

**MODEL****VG**

## RUBBER SLEEVE KNIFE GATE VALVE

The VG model knife gate is a bi-directional wafer valve equipped with two metal reinforced rubber sleeves, designed for applications with abrasive slurries. The VG slurry knife gate valve is mainly used in industries such as:

- Mining
- Chemical plants
- Etc.
- Power plants
- Wastewater treatment

### Sizes:

DN 2"/50mm to 36"/DN 900mm (larger DN on request)

### Working pressure:

DN 2"/ 50mm to 16"/400mm 10 bar (150 psi)

DN 18"/450mm to 24"/600mm 6 bar (90 psi) or 10 bar (150 psi)<sup>(1)</sup>

DN 28"/700mm to 36"/900mm 5 bar (75 psi) or 10 bar (150 psi)<sup>(1)</sup>

Higher pressures and/or diameters on request

<sup>(1)</sup> Duplex gate for 10 bar (150 psi)

### Standard Flange connection:

DIN PN 10 and ANSI B16.5 (class 150)

Other: (On request)

DIN PN 6

DIN PN 16

DIN PN 25

BS "D" and "E"

ANSI 125

Others on request

### Directives:

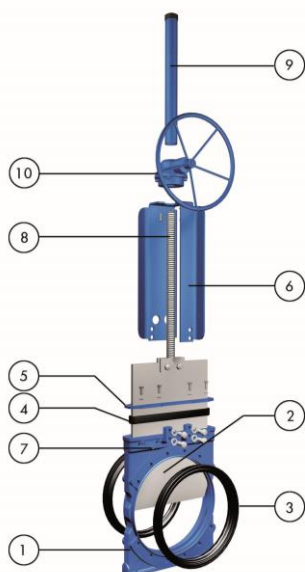
For EU Directives and other Certificates, please see the document:

Directives and Certificates Compliance - Knife Gate Valves -

Catalogues and Datasheets



All ORBINOX valves are tested prior to shipping



### STANDARD PARTS LIST

Part:	Materials:
1- Body	Ductile iron A536 (60-40-18) / 0.7040 / GJS 400
2- Gate	AISI 304 (1.4301)/AISI 316 (1.4401)
3- Sleeves	Natural rubber / EPDM
4- Packing	EPDM
5- Gland Follower	A570 GR.40 / 1.0044 Epoxy coated
6- Yoke	A570 GR.40 / 1.0044 Epoxy coated
7- Grease Nipple	Zinc coated carbon-steel
8- Stem	Stainless Steel
9- Stem protector	A570 GR.40 / 1.0044 Epoxy coated
10- Bevel Gear	-

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## DESIGN FEATURES

### **BODY:**

Wafer style cast monoblock, for installation between flanges, with reinforced ribs in larger diameters, providing the body with extra strength. Internal body design allows the gate to be fully guided. It is equipped with two machined lateral mouths where the sleeves fit perfectly. The grease nipples allow the gate to be lubricated, thus enhancing its capacity to slide between the sleeves. Additionally, the design allows draining through the lower part, where a cover or a bottom splash guard can be installed. Some leakage will occur from the bottom of the valve during operation. This allows solids to be flushed from body cavity and will ensure the full stroke of the valve.

### **GATE:**

Made of stainless steel, polished on both sides, and of rectangular shape, the gate is machined to an edge. As well as reducing friction and damage to the seats, this design allows to cut perfectly through the fluid. The material can be changed upon request, thus allowing greater working pressures.

### **RUBBER SLEEVES:**

The seat is made up of two highly resistant, long-lasting sleeves, made of natural rubber with a metal core. The patented sleeve design allows for maximum flexibility during gate travel, minimising the effort necessary for its operation. In the open position, the two sleeves are in permanent contact with each other, assuring full bore flow. There are no seat cavities which may cause material build-up, and the fluid does not come into contact with the metallic parts of the valve. This design allows for easy replacement of damaged sleeves. See available materials on page VG-6.

### **PACKING:**

Made of EPDM, it eliminates possible leaks to the exterior as well as minimising the maintenance needs of traditional packings. In combination with the grease nipples, it guarantees an optimal functioning of the gate.

