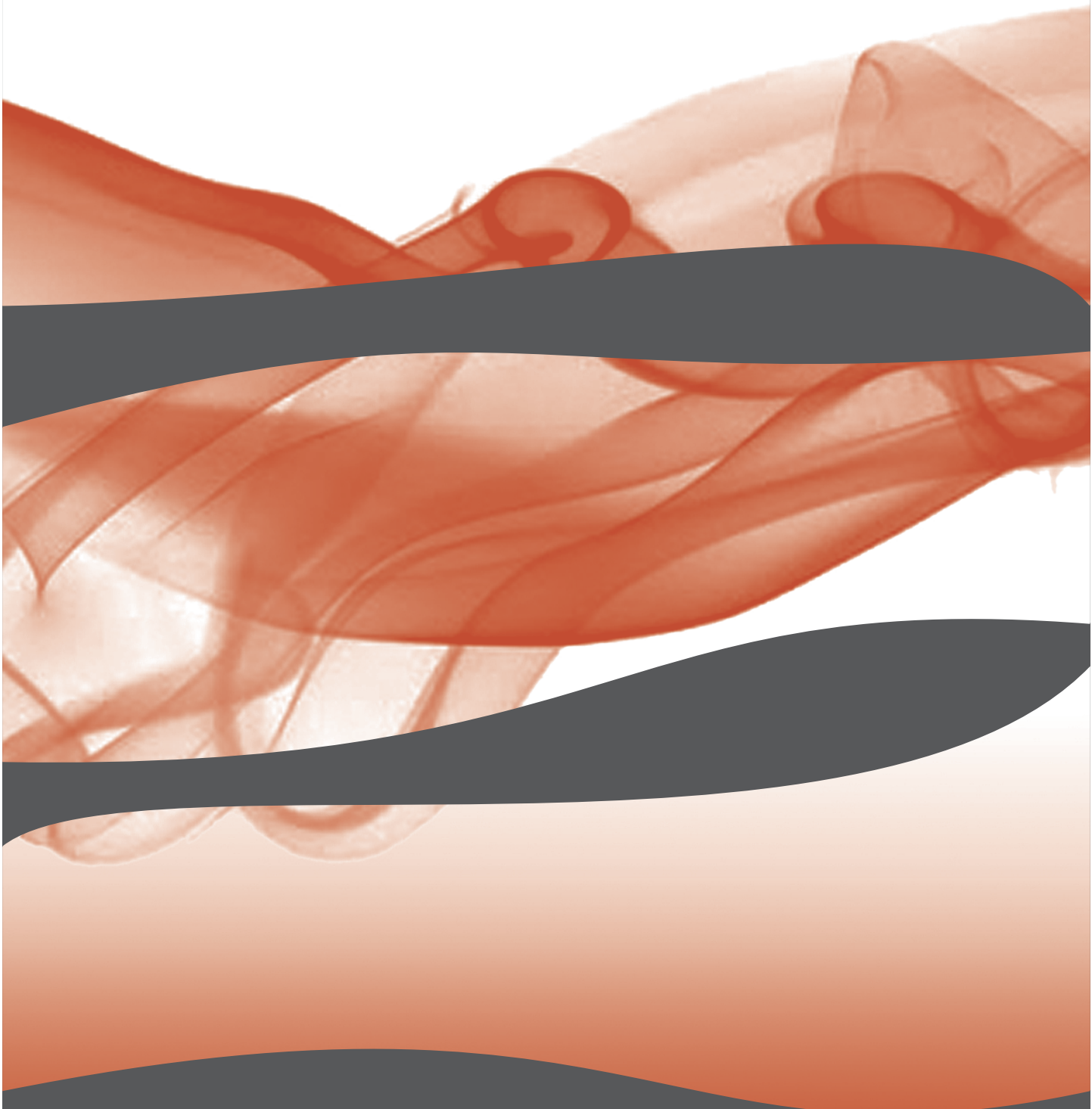




KNIFE GATE
VALVES. RBR





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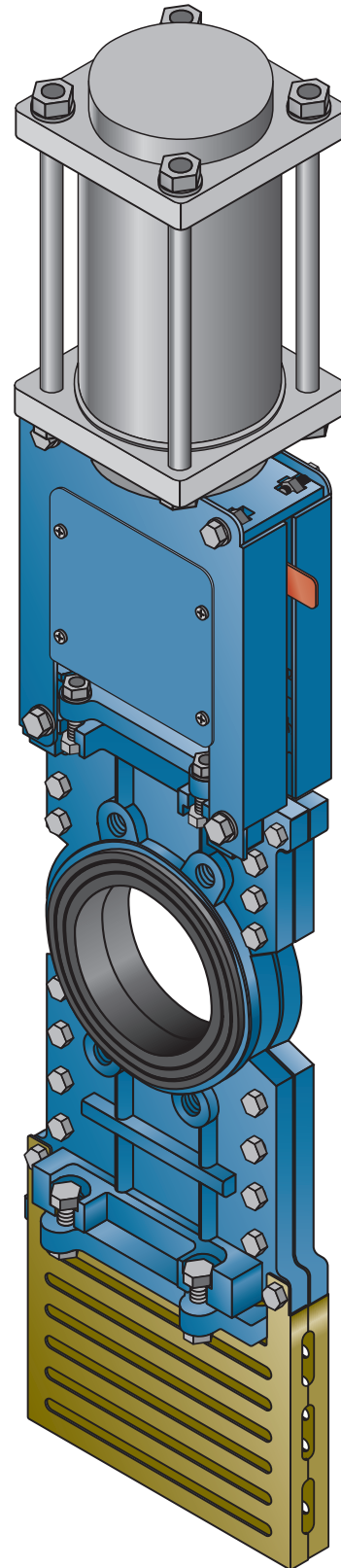
2. Technical features

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1. General features

The RBR-HP 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.).

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

1.1.2. Flow direction and position

The standard valve is bidirectional.

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

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.

DN	50	65	80	100	125	150	200	250	300	350	400	450	500
P	8	8	9	9	9	10	10	12	12	21	21	22	22
t	6	6	6	6	7	7	7	11	11	15	15	19	19

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

Chemical industry (viscous pulps, powder, granules, etc.).

Food industry (washing facilities, silos, etc.).

Metal/glass/cement/mining industries (silos, abrasive products, etc.).

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.

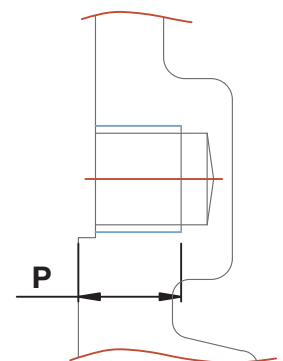
pipe (please check with our technical department first).

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.



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.

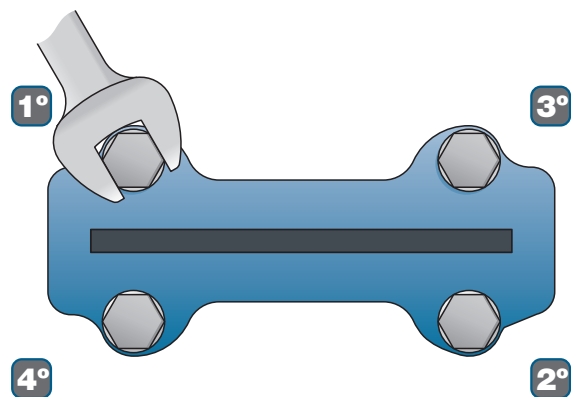
If you overtighten the packing gland, the necessary force to activate the valve is increased, which makes it difficult to operate and reduces the useful life of the packing.

torque permitted for each DN.

