

**THROUGH CONDUIT KNIFE GATE VALVE**

The TL model knife gate is a bi-directional wafer valve designed for media with high consistency. The double seat design assures a non-clogging shut off on either normal or reverse flow. The valve is used in a wide range of demanding applications in industries such as:

- Pulp & Paper
- Wastewater Treatment Plants
- Chemical plants
- Power Plants
- Etc.

**Sizes:**

DN 50 to DN 1000 (larger diameters on request)

**Working pressure:**

DN 50 to DN 125	10 bar
DN 150 to DN 250	8 bar
DN 300 to DN 400	6 bar
DN 450	5 bar
DN 500 to DN 600	4 bar
DN 700 to DN 1000	2 bar

**Standard flange connection:**

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

Other flange connections are available on request such as:

DIN PN 6	DIN PN 16	DIN PN 25
BS "D" and "E"	ANSI 125	

**Directives:**

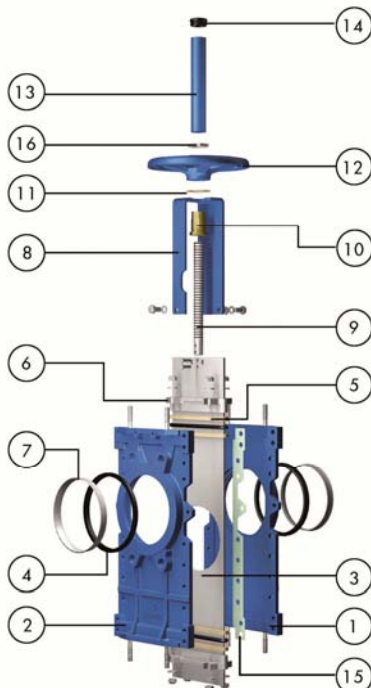
2006/42/CE (MACHINES)

97/23/CE (PED) Fluid: Group 1(b), 2 (Cat. I, mod. A)

94/9/CE (ATEX)



All valves are tested prior to shipping in accordance with the standard developed by the Quality Control Department at ORBINOX



**STANDARD PARTS LIST**

Part:	Cast Iron:	Stainless Steel:
1- Body	GJL250(GG25)	CF8M
2- Body	GJL250(GG25)	CF8M
3- Gate	AISI 304	AISI 316
4-Seat	Metal or EPDM	
5- Packing	PTFE Impreg. Synth. Fibre (ST)+O-ring	
6- Gland Follower	Aluminium (DN50-300) Ductile Iron (DN350-1000)	CF8M
7- Seat Retainer Ring	AISI 304	-
8- Yoke	Carbon Steel - Epoxy Coated	
9- Stem	AISI 430	
10- Stem nut	Brass	
11- Friction washer	Brass	
12- Handwheel	GJS400 (GGG40)	
13- Stem Protector	Epoxy-coated Carbon Steel	
14- Cap	Plastic	
15- Gasket	Aramid fibres	
16- Nut	Zinc plated Carbon Steel	



Reserves the right to change specifications without notice

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OBX 04/16

Rev.6

TL\_1

## DESIGN FEATURES

### **BODY:**

Wafer style cast two-part bolted body, both internally machined, with reinforcing ribs in larger diameters for extra body strength. The stainless steel version valves include internal high density polyethylene sliders (HMWPE) that ensure smoother gate traveling. Full port design to allow a greater flow capacity and to guarantee a minimal pressure drop.

### **SELF-CLEANING GATE:**

Stainless steel as standard. One piece through-going gate with o-port design. When closing, the gate cuts and moves a disc of material downwards, which is again returned to the flow when opening. Gate is polished on both sides to avoid jamming and to ensure a greater seal between the gate with both packing and seat. The thickness and/or the material of the gate can be changed on request for higher pressure requirement.

### **SEAT: (resilient)**

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

### **PACKING:**

Double stuffing box with several layers of braided fibre plus an EPDM o-ring, with an easy access and adjusting 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.

### **ACTUATORS:**

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

### **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.

### **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.



## OTHER OPTIONS

### Bonnet (Fig.1):

Assures tight sealing to atmosphere for using with hazardous gas or fluids.  
Reduces packing maintenance

### Diamond port:

Excellent flow regulation

### Flush ports:

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.

