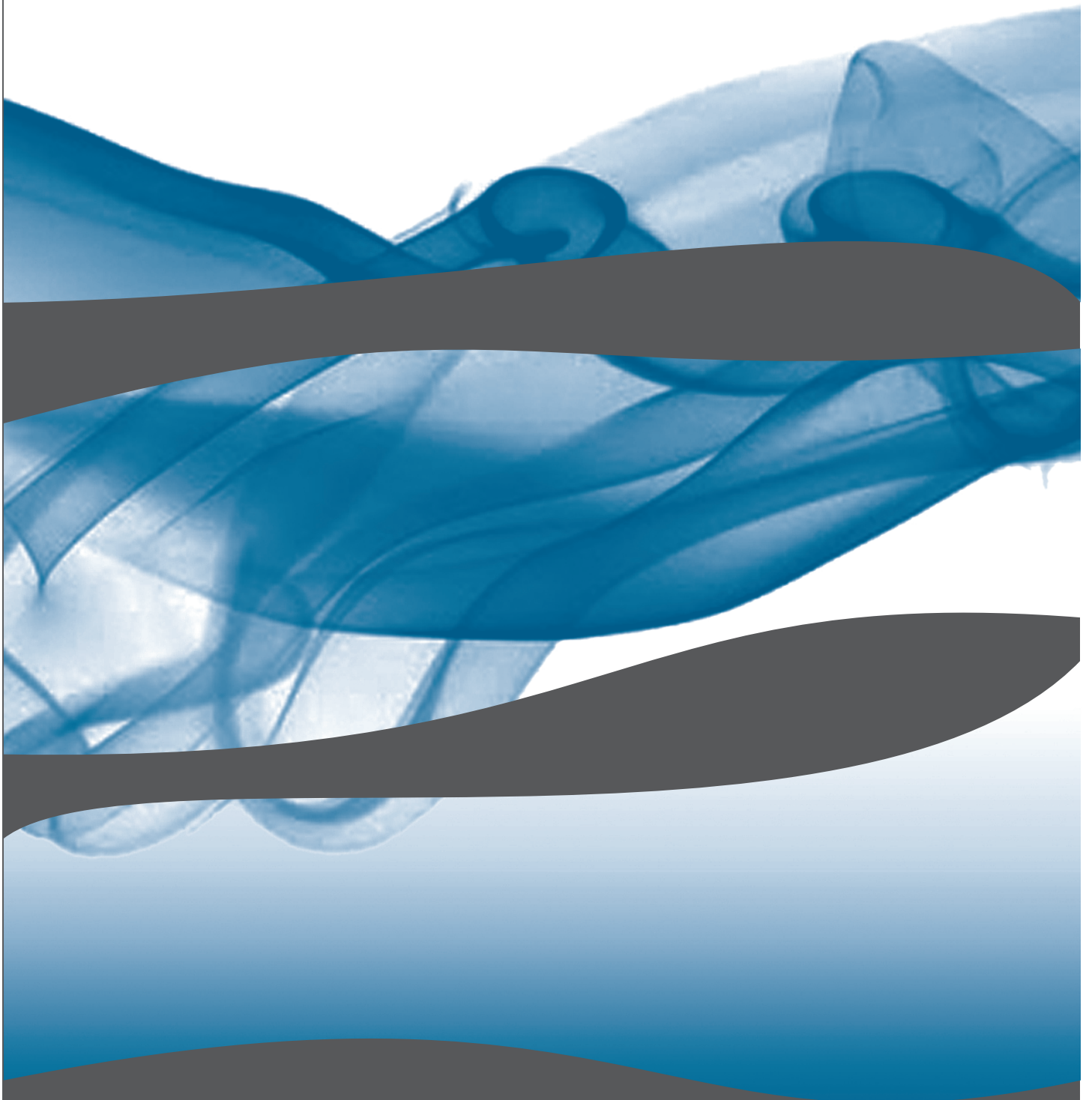




KNIFE GATE
VALVES. RBR 



Contents

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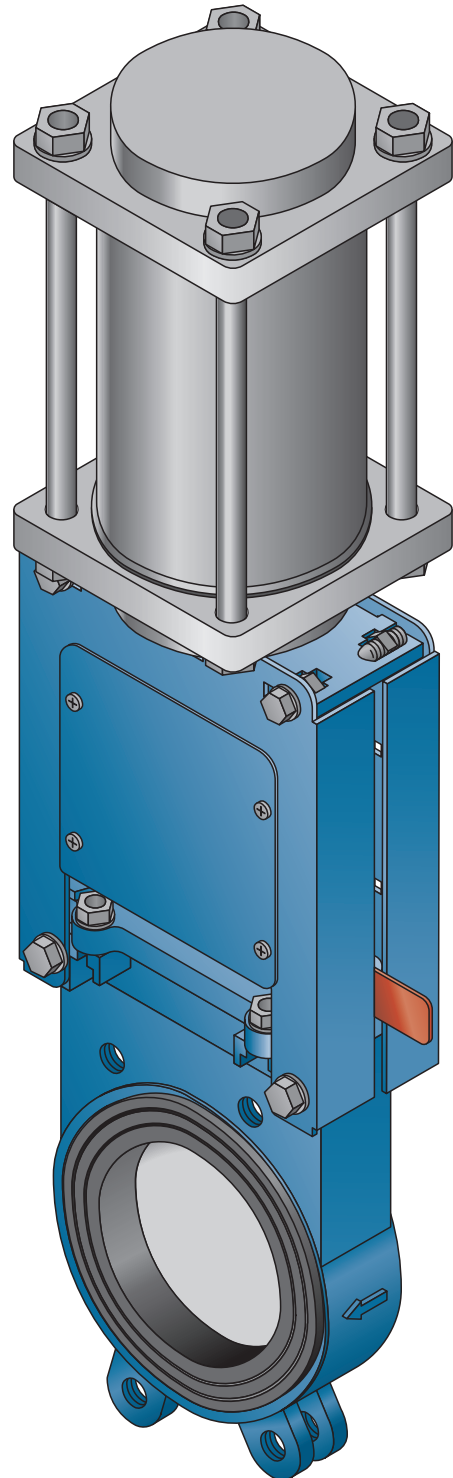
2. Technical features

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1. General features

The RBR-HC model is a wafer-style valve. It is generally used for fluids, although it is also suitable for use in piping carrying liquids that contain suspended solids.

Some of the main areas of application are:

- Paper/cellulose industry (pulp, mechanical pulp, etc.).
- Environment (waste water, mud, ash, ventilation circuits, etc.).
- Chemical industry (viscous pulps, powder, granules, etc.).
- Food industry (washing facilities, silos, etc.).
- Metal/glass/cement/mining industries (silos, abrasive products, etc.).

1.1. Installation and service instructions

1.1.1. Handling

Do not pick up the valve by the protection or operation drive or actuator. They have not been designed to deal with weight and can easily be damaged.

Do not pick up the valve by the opening. This can damage the seat's surface and the seals or gaskets.

Use lifting eye bolts screwed into the threaded bore holes on the body of the valve. You are also advised to use slings to lift the valve during installation. These slings must be placed on the upper part of the body of the valve.

1.1.2. Flow direction and position

The standard valve is unidirectional, they may also be manufactured to be bidirectional. In any case, the direction of the fluid is shown on the body.

The unidirectional valve must be installed so that the highest pressure is exerted on the seat. It is important to remember that the flow direction is not necessarily the same as the pressure direction.

The valve must preferably be set up in a vertical position in a horizontal pipe, providing this is possible in the given facilities. Avoid installing the valve with the operation drive at the bottom. However, the valve can be assembled in any position around the pipe (please check with our technical department first).

1.1.3. Assembly

During the assembly process, it is important to avoid resting the weight on the pipe and any mechanical stress directly onto the valve.

Preparation

Before fixing the valve to the pipe, check to make sure that it has not suffered any damage during transport or storage. Also make sure that the interior of the body is clean, particularly in the seat area.

Check that flanges and flange seals are the most suitable in each case, paying special attention to keeping the correct distance between flanges, and ensuring they are aligned and parallel with the pipe.

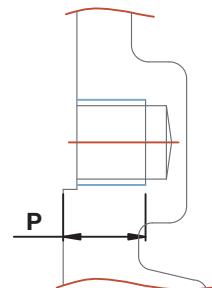
Incorrect positioning can cause deformations on the body of the valve, making it difficult to work properly or even preventing their functionality.

Fixing to the pipe

Make sure the parts attached to the valve (flanges, seals, pipe...) are all clean and check the fluid flow direction.

We recommend you fix threaded rods and nuts, instead of screws, on the threaded blind holes fixing the body to the flange, to prevent their thread from deteriorating when tightened (in the event that the screws are too long). The connection will be made with the most suitable screws in diagonal and without over-tightening.

The table below shows the required tightening torques as well as the maximum distance to insert in the blind bore holes.



DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1,000
P	8	8	9	9	9	10	10	12	12	21	21	22	22	20	20	20	18	18
t	6	6	6	6	7	7	7	11	11	15	15	19	19	23	23	28	28	34

DN Nominal Diameter / **P** Maximum insertion distance in mm. / **t** Tightening torque in Kg.m.

The manufacturer reserves the right to make changes without prior notification.

1.1.4. Warnings



Pneumatic

The valve is supplied with a standard double acting cylinder, with the option of supplying single acting cylinders on request. In both cases, the supply pressure may vary between 3.5 and 10 bar, with the cylinder size having been designed for a supply pressure of 6 bar.

You are advised to use dried, filtered and lubricated pilot air at 6 nominal bar (maximum 10 bar) to get the best out of both the valve and the cylinder, as regards operation and duration.

Electric

Motorisation by servomotor with a declutchable safety handwheel. The motor's opening and closing run limits, as well as the torque limiters, will be regulated on our premises and must not be manipulated thereafter.

The torque limiters' electrical connection is absolutely necessary to be able to offer all our guarantees.

Before any connection, verify the motor's supply voltage.

The instructions sheet and the connection diagram are inside the servomotor's connection box.

NOTE: In all cases, the pneumatic or electric connection must be carried out after all assembly operations have been completed, and after ensuring that there is no risk involved.

Warning. Is user responsibility to verify the compatibility of the fluid in the service conditions with the valve construction materials.

1.1.5. Before and during start-up

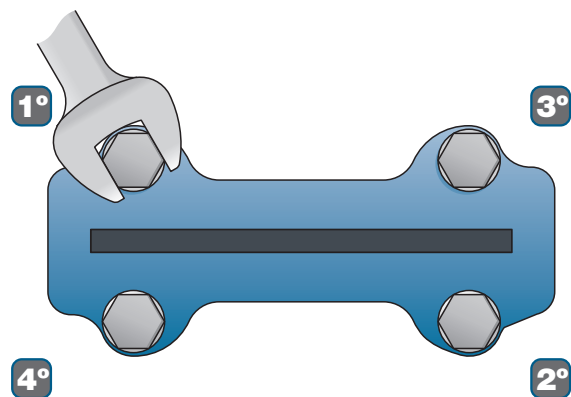
Before pressurising the pipe, you must progressively retighten the screws on the cable gland, in diagonal, as shown in the figure, being careful not to overtighten, as the packing seat may cause minor leakage during the valve transport/storage process.

If you overtighten the packing gland, the necessary force to activate the valve is increased, which makes it difficult to operate and reduces the useful life of the packing.

In any case, the following table shows the maximum tightening torque permitted for each DN.

DN	50-100	125-200	250-1,000
t	20	30	35

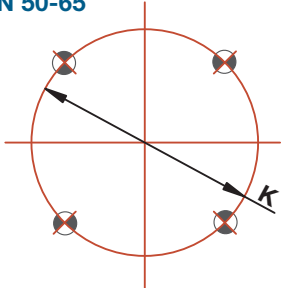
DN Nominal Diameter / t Tightening torque in Kg.m.



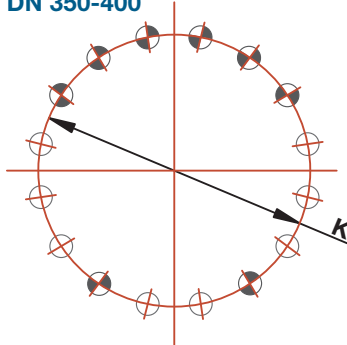
In the event of a leak in the packing gland during start-up, progressively tighten each of the screws in a diagonal and alternate way, as shown in the picture, and wait 30 minutes. Repeat if necessary until the leak has disappeared, at which point you should stop tightening.

1.1.6. DIN PN10 flange dimensions

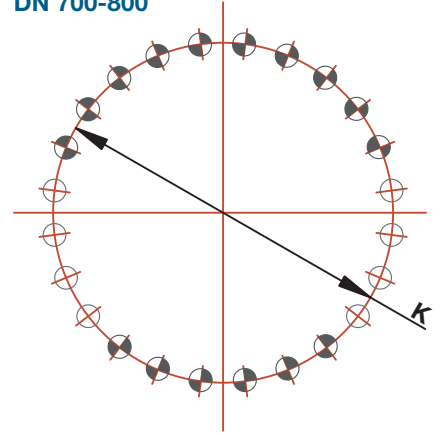
DN 50-65



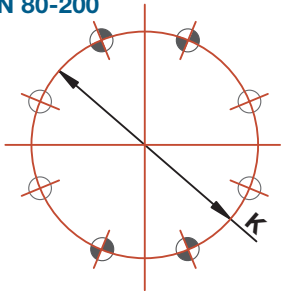
DN 350-400



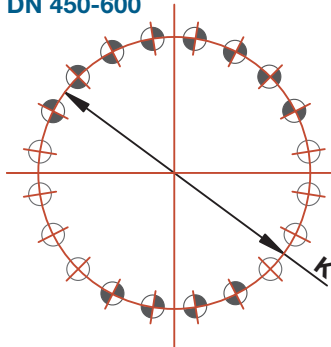
DN 700-800



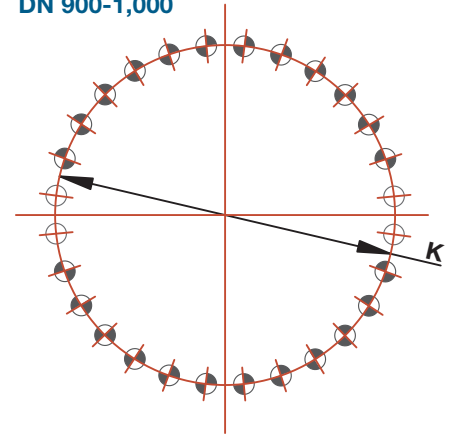
DN 80-200



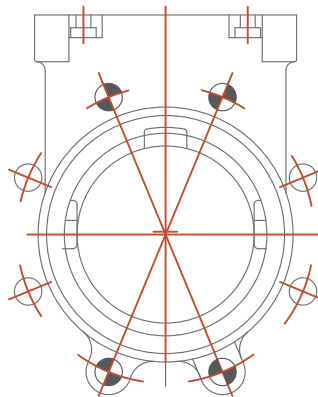
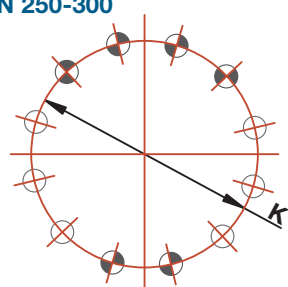
DN 450-600



