

**MODEL****VG**

## RUBBER SLEEVE KNIFE GATE VALVE

The VG model knife gate is a bi-directional wafer valve equipped with two metal reinforced rubber sleeves, designed for applications with abrasive slurries. The VG slurry knife gate valve is mainly used in industries such as:

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

### Sizes:

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

### Working pressure:

DN 2"/ 50mm to 16"/400mm 10 bar (150 psi)

DN 18"/450mm to 24"/600mm 6 bar (90 psi) or 10 bar (150 psi)<sup>(1)</sup>

DN 28"/700mm to 36"/900mm 5 bar (75 psi) or 10 bar (150 psi)<sup>(1)</sup>

Higher pressures and/or diameters on request

<sup>(1)</sup> Duplex gate for 10 bar (150 psi)

### Standard Flange connection:

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

Other: (On request)

DIN PN 6

DIN PN 16

DIN PN 25

BS "D" and "E"

ANSI 125

Others on request

### Directives:

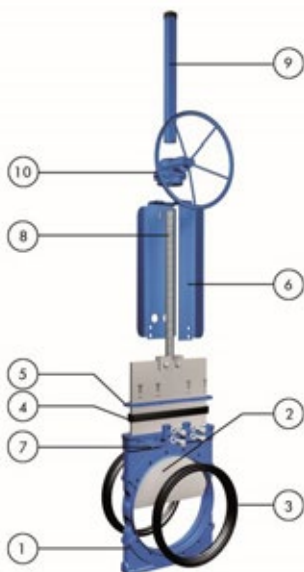
2006/42/CE (MACHINES)

2014/68/EU (PED) Fluid: Group 1(b), 2 (Cat. I, mod. A)

2014/34/EU (ATEX)



All ORBINOX valves are tested prior to shipping



## STANDARD PARTS LIST

| Part:             | Materials:                                      |
|-------------------|---|
| 1- Body           | Ductile iron A536 (60-40-18) / 0.7040 / GJS 400 |
| 2- Gate           | AISI 304 (1.4301)/AISI 316 (1.4401)             |
| 3- Sleeves        | Natural rubber / EPDM                           |
| 4- Packing        | EPDM  |
| 5- Gland Follower | A570 GR.40 / 1.0044 Epoxy coated                |
| 6- Yoke           | A570 GR.40 / 1.0044 Epoxy coated                |
| 7- Grease Nipple  | Zinc coated carbon-steel                        |
| 8- Stem           | Stainless Steel                                 |
| 9- Stem protector | A570 GR.40 / 1.0044 Epoxy coated                |
| 10- Bevel Gear    | -   |

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## 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. Some leakage will occur from the bottom of the valve during operation. This allows solids to be flushed from body cavity and will ensure the full stroke of the valve.

### **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 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 metal core. The patented sleeve design allows for maximum flexibility during gate travel, minimising the effort necessary for its operation. In the open position, the two sleeves are in permanent contact with each other, assuring full bore flow. There are no seat cavities which may cause material 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-6.

### **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. In rising stem valves the stem protector also protects the spindle against dirt.

### **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 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 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:**

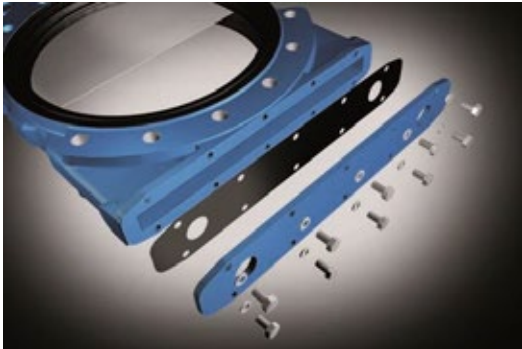
ORBINOX automated valves are provided with gate guards in accordance with EU Safety Standards. The design feature prevents any objects from being caught accidentally while the gate is moving.



## OTHER OPTIONS

### Bottom splash guard (Fig. 1 and 2):

There are two types of splash guards that can be installed on the lower part of the valve body. They permit either periodic or continuous removal of solids that may accumulate during operation of the valve. They shall always be connected to a drain line.



(Fig. 1) Flat plate



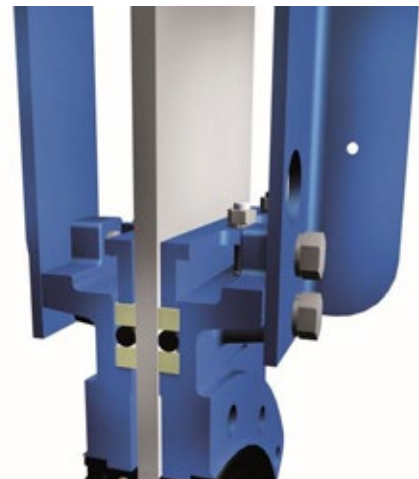
(Fig. 2) Tubular design

### Conventional leak proof packing (Fig. 3 and 4):

The VG can use conventional leak proof packing and packing gland follower which guarantee full tightness at maximum design pressure.



(Fig. 3) Standard packing



(Fig. 4) Optional: conventional leak proof packing

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## OTHER OPTIONS

### **Open-closed lockout system (Fig. 5):**

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



(Fig. 5)

### **Other materials of constructions:**

Other materials may be used, such as carbon steel, different stainless steels (AISI 316, AISI 317, 2205, ...), special alloys (254SMO, Hastelloys, ...), etc.

### **Fabricated valves:**

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

### **Flush ports (Fig. 6):**

Allows flushing out of solids trapped within the body cavity and the sleeves. This option can be used in conjunction with splash guards



(Fig. 6)

### **Gate coatings:**

Gates can be provided with different coatings to improve wear and corrosion resistance, non-adherence properties, etc.

We recommend to contact our technical department

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## ACTUATOR TYPES

### MANUAL:

Handwheel (rising stem)

Bevel Gear

Others (on request)

### AUTOMATIC:

Electric (rising stem)

Pneumatic (single & double-acting)

Hydraulic



All actuators supplied by ORBINOX are interchangeable

## FAIL SAFE SYSTEMS

Used on pneumatic actuated valves

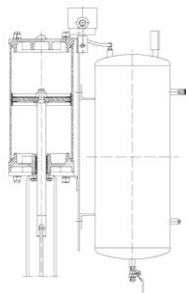
### SINGLE ACTING (SPRING RETURN)

- Available from DN 50 to DN 200
- 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

- Open-closed lockout
- Mechanical stops
- Manual override actuators
- Solenoid valves
- Positioners
- Limit switches
- Proximity switches
- Floor stand
- Spindle extensions

*For further information, please see corresponding EX catalogue*

We recommend to contact our technical department

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## TEMPERATURE CHART

### SEAT / SLEEVES

| Material       | Min/Max T.(°C) | Applications              |
|----------------|----------------|---------------------------|
| Natural rubber | -30/75         | General                   |
| EPDM           | -30/120        | Acids/Non-mineral oils    |
| Neoprene       | -30/90         | Oils/Solvents             |
| Chlorobutyl    | -30/125        | High temperatures         |
| Nitrile        | -30/120        | Hydrocarbons/Oils/Greases |

All of them are reinforced with a metal core. For other temperatures and applications, contact our technical department

### PACKINGS

| Material                        | Max.T. (°C) |
|---------------------------------|-------------|
| EPDM                            | 120         |
| PTFE impregn. synth. fiber (ST) | 240         |

## 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 metal core which provides them with a great resistance to demanding working conditions and pressures.



OPEN



INTERMEDIATE



CLOSED

## ATEX

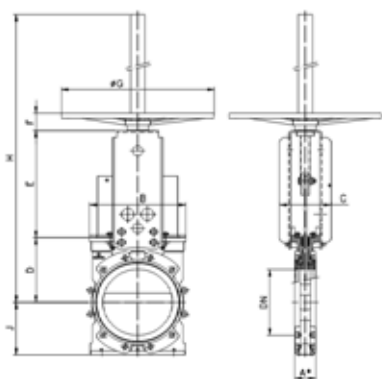


Please contact our ORBINOX representative for info and availability. Some considerations:

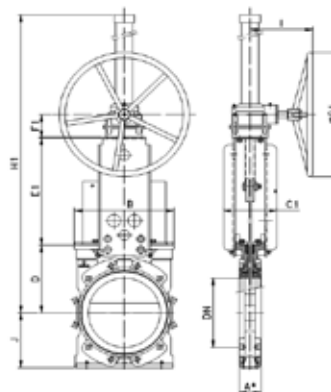
- Hand operated VG valves have been subjected to an ignition risk assessment according to DIN EN 13463: 1-5 and they are out the scope of application of ATEX Directive. Therefore hand operated valves are suitable for ALL ATEX zones.
- Electrically, pneumatically and hydraulically operated valves must 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.

**HAND OPERATED (rising stem)**

HANDWHEEL



GEAR



- Consists of:
  - Epoxy coated cast iron handwheel
  - Yoke
  - Stem and stem nut
  - Stem protector
- Available from DN 50 to DN 600 (larger sizes on request)
- Options (on request):
  - Open-closed lockout
  - Extensions and floor stands
  - PVC bellow
- Note: bevel gear is recommended for valve sizes DN>200 (full force on handwheel > 250 N)

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

| DN  | GEAR  | A1*   | A2* | B    | C   | C1  | D   | E   | E1   | F  | F1  | ØG  | ØG1 | H   | H1   | J   | I   |
|-----|-------|-------|-----|------|-----|-----|-----|-----|------|----|-----|-----|-----|-----|------|-----|-----|
| 50  | -     | 54    | 60  | 144  | 100 | -   | 105 | 147 | -    | 47 | -   | 225 | -   | 445 | -    | 63  | -   |
| 65  | -     | 54    | 60  | 164  | 100 | -   | 115 | 162 | -    | 47 | -   | 225 | -   | 470 | -    | 70  | -   |
| 80  | -     | 57    | 63  | 179  | 100 | -   | 124 | 177 | -    | 47 | -   | 225 | -   | 495 | -    | 90  | -   |
| 100 | -     | 57    | 63  | 171  | 107 | -   | 140 | 193 | -    | 67 | -   | 310 | -   | 645 | -    | 100 | -   |
| 125 | -     | 63,5  | 69  | 200  | 107 | -   | 150 | 234 | -    | 67 | -   | 310 | -   | 700 | -    | 122 | -   |
| 150 | -     | 63,5  | 69  | 238  | 107 | -   | 175 | 259 | -    | 67 | -   | 310 | -   | 745 | -    | 129 | -   |
| 200 | FL0.4 | 76    | 83  | 295  | 165 | 165 | 205 | 326 | 315  | 70 | 109 | 410 | 300 | 945 | 1040 | 164 | 200 |
| 250 | FL0.4 | 76    | 83  | 346  | -   | 185 | 245 | -   | 389  | -  | 84  | -   | 300 | -   | 1060 | 199 | 200 |
| 300 | FL0.4 | 82,5  | 90  | 395  | -   | 250 | 280 | -   | 446  | -  | 84  | -   | 300 | -   | 1460 | 231 | 200 |
| 350 | FL0.4 | 82,5  | 90  | 450  | -   | 250 | 325 | -   | 501  | -  | 84  | -   | 450 | -   | 1530 | 257 | 220 |
| 400 | FL0.4 | 95    | 102 | 511  | -   | 270 | 350 | -   | 558  | -  | 84  | -   | 450 | -   | 1640 | 291 | 220 |
| 450 | FL0.4 | 95,5  | 103 | 564  | -   | 290 | 420 | -   | 625  | -  | 84  | -   | 450 | -   | 1750 | 317 | 220 |
| 500 | FL1.6 | 121   | 129 | 623  | -   | 290 | 462 | -   | 686  | -  | 102 | -   | 650 | -   | 1930 | 345 | 288 |
| 600 | FL1.6 | 121   | 129 | 730  | -   | 290 | 510 | -   | 780  | -  | 102 | -   | 650 | -   | 2425 | 413 | 288 |
| 700 | FL1.6 | 181   | 190 | 845  | -   | 320 | 575 | -   | 896  | -  | 102 | -   | 650 | -   | 2615 | 475 | 288 |
| 750 | FL1.6 | 187   | 195 | 920  | -   | 320 | 605 | -   | 985  | -  | 102 | -   | 650 | -   | 2730 | 500 | 288 |
| 800 | FL1.6 | 206   | 214 | 1008 | -   | 320 | 655 | -   | 1085 | -  | 102 | -   | 650 | -   | 2880 | 550 | 288 |
| 900 | FL1.6 | 225,5 | 234 | 1105 | -   | 320 | 705 | -   | 1165 | -  | 102 | -   | 650 | -   | 3010 | 620 | 288 |

