

MODEL**VG**

RUBBER SLEEVE KNIFE GATE VALVE

The **VG** model knife gate is a bi-directional wafer valve equipped with two metallic covered rubber sleeves designed for use in the handling of abrasive slurries, mainly in industries such as:

- Mining
- Chemical plants
- etc.
- Power plants
- Wastewater treatment

Sizes: DN 50 to DN 900 (larger DN on request)

Working pressure: DN 50/400 10 bar
 DN 450/600 6 bar
 Higher on request

Standard Flange connection: DIN PN 10 and ANSI B16.5 (class 150)

Other: (On request)

DIN PN 6

BS "D" and "E"

DIN PN 16

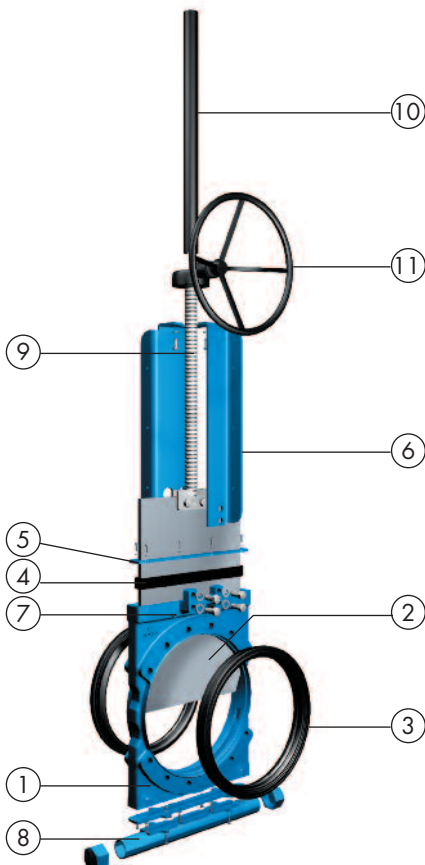
ANSI 125

DIN PN 25

Others on request

Directives: DIR 98/37/CE (MACHINES)
 DIR 97/23/CE (PED) Fluid: Group 1(b), 2 (Cat. I, mod. A)
 DIR 94/9/CE (ATEX) Please contact Orbinox for information and availability of categories and zones.

All ORBINOX valves are tested prior to shipping.



STANDARD PARTS LIST

| Part : | Materials: |
|-------------------------------|----------------------------------|
| 1- Body | Ductile iron GJS400 |
| 2- Gate | AISI 304 (1.4301) |
| 3- Sleeves | Natural rubber |
| 4- Packing | EPDM |
| 5- Gland Follower | A570 GR.40 (1.0044) Epoxy coated |
| 6- Cover | A570 GR.40 (1.0044) Epoxy coated |
| 7- Grease Nipple | Zinc coated carbon-steel |
| 8- Splash guard (optional) | A570 GR.40 (1.0044) Epoxy coated |
| 9- Stem | AISI 430 (1.4016) |
| 10- Stem protector | A570 GR.40 (1.0044) EPOXY-coated |
| 11- Bevel Gear | |

DESIGN FEATURES

BODY

Wafer style cast **monoblock**, for installation between flanges, with reinforced ribs in larger diameters, providing the body with extra strength. Internal body design allows the gate to be fully guided. It is equipped with two machined lateral mouths where the sleeves fit perfectly. The grease nipples allow the gate to be lubricated, thus enhancing its capacity to slide between the sleeves. Additionally, the design allows draining through the lower part, where a cover or a bottom splash guard can be installed.

GATE

Made of **stainless steel**, polished on both sides, and of rectangular shape, the gate is machined to an edge. As well as reducing friction and damage to the seats, this design allows it to cut perfectly through the fluid. The material can be changed upon request, thus allowing greater working pressures.

RUBBER SLEEVES

The seat is made up of two highly resistant, long-lasting sleeves, made of natural rubber with a metallic core. Its highly research and patented hollow design allows for maximum flexibility on passing through the gate, minimising the effort necessary for its operation.

