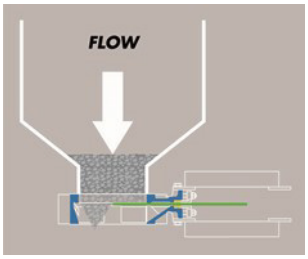
Model **XC**

HOPPER SHAPE KNIFE GATE VALVE

The XC model knife gate is a uni-directional wafer valve designed for industrial bulk handling service applications (powdered and granular products). The special design of the body allows for easy passage of the fluid and makes it ideal for use as silo outlet valve. Widely used in industries such as:

- Power plants
- Chemical plants
- Mining
- Food and Beverage
- Etc.

Valve is usually installed under silos or hoppers in vertical pipes with the seat in the upstream side of the valve in order to protect it from the solids flow. This set up helps to protect the seat from premature wear and gate jamming due to solid build-up



Sizes

DN 50 to DN 600
Larger diameters on request

Working pressure and temperatures

DN 50 to DN 250: 10 bar
DN 300 to DN 400: 6 bar
DN 450: 5 bar
DN 500 to DN 600: 4 bar
For specific tightness requirements contact ORBINOX technical department

GJL250: -10°C / 80°C
CF8M: -20°C / 80°C

Standard flange connection

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

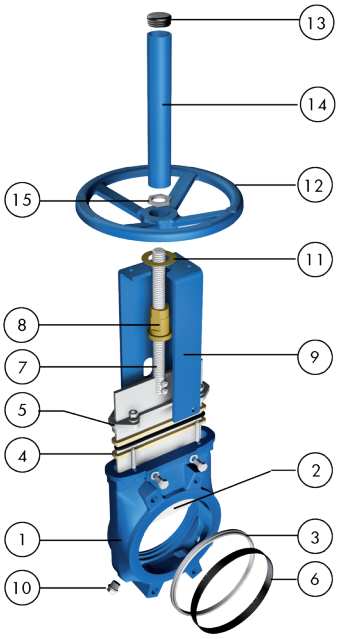
Directives

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	EN-GJL250 / CF8M[1]
2	Gate	AISI 304 / AISI 316[1]
3	Seat	Metal-Metal / EPDM / NBR
4	Packing	PTFE Impreg. Synth. Fibre (ST) + EPDM O-ring
5	Gland follower	Al. (DN 50-DN 300) / EN-GJS400 (DN 350-DN 1200) / CF8M[1]
6	Seat retainer ring	AISI 304 / AISI 316[1]
7	Stem	Stainless Steel
8	Stem nut	Brass
9	Yoke	Epoxy-coated Carbon Steel
10	Cleaning	Carbon steel / Stainless steel [1]
11	Friction washer	Brass
12	Handwheel	EN-GJS400
13	Cap	Plastic
14	Stem protector	Epoxy-coated Carbon Steel
15	Nut	Zinc Plated Carbon Steel

[1] Stainless steel configuration

DESIGN FEATURES

Body
Wafer style cast monoblock design for installation between raised face flanges, with reinforced ribs in larger diameters for extra body strength. Internal cast gate wedges and guides allow for tighter shut-off. Special cast gate supports ensure permanent contact between the gate and the seat when the valve is installed in the reverse position of the flow direction. The wide face to face distance as well as the internal design with the integrated flushing corners avoid any build up of solids that would prevent the valve from closing. Full port design for greater flow capacity and minimal pressure drop. The standard flush ports allow the cleaning of solids trapped within the body cavities that can obstruct the flow or the sealing in the closed position. Depending on the media, the purge ports can be injected with air, steam, liquids, etc.

