

# Model Ser.22 (BT)

## HEAVY DUTY KNIFE GATE VALVE

The Series 22 (BT) model knife gate is a bi-directional lug type valve designed according to MSS-SP-81 and TAPPI TIS 405-8 for industrial service applications. The completely new design of the body and seat (patented) assures non-clogging shut off on suspended solids in industries such as:

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

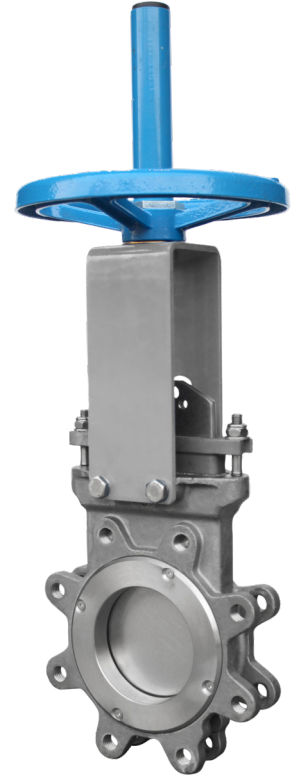
ASME B16.5 (class 150)  
Other flange drillings available on request

### Directives

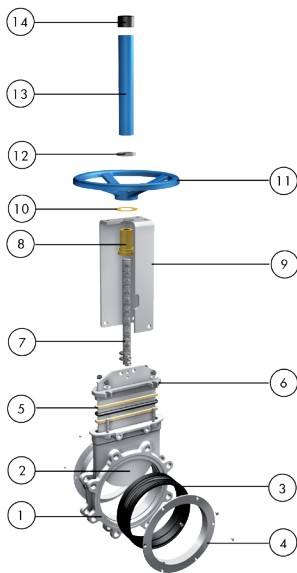
For EU Directives and other Certificates please see the document: Directives & Certificates Compliance - Knife Gate Valves – Catalogues and Datasheets

### Testing

All valves are tested prior to shipping in accordance with the standard EN-12266-1



## STANDARD PARTS LIST



Part	Description
1	Body CF8M /CF8
2	Gate AISI 316 / AISI 304
3	Sleeve EPDM
4	Seat ring CF8M /CF8
5	Packing PTFE Impreg. Synth. Fibre + EPDM O-Ring
6	Gland follower CF8M /CF8
7	Stem Stainless Steel
8	Stem nut Brass
9	Yoke AISI 304 / Epoxy-coated Carbon Steel
10	Thrust washer Brass
11	Handwheel Ductile iron
12	Nut Zinc Plated Carbon Steel
13	Stem protector Epoxy-coated Carbon Steel
14	Cap Plastic

## DESIGN FEATURES

### Body

One piece integrally cast stainless steel body with reinforced ribs in larger diameters for extra body strength. Port design according to MSS-SP-81 and Tappi TIS 405-8. Internal design avoids any build up of solids that could prevent valve from closing

### Gate

Standard AISI 316 or AISI 304 stainless steel gate. Gates polished and lapped for a greater seal between the gate and both the packing and seat

### Seat (resilient)

Patented. Totally new design. The resilient seat is an elastomer sleeve, available in different materials. This sleeve which supports, protects and also guides the gate is slotted in the top half to allow gate travel, and guarantees full tightness with low friction. The sleeve is held by means of two seat rings which support it and also guide the gate

### Packing

Standard braided PTFE impregnated synthetic fibre with EPDM o-ring for better shut off, with an easy access packing gland ensuring a tight seal. The 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 and damage 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 components is electrostatically applied making them 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.\* IN EUROPE ONLY

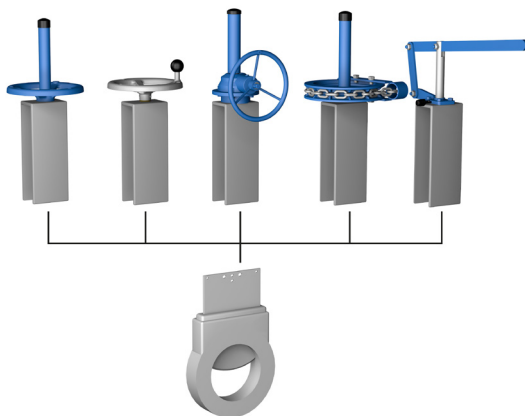
### Other materials

On request, the body and the gate can be supplied in other materials

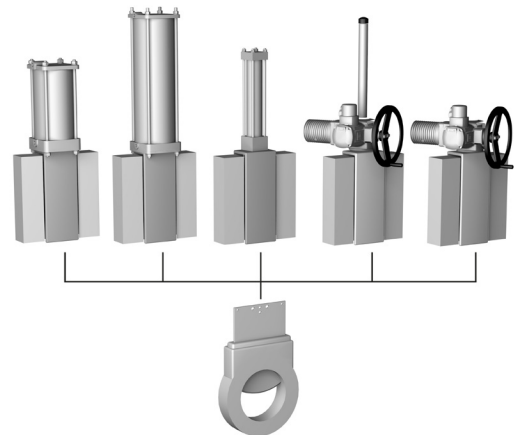
### Actuators

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

Manual RS    Manual NRS    Bevel Gear    Chainwheel    Lever



Pneumatic Double Acting    Pneumatic Single Acting    Hydraulic    Electric RS    Electric NRS



