

**MODEL****ET**

## HEAVY DUTY KNIFE GATE VALVE

The 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 non-clogging 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 50/2" to DN 900/36" (larger diameters on request)

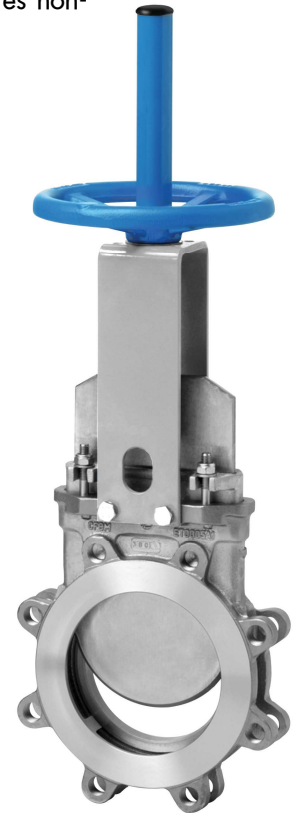
**Working pressure:**

DN 50/2" to DN 600/24"	10 bar / 150 psi
DN 750/30"	7 bar / 100 psi
DN 900/36"	7 bar / 100 psi

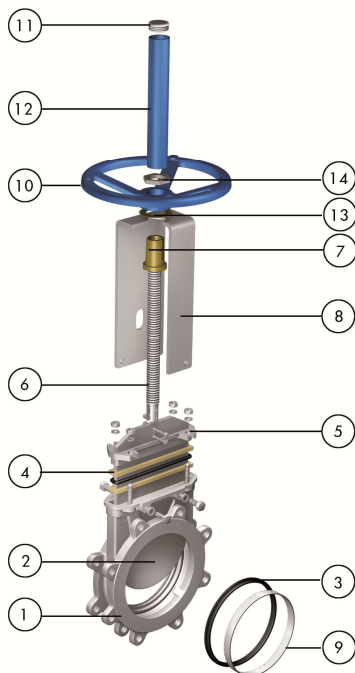
**Standard flange connection:**

DIN PN 10 and ANSI B16.5 (class 150)  
Other flange connections available on request

**Directives:** 2006/42/CE (MACHINES)  
2014/68/EU (PED) Fluid: Group 1(b), 2 (Cat. I, mod. A)  
2014/34/EU (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:	Stainless Steel:
1- Body	CF8M
2- Gate	AISI 316
3- Seat	Metal/Metal or EPDM
4- Packing	PTFE Impreg. Synth. Fibre with an EPDM O-Ring
5- Gland Follower	CF8M
6- Stem	AISI 430
7- Stem nut	Brass
8- Yoke	AISI 304 / Epoxy-coated Carbon Steel
9- Seat Retainer Ring	AISI 316
10- Handwheel	GJS400 (GGG40)
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.

### **ACTUATORS:**

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

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

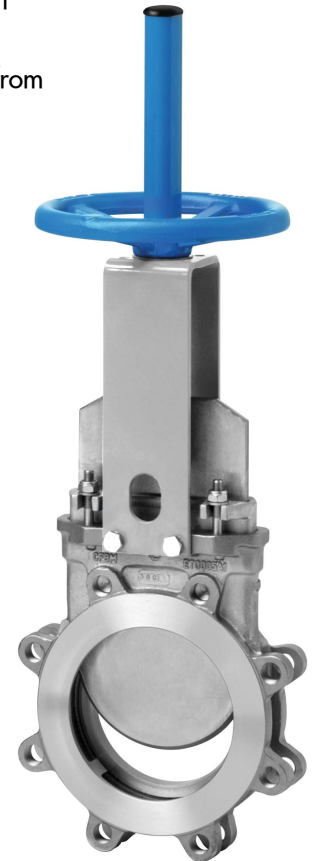
Made of stainless steel (EPOXY coated carbon steel available on request). Compact design makes it extremely robust even under the most severe conditions.

### **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.



## OTHER OPTIONS

### Bonnet (Fig.1):

Assures tight sealing to atmosphere.  
Reduces packing maintenance.

### V-port:

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

### 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.

### Other materials of construction:

Special alloys such as AISI 317 (1.4449), 254SMO (1.4544), Hastelloys, ...