DN 900-1,000



DN 250-300



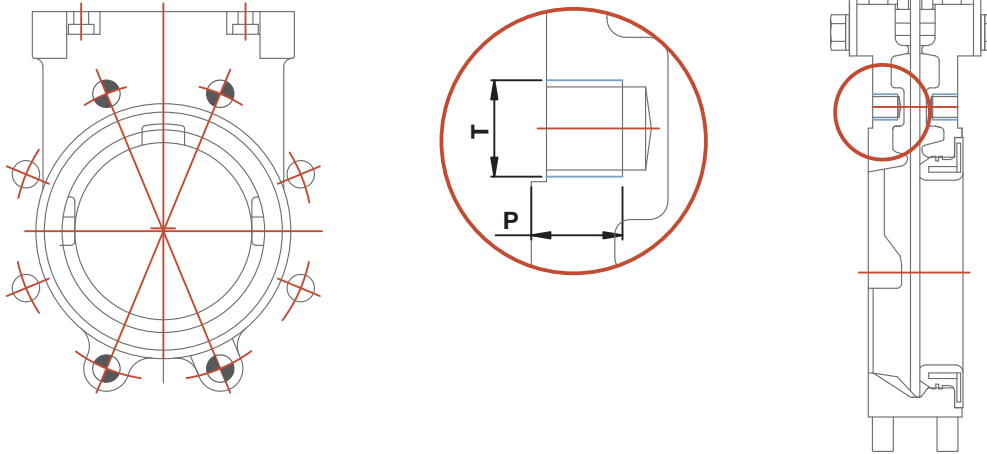
Z No. of bore holes, flange PN10

 Threaded blind bore holes

 Through bolts

K Diameter

1.1.6. DIN PN10 flange dimensions



DN	K	Z	⊕	○	T	D
50	125	4	4	-	M-16	8
65	145	4	4	-	M-16	8
80	160	8	4	4	M-16	9
100	180	8	4	4	M-16	9
125	210	8	4	4	M-16	9
150	240	8	4	4	M-20	10
200	295	8	4	4	M-20	10
250	350	12	6	6	M-20	12
300	400	12	6	6	M-20	12
350	460	16	8	8	M-20	21
400	515	16	8	8	M-24	21
450	565	20	12	8	M-24	22
500	620	20	12	8	M-24	22
600	725	20	12	8	M-27	20
700	840	24	16	8	M-27	20
800	950	24	16	8	M-30	20
900	1,050	28	24	4	M-30	18
1,000	1,160	28	24	4	M-33	18

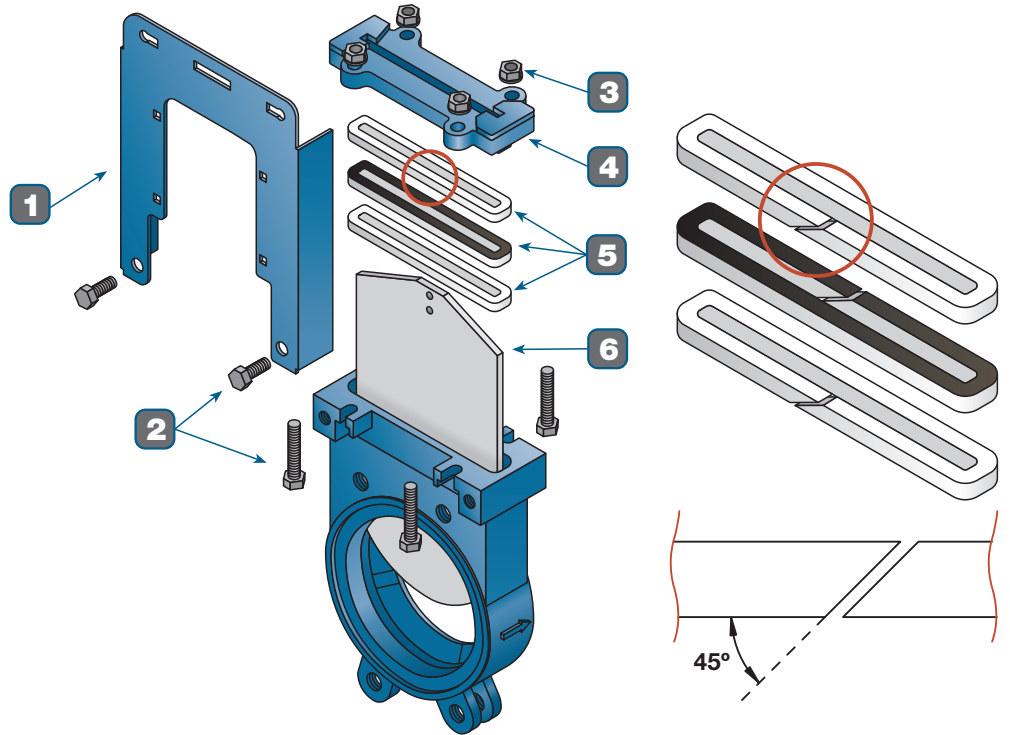
DN Nominal Diameter / **K** Diameter / **Z** No. of bore holes /
 ⊕ Threaded blind bore holes / ○ Through bolts / **T** Thread /
D Depth

The manufacturer reserves the right to make changes without prior notification.

1.2. Maintenance

1.2.1. Changing the packing

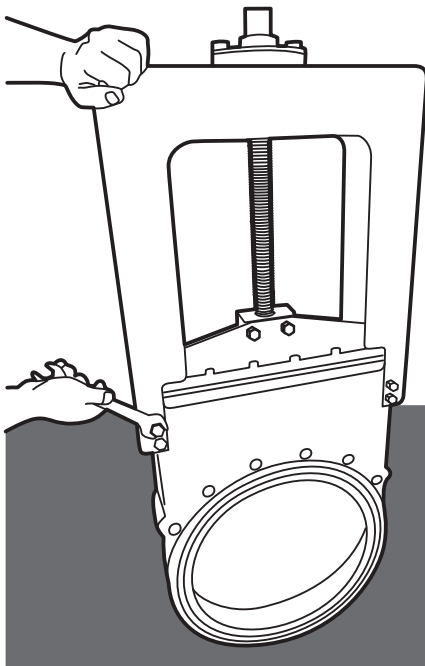
- 1** Support case
- 2** Screws
- 3** Nuts and bearings
- 4** Packing gland
- 5** Packing
- 6** Gate



To change the packing, please follow the steps below:

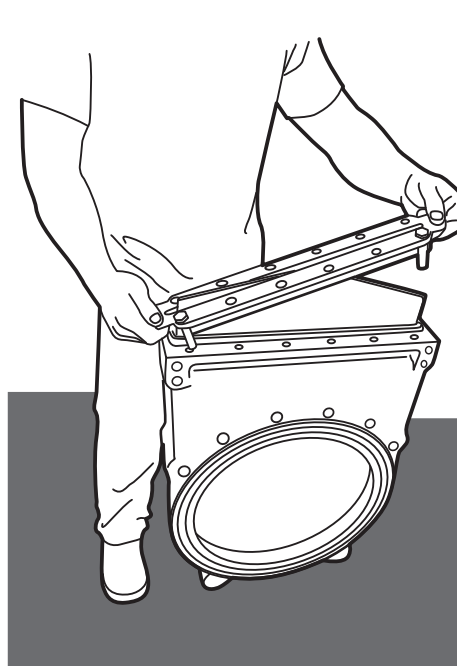
A

Dismantle and remove the support case set (1) releasing the screws (2) that fasten it to the body and releasing the screws that keep the gate (6) fastened to the shaft.



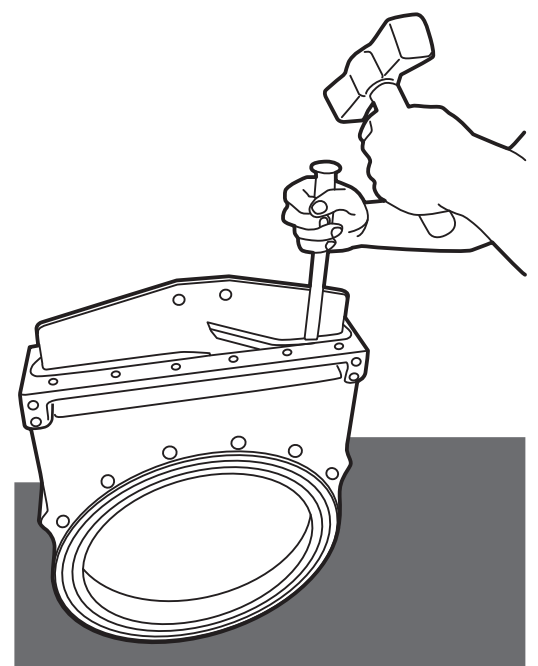
B

Lift the packing gland (4) and remove the packing (5) to be replaced.



C

Insert the new packing and adjust. Put back the packing gland (4) and insert the screws (2), nuts and bearings (3).



The manufacturer reserves the right to make changes without prior notification.

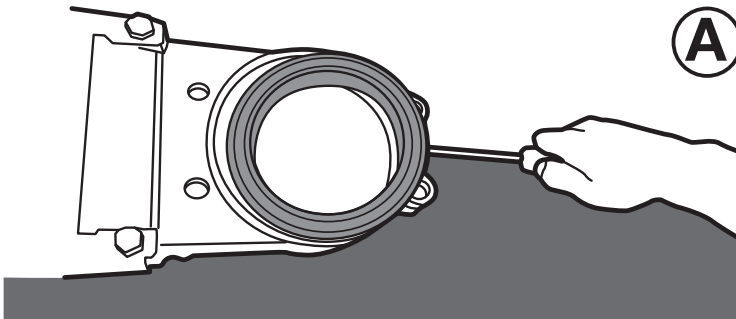
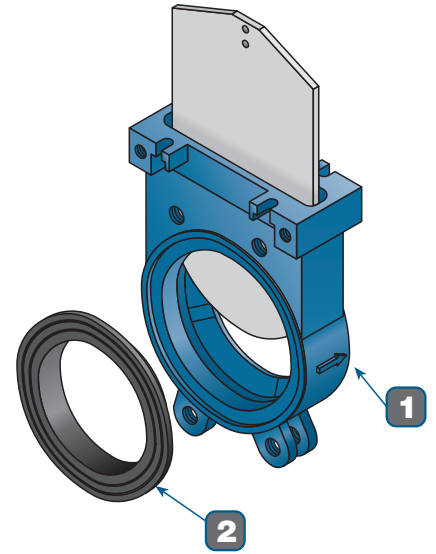
1.2. Maintenance

1.2.2. Changing the seat

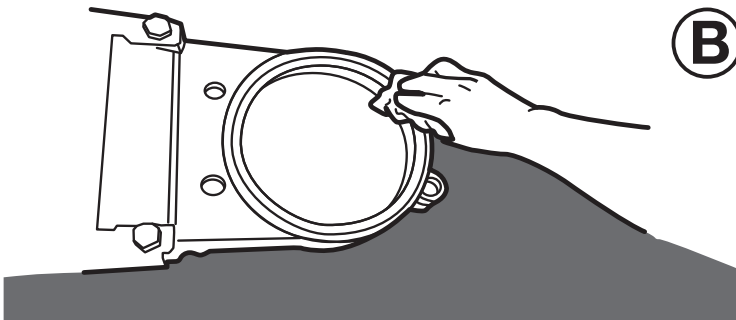
1 Body

2 Seat

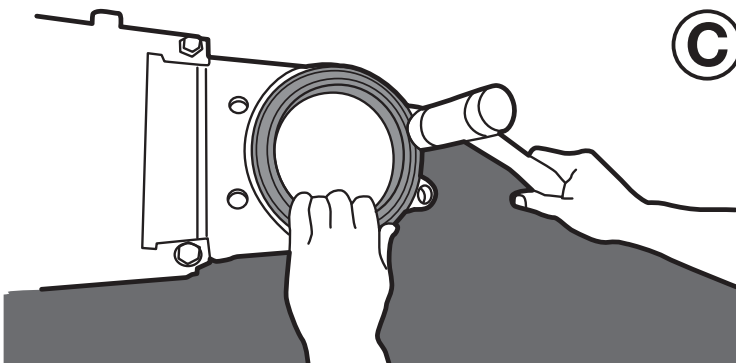
To change the seat, please follow the steps below:



A Dismantle the seat with a screwdriver.



B Clean the base of the body where the new seat will be placed.



C Assemble the new seat, pressing down with a plastic hammer.

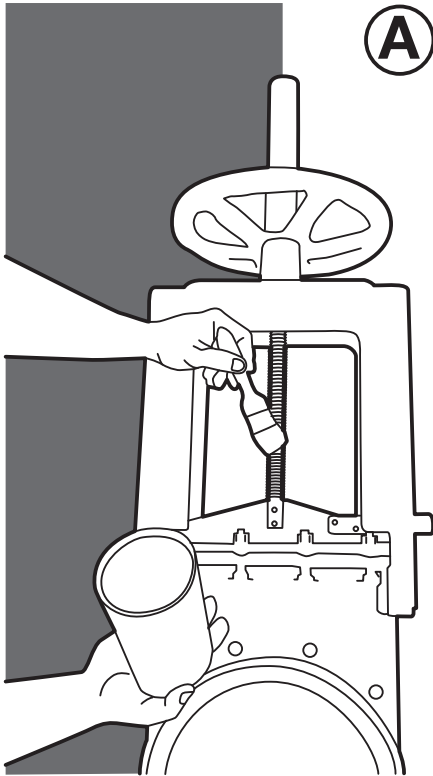
The manufacturer reserves the right to make changes without prior notification.



1.2. Maintenance

1.2.3. Lubrication

In manual drive valves, you should grease the stem at least once a year.





1.3. EC Directives

1. Machines Directive: DIR 2006/42/CE

2. Pressure Equipment Directive (PED): DIR 2014/68/EU

The RBR-HC knife gate valves for Group 1 fluids (dangerous) and Group 2 fluids (not dangerous) in accordance with the tables below meet the requirements of EUROPEAN DIRECTIVE PED2014/68/EU regarding pressure equipment according to Module A.

GROUP 1

DN	MWP	CAT
50	10	I
65	10	I
80	10	I
100	10	I

GROUP 2

DN	MWP	CAT
125	10	I
150	10	I
200	10	I
250	10	I
300	6	I
350	5	I
400	5	I
500	4	I
600	3	I

DN Nominal Diameter in mm.

MWP Maximum working pressure in bar.

CAT Category

3. Directive concerning Equipment and Protective Systems intended for Use in Potentially Explosive Atmospheres (ATEX): DIR 2014/34/EU

The RBR HC knife gate valves with pneumatic and hydraulic drives meet the requirements of the ATEX Directive 2014/34/EU on the equipment and protective systems intended for use in potentially explosive atmospheres, in accordance with GROUP II, CATEGORY 3, ZONES 2 and 22.

