

MODEL**ET****SERIES 20**

HEAVY DUTY KNIFE GATE VALVE

The **ET (SER.20)** 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
- etc.
- Chemical plants
- Wastewater
- Food and Beverage

Sizes: DN 2"/50mm to DN 36"/900mm (larger diameters on request)

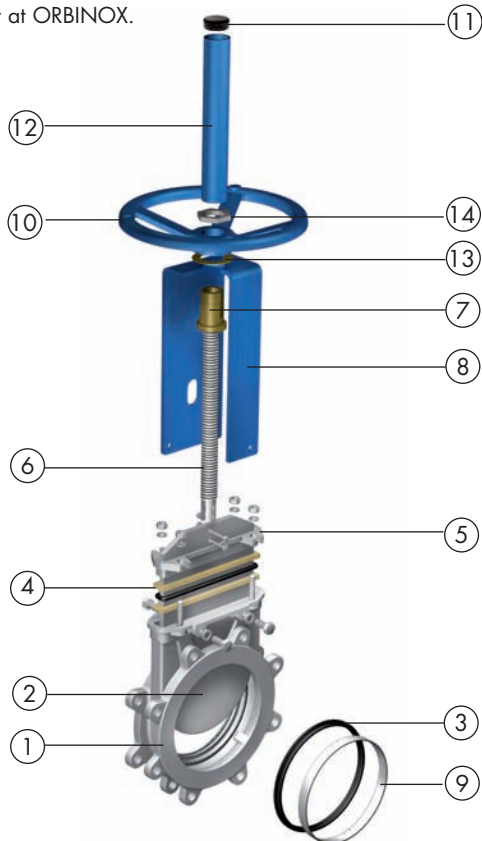
Working pressure: DN 2"/50mm to DN 24"/600mm: 150 psi / (10 kg/cm²)
 DN 30"/750mm: 100 psi / (7 kg/cm²)
 DN 36"/900mm: 100 psi / (7 kg/cm²)

Standard flange connection: DIN PN 10 and ANSI B16.5 (class 150)
 Others on request

Directives: DIR 2006/42/EC (MACHINES)
 DIR 97/23/EC (PED) Fluid: Group 1(b), 2 (Cat. I, mod. A)
 DIR 94/9/EC (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 or EPDM
4- Packing	PTFE Impreg. Synth. Fiber
5- Gland Follower	CF8M
6- Stem	AISI 430
7- Stem Nut	Brass
8- Yoke	Carbon Steel - Epoxy Coated
9- Seat Retainer Ring	AISI 316
10- Handwheel	$\varnothing \leq 12,20"/310\text{mm}$: ductile iron / $\varnothing \geq 14"/410\text{mm}$: GG25
11- Cap	Plastic
12- Stem Protector	Carbon Steel - Epoxy Coated
13- Thrust Washer	Brass
14- Nut	Zinc Plated Carbon Steel



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DESIGN FEATURES

BODY:

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 according to MSS-SP-81 and Tappi TIS 405-8.
Internal design avoids any build up of solids that would prevent valve from closing.

GATE:

Standard AISI 316 stainless steel gate.
Gates polished and lapped for a greater seal between the gate with both packing and seat.
Bottom of the gate edge is machined to a bevel to cut through solids for a tighter seal in the closed position.

SEAT: (resilient)

Unique design that mechanically locks the seat 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:

Standard braided PTFE impregnated fibre with EPDM o-ring for better shut off, 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.

ACTUATORS:

All actuators supplied by **ORBINOX** are interchangeable, and supplied with a standard mounting kit to allow for installation 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.
* IN EUROPE ONLY

OTHER MATERIALS:

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



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OTHER OPTIONS

Bonnet (Fig.1):

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

V-port:

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

Flush ports:

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

Other materials of construction:

Special alloys such as AISI 317, 254SMO, Hastelloys, Titanium,...

Fabricated valves:

Orbinox is equipped for in house fabrication of special valves.
Depending on the design, diameter, pressures, material of construction, etc.

