Neles™ bidirectional knife gate valve

Series KL

This knife-gate valve's main characteristic is that it provides a full continuous flow. This means that in open position it produces no cavities and, therefore, there are no turbulences in the fluid. It is also referred to as a bidirectional through-going gate valve or through conduit knife gate valve. The valve's body is composed of two parts or halves. The internal surface of both parts is fully machined and they are assembled with screws to form a solid block.

The gate in the stainless steel version slides smoothly inside the body thanks to the nylon RCH 1000 slides inserted inside both parts of the body. The stem protection hood is independent from the handwheel securing nut, this means the hood can be disassembled without the need to release the handwheel. This advantage allows regular maintenance operations to be performed, such as lubricating the stem, etc.

- Bidirectional knife gate valve.
- Through going gate
- Two-piece cast body, joined by screws, with internal guides for smooth movement of gate during operation.
- Provides high flow rates with low pressure drop.
- Various seat and packing materials available.
- Face-to-face dimension in accordance with manufacturer standard.

General applications

- This knife gate valve is suitable for liquids that contain a maximum of 20% suspended solids. It is also recommended in gravity discharge applications for solids and fine particles, because of its half-moon shape which cuts the flow and high consistency fluids.
- Designed for a wide range of applications such as:
  - Pulp and paper industry
  - Mining
  - Chemical plants
  - Food industry
  - Pumping
  - Silo emptying
  - Sewage treatment

Sizes

- DN50 to DN2000 (larger sizes on request).

Working pressure (ΔP)

See tables on pages 7 - 10.

Process connections

- DIN PN10 and ANSI B16.5 (Class 150)

Optional flanges

- DIN PN 6, 16 & 25
- BS "D" and "E"
- ANSI 150.
- Others on request.

Directives

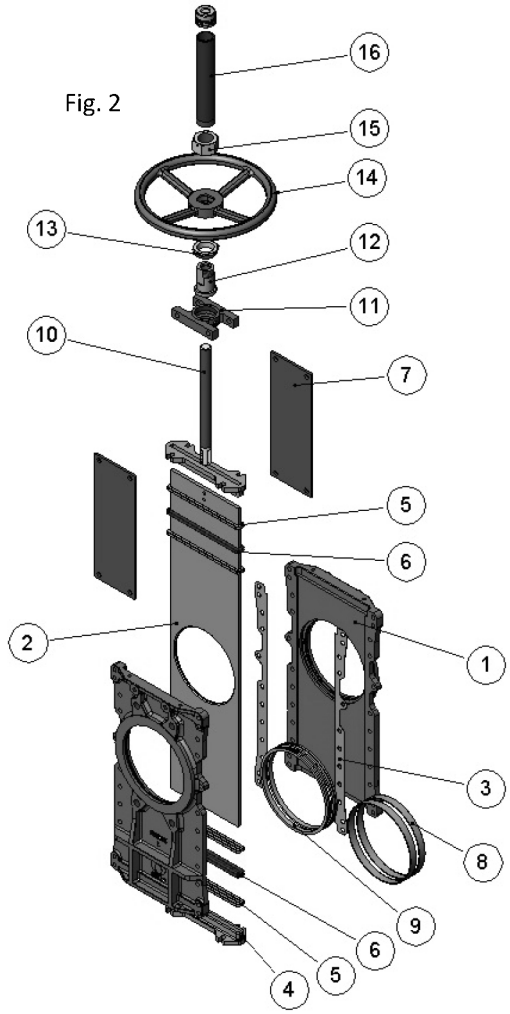
- Machinery Directive: DIR 2006/42/EC (MACHINERY)
- Pressure Equipment Directive: DIR 97/23/EC (PED) ART.3, P.3
- Potential Explosive Atmospheres Directive: DIR 94/9/EC (ATEX) CAT.3 ZONE 2 and 22 GD For further information on categories and zones please contact Valmet.

Quality dossier

- All valves are tested hydrostatically and material and test certificates can be provided.
- Body test = working pressure x 1.5.
- Seat test = working pressure x 1.1.

Standard components list

Fig. 2



PART No.	COMPONENT	MATERIAL
1	Body	CF8M
2	Gate	AISI316
3	Seal	CARDBOARD
4	Packing gland	CF8M
5	Packing	SYNT + PTFE
6	Seal	EPDM
7	Support plates	S275JR
8	Ring	AISI316
9	Seat	EPDM
10	Stem	AISI303
11	Bridge	STEEL
12	Stem nut	BRONZE
13	Check nut	ST44.2 + ZINC
14	Handwheel	NODULAR CAST IRON
15	Nut	STEEL
16	Cap	STEEL

Note: The stainless steel valves have slides on each side of the body to avoid friction and possible seizure of the valve, these slides are made of RCH1000.

Body

CF8M stainless steel body with reinforcements, composed of two parts joined by screws, the stainless steel version has internal nylon RCH1000 slides for the smooth movement of the gate, the GJL-250 versions do not require slides.