DN	50-100	125-200	250-500
t	20	30	35

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

In any case, the following table shows the maximum tightening

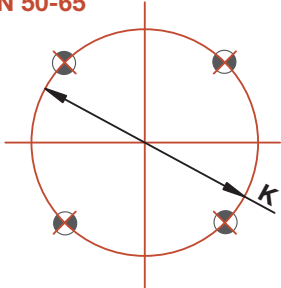


In the event of a leak in the packing gland during start-up, progressively tighten each of the screws in a diagonal and alternate way, as shown in the picture, and wait 30 minutes. Repeat if necessary until the leak has disappeared, at which point you should stop tightening.

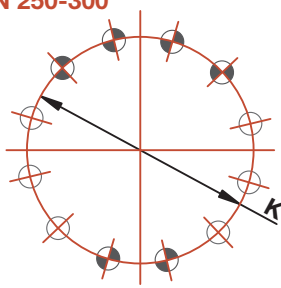
The manufacturer reserves the right to make changes without prior notification.

1.1.6. DIN PN10 flange dimensions

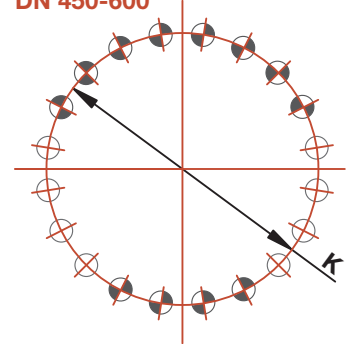
DN 50-65



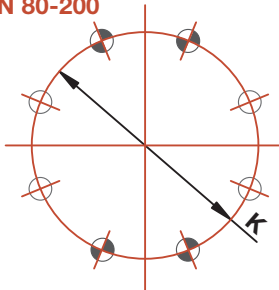
DN 250-300



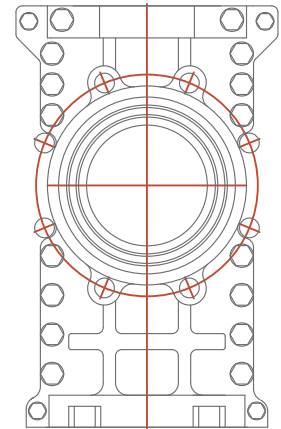
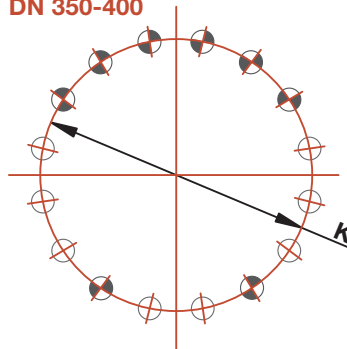
DN 450-600



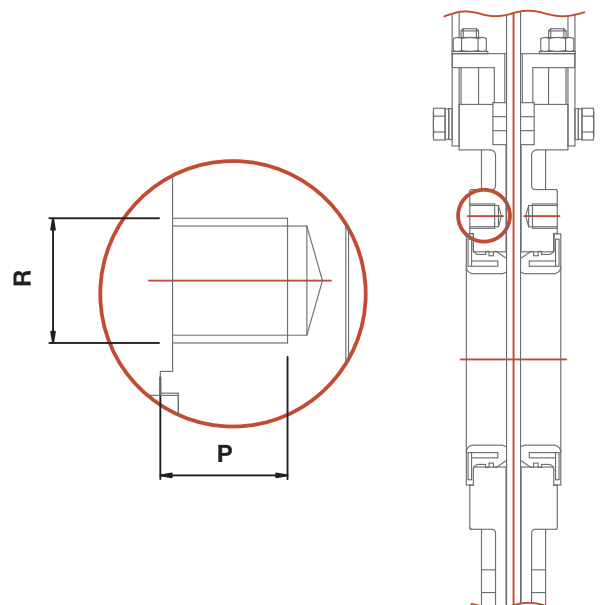
DN 80-200



DN 350-400



DN	K	Z	⊕	○	R	P
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



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

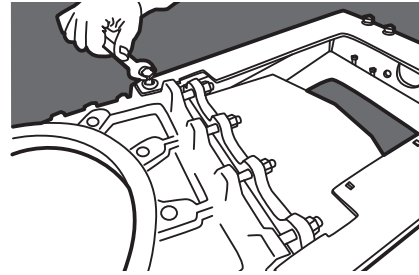
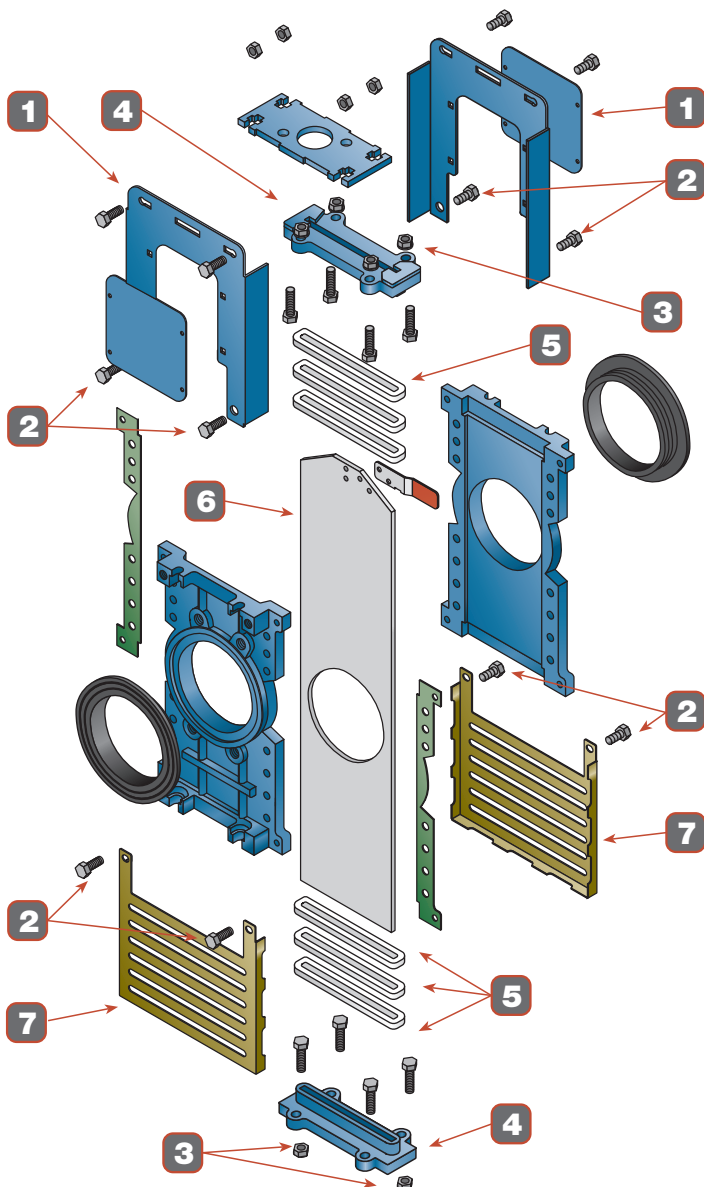
The manufacturer reserves the right to make changes without prior notification.

1.2. Maintenance

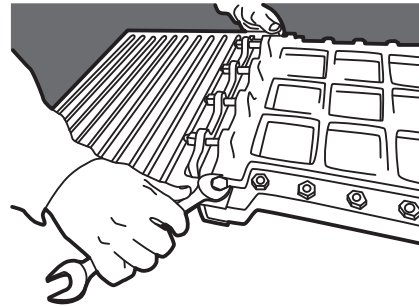
1.2.1. Changing the packing

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

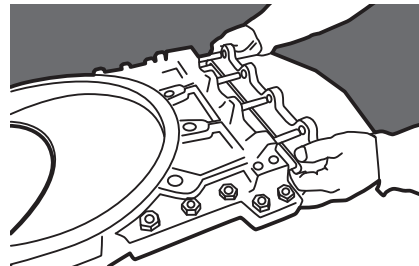
To change packing follow these steps:



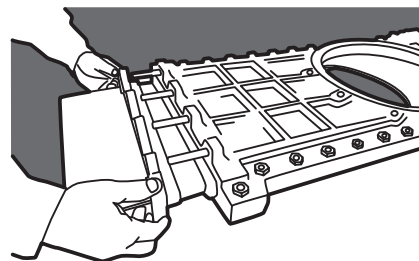
A Dismantle and remove the support case set (1) releasing the screws (2) that fasten it to the body and releasing the screws that keep the gate (6) fastened to the shaft.