### **STEM:**

Made of stainless steel, which provides it with a high resistance to corrosion and a long life. In rising stem valves the stem protector also protects the spindle against dirt.

### **ACTUATORS:**

All actuators supplied by ORBINOX are interchangeable, and supplied with an standard mounting kit for installation purposes on site.

### **YOKE or ACTUATOR SUPPORT:**

Made of steel (stainless steel available on request) and EPOXY coated. Its robust design provides it with great rigidity, withstanding the most adverse operating conditions. Reinforced design is standard starting from DN 200.

### **EPOXY COATING:**

The epoxy coating on all ORBINOX cast iron and carbon steel components is electrostatically applied making the valves to be corrosion resistant with a high quality finished surface. The ORBINOX standard colour is RAL-5015 blue.

### **GATE SAFETY PROTECTION:**

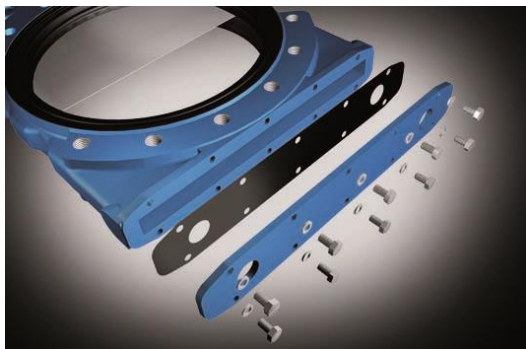
ORBINOX automated valves are provided with gate guards in accordance with EU Safety Standards. The design feature prevents any objects from being caught accidentally while the gate is moving.



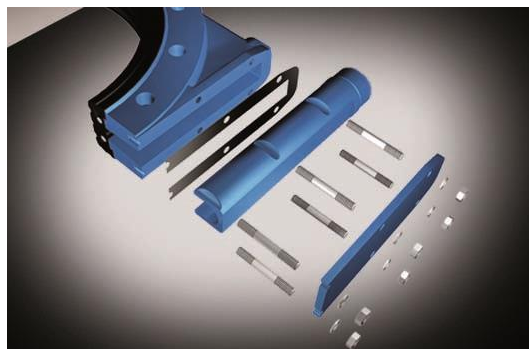
## OTHER OPTIONS

### Bottom splash guard (Fig. 1 and 2):

There are two types of splash guards that can be installed on the lower part of the valve body. They permit either periodic or continuous removal of solids that may accumulate during operation of the valve. They shall always be connected to a drain line.



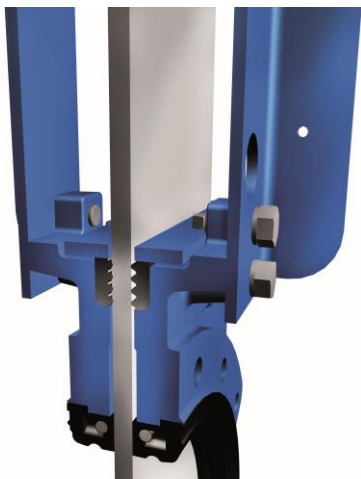
(Fig. 1) Flat plate



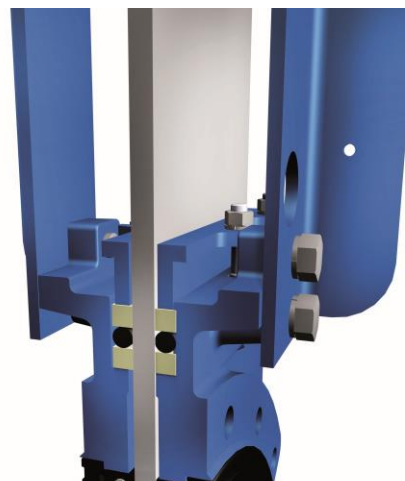
(Fig. 2) Tubular design

### Conventional leak proof packing (Fig. 3 and 4):

The VG can use conventional leak proof packing and packing gland follower which guarantee full tightness at maximum design pressure.