The two sleeves are in permanent contact with each other, so that there is total flow. There are no seat cavities which may cause build-up, and the fluid does not come into contact with the metallic parts of the valve. This design allows for easy replacement of damaged sleeves. (See available materials on page VG-5).

PACKING:

Made of EPDM, it eliminates possible leaks to the exterior as well as minimising the maintenance needs of traditional packings. In combination with the grease nipples, it guarantees an optimal functioning of the gate.

STEM:

Made of **stainless steel**, which provides it with a high resistance to corrosion and a long life. Besides making the valve safe, the **stem protector** also protects it against dirt.

EXCHANGEABILITY OF THE ACTUATORS:

All the actuators are easily interchangeable with one another.

ACTUATOR SUPPORT or YOKE:

Made of steel (stainless steel available on request) and EPOXY coated. Its robust design provides it with great rigidity, withstanding the most adverse operating conditions. Reinforced design is standard starting from DN 200.

EPOXY COATING:

The epoxy coating on all **ORBINOX** cast iron and carbon steel valve bodies and components is applied by means of an electrolytic process which provides the valves with a high resistance to corrosion and an excellent surface finish.

The **ORBINOX** standard colour is RAL-5015 blue.

GATE SAFETY PROTECTION:

In accordance with **EU Safety Standards (CE certified)**, **ORBINOX** automated valves are provided with metallic gate guards along the gate, thus preventing any body or object from being caught or dragged accidentally.



OTHER OPTIONS

Bottom splash guard (Fig.1):

An accessory for this valve, the splash guard, is designed to be installed on the base of the valve, where solids evacuated through the gate can be collected periodically or continuously while closing.

Open-closed lockout system (Fig.2):

The standard valve is ready to install a lockout pin for emergency or maintenance situations.

Other metallic materials:

Other materials may be used, such as carbon-steel, stainless steels (AISI 316, 317, 2.205...), special alloys (254SMO©, Hastelloys...) and Titanium.

Fabricated valves:

ORBINOX designs, manufactures and supplies special fabricated valves for special process conditions (great sizes and/or high pressures).



(Fig.1)



(Fig.2)

We recommend consultation with our technical department.

ACTUATOR TYPES

Manual:

Handwheel with rising stem
 Bevel Gear
 Others (on request)



Automatic:

Pneumatic cylinder
 Hydraulic cylinder
 Electric actuator



One of the design characteristics of ORBINOX S.A. valves is that **all actuators are interchangeable** with one another.

FAIL SAFE SYSTEMS

SINGLE ACTING FAIL-SAFE SYSTEMS

Used on pneumatic actuated valves, they allow the valve to remain in a predetermined position in case of failure (open/closed).

SINGLE ACTING / SPRING RETURN

Available from DN 50 to DN 200

Supply pressure: min. 6 kg/cm²

Options:

- Air opens (spring closes)
- Air closes (spring opens)

From DN 250 upwards an air reservoir is used.

SINGLE ACTING / VOLUME TANK

Available for all diameters.

- 1.- Pneumatic Fail-safe
- 2.- Pneumatic or Electric Fail-safe

GREAT VARIETY OF ACCESSORIES

- Open-closed lockout
 - Mechanical stops
 - Manual override actuators
 - Solenoid valves
 - Positioners
 - Limit switches
 - Proximity switches
 - Floor stands
 - ...
- to meet all needs

For further information, please see corresponding EX chapter.

We recommend consultation with our technical department.

TEMPERATURE CHART

| SEAT / SLEEVES | | | | PACKINGS | |
|----------------|------------|-------------|--------------------------------|----------|-----------------|
| Material | Min.T.(°C) | T.Max. (°C) | Applications | Material | Max. Temp. (°C) |
| Natural rubber | -30 | 75 | General | EPDM | 120 |
| EPDM | -30 | 120 | Acids and non mineral oils | | |
| Neoprene | -30 | 90 | Oils and solvents | | |
| Chlorobutyl | -30 | 125 | High temperatures | | |
| Nitrile | -30 | 120 | Hydrocarbons, oils and greases | | |

All of them are reinforced with a metallic core.
Other temperatures and applications consult with our technical department.