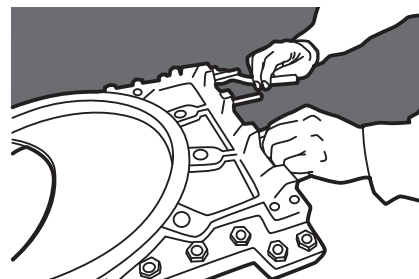
B Removed and take out the protection (7) loosening screws (2) the tie up to de body.



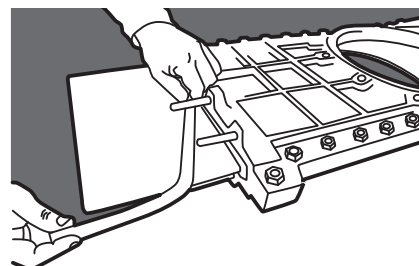
C Dismantel and removed the packing gland (4) from the top side of the valve loosening the nuts and washers (3) that fix it to the body. Take out the packing.



D Dismatel and removed the packing gland (4) from the bottom of the valve loosening the nuts and washers (3) that fix it to the body. Take out the packing.



E Put forward the packing (5) on the upper body and fit it. Place the packing gland (4) and mount the screws (2) nuts and washers.



F Put forward the packing (5) on the bottom of the valve and fit it. Insert the packing gland (4) and mount the screws (2) nuts and washers (3).

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

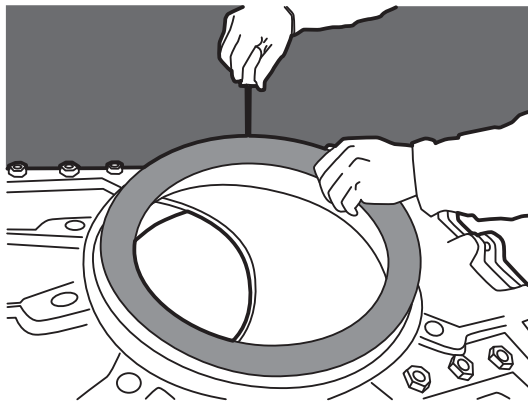
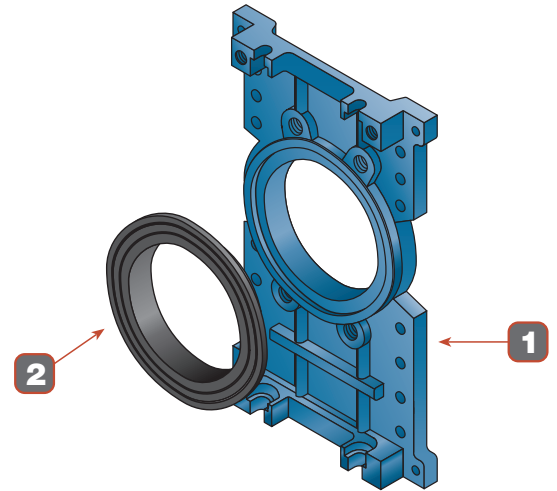
1.2. Maintenance

1.2.2. Changing the seat

1 Body

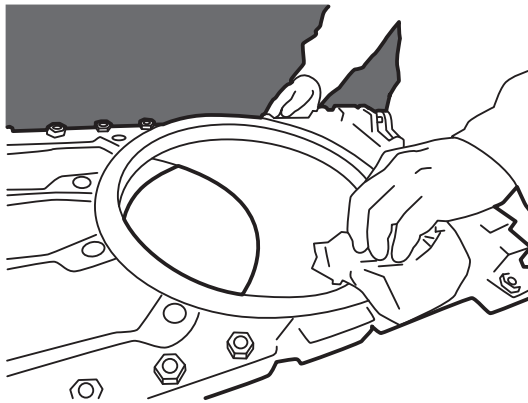
2 Seat

To change seats follow these steps



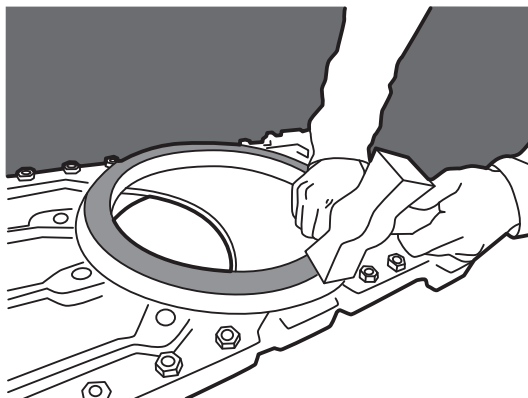
A

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.



1.3. EC Directives.

1. Machines Directive: DIR 2006/42/CE

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

The RBR-HP 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	8	I
150	8	I
200	8	I
250	6	I
300	6	I
350	5	I
400	5	I
500	4	I

DN Nominal Diameter in mm.
PN 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-HP 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

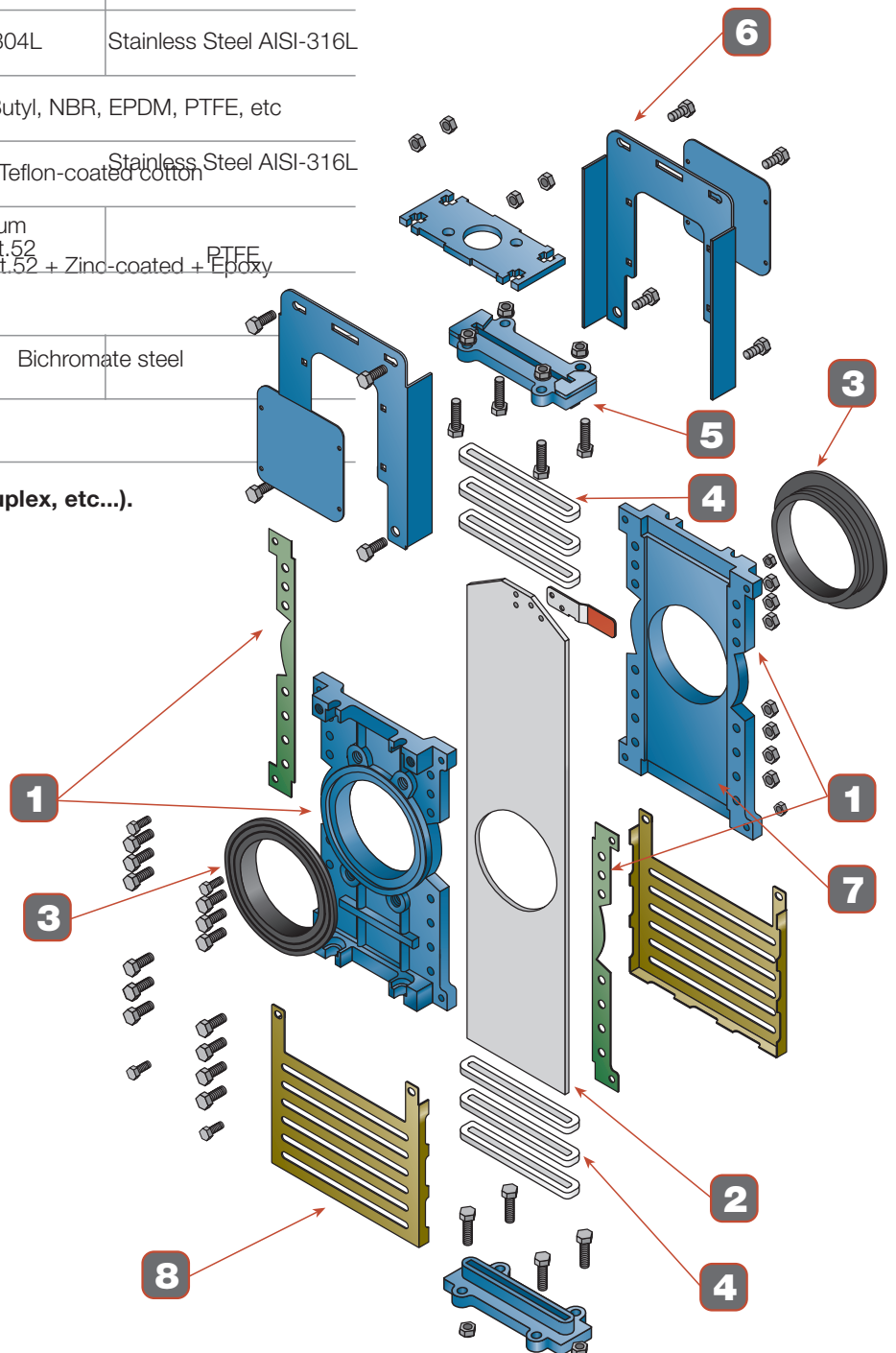
The HP-type knife gate valve is a one-way valve with a wafer-style design.

