# MODEL MU

ORBINOX
VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES

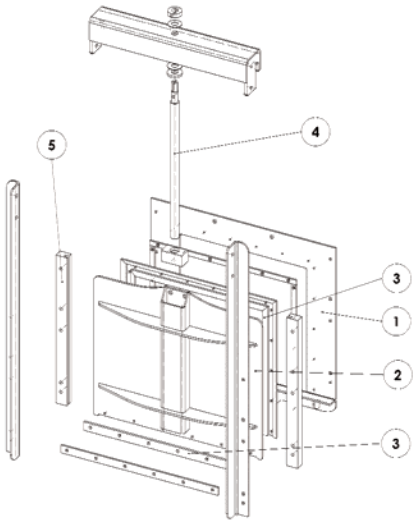
## SLIDE GATE

The MU model is a rectangular penstock suitable for wall and thimble mounting, with a resilient sealing member applied to all 4 sides. There are two different designs, which are size dependent, ≤1000x1000 or ≥1100x1100.

The MU series is used mainly in water treatment, irrigation, hydraulic works and hydro-electric power plants.

This product is manufactured in accordance with the following standards: AWWA 513-05, DIN 19569 and BS 7775.

SIZES: From 200x200 to 2000x2000 (as standard). Alternative sizes available on request.




## CONSTRUCTION MATERIALS

Standard materials of construction:

| | |
|---|---|
| 1.- Frame: | Stainless Steel AISI 304, AISI 316, AISI 316 Ti or Carbon Steel |
| 2.- Gate: | Stainless Steel AISI 304, AISI 316, AISI 316 Ti or Carbon Steel |
| 3.- Seals: | EPDM |
| 4.- Stem: | Stainless steel AISI 303 as standard. AISI 304/AISI 316 on request |
| 5.- Sliders: | UHMWPE |

## SERVICE CONDITIONS

| Size | On-seating design head | Off-seating design head |
|---|---|---|
| 200x200 – 1000x1000 | 10 m.w.c. | 10 m.w.c. |
| 1100x1100 – 2000x2000 | 10 m.w.c. | 2 m.w.c. |

Alternative alloy materials, like AISI 904L or DUPLEX stainless steel, are available if required.





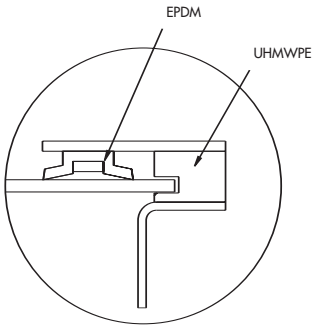
**ORBINOX S.A.** Pol. Ind. s/n - 20270 ANOETA - Tel.: +34 943 698030 - Fax: +34 943 653066 - e-mail: orbinox@orbinox.com
ORBINOX COMERCIAL, ORBINOX CANADA, ORBINOX USA, ORBINOX UK, ORBINOX INDIA, ORBINOX GERMANY, ORBINOX CHINA
**www.orbinox.com**

# MODEL MU

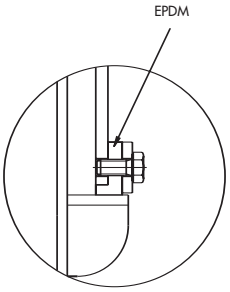
ORBINOX
VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES

## DESIGN FEATURES

- MU slide gates can be fabricated with square or rectangular openings. A circular orifice version, the MC series, is available from Ø200 to Ø600 mm.
- MU penstocks are bi-directional as standard, for sizes ≤1000x1000. On request, we have the capability to provide a custom design service for both off-seating heads and bi-directional aplications, in any size.
- Modular design allows both open frame and self-contained configurations.
- Option of rising or non-rising stem actuation.
- Suitable for linear actuation with either pneumatic or hydraulic cylinders.
- Suitable for wall thimble mounting.
- Frame design allows easy mounting, at medium height or floor level.



SIDE SEALING



INVERT SEALING

- UHMWPE sliders for on-seating and off-seating heads, reduce the friction coeficient during operation, minimising actuation thrust and extending the seal life.
- Stems in AISI 303 stainless steel, threaded in accordance with DIN 103 standard.

## ACTUATORS

MU series modular design ensures they are easily adaptable to non-rising stem (self-contained frame), rising stem (open frame) and linear actuation applications.

