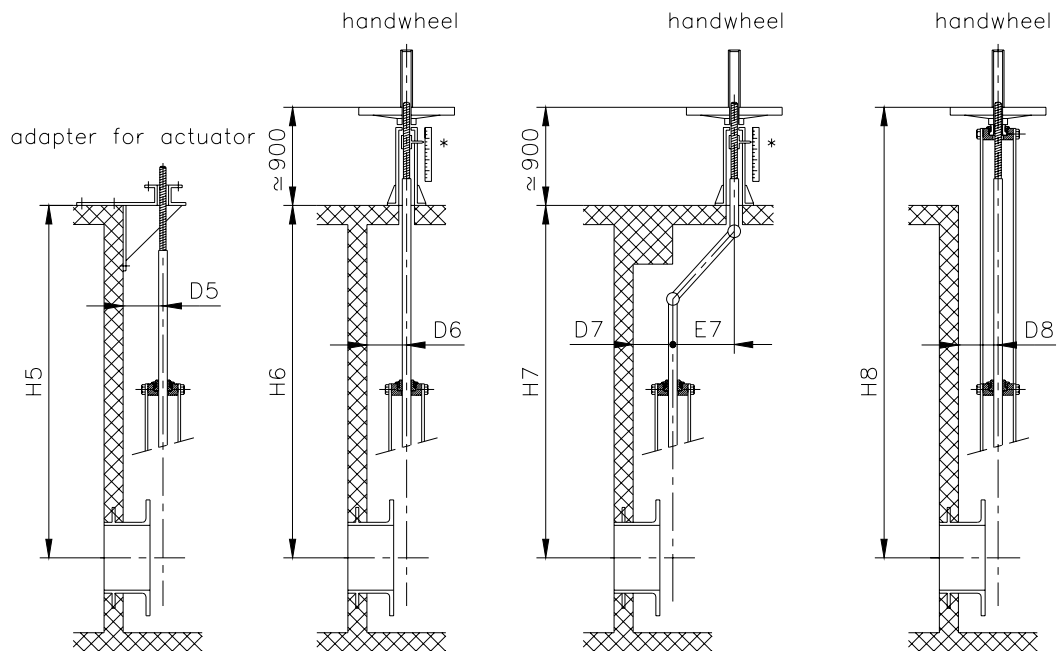
(\*NOTE: ALL AUTOMATED VALVES ARE SUPPLIED WITH  
SAFETY GUARDS COVERING THE GATE MOVEMENT AREA.

STEM EXTENSION TYPES



- 1) Extension tube with inside rising stem
- 2) Equal to 1) but with floor support
- 3) Equal to 1) but with wall support
- 4) Equal to 3) but with T key.

\* Optional indication rule on the pedestal

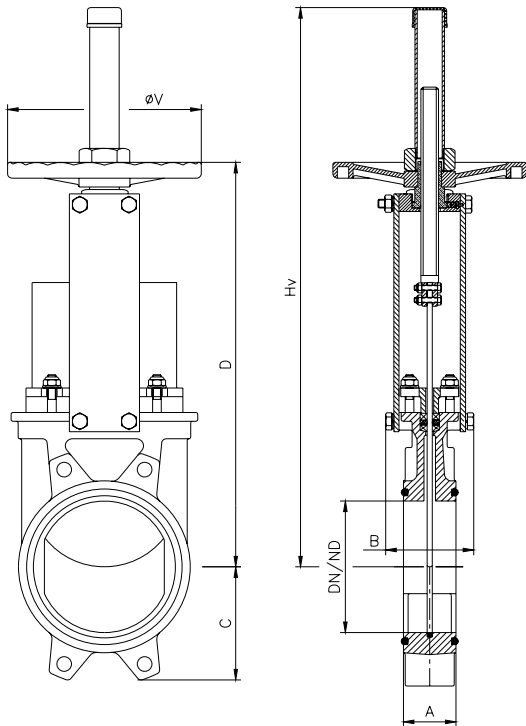


- 5) Rising stem with wall support and adapter for actuator
- 6) Rising stem with floor pedestal
- 7) Non rising stem with pedestal and two universal joints
- 8) Rising stem with extended support plates