DESCRIPTION	EN-GJL-250	CF8M
1 Body	EN-GJL-250 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	
5 Packing gland	DN50-300: Aluminium DN350-600: Steel St.52	PTFE Epoxy
6 Support case		
7 Inner guide**	Bichromate steel	
8 Protection***		

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

** For CF8M body and DN greater than 200.

*** For automatic drive valves.



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



1 Body

Two half bodies in cast EN-GJL-250 joined together with two cardboard and bolted to each other (painted with epoxy protection in RAL 5017) or in CF8M.

It comes with the sides highlighted to be placed between flanges. 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-GJL-250) 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

The valve is bi directional with 2 joints providing a 100% tightness. 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

T. 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.

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-GJL-250) 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

Only for CF8M body and DN greater than 200.

8 Protection

In the pneumatic valves is mount a protection grid type on bichromated steel.

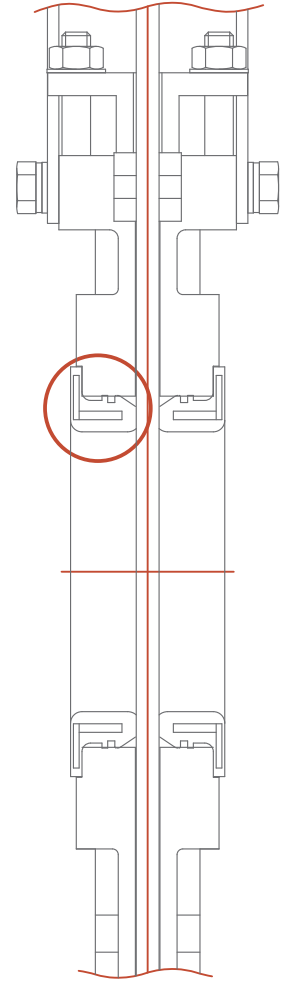
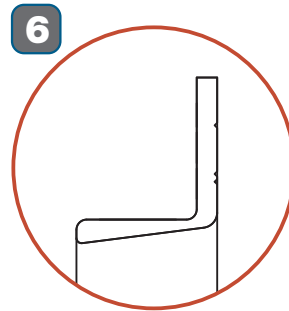
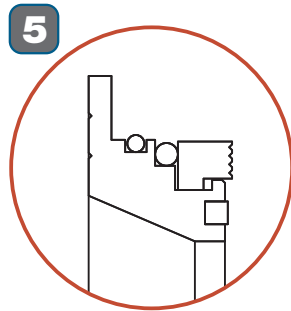
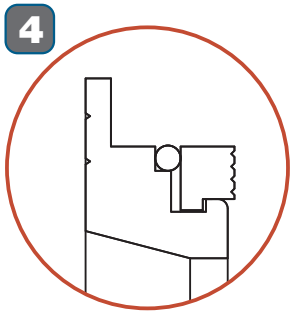
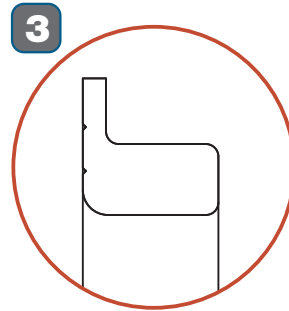
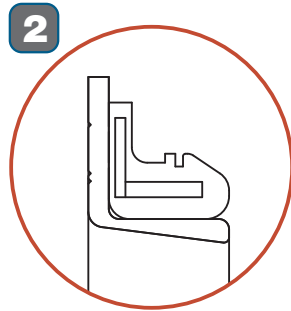
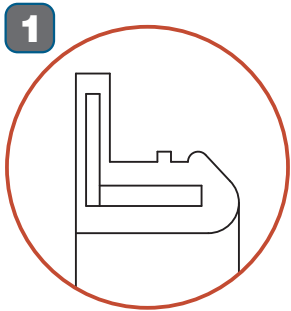
There is a possibility of manufactured on S.Steel under request

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



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.

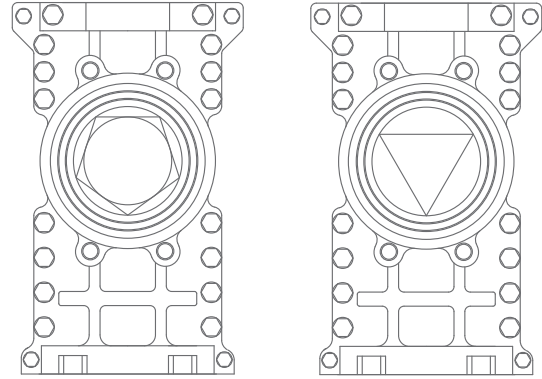
Hard chrome gate

Provides increased hardness and greater resistance to abrasion.

Bonnet

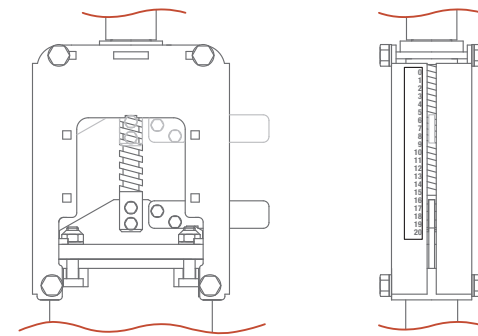
Provides a total seal against the outside, reducing the maintenance of the packing gland. (A special valve will need to be constructed. Please check with manufacturer).

Flow controllers

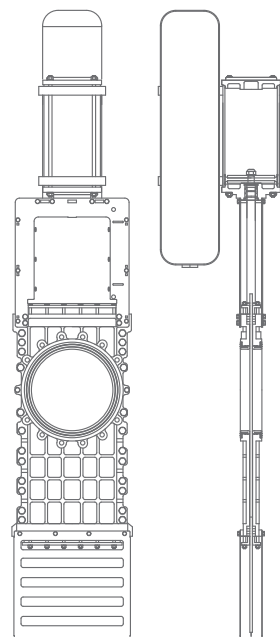


Pentagonal diaphragm

Triangular diaphragm



Graduated position indicator

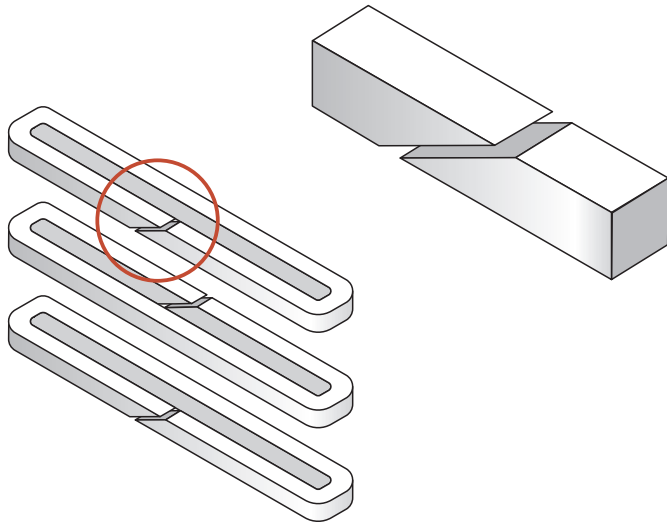
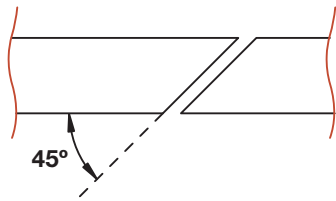


Option single tanking / Volume tank

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

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.