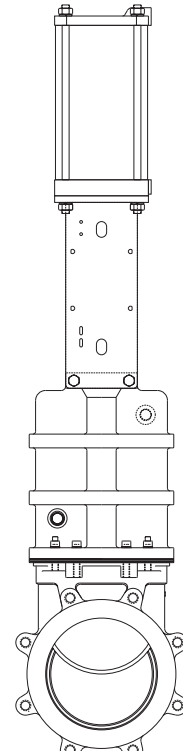
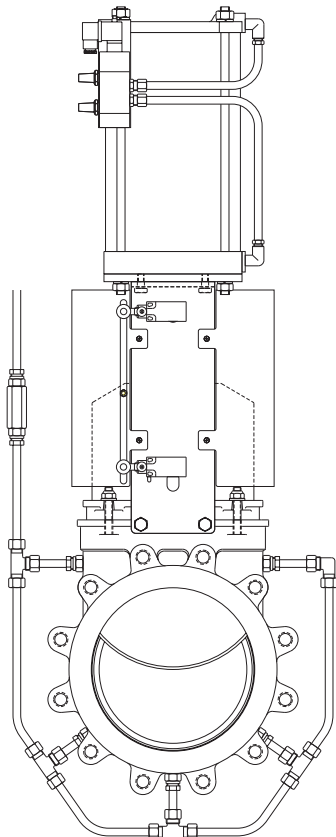


Fig.1



SURFACE TREATMENTS

Valve components can be protected or coated for a longer life expectancy, depending on the application and the service conditions.

At **ORBINOX** we can offer treatments and coatings for the valve components to improve the properties against **abrasion** (Stellite, Polyurethane...), **corrosion** (Halar, Rilsan, Galvanised...) and **adherence** (Polishing, PTFE...).

ATEX



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

- Hand operated **ET (SER.20)** 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 assesment of their own and also of the whole unit valve-actuator to get EC Type Approval to Directive 94/9.

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ACTUATOR TYPES

Manual:

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

Automatic:

Electric
Double Acting Pneumatic
Single Acting Pneumatic
Hydraulic

All actuators supplied by ORBINOX are interchangeable.

FAIL SAFE SYSTEMS

Used on pneumatic actuated valves

SINGLE ACTING / SPRING RETURN

Available from DN 2"/50mm to 8"/DN 200mm

Options:

- Fail open
- Fail closed

SINGLE ACTING / VOLUME TANK

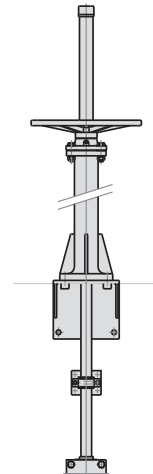
Available for all sizes (DN>8"/200mm)

Options:

- Pneumatic Failsafe
- Pneumatic or Electric Failsafe

ACCESSORIES

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



Wide range of valve extensions available.

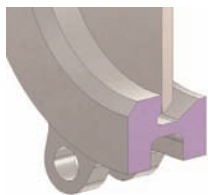
For further information about fail safe systems and valve extensions, please see EX(SER.10)chapter.

We recommend consultation with our technical department.

MODEL**ET****SERIES 20****TEMPERATURE CHART**

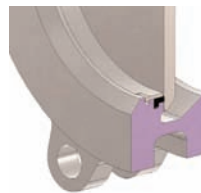
SEAT / SEALS			PACKING			
Material	Max.(F°) Temp.	(°C) Applications	Material	Max. (F°) Temp.	(°C)	pH
Metal/Metal	>482	>250 High temp. Low tightness.	Dry cotton (AS)	122	50	6 - 8
EPDM (E)	248	120 Acids and non mineral oils.	PTFE impregn. synth. fibre (ST)	464	240	2 - 13
Nitrile (N)	248	120 Resistance to petroleum products.	Braided PTFE (TH)	500	260	0 - 14
Viton (V)	392	200 General chemical service. High temperature.	Graphited (GR)	1112	600	0 - 14
Silicone (S)	482	250 Food service. / High temperature.	Ceramic fibre (FC)	2192	1200	—
PTFE (T)	482	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.

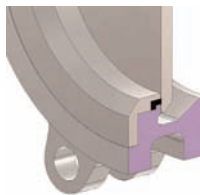
SEAT TYPES**METAL / METAL**

For applications with:

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

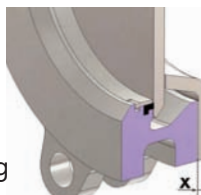
**RESILIENT, TYPE "A"**

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

**TYPE "B" SEAT (resilient)**

For applications with:

- High temperature
- High density media application
- When full tightness is not required
- Replaceable design without dismantling the valve

**DEFLECTION CONE "C"**

- Deflects the media away from any internal exposed parts of the valve such as gate guides, seat, etc.
- Different types of material available such as AISI 316 stainless, CA15, Ni-Hard, etc.