### Other materials of construction:

Special alloys such as AISI 317 (1.4449), 254SMO (1.4547), Hastelloys, etc.

### Fabricated valves:

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

### Square port (Fig.2):

Greater flow capacity for bulk material. Designed for equipment with square flange connections

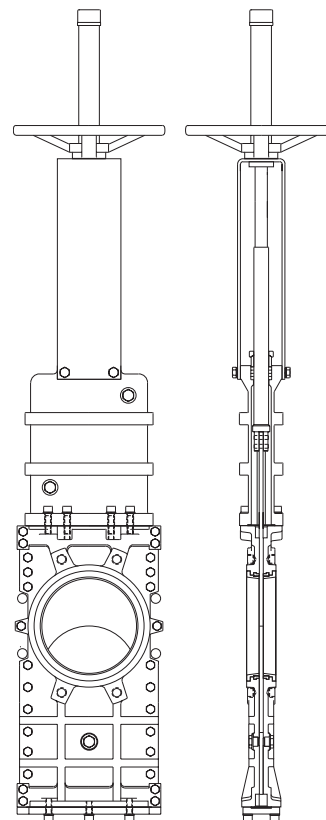


Fig.1

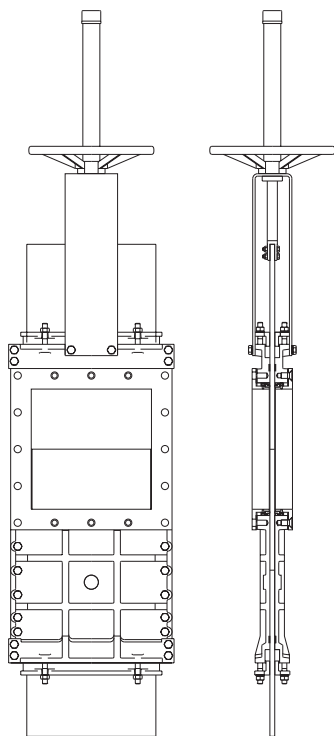


Fig.2

## 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, polyurethane...), against corrosion (Halar, Rilsan, galvanizing...) and against adherence (polishing, PTFE...).

## ATEX



Please contact our ORBINOX representative for info and availability. Some considerations:

- Hand operated TL valves have been subjected to an ignition risk assessment according to DIN EN 13463: 1-5 and they are out the scope of application of ATEX Directive. Therefore hand operated valves are suitable for ALL ATEX zones.
- Electrical, pneumatical and hydraulically operated valves must be subjected to a conformity assessment of their own and also of the whole unit valve-actuator to get EC Type Approval to Directive 94/9.

We recommend to contact our technical department

## ACTUATOR TYPES

### MANUAL:

- Handwheel (rising stem)
- Handwheel (non-rising stem)
- Chainwheel
- Bevel Gear
- Lever
- Others (square nut...)

### AUTOMATIC:

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

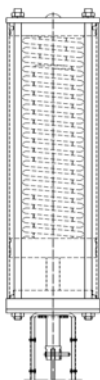
All actuators supplied by ORBINOX are interchangeable

## FAIL SAFE SYSTEMS

Used on pneumatic actuated valves

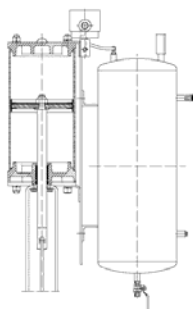
### SINGLE ACTING (SPRING RETURN)

- Available from DN 50 to DN 300
- 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

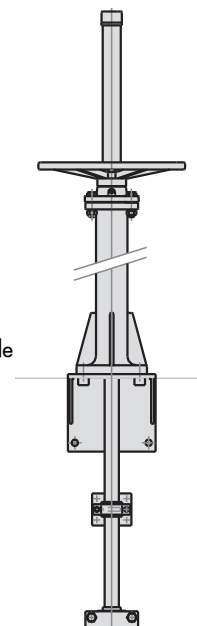
- Available for all valve sizes
- Supply pressure:
  - min. 3.5 bar - max. 10 bar
- Options:
  - Pneumatic or electric fail open
  - Pneumatic or electric fail close
  - Other options on request



## ACCESSORIES

- Mechanical stops
- Locking device
- Manual override
- Solenoid valves
- Positioners
- Limit switches
- Proximity switches
- Floor stands
- Stem extensions