### Fabricated valves:

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

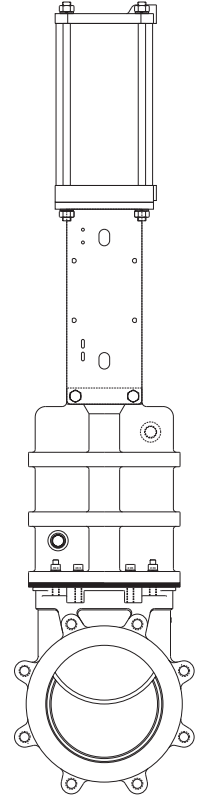


Fig.1

## 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...).

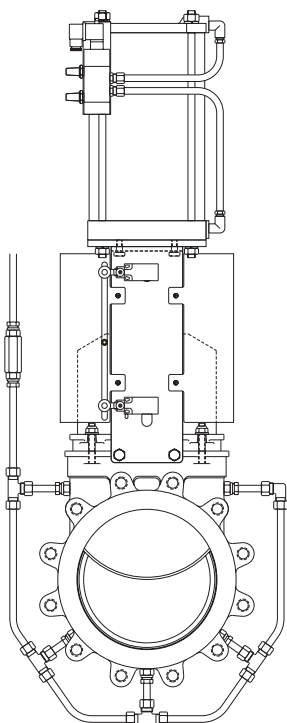


Fig.2

## ATEX



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

- Hand operated ET 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 2014/34.

We recommend to contact our technical department.

## ACTUATOR TYPES

### MANUAL:

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

### AUTOMATIC:

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

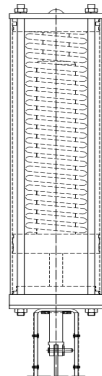
All actuators supplied by ORBINOX are interchangeable

## FAIL SAFE SYSTEMS

Used on pneumatic actuated valves

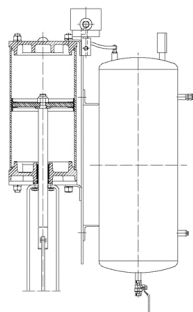
### SINGLE ACTING (SPRING RETURN)

- Available from  
DN 50mm/2" to DN 300mm/12"
- 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

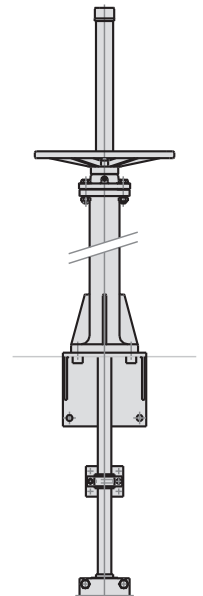
- Available for all valve sizes
- Supply pressure:  
min. 3.5 bar - max. 10 bar
- Options:
  - Pneumatic or electric fail open
  - Pneumatic or electric fail close
  - Other options on request



## 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.*

We recommend to contact our technical department

## TEMPERATURE CHART

### SEAT / SEALS

Material	Max.T (°C)	Applications
Metal/Metal	>250	High temp. / Low tightness
EPDM (E)	120	Acids and non mineral oils
Nitrile (N)	120	Resistance to petroleum products
Viton (V)	200	Chemical service /High temp.
Silicone (S)	250	Food service / High temp.
PTFE (T)	250	Corrosion resistance

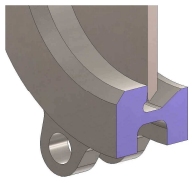
### PACKING

Material	Max.T (°C)	pH
Dry cotton (AS)	50	6-8
PTFE impregn. synth. fibre (ST)	240	2-13
Braided PTFE (TH)	260	0-14
Graphited (GR)	600	0-14
Ceramic fibre (FC)	1200	--

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

More details and other materials under request

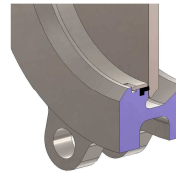
## SEAT TYPES



### METAL / METAL

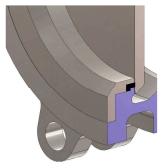
For applications with:

- High temperature
- High density media application
- When full tightness is not required



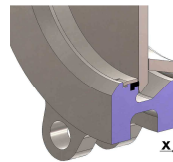
### RESILIENT, TYPE "A"

- Standard resilient seat.
- Temperature limitations according to seat material selected. Review the above chart or contact our technical department for more information.
- Replaceable seat retainer ring.



### RESILIENT, TYPE "B"

- Temperature limitations according to the selected seat material. Review the above chart or contact our Technical Department for more information.
- Replaceable and reinforced seat ring available in different materials such as: AISI 316 (1.4401), CA15, Ni Hard, etc.