**Manual operators:**

- Handwheel with rising spindle
- Handwheel with non-rising spindle
- Gear box with rising spindle
- Gear box with non rising spindle
- Others (cap top,...)

**Actuators:**

- Electric actuator
- Pneumatic cylinder
- Hydraulic cylinder

Slide gates with a self-contained frame design accommodate a direct interface with various actuators. However, when using extensions, the actuator must be mounted securely onto a dedicated floor pillar or appropriate wall bracket supports.

**Accessories:**
There are various accessories available for the manual operatrors or actuators: mechanical stops, actuator manual overrides, locking devices, solenoid valves, positioners, limit switches, proximity switches or sensors, etc.



**ORBINOX S.A.** Pol. Ind. s/n - 20270 ANOETA - Tel.: +34 943 698030 - Fax: +34 943 653066 - e-mail: orbinox@orbinox.com
ORBINOX COMERCIAL, ORBINOX CANADA, ORBINOX USA, ORBINOX UK, ORBINOX INDIA, ORBINOX GERMANY, ORBINOX CHINA
**www.orbinox.com**

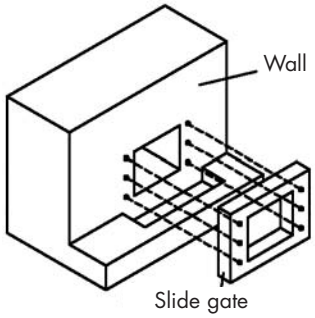
# MODEL MU

ORBINOX
VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES

## INSTALLATION INSTRUCTIONS

### 1. Wall mounting

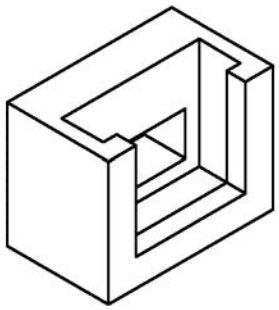
#### 1.1. Slide gates ≤ 2000




- Open the gate.
- Place the frame against the wall making sure the orifices on both the wall and the frame are perfectly aligned.
- Drill the concrete using the holes on the frame as a guide.
- Introduce the anchor bolts with a hammer.
- In order to avoid leakage between frame and the wall, separate the frame from the wall and fill the space between them with SIKAFLEX 11 FC or similar. As an alternative, soft adhesive rubber tape can be used (20mm wide by 10mm deep), placed on the back of the frame around the orifice.
- Place the frame back on the wall and tighten the fasteners of the anchor bolts. Be very careful not bending the frame.

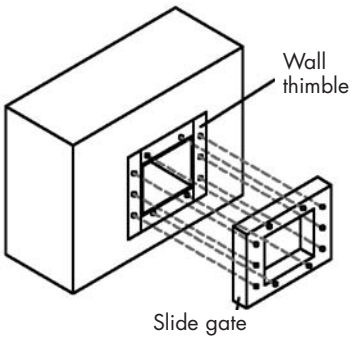
**⚠ WARNING!!**
If the wall is not level, tightening the fasteners fully may bend the frame. Use of a spirit level or flat ruler is recommended, whilst installing, to control the level of the frame. If you notice the frame is beginning to bend, stop tightening. Fill the void between the wall and metal frame with expansive mortar, allow necessary time to dry. Once satisfied, resume retighten all fasteners. Malfunctioning of a penstock due to incorrect installation is not the responsibility of ORBINOX.

#### 1.2. Slide gates > 2000



- Slide gates on these sizes can not be held on the wall by only anchor bolts. They have to be held into concrete. The wall must have a shape similar to the one shown in the figure. Dimensions are shown in drawings.
- Place the frame against the wall with the seal side downstream.
- Center the slide gate horizontally and vertically making sure the orifices of both the frame and the wall are perfectly aligned.
- Hold the slide gate in place in such position. The slide gates are delivered with special bolts, nuts and counternuts to adjust the frame and fix it in position.
- Fill the void with expansive mortar type SIKAGROUT or similar.

### 2. Wall thimble mounting




- MU slide gates can be mounted on a wall thimble. The thimble has threaded holes, to be aligned with the fixing holes on the frame of the slide gate.
- Thighten the frame against the wall thimble placing a seal between them.

MODEL **MU**

ORBINOX
VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES

# MAINTENANCE INSTRUCTIONS

## 1. Stem lubrication

Keep the stem well greased to avoid premature wear of the bronze nut.