Face to face dimensions increase:

DN 2"/50mm to DN 10"/250mm X = 0.35"/9mm

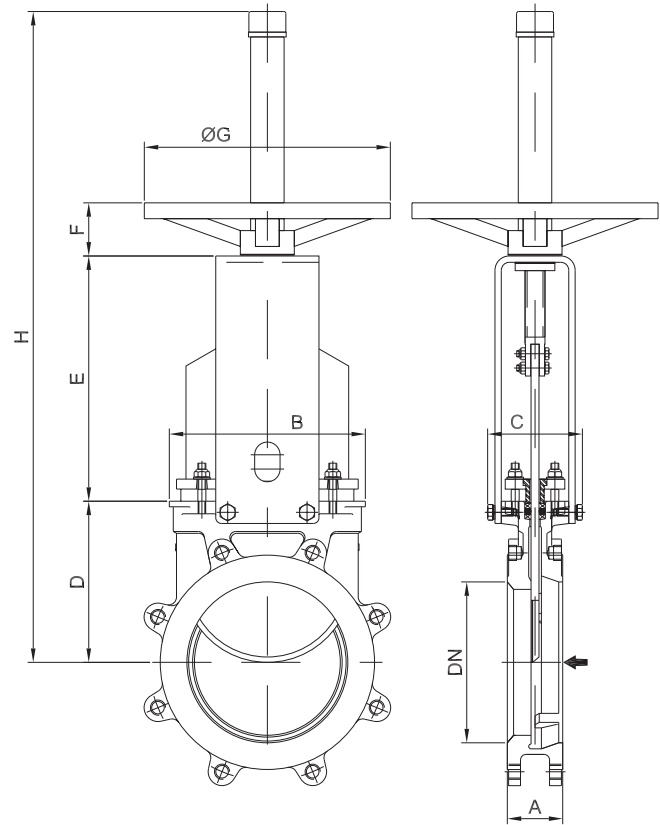
DN 12"/300mm to DN 24"/600mm X = 0.47"/12mm

Larger diameters on request.

MODEL**ET****SERIES 20****HANDWHEEL (rising stem)**

Standard handwheel actuator.

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



DN ("/mm.)	A	B	C	D	E	F	ØG	H	Weight (lbs/kg.)
2"/50	1,89/48	4,88/124	3,94/100	3,85/98	5,35/136	1,85/47	8,86/225	16,53/420	18/8
3"/80	2,00/51	5,87/149	3,94/100	4,68/119	6,38/162	1,85/47	8,86/225	18,50/470	22/10
4"/100	2,00/51	6,65/169	3,94/100	5,47/139	7,36/187	1,85/47	8,86/225	20,43/519	28/12,5
5"/125	2,24/57	6,65/169	3,94/100	5,90/150	8,78/223	1,85/47	8,86/225	24,13/613	35/16
6"/150	2,24/57	7,75/197	3,94/100	6,50/165	9,33/237	1,85/47	8,86/225	25,27/642	44/20
8"/200	2,75/70	9,72/247	4,80/122	7,99/203	12,16/309	2,64/67	12,20/310	32,28/820	70/32
10"/250	2,75/70	11,73/298	4,80/122	9,17/233	13,58/345	2,64/67	12,20/310	38,81/986	103/47
12"/300	2,99/76	13,74/349	4,80/122	10,74/273	15,35/390	2,72/69	16,14/410	42,16/1071	143/65
14"/350	2,99/76	15,39/391	7,60/193	12,28/312	17,04/433	2,60/66	16,14/410	49,01/1245	209/95
16"/400	3,50/89	17,28/439	7,60/193	13,66/347	18,81/478	2,60/66	16,14/410	52,16/1325	268/122
18"/450	3,50/89	19,01/483	7,75/197	16,33/415	21,73/552	2,64/67	21,65/550	59,49/1510	352/160
20"/500	4,49/114	21,33/542	7,75/197	17,71/450	24,05/611	2,64/67	21,65/550	63,66/1617	444/202
24"/600	4,49/114	25,08/637	7,75/197	19,72/501	27,44/697	2,64/67	21,65/550	74,13/1883	638/290