# KNIFE GATE VALVES -- MODEL AB

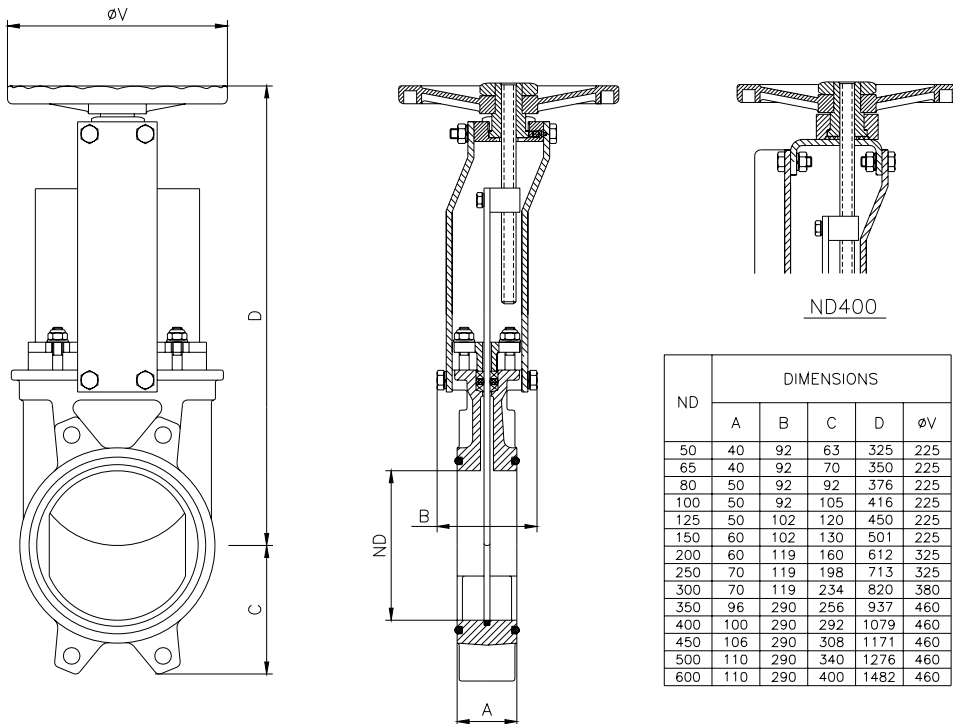
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## GENERAL DIMENSIONS: HANDWHEEL – RISING STEM



DN	DIMENSIONS					
	A	B	C	D	φV	Hv
50	40	92	63	289	185	409
65	40	92	70	316	185	436
80	50	92	92	342	185	462
100	50	92	105	382	185	502
125	50	102	120	415	225	585
150	60	102	130	458	225	637
200	60	119	160	575	325	815
250	70	119	198	676	325	1016
300	70	119	234	776	380	1116
350	96	290	256	906	450	1336
400	100	290	292	1012	450	1442
450	106	290	308	1098	450	1628
500	110	290	340	1210	450	1740
600	110	290	400	1416	450	2046