## 2. Seal replacement

The seals are retained with stainless steel plates and fasteners. After replacing the seals, the fixing components can be reused.

# OPERATING INSTRUCTIONS

## 1. Opening and closing

A clockwise rotation closes the gate. Once the closed position is reached, apply additional 1/4 turn. This will ensure that the bottom seal is properly pressed.

⚠ **WARNING!!**
Forcing the spindle unnecessarily does not improve the sealing performance and may cause irrepairable damage on stems, nuts, gates and frames.

A counter clockwise rotation opens the gate. The gate will stop against the upper beam once the slide gate is fully open.

The slide gate operating system is self-locking by design, thus the gate will remain in the last operated position: open, closed or intermediate.

## 2. Electric actuators

Electric actuators for ORBINOX slide gates should have the following adjustments:

**Opening:**
Position indicator and motor cut-off by limit switch.
Adjust the torque switch setting at the values specified by ORBINOX.

**Closing:**
Position indicator and motor cut-off by limit switch or torque switch.
Adjust the torque switch setting at the values specified by ORBINOX.

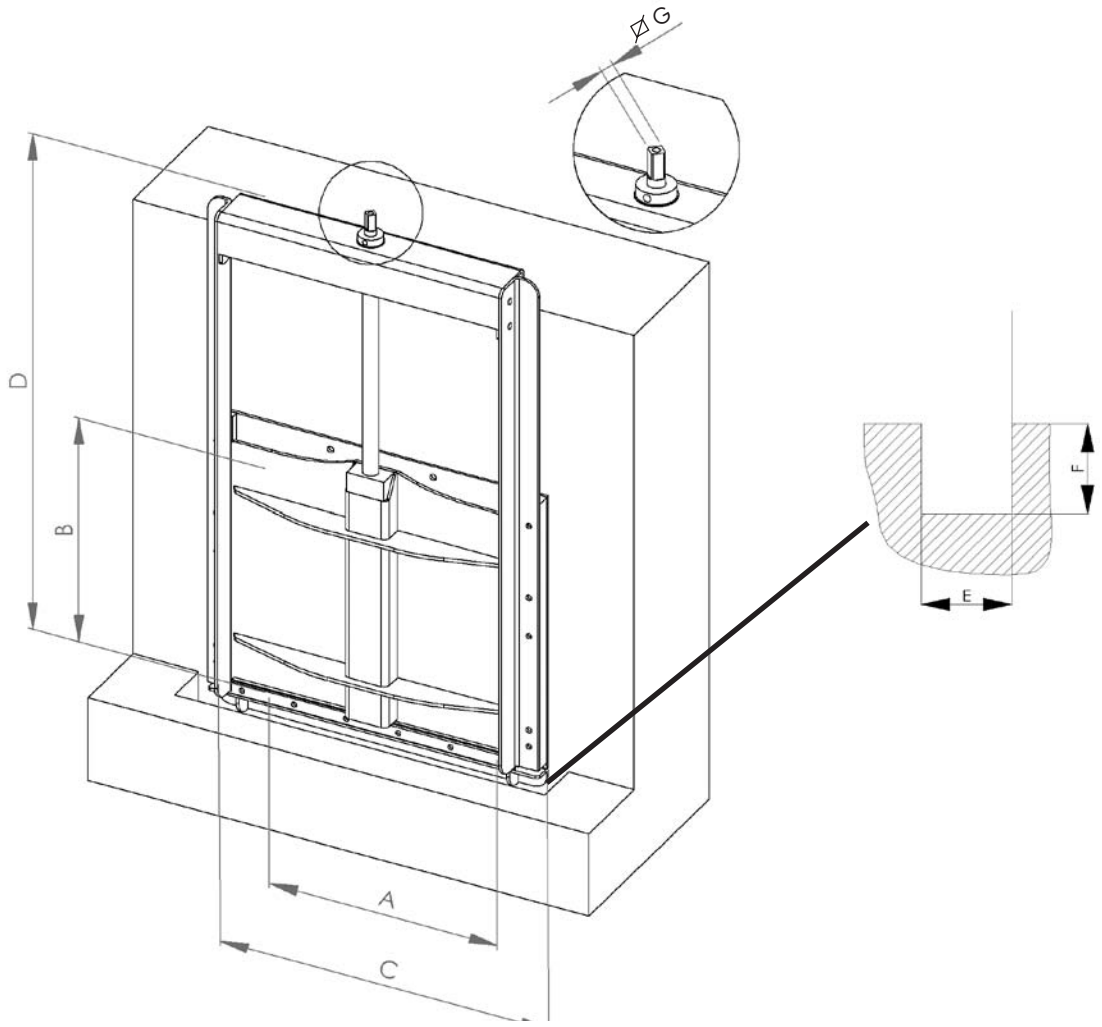
⚠ **WARNING!!**

- Electric motors without limit and torque switches are not applicable to ORBINOX slide gates
- Electric motors have internal anti-condensation electric heaters. Avoid mounting the actuators outside if they are not connected to the electric supply. Internal humidity could damage the electric/electronic components.
- For motor maintenance, refer to the dedicated manufacturers IOM manual.

# MODEL MU

ORBINOX
VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES

## MU NON RISING STEM ≤ 1000X1000




| A | B | C | D | ⌀ G | E X F |
|---|---|---|---|---|---|
| 200 | 200 | 380 | 492 | ⌀12x12 | 70x75 |
| 300 | 300 | 480 | 692 | ⌀12x12 | 70x75 |
| 400 | 400 | 580 | 893 | ⌀14x14 | 70x75 |
| 500 | 500 | 680 | 1093 | ⌀14x14 | 70x75 |
| 600 | 600 | 780 | 1294 | ⌀14x14 | 70x75 |
| 700 | 700 | 880 | 1496 | ⌀14x14 | 70x75 |
| 800 | 800 | 980 | 1696 | ⌀14x14 | 70x75 |
| 900 | 900 | 1100 | 1976 | ⌀20x20 | 70x85 |
| 1000 | 1000 | 1200 | 2176 | ⌀20x20 | 70x85 |