Wide range of valve extensions available



*For further information about fail safe systems and valve extensions, please see EX catalogue*

For more detailed information, please contact our Technical Department

## TEMPERATURE CHART

### SEAT / SEALS

### PACKING

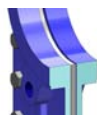
Material	Max.Temp.(°C)	Applications	Material	Max.Temp.(°C)	pH
Metal/Metal	>250	High temp./Low tightness	Dry cotton (AS)	50	6 - 8
EPDM (E)	120	Acids and non mineral oils	PTFE impregn. synth. fibre (ST)	240	2 - 13
Nitrile (N)	120	Resistance to petroleum products	Braided PTFE (TH)	260	0 - 14
Viton (V)	200	Chemical service/High temp.	Graphited (GR)	600	0 - 14
Silicone (S)	250	Food service/ High temp.	Ceramic fibre (FC)	1200	- - -
PTFE (T)	250	Corrosion resistance			

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

More details and other materials under request

## SEAT TYPES

### Cast Iron



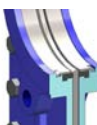
#### METAL / METAL

Used for applications with high temperature or applications where tight shutoff is not required. The stainless steel version includes HMW polyethylene seat sliders that ensure a smoother gate traveling



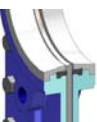
#### METAL / METAL, TYPE "B"

Two replaceable reinforced "B" type rings (available in AISI 316, Ni-hard, CA15,...) protect the seat in abrasive services. HMW polyethylene seat sliders for smoother gate traveling (stainless steel version only)



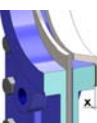
#### RESILIENT, TYPE "A"

The standard resilient seat design consists of an elastomer seal fixed to the valve body with a replaceable stainless steel retainer ring. Temperature limitations according to seat material selected. Verify the above chart or contact our technical department for more information. HMW polyethylene seat sliders for smoother gate traveling (stainless steel version only)



#### RESILIENT, TYPE "B"

Resilient seat design with an elastomer seal fixed to the valve body with two replaceable reinforced seal retainer rings (available in AISI 316, Ni-hard, CA15,...) that protect the seat in abrasive services. Temperature limitations according to seat material selected. Verify the above chart or contact our technical department for more information. HMW polyethylene seat sliders for smoother gate traveling (stainless steel version only)



#### DEFLECTION CONE "C"

Deflects the media away from any valve internal exposed parts such as gate guides, seats, etc. Different types of material available such as AISI 316, CA15, Ni-Hard, etc. Installed at flow inlet, deflection cones protect the seat. They slightly reduce the inlet bore and the face-to-face dimensions also increase:

DN 50 to DN 250 X = 9mm

DN 300 to DN 600 X = 12mm

### Stainless Steel



DN 50 - 150



DN 200 - 600



DN 50 - 150



DN 200 - 600

See option TK valve

See option TK valve



DN 50 - 150

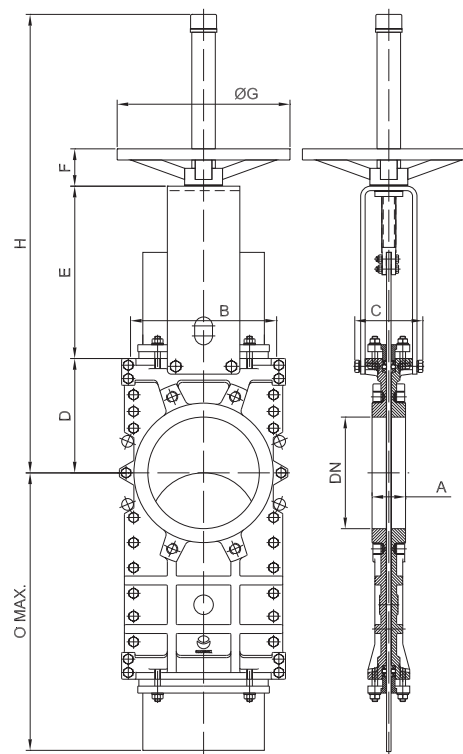


DN 200 - 600



## HANDWHEEL (rising stem)

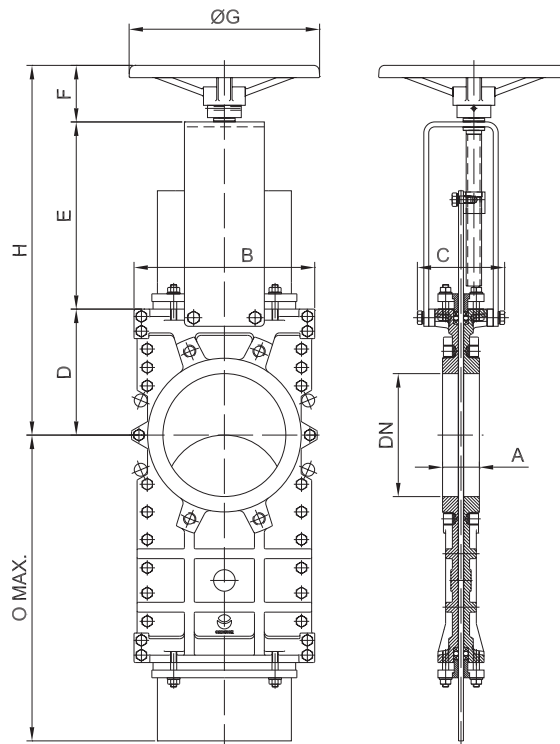
- Standard manual actuator
- Consists of:
  - Handwheel: Epoxy coated Cast Iron
  - Floor stand
  - Stem
  - Stem nut
  - Stem protector
- Available from DN 50 to DN 600
- Options (on request):
  - Locking Device
  - Extensions



DN	A	B	C	D	E	F	ØG	H	O max.	Weight (kg.)
50	40	152	100	110	129	47	225	429	232	12
65	40	167	100	115	146	47	225	451	255	14
80	50	182	100	124	162	47	225	476	310	16
100	50	202	100	140	187	47	225	517	367	20
125	50	216	100	150	211	47	225	601	432	29
150	60	241	100	175	237	47	225	652	497	35
200	60	294	122	205	309	67	310	822	635	62
250	70	356	122	245	364	67	310	1017	777	89
300	70	410	122	280	414	67	310	1102	905	110
350	96	473	197	300	486	66	410	1286	1047	174
400	100	538	197	350	536	66	410	1386	1171	266
450	106	588	201	420	588	66	550	1583	1301	326
500	110	646	201	450	648	66	550	1673	1461	372
600	110	754	201	530	748	66	550	1963	1711	445

## HANDWHEEL (non-rising stem)

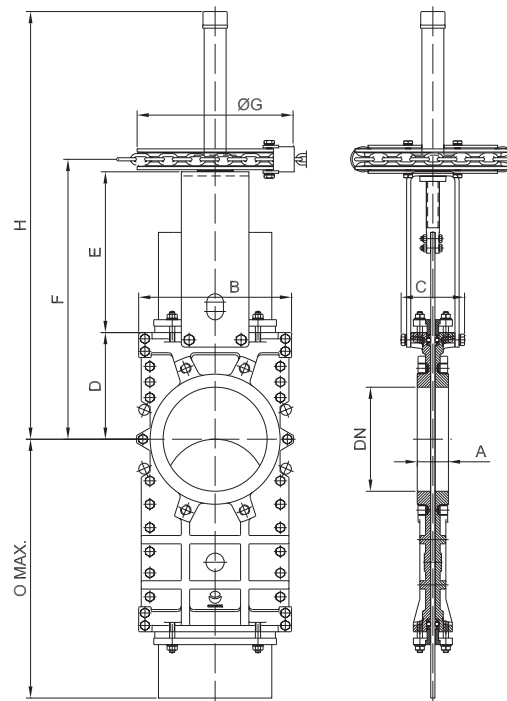
- Recommended for installation where space is limited
- Consists of:
  - Handwheel: Epoxy coated Cast Iron
  - Stem
  - Yoke bushing
  - Stem nut fixed to the gate
- Available from DN 50 to DN 600
- Options (on request):
  - Locking Device
  - Extension
  - Square Nut Drive