## GENERAL DIMENSIONS: HANDWHEEL – NON RISING STEM

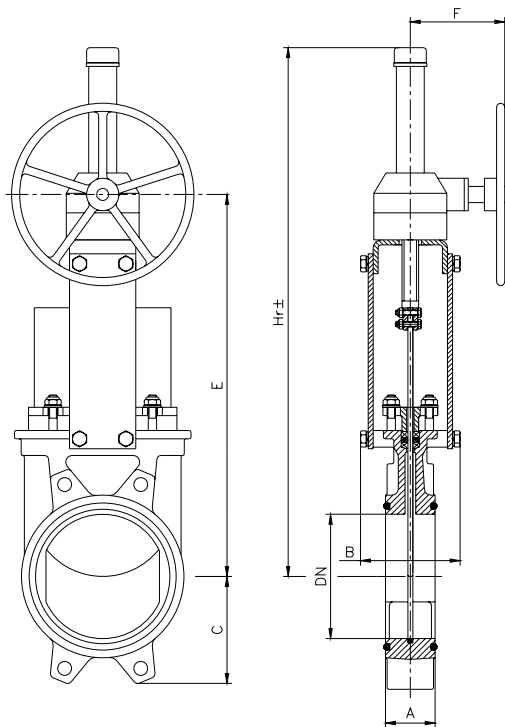


ND	DIMENSIONS					
	A	B	C	D	φV	
50	40	92	63	325	225	
65	40	92	70	350	225	
80	50	92	92	376	225	
100	50	92	105	416	225	
125	50	102	120	450	225	
150	60	102	130	501	225	
200	60	119	160	612	325	
250	70	119	198	713	325	
300	70	119	234	820	380	
350	96	290	256	937	460	
400	100	290	292	1079	460	
450	106	290	308	1171	460	
500	110	290	340	1276	460	
600	110	290	400	1482	460	

**KNIFE GATE VALVES -- MODEL AB**

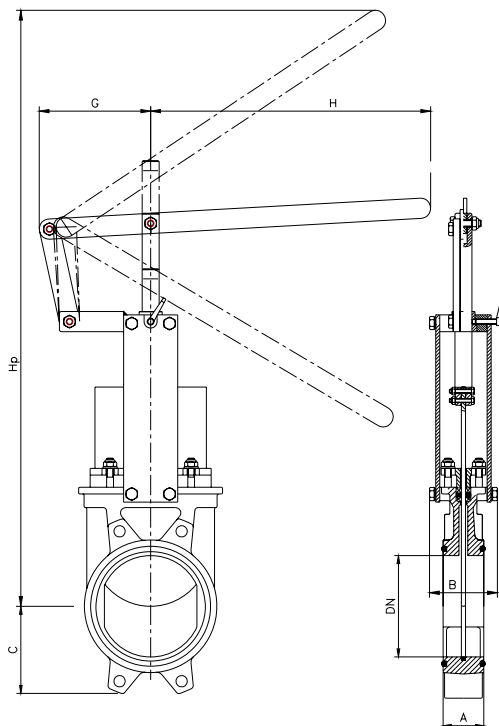
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**GENERAL DIMENSIONS: GEAR BOX – RISING STEM (non rising stem also available)**



DN	DIMENSIONS					
	A	B	C	E	F	Hr
50	40	92	63	339	198	489
65	40	92	70	366	198	516
80	50	92	92	392	198	542
100	50	92	105	432	198	582
125	50	102	120	465	198	615
150	60	102	130	517	198	686
200	60	119	160	622	198	911
250	70	119	198	723	198	1012
300	70	119	234	823	198	1112
350	96	194	256	890	218	1279
400	100	194	292	996	218	1385
450	106	290	308	1082	218	1671
500	110	290	340	1194	218	1783
600	110	290	400	1400	218	1989