## 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

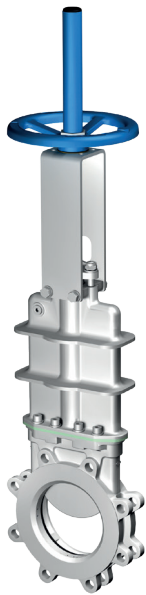


Fig.1



Fig.2



Fig.3

### 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

### Mechanical stops

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

### Actuator manual override (Fig. 2)

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. 3)

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
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.

More details and other materials under request. All are reinforced with a metal core

## PACKING TYPES

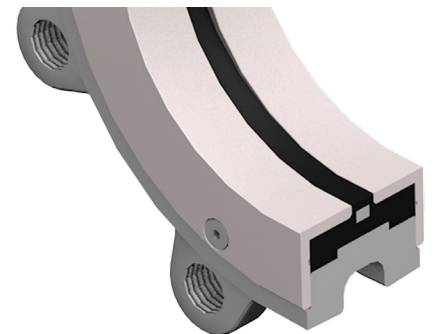
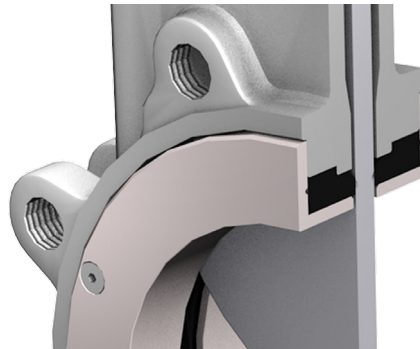
Material	Max.T (°F)	Max.T (°C)	pH
PTFE impregn. synth. fibre (ST)	482	250	2-13

## SEAT CONFIGURATIONS/DESIGNS

Type	Features
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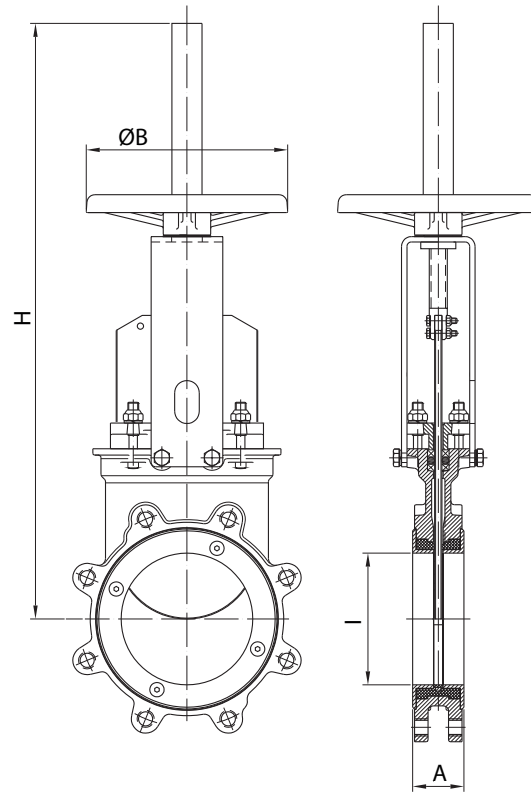
### Resilient

The new seat (patented) is a slotted sleeve on its top half and includes a metal core in the bottom half which provides a great resistance to demanding working conditions and pressures. The seat is held by means of two stainless steel rings. This design provides watertightness in both directions while avoiding any buildup of solids that could prevent the valve from closing. The seat can be supplied in different resilient material qualities