Gate
Stainless steel rectangular shape gate. Gate is polished on both sides to avoid jamming and seat damage. Bottom of the gate edge is machined to a bevel to cut through solids for a tighter seal in the closed position. The thickness and/or material of the gate can be changed on request for higher pressure requirements

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 braided 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 handwheel actuators only, a stem protector is provided for additional protection against dust while the valve is in the open position

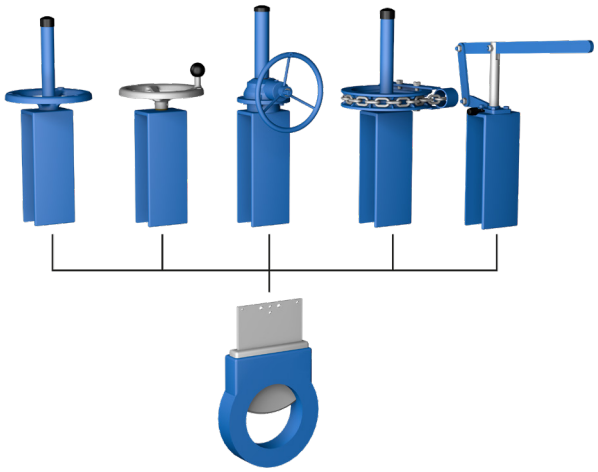
Yoke or actuator support
Made of Epoxy coated steel (stainless steel available on request). Compact design makes it extremely robust even under the most severe conditions. Reinforced design is standard starting from DN 250.

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

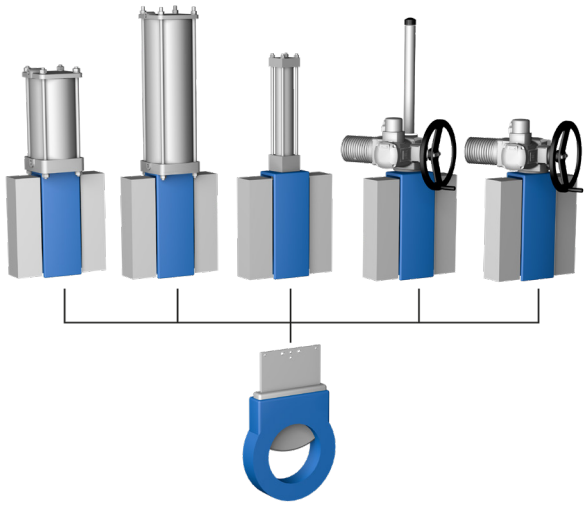
Gate safety protection
ORBINOX automated valves are provided with gate guards in accordance with EU Safety Standards. The design feature prevents any objects from being caught accidentally while the gate is moving

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

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 overraide handwheels to manually operate the actuators in emergency situations or for maintenance operations

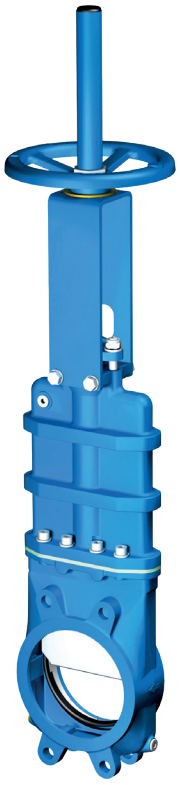


Fig.1

Fig.2

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

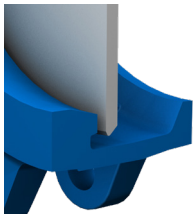
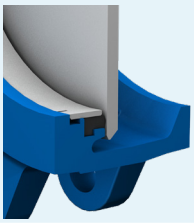
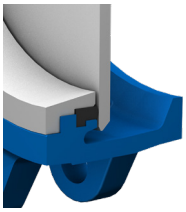
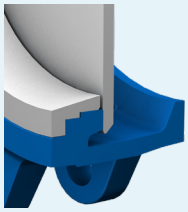
More details and other materials under request

PACKING TYPES

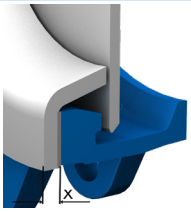
Material	Max.T (°C)	pH
PTFE impregn. synth. fibre (ST)	250	2-13
Braided PTFE (TH)	260	0-14
Graphited (GR)	600	0-14
Ceramic fibre (FC)	1200	- - -