- 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
MWP	10	10	10	10	8	8	8	6	6	5	5	4	4

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

2.1.5. Weight

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

DN	VA	NDE
50	12	15
65	13	17
80	15	20
100	17	22
125	29	45
150	43	52
200	70	90
250	95	118
300	128	154
350	178	230
400	275	344
450		404
500		

DN Nominal Diameter in mm.

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

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



KNIFE GATE VALVES. RBR

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

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.

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

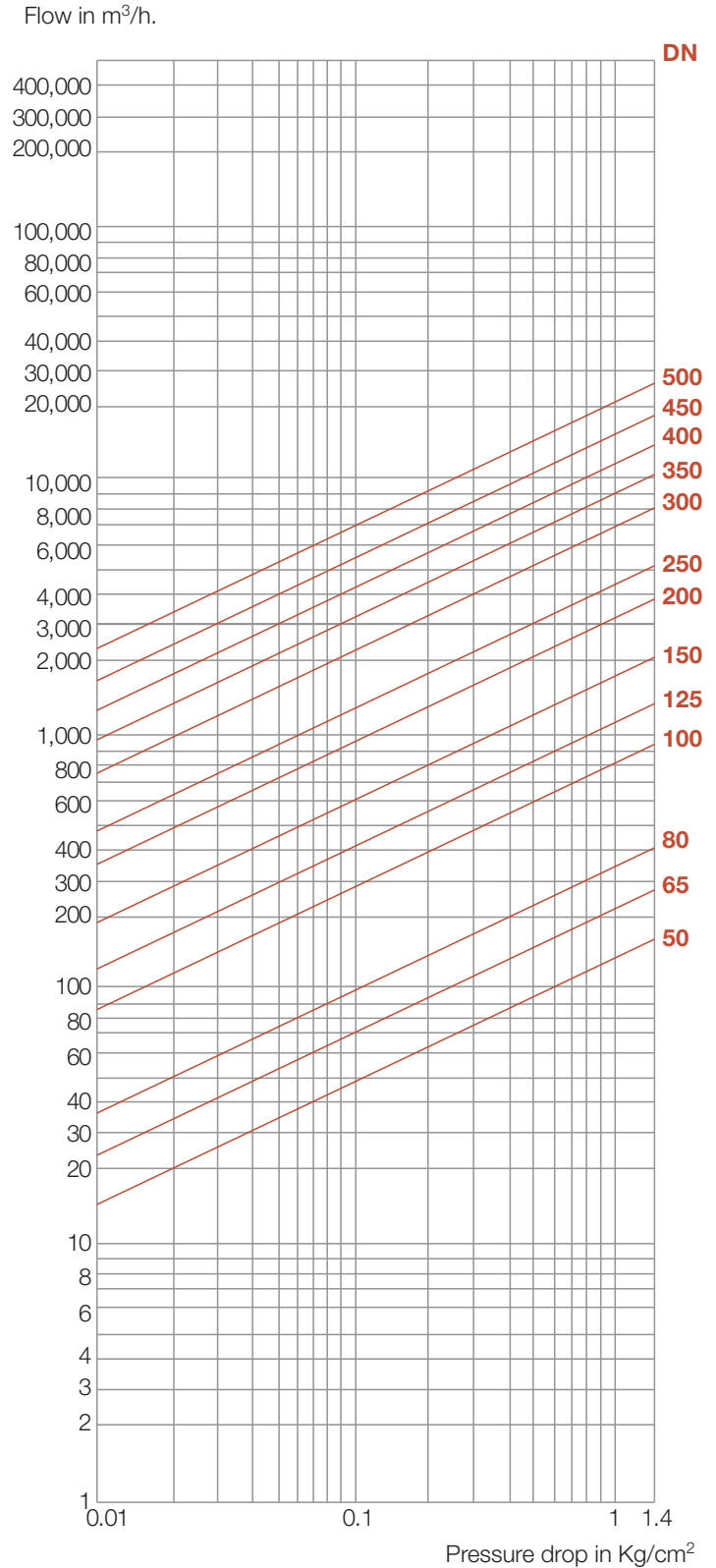
Q Flow in m³/h.
P h Pressure drops in bar.
d Relative density of the fluid (1 in the case of water at 4°C).

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

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

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

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

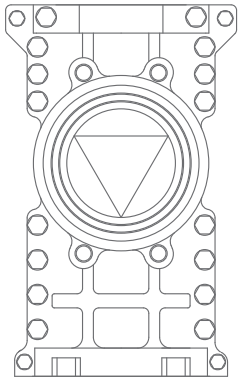


The manufacturer reserves the right to make changes without prior notification.

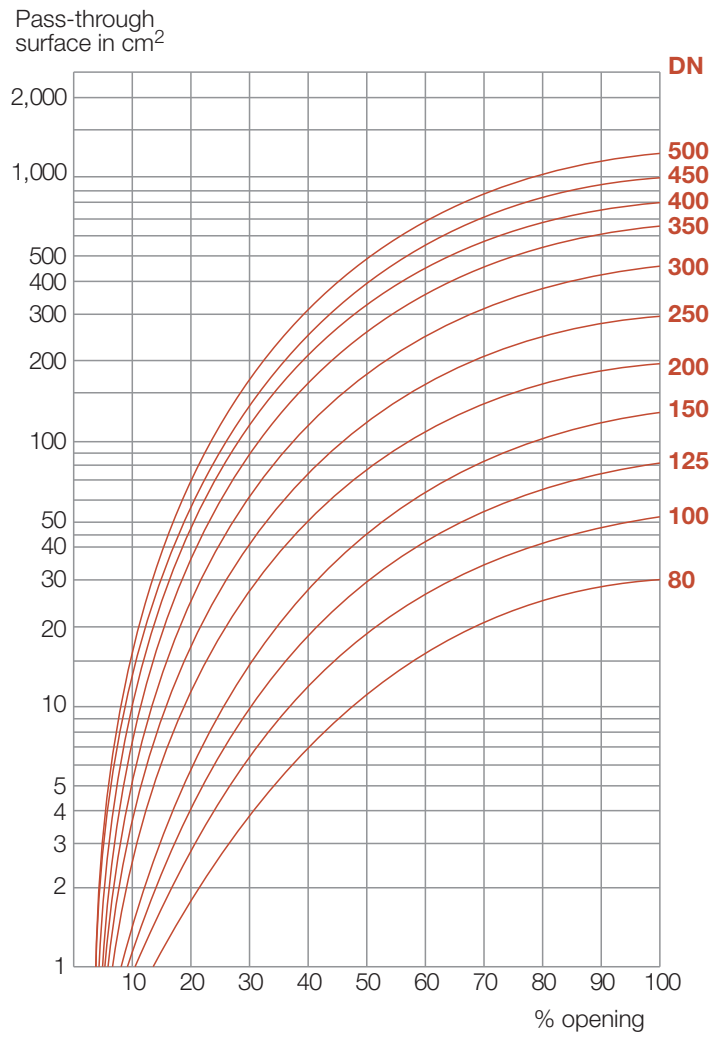


2.1.6. Pressure drops

For valves with a triangular diaphragm



Triangular diaphragm



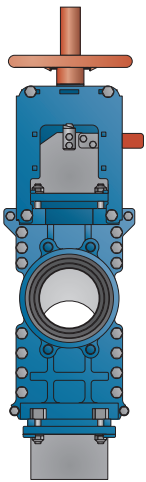
The manufacturer reserves the right to make changes without prior notification.