(Fig. 3) Standard packing



(Fig. 4) Optional: conventional leak proof packing

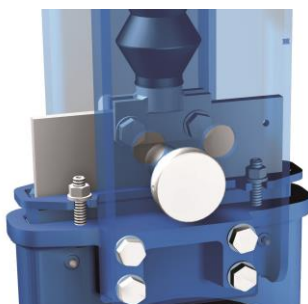
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## OTHER OPTIONS

### Open-closed lockout system (Fig. 5):

The standard valve is ready to install a lockout pin for emergency or maintenance situations.



(Fig. 5)

### Other materials of constructions:

Other materials may be used, such as carbon steel, different stainless steels (AISI 316, AISI 317, 2205, ...), special alloys (254SMO, Hastelloys, ...), etc.

### Fabricated valves:

ORBINOX designs, produces and delivers special fabricated valves for special process conditions (big sizes and/or high pressures)

### Flush ports (Fig. 6):

Allows flushing out of solids trapped within the body cavity and the sleeves. This option can be used in conjunction with splash guards



(Fig. 6)

### Gate coatings:

Gates can be provided with different coatings to improve wear and corrosion resistance, non-adherence properties, etc.

We recommend to contact our technical department

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## ACTUATOR TYPES

### MANUAL:

- Handwheel (rising stem)
- Bevel Gear
- Others (on request)

### AUTOMATIC:

- Electric (rising stem)
- Pneumatic (single & double-acting)
- Hydraulic



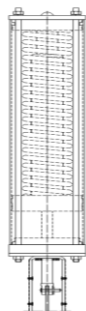
All actuators supplied by ORBINOX are interchangeable

## FAIL SAFE SYSTEMS

Used on pneumatic actuated valves

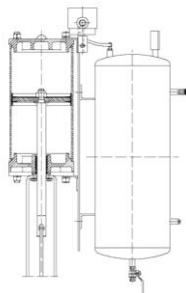
### SINGLE ACTING (SPRING RETURN)

- Available from DN 50 to DN 200
- Supply pressure:  
min. 5 bar - max. 10 bar
- Options:
  - Pneumatic or electric fail open
  - Pneumatic or electric fail close
  - Other options on request



### DOUBLE ACTING WITH AIR TANK

- Available for all valve sizes
- Supply pressure:  
min. 3.5 bar - max. 10 bar
- Options:
  - Pneumatic or electric fail open
  - Pneumatic or electric fail close
  - Other options on request



## ACCESSORIES

- Open-closed lockout
- Mechanical stops
- Manual override actuators
- Solenoid valves
- Positioners
- Limit switches
- Proximity switches
- Floor stand
- Spindle extensions

*For further information, please see corresponding EX catalogue*

We recommend to contact our technical department

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## TEMPERATURE CHART

### SEAT / SLEEVES

Material	Min/Max T.(°C)	Applications
Natural rubber	-30/75	General
EPDM	-30/120	Acids/Non-mineral oils
Neoprene	-30/90	Oils/Solvents
Chlorobutyl	-30/125	High temperatures
NBR	-30/120	Hydrocarbons/Oils/Greases

All of them are reinforced with a metal core. For other temperatures and applications, contact our technical department

### PACKINGS

Material	Max.T. (°C)
EPDM	120
PTFE impregn. synth. fiber (ST)	250

## SEAT

### RUBBER SLEEVES

The closure of the VG valve is achieved by its two characteristic high resistance elastomer sleeves, which improve the tight seal both in the adjustment with the flanges and in the closure. These sleeves have a metal core which provides them with a great resistance to demanding working conditions and pressures.