**GENERAL DIMENSIONS: MANUAL LEVER**

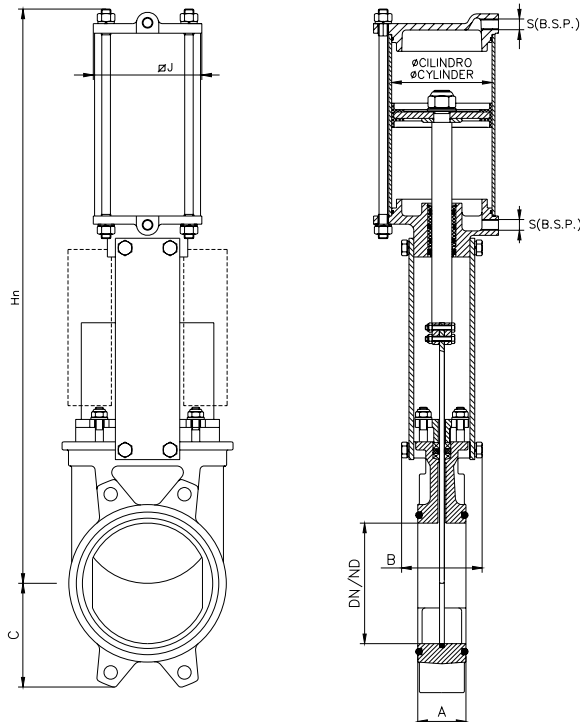


DN	DIMENSIONS					
	A	B	C	G	H	Hp
50	40	92	63	165	315	389
65	40	92	70	165	315	436
80	50	92	92	165	315	507
100	50	92	105	165	315	614
125	50	102	120	165	415	725
150	60	102	130	165	415	851
200	60	119	160	290	620	1098
250	70	119	198	290	620	1345
300	70	119	234	290	620	1594

**KNIFE GATE VALVES -- MODEL AB**

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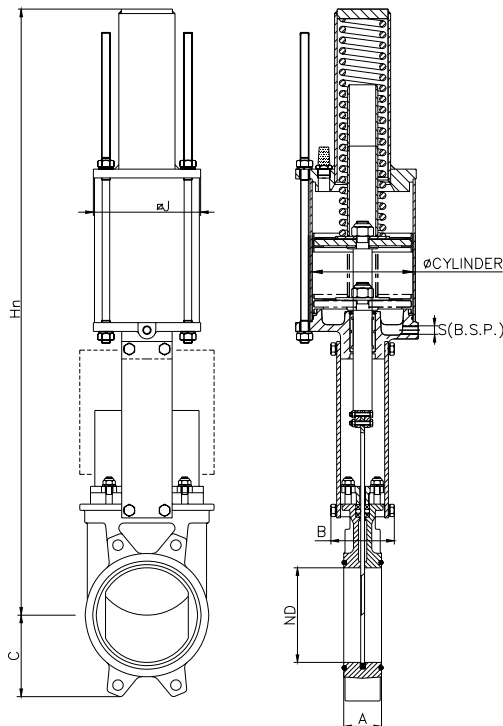
**GENERAL DIMENSIONS: PNEUMATIC DOUBLE ACTING (air supply pressure: 6 kg/cm<sup>2</sup>)**



DN	DIMENSIONS						
	A	B	C	ø CYLINDER	S B.S.P.	ø J	Hn
50	40	92	63	80	1/4"	96	400
65	40	92	70	80	1/4"	96	442
80	50	92	92	80	1/4"	96	484
100	50	92	105	100	1/4"	115	546
125	50	102	120	125	1/4"	138	630
150	60	102	130	125	1/4"	138	692
200	60	119	160	160	1/4"	175	869
250	70	119	198	200	3/8"	218	1032
300	70	119	234	200	3/8"	218	1181
350	96	290	256	250	3/8"	270	1379
400	100	290	292	250	3/8"	270	1535
450	106	290	308	300	1/2"	382	1677
500	110	290	340	300	1/2"	382	1839
600	110	290	400	300	1/2"	382	2145

**GENERAL DIMENSIONS: PNEUMATIC SINGLE ACTING (air supply pressure: 6 kg/cm<sup>2</sup>)**

**SPRING TO CLOSE (spring to open also available)**



ND	DIMENSIONS						
	A	B	C	ø CYLINDER	S B.S.P.	ø J	Hn
50	40	92	63	125	1/4"	135	781
65	40	92	70	125	1/4"	135	806
80	50	92	92	125	1/4"	135	833
100	50	92	105	125	1/4"	135	873
125	50	102	120	160	1/4"	170	909
150	60	102	130	160	1/4"	170	960
200	60	119	160	200	3/8"	215	1355
250	70	119	198	250	3/8"	270	1451
300	70	119	234	250	3/8"	270	1551

## KNIFE GATE VALVES -- MODEL AB

DOC. AB.05/08

As standard the CMO double acting and single acting actuators are designed to work between 6 and 10 Kg/cm<sup>2</sup> air supply pressure.

