

# Model Ser.20 (ET)

## HEAVY DUTY KNIFE GATE VALVE

The Series 20 (ET) model knife gate is an uni-directional lug type valve designed according to MSS-SP-81 and TAPPI TIS 405-8 for industrial service applications. The design of the body and seat assures nonclogging shut off on suspended solids in industries such as:

- Pulp and Paper
- Power plants
- Mining
- Chemical plants
- Wastewater treatment plants
- Food and Beverage
- etc

### Sizes (DN)

2in/50mm to 36in/900mm  
Larger diameters on request

### Working pressure and temperatures

2in/50mm to 24in/600mm: 150 psi/10 bar  
30in/750mm: 100 psi/7 bar  
36in/900mm: 100 psi/7 bar

CF8M: -4°F (-20°C) / 176°F (80°)

### Standard flange drilling

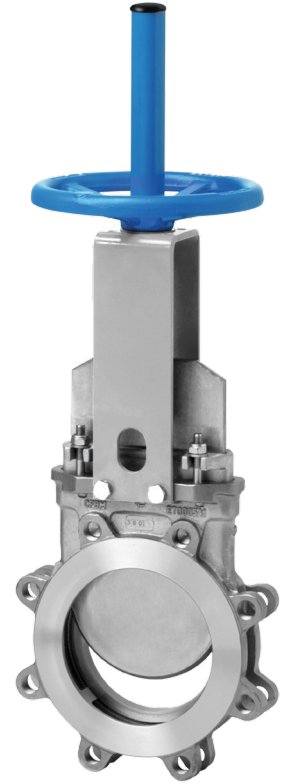
EN-1092 PN10 / PN 16  
ASME B16.5 (class 150)  
Other flange drillings available on request

### Directives

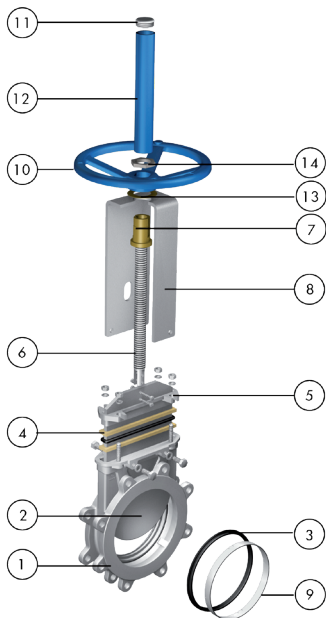
For EU Directives and other Certificates please see the document: Directives & Certificates Compliance - Knife Gate Valves – Catalogues and Datasheets

### Testing

All valves are tested prior to shipping in accordance with the standard MSS-SP 151



## STANDARD PARTS LIST



Part	Description
1	Body CF8M
2	Gate AISI 316
3	Seat Metal/Metal or EPDM
4	Packing PTFE Impreg. Synth. Fibre + EPDM O-Ring
5	Gland follower CF8M
6	Stem Stainless Steel
7	Stem nut Brass
8	Yoke AISI 304 / Epoxy-coated Carbon Steel
9	Seal retainer ring AISI 316
10	Handwheel EN-GJS400
11	Cap Plastic
12	Stem protector Epoxy-coated Carbon Steel
13	Friction washer Brass
14	Nut Zinc Plated Carbon Steel

## DESIGN FEATURES

### Body

Lug type one piece integrally cast stainless steel body with reinforced ribs in larger diameters for extra body strength. Internal cast gate wedges and guides allows for tighter shutoff. Port design follows the MSS-SP-81 and Tappi TIS 405-8 standards. The internal design of the valve avoids any build up of solids that would prevent the valve from closing

### Gate

Standard AISI 316 stainless steel gate. The gates are polished and lapped to attain a greater seal between the gate and both the packing and the seat. The bottom of the gate edge is also machined to a bevel, so that it cuts through the solids for a tighter seal in the closed position

### Seat (resilient)

Unique design that mechanically locks the seal in the internal of the valve body with a stainless steel retainer ring. Standard EPDM also available in different materials such as Viton, PTFE, etc.