OPEN



INTERMEDIATE

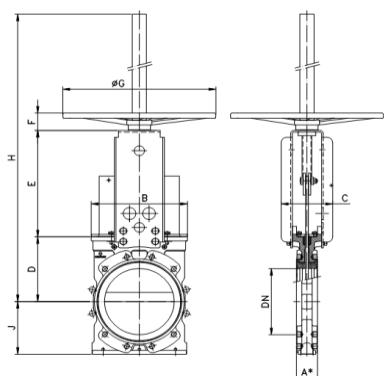


CLOSED

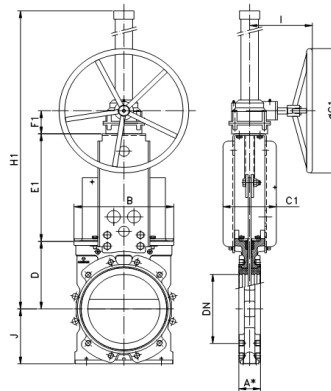


**HAND OPERATED (rising stem)**

HANDWHEEL



GEAR



- Consists of:
  - Epoxy coated cast iron handwheel
  - Yoke
  - Stem and stem nut
  - Stem protector
- Available from DN 50 to DN 600 (larger sizes on request)
- Options (on request):
  - Open-closed lockout
  - Extensions and floor stands
  - PVC bellow
- Note: bevel gear is recommended for valve sizes DN>200 (full force on handwheel > 250 N)

- Recommended for valves larger than DN 200
- Consists of:
  - Stem and stem protector
  - Yoke
  - Bevel Gear Actuator with Handwheel
- Available from DN 200 to DN 900
- Options (on request):
  - Chainwheel
  - Open-closed lockout
  - Extensions and floor stands
  - PVC bellow

DN	GEAR	A1*	A2*	B	C	C1	D	E	E1	F	F1	ØG	ØG1	H	H1	J	I
50	-	54	60	144	100	-	105	147	-	47	-	225	-	445	-	63	-
65	-	54	60	164	100	-	115	162	-	47	-	225	-	470	-	70	-
80	-	57	63	179	100	-	124	177	-	47	-	225	-	495	-	90	-
100	-	57	63	171	107	-	140	193	-	67	-	310	-	645	-	100	-
125	-	63,5	69	200	107	-	150	234	-	67	-	310	-	700	-	122	-
150	-	63,5	69	238	107	-	175	259	-	67	-	310	-	745	-	129	-
200	FL0.4	76	83	295	165	165	205	326	315	70	109	410	300	945	1040	164	200
250	FL0.4	76	83	346	-	185	245	-	389	-	84	-	300	-	1060	199	200
300	FL0.4	82,5	90	395	-	250	280	-	446	-	84	-	300	-	1460	231	200
350	FL0.4	82,5	90	450	-	250	325	-	501	-	84	-	450	-	1530	257	220
400	FL0.4	95	102	511	-	270	350	-	558	-	84	-	450	-	1640	291	220
450	FL0.4	95,5	103	564	-	290	420	-	625	-	84	-	450	-	1750	317	220
500	FL1.6	121	129	623	-	290	462	-	686	-	102	-	650	-	1930	345	288
600	FL1.6	121	129	730	-	290	510	-	780	-	102	-	650	-	2150	413	288
700	FL1.6	181	190	845	-	320	575	-	896	-	102	-	650	-	2615	475	288
750	FL1.6	187	195	920	-	320	605	-	985	-	102	-	650	-	2730	500	288
800	FL1.6	206	214	1008	-	320	655	-	1085	-	102	-	650	-	2880	550	288
900	FL1.6	225,5	234	1105	-	320	705	-	1165	-	102	-	650	-	3010	620	288

A1\*: installed face to face

A2\*: minimum required dimension for installation

## PNEUMATIC ACTUATOR

- The standard pneumatic actuator (double acting on-off cylinder) consists of:

- $\varnothing \leq 300$ : Aluminum barrels
- $\varnothing \geq 350$ : Composite barrels
- Aluminum end caps
- Stainless Steel (AISI 304) piston rod
- Nitrile coated steel piston
- PVC bellows