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

SEAT CONFIGURATIONS/DESIGNS

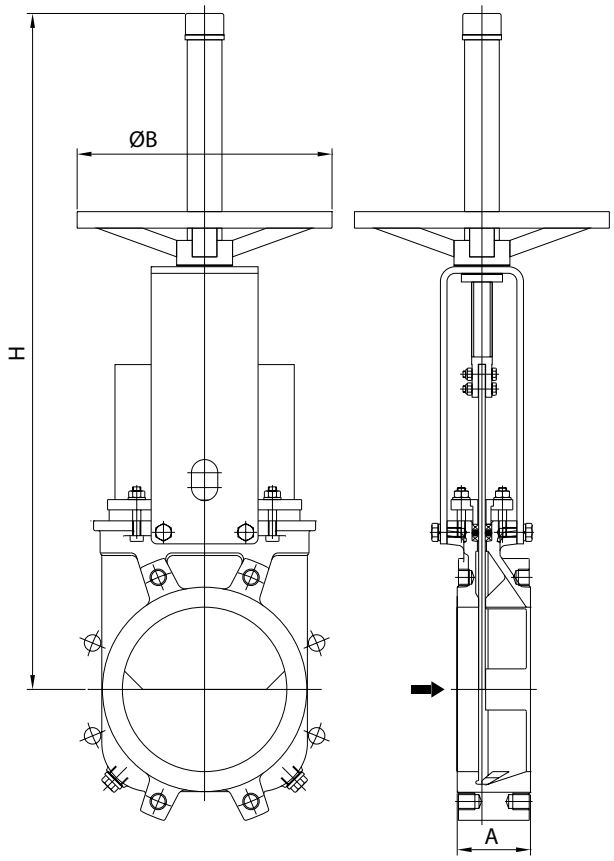
Type	Features	
Metal / Metal	-High temperature applications -High density media applications -When full tightness is not required	
A ring Resilient	-Standard resilient seat -See temperature chart for seat materials -Seat with replaceable ring	
B ring Resilient	-Reinforced resilient seat design -See temperature chart for seat materials -Seat with replaceable retainer ring - Ring available in different materials: AISI 316, Ni Hard,...	
B ring Metal/Metal	-High temperature applications -High density media applications -When full tightness is not required -Replaceable ring	

OTHER SEAT FEATURES

Type	Features	
Deflection cone C	-Used to protect valve seats and internals from wear deflecting the media away from them -Material: AISI 316, CA15, Ni-Hard, etc. -Face-to-face dimension increases: DN 50 to DN 250 X = 9mm DN 300 to DN 600 X = 12mm Larger diameters on request	

HANDWHEEL RISING STEM

Standard manual actuator available from DN 50 to DN 600 and recommended with gearbox from DN 300 and above