## HANDWHEEL RISING STEM

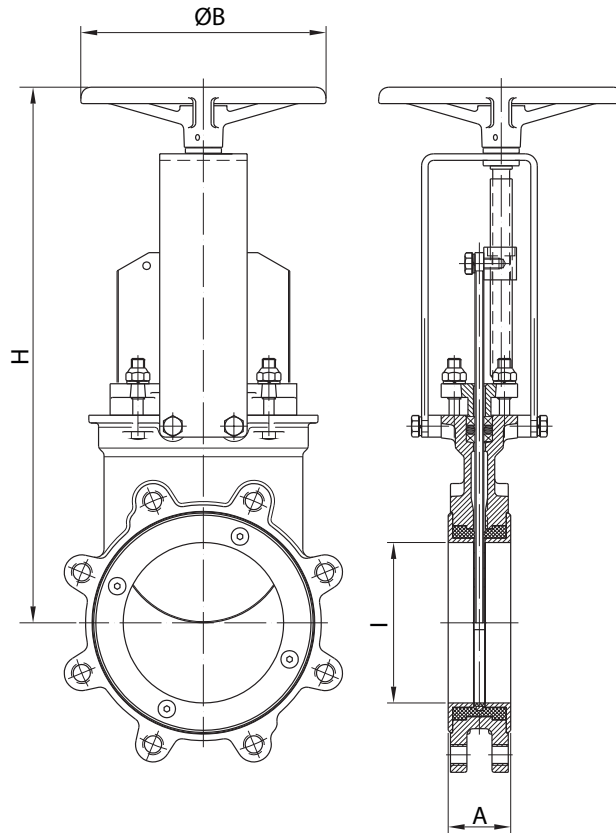
Standard manual actuator, available from 2in/50mm to 24in/600mm and recommended with gearbox from 12in/300mm and above



DN (in/mm)	l (in/mm)	A (in/mm)	ØB (in/mm)	H (in/mm)
2/50	2.00/50	1.88/47,8	8.86/225	16.92/430
3/80	2.90/75	2.00/50,8	8.86/225	18.70/475
4/100	3.80/97	2.00/50,8	8.86/225	20.66/525
5/125	4.76/121	2.25/57,2	8.86/225	24.40/620
6/150	5.78/147	2.25/57,2	8.86/225	26.37/670
8/200	7.63/194	2.74/69,8	12.20/310	40.51/1029
10/250	9.40/239	2.74/69,8	12.20/310	43.81/1113
12/300	11.18/284	3.00/76,2	16.14/410	48.62/1235
14/350	12.67/322	3.00/76,2	16.14/410	50.78/1290
16/400	14.40/366	3.50/89	16.14/410	54.92/1395
18/450	15.74/400	3.50/89	21.65/550	62.20/1580
20/500	18.11/460	4.50/114,2	21.65/550	66.53/1690
24/600	20.86/530	4.50/114,2	21.65/550	75.39/1915

## HANDWHEEL NON-RISING STEM

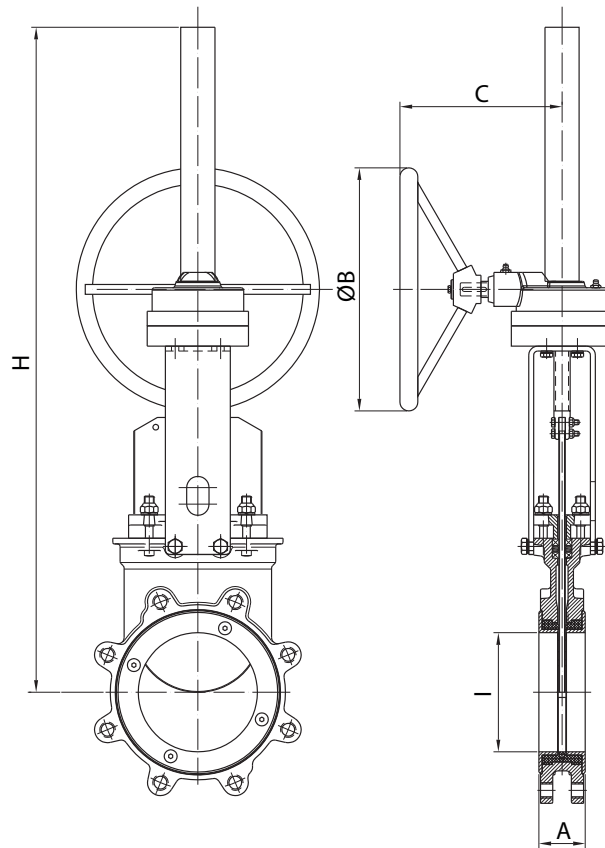
Recommended for installation where space is limited, available from 2in/50mm to 24in/600mm and recommended with gearbox from 12in/300mm and above



DN (in/mm)	l (in/mm)	A (in/mm)	ØB (in/mm)	H (in/mm)
2/50	2.00/50	1.88/47,8	8.86/225	11.62/298
3/80	2.90/75	2.00/50,8	8.86/225	13.45/345
4/100	3.80/97	2.00/50,8	8.86/225	15.47/393
5/125	4.76/121	2.25/57,2	8.86/225	17.32/440
6/150	5.78/147	2.25/57,2	8.86/225	19.33/491
8/200	7.63/194	2.74/69,8	12.20/310	24.13/613
10/250	9.40/239	2.74/69,8	12.20/310	27.48/698
12/300	11.18/284	3.00/76,2	16.14/410	32.52/826
14/350	12.67/322	3.00/76,2	16.14/410	35.90/912
16/400	14.40/366	3.50/89	16.14/410	39.56/1005
18/450	15.74/400	3.50/89	21.65/550	42.87/1089
20/500	18.11/460	4.50/114,2	21.65/550	47.87/1216
24/600	20.86/530	4.50/114,2	21.65/550	52.48/1333

