

**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
- Chemical plants
- Wastewater treatment plants
- Food and Beverage
- Etc.

### 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/cm <sup>2</sup> )
DN 30"/750mm	100 psi / (7 kg/cm <sup>2</sup> )
DN 36"/900mm	100 psi / (7 kg/cm <sup>2</sup> )

### Standard flange connection:

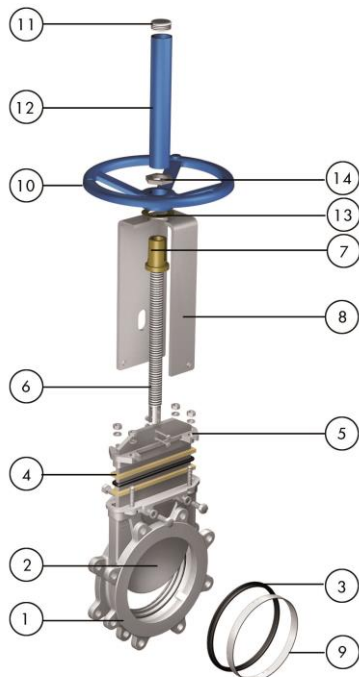
DIN PN 10 and ANSI B16.5 (class 150)  
Other flange connections available on request

### Directives:

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



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. Fibre with an EPDM O-Ring
5- Gland Follower	CF8M
6- Stem	Stainless Steel
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

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## 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 a 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.

\*ONLY IN EUROPE



## OTHER OPTIONS

### Bonnet (Fig. 1):

Assures tight seal 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).

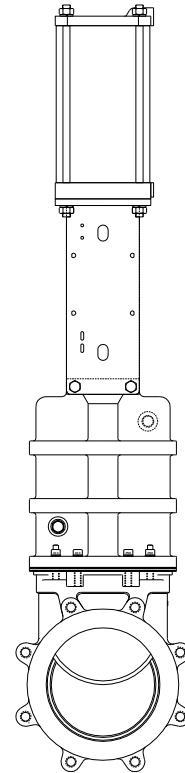


Fig.1

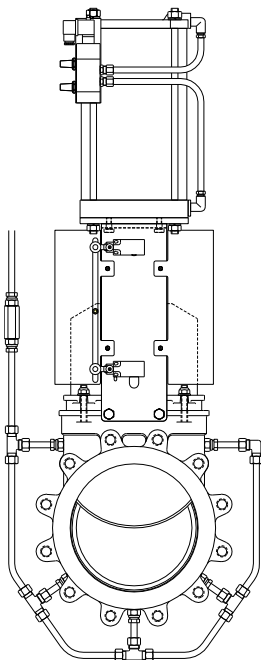


Fig.2

## 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...).

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## 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

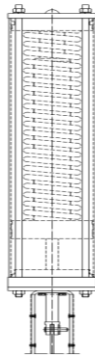
All actuators supplied by ORBINOX are interchangeable.

## FAIL SAFE SYSTEMS

Used on pneumatic actuated valves

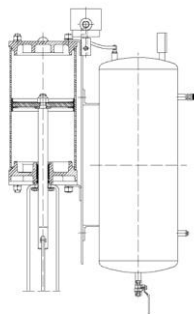
### SINGLE ACTING (SPRING RETURN)

- Available from  
DN 2"/50mm to DN 12"/300mm
- Supply pressure:
  - min. 75 psi / (5 kg/cm<sup>2</sup>)
  - max. 150 psi / (10 kg/cm<sup>2</sup>)
- Options:
  - Pneumatic or electric fail open
  - Pneumatic or electric fail close
  - Other options on request



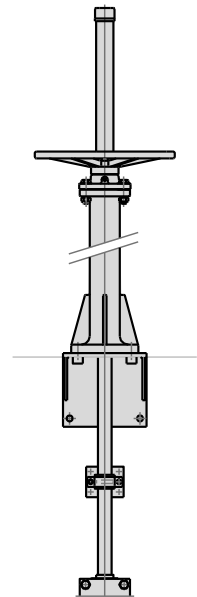
### DOUBLE ACTING WITH AIR TANK

- Available for all valve sizes
- Supply pressure:
  - min. 50 psi / (3.5 kg/cm<sup>2</sup>)
  - max. 150 psi / (10 kg/cm<sup>2</sup>)
- 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(SER. 10) catalog.*

We recommend to contact with our technical department.