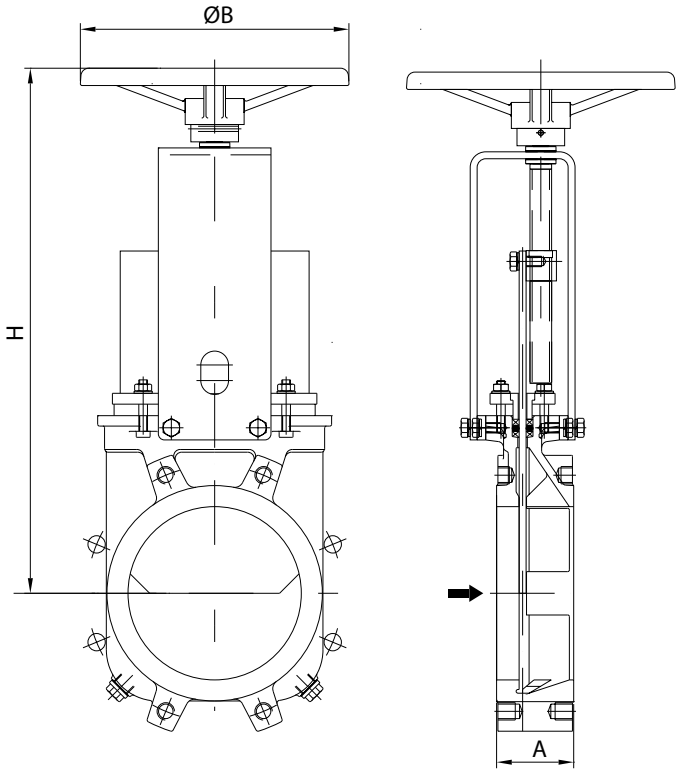


DN	A	ØB	H	Weight (Kg)
50	46	225	420	9
65	46	225	450	10
80	64	225	475	12
100	64	225	520	14
125	70	225	600	15
150	76	225	647	17
200	89	310	822	34
250	114	310	1012	56
300	114	310	1102	66
350	127	410	1305	111
400	140	410	1385	148
450	152	550	1582	197
500	152	550	1672	208
600	178	550	1962	291

HANDWHEEL NON-RISING STEM

Recommended for installation where space is limited, available from DN 50 to DN 600 and recommended with gearbox from DN 350 and above.

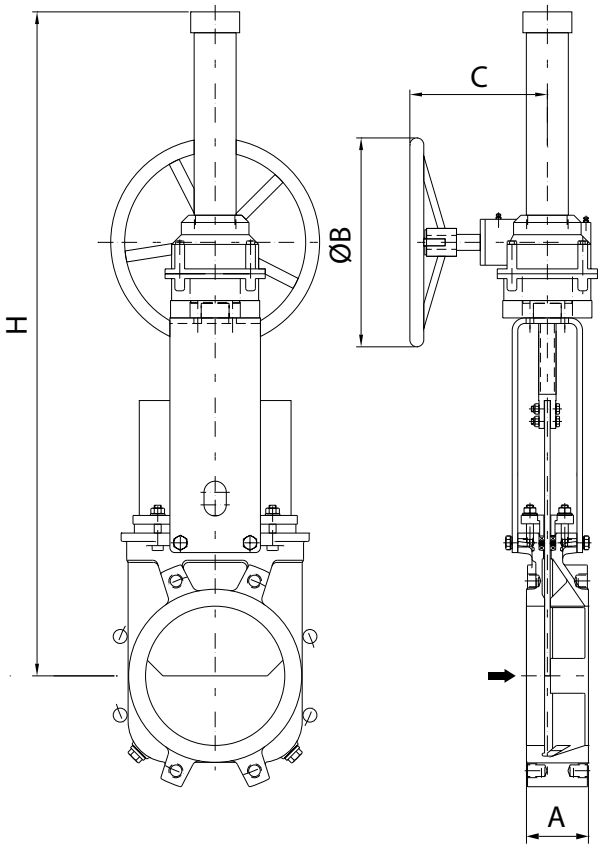
Aluminium handwheel for DN 50 to DN 300 valves and EN-GJS400 from DN 350 and above



DN	A	ØB	H	Weight (Kg)
50	46	225	312	7
65	46	225	339	9
80	64	225	364	11
100	64	225	405	13
125	70	225	439	14
150	76	225	485	16
200	89	310	595	31
250	114	310	685	49
300	114	310	775	58
350	127	410	927	107
400	140	410	1007	142
450	152	550	1129	-
500	152	550	1219	-
600	178	550	1399	-