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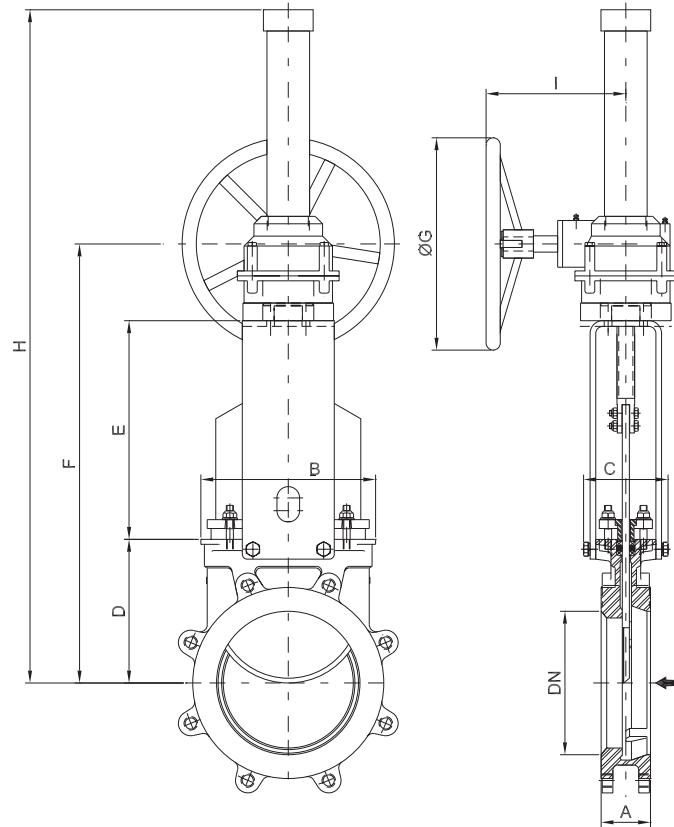
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MODEL**ET****SERIES 20****GEAR**

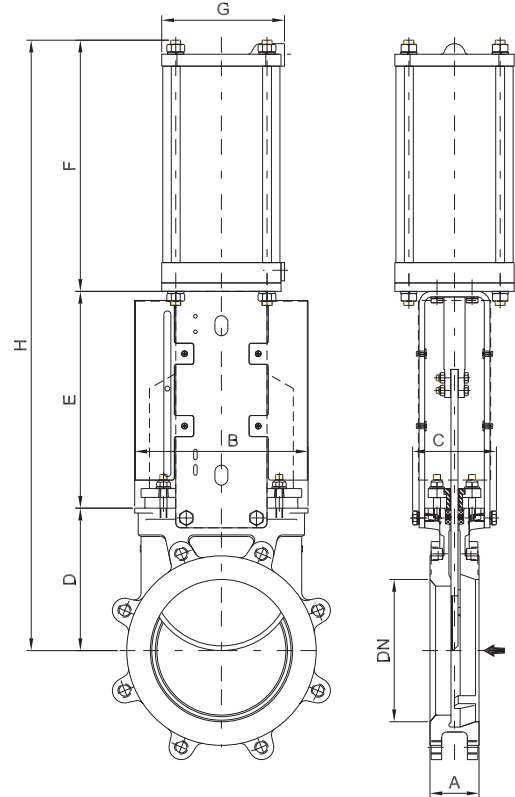
- Recommended for valves larger than DN 14"/350mm and working pressures greater than 55psi / 3.5 kg/cm²
- Consists of:
 - Stem
 - Yoke
 - Bevel Gear Actuator with Handwheel (Standard Ratio 4:1)
- Available from DN 8"/200mm to DN 36"/900mm
- Options:
 - Chainwheel
 - Non-rising Stem
 - Locking Device
 - Extensions