**MODEL****ET****SERIES 20****TEMPERATURE CHART****SEAT / SEALS**

Material	Max.T.(F°)	(°C)	Applications
Metal/Metal	>482	>250	High temp. Low tightness.
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.
VMQ (S)	482	250	Food service. / High temp.
PTFE (T)	482	250	Corrosion resistance.

**PACKING**

Material	Max.T. (F°)	(°C)	pH
PTFE impregn. synth. fibre (ST)	482	250	2-13
Braided PTFE (TH)	500	260	0-14
Graphited (GR)	1112	600	0-14
Ceramic fibre (FC)	2192	1200	--

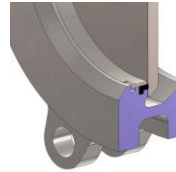
NOTE: all types include an elastomere O-ring (same material as seal), excluding TH, GR and FC.

More details and other materials under request

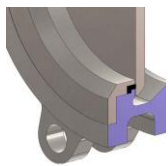
**SEAT TYPES****METAL / METAL**

For applications with:

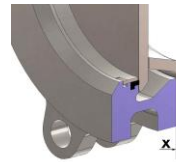
- High temperature
- High density media application
- When full tightness is not required

**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.

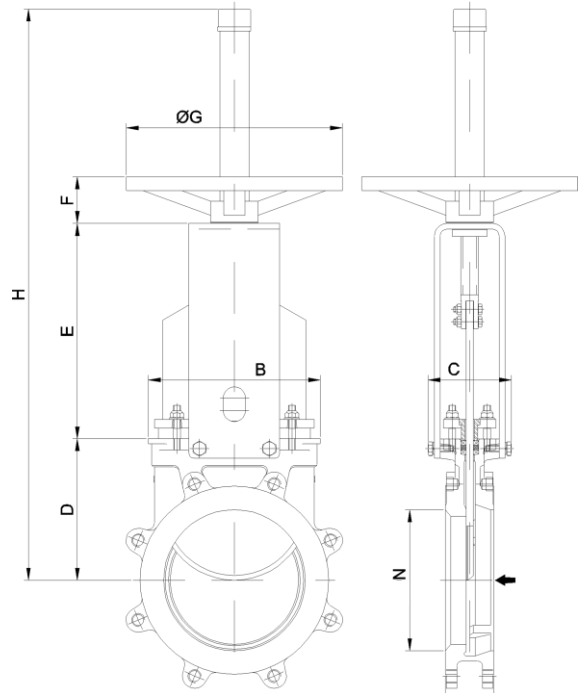
**DEFLECTION CONE "C"**

- Deflects the media away from any valve internal exposed parts (gate, seat,...)
- Material: AISI 316 (1.4401), CA15, Ni-Hard, PU, etc.
- Face-to-face dimension increases:  
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

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## HANDWHEEL (rising stem)

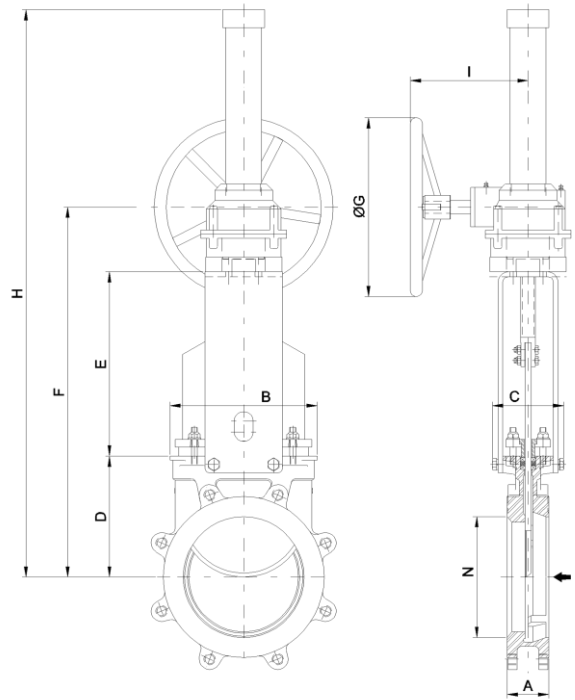
- Standard handwheel actuator.
- Consists of:
  - Handwheel: Epoxy coated Cast Iron
  - Yoke
  - Stem
  - Stem nut
  - Stem protector
- Available from DN 2"/50mm to DN 24"/600mm
- Options (on request):
  - Chainwheel
  - Non-rising stem
  - Locking Device
  - Extensions