The internal surface of both parts is fully machined and they are assembled with screws to form a solid block.

Provides a full continuous flow. This means that in open position it produces no cavities and, therefore, there are no turbulences in the fluid and the load loss is minimal.

For diameters greater than DN1200 the body is machine-welded with the necessary reinforcements to resist the maximum working pressure.

The standard manufacturing material is CF8M stainless steel. Other materials, please contact Valmet.

Gate

The standard gate manufacturing material in valves having CF8M body is AISI316 stainless steel. Other materials or combinations can be supplied on request.

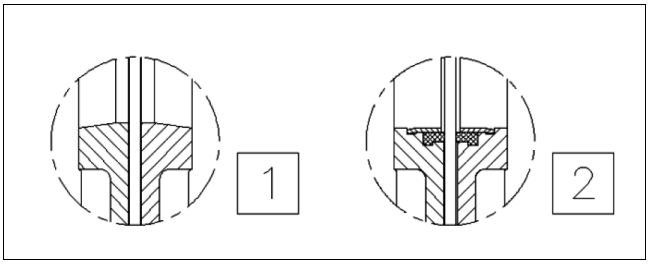
The gate is polished on both sides to provide a smooth contact surface with the resilient seat. At the same time, the gate is rounded to prevent the seat from being cut. Different degrees of polishing, anti- abrasion treatments and modifications are available to adapt the valves to the customer's requirements.

Seat

The following six types of seats are available according to the working application:

Seat 1: Metal / metal seat. This type of seat does not include any kind of resilient seat and the estimated leakage (considering water as the test fluid) is 1.5% of the pipe flow.

Seat 2: Standard soft-seated valve. This type of seat includes a resilient seat which is fixed to the inside of the body via an AISI316 stainless steel
retaining ring. As this valve is bidirectional it includes two watertight seals.



Resilient seat materials EPDM

This is the standard resilient seat fitted on Neles valves. It can be used in many applications, however, it is generally used for water and products diluted in water at temperatures no higher than 90 °C*. It can also be used with abrasive products and it provides the valve with 100% watertight integrity.

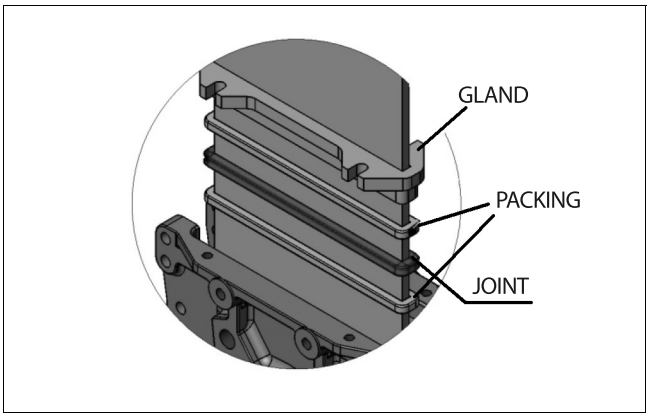
VITON Suitable for corrosive applications and continuous high temperatures of up to 190 °C and peaks of 210 °C. It provides the valve with 100% watertight integrity.

PTFE Suitable for corrosive applications and pH between 2 and 12. Does not provide the valve with 100% watertight integrity. Estimated leakage: 0.5% of the tube flow.

Note: In some applications other types of resilient materials are used, such as hypalon, butile or natural rubber. Please contact us if you require one of these materials.

Packing

Standard packing is composed of three lines with a specially designed EPDM O-ring in the middle which provides watertight integrity between the body and the gate, preventing any type of leakage to the atmosphere. It is located in an easily accessible place and can be replaced without dismantling the valve from the pipeline. Below we indicate various types of packing available according to the application in which the valve is located:



SYNTHETIC + PTFE: This packing is composed of braided synthetic fibres soaked in PTFE both inside and out. It is for general use in hydraulic applications in both pumps and valves and in all types of fluids, especially corrosive ones, including concentrated and oxidising oils. It is also used in liquids with solid particles in suspension.