DN ("/mm.)	A	B	C	D	E	F	ØG	H	I
8"/200	2,75/70	9,72/247	4,80/122	7,99/203	12,16/309	22,91/582	12"/300	39,05/992	7,87/200
10"/250	2,75/70	11,73/298	4,80/122	9,17/233	13,58/345	25,51/648	12"/300	41,73/1060	7,87/200
12"/300	2,99/76	13,74/349	4,80/122	10,75/273	15,35/390	28,85/733	12"/300	45/1143	7,87/200
14"/350	2,99/76	15,39/391	7,75/197	12,28/312	16,93/430	31,10/790	18"/450	58,62/1489	10,63/270
16"/400	3,50/89	17,28/439	7,75/197	13,66/347	18,70/475	34,25/870	18"/450	61,81/1570	10,63/270
18"/450	3,50/89	19,01/483	7,91/201	16,34/415	20,39/518	38,74/984	18"/450	63,58/1615	10,63/270
20"/500	4,49/114	21,33/542	7,91/201	17,77/450	21,97/558	42,99/1092	18"/450	71,25/1810	11,02/280
24"/600	4,49/114	25,07/637	7,91/201	19,72/501	26,10/663	49,13/1248	26"/650	73,98/1879	11,41/290
30"/750	4,60/117	33,15/842	12,60/320	24,57/624	34,29/871	62,87/1597	26"/650	104,33/2650	16,26/413
36"/900	4,60/117	38,19/970	12,60/320	30,67/779	41,18/1046	84,05/2135	26"/650	123,42/3135	17,40/442

MODEL**ET****SERIES 20****PNEUMATIC CYLINDER**

- The standard pneumatic actuator (double acting on-off cylinder) consists of:
 - DN 50-250: Aluminum barrels
 - DN ≥ 300: Composite barrels
 - Stainless Steel (AISI 304) piston rod
 - Nitrile coated steel piston
- Available from DN 2"/50mm to DN 36"/900mm
- Supply Pressure: minimum 55psi / 3.5 kg/cm² - maximum 150psi / 10 kg/cm²
Actuator designed with 90psi / 6 kg/cm² air supply
- For valves installed in a horizontal position, we recommend U-type support plates and/or actuator support.
- Options:
 - Hard anodized jacket and covers
 - Over / Undersized cylinder
 - Stainless Steel jacket and covers
 - Manual override
 - Fail safe systems
 - Travel stops
- Instrumentation (on request):
 - Positioners
 - Flow regulators
 - Solenoid valves
 - Air preparation units



DN ("/mm.)	A	B	C	D	E	F	G	H	Weight (lbs/kg.)	Standard Cyl	Connect
2"/50	1,89/48	4,88/124	3,94/100	3,86/98	5,35/136	7,00/178	4,53/115	16,22/412	22/10	C4"-2.44"/(100-62)	1/4" G
3"/80	2,00/51	5,87/149	3,94/100	4,68/119	6,37/162	8,30/211	4,53/115	19,37/492	26/12	C4"-3.74"/(100-95)	1/4" G
4"/100	2,00/51	6,65/169	3,94/100	5,47/139	7,36/187	9,09/231	4,53/115	21,93/557	33/15	C4"-4.52"/(100-115)	1/4" G
5"/125	2,24/57	6,65/169	3,94/100	5,90/150	8,77/223	10,66/271	5,51/140	25,35/644	46/21	C5"-5.62"/(125-143)	1/4" G
6"/150	2,24/57	7,75/197	3,94/100	6,50/165	9,33/237	11,65/296	5,51/140	27,48/698	59/27	C5"-6.61"/(125-168)	1/4" G
8"/200	2,75/70	9,72/247	4,80/122	8,00/203	12,16/309	14,09/358	6,89/175	34,25/870	101/46	C6.30"-8.66"/(160-220)	1/4" G
10"/250	2,75/70	11,73/298	4,80/122	9,17/233	13,58/345	16,85/428	8,66/220	39,60/1006	154/70	C8"-10.62"/(200-270)	3/8" G
12"/300	2,99/76	13,74/349	4,80/122	10,74/273	15,35/390	18,81/478	8,66/220	44,93/1141	195/89	C8"-12.60"/(200-320)	3/8" G
14"/350	2,99/76	15,39/391	7,60/193	12,28/312	17,04/433	21,61/549	10,90/277	50,95/1294	297/135	C10"-14.76"/(250-375)	3/8" G
16"/400	3,50/89	17,28/439	7,60/193	13,66/347	18,81/478	23,58/599	10,90/277	56,06/1424	356/162	C10"-16.73"/(250-425)	3/8" G
18"/450	3,50/89	19,01/483	7,75/197	16,33/415	21,73/552	26,77/680	15,03/382	64,84/1647	466/212	C12"-18.70"/(300-475)	1/2" G
20"/500	4,49/114	21,33/542	7,75/197	17,71/450	24,05/611	28,30/719	15,03/382	70,08/1780	638/290	C12"-20.67"/(300-525)	1/2" G
24"/600	4,49/117	25,07/637	7,75/197	19,72/501	27,44/697	32,24/819	15,03/382	79,41/2017	825/375	C12"-24.60"/(300-625)	1/2" G
30"/750	4,60/117	33,15/842	12,60/320	24,57/624	37,00/940	37,80/960	17,48/444	99,37/2524	1419/645	C14"-28.74"/(350-730)	3/4" G
36"/900	4,60/117	38,19/970	12,60/320	30,51/775	43,30/1100	46,85/1190	20,27/515	120,70/3065	1716/780	C16"-36.61"/(400-930)	3/4" G