DN(" /mm)	N	A	B	C	D	E	F	ØG	H	Weight (lbs/kg.)
2"/50	1,96/50	1,89/48	4,88/124	4/100	3,85/98	5,35/139	1,85/47	8,86/225	16,53/420	18/8
3"/80	3,14/80	2/51	5,87/149	4/100	4,68/119	6,38/162	1,85/47	8,86/225	18,50/470	22/10
4"/100	3,81/97	2/51	6,65/169	4/100	5,47/139	7,36/187	1,85/47	8,86/225	20,43/519	28/12,5
5"/125	4,6/117	2,24/57	6,65/169	4/100	5,90/150	8,78/223	1,85/47	8,86/225	24,13/613	35/16
6"/150	5,51/140	2,24/57	7,75/197	4/100	6,50/165	9,33/237	1,85/47	8,86/225	25,27/642	44/20
8"/200	7,24/184	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	9,05/230	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	10,82/275	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	12/305	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	13,84/351,6	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	15,35/390	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	17,12/435	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	20,55/522	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

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

- Recommended for valves larger than DN14"/350mm and working pressures greater than 50 psi/(3.5 kg/cm<sup>2</sup>)
- 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

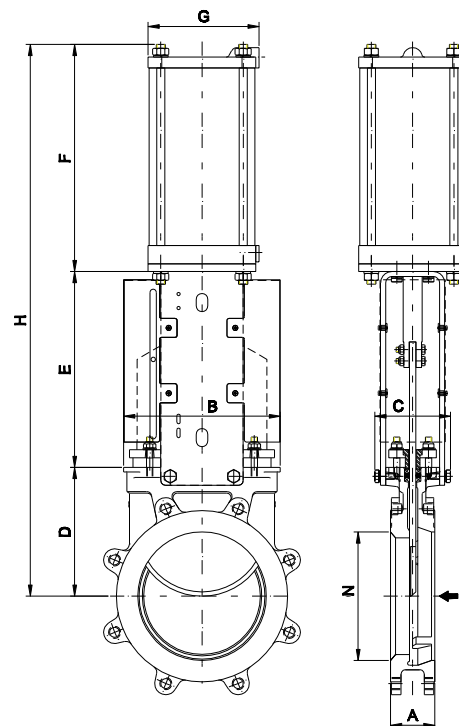


DN("/mm)	N	A	B	C	D	E	F	ØG	H	I
8"/200	7,24/184	2,75/70	9,72/247	4,80/122	7,99/203	12,16/309	22,91/582	12/300	39,05/992	7,87/200
10"/250	9,05/230	2,75/70	11,73/298	4,80/122	9,17/233	13,58/345	25,51/648	12/300	41,73/1060	7,87/200
12"/300	10,82/275	2,99/76	13,74/349	4,80/122	10,74/273	15,35/390	28,85/733	12/300	45/1143	7,87/200
14"/350	12/305	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	13,84/351,6	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	15,35/390	3,50/89	19,01/483	7,91/201	16,33/415	20,39/518	38,74/984	18/450	63,58/1615	10,63/270
20"/500	17,12/435	4,49/114	21,33/542	7,91/201	17,71/450	21,97/558	42,99/1092	18/450	71,25/1810	11,02/280
24"/600	20,55/522	4,49/114	25,08/637	7,91/201	19,72/501	26,10/663	49,13/1248	26/650	73,98/1879	11,41/290
30"/750	26,37/670	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	31,88/810	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:
  - $\varnothing \leq 12''/300\text{mm}$ : Aluminum barrels
  - $\varnothing \geq 14''/350\text{mm}$ : Composite barrels
  - Aluminum end covers
  - Stainless Steel (AISI 304) piston rod
  - Nitrile coated steel piston
- Available from DN 2''/50mm to DN 36''/900mm
- Supply Pressure: min. 50 psi/(3.5 kg/cm<sup>2</sup>) - max. 145 psi/(10 kg/cm<sup>2</sup>)  
Actuator designed with 85psi/(6 kg/cm<sup>2</sup>) 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
  - Travel stops
- Instrumentation (on request):
  - Positioners
  - Flow regulators
  - Solenoid valves
  - Air preparation units