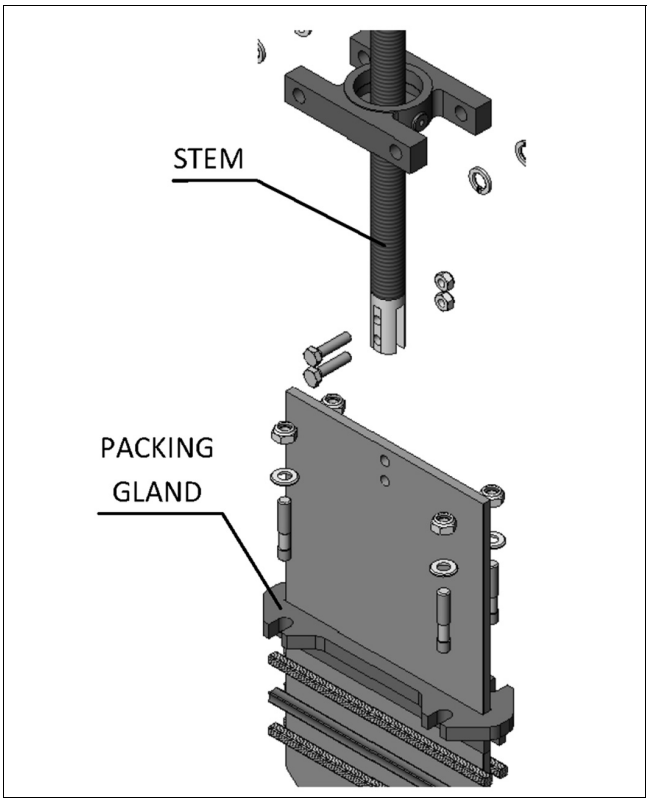
GRAPHITE: This packing is composed of high-purity graphite fibres. A diagonal braiding system is used and it´s impregnated with graphite and lubricant which helps to reduce porosity and improve operation. It has a wide range of applications as graphite is resistant to steam, water, oils, solvents, alkali and most acids.

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

SEATS / SEALS		
MATERIAL	Temp. max	APLICATIONS
Steel/Steel	>250 °C	High temp./Low watertight integ
EPDM (E)	90 °C*	Non-mineral acids and oils
Viton (V)	200 °C	Hydrocarbons and solvents
PTFE (T)	250 °C	Corrosion resistant

PACKING		
MATERIAL	Temp. max	pH
Synthetic+PTFE / EPDM	-20 to +90 °C	
Synthetic+PTFE / VITON	-20 to +200 °C	
Graphite	650 °C	0-14
Ceramic fibre	1400 °C	0-14

Nota: More details and other materials available on request.
* EPDM and nitrile: is possible until serving temperature Max.: 120 °C under request



Stem

The stem on the valve is made of 18/8 stainless steel. This characteristic provides high resistance and excellent corrosion-resistant properties.
The valve design can be rising stem or non-rising stem. When rising stem is required a stem hood is supplied to protect the stem from contact with dust and dirt, as well as keeping it lubricated.

Packing gland

The packing gland allows uniform force and pressure to be applied to the packing to ensure watertight integrity.

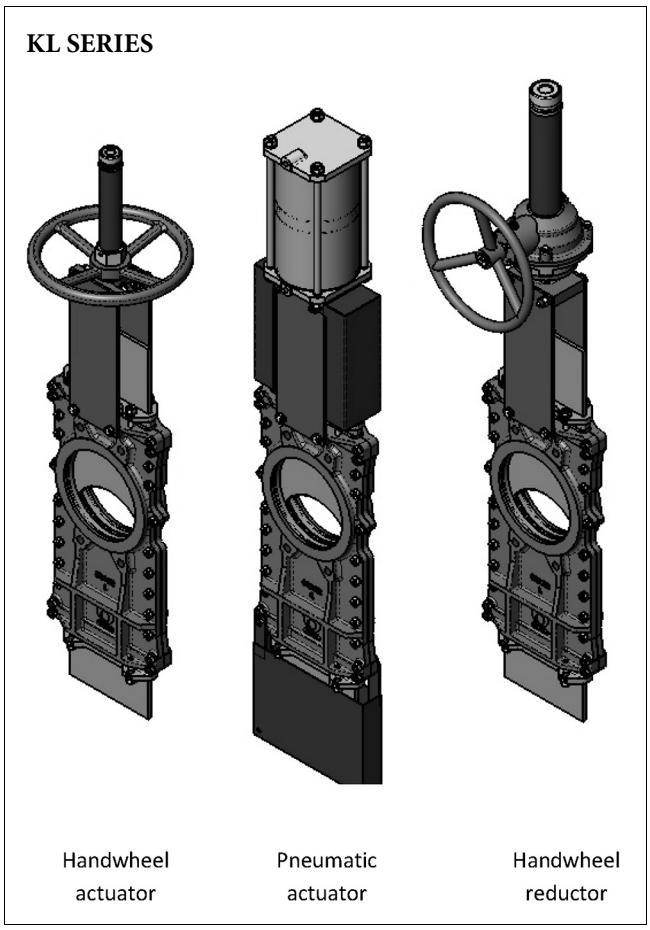
Actuators

All types of actuators can be supplied, with the advantage that the design is fully interchangeable. This design allows the customer to change the actuators themselves and normally no extra assembly accessories are required. In the event any accessory is required, Valmet will supply it.

Manual:	Automatic:
Handwheel with rising stem	Electric actuator
Handwheel with non-rising stem	Pneumatic cylinder
Gear box	Hydraulic cylinder

The chainwheel and gear box actuators are also available with non-rising stem. The pneumatic actuators can be single or double acting, and the single acting ones can in turn be open spring or close spring.