## BEVEL GEAR RISING STEM

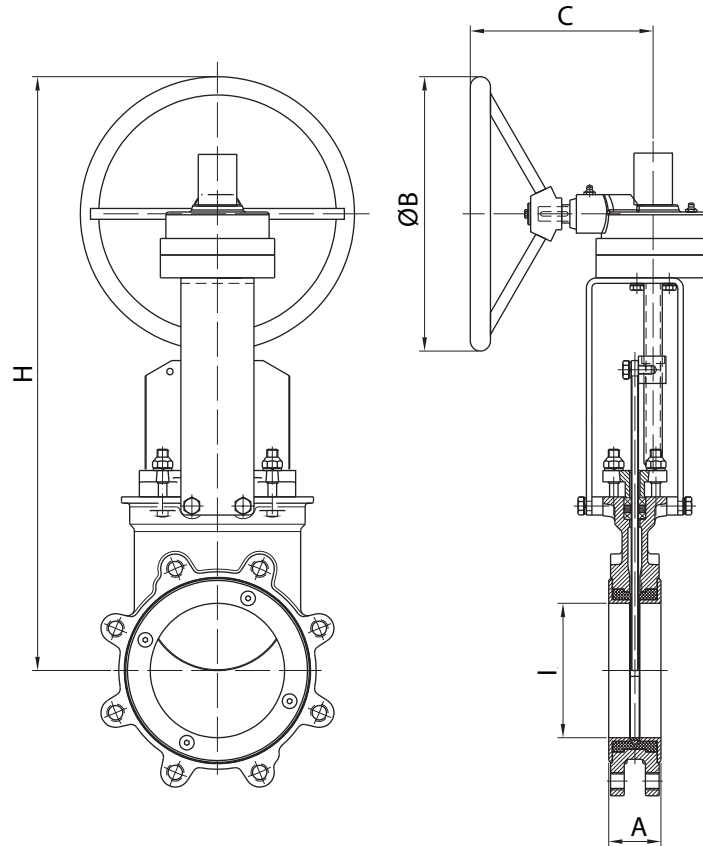
Recommended for valves larger than 12in/300mm. Bevel gear with handwheel with different reduction ratios



DN (in/mm)	l (in/mm)	A (in/mm)	ØB (in/mm)	C (in/mm)	H (in/mm)
8/200	7.63/194	2.74/69,8	12.00/300	7.87/200	40.51/1029
10/250	9.4/239	2.74/69,8	12.00/300	7.87/200	43.82/1113
12/300	11.18/284	3.00/76,2	12.00/300	7.87/200	48.62/1235
14/350	12.67/322	3.00/76,2	17.72/450	10.62/270	63.38/1610
16/400	14.40/366	3.50/89	17.72/450	10.62/270	67.72/1720
18/450	15.74/400	3.50/89	17.72/450	10.62/270	70.87/1800
20/500	18.11/460	4.50/114,2	17.72/450	10.62/270	74.61/1895
24/600	20.86/530	4.50/114,2	17.72/450	10.62/270	80.31/2040
30/750	26.37/670	4.60/117	17.72/450	12.20/310	105.11/2670
36/900	31.88/810	4.60/117	25.50/650	14.56/370	126.29/3208

## BEVEL GEAR NON-RISING STEM

Recommended for valves larger than 12in/300mm. Bevel gear with handwheel with different reduction ratios