- Available from DN 50 to DN 600

- Supply Pressure: 6 bar

- Reinforced design of support plates is standard starting from DN 200

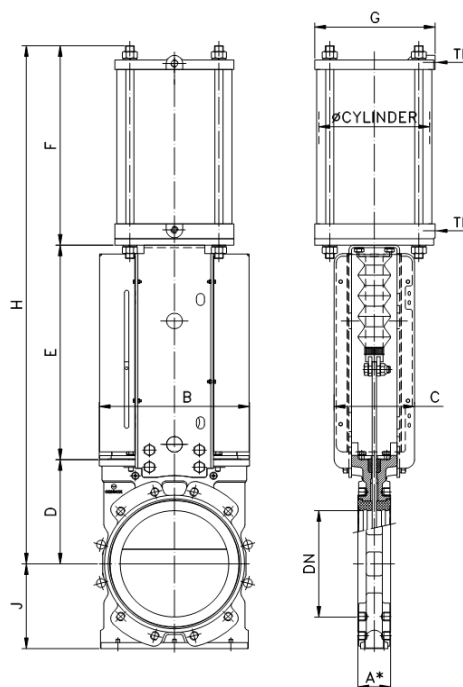
- Options (on request):

- Hard anodized barrel and covers
- Stainless steel barrel and covers on request
- Open-closed lockout
- Manual override actuator
- Fail-safe systems

- Instrumentation (on request):

- Positioners
- Flow regulators
- Solenoid valves
- Air preparation unit

- Note: in order to guarantee the correct functioning of the pneumatic cylinder for the catalogue pressures, a supply pressure of 6 bar is required. For lower pressures, we recommend to contact our technical department



DN	ØCYL.	TM	A1*	A2*	B	C	D	E	F	G	H	J
50	C100/80	1/4"	54	60	144	100	105	211	200	115	516	63
65	C100/95	1/4"	54	60	164	100	115	221	214	115	550	70
80	C125/110	1/4"	57	63	179	100	124	257	240	140	621	90
100	C125/130	1/4"	57	63	171	107	140	270	258	140	668	100
125	C160/160	1/4"	63,5	69	200	107	150	369	298	175	817	122
150	C160/185	1/4"	63,5	69	238	107	175	395	323	175	893	129
200	C200/240	3/8"	76	83	291	165	205	464	398	220	1067	164
250	C250/290	3/8"	76	83	346	185	245	505	470	277	1220	199
300	C300/345	1/2"	82,5	90	398	250	280	656	538	335	1473	231
350	C350/395	3/4"	82,5	90	450	290	325	712	650	444	1687	257
400	C350/450	3/4"	95	102	511	290	350	769	705	444	1824	291
450	C400/500	3/4"	95,5	103	564	290	420	838	767	515	2025	317
500	C400/560	3/4"	121	129	623	290	462	897	839	515	2198	345
600	C400/655	3/4"	121	129	730	290	510	989	921	515	2420	413

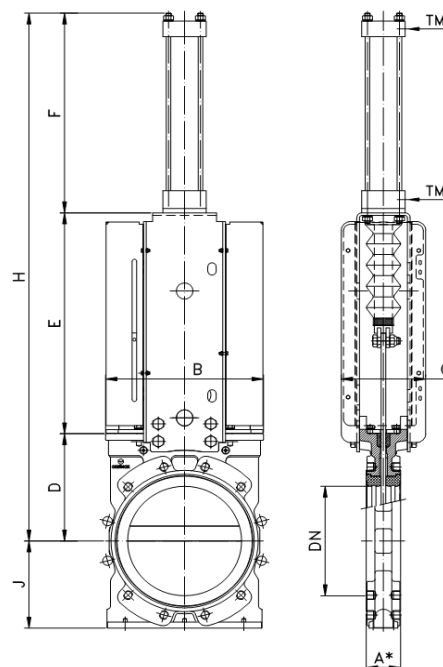
A1\*: installed face to face

A2\*: minimum required dimension for installation



## HYDRAULIC ACTUATOR

- The hydraulic actuator consists of a double acting cylinder in accordance with ISO 6020/2
- Available from DN 50 to DN 900 with PVC bellows
- Hydraulic pressure: 100 bar
- Maximum hydraulic pressure: 160 bar
- Options:
  - Pressure indicators: mechanical and inductive
  - Open-closed lockout
  - Position transducers
  - Hydraulic groups
  - Electrical cabinets