SEAT

RUBBER SLEEVES

The closure of the VG valve is achieved by its two characteristic high resistance elastomer sleeves, which improve the tight seal both in the adjustment with the flanges and in the closure. These sleeves have a metallic core which provides them with a great resistance to demanding working conditions and pressures.



OPEN



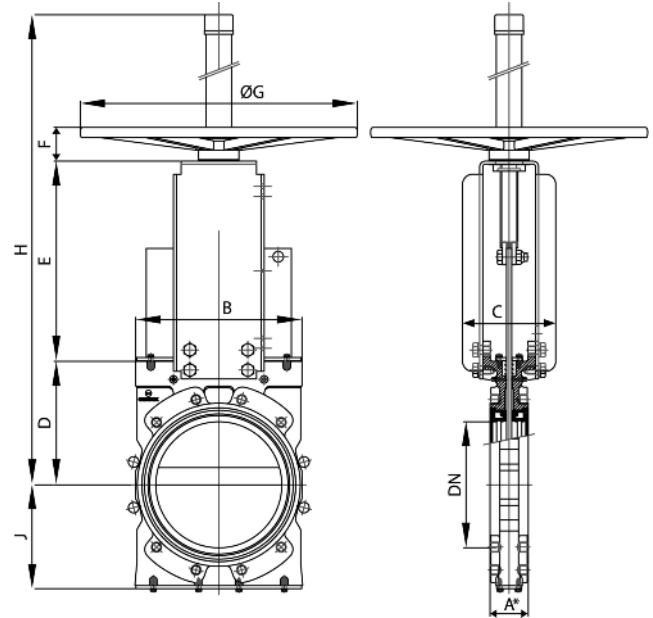
INTERMEDIATE



CLOSED

HANDWHEEL (rising stem)

- Consists of:
 - Cast iron handwheel
 - Stem
 - Stem nut
- It is also equipped with a stem protector.
- Available from DN 50 to DN 600
 - Greater sizes on request
- Options (on request):
 - Open-closed lockout
 - PVC bellow
 - Extensions and floor stands
 - Face to face according MSS-SP81



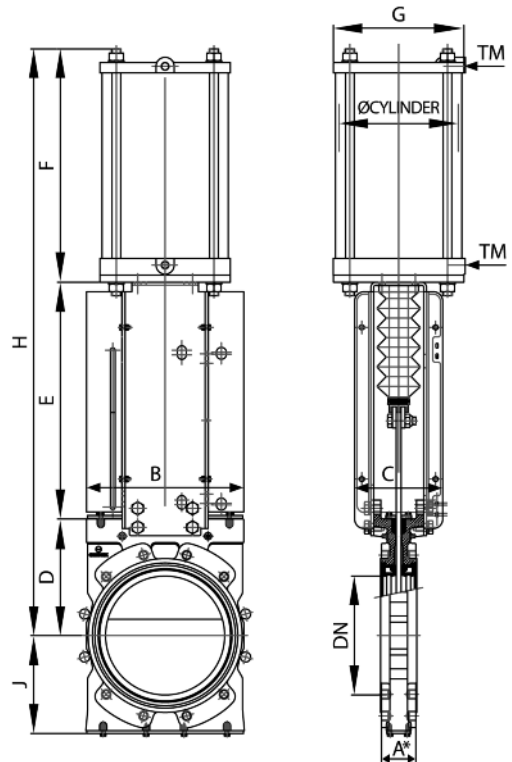
Note: use of the bevel gear is recommended for valve sizes greater than DN 200. Direct handwheel actuation is insufficient in these sizes for the maximum catalogue pressure.