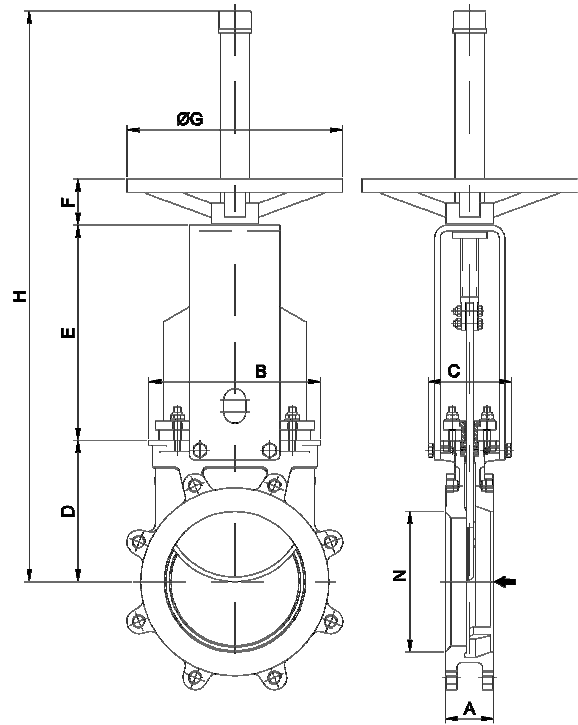


### DEFLECTION CONE "C"

- Deflects the media away from any valve internal exposed parts (gate, seat,...)
- Material: AISI 316 (1.4401), 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)

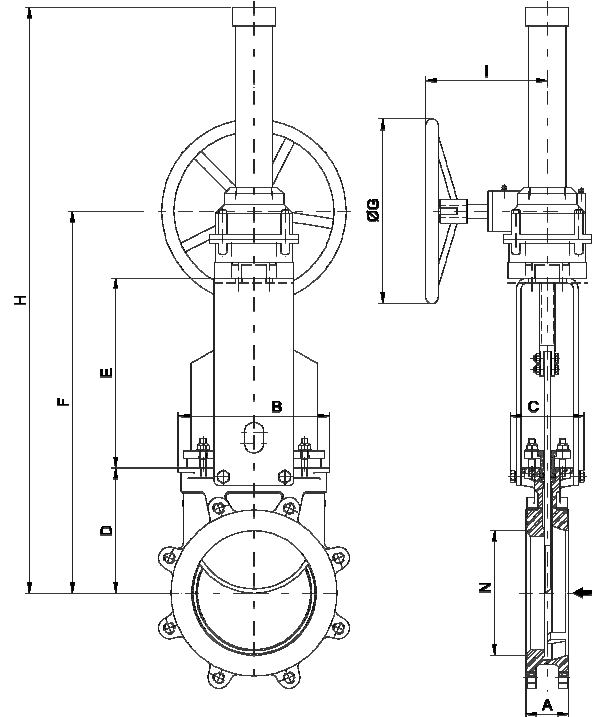
- Standard manual actuator
- Consists of:
  - Handwheel: Epoxy coated Cast Iron
  - Yoke
  - Stem
  - Stem nut
  - Stem protector
- Available from DN 50/2" to DN 600/24"
- Options (on request):
  - Chainwheel
  - Non-rising stem
  - Locking Device
  - Extensions



DN (mm/")	N	A	B	C	D	E	F	ØG	H	Weight (kg.)
50/2"	50	48	124	100	98	136	47	225	420	8
80/3"	80	51	149	100	119	162	47	225	470	10
100/4"	97	51	169	100	139	187	47	225	519	12,5
125/5"	117	57	169	100	150	223	47	225	613	16
150/6"	140	57	197	100	165	237	47	225	642	20
200/8"	184	70	247	122	203	309	67	310	820	32
250/10"	230	70	298	122	233	345	67	310	986	47
300/12"	275	76	349	122	273	390	69	410	1071	65
350/14"	305	76	391	193	312	433	66	410	1245	95
400/16"	351,6	89	439	193	347	478	66	410	1325	122
450/18"	390	89	483	197	415	552	67	550	1510	160
500/20"	435	114	542	197	450	611	67	550	1617	202
600/24"	522	114	637	197	501	697	67	550	1883	290