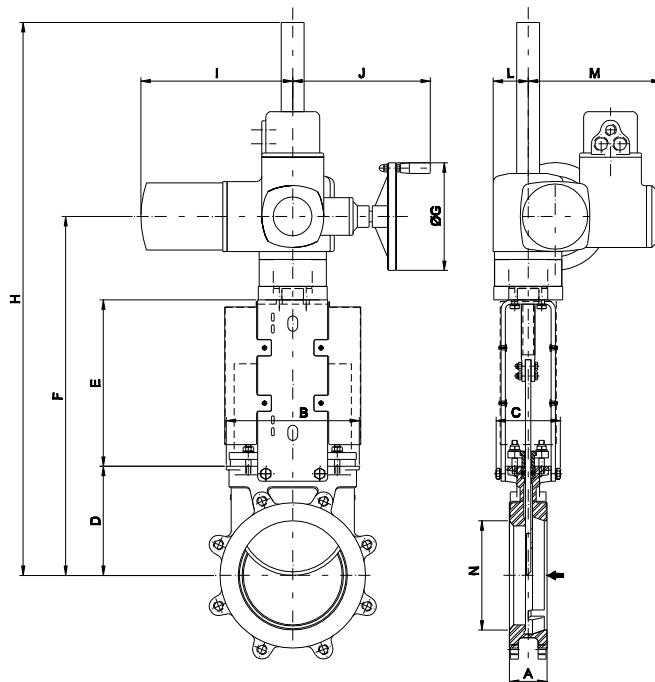


DN(″/mm)	N	A	B	C	D	E	F	G	H	Weight (lbs./kg.)	Standard Cyl.	Connect.
2″/50	1,96/50	1,89/48	4,88/124	4/100	3,85/98	5,35/139	7,00/178	4,53/115	16,22/412	22/10	C4″-2.44″/(100-62)	¼″ G
3″/80	3,14/80	2/51	5,87/149	4/100	4,68/119	6,38/162	8,30/211	4,53/115	19,37/492	26/12	C4″-3.74″/(100-95)	¼″ G
4″/100	3,81/97	2/51	6,65/169	4/100	5,47/139	7,36/187	9,09/231	4,53/115	21,93/557	33/15	C4″-4.52″/(100-115)	¼″ G
5″/125	4,6/117	2,24/57	6,65/169	4/100	5,90/150	8,78/223	10,66/271	5,51/140	25,35/644	46/21	C5″-5.52″/(125-143)	¼″ G
6″/150	5,51/140	2,24/57	7,75/197	4/100	6,50/165	9,33/237	11,65/296	5,51/140	27,48/698	59/27	C5″-6.61″/(125-168)	¼″ G
8″/200	7,24/184	2,75/70	9,72/247	4,80/122	7,99/203	12,16/309	14,09/358	6,89/175	34,25/870	101/46	C6.30″-8.66″/(160-220)	¼″ G
10″/250	9,05/230	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	10,82/275	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	12/305	2,99/76	15,39/391	7,60/193	12,28/312	18,07/459	21,61/549	10,90/277	51,96/1320	297/135	C10″-14.76″/(250-375)	3/8″ G
16″/400	13,84/351,6	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″-16.78″/(250-425)	3/8″ G
18″/450	15,35/390	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)	½″ G
20″/500	17,12/435	4,49/114	21,33/542	7,75/197	17,71/450	24,05/611	28,74/730	15,03/382	70,51/1791	638/290	C12″-20.67″/(300-525)	½″ G
24″/600	20,55/522	4,49/114	25,08/637	7,75/197	19,72/501	27,44/697	32,68/830	15,03/382	79,84/2028	825/375	C12″-24.60″/(300-625)	½″ G
30″/750	26,37/670	4,60/117	33,15/842	12,60/320	24,57/624	37,00/940	38,77/985	17,48/444	100,35/2549	1419/645	C14″-30.70″/(350-780)	¾″ G
36″/900	31,88/810	4,60/117	38,19/970	12,60/320	30,51/775	43,30/1100	47,32/1202	20,27/515	121,14/3077	1716/780	C16″-36.61″/(400-930)	¾″ G





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

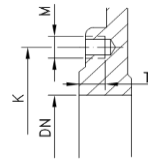
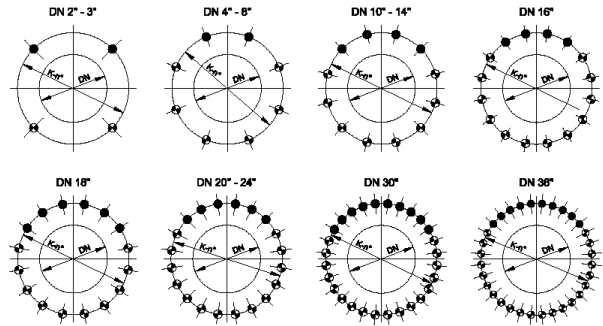
- Consists of:
  - Electric actuator
  - Rising stem
  - Motor support yoke flange acc. to ISO 5210 / DIN 3338
- The standard electric motor is equipped with:
  - Manual emergency operation
  - Limit switches (open/closed)
  - Torque switches
- Available from DN 2"/50mm to DN 48"/1200mm
- Wide range of types and marks available to meet customer's needs.
- Option:
  - Non rising stem