Above cylinder bore sizes are ORBINOX standard. For higher or lower working pressure, please consult with our technical department.

* Weights are estimate only and may vary depending on pneumatic cylinder material.

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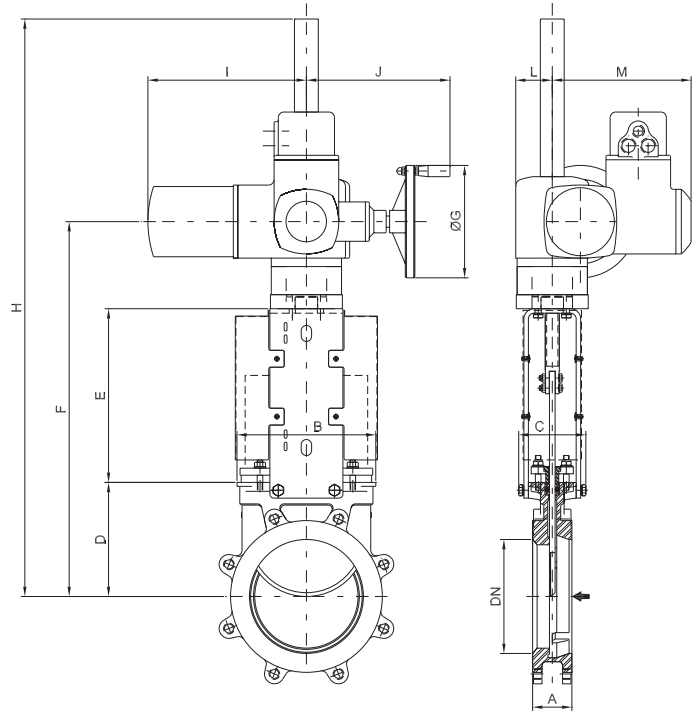
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MODEL**ET****SERIES 20****ELECTRIC ACTUATOR**

- 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 2"/50mm to DN 36"/900mm
- Wide range of types and makes available to meet customer's needs.
- Option:
 - Non rising stem