2. Technical features

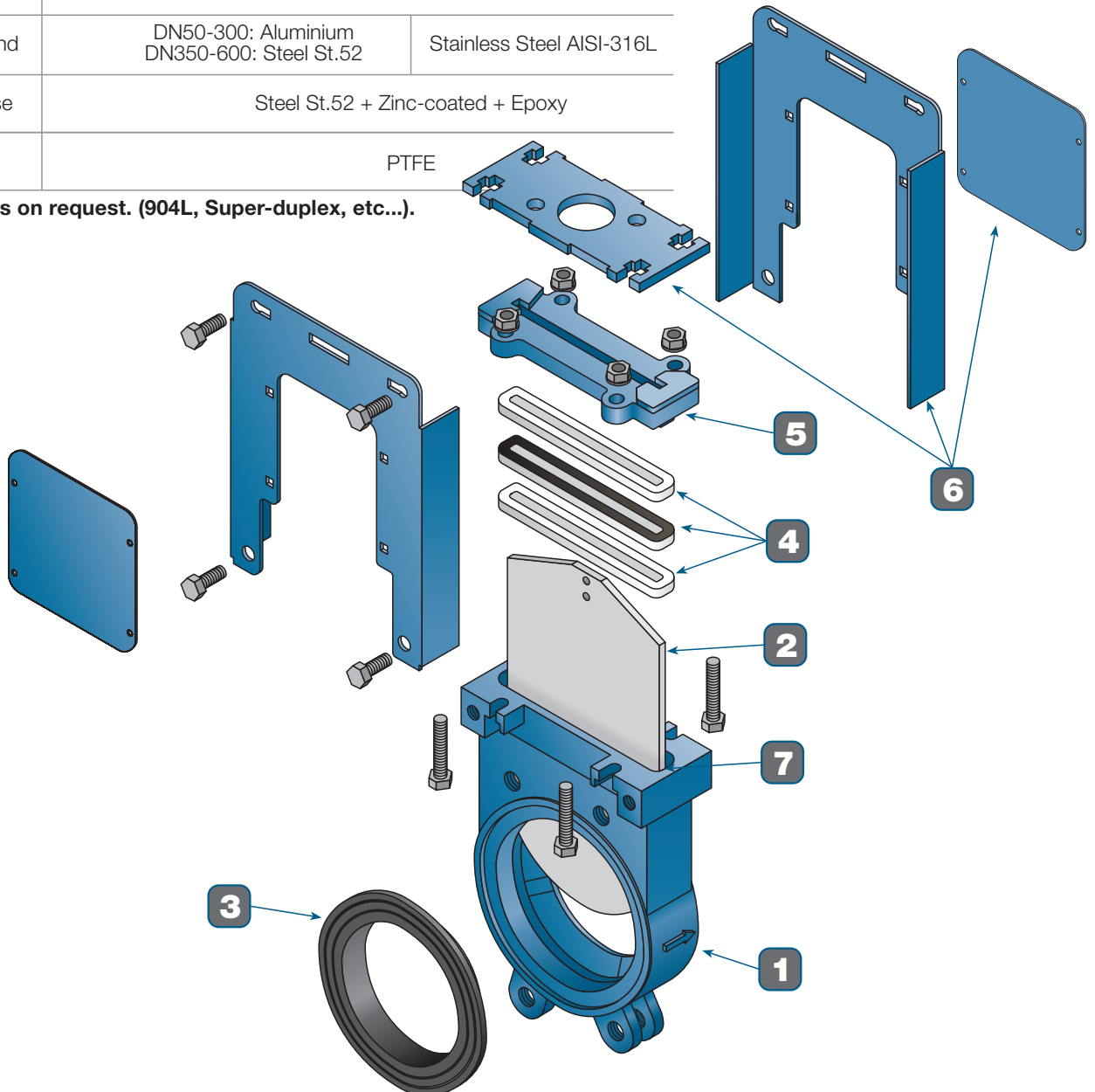
2.1. Construction and Terminology

2.1.1. Description and Materials

The HC-type knife gate valve is a one-way valve with a wafer-style design.

DESCRIPTION	EN-GJS-400	CF8M
1 Body	EN-GJS-400 Cast Iron + Epoxy	CF8M Stainless Steel
2 Gate	Stainless Steel AISI-304L	Stainless Steel AISI-316L
3 Seat	Metal, Butyl, NBR, EPDM, PTFE, etc	
4 Packing	Teflon-coated cotton + Elastomer seal (NBR, EPDM)	
5 Packing gland	DN50-300: Aluminium DN350-600: Steel St.52	Stainless Steel AISI-316L
6 Support case	Steel St.52 + Zinc-coated + Epoxy	
7 Inner guide	PTFE	

* Other materials on request. (904L, Super-duplex, etc...).



The manufacturer reserves the right to make changes without prior notification.



1 Body

The body is made of cast iron in EN-GJS-400 (painted with epoxy protection in RAL 5017) or in CF8M.

It comes with the sides highlighted to be placed between flanges. It has inner guides to ensure closure between the gate and the sealing gasket.

It can be supplied in other materials on request.

2 Gate

The standard manufacturing materials are stainless steel AISI304L in valves with the body in cast iron (EN-GJS-400) and stainless steel AISI316L in valves with the body in CF8M. For other materials or combinations, please check.

The gate is polished on both sides to provide a smooth, even contact surface with the sealing gasket.

There are different degrees of polishing available, as well as a range of anti-abrasion treatments and modifications to adapt to the specific requirements of special facilities.

3 Seat

This part ensures the valve is 100% sealed.

The standard seal is made using a metal ring that is vulcanised with different types of elastomers, depending on its application.

BUTYL

This is the standard seat. It can be used in a wide range of applications.

NBR

Suitable for fluids containing grease or oil at temperatures no higher than 100°C.

EPDM

Generally used for water and water-diluted products at temperatures no higher than 100°C. It can also be used with abrasive products.

VITON

Suitable for corrosive applications and for high temperatures up to 190°C continually and for peaks up to 220°C.

SILICONE

Mainly used in the food industry and for pharmaceutical products with temperatures no higher than 250°C.

PTFE

It is not constructed with the inner metal ring. Suitable for corrosive applications and also for the food industry.

OTHER

The seat can be supplied in different types of elastomers on request.

COMPARISON TABLE OF RUBBER TEMPERATURES:

Elastomers	Min. temp.	Max. temp.
Butyl	-15	130
NBR	-20	100
EPDM	-25	100
Viton	-5	220
Silicone	-40	250

Temperatures in °C.

4 Packing

The standard used is braided packing using high quality acrylic threads that have been impregnated with PTFE and a silicone-free running-in lubricant, which makes it highly durable and resistant to temperatures up to 250°C.

Includes an Elastomer seal.

There is a wide range of tows available for specific applications that can be supplied on request.

5 Packing gland

The valve with the body in cast iron (EN-GJS-400) is supplied with a packing gland in aluminium up to Dn 300 and in highly resistant machine-welded carbon steel from Dn 350.

For the valve with the body in CF8M, the packing gland is supplied in machine-welded stainless steel.

6 Support case

Designed in a U shape for greater resistance and manufactured in carbon steel with a zinc-plated treatment that is subsequently coated in Epoxy paint in RAL 5017.

The support case can also be supplied entirely manufactured in stainless steel on request.

7 Inner guide

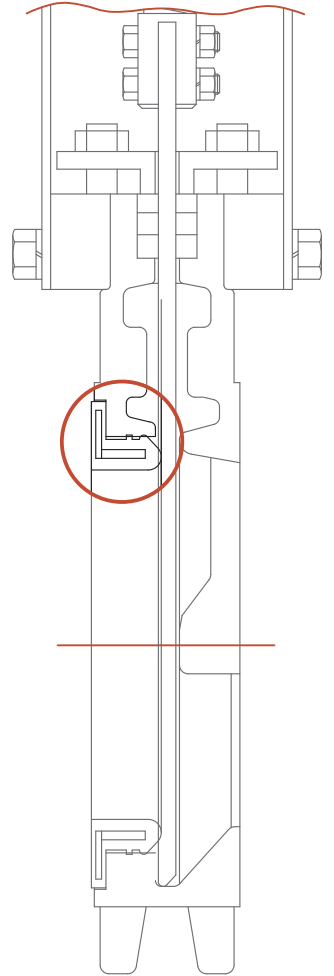
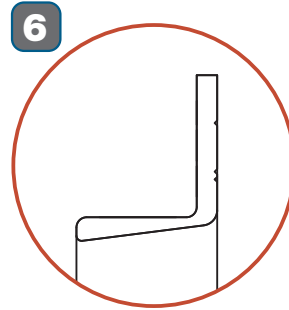
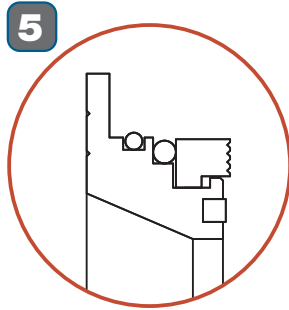
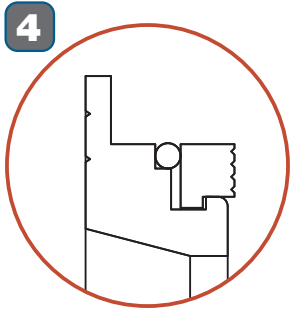
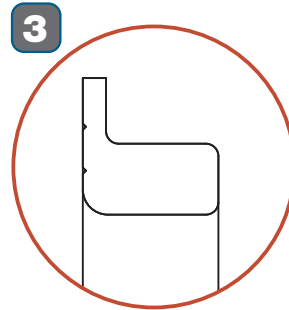
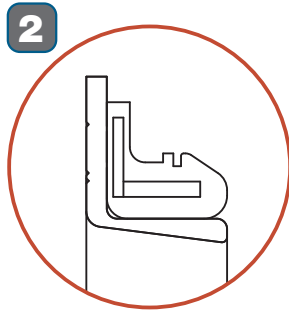
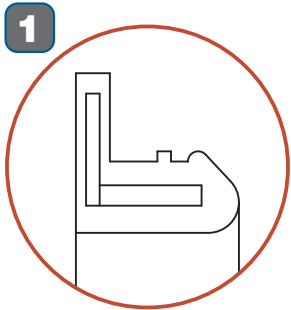
The gate slides inside by means of delrin guides that protect the gate and help to keep it sealed, as it provides a greater contact

between the gate and the seat.

The manufacturer reserves the right to make changes without prior notification.

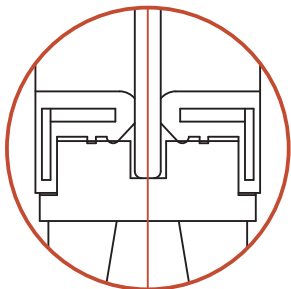
2.1.2. Types of closure

- 1** Seat
- 2** Seat + Scraper Deflector / Ref. 2310
- 3** M/M Metal-Metal Deflector / Ref. 2313
- 4** PTFE Deflector / Ref. 2317
- 5** S.L.R. Deflector / Ref. 2316
- 6** Cone Deflector. Opposite rubber side



Important

Valve can be bidirectional with any type of seat.



Sample of bidirectional tightness with two seats.

2.1.3. Options and accessories

Flushing holes

Locking devices

They lock the valve to prevent it from being unduly operated.

Manual emergency drives (handwheel, lever)

They enable the pneumatic valves to be manually handled in the event of failure or loss of pressure in the air system.

Columns and extensions

They make it easier to operate the valve in situations with complicated access.

Mechanical travel stops

Allow mechanical regulation of pneumatic cylinder.

Travel stop supports

They enable different types of detectors and positioners to be put into place.

Mechanical limits switches, inductive sensors and positioners

To indicate the precise or continual position of the valve.

Pneumatic distributors or electro-distributors

To distribute air to the pneumatic drives.

Mirror-polished gate

Particularly recommended for the food industry and, in general, for applications where the solids need to slide off and not get stuck to the gate.

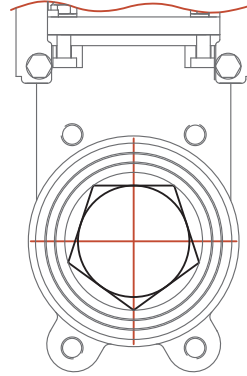
Hard chrome gate

Provides increased hardness and greater resistance to abrasion.

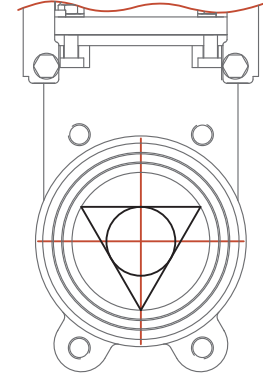
Bonnet

Provides a total seal against the outside, reducing the maintenance of the packing gland. (A special valve will need to be constructed. Please check with manufacturer).

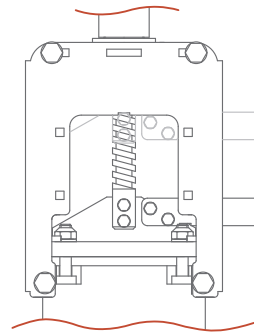
Flow controllers



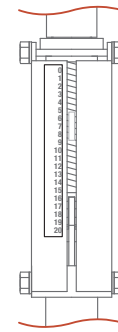
Pentagonal diaphragm



Triangular diaphragm

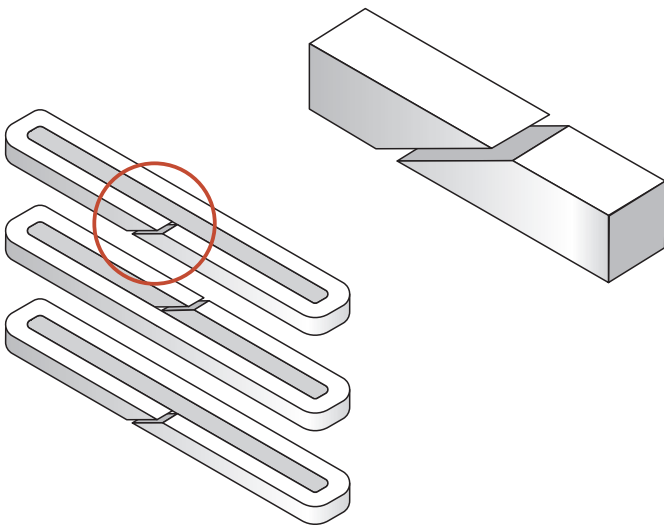
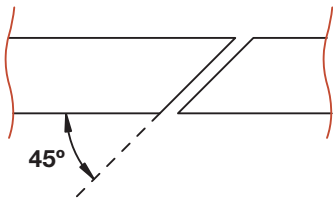


Graduated position indicator



2.1.3. Options and accessories

Packing types



STANDARD

Teflon-coated cotton packing

Braided packing with interwoven system based on high quality acrylic threads that have been impregnated with PTFE and a silicone-free running-in lubricant. Includes an Elastomer seal.

- pH range: 5-11
- Temperature range in °C: -100 +250

OPTIONS

Graphite cotton packing

Braided packing with interwoven system based on high quality acrylic threads that have been impregnated with high-performance grease and graphite.

- pH range: 4-10
- Temperature range in °C: -50 +250

Greased cotton packing

Braided packing with cotton threads, the mass of which has been impregnated with treated grease to prevent a loss of properties.

- pH range: 6-8
- Temperature range in °C: -20 +120

Teflon-coated cotton packing (food sector)

Braided packing with interwoven system based on expanded PTFE filaments that have been impregnated with PTFE diffusion, 100% Gore-Tex® fibre. This packing meets the standards for working in oxygen as well as in the food industry (FDA).

- pH range: 0-14
- Temperature range in °C: -100 +280

Carbon packing for high temperatures

Braided packing with interwoven system based on high quality carbon and finished with locking lubricants.

- pH range: 0-14
- Temperature range in °C: -100 +650

*Others on request



2.1.4. Maximum working pressures

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600
MWP	10	10	10	10	10	10	10	10	6	5	5	4	4	3

DN Nominal diameter in mm./ **MWP** Maximum working pressure in bar.

2.1.5. Weight

The table below shows the weights of the HC valve with VA and NDE drives at their different diameters.

DN	VA	NDE
50	7	10
65	8	11
80	9	13
100	10	15
125	15	20
150	19	24
200	25	36
250	39	52
300	53	69
350	77	93
400	119	153
450	165	192
500	185	216

DN Nominal Diameter in mm.

VA Weight in kg. of the HC valve with VA drive.

NDE Weight in kg. of the HC valve with NDE drive.