DN ("/mm)	N	A	B	C	D	E	F	ØG	H	I	J	L	M	Stem Ø x pitch	Torque (ft.LBS/Nm)
2"/50	1,96/50	1,89/48	4,88/124	4/100	3,86/98	5,35/136	14,84/377	6,30/160	17,87/454	10,43/265	9,80/249	2,44/62	9,37/238	0.79 x 0.16/20 x 4	7.4/10
3"/80	3,14/80	2/51	5,87/149	4/100	4,68/119	6,38/162	16,69/424	6,30/160	19,72/501	10,43/265	9,80/249	2,44/62	9,37/238	0.79 x 0.16/20 x 4	7.4/10
4"/100	3,81/97	2/51	6,65/169	4/100	5,47/139	7,36/187	18,46/469	6,30/160	21,49/546	10,43/265	9,80/249	2,44/62	9,37/238	0.79 x 0.16/20 x 4	7.4/10
5"/125	4,6/117	2,24/57	6,65/169	4/100	5,90/150	8,78/223	20,31/516	6,30/160	23,34/593	10,43/265	9,80/249	2,44/62	9,37/238	0.79 x 0.16/20 x 4	11.1/15
6"/150	5,51/140	2,24/57	7,75/197	4/100	6,50/165	9,33/237	21,45/545	6,30/160	44,17/1122	10,43/265	9,80/249	2,44/62	9,37/238	0.79 x 0.16/20 x 4	14.8/20
8"/200	7,24/184	2,75/70	9,72/247	4,80/122	7,99/203	12,16/309	26,25/667	6,30/160	49,40/1255	10,43/265	9,80/249	2,44/62	9,37/238	0.98 x 0.2/25 x 5	22.2/30
10"/250	9,05/230	2,75/70	11,73/298	4,80/122	9,17/233	13,58/345	28,85/733	6,30/160	52,00/1321	10,43/265	9,80/249	2,44/62	9,37/238	0.98 x 0.2/25 x 5	33.3/45
12"/300	10,82/275	2,99/76	13,74/349	4,80/122	10,74/273	15,35/390	31,22/793	7,87/200	54,37/1381	11,14/283	10/254	2,55/65	9,76/248	0.98 x 0.2/25 x 5	51.8/70
14"/350	12/305	2,99/76	15,39/391	7,60/193	12,28/312	17,04/433	34,44/875	7,87/200	57,59/1463	11,14/283	10/254	2,55/65	9,76/248	1.38 x 0.24/35 x 6	81.4/110
16"/400	13,84/351,6	3,50/89	17,28/439	7,60/193	13,66/347	18,81/478	37,60/955	12,40/315	60,75/1543	15,31/389	13,22/336	3,58/91	11,25/286	1.38 x 0.24/35 x 6	118.4/160
18"/450	15,35/390	3,50/89	19,01/483	7,75/197	16,33/415	21,73/552	44,96/1142	12,40/315	73,63/1870	15,31/389	13,22/336	3,58/91	11,25/286	1.38 x 0.24/35 x 6	140.6/190
20"/500	17,12/435	4,49/114	21,33/542	7,75/197	17,71/450	24,05/611	48,11/1222	15,74/400	76,77/1950	15,31/389	13,34/339	3,58/91	11,25/286	1.38 x 0.24/35 x 6	199.8/270
24"/600	20,55/522	4,49/114	25,08/637	7,75/197	19,72/501	27,44/697	56,85/1444	15,74/400	85,51/2172	15,31/389	13,34/339	3,58/91	11,25/286	1.57 x 0.27/40 x 7	333/450
30"/750	26,37/670	4,60/117	33,15/842	12,60/320	24,57/624	34,76/883	70,03/1779	19,68/500	111,49/2832	16,92/430	14,37/365	4,61/117	11,93/303	1.97 x 0.31/50 x 8	407/550
36"/900	31,88/810	4,60/117	38,19/970	12,60/320	30,67/779	41,18/1046	80,11/2035	19,68/500	121,26/3080	16,92/430	14,37/365	4,61/117	11,93/303	2.36 x 0.35/60 x 9	627/850



**MODEL****ET****SERIES 20****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 1/4"	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	6 - 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