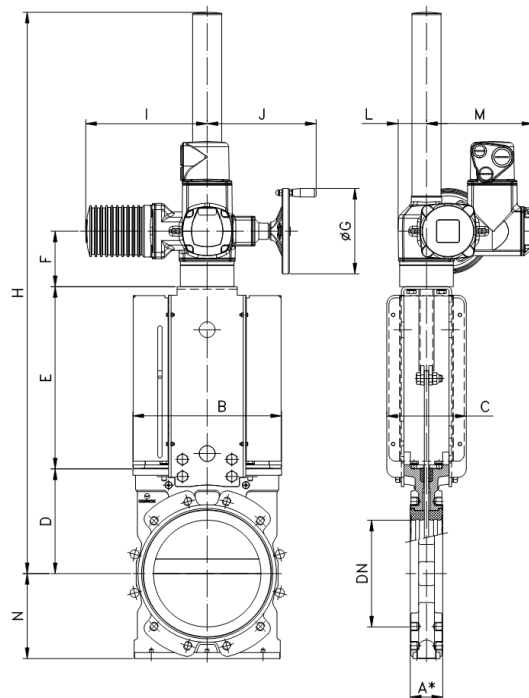
DN	ØCYL.	TM	A1*	A2*	B	C	D	E	F	H	J
50	C32/80	1/4"	54	60	144	100	105	211	223	539	63
65	C32/95	1/4"	54	60	164	100	115	221	238	574	70
80	C32/110	1/4"	57	63	179	100	124	257	253	634	90
100	C32/130	1/4"	57	63	171	107	140	270	273	683	100
125	C32/160	1/4"	63,5	69	200	107	150	369	303	822	122
150	C40/185	3/8"	63,5	69	238	107	175	395	355	925	129
200	C50/240	1/2"	76	83	291	165	205	464	413	1082	164
250	C63/290	1/2"	76	83	346	185	245	505	468	1218	199
300	C80/345	3/4"	82,5	90	398	250	280	656	544	1480	231
350	C80/395	3/4"	82,5	90	450	290	325	712	594	1631	257
400	C80/450	3/4"	95	102	511	290	350	769	649	1768	291
450	C100/500	3/4"	95,5	103	564	290	420	838	710	1968	317
500	C100/560	3/4"	121	129	623	290	462	897	771	2130	345
600	C125/653	1"	121	129	730	290	510	989	853	2352	413
700	C100/765	3/4"	181	190	845	320	575	1100	976	2651	475
750	C100/815	3/4"	187	195	920	320	605	1150	1026	2781	500
800	C125/870	1"	206	214	1008	320	655	1205	1110	2970	550
900	C125/975	1"	225,5	234	1105	320	705	1310	1215	3230	620

A1\*: installed face to face

A2\*: minimum required dimension for installation

**ELECTRIC ACTUATOR (rising stem)**

- Automatic actuator which consists of:
  - Electric motor
  - Motor support yoke flange (standardised flanges as per ISO 5210/DIN 3338)
- The standard electric motor is equipped with:
  - Manual emergency handwheel
  - Limit switches (open/closed)
  - Torque switches
- Available from DN 50 to DN 900
- Wide range of types and brands available to meet customer requirements
- Options: (on request)
  - Open-closed lockout