2.2. Drives

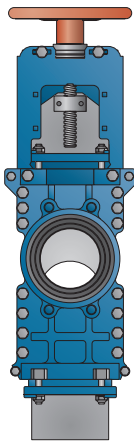
HERBE's RBR-HP knife gate valves can be activated with different types of drives, both manual and automatic. A correct choice of the type of drive will enable a more efficient use of the valve.

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

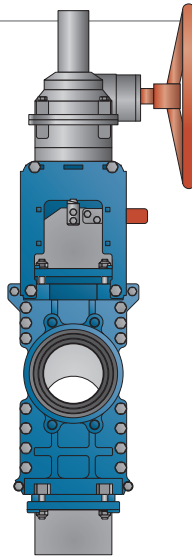
MANUAL



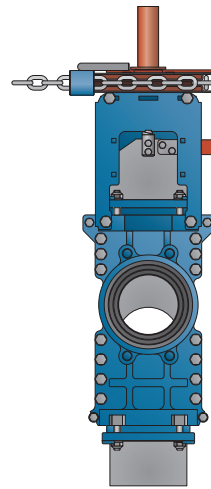
HP-VA
Handwheel with rising stem



HP-VF
Handwheel with non-rising stem

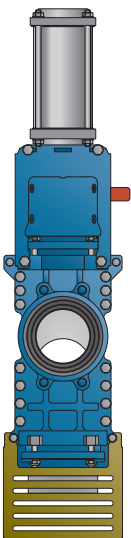


HP-R
Gear operator

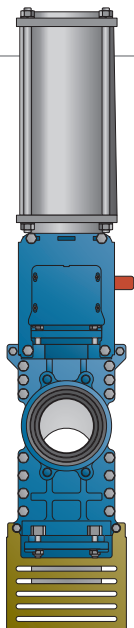


HP-C
Chain wheel

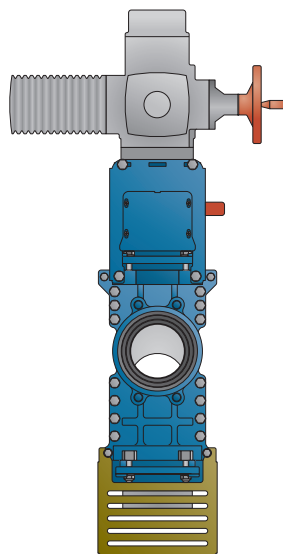
AUTOMATIC



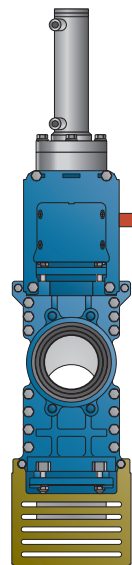
HP-NDE
Pneumatic cylinder



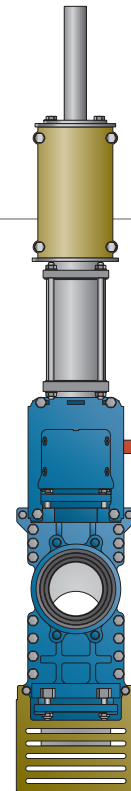
HP-NSE
Single effect pneumatic cylinder



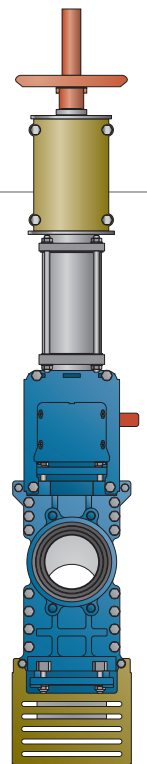
HP-E
Electric actuator



HP-HI
Hydraulic cylinder



HP-NDE
+ Mechanical travel stop



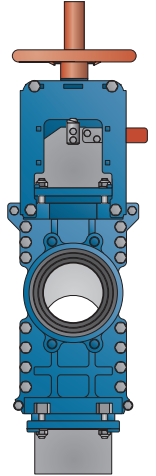
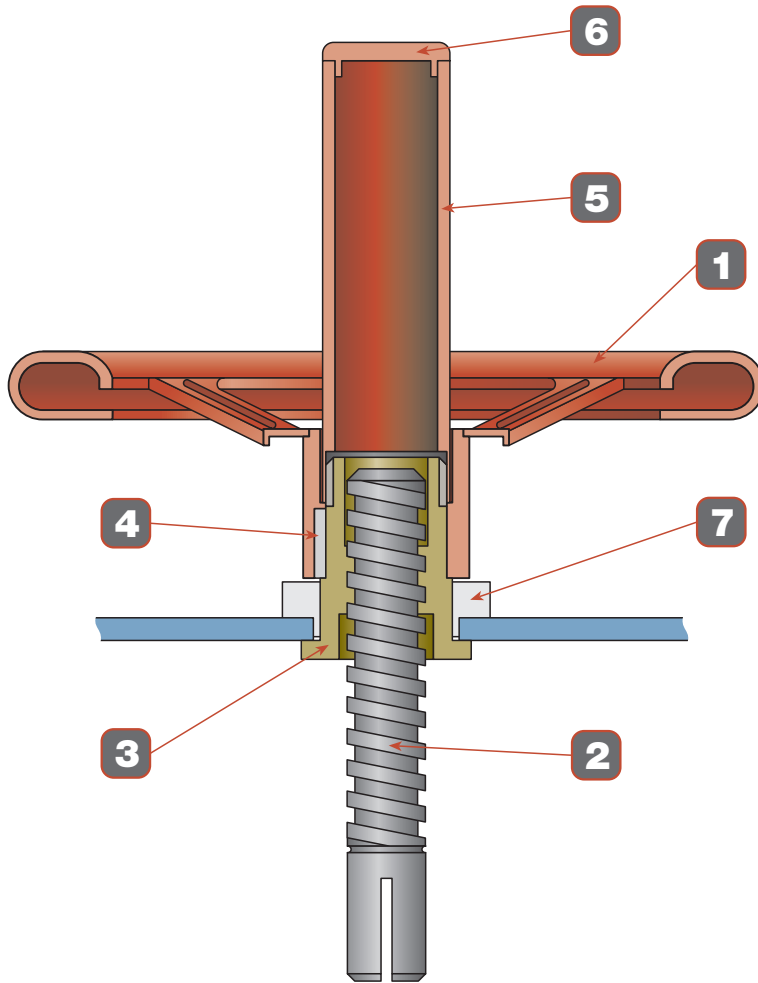
HP-NDE
+ Emergency handwheel

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 500, for any other sizes, please check with our Technical Department.