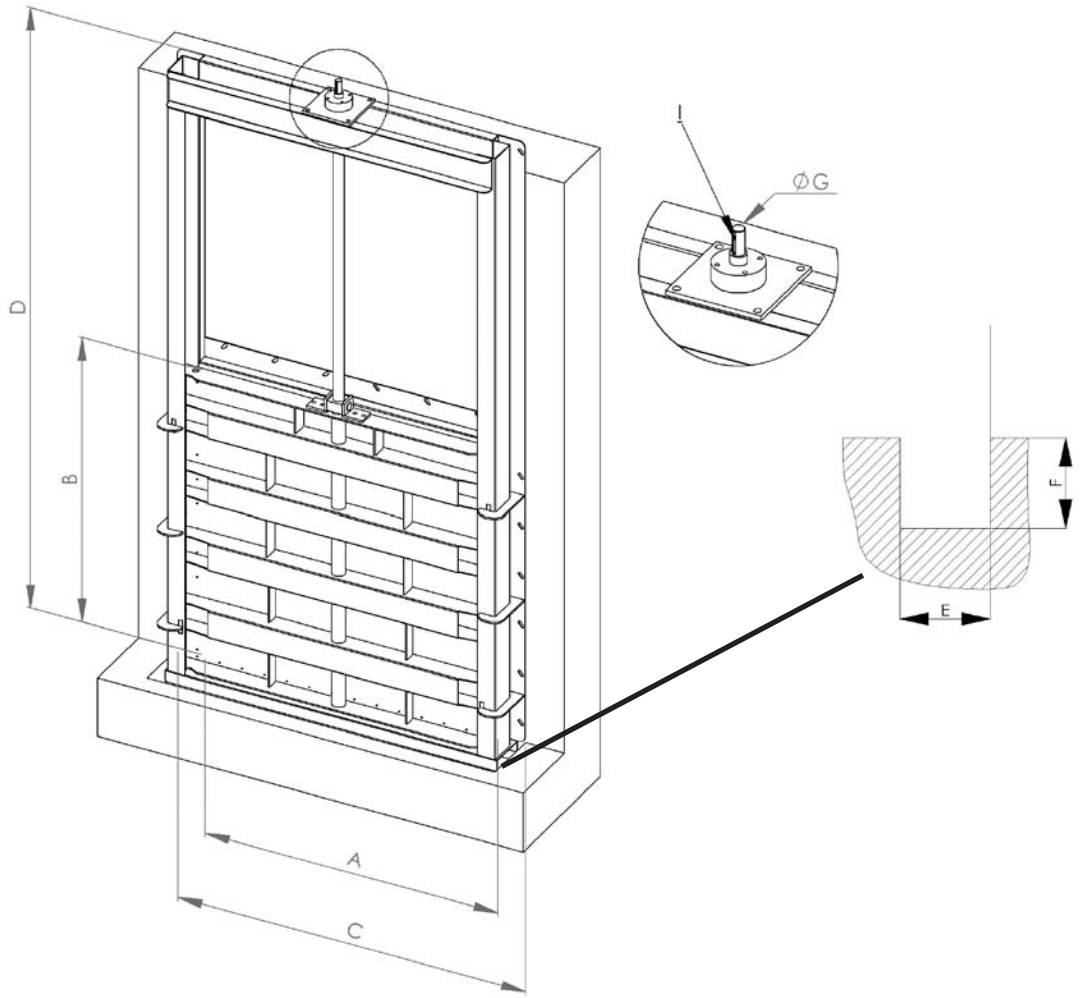


**ORBINOX S.A.** Pol. Ind. s/n - 20270 ANOETA - Tel.: +34 943 698030 - Fax: +34 943 653066 - e-mail: orbinox@orbinox.com
ORBINOX COMERCIAL, ORBINOX CANADA, ORBINOX USA, ORBINOX UK, ORBINOX INDIA, ORBINOX GERMANY, ORBINOX CHINA
**www.orbinox.com**

# MODEL MU

ORBINOX
VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES

## MU NON RISING STEM 1100X1100 - 2000X2000




| A | B | C | D | Ø G | I | E X F |
|---|---|---|---|---|---|---|
| 1100 | 1100 | 1380 | 2370 | Ø 30 | 8x7x60 | 300x110 |
| 1200 | 1200 | 1430 | 2570 | Ø 30 | 8x7x60 | 300x110 |
| 1300 | 1300 | 1580 | 2770 | Ø 30 | 8x7x60 | 300x110 |
| 1400 | 1400 | 1680 | 2970 | Ø 30 | 8x7x60 | 300x110 |
| 1500 | 1500 | 1780 | 3170 | Ø 30 | 8x7x60 | 300x110 |
| 1600 | 1600 | 1880 | 3370 | Ø 35 | 10x8x70 | 400x140 |
| 1700 | 1700 | 1780 | 3570 | Ø 35 | 10x8x70 | 400x140 |
| 1800 | 1800 | 2080 | 3770 | Ø 35 | 10x8x70 | 400x140 |
| 1900 | 1900 | 2180 | 3970 | Ø 35 | 10x8x70 | 400x140 |
| 2000 | 2000 | 2280 | 4170 | Ø 35 | 10x8x70 | 400x140 |

* For alternative sizes check with ORBINOX technical department.