2.1.6. Pressure drops

DN	Kv	Cv
50	167	160
65	290	275
80	380	365
100	650	620
125	1,165	1,115
150	1,520	1,450
200	2,835	2,710
250	4,485	4,285
300	5,675	5,420
350	7,130	6,810
400	9,220	8,805
450	11,465	10,950
500	14,940	14,270
600	21,875	20,895

DN Nominal Diameter in mm.

$$Kv = Q \sqrt{\frac{d}{\Delta P}}$$

Kv Flow coefficient. Flow of water in m³/h. passing through the valve and generating a pressure drop of 1 bar.

$$\Delta P = \left(\frac{Q}{Kv} \right)^2 d$$

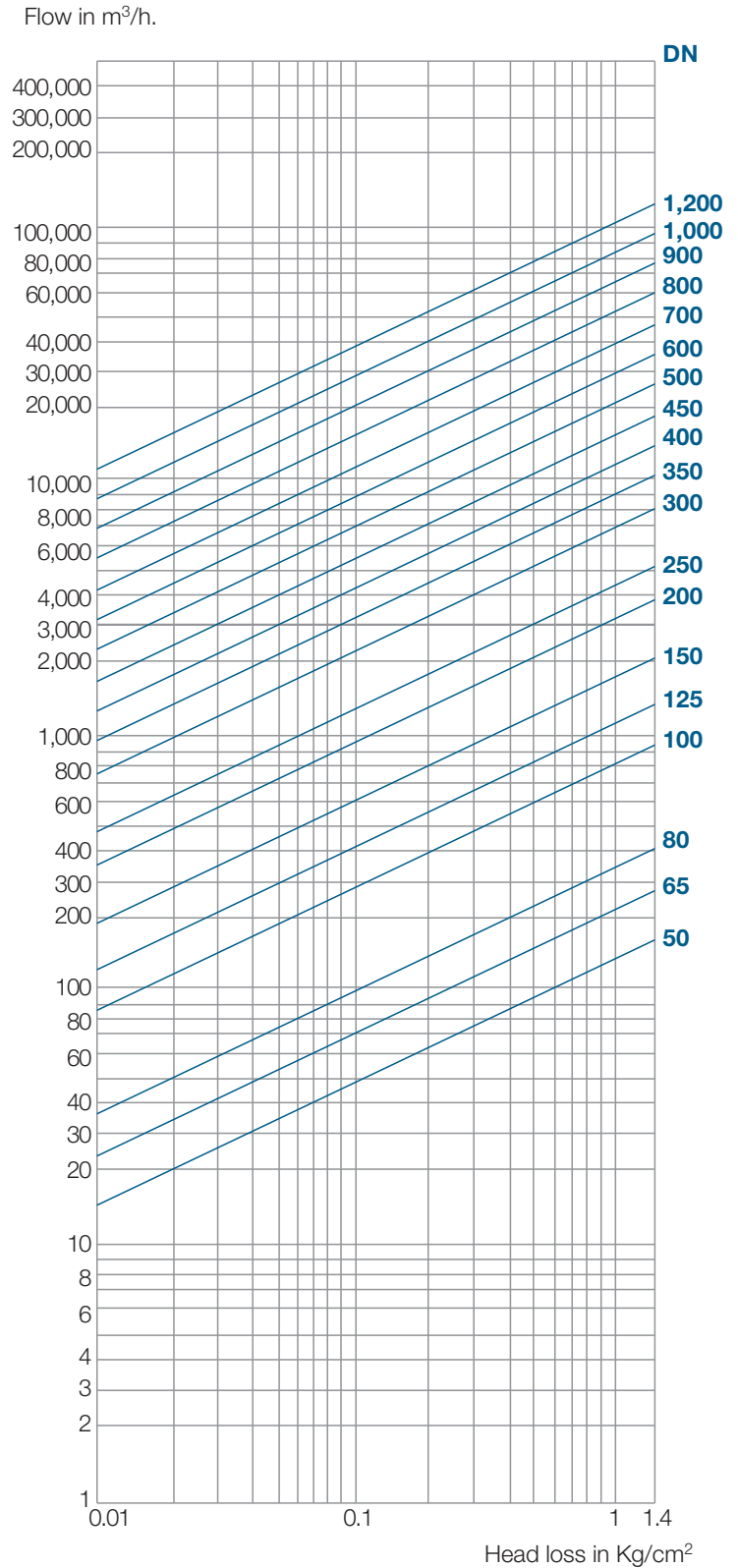
Q Flow in m³/h.
ΔP Pressure drop in bar.
d Relative density of the fluid (1 in the case of water at 4°C).

$$Cv = Q \sqrt{\frac{d}{\Delta P}}$$

Cv Gallons per minute that pass through the valve for the pressure drop to be 1 psi.

$$\Delta P = \left(\frac{Q}{Cv} \right)^2 d$$

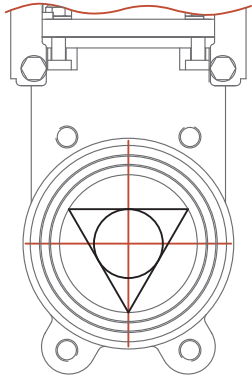
Q Flow in gallons/min.
ΔP Pressure drop in psi.
d Relative density of the fluid (1 in the case of water at 60°F).



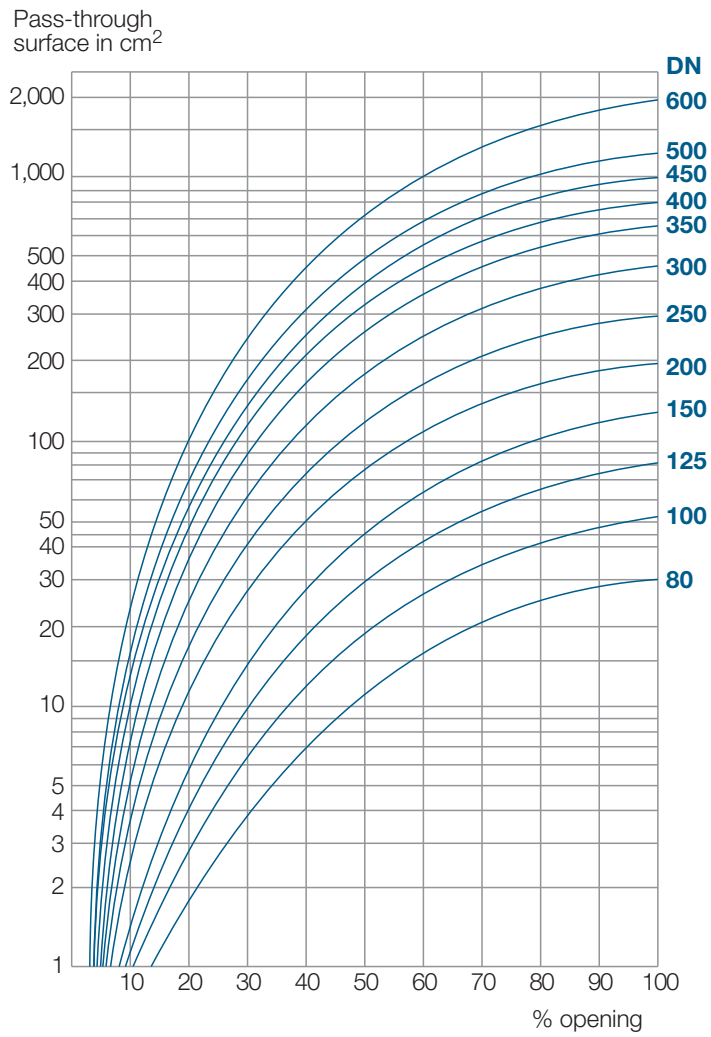
The manufacturer reserves the right to make changes without prior notification.

2.1.6. Pressure drops

For valves with a triangular diaphragm



Triangular diaphragm

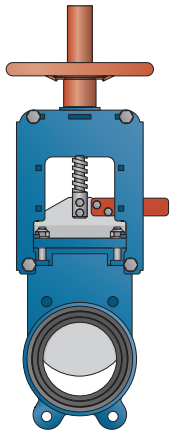


2.2. Drives

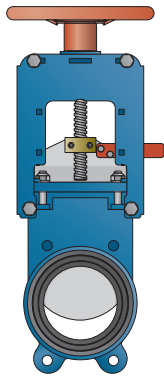
HERBE's RBR-HC knife gate valves can be activated with different types of drives, both manual and automatic. A correct choice of the type of drive will enable a more efficient use of the valve.

Please check with our Technical Department to select the most appropriate drive for your needs.

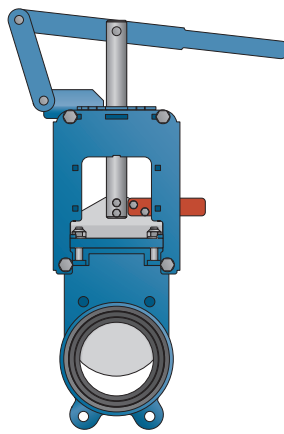
MANUAL



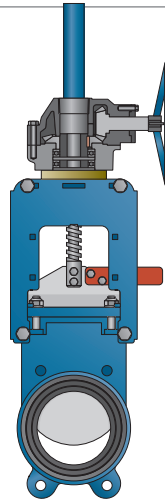
HC-VA
Handwheel with rising stem



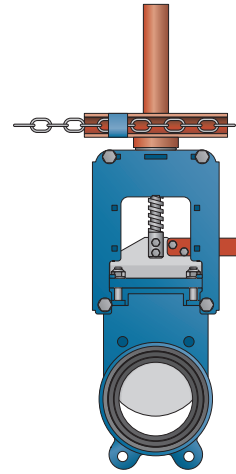
HC-VF
Handwheel with non-rising stem



HC-P
Lever

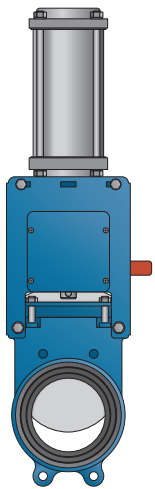


HC-R
Gear operator

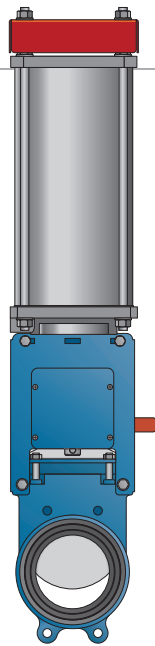


HC-C
Chain wheel

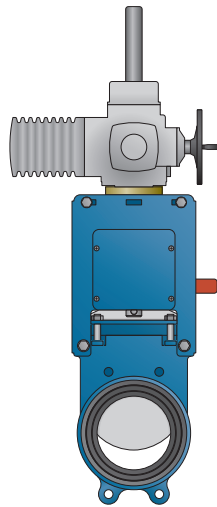
AUTOMATIC



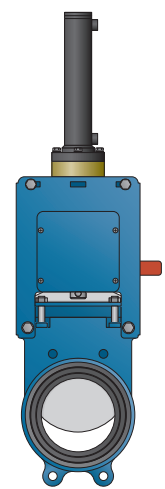
HC-NDE
Pneumatic cylinder



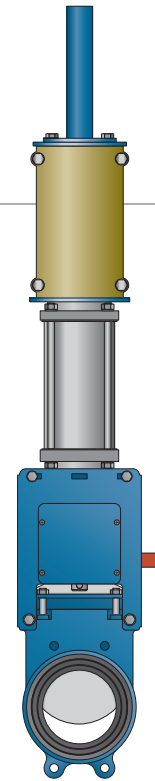
HC-NDE
Single effect pneumatic cylinder



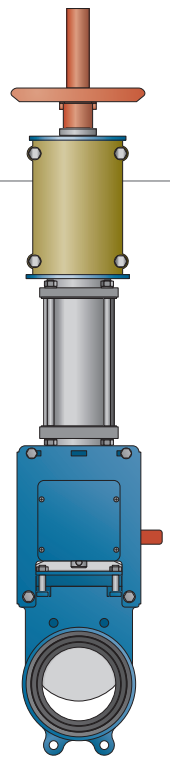
HC-E
Electric actuator



HC-HI
Hydraulic cylinder



HC-NDE
+ Mechanical travel stop



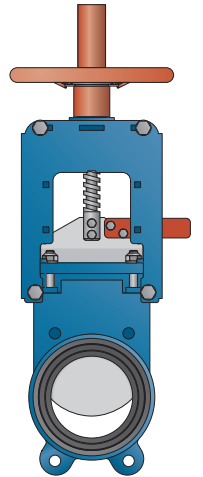
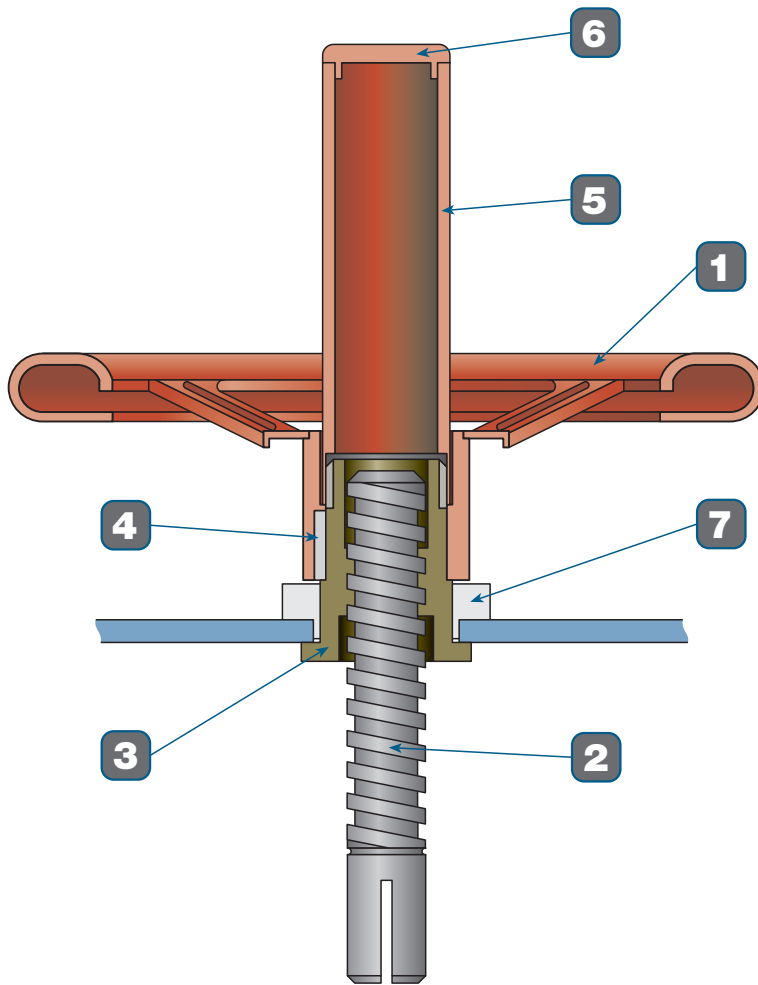
HC-NDE
+ Emergency handwheel

The manufacturer reserves the right to make changes without prior notification.

2.2.1. VA

VA. Handwheel with rising stem.

Particularly suitable for facilities in which space is not a problem. Manufactured from DN 50 up to DN 600, for any other sizes, please check with our Technical Department.