Accessories and options



Mechanical limit switches, inductive switches and positioners
Limit switches or inductive switches are installed to indicate precise valve position, as well as positioners to indicate continuous position.

Solenoid valves For air distribution to pneumatic actuators.

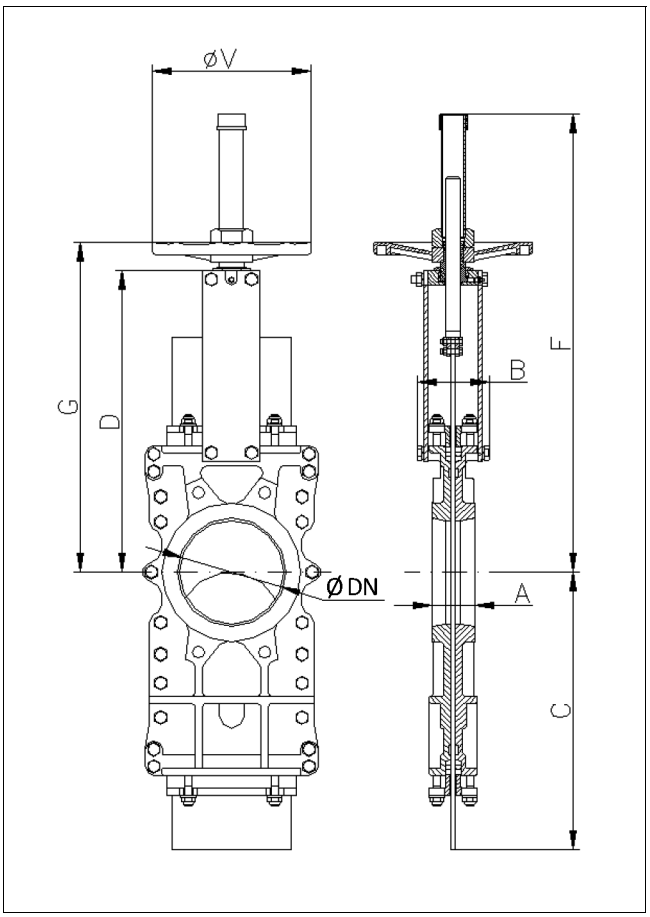
Connection boxes, wiring and pneumatic piping
Fully assembled units can be supplied with all the necessary accessories.

Stroke limiting mechanical stops mechanical locking device
Allows the valve to be mechanically locked in a set position for long periods of time.

Emergency manual actuator (Hand wheel / Gear box)
Allows manual operation of the valve in the event of power or air failure.

Locking device

Handwheel with rising stem

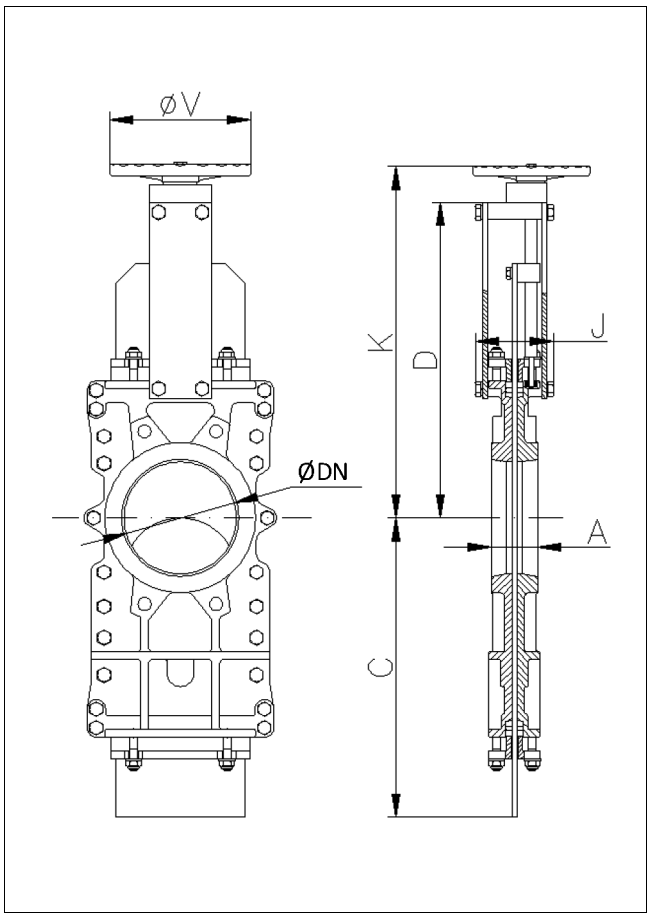


- **B = Max. width** of the valve (without actuator).
  D = Max. height of the valve (without actuator).
  C = maximum length when the gate is centred.
- Options:
  - Locking devices.
  - Extensions: stand, pipe, plates...
  - ND higher than those give in the table.
- Actuator including:
  - Handwheel.
  - Stem.
  - Nut.
  - Stem protection hood.
- Available: DN50 to DN1200, other DN on request.
- From DN600 the actuator is with gears.
- The weights are approximate and vary according to the material and the valve's accessories.