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

## PNEUMATIC ACTUATOR

• The standard pneumatic actuator (double acting on-off cylinder) consists of:

- $\varnothing \leq 300$ : Aluminum barrels
- $\varnothing \geq 350$ : Composite barrels
- Aluminum end caps
- Stainless Steel (AISI 304) piston rod
- Nitrile coated steel piston
- PVC bellows

• Available from DN 50 to DN 600

• Supply Pressure: 6 bar

• Reinforced design of support plates is standard starting from DN 200

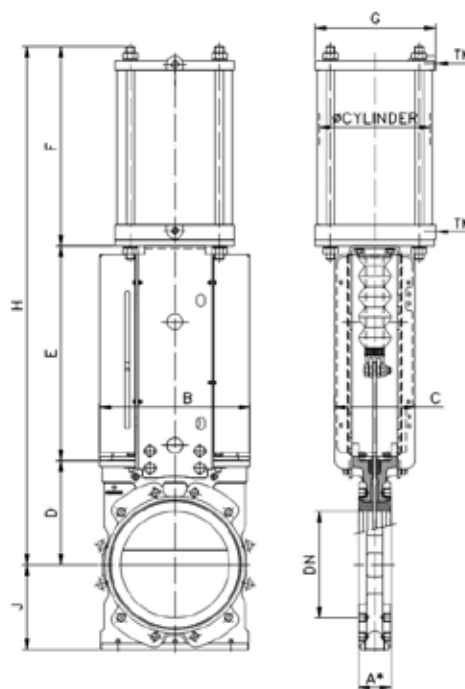
• Options (on request):

- Hard anodized barrel and covers
- Stainless steel barrel and covers on request
- Open-closed lockout
- Manual override actuator
- Fail-safe systems

• Instrumentation (on request):

- Positioners
- Flow regulators
- Solenoid valves
- 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 to contact our technical department



| DN  | ØCYL.    | TM   | A1*  | A2* | B   | C   | D   | E   | F   | G   | H    | J   |
|-----|----------|------|------|-----|-----|-----|-----|-----|-----|-----|------|-----|
| 50  | C100/80  | 1/4" | 54   | 60  | 144 | 100 | 105 | 211 | 200 | 115 | 516  | 63  |
| 65  | C100/95  | 1/4" | 54   | 60  | 164 | 100 | 115 | 221 | 214 | 115 | 550  | 70  |
| 80  | C125/110 | 1/4" | 57   | 63  | 179 | 100 | 124 | 257 | 240 | 140 | 621  | 90  |
| 100 | C125/130 | 1/4" | 57   | 63  | 171 | 107 | 140 | 270 | 258 | 140 | 668  | 100 |
| 125 | C160/160 | 1/4" | 63,5 | 69  | 200 | 107 | 150 | 369 | 298 | 175 | 817  | 122 |
| 150 | C160/185 | 1/4" | 63,5 | 69  | 238 | 107 | 175 | 395 | 323 | 175 | 893  | 129 |
| 200 | C200/240 | 3/8" | 76   | 83  | 291 | 165 | 205 | 464 | 398 | 220 | 1067 | 164 |
| 250 | C250/290 | 3/8" | 76   | 83  | 346 | 185 | 245 | 505 | 470 | 277 | 1220 | 199 |
| 300 | C300/345 | 1/2" | 82,5 | 90  | 398 | 250 | 280 | 656 | 538 | 335 | 1474 | 231 |
| 350 | C350/395 | 3/4" | 82,5 | 90  | 450 | 290 | 325 | 712 | 650 | 444 | 1687 | 257 |
| 400 | C350/450 | 3/4" | 95   | 102 | 511 | 290 | 350 | 769 | 705 | 444 | 1824 | 291 |
| 450 | C400/500 | 3/4" | 95,5 | 103 | 564 | 290 | 420 | 838 | 767 | 515 | 2025 | 317 |
| 500 | C400/560 | 3/4" | 121  | 129 | 623 | 290 | 462 | 897 | 839 | 515 | 2198 | 345 |
| 600 | C400/655 | 3/4" | 121  | 129 | 730 | 290 | 510 | 989 | 921 | 515 | 2420 | 413 |

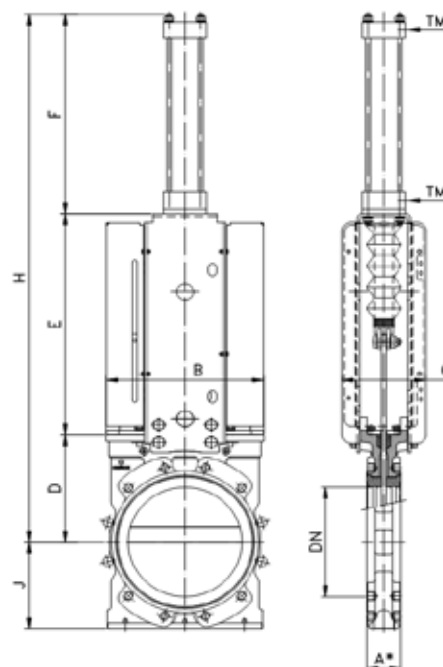
A1\*: installed face to face

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
- Hydraulic pressure: 100 bar
- Maximum hydraulic pressure: 160 bar
- Options:
  - Pressure indicators: mechanical and inductive
  - Open-closed lockout
  - Position transducers
  - Hydraulic groups
  - Electrical cabinets

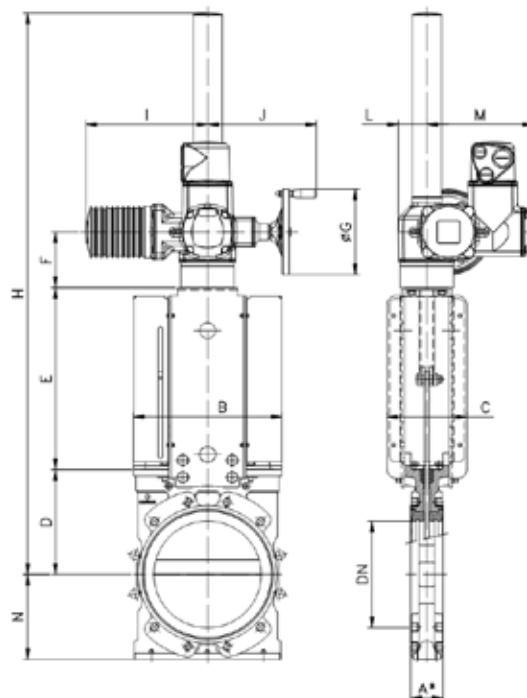


| DN  | ØCYL.    | TM   | A1*   | A2* | B    | C   | D   | E    | F    | H    | J   |
|-----|----------|------|-------|-----|------|-----|-----|------|------|------|-----|
| 50  | C32/80   | 1/4" | 54    | 60  | 144  | 100 | 105 | 211  | 223  | 539  | 63  |
| 65  | C32/95   | 1/4" | 54    | 60  | 164  | 100 | 115 | 221  | 238  | 574  | 70  |
| 80  | C32/110  | 1/4" | 57    | 63  | 179  | 100 | 124 | 257  | 253  | 634  | 90  |
| 100 | C32/130  | 1/4" | 57    | 63  | 171  | 107 | 140 | 270  | 273  | 683  | 100 |
| 125 | C32/160  | 1/4" | 63,5  | 69  | 200  | 107 | 150 | 369  | 303  | 822  | 122 |
| 150 | C40/185  | 3/8" | 63,5  | 69  | 238  | 107 | 175 | 395  | 355  | 925  | 129 |
| 200 | C50/240  | 1/2" | 76    | 83  | 291  | 165 | 205 | 464  | 413  | 1082 | 164 |
| 250 | C63/290  | 1/2" | 76    | 83  | 346  | 185 | 245 | 505  | 468  | 1218 | 199 |
| 300 | C80/345  | 3/4" | 82,5  | 90  | 398  | 250 | 280 | 656  | 544  | 1480 | 231 |
| 350 | C80/395  | 3/4" | 82,5  | 90  | 450  | 290 | 325 | 712  | 594  | 1631 | 257 |
| 400 | C80/450  | 3/4" | 95    | 102 | 511  | 290 | 350 | 769  | 649  | 1768 | 291 |
| 450 | C100/500 | 3/4" | 95,5  | 103 | 564  | 290 | 420 | 838  | 710  | 1968 | 317 |
| 500 | C100/560 | 3/4" | 121   | 129 | 623  | 290 | 462 | 897  | 771  | 2130 | 345 |
| 600 | C125/653 | 1"   | 121   | 129 | 730  | 290 | 510 | 989  | 853  | 2352 | 413 |
| 700 | C100/765 | 3/4" | 181   | 190 | 845  | 320 | 575 | 1100 | 976  | 2651 | 475 |
| 750 | C100/815 | 3/4" | 187   | 195 | 920  | 320 | 605 | 1150 | 1026 | 2781 | 500 |
| 800 | C125/870 | 1"   | 206   | 214 | 1008 | 320 | 655 | 1205 | 1110 | 2970 | 550 |
| 900 | C125/975 | 1"   | 225,5 | 234 | 1105 | 320 | 705 | 1310 | 1215 | 3230 | 620 |