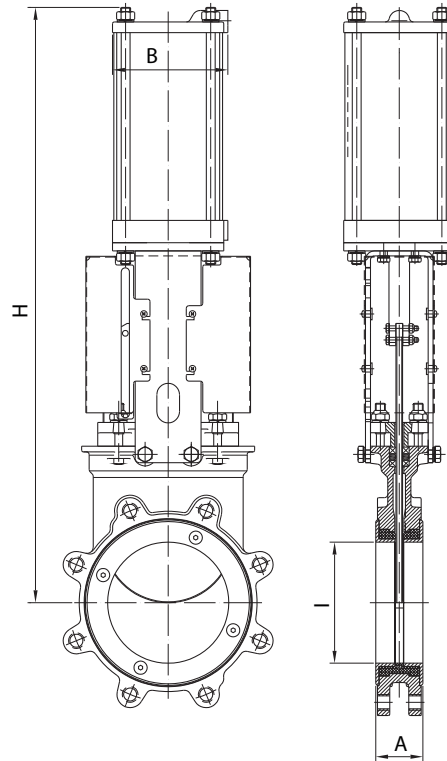
DN (in/mm)	l (in/mm)	A (in/mm)	ØB (in/mm)	C (in/mm)	H (in/mm)
8/200	7.63/194	2.74/69,8	12.00/300	7.87/200	30.51/775
10/250	9.4/239	2.74/69,8	12.00/300	7.87/200	34.29/871
12/300	11.18/284	3.00/76,2	12.00/300	7.87/200	38.97/990
14/350	12.67/322	3.00/76,2	12.00/300	8.54/217	40.78/1036
16/400	14.40/366	3.50/89	17.72/450	8.54/217	47.36/1203
18/450	15.74/400	3.50/89	17.72/450	8.54/217	50.66/1287
20/500	18.11/460	4.50/114,2	17.72/450	11.33/288	56.37/1432
24/600	20.86/530	4.50/114,2	17.72/450	11.33/288	64.92/1649
30/750	26.37/670	4.60/117	17.72/450	12.20/310	76.06/1932
36/900	31.88/810	4.60/117	25.59/650	14.56/370	88.85/2257



## 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



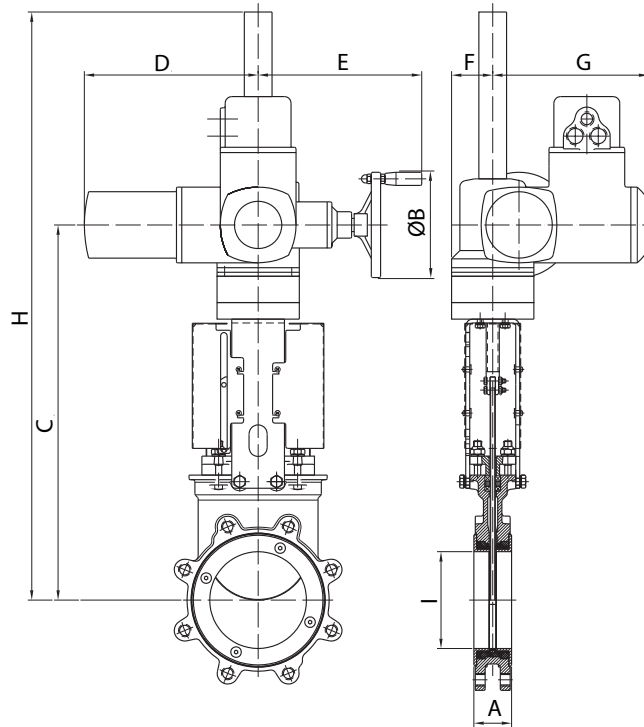
DN (in/mm)	l (in/mm)	A (in/mm)	B (in/mm)	H (in/mm)	Connect.
2/50	2.00/50	1.88/47,8	4.52/115	16.22/412	1/4" G
3/80	2.90/75	2.00/50,8	4.52/115	19.37/492	1/4" G
4/100	3.80/97	2.00/50,8	4.52/115	22.04/560	1/4" G
5/125	4.76/121	2.25/57,2	5.51/140	25.47/647	1/4" G
6/150	5.78/147	2.25/57,2	5.51/140	28.46/723	1/4" G
8/200	7.63/194	2.74/69,8	6.88/175	35.70/907	1/4" G
10/250	9.4/239	2.74/69,8	8.66/220	41.92/1065	3/8" G
12/300	11.18/284	3.00/76,2	8.66/220	48.54/1233	3/8" G
14/350	12.67/322	3.00/76,2	10.90/277	52.28/1328	3/8" G
16/400	14.40/366	3.50/89	10.90/277	56.42/1433	3/8" G
18/450	15.74/400	3.50/89	15.04/382	64.72/1644	1/2" G
20/500	18,11/460	4.50/114,2	15.04/382	69.09/1755	1/2" G
24/600	20.86/530	4.50/114,2	15.04/382	79.84/2028	1/2" G
30/750	26.37/670	4.60/117	17.48/444	102.16/2595	3/4" G
36/900	31.88/810	4.60/117	20.27/515	122.12/3102	3/4" G

## ELECTRIC ACTUATOR RISING STEM

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

Wide range of electric actuator brands available.