DN	ΔP (bar)	DRAW (Nw)	TORQUE (Nm)	A	B	C	D	F	G	ØV	Weight (kg.)
50	10	894	2.1	40	91	225	243	412	282	225	12
65	10	1508	3.5	40	91	265	269	437	308	225	13
80	10	2281	5.2	50	91	310	293	462	332	225	17
100	10	3561	8.2	50	91	370	334	503	373	225	19
125	10	5565	13	50	101	430	367	586	407	225	28
150	10	6419	15	60	101	495	419	638	458	225	38
200	10	10020	29	60	118	630	525	816	578	325	54
250	10	11230	32.5	70	118	770	620	1017	679	325	88
300	6	16210	47	70	118	895	704	1117	779	380	112
350	6	17740	70	96	290	1050	780	1337	906	450	163
400	6	23260	92	100	290	1185	855	1443	1012	450	235
450	5	22260	89	106	290	1320	975	1629	1098	450	368
500	4	27470	110	110	290	1455	1064	1741	1210	450	471
600	4	39850	160	110	290	1720	1244	2047	1416	450	532
700	3	36880	212	110	320	1995	1425	--	--	--	936
800	3	48980	285	110	320	2230	1615	--	--	--	N.G.
900	3	61230	353	110	320	2465	1823	--	--	--	N.G.
1000	3	77690	457	110	320	2620	1992	--	--	--	N.G.
1100	3	95506	674	150	340	3030	2217	--	--	--	N.G.
1200	3	113710	802	150	340	3250	2351	--	--	--	N.G.

N.G.: Weight not given

Handwheel with non-rising stem

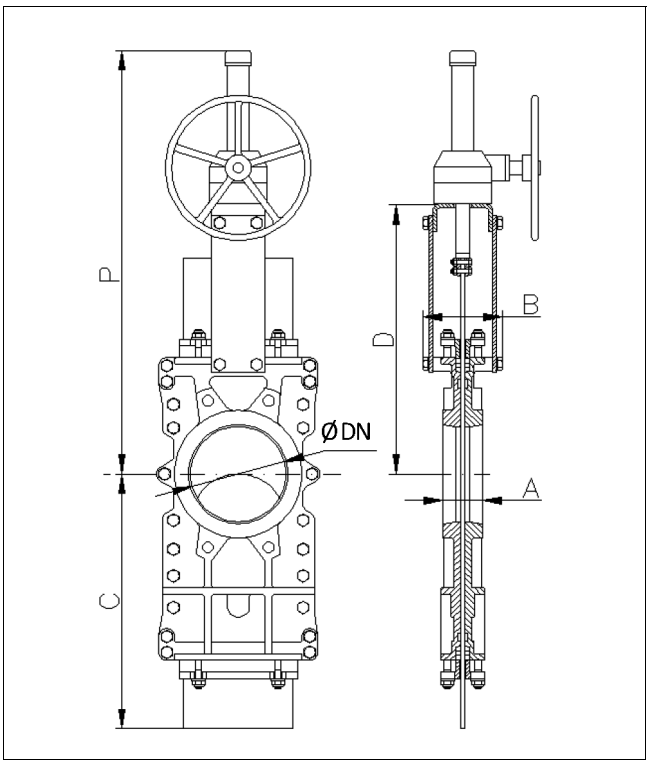


- Suitable when no size limitations exist.
- **J = Max. width** of the valve (without actuator).
  B = Max. height of the valve (without actuator).
  C = maximum length when the gate is centred.
- Options:
  - Square nut.
  - Locking devices.
  - Extensions: stand, pipe, plates...
  - ND higher than those give in the table.
- Actuator including:
  - Handwheel.
  - Stem.
  - Guide bearings on the yoke.
  - Nut.
- Available: DN50 to DN1200, other DN on request.
- The weights are approximate and vary according to the material and the valve's accessories.
- From DN600 the actuator is with gears.

DN	ΔP (bar)	DRAW (Nw)	TORQUE (Nm)	A	C	D	J	K	ØV	Weight (kg.)
50	10	894	2.1	40	225	243	101	277	225	12
65	10	1508	3.5	40	265	269	101	304	225	13
80	10	2281	5.2	50	310	293	101	330	225	17
100	10	3561	8.2	50	370	334	101	370	225	19
125	10	5565	13	50	430	367	111	402	225	28
150	10	6419	15	60	495	419	111	454	225	38
200	10	10020	29	60	630	525	128	578	325	54
250	10	11230	32.5	70	770	620	128	679	325	88
300	6	16210	47	70	895	704	128	779	380	112
350	6	17740	70	96	1050	780	305	860	450	163
400	6	23260	92	100	1185	855	305	981	450	235
450	5	22260	89	106	1320	975	305	1067	450	368
500	4	27470	110	110	1455	1064	305	1179	450	471
600	4	39850	160	110	1720	1244	305	1386	450	532
700	3	36880	212	110	1995	1425	335	--	--	936
800	3	48980	285	110	2230	1615	335	--	--	N.G.
900	3	61230	353	110	2465	1823	335	--	--	N.G.
1000	3	77690	457	110	2620	1992	335	--	--	N.G.
1100	3	95506	674	150	3030	2217	355	--	--	N.G.
1200	3	113710	802	150	3250	2351	355	--	--	N.G.