BEVEL GEAR

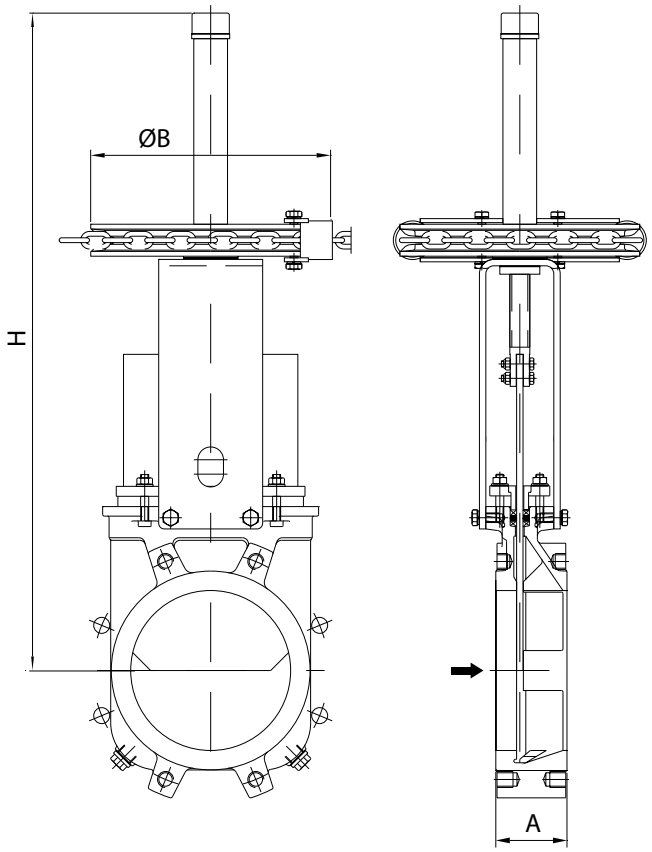
Recommended for valves larger than DN 300, available both for rising stem and non-rising stem configurations and with different reduction ratios



DN	A	ØB	H	C	Weight (Kg)
200	89	300	964	198	50
250	114	300	1054	198	73
300	114	300	1144	198	82
350	127	450	1545	218	129
400	140	450	1626	218	166
450	152	450	1742	218	213
500	152	450	1833	218	225
600	178	450	2014	218	308

CHAINWHEEL

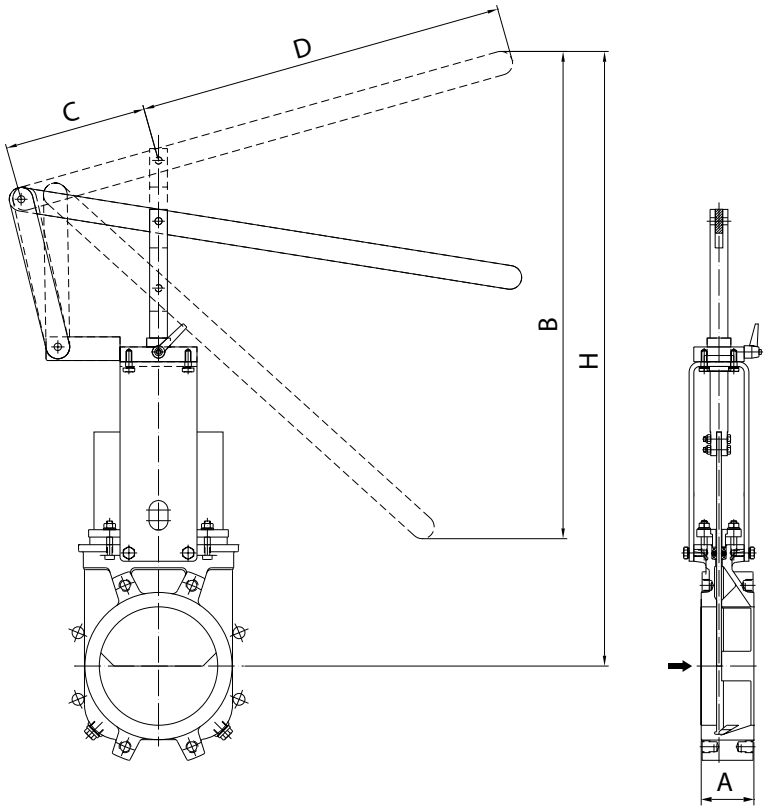
Recommended for elevated installations, the handwheel is replaced by a chainwheel to accomodate the chain. Available both for rising stem and non-rising stem and for sizes from DN 50 to DN 600