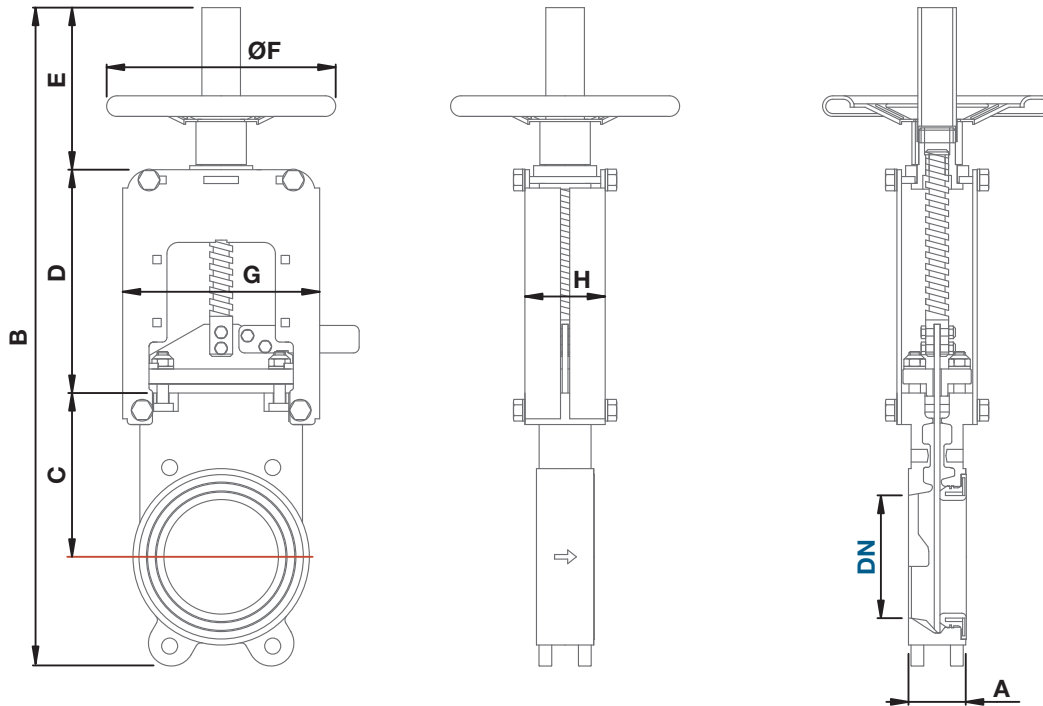
DESCRIPTION	MATERIAL	U. (units)
1 Handwheel	Steel	1
2 Stem	AISI-303	1
3 Nut	Brass	1
4 Cotter	Steel	1
5 Protection	Steel	1
6 Plug	Plastic	1
7 Bearing	Nylon	1

* Other materials available on request.

The manufacturer reserves the right to make changes without prior notification.

2.2.1. VA

Measurements.



DN	A	B	C	D	E	ØF	G	H	WEIGHT	PN
50	50	464	115	140	144	200	152	68	7	10
65	50	483	115	165	135	200	190	68	8	10
80	50	551	130	175	156	200	187	70	9	10
100	50	575	143	195	142	200	204	70	10	10
125	50	695	155	223	204	250	233	78	15	10
150	60	750	176	254	192	250	259	79	19	10
200	60	946	204	318	266	300	326	88	25	10
250	65	1,103	253	364	297	350	370	90	39	10
300	70	1,303	303	424	361	350	430	95	53	6
350	90	1,429	343	470	399	400	473	94	77	5
400	100	1,665	400	549	475	500	543	110	119	5
450	100	1,874	452	599	519	500	597	126	165	4
500	110	2,086	505	675	575	500	652	126	185	4
600	110	2,573	620	836	727	500	752	120	253	3

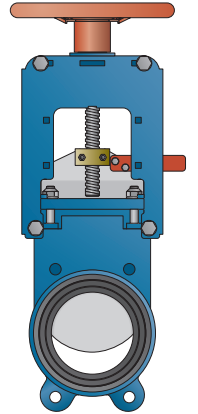
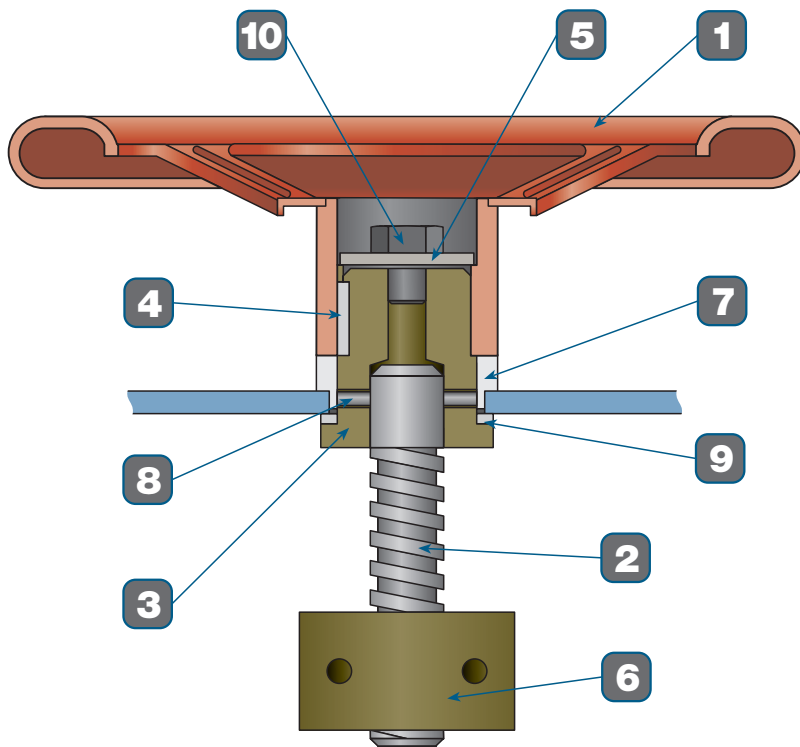
Assembly between Flanges PN10 / DN Nominal diameter / ØF Handwheel diameter
 Weight in Kg. / PN Nominal pressure in bar. / Measurements in mm.

The manufacturer reserves the right to make changes without prior notification.

2.2.2. VF

VF. Handwheel with non-rising stem

Manufactured from DN 50 up to DN 600, for any other sizes, please check with our Technical Department.



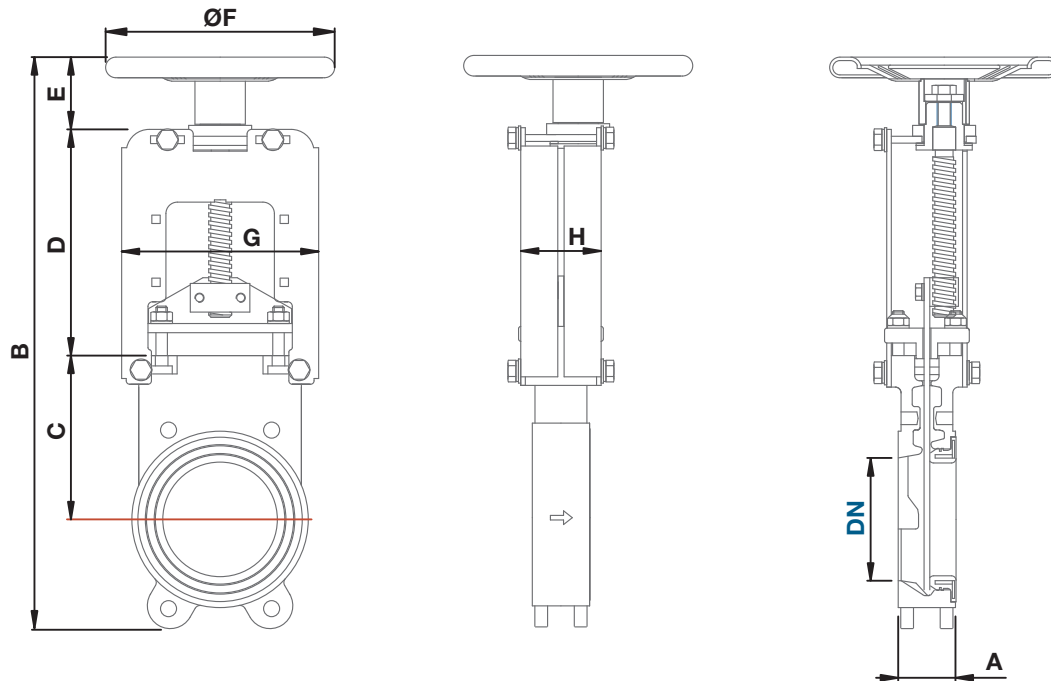
DESCRIPTION	MATERIAL	U.
1 Handwheel	Steel	1
2 Stem	AISI-303	1
3 Nut	Brass	1
4 Cotter	Steel	1
5 Washer	Steel	1
6 Nut	Brass	1
7 Bearing	Nylon	1
8 Pin	Steel	1
9 Washer	Nylon	1
10 Screw	Steel	1

* Other materials available on request.

The manufacturer reserves the right to make changes without prior notification.

2.2.2. VF

Measurements.



DN	A	B	C	D	E	ØF	G	H	WEIGHT	PN
50	50	391	115	140	71	200	117	68	7	10
65	50	414	115	166	65	200	155	68	8	10
80	50	456	130	175	61	200	152	70	9	10
100	50	496	143	195	63	200	172	70	10	10
125	50	562	155	223	71	250	199	78	15	10
150	60	629	176	254	71	250	226	79	19	10
200	60	791	204	318	111	300	293	88	25	10
250	65	914	253	364	108	350	335	90	39	10
300	70	1,050	303	424	108	350	395	95	53	6
350	90	1,147	343	470	117	400	440	94	77	5
400	100	1,303	400	549	113	500	543	110	119	5
450	100	1,468	452	599	113	500	597	126	165	4
500	110	1,624	505	675	113	500	652	126	185	4
600	110	1,955	620	836	109	500	752	120	253	3

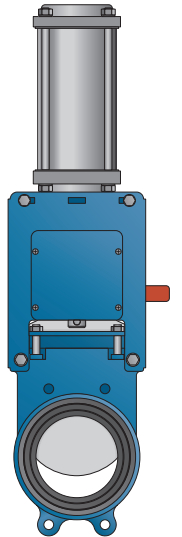
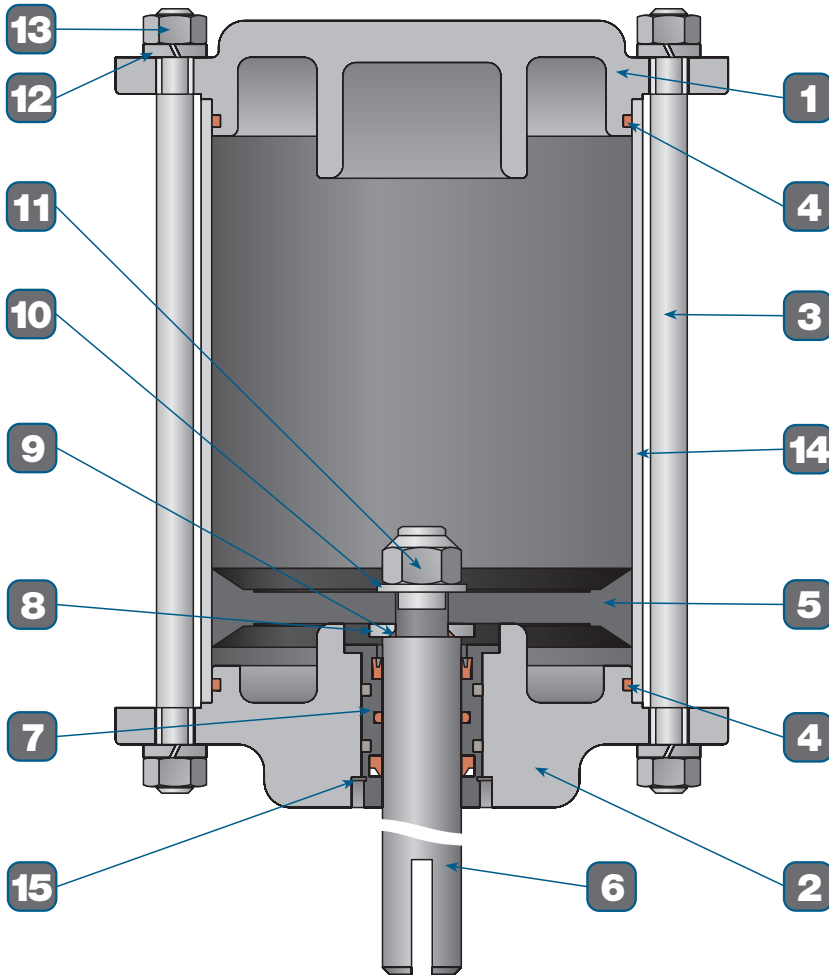
Assembly between Flanges PN10 / DN Nominal diameter / **ØF** Handwheel diameter
Weight in Kg. / **PN** Nominal pressure in bar. / **Measurements** in mm.

The manufacturer reserves the right to make changes without prior notification.

2.2.3. NDE

NDE. Double acting pneumatic cylinder.

Manufactured from DN 50 up to DN 600, for any other sizes, please check with our Technical Department.



	DESCRIPTION	MATERIAL	U.
1	Top cover	Aluminium	1
2	Bottom cover	Aluminium	1
3	Tie-rods	Bichromate steel	4
4	O-ring	NBR	2
5	Piston	NBR	1
6	Shaft	Chromate steel	1
7	Bushing	Delrin	1
	Collar	NBR	1
	Inner ring	NBR	1
	Outer ring	NBR	2
	Scraper	Polyurethane	1

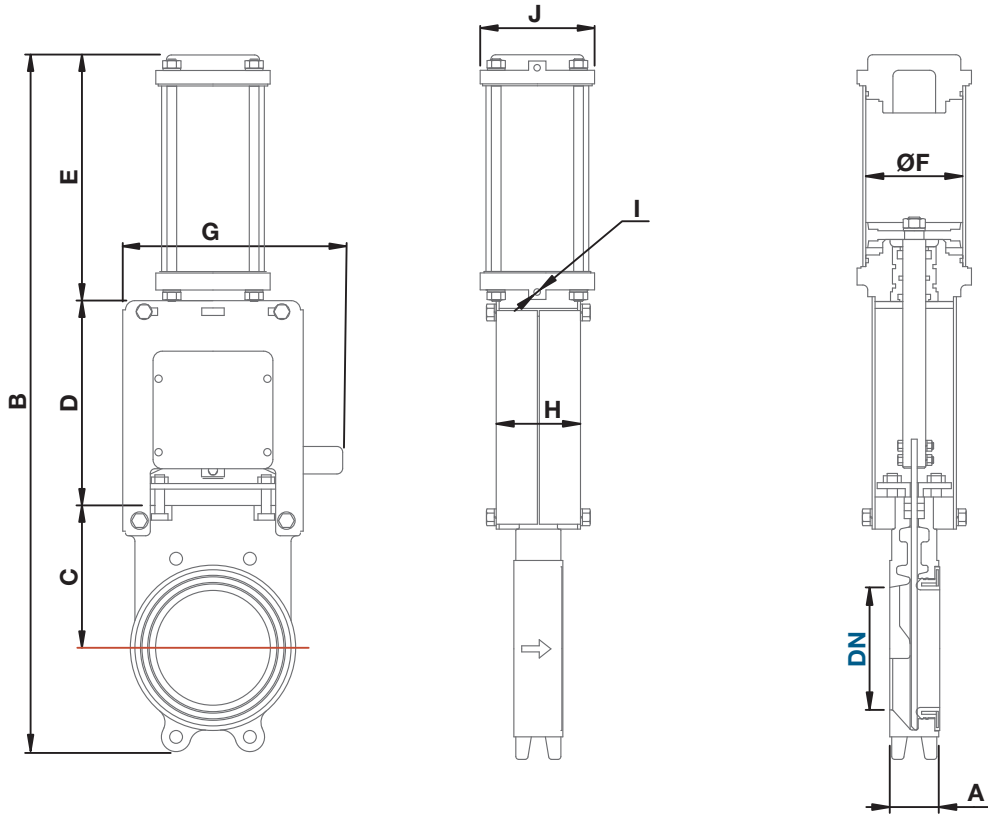
	DESCRIPTION	MATERIAL	U.
8	Bearing	Bichromate steel	1
9	O-ring	NBR	1
10	Bearing DIN 125	Bichromate steel	1
11	Self-locking nut DIN 985	Bichromate steel	1
12	Grower bearing DIN 127	Bichromate steel	8
13	Nut DIN 934	Bichromate steel	8
14	Jacket	Aluminium	1
15	Safety ring DIN 471	Bichromate steel	1

* Other materials available on request.