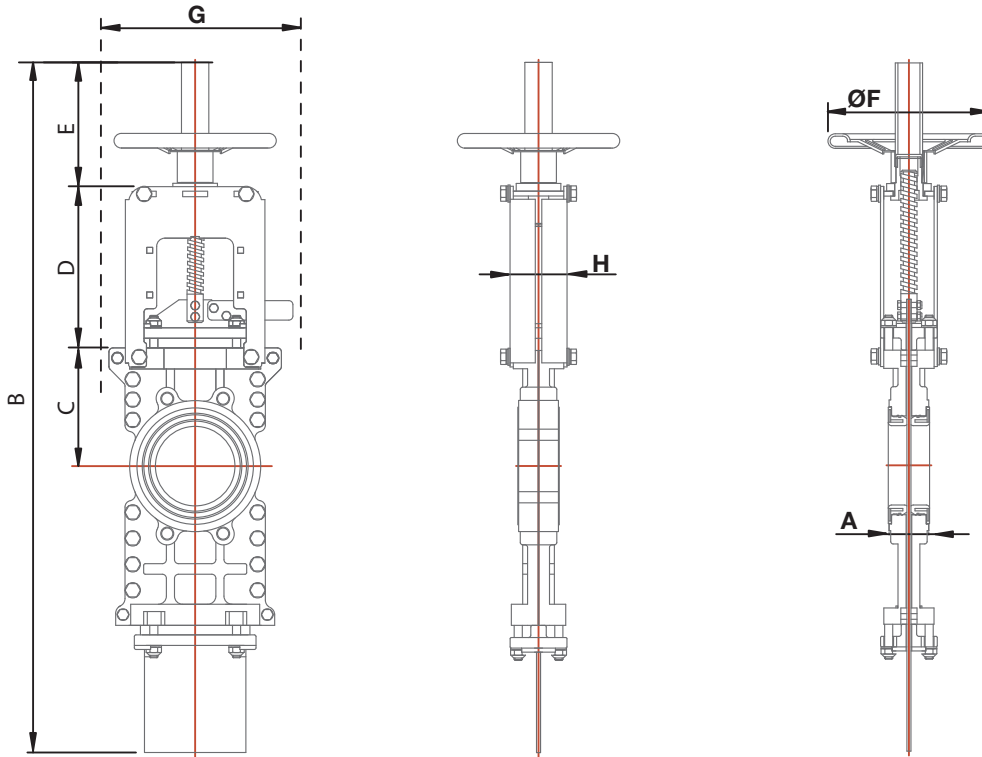


	DESCRIPTION	MATERIAL	U. (units)
1	Handwheel	Steel	1
2	Stem	AISI-303	1
3	Nut	Brass	1
4	Cotter	Steel	1
5	Protection	Steel	1
6	Plug	Plastic	1
7	Bearing	Nylon	1

* Other materials available on request.

2.2.1. VA

Measurements.



DN	A	B	C	D	E	ØF	G	H	WEIGHT	PN
50	50	585	115	143	96	200	173	68	12	10
65	50	667	110	170	109	200	209	68	13	10
80	50	742	127	179	139	200	209	70	15	10
100	50	832	146	199	134	200	226	70	17	10
125	50	1,001	157	224	205	250	265	78	29	8
150	60	1,108	184	254	191	250	275	79	43	8
200	60	1,400	209	315	265	300	342	90	70	8
250	65	1,665	260	350	313	350	395	92	95	6
300	70	2,009	280	422	434	350	457	95	128	6
350	90	2,229	352	471	398	400	533	94	178	5
400	100	2,546	362	553	474	500	565	110	275	5
450	100	2,774	375	600	520	500	630	126		4
500	110	3,107	425	675	575	500	718	126		4

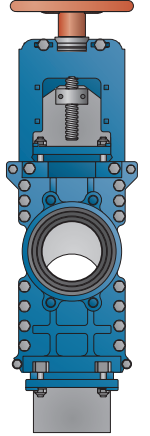
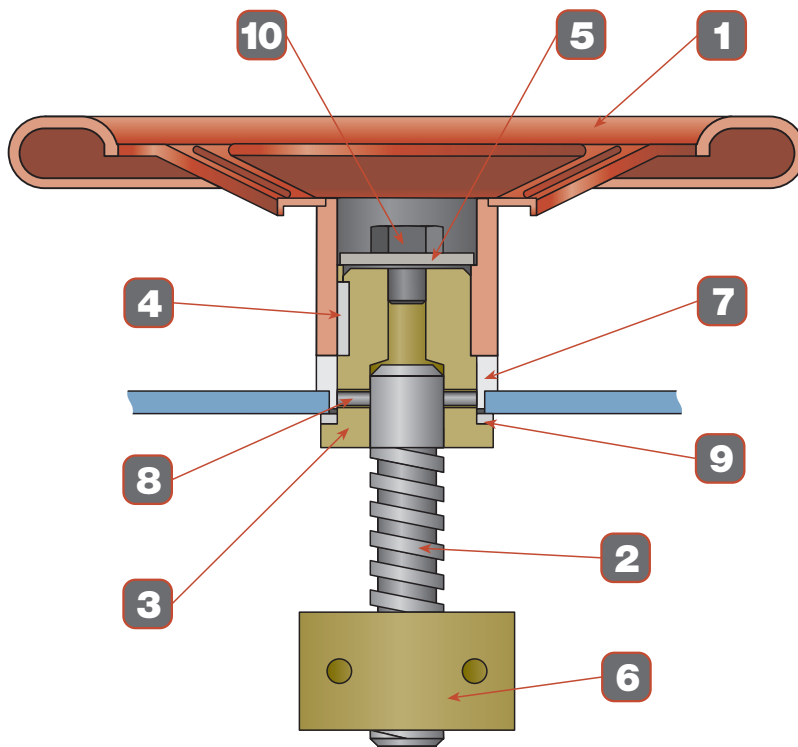
Assembly between Flanges PN10 / DN Nominal diameter / ØF Handwheel diameter
 G Maximum width / Weight in Kg. / PN Nominal pressure in bar. / Measurements in mm.

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 500, for any other sizes, please check with our Technical Department.



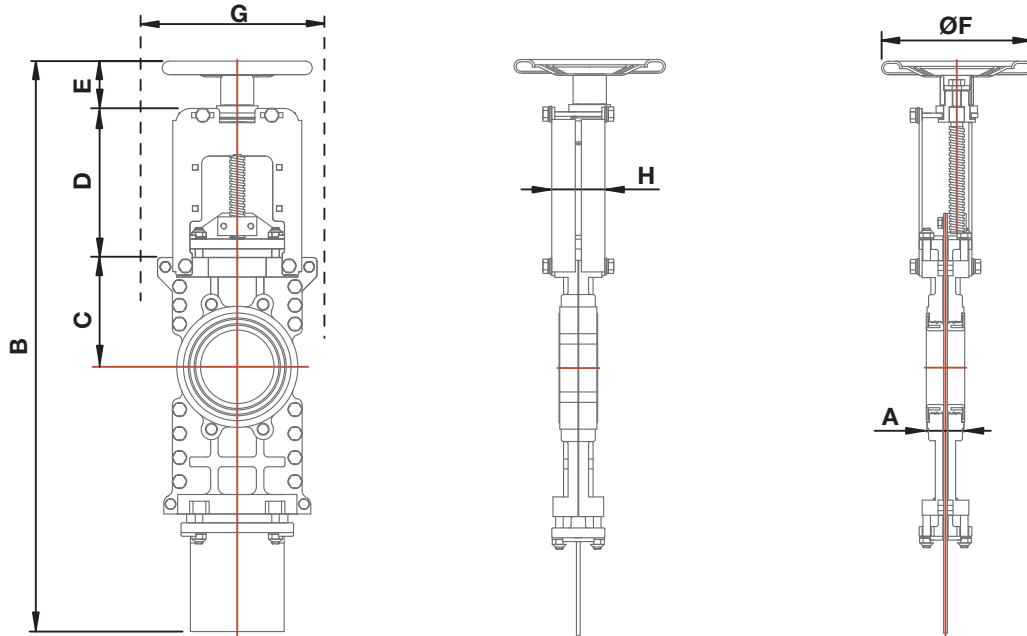
DESCRIPTION	MATERIAL	U.
1 Handwheel	Steel	1
2 Stem	AISI-303	1
3 Nut	Brass	1
4 Cotter	Steel	1
5 Washer	Steel	1
6 Nut	Brass	1
7 Bearing	Nylon	1
8 Pin	Steel	1
9 Washer	Nylon	1
10 Screw	Steel	1

* 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	560	115	143	71	200	173	68	12	10
65	50	623	110	170	64	200	209	68	13	10
80	50	664	127	179	61	200	209	70	15	10
100	50	760	146	199	62	200	226	70	17	10
125	50	867	157	224	70	250	265	78	29	8
150	60	987	184	254	70	250	279	79	50	8
200	60	1,245	209	315	110	300	342	90	70	8
250	65	1,467	260	350	115	350	395	92	95	6
300	70	1,682	280	422	107	350	457	95	128	6
350	90	1,947	352	471	117	400	533	94	178	5
400	100	2,184	362	553	112	500	565	110	275	5
450	100	2,368	375	600	114	500	630	126		4
500	110	2,641	425	675	109	500	718	126		4