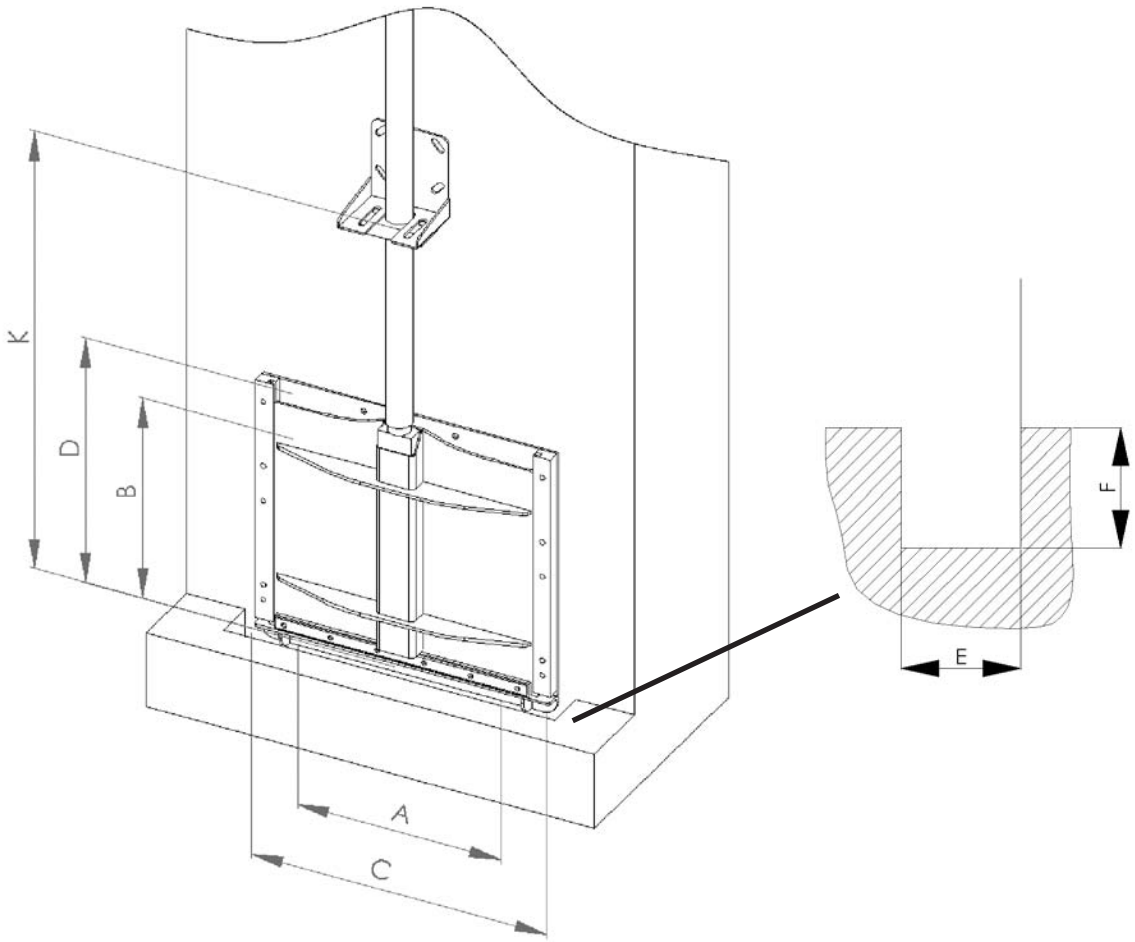


**ORBINOX S.A.** Pol. Ind. s/n - 20270 ANOETA - Tel.: +34 943 698030 - Fax: +34 943 653066 - e-mail: orbinox@orbinox.com
ORBINOX COMERCIAL, ORBINOX CANADA, ORBINOX USA, ORBINOX UK, ORBINOX INDIA, ORBINOX GERMANY, ORBINOX CHINA
**www.orbinox.com**

# MODEL MU

ORBINOX
VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES

## MU RISING STEM ≤ 1000X1000




| A | B | C | D | K | E X F |
|---|---|---|---|---|---|
| 200 | 200 | 380 | 290 | 475 | 70x75 |
| 300 | 300 | 480 | 390 | 675 | 70x75 |
| 400 | 400 | 580 | 490 | 900 | 70x75 |
| 500 | 500 | 680 | 590 | 1100 | 70x75 |
| 600 | 600 | 780 | 690 | 1300 | 70x75 |
| 700 | 700 | 880 | 790 | 1500 | 70x75 |
| 800 | 800 | 980 | 890 | 1700 | 70x75 |
| 900 | 900 | 1100 | 1000 | 1904 | 70x85 |
| 1000 | 1000 | 1200 | 1100 | 2104 | 70x85 |