| DN | A1* | A2* | B | C | D | E | F | ØG | H | J |
|-----|------|-----|-----|-----|-----|-----|----|-----|------|-----|
| 50 | 54 | 60 | 140 | 100 | 105 | 145 | 47 | 225 | 440 | 63 |
| 80 | 57 | 63 | 175 | 100 | 124 | 175 | 47 | 225 | 545 | 90 |
| 100 | 57 | 63 | 170 | 100 | 140 | 200 | 67 | 310 | 620 | 100 |
| 125 | 63,5 | 69 | 195 | 100 | 150 | 240 | 67 | 310 | 700 | 123 |
| 150 | 63,5 | 69 | 230 | 100 | 175 | 265 | 67 | 310 | 755 | 130 |
| 200 | 76 | 83 | 280 | 165 | 205 | 325 | 66 | 410 | 935 | 160 |
| 250 | 76 | 83 | 335 | 185 | 245 | 415 | 66 | 550 | 1090 | 200 |
| 300 | 82,5 | 90 | 390 | 266 | 280 | 475 | 66 | 550 | 1260 | 232 |
| 350 | 82,5 | 90 | 440 | 270 | 325 | 555 | 66 | 550 | 1410 | 258 |
| 400 | 95 | 102 | 505 | 270 | 350 | 605 | 74 | 800 | 1677 | 292 |
| 450 | 95,5 | 103 | 560 | 270 | 420 | 680 | 74 | 800 | 1905 | 318 |
| 500 | 121 | 129 | 620 | 270 | 462 | 745 | 74 | 800 | 2020 | 345 |
| 600 | 121 | 129 | 730 | 270 | 510 | 845 | 74 | 800 | 2320 | 400 |

A1*: installed face to face
A2*: minimum required dimension for installation

PNEUMATIC ACTUATOR

- The standard pneumatic actuator (double acting on-off cylinder) consists of:
 - Aluminium jacket and covers
 - Stainless Steel (AISI 304) piston rod
 - Nitrile coated steel piston
 - PVC bellows
- Available from DN 50 to DN 600
- Supply Pressure: 6 kg/cm²
- Reinforced design of support plates is standard starting from DN 200.
- Options (on request):
 - Hard anodized jacket and covers (stainless steel optional)
 - Open-closed lockout
 - Manual override actuator
 - Fail-safe systems
- Instrumentation (on request):
 - Positioners
 - Solenoid valves
 - Flow regulators
 - Air preparation unit



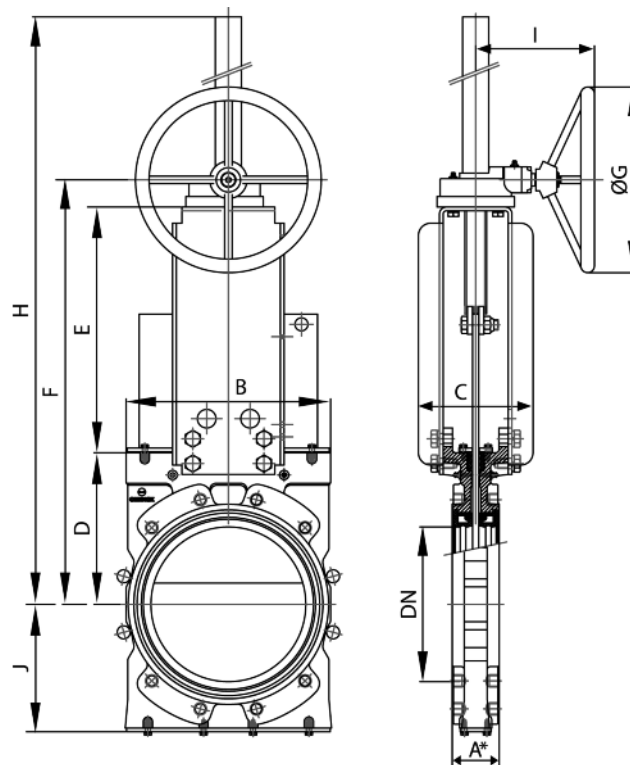
Note: in order to guarantee the correct functioning of the pneumatic cylinder for the catalogue pressures, a supply pressure of 6 bar is required. For lower pressures, we recommend consultation with our technical department.