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



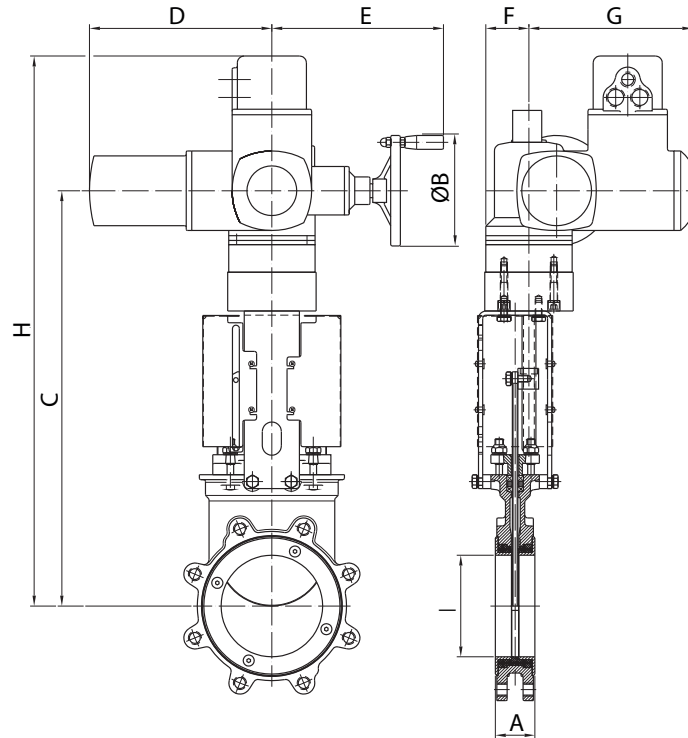
DN (in/mm)	I (in/mm)	A (in/mm)	C (in/mm)	ØB (in/mm)	H (in/mm)	D (in/mm)	E (in/mm)	F (in/mm)	G (in/mm)	Torque (ft.LBS/Nm)
2/50	2.00/50	1.88/47,8	14.84/377	6.30/160	17.87/454	10.43/265	9.80/249	2.44/62	9.33/237	7.4/10
3/80	2.90/75	2.00/50,8	16.70/424	6.30/160	19.72/501	10.43/265	9.80/249	2.44/62	9.33/237	7.4/10
4/100	3.80/97	2.00/50,8	18.58/472	6.30/160	21.61/549	10.43/265	9.80/249	2.44/62	9.33/237	7.4/10
5/125	4.76/121	2.25/57,2	20.43/519	6.30/160	23.46/596	10.43/265	9.80/249	2.44/62	9.33/237	11.1/15
6/150	5.78/147	2.25/57,2	22.44/570	6.30/160	45.15/1147	10.43/265	9.80/249	2.44/62	9.33/237	14.8/20
8/200	7.63/194	2.74/69,8	27.71/704	6.30/160	50.86/1292	10.43/265	9.80/249	2.44/62	9.33/237	22.2/30
10/250	9.40/239	2.74/69,8	31.10/790	6.30/160	54.25/1378	10.43/265	9.80/249	2.44/62	9.33/237	33.3/45
12/300	11.18/284	3.00/76,2	34.76/883	7.87/200	57.91/1471	11.10/282	10.08/256	2.55/65	9.72/247	51.8/70
14/350	12.67/322	3.00/76,2	35.79/909	7.87/200	58.94/1497	11.14/283	10.00/254	2.55/65	9.76/248	81.4/110
16/400	14.40/366	3.50/89	42.32/1075	12.40/315	70.98/1803	15.31/389	13.22/336	3.58/91	11.25/286	118.4/160
18/450	15.74/400	3.50/89	44.84/1139	12.40/315	73.50/1867	15.31/389	13.22/336	3.58/91	11.25/286	140.6/190
20/500	18.11/460	4.50/114,2	52.00/1321	15.74/400	80.67/2049	15.31/389	13.34/339	3.58/91	11.25/286	199.8/270
24/600	20.86/530	4.50/114,2	56.85/1444	15.74/400	85.51/2172	15.31/389	13.34/339	3.58/91	11.25/286	333/450
30/750	26.37/670	4.60/117	71.65/1820	19.68/500	115.55/2935	16.92/430	14.37/365	4.60/117	11.92/303	407/550
36/900	31.88/810	4.60/117	74.80/1900	19.68/500	126.96/3225	16.92/430	14.37/365	4.60/117	11.92/303	629/850

## ELECTRIC ACTUATOR NON-RISING STEM

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, for non-rising stem configuration and with manual override.



Wide range of electric actuator brands available.