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

**ELECTRIC ACTUATOR (rising stem)**

- Automatic actuator which consists of:
  - Electric motor
  - Motor support yoke flange (standardised flanges as per ISO 5210/DIN 3338)
- The standard electric motor is equipped with:
  - Manual emergency handwheel
  - Limit switches (open/closed)
  - Torque switches
- Available from DN 50 to DN 900
- Wide range of types and brands available to meet customer requirements
- 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  | 144  | 100 | 105 | 145  | 143 | 160 | 603  | 265 | 249 | 62  | 238 | 63  | 20          |
| 65  | 54    | 60  | 164  | 100 | 115 | 160  | 143 | 160 | 628  | 265 | 249 | 62  | 238 | 70  | 20          |
| 80  | 57    | 63  | 179  | 100 | 124 | 185  | 143 | 160 | 662  | 265 | 249 | 62  | 238 | 90  | 30          |
| 100 | 57    | 63  | 171  | 107 | 140 | 195  | 143 | 160 | 688  | 265 | 249 | 62  | 238 | 100 | 35          |
| 125 | 63,5  | 69  | 200  | 107 | 150 | 235  | 143 | 160 | 1100 | 265 | 249 | 62  | 238 | 122 | 40          |
| 150 | 63,5  | 69  | 238  | 107 | 175 | 260  | 143 | 160 | 1158 | 265 | 249 | 62  | 238 | 129 | 50          |
| 200 | 76    | 83  | 291  | 165 | 205 | 330  | 155 | 200 | 1272 | 283 | 254 | 65  | 248 | 164 | 70          |
| 250 | 76    | 83  | 346  | 185 | 245 | 405  | 155 | 200 | 1387 | 283 | 254 | 65  | 248 | 199 | 110         |
| 300 | 82,5  | 90  | 398  | 250 | 280 | 462  | 155 | 200 | 1454 | 283 | 254 | 65  | 248 | 231 | 120         |
| 350 | 82,5  | 90  | 450  | 290 | 325 | 520  | 158 | 315 | 1602 | 389 | 336 | 90  | 286 | 257 | 160         |
| 400 | 95    | 102 | 511  | 290 | 350 | 580  | 158 | 315 | 1690 | 389 | 336 | 90  | 286 | 291 | 240         |
| 450 | 95,5  | 103 | 564  | 290 | 420 | 645  | 158 | 409 | 1822 | 389 | 336 | 90  | 286 | 317 | 200         |
| 500 | 121   | 129 | 623  | 290 | 462 | 705  | 158 | 400 | 1925 | 389 | 339 | 90  | 286 | 345 | 300         |
| 600 | 121   | 129 | 730  | 290 | 510 | 804  | 158 | 500 | 2120 | 430 | 365 | 115 | 303 | 413 | 400         |
| 700 | 181   | 190 | 845  | 320 | 575 | 935  | 158 | 400 | 2770 | 389 | 339 | 90  | 286 | 475 | 450         |
| 750 | 187   | 195 | 920  | 320 | 605 | 967  | 190 | 500 | 2880 | 430 | 365 | 115 | 303 | 500 | 550         |
| 800 | 206   | 214 | 1008 | 320 | 655 | 1078 | 190 | 500 | 3035 | 430 | 365 | 115 | 303 | 550 | 600         |
| 900 | 225,5 | 234 | 1105 | 320 | 705 | 1170 | 190 | 500 | 3180 | 430 | 365 | 115 | 303 | 620 | 750         |

A1\*: installed face to face

A2\*: minimum required dimension for installation

MODEL

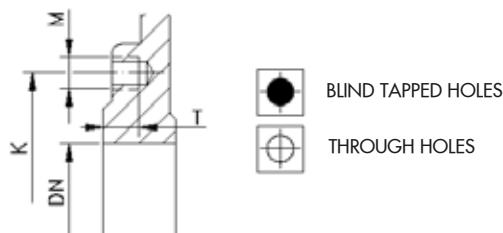
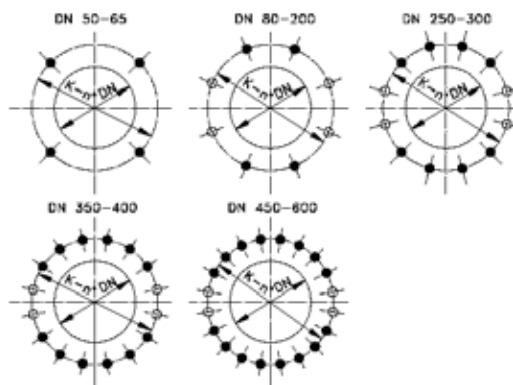
VG



FLANGE AND BOLTING DETAILS

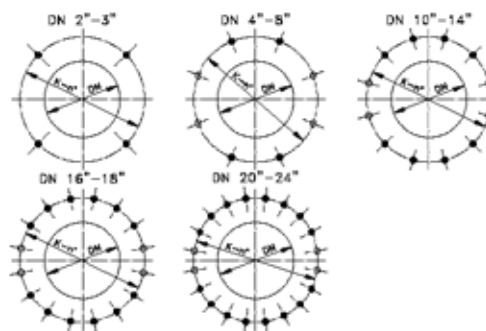
EN 1092-2 PN10

| DN  | K   | n° | M    | T  | ⬤ ⊕    |
|-----|-----|----|------|----|--------|
| 50  | 125 | 4  | M-16 | 10 | 4 - 0  |
| 65  | 145 | 4  | M-16 | 12 | 4 - 0  |
| 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 | 20 | 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, class 150

| DN     | K       | n° | M              | T      | ⬤ ⊕    |
|--------|---------|----|----------------|--------|--------|
| 2"     | 4 3/4"  | 4  | 5/8" - 11 UNC  | 3/8"   | 4 - 0  |
| 2 1/2" | 5 1/2"  | 4  | 5/8" - 11 UNC  | 1/2"   | 4 - 0  |
| 3"     | 6"      | 4  | 5/8" - 11 UNC  | 1/2"   | 4 - 4  |
| 4"     | 7 1/2"  | 8  | 5/8" - 11 UNC  | 1/2"   | 4 - 4  |
| 5"     | 8 1/2"  | 8  | 3/4" - 10 UNC  | 9/16"  | 4 - 4  |
| 6"     | 9 1/2"  | 8  | 3/4" - 10 UNC  | 9/16"  | 4 - 4  |
| 8"     | 11 3/4" | 8  | 3/4" - 10 UNC  | 5/8"   | 4 - 4  |
| 10"    | 14 1/4" | 12 | 7/8" - 9 UNC   | 5/8"   | 8 - 4  |
| 12"    | 17"     | 12 | 7/8" - 9 UNC   | 3/4"   | 8 - 4  |
| 14"    | 18 3/4" | 12 | 1" - 8 UNC     | 3/4"   | 8 - 4  |
| 16"    | 21 1/4" | 16 | 1" - 8 UNC     | 3/4"   | 12 - 4 |
| 18"    | 22 3/4" | 16 | 1 1/8" - 7 UNC | 3/4"   | 12 - 4 |
| 20"    | 25"     | 20 | 1 1/8" - 7 UNC | 15/16" | 16 - 4 |
| 24"    | 29 1/2" | 20 | 1 1/4" - 7 UNC | 15/16" | 16 - 4 |



**MODEL****WG**

## RUBBER SLEEVE KNIFE GATE VALVE

The WG model knife gate is a bi-directional full flanged valve equipped with two metal reinforced 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 3"/80mm to DN 36"/900mm (larger DN on request)

### Working pressure:

DN 3"/ 80mm to 16"/400mm 10 bar (150 psi)  
 DN 18"/450mm to 24"/600mm 6 bar (90 psi) or 10 bar (150 psi)<sup>(1)</sup>  
 DN 30"/750mm 5 bar (75 psi) or 10 bar (150 psi)<sup>(1)</sup>  
 DN 36"/900mm 5 bar (75 psi) or 10 bar (150 psi)<sup>(1)</sup>

Higher pressures on request

<sup>(1)</sup> Duplex gate for 10 bar (150 psi)

### Standard Flange connection:

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

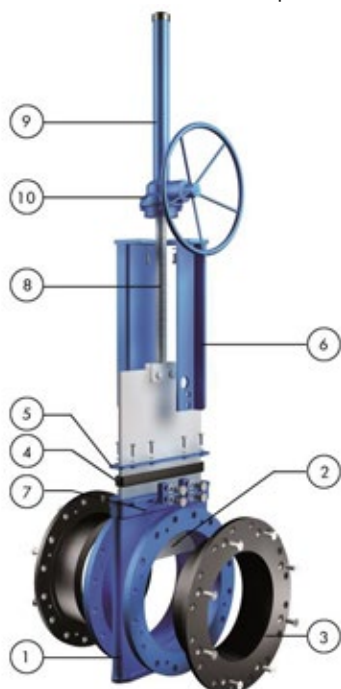
### Directives:

2006/42/CE (MACHINES)

2014/68/EU (PED) Fluid: Group 1(b), 2 (Cat. I, mod. A)

2014/34/EU (ATEX)

All ORBINOX valves are tested prior to shipping



### STANDARD PARTS LIST

| Part:             | Materials:                                      |
|-------------------|---|
| 1- Body           | Ductile iron A536 (60-40-18) / 0.7040 / GJS 400 |
| 2- Gate           | AISI 304 (1.4301) / AISI 316 (1.4401)           |
| 3- Sleeves        | Natural rubber / EPDM                           |
| 4- Packing        | EPDM  |
| 5- Gland Follower | A570 GR.40 / 1.0044 Epoxy coated                |
| 6- Yoke           | A570 GR.40 / 1.0044 Epoxy coated                |
| 7- Grease Nipple  | Zinc coated carbon-steel                        |
| 8- Stem           | Stainless Steel                                 |
| 9- Stem protector | A570 GR.40 / 1.0044 Epoxy coated                |
| 10- Bevel Gear    | -   |

MODEL

WG



## DESIGN FEATURES

### **BODY:**

Full flange 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. 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. Some leakage will occur from the bottom of the valve during operation, this allows solids to be flushed from body cavity and will ensure the full stroke of the valve.

### **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 to cut perfectly through the fluid. The gate 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 metal core. Its solid sleeve design allows for maximum flexibility during gate travel, minimising the effort necessary for operation. In the open position, the two sleeves are in permanent contact with each other, assuring full bore flow. There are no seat cavities which may cause material 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 WG-6.

### **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 a high resistance to corrosion and a long life. In rising stem valves the stem protector protects the stem against dirt build up.

### **ACTUATORS:**

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

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

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

### **EPOXY COATING:**

The epoxy coating on all ORBINOX cast iron and carbon steel components is electrostatically applied making them corrosion resistant with a high quality surface finish.

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

### Bottom splash guard (Fig. 1 and 2):

There are two types of splash guards that can be installed on the lower part of the valve body. They permit either periodic or continuous removal of solids that may accumulate during operation of the valve. They shall always be connected to a drain line.