DN	A	ØB	H
50	46	225	424
65	46	225	451
80	64	225	476
100	64	225	518
125	70	225	601
150	76	225	647
200	89	300	822
250	114	300	1012
300	114	300	1102
350	127	454	1305
400	140	454	1385
450	152	454	1577
500	152	454	1662
600	178	454	1962

LEVER

Recommended for quick opening and closing, available from DN 50 to DN 200

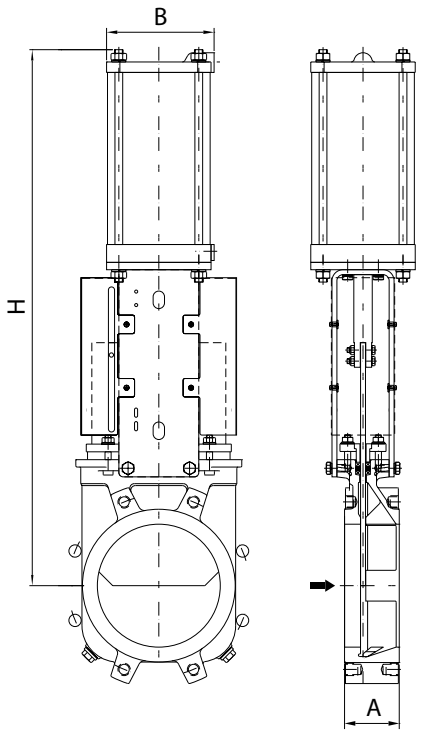


DN	A	B	C	H	D
50	46	256	150	408	315
65	46	259	150	435	315
80	64	307	150	509	315
100	64	378	150	637	415
125	70	439	150	755	415
150	76	529	150	890	415
200	89	620	235	1038	620

PNEUMATIC CYLINDER

With a double-acting pneumatic cylinder as standard, it is available in sizes from DN 50 to DN 600. 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 6 bar air supply, see ORBINOX Pneumatic Solutions Catalogue for more information

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



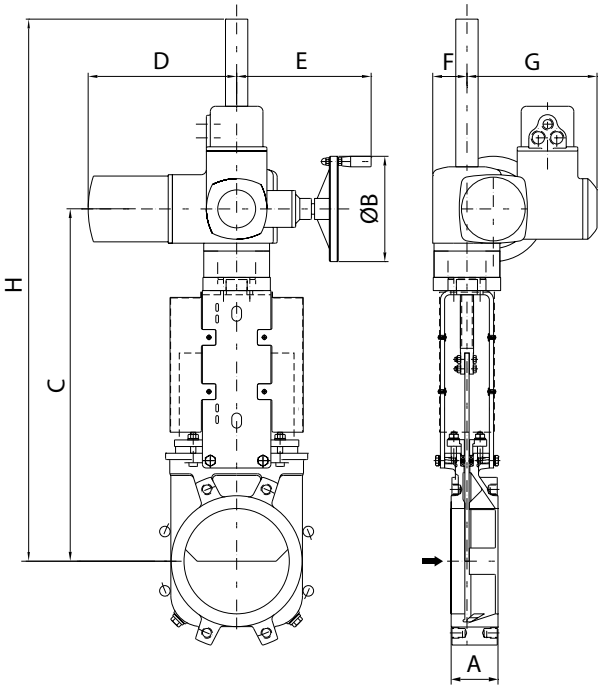
DN	A	B	H	Connect.	Weight (Kg)
50	46	115	412	1/4" G	8
65	46	115	454	1/4" G	10
80	64	115	497	1/4" G	12
100	64	115	558	1/4" G	14
125	70	140	632	1/4" G	19
150	76	140	703	1/4" G	22
200	89	175	872	1/4" G	41
250	114	220	1032	3/8" G	69
300	114	220	1172	3/8" G	80
350	127	277	1369	3/8" G	145
400	140	277	1499	3/8" G	184
450	152	382	1698	1/2" G	256
500	152	382	1838	1/2" G	269
600	178	382	2128	1/2" G	357