| DN | ØCYL. | TM (BSP) | A1* | A2* | B | C | D | E | F | G | H | J |
|-----|----------|----------|------|-----|-----|-----|-----|-----|------|-----|------|-----|
| 50 | C100/91 | 1/4" | 54 | 60 | 140 | 100 | 105 | 145 | 220 | 100 | 470 | 63 |
| 80 | C125/121 | 1/4" | 57 | 63 | 175 | 100 | 124 | 175 | 260 | 140 | 559 | 90 |
| 100 | C125/140 | 1/4" | 57 | 63 | 170 | 100 | 140 | 198 | 280 | 140 | 618 | 100 |
| 125 | C160/168 | 1/4" | 63,5 | 69 | 195 | 100 | 150 | 240 | 320 | 175 | 710 | 123 |
| 150 | C160/194 | 1/4" | 63,5 | 69 | 230 | 100 | 175 | 265 | 345 | 175 | 785 | 130 |
| 200 | C200/252 | 3/8" | 76 | 83 | 280 | 165 | 205 | 322 | 420 | 220 | 947 | 160 |
| 250 | C250/317 | 3/8" | 76 | 83 | 335 | 185 | 245 | 415 | 505 | 277 | 1165 | 200 |
| 300 | C300/376 | 1/2" | 82,5 | 90 | 390 | 266 | 280 | 472 | 580 | 382 | 1332 | 232 |
| 350 | C350/440 | 3/4" | 82,5 | 90 | 440 | 270 | 325 | 555 | 710 | 444 | 1590 | 258 |
| 400 | C350/490 | 3/4" | 95 | 102 | 505 | 270 | 350 | 605 | 760 | 444 | 1715 | 292 |
| 450 | C400/542 | 3/4" | 95,5 | 103 | 560 | 270 | 420 | 677 | 830 | 515 | 1927 | 318 |
| 500 | C400/606 | 3/4" | 121 | 129 | 620 | 270 | 462 | 742 | 890 | 515 | 2094 | 345 |
| 600 | C400/712 | 3/4" | 121 | 129 | 730 | 270 | 510 | 843 | 1010 | 515 | 2363 | 400 |

A1*: installed face to face
 A2*: minimum required dimension for installation

BEVEL GEAR

- Recommended for valves larger than DN 200
- Consists of:
 - Stem
 - Yoke
 - Bevel Gear Actuator with Handwheel
- Available from DN 200 to DN 900
- Options: (on request)
 - Chainwheel
 - Open-closed lockout
 - Extensions and floor stands
 - Face to face according MSS-SP81
 - PVC below