DN	A1*	A2*	B	C	D	E	F	ØG	H	I	J	L	M	N	TORQUE (Nm)
50	54	60	144	100	105	145	143	160	603	265	249	62	238	63	20
65	54	60	164	100	115	160	143	160	628	265	249	62	238	70	20
80	57	63	179	100	124	185	143	160	662	265	249	62	238	90	30
100	57	63	171	107	140	195	143	160	688	265	249	62	238	100	35
125	63,5	69	200	107	150	235	143	160	1100	265	249	62	238	122	40
150	63,5	69	238	107	175	260	143	160	1158	265	249	62	238	129	50
200	76	83	291	165	205	330	155	200	1272	283	254	65	248	164	70
250	76	83	346	185	245	405	155	200	1387	283	254	65	248	199	110
300	82,5	90	398	250	280	462	155	200	1454	283	254	65	248	231	120
350	82,5	90	450	290	325	520	158	315	1602	389	336	90	286	257	160
400	95	102	511	290	350	580	158	315	1690	389	336	90	286	291	240
450	95,5	103	564	290	420	645	158	409	1822	389	336	90	286	317	200
500	121	129	623	290	462	705	158	400	1925	389	339	90	286	345	300
600	121	129	730	290	510	804	158	500	2120	430	365	115	303	413	400
700	181	190	845	320	575	935	158	400	2770	389	339	90	286	475	450
750	187	195	920	320	605	967	190	500	2880	430	365	115	303	500	550
800	206	214	1008	320	655	1078	190	500	3035	430	365	115	303	550	600
900	225,5	234	1105	320	705	1170	190	500	3180	430	365	115	303	620	750

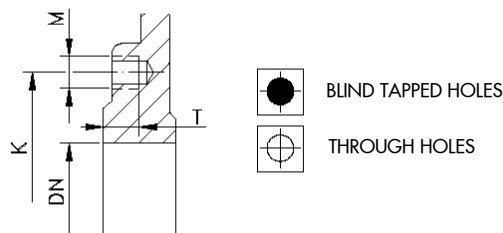
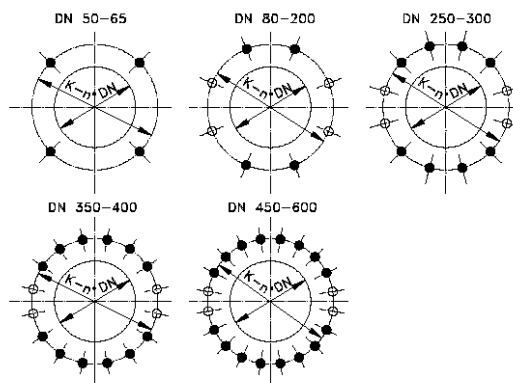
A1\*: installed face to face

A2\*: minimum required dimension for installation

**FLANGE AND BOLTING DETAILS**

**EN 1092-2 PN10**

DN	K	n°	M	T	⊕ ⊖
50	125	4	M-16	10	4 - 0
65	145	4	M-16	12	4 - 0
80	160	8	M-16	12	4 - 4
100	180	8	M-16	12	4 - 4
125	210	8	M-16	14	4 - 4
150	240	8	M-20	14	4 - 4
200	295	8	M-20	16	4 - 4
250	350	12	M-20	16	8 - 4
300	400	12	M-20	20	8 - 4
350	460	16	M-20	20	12 - 4
400	515	16	M-24	20	12 - 4
450	565	20	M-24	20	16 - 4
500	620	20	M-24	25	16 - 4
600	725	20	M-27	24	16 - 4



**ANSI B16.5, class 150**

DN	K	n°	M	T	⊕ ⊖
2"	4 3/4"	4	5/8" - 11 UNC	3/8"	4 - 0
2 1/2"	5 1/2"	4	5/8" - 11 UNC	1/2"	4 - 0
3"	6"	4	5/8" - 11 UNC	1/2"	4 - 4
4"	7 1/2"	8	5/8" - 11 UNC	1/2"	4 - 4
5"	8 1/2"	8	3/4" - 10 UNC	9/16"	4 - 4
6"	9 1/2"	8	3/4" - 10 UNC	9/16"	4 - 4
8"	11 3/4"	8	3/4" - 10 UNC	5/8"	4 - 4
10"	14 1/4"	12	7/8" - 9 UNC	5/8"	8 - 4
12"	17"	12	7/8" - 9 UNC	3/4"	8 - 4
14"	18 3/4"	12	1" - 8 UNC	3/4"	8 - 4
16"	21 1/4"	16	1" - 8 UNC	3/4"	12 - 4
18"	22 3/4"	16	1 1/8" - 7 UNC	3/4"	12 - 4
20"	25"	20	1 1/8" - 7 UNC	15/16"	16 - 4
24"	29 1/2"	20	1 1/4" - 7 UNC	15/16"	16 - 4