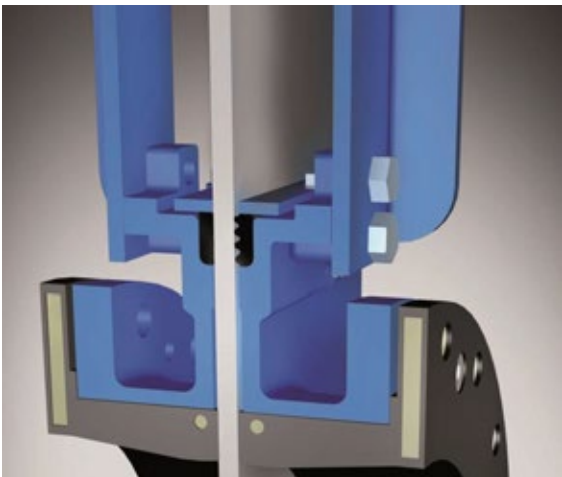
(Fig. 1) Flat plate



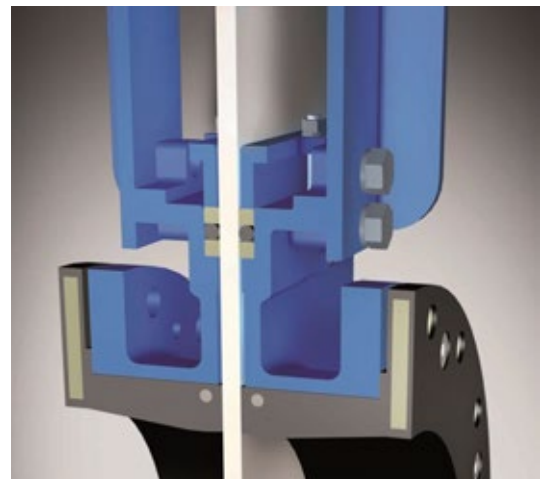
(Fig. 2) Tubular design

### Conventional leak proof packing (Fig. 3 and 4):

The WG can use conventional leak proof packing and packing gland follower which guarantee full tightness at maximum design pressure.



(Fig. 3) Standard packing



(Fig. 4) Optional: conventional leak proof packing

**MODEL**

**WG**



## OTHER OPTIONS

### Open-closed lockout system (Fig. 5):

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



(Fig. 5)

### Other materials of construction:

Other materials may be used, such as carbon steel, different stainless steels (AISI 316, AISI 317, 2205, ...), special alloys (254SMO, Hastelloys, ...), etc.

### Fabricated valves:

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

### Flush ports (Fig. 6):

Allows flushing out of solids trapped within the body cavity and the sleeves. This option can be used in conjunction with splash guards



(Fig. 6)

### Gate coatings:

Gates can be provided with different coatings to improve wear and corrosion resistance, non-adherence properties, etc.

We recommend to contact our technical department

MODEL

WG

## ACTUATOR TYPES

### MANUAL:

- Handwheel (rising stem)
- Bevel Gear
- Others (on request)

### AUTOMATIC:

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



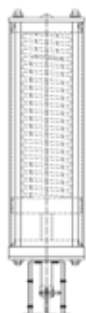
All actuators supplied by ORBINOX are interchangeable

## FAIL SAFE SYSTEMS

Used on pneumatic actuated valves

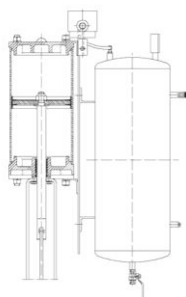
### SINGLE ACTING (SPRING RETURN)

- Available from DN 50 to DN 200
- 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

- Open-closed lockout
- Mechanical stops
- Manual override actuators
- Solenoid valves
- Positioners
- Limit switches
- Proximity switches
- Floor stand
- Stem extensions

*For further information, please see EX catalogue*

We recommend to contact our technical department



**MODEL****WG**

## TEMPERATURE CHART

### SEAT / SLEEVES

| Material       | Min/Max T.(°C) | Applications              |
|----------------|----------------|---------------------------|
| Natural rubber | -30/75         | General                   |
| EPDM           | -30/120        | Acids/Non-mineral oils    |
| Neoprene       | -30/90         | Oils/Solvents             |
| Chlorobutyl    | -30/125        | High temperatures         |
| NBR            | -30/120        | Hydrocarbons/Oils/Greases |

### PACKINGS

| Material                        | Max.T. (°C) |
|---------------------------------|-------------|
| EPDM                            | 120         |
| PTFE impregn. synth. fiber (ST) | 240         |

All are reinforced with a metal core. For other temperatures and applications, contact our technical department

## SEAT

### RUBBER SLEEVES

The closure of the WG 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 metal core which provides them with a great resistance to demanding working conditions and pressures.



OPEN



INTERMEDIATE



CLOSED

## ATEX



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

- Hand operated WG 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.
- Electrically, pneumatically 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.

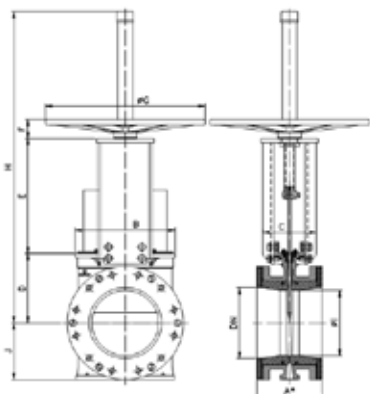
**MODEL**

**WG**

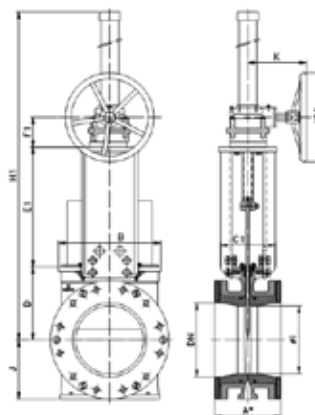


**HAND OPERATED (rising stem)**

**HANDWHEEL**



**GEAR**



- Consists of:
  - Epoxy coated cast iron handwheel
  - Yoke
  - Stem and stem nut
  - Stem protector
- Available from DN 80 to DN 200 (larger sizes on request)
- Options (on request):
  - Open-closed lockout
  - Extensions and floor stands
  - PVC bellows
  - Splash guards
- Note: bevel gear is recommended for valve sizes DN>150 (full force on handwheel > 250 N)

- Recommended for valves larger than DN 150
- Consists of:
  - Stem and stem protector
  - Yoke
  - Bevel Gear Actuator with Handwheel
- Available from DN 200 to DN 900
- Options (on request):
  - Chainwheel
  - Open-closed lockout
  - Extensions and floor stands
  - PVC bellows
  - Splash guards

| DN  | GEAR  | A1*   | A2* | B    | C   | C1  | D   | E   | E1   | F  | F1  | ØG  | ØG1 | H   | H1   | J   | K   | ØI  |
|-----|-------|-------|-----|------|-----|-----|-----|-----|------|----|-----|-----|-----|-----|------|-----|-----|-----|
| 80  | -     | 175   | 183 | 179  | 100 | -   | 124 | 177 | -    | 47 | -   | 225 | -   | 495 | -    | 96  | -   | 62  |
| 100 | -     | 175   | 183 | 171  | 107 | -   | 140 | 193 | -    | 67 | -   | 310 | -   | 645 | -    | 115 | -   | 85  |
| 150 | -     | 178   | 183 | 238  | 107 | -   | 175 | 259 | -    | 67 | -   | 310 | -   | 745 | -    | 141 | -   | 137 |
| 200 | FL0.4 | 184   | 192 | 295  | 165 | 165 | 205 | 326 | 315  | 70 | 109 | 410 | 300 | 945 | 1040 | 173 | 200 | 175 |
| 250 | FL0.4 | 225,5 | 233 | 346  | -   | 185 | 245 | -   | 389  | -  | 84  | -   | 300 | -   | 1060 | 204 | 200 | 230 |
| 300 | FL0.4 | 257   | 264 | 395  | -   | 250 | 280 | -   | 446  | -  | 84  | -   | 300 | -   | 1460 | 244 | 200 | 273 |
| 350 | FL0.4 | 257   | 264 | 450  | -   | 250 | 325 | -   | 501  | -  | 84  | -   | 450 | -   | 1530 | 268 | 220 | 318 |
| 400 | FL0.4 | 279,5 | 287 | 511  | -   | 270 | 350 | -   | 558  | -  | 84  | -   | 450 | -   | 1640 | 300 | 220 | 356 |
| 450 | FL0.4 | 311   | 319 | 564  | -   | 290 | 420 | -   | 625  | -  | 84  | -   | 450 | -   | 1750 | 320 | 220 | 378 |
| 500 | FL1.6 | 359   | 367 | 623  | -   | 290 | 462 | -   | 686  | -  | 102 | -   | 650 | -   | 1930 | 359 | 288 | 420 |
| 600 | FL1.6 | 371,5 | 380 | 730  | -   | 290 | 510 | -   | 780  | -  | 102 | -   | 650 | -   | 2425 | 422 | 288 | 539 |
| 750 | FL1.6 | 395,5 | 405 | 911  | -   | 320 | 600 | -   | 985  | -  | 102 | -   | 650 | -   | 2730 | 532 | 288 | 680 |
| 900 | FL1.6 | 470   | 480 | 1084 | -   | 320 | 700 | -   | 1165 | -  | 102 | -   | 650 | -   | 3010 | 633 | 288 | 810 |

A1\*: installed face to face

A2\*: minimum required dimension for installation

**MODEL****WVG**

## PNEUMATIC ACTUATOR

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

- $\varnothing \leq 300$ : Aluminum barrels
- $\varnothing \geq 350$ : Composite barrels
- Aluminum end caps
- Stainless Steel (AISI 304) piston rod
- Nitrile coated steel piston
- PVC bellows

- Available from DN 80 to DN 600

- Supply Pressure: 6 bar

- Reinforced design of support plates is standard starting from DN 200

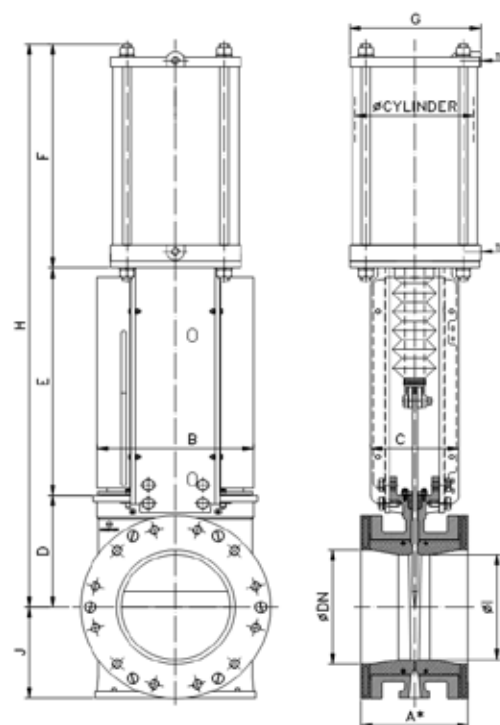
- Options (on request):