N.G.: Weight not given

Gear box

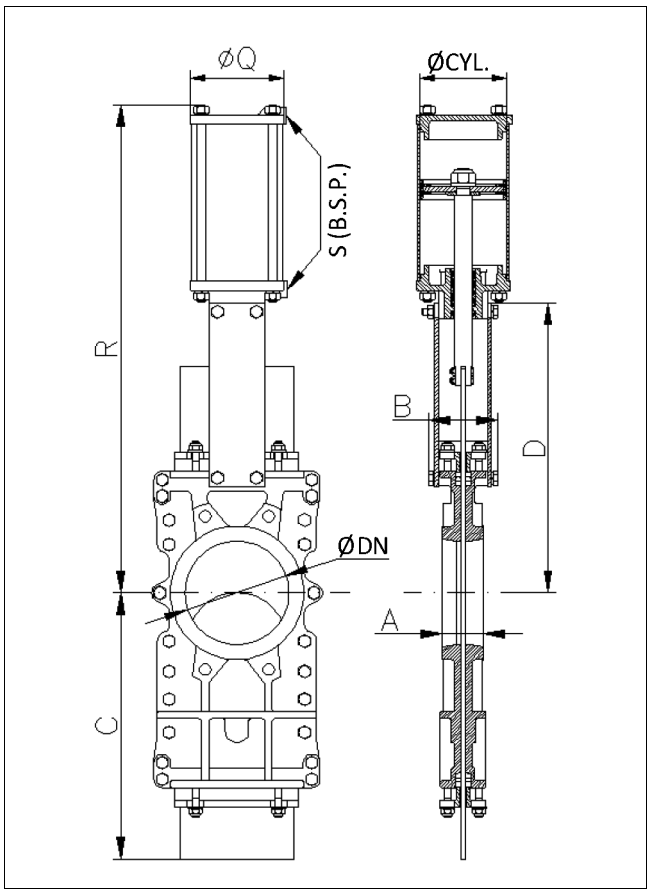


- It is recommendable for DN greater than 600.
- **A = Max. width** of the valve (without actuator).
  B = Max. height of the valve (without actuator).
  C = maximum length when the gate is centred.
- Options:
  - Chainwheel- Locking devices
  - Non-rising stem
  - Extensions: stand, pipe, plates...
- Actuator including:- Cone-shaped gear box
  - Stem
  - Yoke
  - Handwheel
- Standard ratio = 4 to 1 .
- Available: DN50 to DN2000, other DN on request.
- The weights are approximate and vary according to the material and the valve's accessories.

DN	ΔP (bar)	DRAW (Nw)	TORQUE (Nm)	A	B	C	D	P	Weight (kg.)
50	10	894	2.1	40	91	225	243	540	22
65	10	1508	3.5	40	91	265	269	566	23
80	10	2281	5.2	50	91	310	293	591	27
100	10	3561	8.2	50	91	370	334	631	28
125	10	5565	13	50	101	430	367	665	37
150	10	6419	15	60	101	495	419	717	47
200	10	10020	29	60	118	630	525	943	76
250	10	11230	32.5	70	118	770	620	1037	111
300	6	16210	47	70	118	895	726	1171	133
350	6	17740	70	96	290	1050	780	1318	163
400	6	23260	92	100	290	1185	855	1393	247
450	5	22260	89	106	290	1320	975	1662	386
500	4	27470	110	110	290	1455	1064	1752	495
600	4	39850	160	110	290	1720	1244	1981	552
700	3	36880	212	110	320	1995	1425	2320	956
800	3	48980	285	110	320	2230	1615	2610	N.G.
900	3	61230	353	110	320	2465	1823	2913	N.G.
1000	3	77690	457	110	320	2620	1992	3206	N.G.
1100	3	95506	674	150	340	3030	2217	3777	N.G.
1200	3	113710	802	150	340	3250	2351	4042	N.G.
1300	2	133563	943	150	390	3430	2882	4382	N.G.
1400	2	157280	1298	150	390	3680	3250	4852	N.G.
1500	2	180712	1493	170	426	3930	3517	5217	N.G.
1600	2	205780	1904	170	426	4272	3775	5575	N.G.
1700	2	236498	2214	190	440	4615	4008	5908	N.G.
1800	2	264860	2477	190	440	4886	4242	6242	N.G.
1900	2	299502	3213	210	480	5158	4390	6490	N.G.
2000	2	331260	3549	210	480	5430	4540	6740	N.G.