### Packing

Long-life packing with several layers of PTFE impregnated fibre plus an EPDM O-ring, with an easy access packing gland ensuring a tight seal. Long-life braided packing is available in a wide range of materials.

### Stem

The standard stainless steel stem offers a long corrosion resistant life. For rising stem actuators only, a stem protector is provided for additional protection against dust while the valve in the open position

### Yoke or actuator support

Made of stainless steel (Epoxy coated carbon steel available on request). Compact design makes it extremely robust even under the most severe conditions

### Epoxy coating

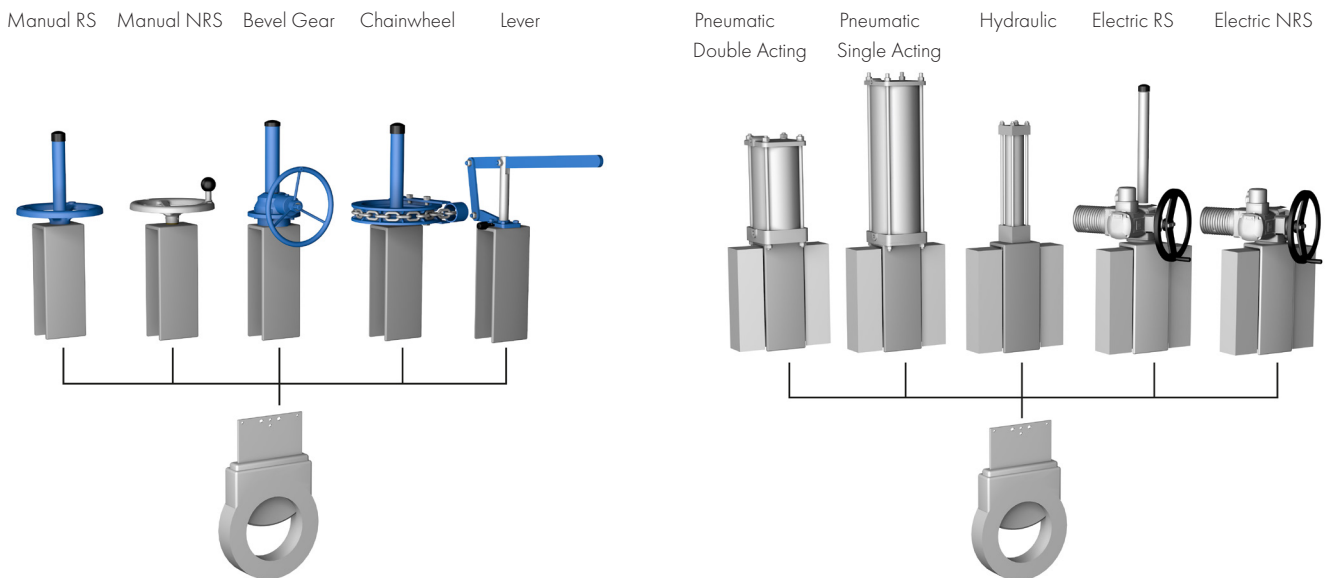
The Epoxy coating on all ORBINOX cast iron and carbon steel valve bodies and components is electrostatically applied making the valves to be corrosion resistant with a high quality finished surface. The ORBINOX standard colour is RAL-5015 blue

### 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.\*ONLY IN EUROPE

### Actuators

ORBINOX offers a complete range of actuator solutions, including manual, pneumatic, electric and hydraulic actuators



## OTHER OPTIONS

### Other materials of construction

Ductile iron, carbon steel, special stainless steels (Duplex, ...), 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)

### Surface treatments

Valve components can be protected or coated for a longer life expectancy, depending on the application of the valves and the valve service conditions. At ORBINOX we can offer alternative treatments and coatings for the different valve components to improve their properties against abrasion (Stellite, hard-chroming, carbides, ...), against corrosion and against adherence

### Bonnet (Fig. 1)

Assures tight sealing to atmosphere. Reduces packing maintenance



Fig.1

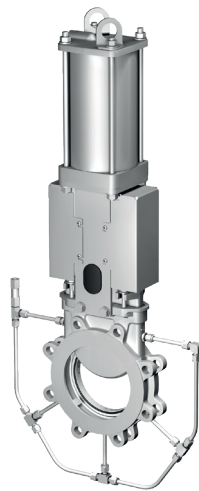


Fig.2



Fig.3



Fig.4

### V-Port

60 degree and pentagonal port design. Selection depends on the desired fluid control type

### Locking device

The valve can be designed with a locking pin system to block the gate in emergency situations or for maintenance operations

### Flush ports (Fig. 2)

Allow for cleaning of solids trapped within the body cavities that can obstruct the flow or prevent the valve from closing. Depending on the process, purging can be made with air, steam, liquids, etc.