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

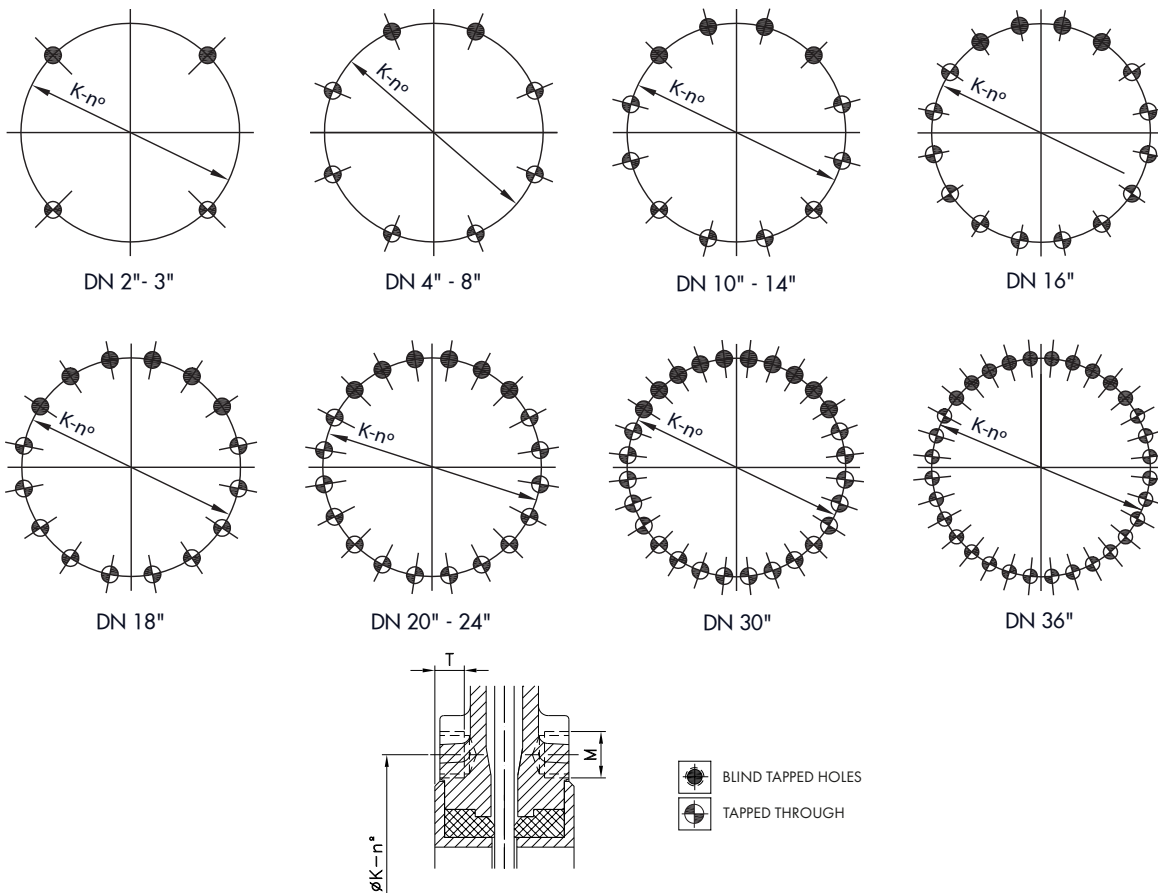


DN (in/mm)	I (in/mm)	A (in/mm)	C (in/mm)	ØB (in/mm)	H (in/mm)	D (in/mm)	E (in/mm)	F (in/mm)	G (in/mm)	Torque (ft.LBS/Nm)
2/50	2.00/50	1.88/47,8	14.84/377	6.30/160	21.33/547	10.43/265	9.80/249	2.44/62	9.33/237	7.4/10
3/80	2.90/75	2.00/50,8	16.70/424	6.30/160	23.17/594	10.43/265	9.80/249	2.44/62	9.33/237	7.4/10
4/100	3.80/97	2.00/50,8	18.58/472	6.30/160	25.27/642	10.43/265	9.80/249	2.44/62	9.33/237	7.4/10
5/125	4.76/121	2.25/57,2	20.43/519	6.30/160	27.16/690	10.43/265	9.80/249	2.44/62	9.33/237	11.1/15
6/150	5.78/147	2.25/57,2	22.44/570	6.30/160	29.13/740	10.43/265	9.80/249	2.44/62	9.33/237	14.8/20
8/200	7.63/194	2.74/69,8	27.71/704	6.30/160	34.44/875	10.43/265	9.80/249	2.44/62	9.33/237	22.2/30
10/250	9.40/239	2.74/69,8	31.10/790	6.30/160	37.79/960	10.43/265	9.80/249	2.44/62	9.33/237	33.3/45
12/300	11.18/284	3.00/76,2	34.76/883	7.87/200	41.45/1053	11.10/282	10.08/256	2.55/65	9.72/247	51.8/70
14/350	12.67/322	3.00/76,2	35.79/909	7.87/200	42.48/1079	11.14/283	10.00/254	2.55/65	9.76/248	81.4/110
16/400	14.40/366	3.50/89	42.32/1075	12.40/315	49.01/1245	15.31/389	13.22/336	3.58/91	11.25/286	118.4/160
18/450	15.74/400	3.50/89	44.84/1139	12.40/315	51.53/1309	15.31/389	13.22/336	3.58/91	11.25/286	140.6/190
20/500	18.11/460	4.50/114,2	52.00/1321	15.74/400	58.70/1491	15.31/389	13.34/339	3.58/91	11.25/286	199.8/270
24/600	20.86/530	4.50/114,2	56.85/1444	15.74/400	63.54/1614	15.31/389	13.34/339	3.58/91	11.25/286	333/450
30/750	26.37/670	4.60/117	71.65/1820	19.68/500	78.43/2005	16.92/430	14.37/365	4.60/117	11.92/303	407/550
36/900	31.88/810	4.60/117	74.80/1900	19.68/500	40.35/2295	16.92/430	14.37/365	4.60/117	11.92/303	629/850