The manufacturer reserves the right to make changes without prior notification.

2.2.3. NDE

Measurements.



DN	A	B	C	D	E	ØF	G	H	I	J	STROKE	WEIGHT	PN
50	50	527	115	140	207	80	152	68	1/4" GAS	100	67	10	10
65	50	565	115	166	216	80	190	68	1/4" GAS	100	82	11	10
80	50	639	130	175	244	100	187	70	3/8" GAS	118	102	13	10
100	50	687	143	195	254	100	204	70	3/8" GAS	118	121	15	10
125	50	776	155	223	285	125	233	78	3/8" GAS	144	142	20	10
150	60	860	176	254	302	125	259	79	3/8" GAS	144	167	24	10
200	60	1,047	204	318	367	160	326	88	3/8" GAS	180	219	36	10
250	65	1,217	253	364	411	160	370	90	3/8" GAS	180	270	52	10
300	70	1,416	303	424	474	200	430	95	1/2" GAS	220	317	69	6
350	90	1,564	343	470	534	200	473	94	1/2" GAS	220	368	93	5
400	100	1,792	400	549	602	250	543	110	1/2" GAS	280	417	153	5
450	100	2,002	452	599	647	250	597	126	1/2" GAS	280	475	192	4
500	110	2,211	505	675	700	250	652	126	1/2" GAS	280	517	216	4
600	110	2,573	620	836	727	300	752	120	3/4" GAS	325	617	320	3

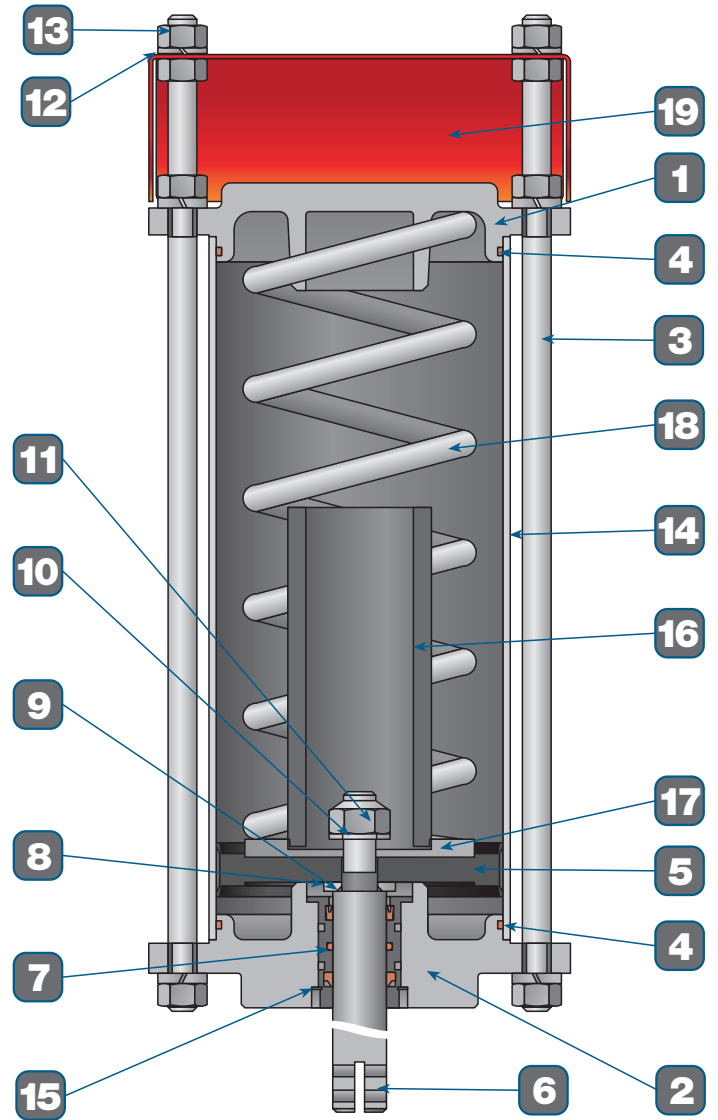
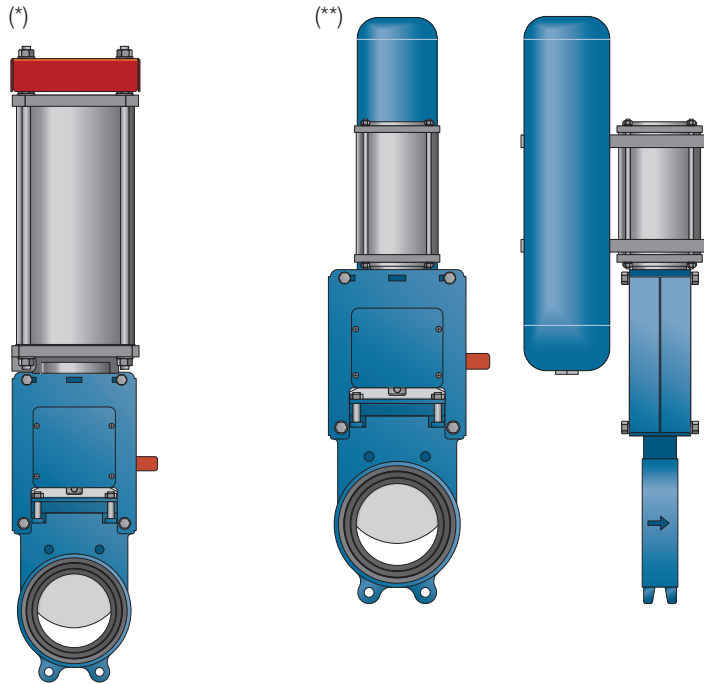
Assembly between Flanges PN10 / DN Nominal diameter / ØF Cylinder diameter / I Inlets / Weight in Kg.
 PN Nominal pressure in bar. / Measurements in mm.

The manufacturer reserves the right to make changes without prior notification.

2.2.4. NSE

NSE. Single acting pneumatic cylinder.

Manufactured from DN 50 up to DN 300 using a spring system (*) and from DN 350 upwards using a drum system or accumulator tank (**).



	DESCRIPTION	MATERIAL	U.
1	Top cover	Aluminium	1
2	Bottom cover	Aluminium	1
3	Tie-rods	Bichromate steel	4
4	O-ring	NBR	2
5	Piston	NBR	1
6	Shaft	Chromate steel	1
7	Bushing	Delrin	1
	Collar	NBR	1
	Inner ring	NBR	1
	Outer ring	NBR	2
	Scraper	Polyurethane	1
8	Bearing	Bichromate steel	1

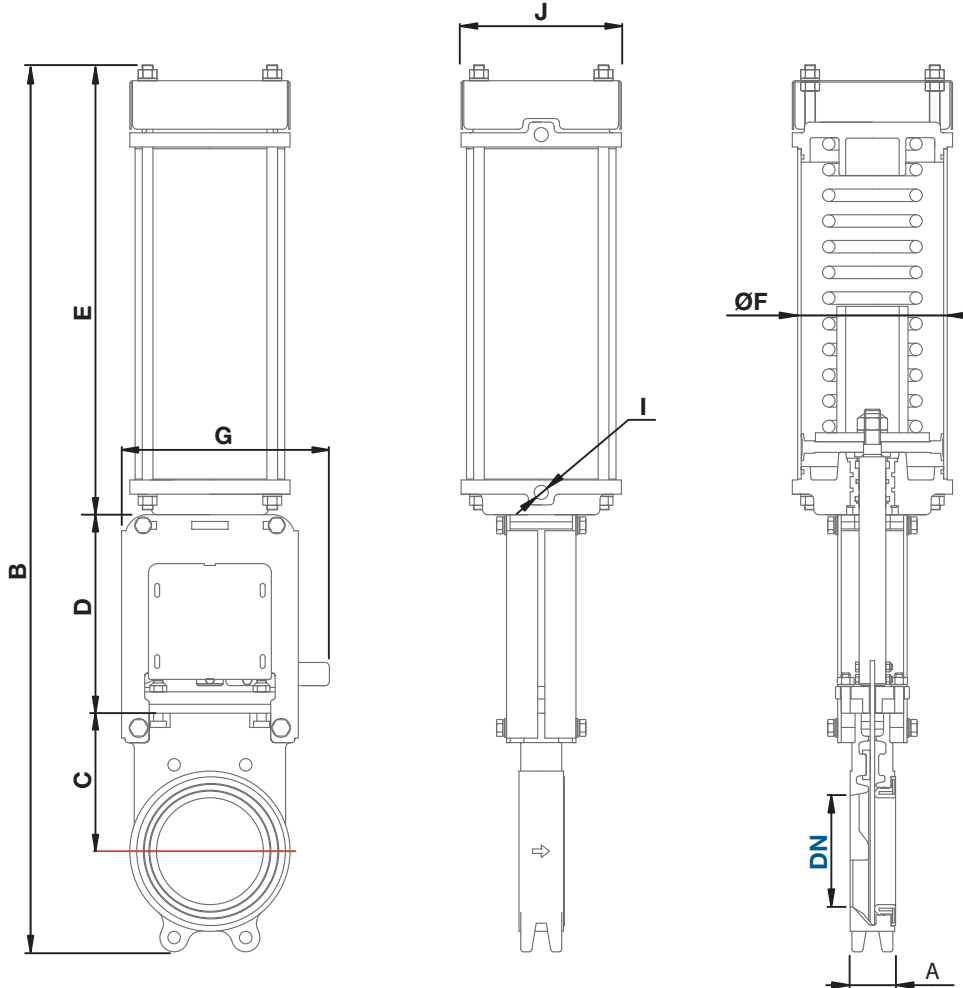
	DESCRIPTION	MATERIAL	U.
9	O-ring	NBR	1
10	Bearing DIN125	Bichromate steel	1
11	Nut DIN985	Bichromate steel	1
12	Bearing DIN125	Bichromate steel	12
13	Nut DIN934	Bichromate steel	16
14	Jacket	Aluminium	1
15	Safety ring DIN471	Bichromate steel	1
16	Stop-tube	Steel	1
17	Tube-washer	Steel	1
18	Spring	Steel	1
19	Protective shield	Steel	1

* Other materials available on request.

The manufacturer reserves the right to make changes without prior notification.

2.2.4. NSE

Measurements.



DN	A	B	C	D	E	ØF	G	H	I	J	STROKE	WEIGHT	PN
50	50	666	115	140	348	100	152	68	3/8"GAS	118	67		10
65	50	706.5	115	166	358	100	190	68	3/8"GAS	118	82		10
80	50	803	130	175	407.5	160	187	70	3/8"GAS	180	102		10
100	50	906	143	195	466	160	204	70	3/8"GAS	180	121		10
125	50	996	155	223	505	160	233	78	3/8"GAS	180	142		10
150	60	1,113	176	254	555	160	259	79	3/8"GAS	180	167		10
200	60	1,380	204	318	699	200	326	88	1/2"GAS	220	219		10
250	65	1,529	253	364	723	200	370	90	1/2"GAS	220	270		10
300	70	1,760	303	424	813.5	200	430	95	1/2"GAS	220	317		6

Assembly between Flanges PN10 / DN Nominal diameter / **ØF** Cylinder diameter / **I** Inlets / **Weight** in Kg. (approx.)
PN Nominal pressure in bar. / **Measurements** in mm.

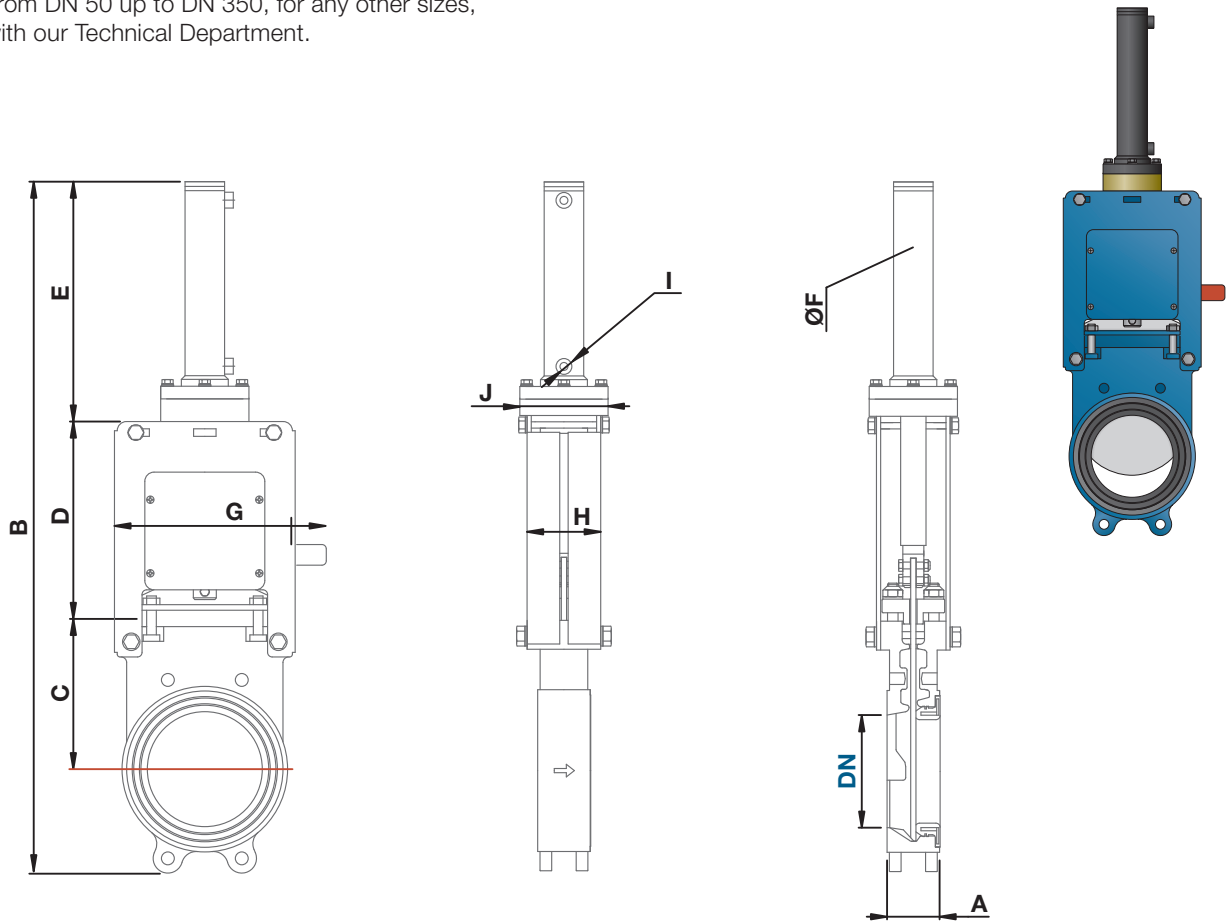
The manufacturer reserves the right to make changes without prior notification.

2.2.5. HI

HI. Hydraulic cylinder.

Manufactured from DN 50 up to DN 350, for any other sizes, please check with our Technical Department.

Measurements.