### Mechanical stops

Mechanical stops can be added to limit stem travel at a certain stroke position

### Actuator manual override (Fig. 3)

Pneumatic and electric actuators can be equipped with manual override handwheels to manually operate the actuators in emergency situations or for maintenance operations

### Stem extensions and floor stand (Fig. 4)

Extensions for valve operation when valves are installed in positions below operation level are available, including wall brackets and different types of pedestals for actuators

### Accessories for pneumatic valve automation

Limit and proximity switches, solenoid valves, positioners, flow regulations, air filter units, silencers, junction boxes

## SEAT/SEAL TYPES

Material	Max.T (°F)	Max.T (°C)	Applications
Metal/Metal	>482	>250	High temp./Low tightness
EPDM (E)	248	120	Acids and non mineral oils.
NBR (N)	248	120	Resistance to petroleum products.
FKM-FPM (V)	392	200	Chemical service / High temp.
VMQ (S)	482	250	Food service / High temp.
PTFE (T)	482	250	Corrosion resistance

More details and other materials under request

## PACKING TYPES

Material	Max.T (°F)	Max.T (°C)	pH
PTFE impregn. synth. fibre (ST)	482	250	2-13
Braided PTFE (TH)	500	260	0-14
Graphited (GR)	1112	600	0-14
Ceramic fibre (FC)	2192	1200	- - -

All types include an elastomere O-ring (same material as seal), excluding TH, GR and FC

## SEAT CONFIGURATIONS/DESIGNS

Type	Features	
<b>Metal / Metal</b>	<ul style="list-style-type: none"> <li>- High temperature applications</li> <li>- High density media applications</li> <li>- When full tightness is not required</li> </ul>	
<b>A Ring Resilient</b>	<ul style="list-style-type: none"> <li>- Standard resilient seat</li> <li>- See temperature chart for seat materials</li> <li>- Seat with replaceable ring</li> </ul>	
<b>B Ring Resilient</b>	<ul style="list-style-type: none"> <li>- Reinforced resilient seat design</li> <li>- See temperature chart for seat materials</li> <li>- Seat with replaceable retainer ring</li> <li>- Ring available in different materials: AISI 316, Ni Hard,...</li> </ul>	