**GEAR**

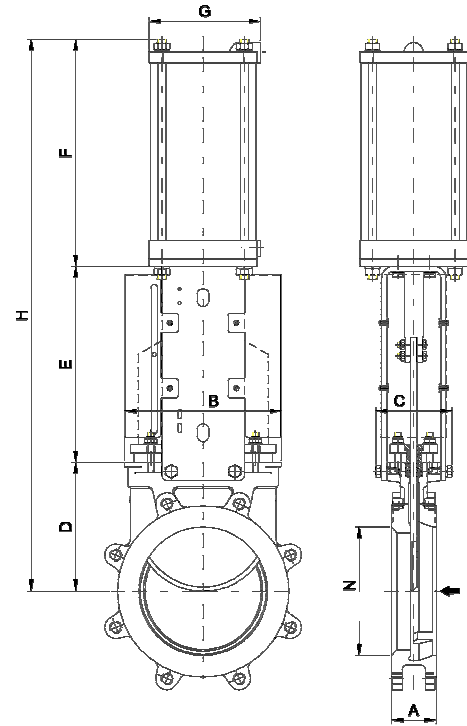
- Recommended for valves larger than DN 350/14" and working pressures greater than 3.5 bar / 50 psi
- Consists of:
  - Stem
  - Yoke
  - Bevel Gear Actuator with Handwheel (Standard Ratio 4:1)
- Available from DN 200/8" to DN 900/36"
- Options:
  - Chainwheel
  - Non-rising Stem
  - Locking Device
  - Extensions



DN(mm/")	N	A	B	C	D	E	F	ØG	H	I
200/8"	184	70	247	122	203	309	582	300	992	200
250/10"	230	70	298	122	233	345	648	300	1060	200
300/12"	275	76	349	122	273	390	733	300	1143	200
350/14"	305	76	391	197	312	430	790	450	1489	270
400/16"	351,6	89	439	197	347	475	870	450	1570	270
450/18"	390	89	483	201	415	518	984	450	1615	270
500/20"	435	114	542	201	450	558	1092	450	1810	280
600/24"	522	114	637	201	501	663	1248	650	1879	290
750/30"	670	117	842	320	624	871	1597	650	2650	413
900/36"	810	117	970	320	779	1046	2135	650	3135	442

**PNEUMATIC CYLINDER**

- The standard pneumatic actuator (double acting on-off cylinder) consists of:
  - DN ≤ 250/10": Aluminum barrels
  - DN ≥ 300/12": Composite barrels
  - Aluminum end covers
  - Stainless Steel (AISI 304) piston rod
  - Nitrile coated steel piston
- Available from DN 50/2" to DN 900/36"
- Supply Pressure: min. 3.5 bar / 50 psi - max. 10 bar / 145 psi. Actuator designed with 6 bar / 85 psi air supply.
- For valves installed in a horizontal position, we recommend U-type support plates and/or actuator support.
- Options:
  - Hard anodized barrel and covers
  - Stainless Steel barrel and covers
  - Over/Undersized cylinder
  - Manual override
  - Fail safe systems
  - Limit switches
- Instrumentation (on request):
  - Positioners
  - Solenoid valves
  - Flow regulators
  - Air preparation units



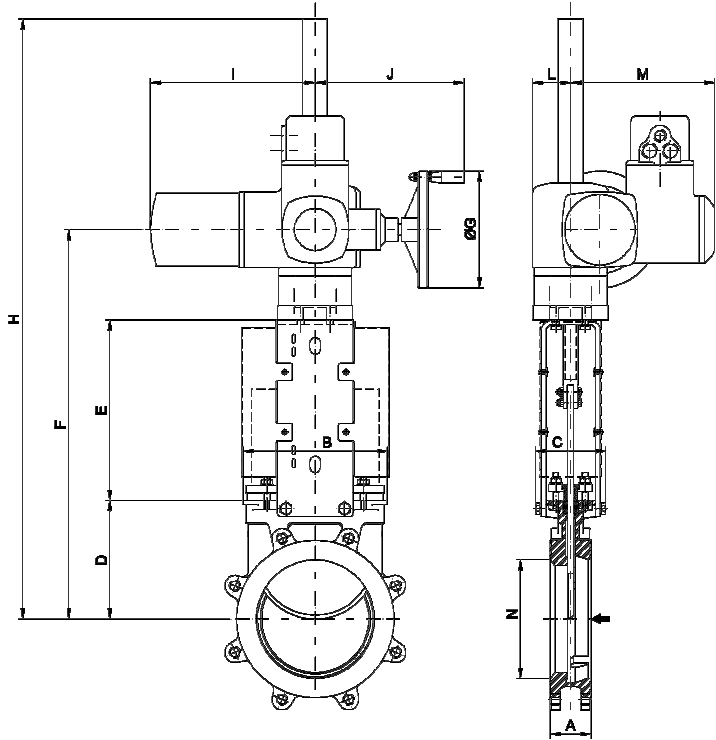
DN(mm/")	N	A	B	C	D	E	F	G	H	Weight (kg.)	Standard Cyl.	Connect.
50/2"	50	48	124	100	98	136	178	115	412	10	C100/62	1/4" G
80/3"	80	51	149	100	119	162	211	115	492	12	C100/95	1/4" G
100/4"	97	51	169	100	139	187	231	115	557	15	C100/115	1/4" G
125/5"	117	57	169	100	150	223	271	140	644	21	C125/143	1/4" G
150/6"	140	57	197	100	165	237	296	140	698	27	C125/168	1/4" G
200/8"	184	70	247	122	203	309	358	175	870	46	C160/220	1/4" G
250/10"	230	70	298	122	233	345	428	220	1006	70	C200/270	3/8" G
300/12"	275	76	349	122	273	390	478	220	1141	89	C200/320	3/8" G
350/14"	305	76	391	193	312	459	549	277	1320	135	C250/375	3/8" G
400/16"	351,6	89	439	193	347	478	599	277	1424	162	C250/425	3/8" G
450/18"	390	89	483	197	415	552	680	382	1647	212	C300/475	1/2" G
500/20"	435	114	542	197	450	611	730	382	1791	290	C300/525	1/2" G
600/24"	522	114	637	197	501	697	830	382	2028	375	C300/625	1/2" G
750/30"	670	117	842	320	624	940	985	444	2549	645	C350/730	3/4" G
900/36"	810	117	970	320	775	1100	1202	515	3077	780	C400/930	3/4" G