- Hard anodized barrel and covers
- Stainless steel barrel and covers on request
- Open-closed lockout
- Manual override actuator
- Fail-safe systems
- Splash guards

- Instrumentation (on request):

- Positioners
- Flow regulators
- Solenoid valves
- Air preparation unit
- Limit/proximity switches

- 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 to contact our technical department



| DN  | ØCYL     | TM (BSP) | A1*   | A2* | B   | C   | D   | E   | F   | G   | H    | J   | ØI  |
|-----|----------|----------|-------|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|
| 80  | C125/110 | 1/4"     | 175   | 183 | 179 | 100 | 124 | 257 | 240 | 140 | 621  | 96  | 62  |
| 100 | C125/130 | 1/4"     | 175   | 183 | 171 | 107 | 140 | 270 | 258 | 140 | 668  | 115 | 85  |
| 150 | C160/185 | 1/4"     | 178   | 183 | 238 | 107 | 175 | 395 | 323 | 175 | 893  | 141 | 137 |
| 200 | C200/240 | 3/8"     | 184   | 192 | 291 | 165 | 205 | 464 | 398 | 220 | 1067 | 173 | 175 |
| 250 | C250/290 | 3/8"     | 225,5 | 233 | 346 | 185 | 245 | 505 | 470 | 277 | 1220 | 204 | 230 |
| 300 | C300/345 | 1/2"     | 257   | 264 | 398 | 250 | 280 | 650 | 538 | 335 | 1474 | 244 | 273 |
| 350 | C350/395 | 3/4"     | 257   | 264 | 450 | 290 | 325 | 712 | 650 | 444 | 1687 | 268 | 318 |
| 400 | C350/450 | 3/4"     | 279,5 | 287 | 511 | 290 | 350 | 769 | 705 | 444 | 1824 | 300 | 356 |
| 450 | C400/500 | 3/4"     | 311   | 319 | 564 | 290 | 420 | 838 | 767 | 515 | 2025 | 320 | 378 |
| 500 | C400/560 | 3/4"     | 359   | 367 | 623 | 290 | 462 | 897 | 839 | 515 | 2198 | 359 | 420 |
| 600 | C400/655 | 3/4"     | 371,5 | 380 | 730 | 290 | 510 | 990 | 921 | 515 | 2420 | 422 | 539 |

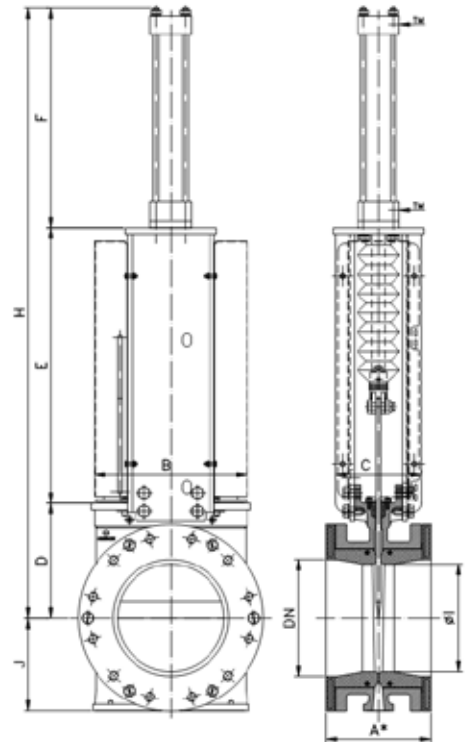
A1\*: installed face to face

A2\*: minimum required dimension for installation

**MODEL****WG**

## HYDRAULIC ACTUATOR

- The hydraulic actuator consists of a double acting cylinder in accordance with ISO 6020/2
- Available from DN 80 to DN 900 with PVC bellows
- Hydraulic pressure: 100 bar
- Maximum hydraulic pressure: 160 bar
- Options:
  - Pressure indicators: mechanical and inductive
  - Open-closed lockout
  - Position transducers
  - Hydraulic groups
  - Electrical cabinets
  - Splash guards
  - Limit/proximity switches



| DN  | ØCYL.    | TM (BSP) | A1*   | A2* | B    | C   | D   | E    | F    | H    | J   | ØI  |
|-----|----------|----------|-------|-----|------|-----|-----|------|------|------|-----|-----|
| 80  | C32/110  | 1/4"     | 175   | 183 | 179  | 100 | 124 | 257  | 253  | 634  | 96  | 62  |
| 100 | C32/130  | 1/4"     | 175   | 183 | 171  | 107 | 140 | 270  | 273  | 683  | 115 | 85  |
| 150 | C40/185  | 3/8"     | 178   | 183 | 238  | 107 | 175 | 395  | 355  | 925  | 141 | 137 |
| 200 | C50/240  | 1/2"     | 184   | 192 | 291  | 165 | 205 | 464  | 413  | 1082 | 173 | 175 |
| 250 | C63/290  | 1/2"     | 225,5 | 233 | 346  | 185 | 245 | 505  | 468  | 1218 | 204 | 230 |
| 300 | C80/345  | 3/4"     | 257   | 264 | 398  | 250 | 280 | 656  | 544  | 1480 | 244 | 273 |
| 350 | C80/395  | 3/4"     | 257   | 264 | 450  | 290 | 325 | 712  | 594  | 1631 | 268 | 318 |
| 400 | C80/450  | 3/4"     | 279,5 | 287 | 511  | 290 | 350 | 769  | 649  | 1768 | 300 | 356 |
| 450 | C100/500 | 3/4"     | 311   | 319 | 564  | 290 | 420 | 838  | 710  | 1968 | 320 | 378 |
| 500 | C100/560 | 3/4"     | 359   | 367 | 623  | 290 | 462 | 897  | 771  | 2130 | 359 | 420 |
| 600 | C125/653 | 1"       | 371,5 | 380 | 730  | 290 | 510 | 989  | 853  | 2352 | 422 | 539 |
| 750 | C125/653 | 3/4"     | 395,5 | 405 | 911  | 320 | 600 | 1247 | 1117 | 2964 | 532 | 680 |
| 900 | C125/975 | 1"       | 470   | 480 | 1084 | 320 | 700 | 1447 | 1422 | 3569 | 633 | 810 |

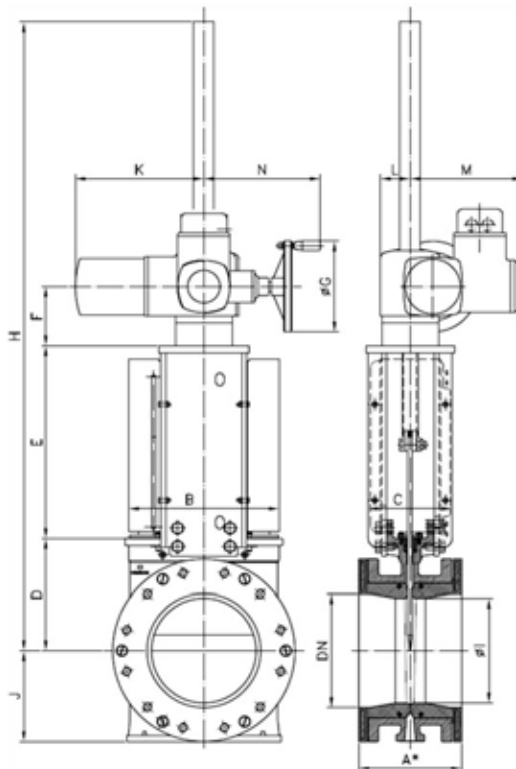
A1\*: installed face to face

A2\*: minimum required dimension for installation

**MODEL****WG**

## ELECTRIC ACTUATOR (rising stem)

- Automatic actuator which consists of:
  - Electric motor
  - Motor support yoke flange  
(standardised flanges as per ISO 5210/DIN 3338)
  
- The standard electric motor is equipped with:
  - Manual emergency handwheel
  - Limit switches (open/closed)
  - Torque switches
  
- Available from DN 80 to DN 900
  
- Wide range of types and brands available to meet customer requirements
  
- Options: (on request)
  - Open-closed lockout
  - Splash guards



| DN  | A1*   | A2* | B    | C   | D   | E    | F   | ØG  | H    | J   | K   | L   | M   | N   | ØI  | TORQUE (Nm) |
|-----|-------|-----|------|-----|-----|------|-----|-----|------|-----|-----|-----|-----|-----|-----|-------------|
| 80  | 175   | 183 | 179  | 100 | 124 | 185  | 143 | 160 | 662  | 96  | 265 | 62  | 238 | 249 | 62  | 30          |
| 100 | 175   | 183 | 171  | 107 | 140 | 195  | 143 | 160 | 688  | 115 | 265 | 62  | 238 | 249 | 85  | 35          |
| 150 | 178   | 183 | 238  | 107 | 175 | 260  | 143 | 160 | 1158 | 141 | 265 | 62  | 238 | 249 | 137 | 50          |
| 200 | 184   | 192 | 291  | 165 | 205 | 330  | 155 | 200 | 1272 | 173 | 283 | 65  | 248 | 254 | 175 | 70          |
| 250 | 225,5 | 233 | 346  | 185 | 245 | 405  | 155 | 200 | 1387 | 204 | 283 | 65  | 248 | 254 | 230 | 110         |
| 300 | 257   | 264 | 398  | 250 | 280 | 462  | 155 | 200 | 1454 | 244 | 283 | 65  | 248 | 254 | 273 | 120         |
| 350 | 257   | 264 | 450  | 290 | 325 | 520  | 158 | 315 | 1602 | 268 | 389 | 90  | 286 | 336 | 318 | 160         |
| 400 | 279,5 | 287 | 511  | 290 | 350 | 580  | 158 | 315 | 1690 | 300 | 389 | 90  | 286 | 336 | 356 | 240         |
| 450 | 311   | 319 | 564  | 290 | 420 | 645  | 158 | 409 | 1822 | 320 | 389 | 90  | 286 | 336 | 378 | 200         |
| 500 | 359   | 367 | 623  | 290 | 462 | 705  | 158 | 400 | 1925 | 359 | 389 | 90  | 286 | 339 | 420 | 300         |
| 600 | 371,5 | 380 | 730  | 290 | 510 | 804  | 158 | 500 | 2120 | 422 | 430 | 115 | 303 | 365 | 539 | 400         |
| 750 | 395,5 | 405 | 911  | 320 | 600 | 967  | 190 | 500 | 2880 | 532 | 430 | 115 | 303 | 365 | 680 | 550         |
| 900 | 470   | 480 | 1084 | 320 | 700 | 1170 | 190 | 500 | 3180 | 633 | 430 | 115 | 303 | 365 | 810 | 750         |