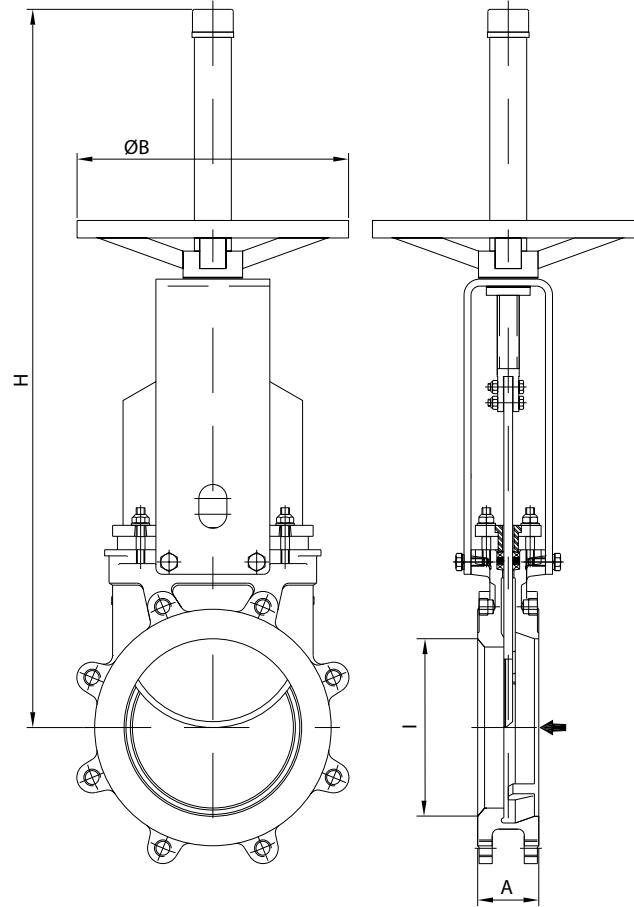
## OTHER SEAT FEATURES

Type	Features	
<b>Deflection cone C</b>	<ul style="list-style-type: none"> <li>- Used to protect valve seats and internals</li> <li>- Material: AISI 316, Ni-Hard, etc.</li> <li>- Face-to-face dimension increases:                      DN 2in/50mm - DN 10in/250mm X = 0.35in/9mm                      DN 12in/300mm - DN 24in/600mm X = 0.47in/12mm                      Larger diameters on request</li> </ul>	

Note: Tightness tests according to MSS-SP-151

## HANDWHEEL

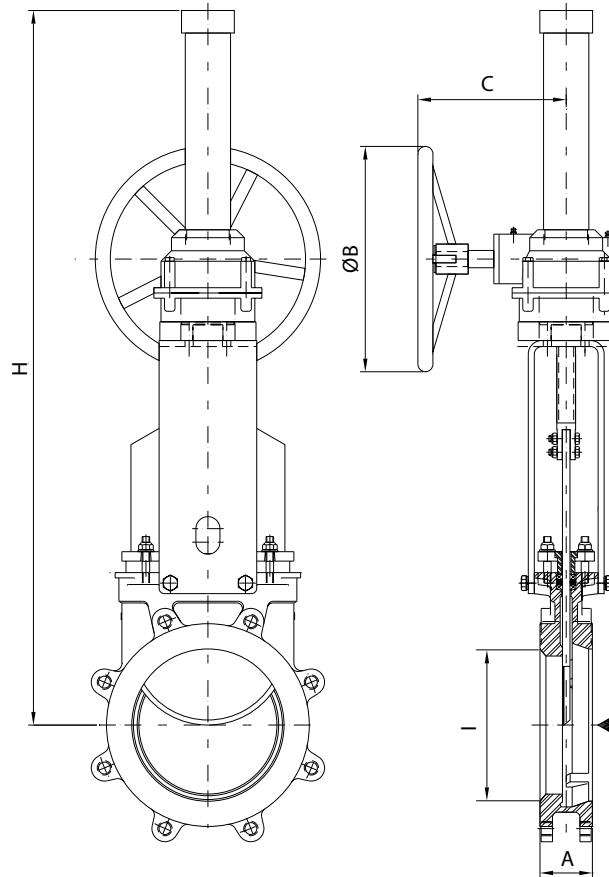
Standard manual actuator, available from 2in/50mm to 24in/600mm, both for rising stem and non-rising stem configurations. Recommended with gearbox from 12in/300mm and above



DN (in/mm)	l (in/mm)	A (in/mm)	ØB (in/mm)	H (in/mm)	Weight (lbs./kg.)
2/50	1,96/50	1,89/48	8,86/225	16,53/420	20/9
3/80	3,14/80	2,00/51	8,86/225	18,50/470	27/12
4/100	3,81/97	2,00/51	8,86/225	20,43/519	31/14
5/125	4,60/117	2,24/57	8,86/225	24,13/613	36/16
6/150	5,51/140	2,24/57	8,86/225	25,27/642	42/19
8/200	7,24/184	2,75/70	12,20/310	32,28/820	80/36
10/250	9,05/230	2,75/70	12,20/310	38,81/986	102/46
12/300	10,82/275	2,99/76	16,14/410	42,16/1071	144/65
14/350	12,00/305	2,99/76	16,14/410	49,01/1245	201/91
16/400	13,84/351,6	3,50/89	16,14/410	52,16/1325	258/117
18/450	15,35/390	3,50/89	21,65/550	59,49/1510	336/152
20/500	17,12/435	4,49/114	21,65/550	63,66/1617	455/206
24/600	20,55/522	4,49/114	21,65/550	74,13/1883	629/285