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



**ELECTRIC ACTUATOR**

- Consists of:
  - Electric actuator
  - Rising stem
  - Motor support yoke flange 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 /2" to DN 900/36"
- Wide range of types and marks available to meet customer's needs.
- Option:
  - Non rising stem





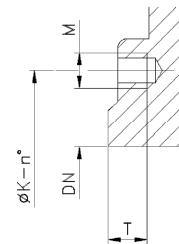
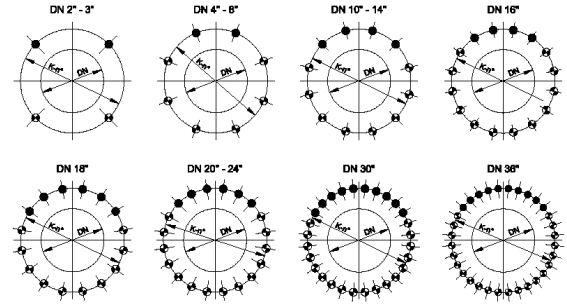
DN <sub>(mm/″)</sub>	N	A	B	C	D	E	F	ØG	H	I	J	L	M	Stem Ø x pitch	Torque (Nm)
50/2″	50	48	124	100	98	136	377	160	454	265	249	62	238	20 x 4	10
80/3″	80	51	149	100	119	162	424	160	501	265	249	62	238	20 x 4	10
100/4″	97	51	169	100	139	187	469	160	546	265	249	62	238	20 x 4	10
125/5″	117	57	169	100	150	223	516	160	593	265	249	62	238	20 x 4	15
150/6″	140	57	197	100	165	237	545	160	1122	265	249	62	238	20 x 4	20
200/8″	184	70	247	122	203	309	667	160	1255	265	249	62	238	24 x 5	30
250/10″	230	70	298	122	233	345	733	160	1321	265	249	62	238	24 x 5	45
300/12″	275	76	349	122	273	390	793	200	1381	283	254	65	248	24 x 5	70
350/14″	305	76	391	193	312	433	875	200	1463	283	254	65	248	36 x 6	110
400/16″	351,6	89	439	193	347	478	955	315	1543	389	336	91	286	36 x 6	160
450/18″	390	89	483	270	415	552	1142	315	1870	389	336	91	286	36 x 6	190
500/20″	435	114	542	270	450	611	1222	400	1950	389	339	91	286	36 x 6	270
600/24″	522	114	637	270	501	697	1444	400	2172	389	339	91	286	40 x 7	450
750/30″	670	117	842	320	624	883	1779	500	2832	430	365	117	303	50 x 8	550
900/36″	810	117	970	320	779	1046	2035	500	3080	430	365	117	303	60 x 9	850



\* For sizes 12" and above, Torque figures calculated based on pressure rate for EX valve model.

**FLANGE AND BOLTING DETAILS**



**ANSI B16.5 / B16.47, 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"	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 - 22



-  BLIND TAPPED HOLES
-  TAPPED THROUGH

**EN 1092-2 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	6 - 10
400	515	16	M-24	15	4 - 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