ELECTRIC ACTUATOR

Designed with a yoke flange for the actuator according to ISO 5210 / DIN 3338 as standard, it is available from DN 50 to DN 600, 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

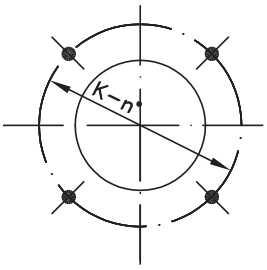


DN	A	C	ØB	H	D	E	F	G	Weight (Kg)
50	46	337	160	547	265	249	62	238	31
65	46	404	160	574	265	249	62	238	32
80	64	429	160	599	265	249	62	238	34
100	64	470	160	640	265	249	62	238	36
125	70	504	160	674	265	249	62	238	38
150	76	550	160	1120	265	249	62	238	40
200	89	669	160	1289	265	249	62	238	56
250	114	759	160	1339	265	249	62	238	79
300	114	849	160	1434	265	249	62	238	89
350	127	950	200	1535	283	254	65	248	141
400	140	1030	200	1615	283	254	65	248	178
450	152	1193	200	1793	283	254	65	248	227
500	152	1283	200	1883	283	254	65	248	240
600	178	1463	315	2163	389	336	91	286	355

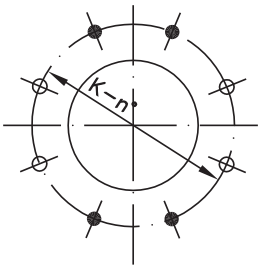
FLANGE AND BOLTING DETAILS EN-1092 PN10

DN	K	nº	M	T	
50	125	4	M-16	8	4 - 0 - 0
65*	145	4	M-16	8	4 - 0 - 0
80	160	8	M-16	9	4 - 0 - 4
100	180	8	M-16	11	4 - 0 - 4
125	210	8	M-16	11	4 - 0 - 4
150	240	8	M-20	14	4 - 0 - 4
200	295	8	M-20	14	4 - 0 - 4
250	350	12	M-20	18	6 - 2 - 4
300	400	12	M-20	18	8 - 0 - 4
350	460	16	M-20	22	10 - 2 - 4
400	515	16	M-24	21	10 - 2 - 4
450	565	20	M-24	22	14 - 2 - 4
500	620	20	M-24	22	14 - 2 - 4
600	725	20	M-27	24	14 - 2 - 4

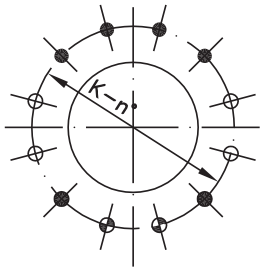
* Flange drilling of DN 65 PN10/16 according to EN-1092 allow 4 or 8 drills. ORBINOX designs of DN 65 PN10/16 have 4 drills