A1\*: installed face to face

A2\*: minimum required dimension for installation

MODEL

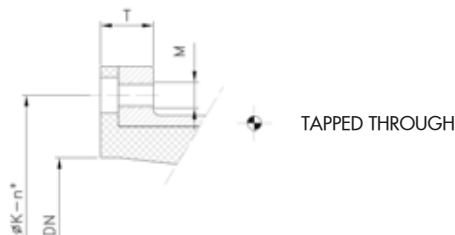
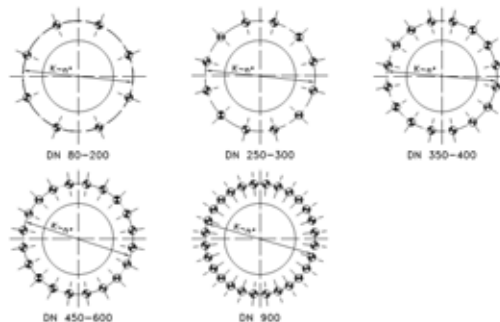
WG



FLANGE AND BOLTING DETAILS

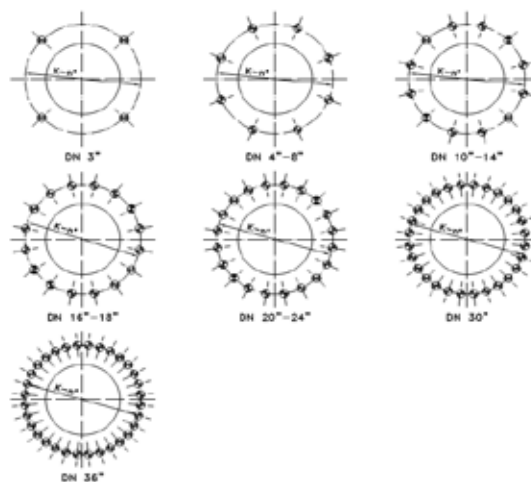
EN 1092-2 PN10

| DN  | K    | n° | M    | T   | ⊕  |
|-----|------|----|------|-----|----|
| 80  | 160  | 8  | M-16 | 39  | 8  |
| 100 | 180  | 8  | M-16 | 39  | 8  |
| 150 | 240  | 8  | M-20 | 41  | 8  |
| 200 | 295  | 8  | M-20 | 41  | 8  |
| 250 | 350  | 12 | M-20 | 46  | 12 |
| 300 | 400  | 12 | M-20 | 52  | 12 |
| 350 | 460  | 16 | M-20 | 57  | 16 |
| 400 | 515  | 16 | M-24 | 61  | 16 |
| 450 | 565  | 20 | M-24 | 61  | 20 |
| 500 | 620  | 20 | M-24 | 67  | 20 |
| 600 | 725  | 20 | M-27 | 72  | 20 |
| 900 | 1050 | 28 | M-30 | 122 | 28 |



ANSI B16.5, class 150(\*)

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



(\*) From DN 28", acc. to ANSI B16.47 "series A"(class 150)

**MODEL****HG**

## RUBBER SLEEVE KNIFE GATE VALVE

The HG model knife gate is a bi-directional full flanged valve equipped with two metal reinforced 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 3"/80mm to DN 36"/900mm (larger DN on request)

### Working pressure:

DN 3"/80mm to DN 36"/900mm 20 bar (300 psi)  
Higher pressures and/or diameters on request

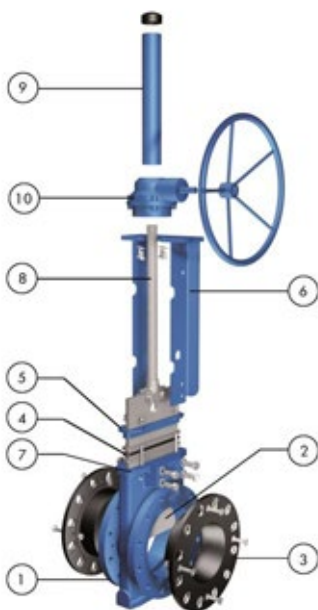
### Standard Flange connection:

ANSI B 16.5 (class 300)  
DIN PN 25  
Others available

### Directives:

2006/42/CE (MACHINERY)  
2014/68/EU (PED) Fluid: Group 1(b), 2 (Cat. II, mod. A2)  
2014/34/EU (ATEX) when applicable

All ORBINOX valves are tested prior to shipping



### STANDARD PARTS LIST

| Part:             | Materials:   |
|-------------------|--|
| 1- Body           | Ductile iron A536 (60-40-18) / Carbon Steel S275JR |
| 2- Gate           | AISI 304 (1.4301) + Chrome / Duplex 2205 + Chrome  |
| 3- Sleeves        | Natural rubber / EPDM                              |
| 4- Packing        | PTFE Impreg. Synth. Fibre (with a EPDM O-Ring)     |
| 5- Gland Follower | A570 GR.40 / 1.0044 Epoxy coated                   |
| 6- Yoke           | A570 GR.40 / 1.0044 Epoxy coated                   |
| 7- Grease Nipple  | Zinc coated carbon-steel                           |
| 8- Stem           | Stainless Steel                                    |
| 9- Stem protector | A570 GR.40 / 1.0044 Epoxy coated                   |
| 10- Bevel Gear    | -  |

**MODEL**

**HG**



## DESIGN FEATURES

### **BODY:**

Full flange 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. 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. Some leakage will occur from the bottom of the valve during operation, this allows solids to be flushed from body cavity and will ensure the full stroke of the valve.

### **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 to cut perfectly through the fluid. The gate 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 rubber with a metal core. Its solid sleeve design allows for maximum flexibility during gate travel, minimising the effort necessary for operation. In the open position, the two sleeves are in permanent contact with each other, assuring full bore flow. There are no seat cavities which may cause material 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 HG-6.

### **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 a high resistance to corrosion and a long life. In rising stem valves the stem protector protects the stem against dirt build up.

### **ACTUATORS:**

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

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

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

### **EPOXY COATING:**

The epoxy coating on all ORBINOX cast iron and carbon steel components is electrostatically applied making them corrosion resistant with a high quality surface finish.

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.





MODEL

HG

## OTHER OPTIONS

### Bottom splash guard (Fig. 1 and 2):

There are two types of splash guards that can be installed on the lower part of the valve body. They permit either periodic or continuous removal of solids that may accumulate during operation of the valve. They shall always be connected to a drain line.



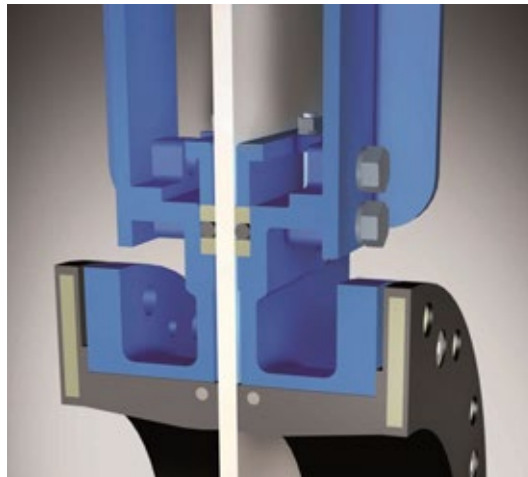
(Fig. 1) Flat plate



(Fig. 2) Tubular design

### Conventional leak proof packing (Fig. 3 y 4):

The HG can use conventional leak proof packing and packing gland follower which guarantee full tightness at maximum design pressure.

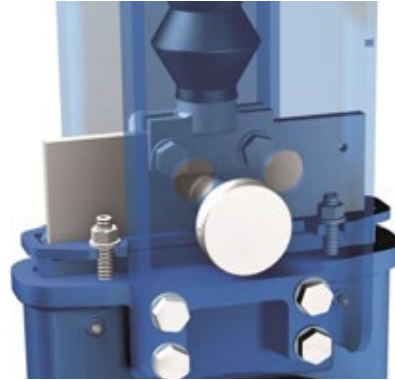


(Fig. 3) Conventional leak proof packing

## OTHER OPTIONS

### Open-closed lockout system (Fig. 4):

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



(Fig. 4)

### Other materials of construction:

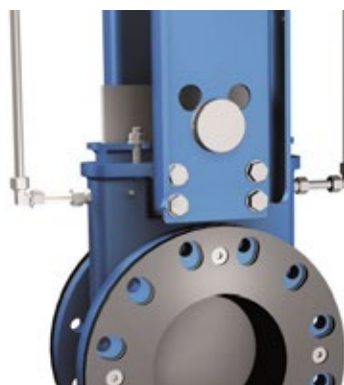
Other materials may be used, such as carbon steel, different stainless steels (AISI 316, AISI 317, 2205, ...), special alloys (254SMO, Hastelloys, ...), etc.

### Fabricated valves:

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

### Flush ports (Fig. 5):

Allows flushing out of solids trapped within the body cavity and the sleeves. This option can be used in conjunction with splash guards



(Fig. 5)

### Gate coatings:

Gates can be provided with different coatings to improve wear and corrosion resistance, non-adherence properties, etc.

**MODEL**

**HG**

## ACTUATOR TYPES

### MANUAL:

Handwheel (rising stem)

Bevel Gear

Others (on request)

### AUTOMATIC:

Electric (rising stem)

Pneumatic (single & double-acting)

Hydraulic



All actuators supplied by ORBINOX are interchangeable

## FAIL SAFE SYSTEMS

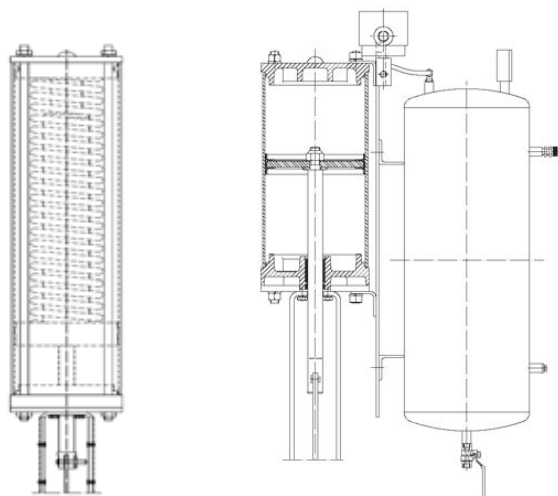
Used on pneumatic actuated valves

Different pneumatic solutions available

Fail open/ Fail close

DN<200 Single acting spring return cylinder

DN =>200 Air tank



## ACCESSORIES

Open-closed lockout

Mechanical stops

Manual override actuators

Solenoid valves

Positioners

Limit switches

Proximity switches

Floor stand

Stem extensions

*For further information, please see EX catalogue*

We recommend to contact our technical department

**MODEL****HG**

## TEMPERATURE CHART

### SEAT / SLEEVES

| Material       | Min/Max T.(°C) | Applications              |
|----------------|----------------|---------------------------|
| Natural rubber | -30/75         | General                   |
| EPDM           | -30/120        | Acids/Non-mineral oils    |
| Neoprene       | -30/90         | Oils/Solvents             |
| Chlorobutyl    | -30/125        | High temperatures         |
| NBR            | -30/120        | Hydrocarbons/Oils/Greases |

### PACKINGS

| Material                        | Max.T. (°C) |
|---------------------------------|-------------|
| EPDM                            | 120         |
| PTFE impregn. synth. fiber (ST) | 240         |

All are reinforced with a metal core. For other temperatures and applications, contact our technical department

## SEAT

### RUBBER SLEEVES

The closure of the HG 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 metal core which provides them with a great resistance to demanding working conditions and pressures.