10 Kg/cm<sup>2</sup> is the maximum allowed air supply pressure. When the air supply pressure is less than 6 Kg/cm<sup>2</sup> the actuator is oversized.

### Double acting actuator:

For valves of diameter DN50 up to DN200 the cylinder jacket and the caps are in aluminium, the piston rod in AISI304, the cylinder piston in steel covered by nitrile and the o-rings in nitrile.

For valves bigger than DN200 the caps are manufactured in nodular cast iron or carbon steel.

The actuator can be manufactured fully in stainless steel under request and specially for very corrosive ambient.

### Single acting actuator:

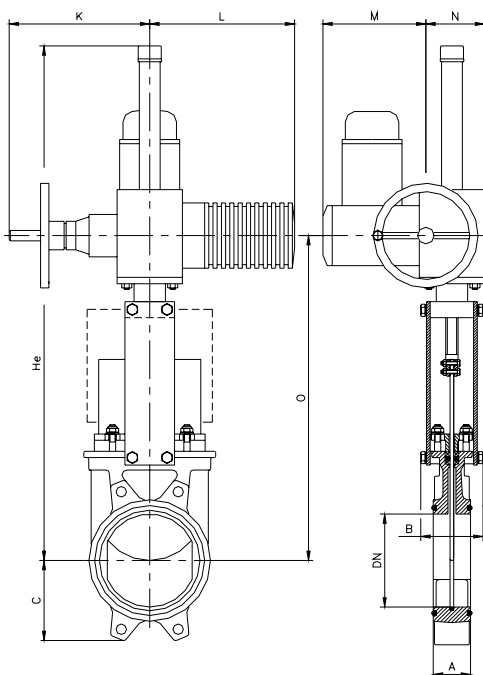
Fail close or fail open single actuators are available (spring to close or spring to open).

For all size of valves the cylinder jacket is manufactured in aluminium, the caps are in cast iron or carbon steel, the piston rod in AISI304, the cylinder piston in steel covered by nitrile, the o-rings in nitrile and the spring in steel.

The single acting actuator with spring design is manufactured for valves up to DN300. For bigger sizes a double acting actuator is supplied including an air tank. This is tank keeps inside the necessary air volume to make the last stroke of movement in case of fail.