DN	A	B	C	D	E	ØF	G	H	I	J
50	50	536	115	140	216	40	152	68	3/8" GAS	100
65	50	570	115	166	221	40	190	68	3/8" GAS	100
80	50	650	130	175	255	40	187	70	3/8" GAS	100
100	50	707	143	195	274	40	204	70	3/8" GAS	100
125	50	802	155	223	311	50	233	78	3/8" GAS	125
150	60	894	176	254	336	50	259	79	3/8" GAS	125
200	60	1,087	204	318	407	63	326	88	1/2" GAS	145
250	65	1,261	253	364	455	63	370	90	1/2" GAS	145
300	70	1,447	303	424	505	63	430	95	1/2" GAS	145
350	90	1,593	343	470	563	63	473	94	1/2" GAS	145

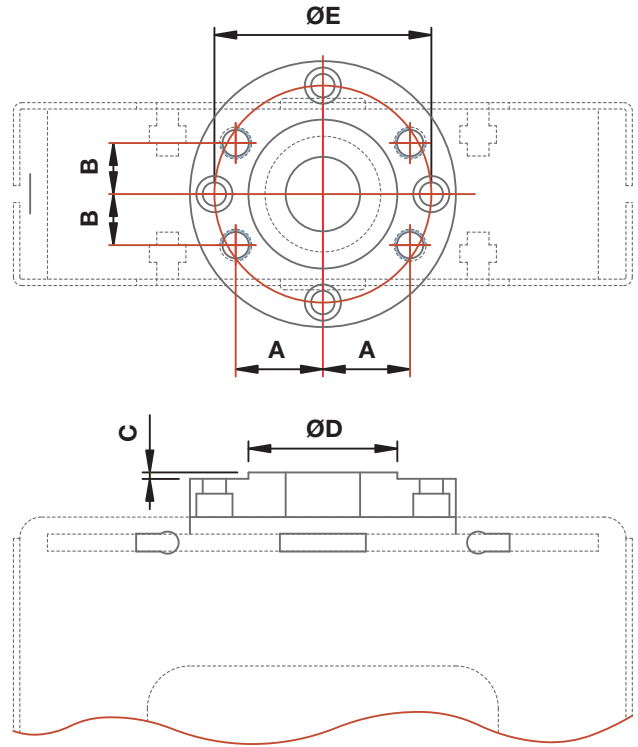
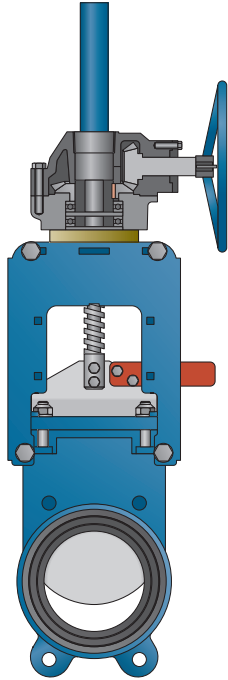
Assembly between Flanges PN10 / DN Nominal diameter / ØF Cylinder diameter / I Inlets / Measurements in mm.

The manufacturer reserves the right to make changes without prior notification.

2.2.6. R

R. Gear operator.

Manufactured from DN 50 up to DN 600, for any other sizes, please check with our Technical Department.

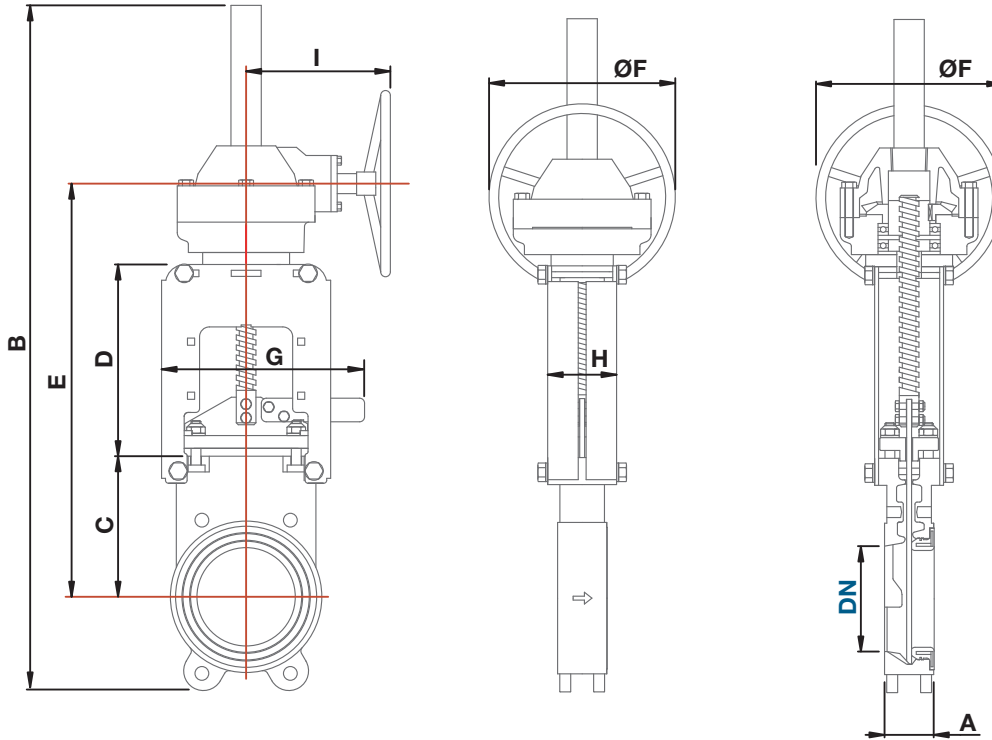


VALVE	STEM SCREW	TYPE OF REDUCER	BRIDGE-FLANGE FASTENING				FLANGE-REDUCER FASTENING	
			A	B	C	ØD	ØE	
DN50	Tr. left 20x4	MANUAL FLO-4	33	19	3	70	4 Allen size M10 on ø102	
DN65	Tr. left 20x4		33	19	3	70		
DN80	Tr. left 20x4		33	19	3	70		
DN100	Tr. left 20x4		33	19	3	70		
DN125	Tr. left 20x4		31	22	3	70		
DN150	Tr. left 20x4		31	22	3	70		
DN200	Tr. left 25x5	MANUAL FLO-4-1	41	24	3	70	4 Allen size M16 on ø140	
DN250	Tr. left 25x5		41	24	3	70		
DN300	Tr. left 25x5		41	24	3	70		
DN350	Tr. left 25x5		41	24	3	70		
DN400	Tr. left 35x6	MANUAL FL1-4	41	24	3	95		
DN450	Tr. left 35x6		55	39	3	95		
DN500	Tr. left 35x6		55	39	3	95		
DN600	Tr. left 35x6		55	39	3	95		

The manufacturer reserves the right to make changes without prior notification.

2.2.6. R

Measurements.



DN	A	B	C	D	E	ØF	G	H	I
50	50	517	115	140	363	300	152	68	197
65	50	546	115	166	389	300	190	68	197
80	50	593	130	175	413	300	187	70	197
100	50	631	143	195	446	300	204	70	197
125	50	739	155	223	486	300	233	78	197
150	60	806	176	254	538	300	259	79	197
200	60	928	204	318	630	300	326	88	197
250	65	1,104	253	364	726	300	370	90	197
300	70	1,290	303	424	836	450	430	95	217
350	90	1,478	343	470	922	450	473	94	217
400	100	1,675	400	549	1,081	450	543	110	260
450	100	1,890	452	599	1,183	450	597	126	260
500	110	2,096	505	675	1,312	650	652	126	288
600	110	2,612	620	836	1,588	650	752	120	288

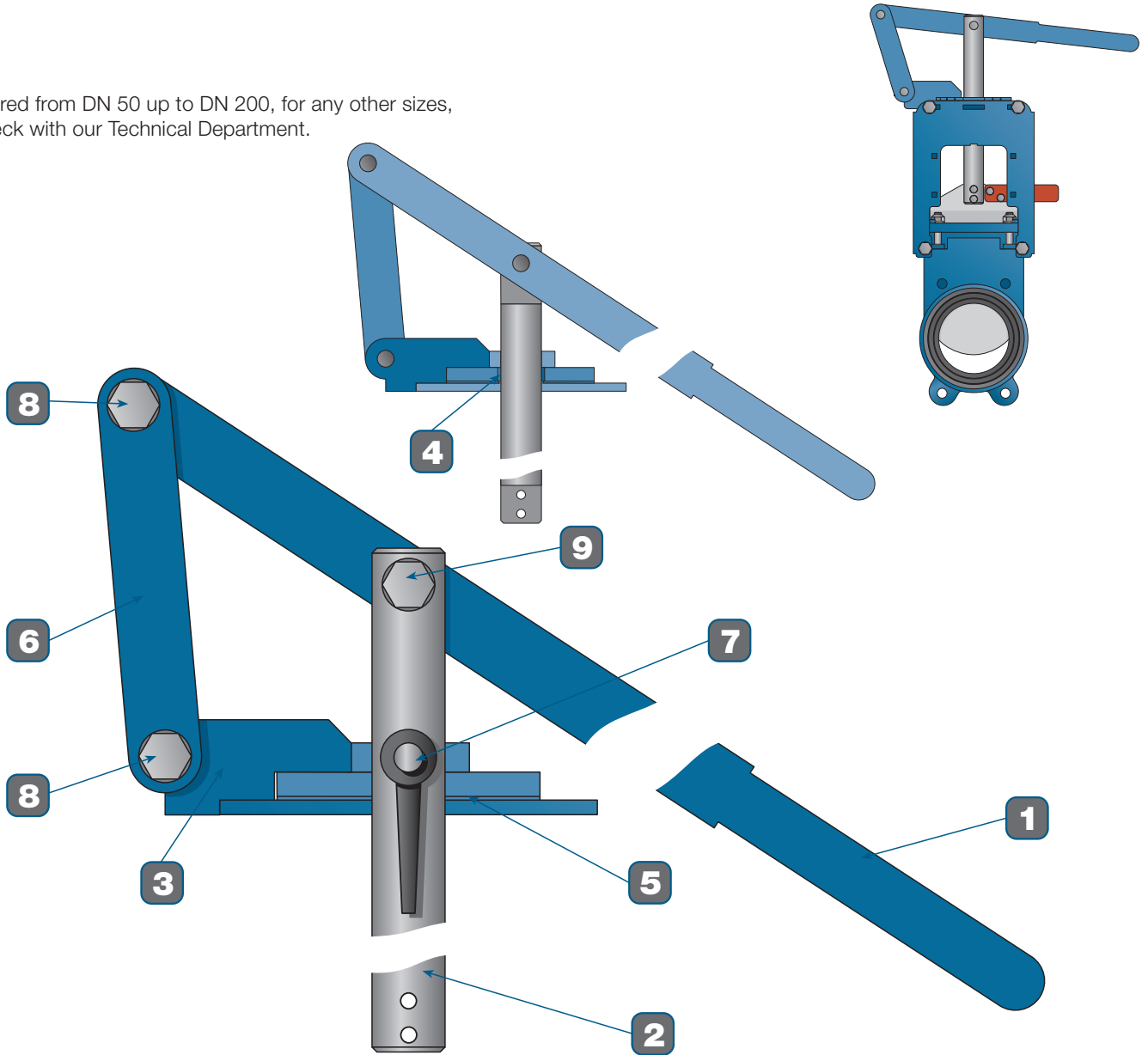
Assembly between Flanges PN10 / DN Nominal diameter / ØF Handwheel diameter
Measurements in mm.

The manufacturer reserves the right to make changes without prior notification.

2.2.7. P

P. Lever

Manufactured from DN 50 up to DN 200, for any other sizes, please check with our Technical Department.



	DESCRIPTION	MATERIAL	U.
1	Lever	Steel	1
2	Rod	AISI-304	1
3	Support set	Steel	1
4	Guide ring	Plastic	1
5	Stop plate	Steel	1

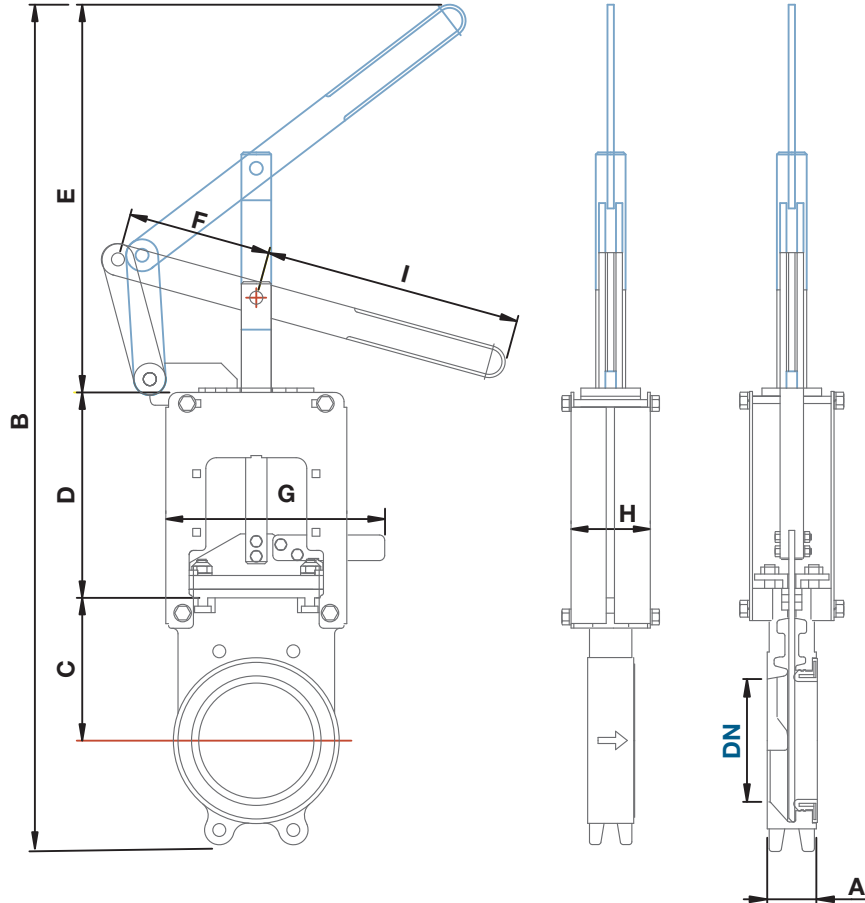
	DESCRIPTION	MATERIAL	U.
6	Lever side	Steel	2
7	Brake handle	Plastic	1
8	Set:		
	Screw DIN933	Bichromate steel	2
	Nut DIN985	Bichromate steel	2
9	Set:		
	Screw DIN933	Bichromate steel	1
	Nut DIN985	Bichromate steel	1

* Other materials available on request.

The manufacturer reserves the right to make changes without prior notification.

2.2.7. P

Measurements.