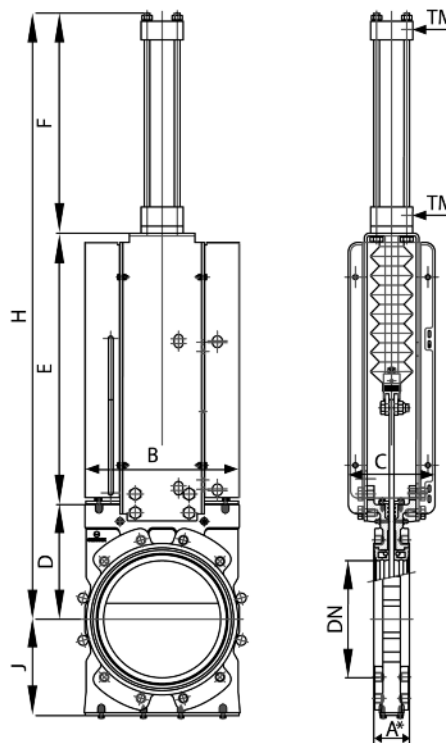


| DN | BEVEL GEAR | A1* | A2* | B | C | D | E | F | Ø G | H | J | I |
|-----|------------|-------|-----|------|-----|-----|------|------|-----|------|-----|-----|
| 200 | RKO.15 | 76 | 83 | 280 | 165 | 205 | 322 | 572 | 300 | 990 | 160 | 200 |
| 250 | RKO.3 | 76 | 83 | 335 | 185 | 245 | 397 | 688 | 300 | 1510 | 200 | 263 |
| 300 | RKO.3 | 82,5 | 90 | 390 | 250 | 280 | 441 | 767 | 450 | 1590 | 232 | 263 |
| 350 | RKO.3 | 82,5 | 90 | 440 | 250 | 325 | 508 | 879 | 450 | 1700 | 258 | 263 |
| 400 | RKO.3 | 95 | 102 | 505 | 270 | 350 | 567 | 963 | 450 | 1780 | 292 | 263 |
| 450 | FL1.6 | 95,5 | 103 | 560 | 270 | 420 | 631 | 1155 | 450 | 2175 | 318 | 263 |
| 500 | FL1.6 | 121 | 129 | 620 | 290 | 462 | 700 | 1265 | 650 | 2305 | 345 | 263 |
| 600 | FL1.6 | 121 | 129 | 730 | 290 | 510 | 805 | 1420 | 650 | 2520 | 400 | 263 |
| 700 | FL1.6 | 181 | 190 | 845 | 320 | 570 | 956 | 1628 | 650 | 2735 | 485 | 288 |
| 750 | FL1.6 | 187 | 195 | 915 | 320 | 600 | 1021 | 1723 | 650 | 2780 | 510 | 288 |
| 800 | FL1.6 | 206 | 214 | 980 | 320 | 650 | 1061 | 1833 | 650 | 2940 | 570 | 288 |
| 900 | FL1.6 | 225,5 | 234 | 1074 | 320 | 700 | 1192 | 1995 | 650 | 3200 | 620 | 288 |

A1*: installed face to face
 A2*: minimum required dimension for installation

HYDRAULIC ACTUATOR

- The hydraulic actuator consists of a double acting cylinder in accordance with ISO 6020/2.
- Available from DN 50 to DN 900 with PVC bellows
- Working pressure: 100 bar
- Maximum working pressure: 160 bar
- Options:
 - Pressure indicators: mechanical and inductive.
 - Open-closed lockout
 - Position transducers
 - Hydraulic groups
 - Electrical cabinets