## BEVEL GEAR

Recommended for valves larger than 12in/300mm, available both for rising stem and non-rising stem configurations and with different reduction ratios

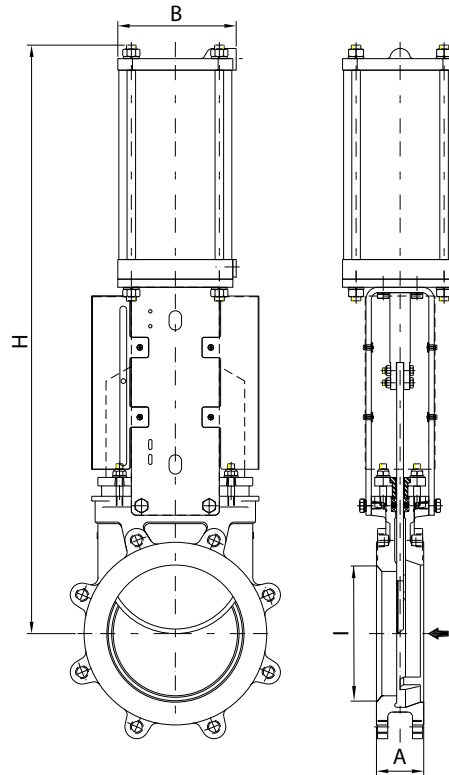


DN (in/mm)	l (in/mm)	A (in/mm)	ØB (in/mm)	C (in/mm)	H (in/mm)	Weight (lbs./kg.)
8/200	7,24/184	2,75/70	12/300	7,87/200	39,05/992	115/52
10/250	9,05/230	2,75/70	12/300	7,87/200	41,73/1060	142/64
12/300	10,82/275	2,99/76	12/300	7,87/200	45,00/1143	175/79
14/350	12,00/305	2,99/76	18/450	10,63/270	58,62/1489	232/105
16/400	13,84/351,6	3,50/89	18/450	10,63/270	61,81/1570	296/134
18/450	15,35/390	3,50/89	18/450	10,63/270	63,58/1615	362/164
20/500	17,12/435	4,49/114	18/450	11,02/280	71,25/1810	547/248
24/600	20,55/522	4,49/114	26/650	11,41/290	73,98/1879	721/327
30/750	26,37/670	4,60/117	26/650	16,26/413	104,33/2650	-
36/900	31,88/810	4,60/117	26/650	17,40/442	123,42/3135	-

## PNEUMATIC CYLINDER

With a double-acting pneumatic cylinder as standard, it is available in sizes from 2in/50mm to 36in/900mm. Single-acting pneumatic cylinders, manual overrides, fail-safe systems as well as a wide variety of pneumatic accessories for valve automation available Actuator sized for 85psi/(6 bar) air supply, see ORBINOX Pneumatic Cylinder Catalogue for more information.

For valves installed in a horizontal position, actuator supports to plant structure is recommended



DN (in/mm)	l (in/mm)	A (in/mm)	ØB (in/mm)	H (in/mm)	Connect.	Weight (lbs./kg.)
2/50	1,96/50	1,89/48	4,53/115	16,22/412	1/4" G	20/9
3/80	3,14/80	2,00/51	4,53/115	19,37/492	1/4" G	27/12
4/100	3,81/97	2,00/51	4,53/115	21,93/557	1/4" G	31/14
5/125	4,60/117	2,24/57	5,51/140	25,35/644	1/4" G	45/20
6/150	5,51/140	2,24/57	5,51/140	27,48/698	1/4" G	53/24
8/200	7,24/184	2,75/70	6,89/175	34,25/870	1/4" G	95/43
10/250	9,05/230	2,75/70	8,66/220	39,60/1006	3/8" G	128/58
12/300	10,82/275	2,99/76	8,66/220	44,93/1141	3/8" G	170/120
14/350	2,00/305	2,99/76	10,90/277	51,96/1320	3/8" G	265/120
16/400	13,84/351,6	3,50/89	10,90/277	56,06/1424	3/8" G	327/148
18/450	15,35/390	3,50/89	15,03/382	64,84/1647	1/2" G	472/214
20/500	17,12/435	4,49/114	15,03/382	70,51/1791	1/2" G	596/270
24/600	20,55/522	4,49/114	15,03/382	79,84/2028	1/2" G	783/355
30/750	26,37/670	4,60/117	17,48/444	100,35/2549	3/4" G	1419/645
36/900	31,88/810	4,60/117	20,27/515	121,14/3077	3/4" G	1716/780