N.G.: Weight not given

Double-acting pneumatic cylinder

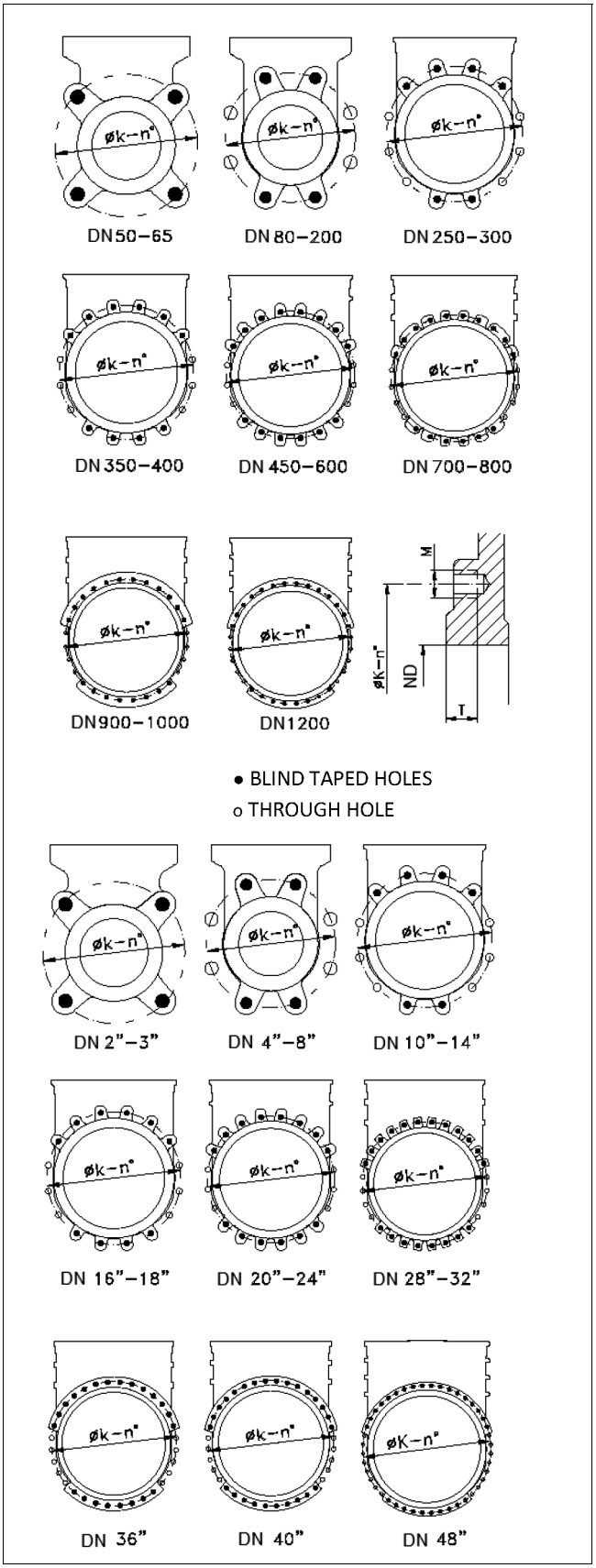


- The air supply pressure to the pneumatic cylinder is a minimum of 6 bar and a maximum of 10 bar, the air must be dry and lubricated.
- For DN50 to DN200 valves, the cylinder's jacket and covers are made of aluminium, the rod of AISI304, the piston of rubber-coated steel and the O-ring seals are made of nitrile.
- For valves larger than DN200 the covers are made of nodular cast iron or carbon steel.
- On request, we can also supply the actuator made entirely of stainless steel, especially for installation in corrosive atmospheres.
- **A = Max. width** of the valve (without actuator).
  B = Max. height of the valve (without actuator).
  C = maximum length when the gate is centred.
- Available: DN50 to DN1200, other DN on request.
- The weights are approximate and vary according to the material and the valve's accessories.

DN	ΔP (bar)	DRAW (Nw)	A	B	C	D	R	Ø CYL.	Ø ROD	ØQ	S (B.S.P.)	Weight (kg.)
50	10	894	40	91	225	243	416	80	20	90	1/4"	12
65	10	1508	40	91	265	269	456	80	20	90	1/4"	13
80	10	2281	50	91	310	293	497	80	20	90	1/4"	19
100	10	3561	50	91	370	334	561	100	20	110	1/4"	19
125	10	5565	50	101	430	367	636	125	25	135	1/4"	33
150	8	6419	60	101	495	419	717	160	30	170	1/4"	43
200	8	10020	60	118	630	525	874	200	30	215	1/4"	65
250	8	11230	70	118	770	620	1030	200	30	215	3/8"	104
300	6	16210	70	118	895	704	1160	250	40	270	3/8"	126
350	6	17740	96	290	1050	780	1364	250	40	270	3/8"	200
400	6	23260	100	290	1185	855	1482	250	40	270	3/8"	281
450	5	22260	106	290	1320	975	1662	250	40	270	1/2"	427
500	4	27470	110	290	1455	1064	1802	300	45	382	1/2"	540
600	4	39850	110	290	1720	1244	2081	350	45	444	1/2"	609
700	3	36880	110	320	1995	1425	2400	350	45	444	1/2"	1054
800	3	48980	110	320	2230	1615	2693	350	45	444	1/2"	N.G.
900	3	61230	110	320	2465	1823	3037	400	50	508	1/2"	N.G.
1000	3	*	110	320	2620	1992	3306	400	50	508	1/2"	N.G.
1100	3	*	150	340	3030	2217	3587	400	50	508	1/2"	N.G.
1200	3	*	150	340	3250	2351	3868	400	50	508	1/2"	N.G.