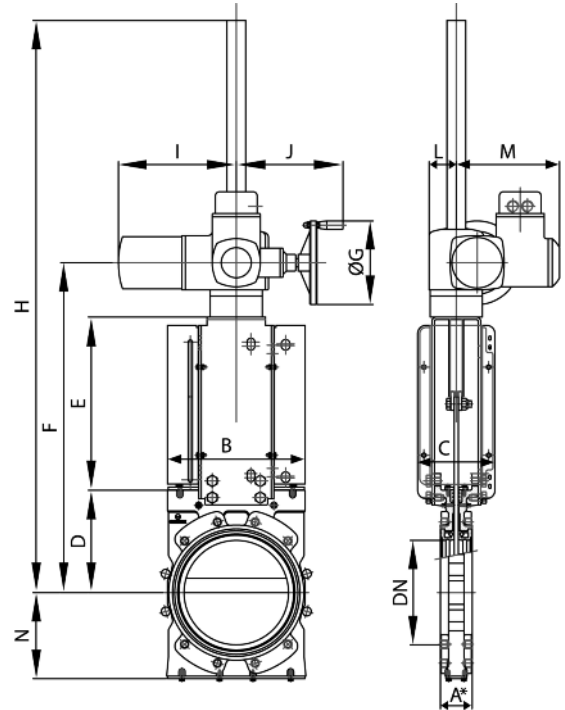


| DN | Ø CYL. | TM (BSP) | A1* | A2* | B | C | D | E | F | H | J |
|-----|----------|----------|-------|-----|------|-----|-----|------|------|------|-----|
| 50 | C32/62 | 1/4" | 54 | 60 | 140 | 100 | 105 | 190 | 205 | 500 | 63 |
| 80 | C32/95 | 1/4" | 57 | 63 | 175 | 100 | 124 | 216 | 230 | 570 | 90 |
| 100 | C32/115 | 1/4" | 57 | 63 | 170 | 100 | 140 | 238 | 248 | 626 | 100 |
| 125 | C40/143 | 3/8" | 63,5 | 69 | 195 | 100 | 150 | 283 | 306 | 739 | 123 |
| 150 | C50/168 | 1/2" | 63,5 | 69 | 230 | 100 | 175 | 309 | 338 | 836 | 130 |
| 200 | C63/220 | 1/2" | 76 | 83 | 280 | 165 | 205 | 395 | 375 | 975 | 160 |
| 250 | C80/270 | 3/4" | 76 | 83 | 335 | 185 | 245 | 472 | 465 | 1182 | 200 |
| 300 | C80/320 | 3/4" | 82,5 | 90 | 390 | 266 | 280 | 531 | 525 | 1336 | 232 |
| 350 | C80/375 | 3/4" | 82,5 | 90 | 440 | 270 | 325 | 595 | 590 | 1510 | 258 |
| 400 | C100/425 | 3/4" | 95 | 102 | 505 | 270 | 350 | 653 | 645 | 1648 | 292 |
| 450 | C100/475 | 3/4" | 95,5 | 103 | 560 | 270 | 420 | 708 | 695 | 1823 | 318 |
| 500 | C125/525 | 1" | 121 | 129 | 620 | 270 | 462 | 773 | 790 | 2025 | 345 |
| 600 | C160/625 | 1" | 121 | 129 | 730 | 270 | 510 | 911 | 940 | 2361 | 400 |
| 700 | C125/730 | 1" | 181 | 190 | 860 | 320 | 575 | 1024 | 1077 | 2676 | 490 |
| 750 | C125/780 | 1" | 187 | 195 | 930 | 320 | 605 | 1073 | 1109 | 2787 | 515 |
| 800 | C160/830 | 1" | 206 | 214 | 990 | 320 | 655 | 1123 | 1168 | 2946 | 565 |
| 900 | C160/930 | 1" | 225,5 | 234 | 1095 | 320 | 705 | 1206 | 1335 | 3246 | 615 |

A1*: installed face to face
 A2*: minimum required dimension for installation

ELECTRIC ACTUATOR

- Automatic actuator which consists of:
 - Electric motor
 - Rising stem
 - Motor support yoke flange
- The standard electric motor is equipped with:
 - Manual emergency handwheel
 - Limit switches (open/closed)
 - Torque switches (open/closed)
- Available from DN 50 to DN 900
- Wide range of types and brands available to meet customer requirements.
- Standardised flanges in accordance with ISO 5210/DIN 3338.
- Options: (on request)
 - Open-closed lockout