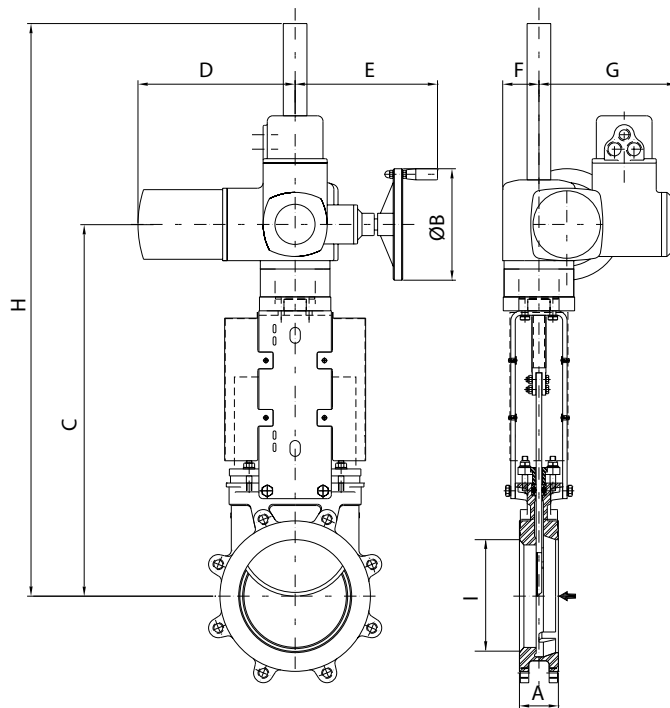
\* For sizes DN 12in/300mm and above, actuator diameter may need to be oversized depending on the actual working pressure

## ELECTRIC ACTUATOR

Designed with a yoke flange for the actuator according to ISO 5210 / DIN 3338 as standard, it is available from 2in/50mm to DN 36in/900mm, both for rising stem and non-rising stem configurations and with manual overrides.

Wide range of electric actuator brands available.

For valves installed in a horizontal position, actuator supports to plant structure is recommended





DN (in/mm)	I (in/mm)	A (in/mm)	C (in/mm)	ØB (in/mm)	H (in/mm)	D (in/mm)	E (in/mm)	F (in/mm)	G (in/mm)	Torque (ft.LBS/Nm)	Weight (lbs./kg.)
2/50	1,96/50	1,89/48	14,84/377	6,30/160	17,87/454	10,43/265	9,80/249	2,44/62	9,37/238	7,4/10	148/67
3/80	3,14/80	2,00/51	16,69/424	6,30/160	19,72/501	10,43/265	9,80/249	2,44/62	9,37/238	7,4/10	153/69
4/100	3,81/97	2,00/51	18,46/469	6,30/160	21,49/546	10,43/265	9,80/249	2,44/62	9,37/238	7,4/10	157/71
5/125	4,60/117	2,24/57	20,31/516	6,30/160	23,34/593	10,43/265	9,80/249	2,44/62	9,37/238	11,1/15	164/74
6/150	5,51/140	2,24/57	21,45/545	6,30/160	44,17/1122	10,43/265	9,80/249	2,44/62	9,37/238	14,8/20	170/77
8/200	7,24/184	2,75/70	26,25/667	6,30/160	49,40/1255	10,43/265	9,80/249	2,44/62	9,37/238	22,2/30	206/93
10/250	9,05/230	2,75/70	28,85/733	6,30/160	52,00/1321	10,43/265	9,80/249	2,44/62	9,37/238	33,3/45	-
12/300	10,82/275	2,99/76	31,22/793	7,87/200	54,37/1381	11,14/283	10,00/254	2,55/65	9,76/248	51,8/70	199/90
14/350	12,00/305	2,99/76	34,44/875	7,87/200	57,59/1463	11,14/283	10,00/254	2,55/65	9,76/248	81,4/110	-
16/400	13,84/352	3,50/89	37,60/955	12,40/315	60,75/1543	15,31/389	13,22/336	3,58/91	11,25/286	118,4/160	-
18/450	15,35/390	3,50/89	44,96/1142	12,40/315	73,63/1870	15,31/389	13,22/336	3,58/91	11,25/286	140,6/190	-
20/500	17,12/435	4,49/114	48,11/1222	15,74/400	76,77/1950	15,31/389	13,34/339	3,58/91	11,25/286	199,8/270	-
24/600	20,55/522	4,49/114	56,85/1444	15,74/400	85,51/2172	15,31/389	13,34/339	3,58/91	11,25/286	333/450	790/358
30/750	26,37/670	4,60/117	70,03/1779	19,68/500	111,49/2832	16,92/430	14,37/365	4,61/117	11,93/303	407/550	-
36/900	31,88/810	4,60/117	80,11/2035	19,68/500	121,26/3080	16,92/430	14,37/365	4,61/117	11,93/303	627/850	-