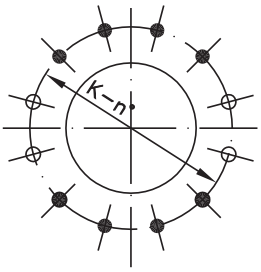
DN 50-65



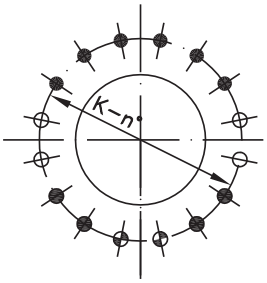
DN 80-200



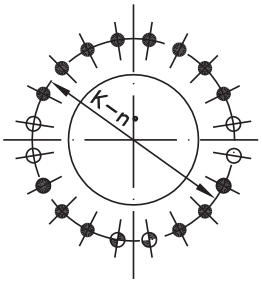
DN 250



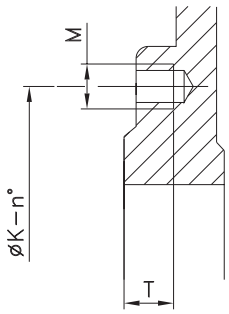
DN 300

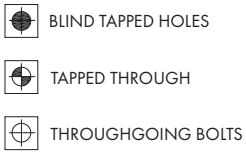


DN 350-400



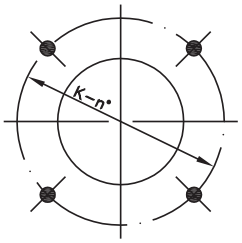
DN 450-600



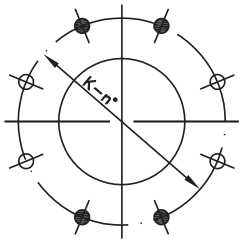


FLANGE AND BOLTING DETAILS ASME B16.5, CLASS 150

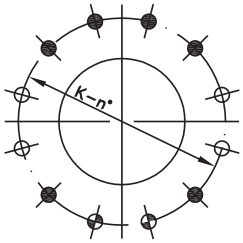
DN	K	nº	M	T	
2″	4 ¾″	4	5/8″ - 11 UNC	5/16″	4 - 0 - 0
2 ½″	5 ½″	4	5/8″ - 11 UNC	5/16″	4 - 0 - 0
3″	6″	4	5/8″ - 11 UNC	3/8″	4 - 0 - 0
4″	7 ½″	8	5/8″ - 11 UNC	7/16″	4 - 0 - 4
5″	8 ½″	8	3/4″ - 10 UNC	7/16″	4 - 0 - 4
6″	9 ½″	8	3/4″ - 10 UNC	9/16″	4 - 0 - 4
8″	11 ¾″	8	3/4″ - 10 UNC	9/16″	4 - 0 - 4
10″	14 ¼″	12	7/8″ - 9 UNC	11/16″	6 - 2 - 4
12″	17″	12	7/8″ - 9 UNC	11/16″	8 - 0 - 4
14″	18 ¾″	12	1″ - 8 UNC	7/8″	6 - 2 - 4
16″	21 ¼″	16	1″ - 8 UNC	13/16″	10 - 2 - 4
18″	22 ¾″	16	1 1/8″ - 7 UNC	7/8″	10 - 2 - 4
20″	25″	20	1 1/8″ - 7 UNC	7/8″	14 - 2 - 4
24″	29 ½″	20	1 1/4″ - 7 UNC	15/16″	14 - 2 - 4



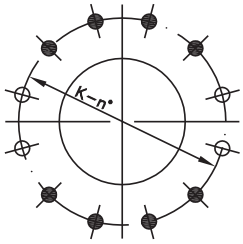
DN 2"- 3"



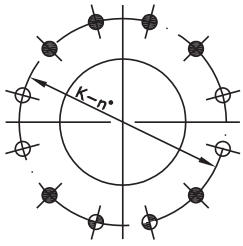
DN 4" - 8"



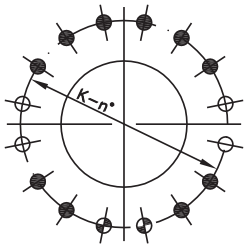
DN 10"



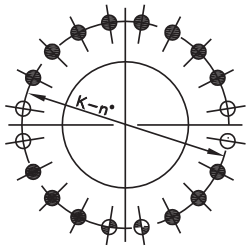
DN 12"



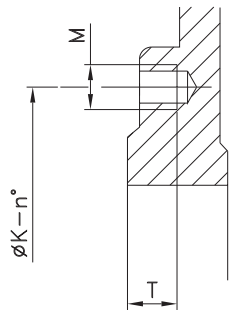
DN 14"



DN 16" - 18"



DN 20" - 24"



BLIND TAPPED HOLES

TAPPED THROUGH

THROUGHGOING BOLTS