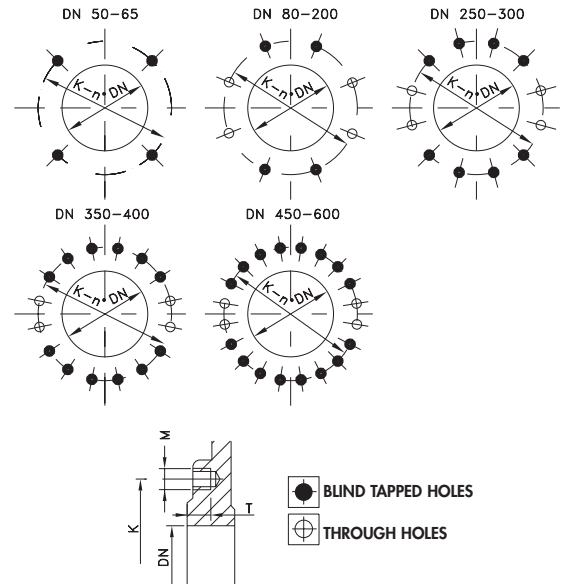
| DN | A1* | A2* | B | C | D | E | F | ØG | H | I | J | L | M | N | TORQUE Nm |
|-----|-------|-----|------|-----|-----|------|------|-----|------|-----|-----|-----|-----|-----|-----------|
| 50 | 54 | 60 | 140 | 100 | 105 | 145 | 393 | 140 | 945 | 265 | 234 | 62 | 237 | 63 | 20 |
| 80 | 57 | 63 | 175 | 100 | 124 | 175 | 442 | 140 | 1000 | 265 | 234 | 62 | 237 | 90 | 20 |
| 100 | 57 | 63 | 170 | 100 | 140 | 198 | 481 | 160 | 1035 | 265 | 250 | 62 | 237 | 100 | 30 |
| 125 | 63,5 | 69 | 195 | 100 | 150 | 240 | 533 | 160 | 1085 | 265 | 250 | 62 | 237 | 123 | 35 |
| 150 | 63,5 | 69 | 230 | 100 | 175 | 265 | 583 | 160 | 1135 | 265 | 250 | 62 | 237 | 130 | 40 |
| 200 | 76 | 83 | 280 | 165 | 205 | 322 | 682 | 200 | 1245 | 282 | 256 | 65 | 247 | 150 | 50 |
| 250 | 76 | 83 | 335 | 185 | 245 | 415 | 790 | 200 | 1378 | 282 | 256 | 65 | 247 | 200 | 70 |
| 300 | 82,5 | 90 | 390 | 266 | 280 | 472 | 882 | 200 | 1470 | 282 | 256 | 65 | 247 | 232 | 110 |
| 350 | 82,5 | 90 | 440 | 270 | 325 | 555 | 1055 | 315 | 1657 | 385 | 325 | 90 | 285 | 258 | 120 |
| 400 | 95 | 102 | 505 | 270 | 350 | 605 | 1130 | 315 | 1732 | 385 | 325 | 90 | 285 | 292 | 160 |
| 450 | 95,5 | 103 | 560 | 270 | 420 | 677 | 1272 | 400 | 1974 | 385 | 332 | 90 | 285 | 318 | 200 |
| 500 | 121 | 129 | 620 | 270 | 462 | 742 | 1379 | 400 | 2481 | 385 | 332 | 90 | 285 | 345 | 300 |
| 600 | 121 | 129 | 730 | 270 | 510 | 843 | 1528 | 400 | 2630 | 385 | 332 | 90 | 285 | 400 | 350 |
| 700 | 181 | 190 | 860 | 320 | 575 | 980 | 1730 | 400 | 2832 | 385 | 332 | 90 | 285 | 490 | 450 |
| 750 | 187 | 195 | 930 | 320 | 605 | 1115 | 1930 | 500 | 3053 | 510 | 355 | 115 | 310 | 515 | 550 |
| 800 | 206 | 214 | 990 | 320 | 655 | 1220 | 2085 | 500 | 3208 | 510 | 355 | 115 | 310 | 565 | 600 |
| 900 | 225,5 | 234 | 1095 | 320 | 705 | 1370 | 2285 | 500 | 3408 | 510 | 355 | 115 | 310 | 615 | 750 |

A1*: installed face to face
A2*: minimum required dimension for installation

FLANGE AND BOLTING DETAILS

EN 1092-2 PN10

| DN | K | n° | M | T | ◆ ◆ |
|-----|-----|----|------|----|--------|
| 50 | 125 | 4 | M-16 | 10 | 4 - - |
| 80 | 160 | 8 | M-16 | 12 | 4 - 4 |
| 100 | 180 | 8 | M-16 | 12 | 4 - 4 |
| 125 | 210 | 8 | M-16 | 14 | 4 - 4 |
| 150 | 240 | 8 | M-20 | 14 | 4 - 4 |
| 200 | 295 | 8 | M-20 | 16 | 4 - 4 |
| 250 | 350 | 12 | M-20 | 16 | 8 - 4 |
| 300 | 400 | 12 | M-20 | 20 | 8 - 4 |
| 350 | 460 | 16 | M-20 | 15 | 12 - 4 |
| 400 | 515 | 16 | M-24 | 20 | 12 - 4 |
| 450 | 565 | 20 | M-24 | 20 | 16 - 4 |
| 500 | 620 | 20 | M-24 | 25 | 16 - 4 |
| 600 | 725 | 20 | M-27 | 24 | 16 - 4 |



ANSI B16.5, class150

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