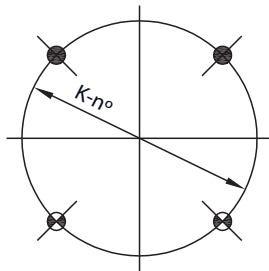
\* For sizes DN 12in/300mm and above, Torque figures calculated based on pressure rate for EX valve model



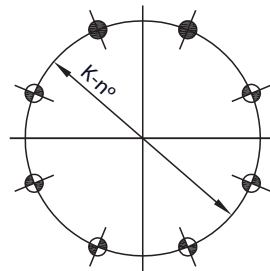
## FLANGE AND BOLTING DETAILS ASME B16.5, CLASS 150 \*

DN	K	n°	M	T	 
2"	4 3/4"	4	5/8" - 11 UNC	7/16"	2 - 2
3"	6"	4	5/8" - 11 UNC	11/32"	2 - 2
4"	7 1/2"	8	5/8" - 11 UNC	11/32"	2 - 6
5"	8 1/2"	8	3/4" - 10 UNC	3/8"	2 - 6
6"	9 1/2"	8	3/4" - 10 UNC	3/8"	2 - 6
8"	11 3/4" 3/4"	8	3/4" - 10 UNC	15/32"	2 - 6
10"	14 1/4"	12	7/8" - 9 UNC	15/32"	4 - 8
12"	17"	12	7/8" - 9 UNC	15/32"	4 - 8
14"	18 3/4"	12	1" - 8 UNC	19/32"	4 - 8
16"	21 1/4"	16	1" - 8 UNC	19/32"	4 - 12
18"	22 3/4"	16	1 1/8" - 7 UNC	19/32"	6 - 10
20"	25"	20	1 1/8" - 7 UNC	7/8"	6 - 14
24"	29 1/2"	20	1 1/4" - 7 UNC	7/8"	6 - 14
30"	36"	28	1 1/4" - 7 UNC	1 1/8"	10 - 18
36"	42 3/4"	32	1 1/2" - 6 UNC	1 1/4"	10 - 18

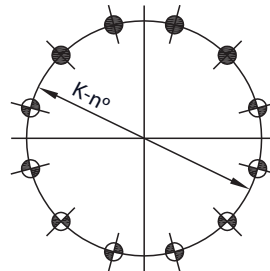
\* From NPS 24, acc. to ASME B16.47 Series A (class 150)



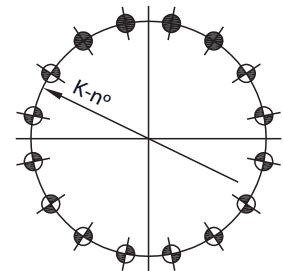
DN 2" - 3"



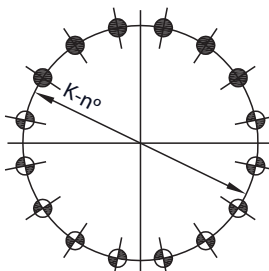
DN 4" - 8"