DN	A	B	C	D	E	F	G	H	I
50	50	497	115	140	177	135	152	68	410
65	50	576	115	166	227	135	190	68	410
80	50	665	130	175	270	135	187	70	410
100	50	838	143	195	405	135	204	70	410
125	50	873	155	223	382	160	233	78	410
150	60	1,019	176	254	461	160	259	79	410
200	60	1,382	204	318	702	248	326	88	780

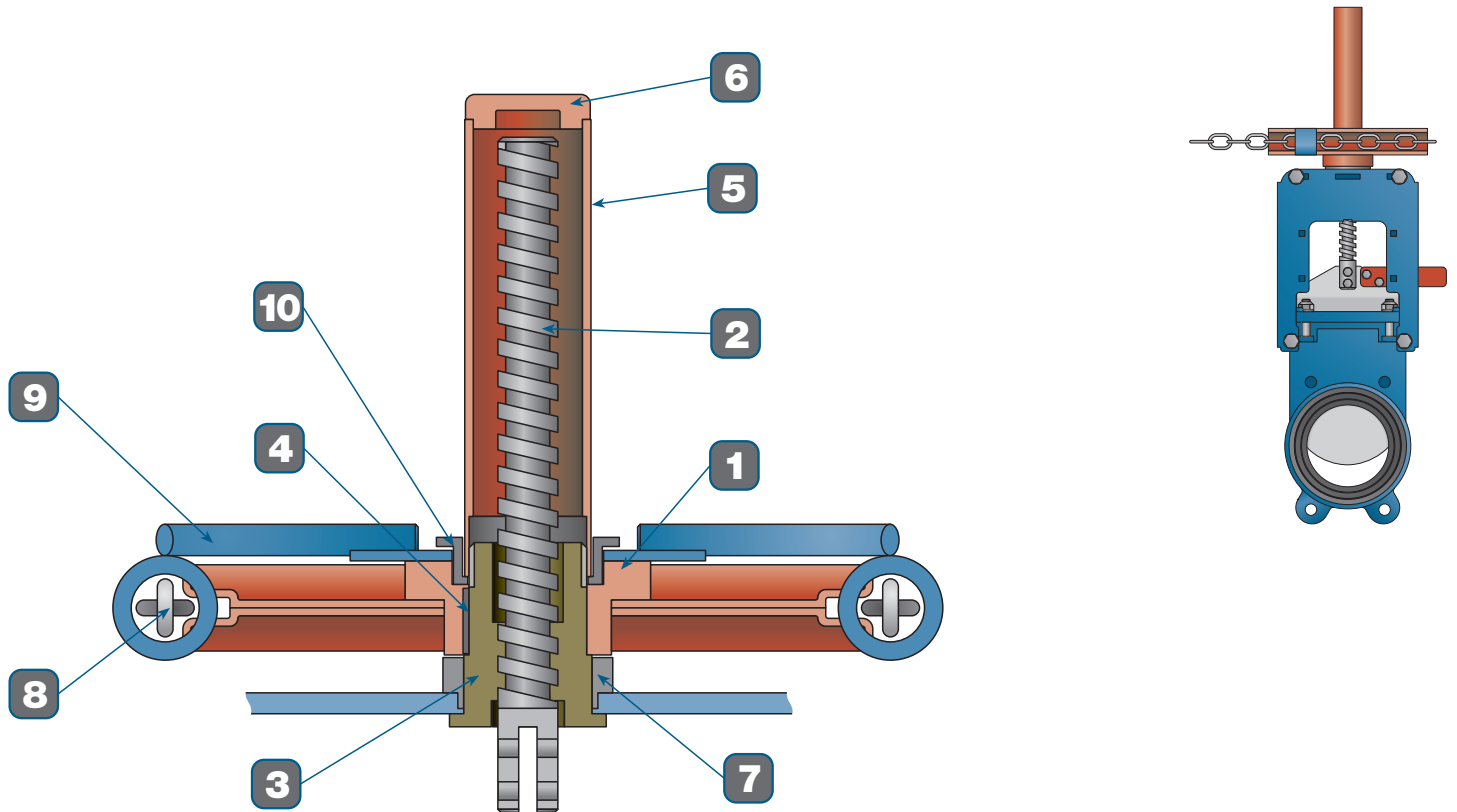
Assembly between Flanges PN10 / DN Nominal diameter / Measurements in mm.

The manufacturer reserves the right to make changes without prior notification.

2.2.8. C

C. Chain wheel

Manufactured from DN 50 up to DN 600, for any other sizes, please check with our Technical Department.



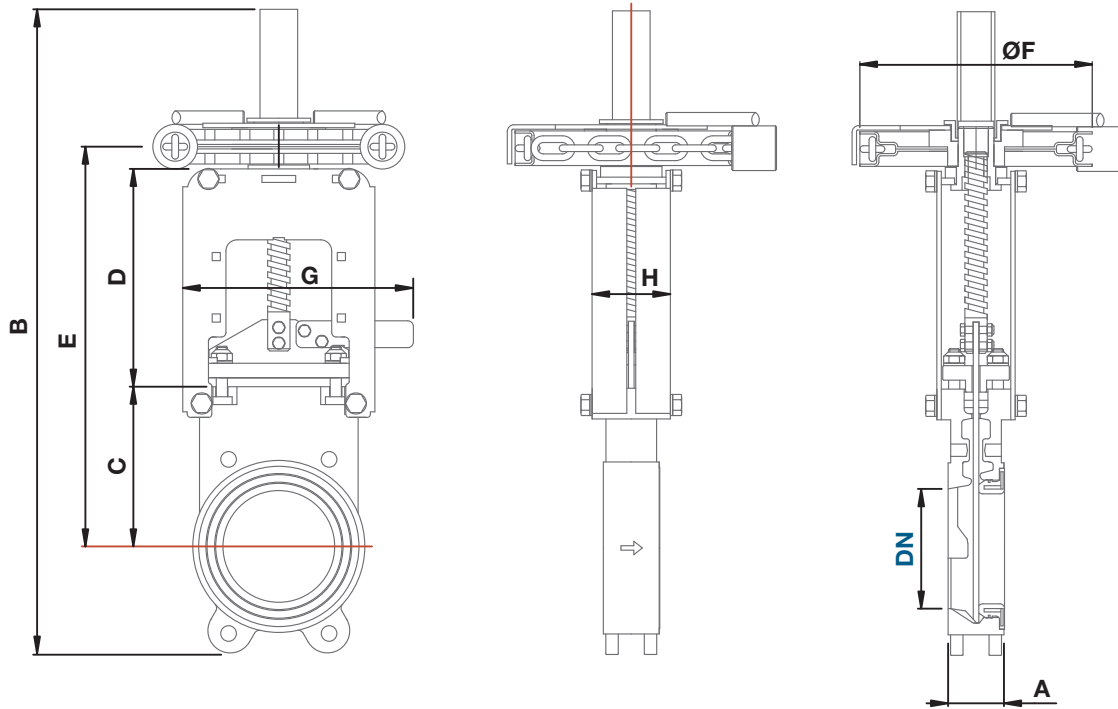
	DESCRIPTION	MATERIAL	U.
1	Handwheel	Steel	1
2	Stem	AISI-303	1
3	Nut	Brass	1
4	Cotter	Steel	1
5	Protection	Steel	1
6	Plug	Plastic	1
7	Bearing	Nylon	1
8	Chain	Steel	1
9	Chain guide	Steel	1
10	Bushing	Steel	1

* Other materials available on request.

The manufacturer reserves the right to make changes without prior notification.

2.2.8. C

Measurements.



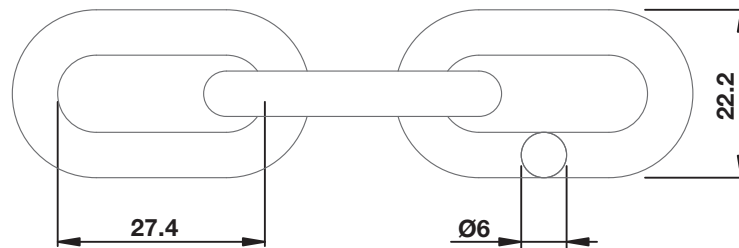
DN	A	B	C	D	E	ØF	G	H
50	50	439	115	140	272	210	152	68
65	50	467	115	166	297	210	190	68
80	50	536	130	175	322	210	187	70
100	50	574	143	195	355	210	204	70
125	50	702	155	223	400	260	233	78
150	60	769	176	254	452	260	259	79
200	60	928	204	318	547	300	326	88
250	65	1,096	253	364	642	300	370	90
300	70	1,299	303	424	752	300	430	95
350	90	1,426	343	470	834	400	473	94
400	100	1,654	400	549	984	500	543	110
450	100	1,874	452	599	1,086	500	597	126
500	110	2,097	505	675	1,215	500	652	126
600	110	2,563	620	836	1,491	500	752	120

Assembly between Flanges PN10 / DN Nominal diameter
 ØF Handwheel diameter / Measurements in mm.

The manufacturer reserves the right to make changes without prior notification.

2.2.8. C

Types of chain handwheel according to the valve diameter.



HANDWHEEL FEATURES

VALVE	TYPE OF HANDWHEEL	No. of TEETH	CHAIN	Weight
DN50				
DN65	Ø210	11	6	1.6
DN80				
DN100				
DN125	Ø260	14	6	3.1
DN150				
DN200				
DN250	Ø300	16	6	4.2
DN300				
DN350				
DN400	Ø400	22	6	7.3
DN500				
DN600				

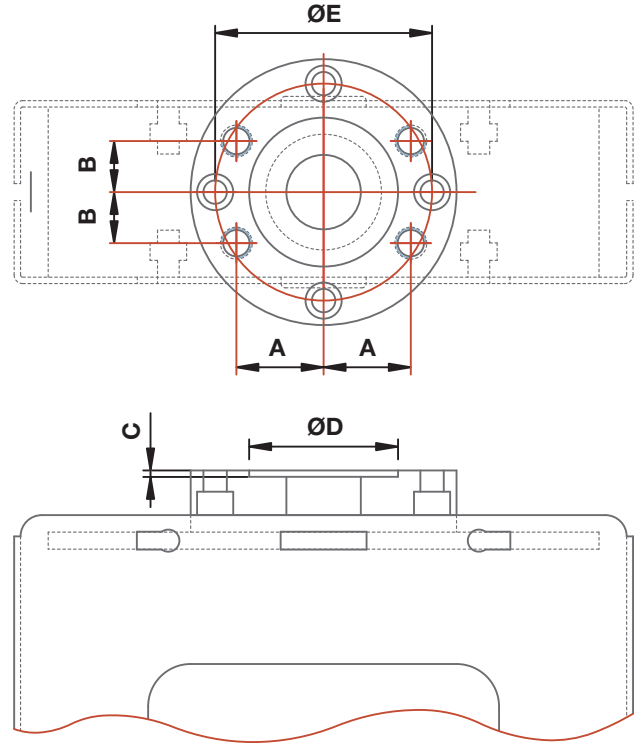
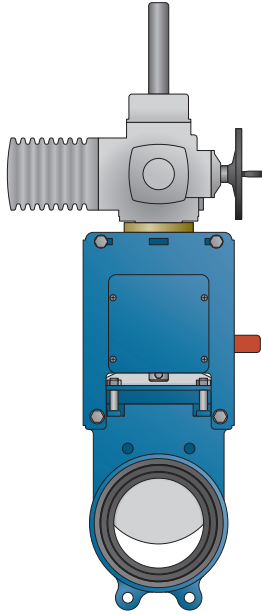
DN Nominal diameter / **Weight** in Kg/m. (approx.) / **Measurements** in mm.

The manufacturer reserves the right to make changes without prior notification.

2.2.9. E

E. Electric actuator

Manufactured from DN 50 up to DN 600, for any other sizes, please check with our Technical Department.

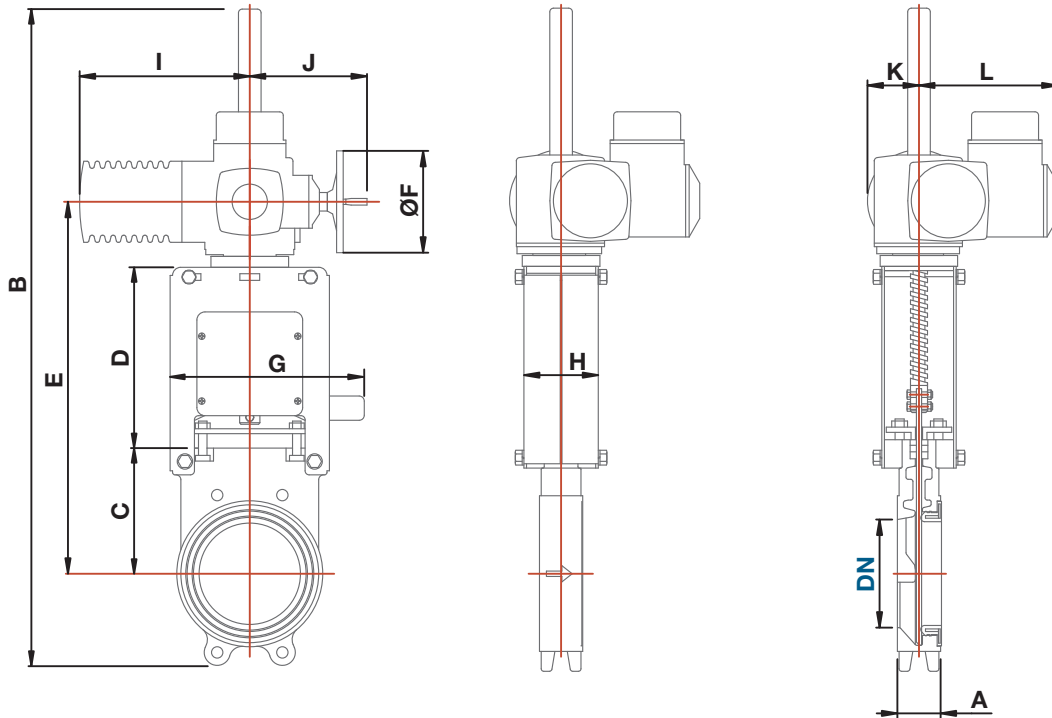


VALVE	STEM SCREW	TYPE OF ELECTRIC ACT.	BRIDGE-FLANGE FASTENING			FLANGE-ELECTRIC ACT. FASTENING	
			A	B	C	ØD	ØE
DN50	Tr. left 20x4	AUMA SA 07.2	33	19	3	55	4 Allen size M10 on ø70
DN65	Tr. left 20x4		33	19	3	55	
DN80	Tr. left 20x4		33	19	3	70	
DN100	Tr. left 20x4		33	19	3	70	
DN125	Tr. left 20x4	AUMA SA 07.6	31	22	3	70	4 Allen size M10 on ø102
DN150	Tr. left 20x4		31	22	3	70	
DN200	Tr. left 25x5		41	24	3	70	
DN250	Tr. left 25x5		41	24	3	70	
DN300	Tr. left 25x5	AUMA SA 10.2	41	24	3	70	4 Allen size M10 on ø102
DN350	Tr. left 25x5		41	24	3	70	
DN400	Tr. left 35x6		41	24	3	70	
DN450	Tr. left 35x6		55	39	4	100	
DN500	Tr. left 35x6	AUMA SA 14.2	55	39	4	100	4 Allen size M16 on ø140
DN600	Tr. left 35x6		55	39	4	100	

The manufacturer reserves the right to make changes without prior notification.

2.2.9. E

Measurements.



DN	A	B	C	D	E	ØF	G	H	I	J	K	L
50	50	633	115	140	358	160	152	68	265	249	62	238
65	50	662	115	166	384	160	190	68	265	249	62	238
80	50	708	130	175	408	160	187	70	265	249	62	238
100	50	746	143	195	441	160	204	70	265	249	62	238
125	50	804	155	223	481	160	233	78	265	249	62	238
150	60	871	176	254	533	160	259	79	265	249	62	238
200	60	996	204	318	627	200	326	88	283	254	65	248
250	65	1,151	253	364	722	200	370	90	283	254	65	248
300	70	1,337	303	424	832	200	430	95	283	254	65	248
350	90	1,475	343	470	918	200	473	94	283	254	65	248
400	100	1,938	400	549	1,054	200	543	110	283	254	65	248
450	100	2,104	452	599	1,171	315	597	126	389	336	91	286
500	110	2,233	505	675	1,300	315	652	126	389	336	91	286
600	110	2,394	620	836	1,576	315	752	120	389	336	91	286

Assembly between Flanges PN10 / DN Nominal diameter / ØF Handwheel diameter
Measurements in mm.

The manufacturer reserves the right to make changes without prior notification.



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