DN	A	B	C	D	E	F	ØG	H	O max.
50	40	152	125	110	144	63	225	317	232
65	40	167	125	115	161	63	225	339	255
80	50	182	125	124	177	63	225	364	310
100	50	202	125	140	202	63	225	405	367
125	50	216	125	150	226	63	225	439	432
150	60	241	125	175	252	63	225	490	497
200	60	294	142	205	317	73	310	595	635
250	70	356	142	245	372	73	310	690	777
300	70	410	142	280	422	73	310	775	905
350	96	473	197	300	509	98	410	907	1047
400	100	538	197	350	559	98	410	1007	1171
450	106	588	201	420	611	98	550	1129	1301
500	110	646	201	450	671	98	550	1219	1461
600	110	754	201	530	771	98	550	1399	1711

## CHAINWHEEL (rising stem)

- Recommended for elevated installations
- Consists of:
  - Chainwheel: Epoxy coated Cast Iron
  - Stem
  - Stem nut
  - Stem protector
- Available from DN 50 to DN 600
- Options (on request):
  - Locking Device
  - Extension
  - Non-rising Stem



DN	A	B	C	D	E	F	ØG	H	O max.
50	40	152	100	110	129	258	225	429	232
65	40	167	100	115	146	280	225	451	255
80	50	182	100	124	162	305	225	476	310
100	50	202	100	140	187	347	225	518	367
125	50	216	100	150	211	380	225	601	432
150	60	241	100	175	237	431	225	652	497
200	60	294	119	205	309	538	300	822	635
250	70	356	122	245	364	633	300	1017	777
300	70	410	122	280	414	718	300	1102	905
350	96	473	197	300	486	818	454	1285	1047
400	100	538	197	350	536	918	454	1385	1171
450	106	588	201	420	588	1040	454	1577	1301
500	110	646	201	450	648	1130	454	1672	1461
600	110	754	201	530	748	1310	454	1962	1711



## GEAR (rising stem)

- Recommended for valves larger than DN 350 and working pressures greater than 3.5 bar

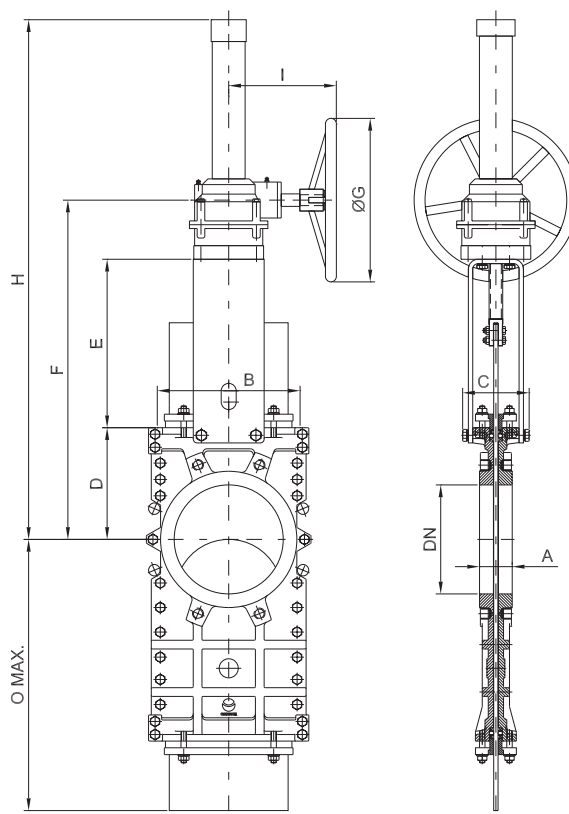
- Consists of:

- Stem
- Yoke
- Bevel Gear Actuator with Handwheel (Standard Ratio 4:1)

- Available from DN 200 to DN 600

- Options (on request):