OPEN



INTERMEDIATE



CLOSED

## ATEX



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

- Hand operated HG 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.
- Electrically, pneumatically 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.

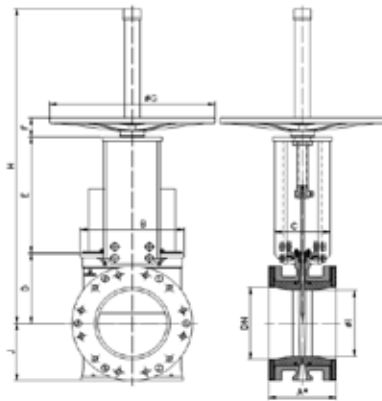
**MODEL**

**HG**

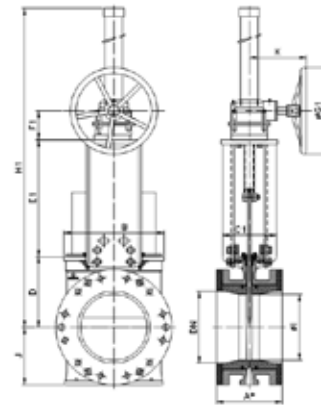


**HAND OPERATED (rising stem)**

HANDWHEEL



GEAR



- Consists of:
  - Epoxy coated cast iron handwheel
  - Yoke
  - Stem and stem nut
  - Stem protector
- Available from DN 80 to DN 100
- Options (on request):
  - Open-closed lockout
  - Extensions and floor stands
  - PVC bellows
  - Splash guards
- Note: bevel gear is recommended for valve sizes DN>100 (full force on handwheel > 250 N)

- Recommended for valves larger than DN 100
- Consists of:
  - Stem and stem protector
  - Yoke
  - Bevel Gear Actuator with Handwheel
- Available from DN 150
- Options (on request):
  - Chainwheel
  - Open-closed lockout
  - Extensions and floor stands
  - PVC bellows
  - Splash guards

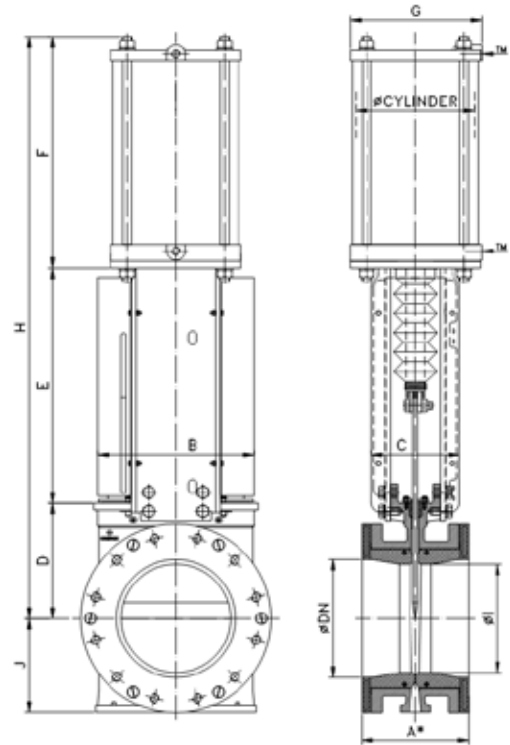
| DN  | GEAR   | A1*   | A2* | B   | C   | C1  | D   | E   | E1  | F  | F1  | ØG  | ØG1 | H   | H1   | J   | K   | ØI  |
|-----|--------|-------|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|-----|-----|------|-----|-----|-----|
| 80  | -      | 175   | 183 | 175 | 100 | -   | 124 | 175 | -   | 67 | -   | 225 | -   | 545 | -    | 90  | -   | 62  |
| 100 | -      | 175   | 183 | 170 | 100 | -   | 140 | 200 | -   | 67 | -   | 310 | -   | 620 | -    | 100 | -   | 85  |
| 150 | FL 0.4 | 178   | 186 | 230 | -   | 165 | 175 | -   | 263 | -  | 84  | -   | 300 | -   | 900  | 130 | 263 | 137 |
| 200 | FL 0.4 | 184   | 192 | 280 | -   | 165 | 205 | -   | 322 | -  | 84  | -   | 300 | -   | 990  | 160 | 263 | 175 |
| 250 | FL 0.4 | 225,5 | 233 | 335 | -   | 185 | 245 | -   | 397 | -  | 84  | -   | 300 | -   | 1510 | 200 | 263 | 230 |
| 300 | FL 0.4 | 257   | 264 | 390 | -   | 266 | 280 | -   | 441 | -  | 84  | -   | 450 | -   | 1590 | 232 | 263 | 273 |
| 350 | FL 0.4 | 257   | 264 | 440 | -   | 270 | 325 | -   | 508 | -  | 84  | -   | 450 | -   | 1700 | 258 | 263 | 318 |
| 400 | FL 0.4 | 279,5 | 287 | 505 | -   | 270 | 350 | -   | 567 | -  | 84  | -   | 450 | -   | 1780 | 292 | 263 | 356 |
| 450 | FL1.6  | 311   | 319 | 560 | -   | 270 | 420 | -   | 631 | -  | 102 | -   | 450 | -   | 2175 | 318 | 263 | 378 |
| 500 | FL1.6  | 359   | 367 | 620 | -   | 270 | 462 | -   | 700 | -  | 102 | -   | 650 | -   | 2305 | 345 | 263 | 420 |
| 600 | FL1.6  | 371,5 | 380 | 730 | -   | 270 | 510 | -   | 805 | -  | 102 | -   | 650 | -   | 2520 | 400 | 263 | 539 |

A1\*: installed face to face

A2\*: minimum required dimension for installation

**PNEUMATIC ACTUATOR**

- The standard pneumatic actuator (double acting on-off cylinder) consists of:
  - $\varnothing \leq 300$ : Aluminum barrels
  - $\varnothing \geq 350$ : Composite barrels
  - Aluminum end caps
  - Stainless Steel (AISI 304) piston rod
  - Nitrile coated steel piston
  - PVC bellows
- Available from DN 80 to DN 400
- Supply Pressure: 6 bar
- Options (on request):
  - Hard anodized barrel and covers
  - Stainless steel barrel and covers on request
  - Open-closed lockout
  - Manual override actuator
  - Fail-safe systems
  - Splash guards
- Instrumentation (on request):
  - Positioners
  - Flow regulators
  - Solenoid valves
  - Air preparation unit
  - Limit/proximity switches



• 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 to contact our technical department

| DN  | ØCYL     | TM (BSP) | A1*   | A2* | B   | C   | D   | E   | F   | G   | H    | J   | ØI  |
|-----|----------|----------|-------|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|
| 80  | C125/114 | 1/4"     | 175   | 183 | 175 | 100 | 124 | 175 | 260 | 175 | 559  | 90  | 62  |
| 100 | C160/140 | 1/4"     | 175   | 183 | 170 | 165 | 140 | 198 | 280 | 220 | 618  | 100 | 85  |
| 150 | C200/200 | 3/8"     | 178   | 186 | 230 | 185 | 175 | 265 | 345 | 277 | 785  | 130 | 137 |
| 200 | C250/252 | 3/8"     | 184   | 192 | 280 | 266 | 205 | 322 | 420 | 382 | 947  | 160 | 175 |
| 250 | C300/313 | 1/2"     | 225,5 | 233 | 335 | 270 | 245 | 415 | 505 | 444 | 1165 | 200 | 230 |
| 300 | C350/359 | 3/4"     | 257   | 264 | 390 | 270 | 280 | 472 | 580 | 515 | 1332 | 232 | 273 |
| 350 | C400/418 | 3/4"     | 257   | 264 | 440 | 270 | 325 | 555 | 710 | 444 | 1590 | 258 | 318 |
| 400 | C400/465 | 3/4"     | 279,5 | 287 | 505 | 270 | 350 | 605 | 760 | 444 | 1715 | 292 | 356 |

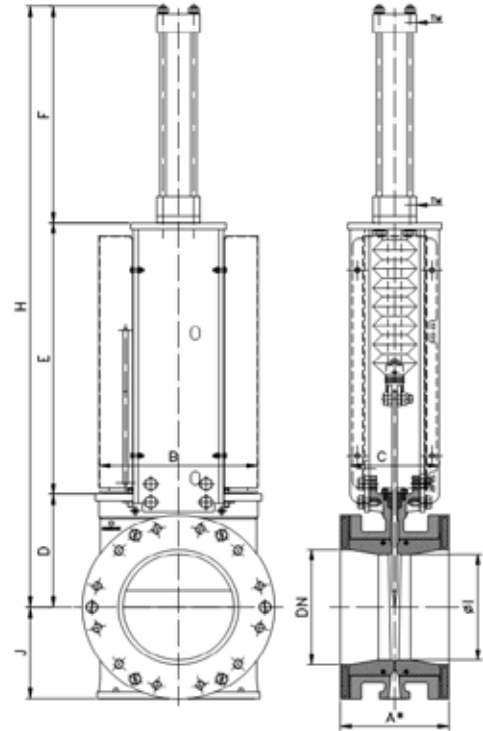
A1\*: installed face to face

A2\*: minimum required dimension for installation

**MODEL****HG**

## HYDRAULIC ACTUATOR

- The hydraulic actuator consists of a double acting cylinder in accordance with ISO 6020/2
- Available from DN 80 to DN 900 with PVC bellows
- Hydraulic pressure: 100 bar
- Maximum hydraulic pressure: 160 bar
- Options:
  - Pressure indicators: mechanical and inductive
  - Open-closed lockout
  - Position transducers
  - Hydraulic groups
  - Electrical cabinets
  - Splash guards
  - Limit/proximity switches



| DN  | ØCYL.     | TM (BSP) | A1*   | A2* | B    | C   | D   | E    | F    | H    | J   | ØI  |
|-----|-----------|----------|-------|-----|------|-----|-----|------|------|------|-----|-----|
| 80  | C32/114   | 1/4"     | 175   | 183 | 175  | 100 | 124 | 283  | 230  | 637  | 90  | 62  |
| 100 | C40/140   | 3/8"     | 175   | 183 | 170  | 100 | 140 | 305  | 248  | 693  | 100 | 85  |
| 150 | C63/200   | 1/2"     | 178   | 186 | 230  | 165 | 175 | 379  | 338  | 883  | 130 | 137 |
| 200 | C80/252   | 3/4"     | 184   | 192 | 280  | 185 | 205 | 427  | 405  | 1037 | 160 | 175 |
| 250 | C100/313  | 3/4"     | 225,5 | 233 | 335  | 266 | 245 | 580  | 484  | 1309 | 200 | 230 |
| 300 | C125/359  | 1"       | 257   | 264 | 390  | 270 | 280 | 639  | 557  | 1480 | 232 | 273 |
| 350 | C125/418  | 1"       | 257   | 264 | 440  | 270 | 325 | 703  | 599  | 1627 | 258 | 318 |
| 400 | C125/465  | 1"       | 279,5 | 287 | 505  | 270 | 350 | 779  | 649  | 1778 | 292 | 356 |
| 450 | C140/520  | 1"       | 311   | 319 | 560  | 270 | 420 | 836  | 710  | 1966 | 318 | 378 |
| 500 | C160/600  | 1"       | 359   | 367 | 620  | 270 | 462 | 952  | 790  | 2188 | 345 | 420 |
| 600 | C200/712  | 1 1/4"   | 371,5 | 380 | 730  | 270 | 510 | 1175 | 940  | 2594 | 400 | 539 |
| 750 | C250/825  | 1"       | 395,5 | 405 | 930  | 320 | 605 | 1273 | 1109 | 2987 | 515 | 680 |
| 800 | C250/907  | 1"       | 470   | 480 | 1040 | 480 | 690 | 1443 | 1168 | 3266 | 575 | 719 |
| 900 | C320/1003 | 1"       | 470   | 480 | 1143 | 485 | 760 | 1526 | 1335 | 3566 | 620 | 810 |