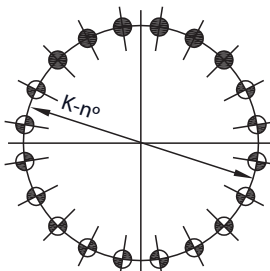
DN 10" - 14"



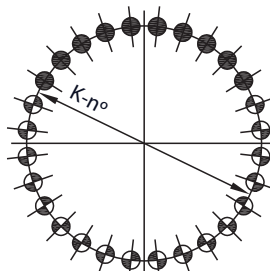
DN 16"



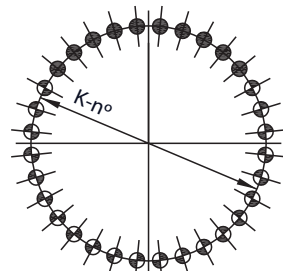
DN 18"



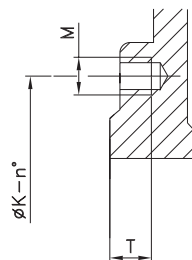
DN 20" - 24"





DN 30"





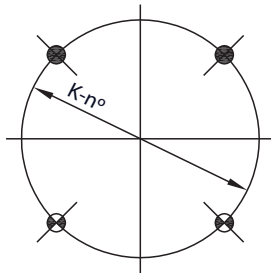
DN 36"



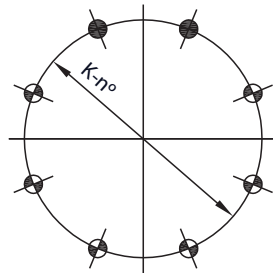
-  BLIND TAPPED HOLES
-  TAPPED THROUGH

## FLANGE AND BOLTING DETAILS EN-1092 PN10

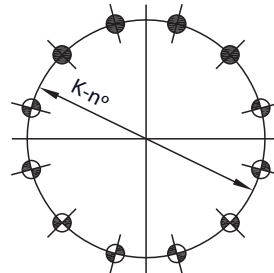
DN	K	n°	M	T	 
50	125	4	M-16	11	2 - 2
80	160	8	M-16	9	2 - 6
100	180	8	M-16	9	2 - 6
125	210	8	M-16	10	2 - 6
150	240	8	M-20	10	2 - 6
200	295	8	M-20	12	2 - 6
250	350	12	M-20	12	4 - 8
300	400	12	M-20	12	4 - 8
350	460	16	M-20	15	06-10
400	515	16	M-24	15	04-12
450	565	20	M-24	15	6- 14
500	620	20	M-24	22	6- 14
600	725	20	M-27	22	6- 14
900	1050	28	M-30	32	10 -18



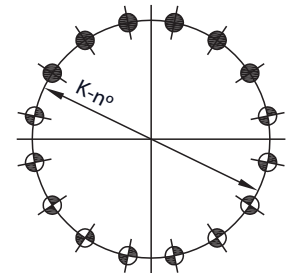
DN 50-65



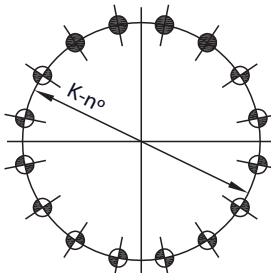
DN 80-200



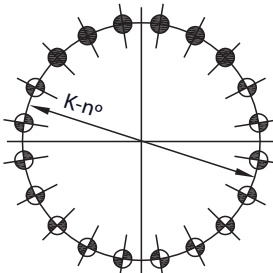
DN 250-300



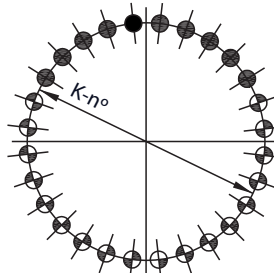
DN 350



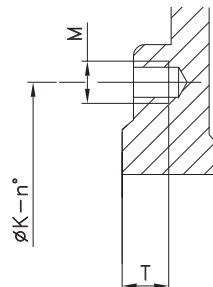
DN 400





DN 450-600



DN 900



-  BLIND TAPPED HOLES
-  TAPPED THROUGH