DN ("/mm.)	A	B	C	D	E	F	ØG	H	I	J	L	M	StemØ x pitch	Torque (ft.LBS/Nm)
2"/50	1,89/48	4,88/124	3,94/100	3,86/98	5,35/136	14,84/377	7,00/160	17,87/454	10,43/265	9,80/249	2,44/62	9,33/237	0.79x0.16/20 x 4	7.4/10
3"/80	2,00/51	5,86/149	3,94/100	4,68/119	6,37/162	16,69/424	7,00/160	19,72/501	10,43/265	9,80/249	2,44/62	9,33/237	0.79x0.16/20 x 4	7.4/10
4"/100	2,00/51	6,65/169	3,94/100	5,47/139	7,36/187	18,46/469	7,00/160	21,49/546	10,43/265	9,80/249	2,44/62	9,33/237	0.79x0.16/20 x 4	7.4/10
5"/125	2,24/51	6,65/169	3,94/100	5,90/150	8,77/223	20,31/516	7,00/160	23,34/593	10,43/265	9,80/249	2,44/62	9,33/237	0.79x0.16/20 x 4	11.1/15
6"/150	2,24/57	7,75/197	3,94/100	6,50/165	9,33/237	21,45/545	7,00/160	44,17/1122	10,43/265	9,80/249	2,44/62	9,33/237	0.79x0.16/20 x 4	14.8/20
8"/200	2,75/70	9,72/247	4,80/122	8,00/203	12,16/309	26,25/667	7,00/160	49,40/1255	10,43/265	9,80/249	2,44/62	9,33/237	0.94x0.2/24 x 5	22.2/30
10"/250	2,75/70	11,73/298	4,80/122	9,17/233	13,58/345	28,85/733	7,00/160	52,00/1321	10,43/265	9,80/249	2,44/62	9,33/237	0.94x0.2/24 x 5	33.3/45
12"/300	2,99/76	13,74/349	4,80/122	10,75/273	15,35/390	31,22/793	8,00/200	54,37/1381	11,10/282	10,07/256	2,55/65	9,72/247	0.94x0.2/24 x 5	51.8/70
14"/350	2,99/76	15,39/391	7,59/193	12,29/312	17,04/433	34,44/875	8,00/200	57,59/1463	11,10/282	10,07/256	2,55/65	9,72/247	1.42x0.24/36 x 6	81.4/110
16"/400	3,50/89	17,28/439	7,59/193	13,66/347	18,82/478	37,60/955	12,40/315	60,75/1543	15,11/384	12,75/324	3,34/85	11,22/285	1.42x0.24/36 x 6	118.4/160
18"/450	3,50/89	19,01/483	17,62/270	16,33/415	21,74/552	44,96/1142	12,40/315	73,63/1870	15,11/384	12,75/324	3,54/90	11,22/285	1.42x0.24/36 x 6	140.6/190
20"/500	4,49/114	21,34/542	17,62/270	17,71/450	24,05/611	48,11/1222	15,75/400	76,77/1950	15,11/384	13,22/336	3,54/90	11,22/285	1.42x0.24/36 x 6	199.8/270
24"/600	4,49/114	25,08/637	17,62/270	19,72/501	27,41/697	56,85/1444	15,75/400	85,51/2172	15,11/384	13,22/336	3,54/90	11,22/285	1.57x0.24/40 x 6	333/450
30"/750	4,60/117	33,14/842	12,60/320	24,57/624	34,76/883	70,03/1779	19,68/500	111,49/2832	17,16/436	13,97/355	6,70/170	13,00/330	1.97x0.31/50 x 8	407/550
36"/900	4,60/117	38,19/970	12,60/320	30,67/779	41,18/1046	80,11/2035	19,68/500	121,26/3080	20,07/510	13,97/355	7,67/195	13,00/330	1.97x0.31/50 x 8	592/800

Torque figures are calculated according to Orbinox standard. For higher or lower pressures, please consult our technical department.

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ET(SER.20)-9

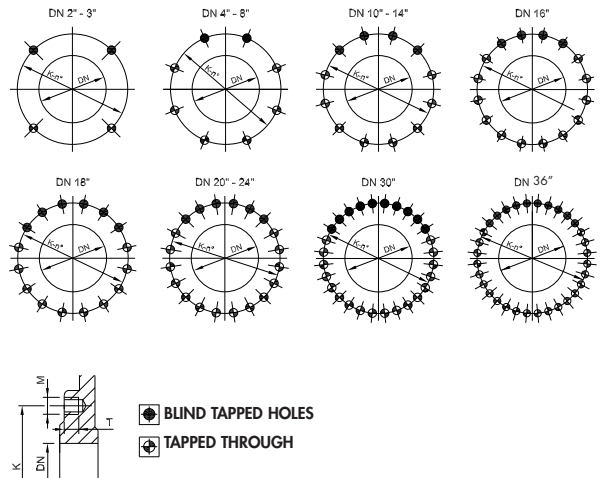
Reserves the right to change specifications without notice

ORBINOX CANADA, ORBINOX USA, ORBINOX BRAZIL, ORBINOX SPAIN, ORBINOX UK, ORBINOX FRANCE, ORBINOX GERMANY, ORBINOX INDIA, ORBINOX CHINA, ORBINOX S.E.A.

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MODEL**ET****SERIES 20****FLANGE AND BOLTING DETAILS****ANSI B16.5, class 150**

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

**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	6 - 10
450	565	20	M-24	15	6 - 10
500	620	20	M-24	22	6 - 14
600	725	20	M-27	22	6 - 14
900	1050	28	M-30	32	10 - 18