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

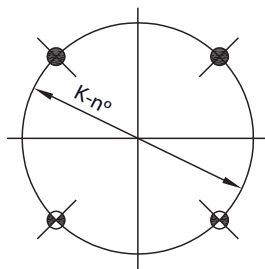
DN	K	Nº	M	T	 
2"	4 3/4"	4	5/8" - 11 UNC	15/32"	2 - 2
3"	6"	4	5/8" - 11 UNC	25/64"	2 - 2
4"	7 1/2"	8	5/8" - 11 UNC	25/64"	2 - 6
5"	8 1/2"	8	3/4" - 10 UNC	15/32"	2 - 6
6"	9 1/2"	8	3/4" - 10 UNC	15/32"	2 - 6
8"	11 3/4"	8	3/4" - 10 UNC	1/2"	2 - 6
10"	14 1/4"	12	7/8" - 9 UNC	19/32"	4 - 8
12"	17"	12	7/8" - 9 UNC	5/8"	4 - 8
14"	18 3/4"	12	1" - 8 UNC	21/32"	4 - 8
16"	21 1/4"	16	1" - 8 UNC	23/32"	4 - 12
18"	22 3/4"	16	1 1/8" - 7 UNC	25/32"	6 - 10
20"	25"	20	1 1/8" - 7 UNC	1 7/32"	6 - 14
24"	29 1/2"	20	1 1/4" - 7 UNC	1 3/32"	6 - 14
30"	36"	28	1 1/4" - 7 UNC	1 9/64"	10 - 18
36"	42 3/4"	32	1 1/2" - 6 UNC	1 1/4"	10 - 22

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

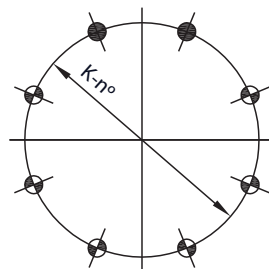


## FLANGE AND BOLTING DETAILS EN-1092 PN10

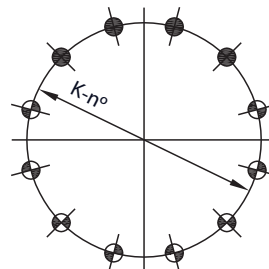
DN	K	Nº	M	T	 
50	125	4	M-16	12	2 - 2
80	160	8	M-16	10	2 - 6
100	180	8	M-16	10	2 - 6
125	210	8	M-16	12	2 - 6
150	240	8	M-20	12	2 - 6
200	295	8	M-20	13	2 - 6
250	350	12	M-20	15	4 - 8
300	400	12	M-20	16	4 - 8
350	460	16	M-20	17	6 - 10
400	515	16	M-24	18	4 - 12
450	565	20	M-24	20	6 - 14
500	620	20	M-24	31	6 - 14
600	725	20	M-27	28	6 - 14
900	1050	28	M-30	32	10 - 18



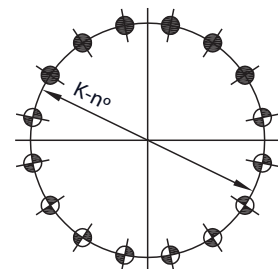
DN 50



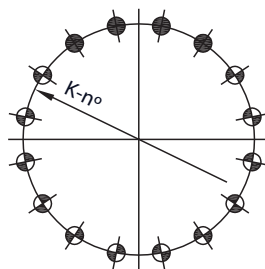
DN 80-200



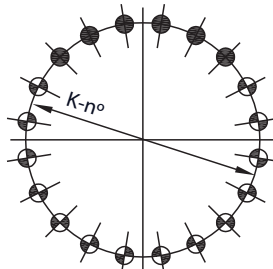
DN 250-300



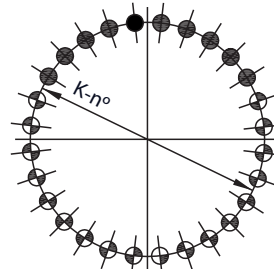
DN 350



DN 400



DN 450-600



DN 900