- Locking Device
- Extension
- Chainwheel
- Non-rising stem



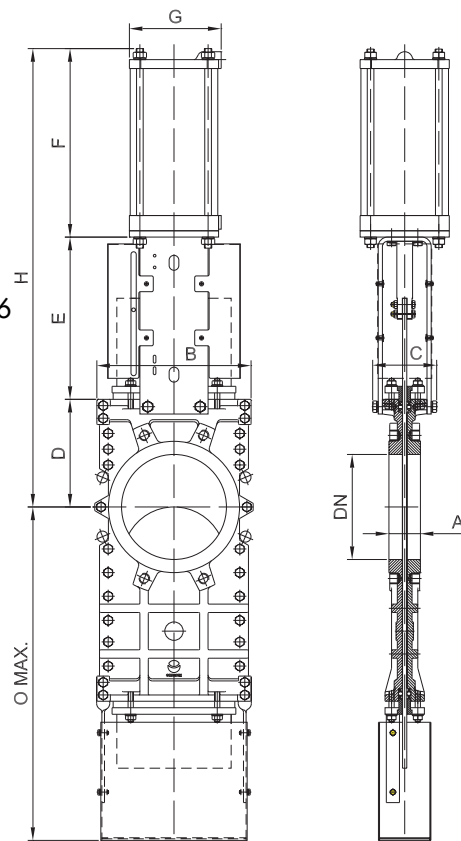
DN	A	B	C	D	E	F	ØG	H	I	O max.
200	60	294	122	205	309	584	300	994	200	635
250	70	356	122	245	364	679	300	1089	200	777
300	70	410	122	280	414	744	300	1154	200	905
350	96	473	197	300	486	836	450	1536	270	1047
400	100	538	197	350	536	936	450	1636	270	1171
450	106	588	201	420	588	1058	450	1758	270	1301
500	110	646	201	450	648	1148	450	1848	270	1461
600	110	754	201	530	748	1328	450	2028	270	1711

## PNEUMATIC CYLINDER

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

consists on:

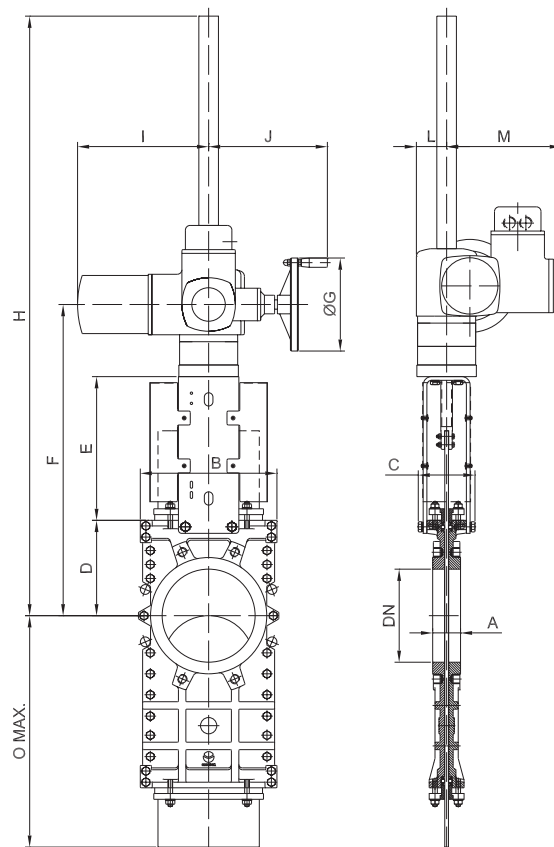
- DN ≤ 250: Aluminum barrels
- DN ≥ 300: Composite barrels
- Aluminum end covers
- Stainless Steel (AISI 304) piston rod
- Nitrile coated steel piston
- Available from DN 50 to DN 600
- Supply Pressure: min. 3,5 bar - max. 10 bar. Actuator designed with 6 bar air supply
- For valves installed in a horizontal position, we recommend Utype support plates and/or actuator support
- Options (on request):
  - Hard anodized barrel and covers
  - Stainless Steel barrel and covers
  - Over / Undersized cylinder
  - Manual override
  - Fail Safe System
  - Limit switches
- Instrumentation (on request):
  - Positioners
  - Solenoid valves
  - Flow regulators
  - Air preparation units



DN	A	B	C	D	Ø max.	E	F	G	H	Weight (kg.)	Standard Cyl.	Connect.
50	40	152	100	110	232	129	178	115	417	14	C100/62	1/4" G
65	40	167	100	115	255	146	193	115	454	16	C100/77	1/4" G
80	50	182	100	124	310	162	211	115	497	18	C100/95	1/4" G
100	50	202	100	140	367	187	231	115	558	23	C100/115	1/4" G
125	50	216	100	150	432	211	271	140	632	34	C125/143	1/4" G
150	60	241	100	175	497	237	296	140	708	41	C125/168	1/4" G
200	60	294	119	205	635	309	358	175	872	73	C160/220	1/4" G
250	70	356	122	245	777	364	428	220	1037	105	C200/270	3/8" G
300	70	410	122	280	905	414	478	220	1172	128	C200/320	3/8" G
350	96	473	197	300	1047	510	549	277	1359	207	C250/375	3/8" G
400	100	538	197	350	1171	560	599	277	1509	300	C250/425	3/8" G
450	106	588	270	420	1301	608	680	382	1708	378	C300/475	1/2" G
500	110	646	270	450	1461	668	730	382	1848	445	C300/525	1/2" G
600	110	754	270	530	1711	796	880	444	2206	619	C300/625	1/2" G