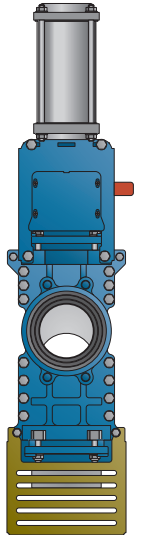
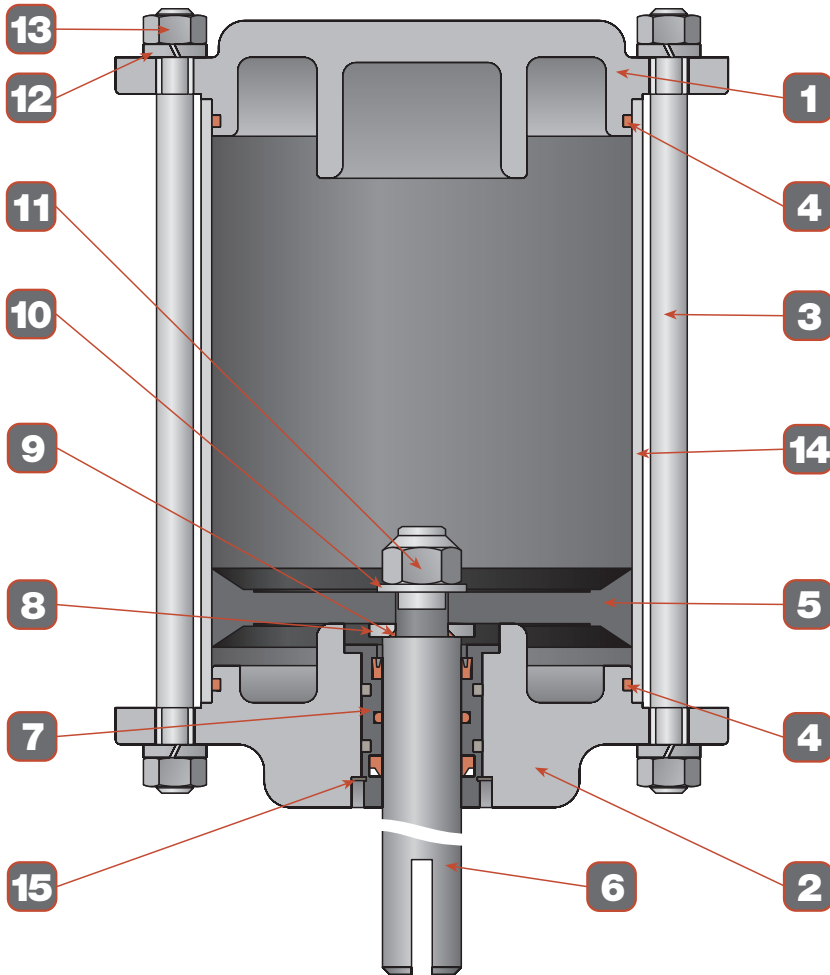
Assembly between Flanges PN10 / DN Nominal diameter / ØF Handwheel diameter
 G Maximum width / Weight in Kg. / PN Nominal pressure in bar. / Measurements in mm.

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 500, for any other sizes, please check with our Technical Department.



	DESCRIPTION	MATERIAL	UD.
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

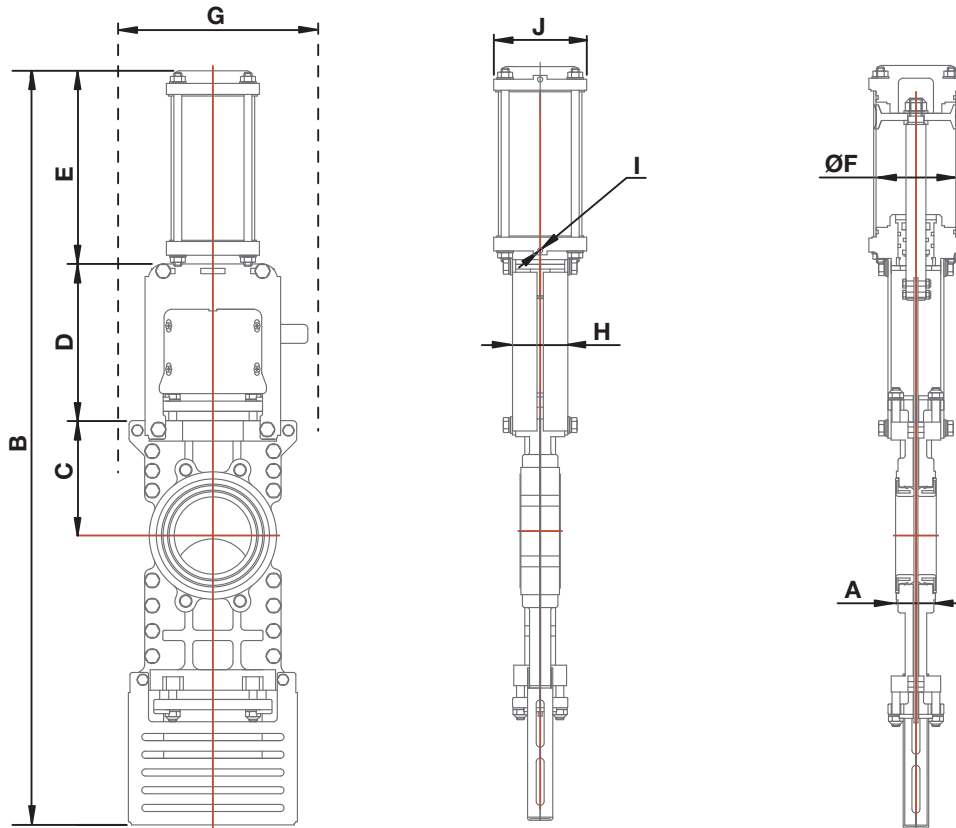
	DESCRIPCIÓN	MATERIAL	UD.
8	Bearing	Bichromate steel	1
9	O-ring	NBR	1
10	Bearing DIN 125	Bichromate steel	1
11	Self-locking nut DIN 985	Bichromate steel	1
12	Grower bearing DIN 127	Bichromate steel	8
13	Nut DIN 934	Bichromate steel	8
14	Jacket	Aluminium	1
15	Safety ring DIN 471	Bichromate steel	1

* 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	705	115	143	199	80	173	68	1/4" GAS	100	67	15	10
65	50	788	110	170	217	80	209	68	1/4" GAS	100	85	17	10
80	50	843	127	179	228	100	209	70	3/8" GAS	118	95	20	10
100	50	956	146	199	244	100	226	70	3/8" GAS	118	118	22	10
125	50	1,091	157	224	280	160	265	78	3/8" GAS	180	141	45	8
150	60	1,245	184	254	318	160	279	79	3/8" GAS	180	177	52	8
200	60	1,512	209	315	365	200	342	90	1/2" GAS	220	214	90	8
250	65	1,794	260	350	434	200	395	92	1/2" GAS	220	270	118	6
300	70	2,061	280	422	474	200	457	95	1/2" GAS	220	322	154	6
350	90	2,393	352	471	554	250	533	94	1/2" GAS	280	373	230	5
400	100	2,684	362	555	581	250	565	110	1/2" GAS	280	410	344	5
450	100	2,961	375	600	666	300	630	126	3/4" GAS	325	469	404	4
500	110	3,287	425	675	727	300	718	126	3/4" GAS	325	517		4

Assembly between Flanges PN10 / DN Nominal diameter / ØF Cylinder diameter / I Inlets / G Maximum width
 Weight in Kg. (aprox.) / PN Nominal pressure in bar. / Measurements in mm.

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



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01/2021