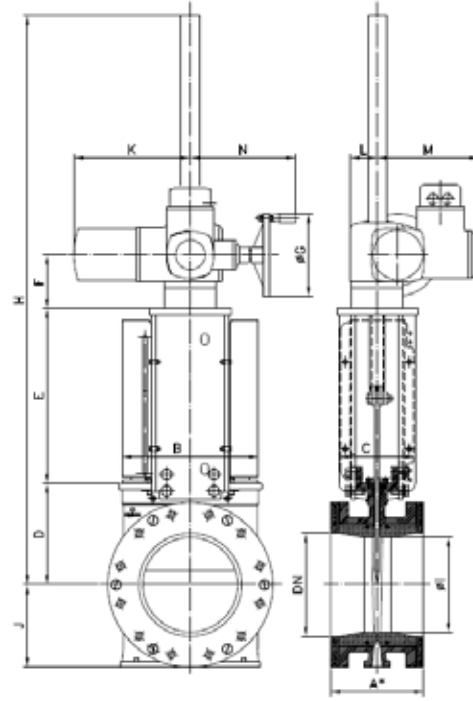
A1\*: installed face to face

A2\*: minimum required dimension for installation

**MODEL****HG**

## ELECTRIC ACTUATOR (rising stem)

- Automatic actuator which consists of:
  - Electric motor
  - Motor support yoke flange (standardised flanges as per ISO 5210/DIN 3338)
  
- The standard electric motor is equipped with:
  - Manual emergency handwheel
  - Limit switches (open/closed)
  - Torque switches
  
- Available from DN 80 to DN 900
  
- Wide range of types and brands available to meet customer requirements
  
- Options: (on request)
  - Open-closed lockout
  - Splash guards



| DN  | A1*   | A2* | B    | C   | D   | E    | F    | ØG  | H    | K   | J   | L   | M   | N   | ØI  | TORQUE (Nm) |
|-----|-------|-----|------|-----|-----|------|------|-----|------|-----|-----|-----|-----|-----|-----|-------------|
| 80  | 175   | 183 | 175  | 100 | 124 | 175  | 442  | 160 | 1000 | 265 | 90  | 62  | 238 | 249 | 62  | 30          |
| 100 | 175   | 183 | 170  | 100 | 140 | 198  | 481  | 160 | 1035 | 265 | 100 | 62  | 238 | 249 | 85  | 40          |
| 150 | 178   | 186 | 230  | 100 | 175 | 265  | 583  | 160 | 1135 | 265 | 130 | 62  | 238 | 249 | 137 | 75          |
| 200 | 184   | 192 | 280  | 165 | 205 | 322  | 682  | 200 | 1245 | 282 | 150 | 65  | 238 | 254 | 175 | 150         |
| 250 | 225,5 | 233 | 335  | 185 | 245 | 415  | 790  | 200 | 1378 | 282 | 200 | 65  | 248 | 254 | 230 | 280         |
| 300 | 257   | 264 | 390  | 266 | 280 | 472  | 882  | 200 | 1470 | 282 | 232 | 65  | 248 | 254 | 273 | 325         |
| 350 | 257   | 264 | 440  | 270 | 325 | 555  | 1055 | 315 | 1657 | 385 | 258 | 91  | 286 | 336 | 318 | 360         |
| 400 | 279,5 | 287 | 505  | 270 | 350 | 605  | 1130 | 315 | 1732 | 385 | 292 | 91  | 286 | 336 | 356 | 500         |
| 450 | 311   | 319 | 560  | 270 | 420 | 677  | 1272 | 315 | 1974 | 385 | 318 | 91  | 286 | 336 | 378 | 600         |
| 500 | 359   | 367 | 620  | 270 | 462 | 742  | 1379 | 400 | 2481 | 385 | 345 | 91  | 286 | 339 | 420 | 700         |
| 600 | 371,5 | 380 | 730  | 270 | 510 | 843  | 1528 | 400 | 2630 | 385 | 400 | 91  | 286 | 339 | 539 | 950         |
| 750 | 395,5 | 405 | 930  | 320 | 605 | 1115 | 1930 | 500 | 3053 | 510 | 515 | 117 | 303 | 365 | 680 | 1490        |
| 800 | 470   | 480 | 1040 | 480 | 690 | 1220 | 2085 | 500 | 3208 | 510 | 575 | 117 | 303 | 365 | 719 | 1800        |
| 900 | 470   | 480 | 1143 | 485 | 760 | 1370 | 2285 | 500 | 3408 | 510 | 620 | 117 | 303 | 365 | 810 | 2500        |

A1\*: installed face to face

A2\*: minimum required dimension for installation



MODEL

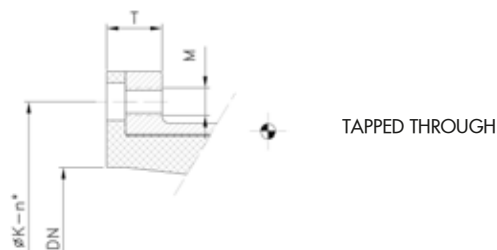
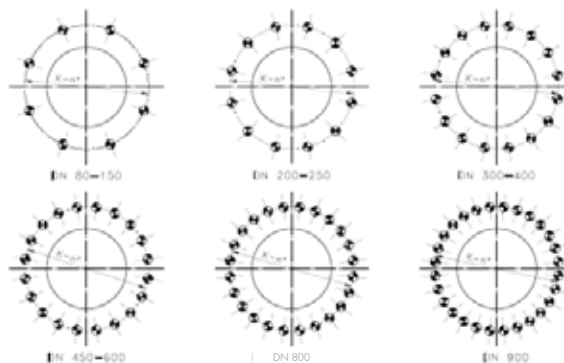
HG



FLANGE AND BOLTING DETAILS

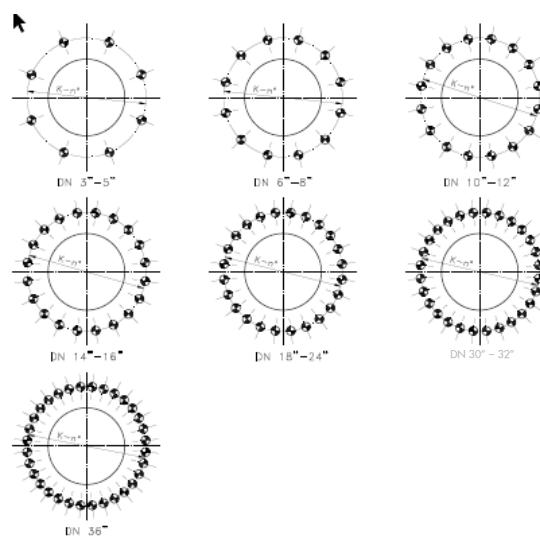
EN 1092-2 PN25

| DN  | K    | n° | M    | T  | ±  |
|-----|------|----|------|----|----|
| 80  | 160  | 8  | M-16 | 39 | 8  |
| 100 | 190  | 8  | M-20 | 39 | 8  |
| 150 | 250  | 8  | M-24 | 42 | 8  |
| 200 | 310  | 12 | M-24 | 45 | 12 |
| 250 | 370  | 12 | M-27 | 47 | 12 |
| 300 | 430  | 16 | M-27 | 52 | 16 |
| 350 | 490  | 16 | M-30 | 57 | 16 |
| 400 | 550  | 16 | M-33 | 61 | 16 |
| 450 | 600  | 20 | M-33 | 63 | 20 |
| 500 | 660  | 20 | M-33 | 67 | 20 |
| 600 | 770  | 20 | M-36 | 72 | 20 |
| 800 | 990  | 24 | M-45 | 80 | 24 |
| 900 | 1090 | 28 | M-45 | 84 | 28 |



ANSI B16.5, class 300(\*)

| DN  | K       | n° | M              | T      | ±  |
|-----|---------|----|----------------|--------|----|
| 3"  | 6 5/8"  | 8  | 3/4" - 10 UNC  | 1 1/2" | 8  |
| 4"  | 7 7/8"  | 8  | 3/4" - 10 UNC  | 1 1/2" | 8  |
| 6"  | 10 5/8" | 12 | 3/4" - 10 UNC  | 1 1/2" | 12 |
| 8"  | 13"     | 12 | 7/8" - 9 UNC   | 1 3/4" | 12 |
| 10" | 15 1/4" | 16 | 1" - 8 UNC     | 1 3/4" | 16 |
| 12" | 17 3/4" | 16 | 1 1/8" - 7 UNC | 2"     | 16 |
| 14" | 20 1/4" | 20 | 1 1/8" - 7 UNC | 2 1/4" | 20 |
| 16" | 22 1/2" | 20 | 1 1/4" - 7 UNC | 2 1/4" | 20 |
| 18" | 24 3/4" | 24 | 1 1/4" - 7 UNC | 2 1/2" | 24 |
| 20" | 27"     | 24 | 1 1/4" - 7 UNC | 2 1/2" | 24 |
| 24" | 32"     | 24 | 1 1/2" - 6 UNC | 2 3/4" | 24 |
| 30" | 39 1/4" | 28 | 1 3/4" - 5 UNC | 4"     | 28 |
| 32" | 41 1/2" | 28 | 1 7/8" - 8 UN  | 3"     | 28 |
| 36" | 46"     | 32 | 2" - 4.5 UNC   | 3 1/4" | 32 |



(\*) From DN 30", acc. to ANSI B16.47 "series A"(class 300)



Klinger Portugal, Lda.  
Via José Régio, 36  
Centro Empresarial Vilar do Pinheiro  
4485-860 Vila do Conde  
T: +351 22 947 0910  
E-mail: geral@klinger.pt

Delegação Lisboa  
Rua de Cabo Verde, 8  
Prior Velho 2685-316  
T: +351 21 940 6620  
E-mail: lisboa@klinger.pt