## ELECTRIC ACTUATOR (rising stem)



- Consists of:
  - Electric motor
  - Rising stem
  - Motor support yoke  
acc. to ISO 5210/DIN 3338
- The standard electric motor is equipped with:
  - Manual emergency operation
  - Limit switches (open/closed)
  - Torque switches
- Available from DN 50 to DN 600
- For valves installed in a horizontal position, we recommend Utype support plates and/or actuator support
- Wide range of types and brands available to meet customer's needs
- Option:
  - Non rising stem

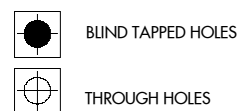
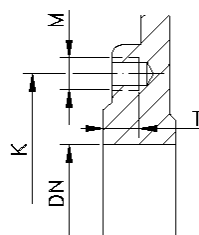
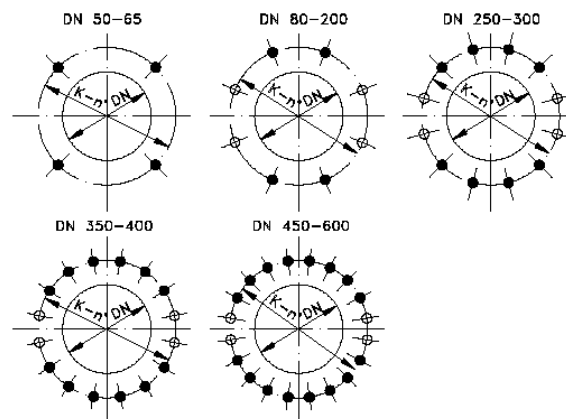


DN	A	B	C	D	E	F	ØG	H	O max.	I	J	L	M	stem Ø x pitch	Torque(Nm)
50	40	152	100	110	129	357	160	547	232	265	249	62	238	20 x 4	10
65	40	167	100	115	146	379	160	549	255	265	249	62	238	20 x 4	10
80	50	182	100	124	162	404	160	574	310	265	249	62	238	20 x 4	10
100	50	202	100	140	187	445	160	615	367	265	249	62	238	20 x 4	10
125	50	216	100	150	211	479	160	649	432	265	249	62	238	20 x 4	15
150	60	241	100	175	237	530	160	1100	497	265	249	62	238	20 x 4	25
200	60	294	122	205	309	632	160	1252	635	265	249	62	238	24 x 5	35
250	70	356	122	245	364	739	200	1319	777	283	254	65	248	24 x 5	60
300	70	410	122	280	414	824	200	1409	905	283	254	65	248	24 x 5	70
350	96	473	197	300	510	940	200	1525	1047	283	254	65	248	36 x 6	100
400	100	538	197	350	560	1085	315	1670	1171	389	336	91	248	36 x 6	140
450	106	588	270	420	608	1203	315	1803	1301	389	336	91	286	36 x 6	180
500	110	646	270	450	668	1293	315	1893	1461	389	336	91	286	36 x 6	170
600	110	754	270	530	796	1505	315	2065	1711	389	336	91	286	36 x 6	220



**FLANGE AND BOLTING DETAILS**

**EN 1092-2 PN10**

DN	K	n°	M	T	 
50	125	4	M-16	11	4 - 0
65	145	4	M-16	11	4 - 0
80	160	8	M-16	14	4 - 4
100	180	8	M-16	14	4 - 4
125	210	8	M-16	14	4 - 4
150	240	8	M-20	18	4 - 4
200	295	8	M-20	18	4 - 4
250	350	12	M-20	22	8 - 4
300	400	12	M-20	22	8 - 4
350	460	16	M-20	28	12 - 4
400	515	16	M-24	28	12 - 4
450	565	20	M-24	32	16 - 4
500	620	20	M-24	32	16 - 4
600	725	20	M-27	25	16 - 4



**ANSI B16.5, class 150**

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