(*) not available data
N.G.: Weight not given

Dimensions for process connections



EN 1092-2 PN10

DN	w	o	Metric	T	ØK
50	4	-	M 16	8	125
65	4	-	M 16	8	145
80	4	4	M 16	9	160
100	4	4	M 16	9	180
125	4	4	M 16	9	210
150	4	4	M 20	10	240
200	4	4	M 20	10	295
250	8	4	M 20	12	350
300	8	4	M 20	12	400
350	12	4	M 20	21	460
400	12	4	M 24	21	515
450	16	4	M 24	22	565
500	16	4	M 24	22	620
600	16	4	M 27	22	725
700	20	4	M 27	22	840
800	20	4	M 30	22	950
900	24	4	M 30	20	1050
1000	24	4	M 33	20	1160
1100	28	4	M 33	20	1270
1200	28	4	M 36	22	1380
1300	28	4	M 36	26	1490
1400	32	4	M 39	26	1590
1500	32	4	M 39	35	1700
1600	36	4	M 45	40	1820
1700	40	4	M 45	40	1920
1800	40	4	M 45	40	2020
1900	44	4	M 45	45	2120
2000	44	4	M 45	45	2230

ANSI B16, Class 150

DN	w	o	R UNC	T	ØK
2"	4	-	5/8"	8	120.6
2 ½"	4	-	5/8"	8	139.7
3"	4	-	5/8"	9	152.4
4"	4	4	5/8"	9	190.5
5"	4	4	3/4"	9	215.9
6"	4	4	3/4"	10	241.3
8"	4	4	3/4"	10	298.4
10"	8	4	7/8"	12	361.9
12"	8	4	7/8"	12	431.8
14"	8	4	1"	21	476.2
16"	12	4	1"	21	539.7
18"	12	4	1⅛"	22	577.8
20"	16	4	1⅛"	22	635
24"	16	4	1¼"	22	749.3
28"	24	4	1¼"	22	863.6
30"	24	4	1¼"	22	914.4
32"	24	4	1½"	22	977.9
36"	28	4	1½"	20	1085.9
40"	32	4	1½"	20	1200.2

How to order

1.	2.	3.	4.	5.	6.	7.	8.
KL	W	J	050	A	B	P	D

1.	VALVE SERIES
KL	Knife gate valve, wafer type, bi-directional

2.	END CONNECTION
W	Wafer

3.	PRESSURE RATING
J	PN10
C	ASME Class 150

4.	BODY SIZE		
050	DN 50	02	2"
065	DN 65	2H	2.5"
080	DN 80	03	3"
100	DN 100	04	4"
125	DN 125	05	5"
150	DN 150	06	6"
200	DN 200	08	8"
250	DN 250	10	10"
300	DN 300	12	12"
350	DN 350	14	14"
400	DN 400	16	16"
450	DN 450	18	18"
500	DN 500	20	20"
600	DN 600	24	24"

5.	BODY MATERIAL
A	CF8M

6.	KNIFE, PACKING GLAND, PACKING & SEAT MATERIALS
B	Knife: AISI 316 Packing gland: CF8M Packing: EPDM/Synthetic+PTFE Seat: EPDM

7.	ACTUATOR TYPE
P	Pneumatic
M	Manual
E	Electric

8.	ACTUATOR SPECIFICATION
D	Double acting

9.	INSTRUMENTATION CONNECTION BOX
-	No connection box
C	Connection box

Solenoid valve typecode

1.	2.	3.
MW	A	0242

1.	MANUFACTURER
MW	Metalwork

2.	MODEL
A	SOV35SOSOO

3.	COIL
0242	W0215000101

Other solenoid valves options on request, please consult Valmet.

Limit switches typecode

1.	2.	3.	4.
M	TM	V	2

1.	TYPE
M	Mechanical
I	Inductive

2.	MANUFACTURER
TM	Telemecanique
PF	Pepperl-Fuchs

3.	Model
V	XCK-M115 (Only for Telemecanique)
A	NBB8-18GM60-US (Only for Pepperl-Fuchs)

4.	NUMBER OF SWITCHES
2	2 Pieces

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