 **Note:** Please read the "CMO pneumatic actuators" catalogue for more information.

### GENERAL DIMENSIONS: ELECTRIC ACTUATOR – RISING STEM (non rising stem also available)

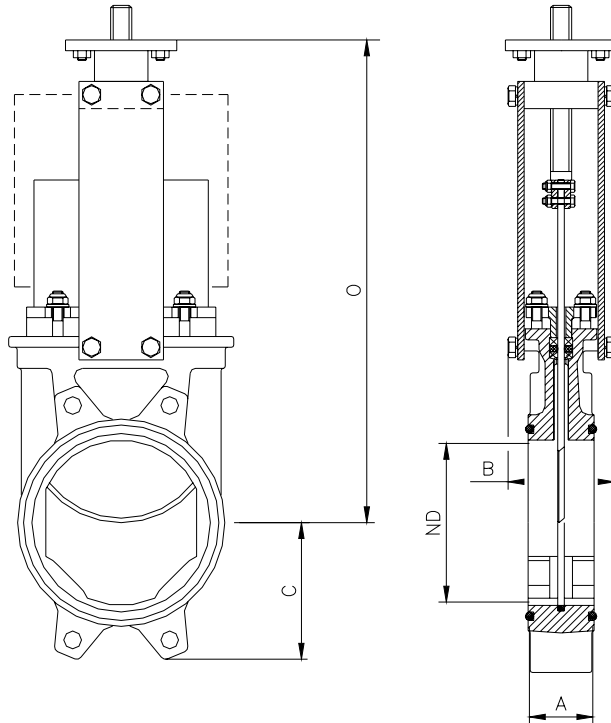


DN	DIMENSIONES								
	A	B	C	K	L	M	N	O	He
50	40	92	63	234	265	197	102	347	587
65	40	92	70	234	265	197	102	374	614
80	50	92	92	234	265	197	102	400	640
100	50	92	105	234	265	197	102	440	680
125	50	102	120	234	265	197	102	473	713
150	60	102	130	234	265	197	102	525	765
200	60	119	160	234	265	197	102	640	880
250	70	119	198	234	265	197	102	741	981
300	70	119	234	234	265	197	102	841	1141
350	96	194	256	256	282	197	115	944	1374
400	100	194	292	256	282	197	115	1050	1550
450	106	290	308	325	385	222	153	1147	1847
500	110	290	340	325	385	222	153	1259	1959
600	110	290	400	325	385	222	153	1465	2165

**KNIFE GATE VALVES -- MODEL AB**

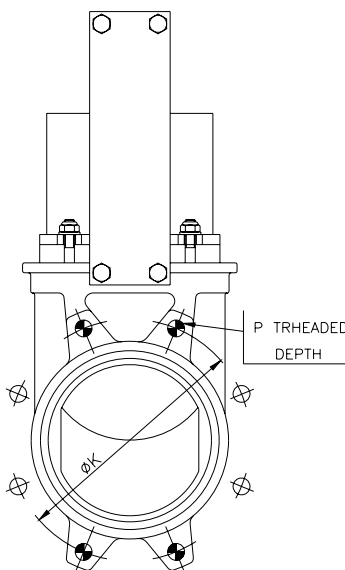
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**GENERAL DIMENSIONS: ADAPTER FOR ELECTRIC ACTUATOR – RISING STEM (non rising stem also available)**



ND	DIMENSIONS			
	A	B	C	O
50	40	92	63	279
65	40	92	70	306
80	50	92	92	332
100	50	92	105	372
125	50	102	120	405
150	60	102	130	457
200	60	119	160	564
250	70	119	198	665
300	70	119	234	763
350	96	194	256	807
400	100	194	292	913
450	106	290	308	999
500	110	290	340	1149
600	110	290	400	1355

**FLANGE CONNECTION DETAILS**



FLANGE DETAIL										
DN	DIN PN10					ANSI150				
	⊕	○	M Metric	P	øK	⊕	○	R UNC	P	øK
50	4		M.16	8	125	4		5/8"	8	120'6
65	4		M.16	8	145	4		5/8"	8	139'7
80	4	4	M.16	9	160	4		5/8"	9	152'4
100	4	4	M.16	9	180	4	4	5/8"	9	190'5
125	4	4	M.16	9	210	4	4	3/4"	9	215'9
150	4	4	M.20	10	240	4	4	3/4"	10	241'3
200	4	4	M.20	10	295	4	4	3/4"	10	298'4
250	6	6	M.20	12	350	6	6	7/8"	12	361'9
300	6	6	M.20	12	400	6	6	7/8"	12	431'8
350	10	6	M.20	21	460	8	4	1"	21	476'2
400	10	6	M.24	21	515	10	6	1"	21	539'7
450	14	6	M.24	22	565	10	6	1 1/8"	22	577'8
500	14	6	M.24	22	620	14	6	1 1/8"	22	635
600	14	6	M.27	22	725	14	6	1 1/4"	22	749'3