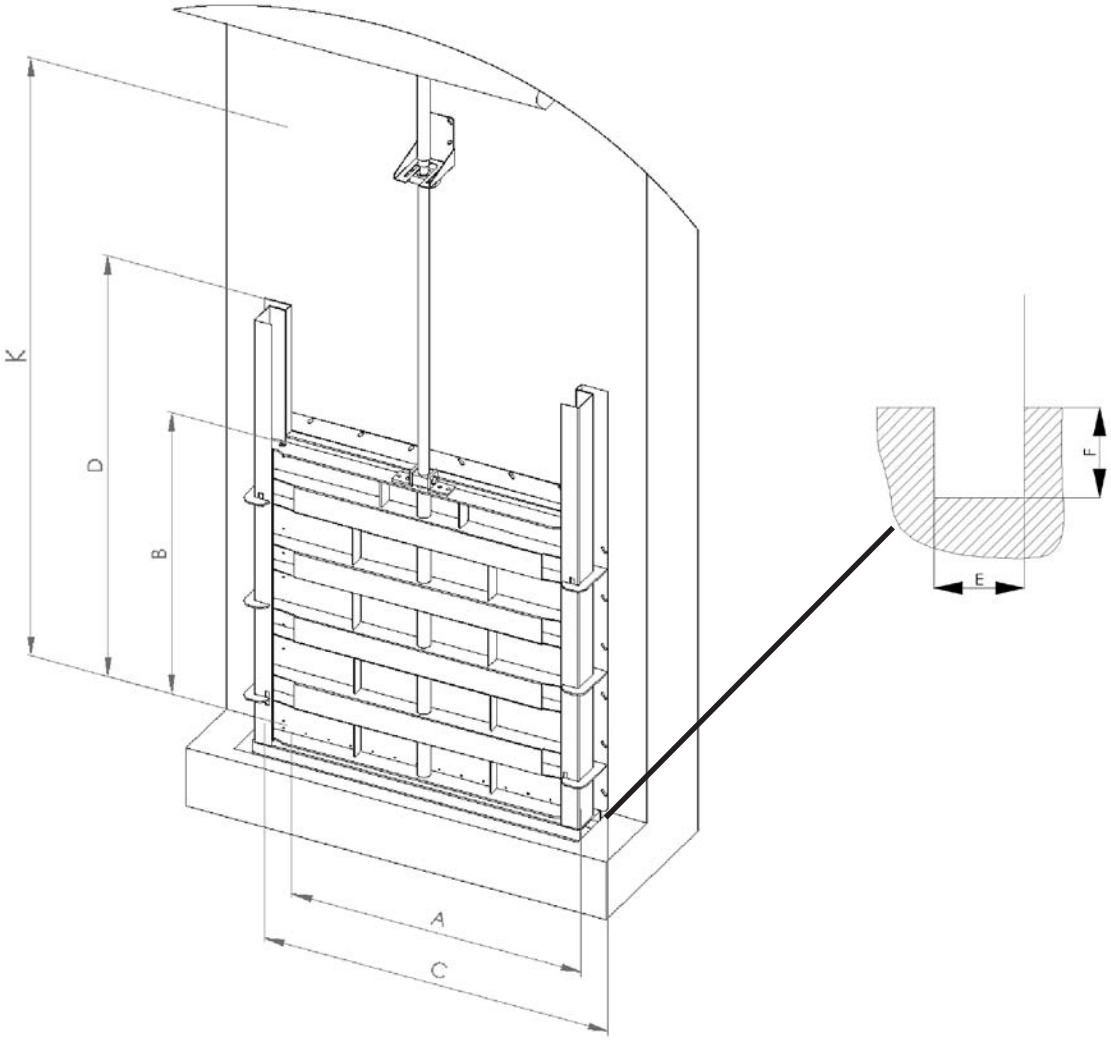


**ORBINOX S.A.** Pol. Ind. s/n - 20270 ANOETA - Tel.: +34 943 698030 - Fax: +34 943 653066 - e-mail: orbinox@orbinox.com
ORBINOX COMERCIAL, ORBINOX CANADA, ORBINOX USA, ORBINOX UK, ORBINOX INDIA, ORBINOX GERMANY, ORBINOX CHINA
**www.orbinox.com**

# MODEL MU

ORBINOX
VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES

## MU RISING STEM 1100X1100 - 2000X2000




| A | B | C | D | K | E X F |
|---|---|---|---|---|---|
| 1100 | 1100 | 1380 | 1850 | 2260 | 300x110 |
| 1200 | 1200 | 1430 | 2000 | 2460 | 300x110 |
| 1300 | 1300 | 1580 | 2150 | 2660 | 300x110 |
| 1400 | 1400 | 1680 | 2300 | 2860 | 300x110 |
| 1500 | 1500 | 1780 | 2450 | 3060 | 300x110 |
| 1600 | 1600 | 1880 | 2600 | 3260 | 400x140 |
| 1700 | 1700 | 1980 | 2750 | 3460 | 400x140 |
| 1800 | 1800 | 2080 | 2900 | 3660 | 400x140 |
| 1900 | 1900 | 2180 | 3050 | 3860 | 400x140 |
| 2000 | 2000 | 2280 | 3200 | 4060 | 400x140 |

* For alternative sizes check with ORBINOX technical department.



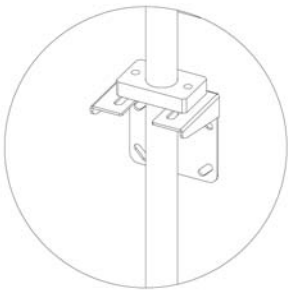
**ORBINOX S.A.** Pol. Ind. s/n - 20270 ANOETA - Tel.: +34 943 698030 - Fax: +34 943 653066 - e-mail: orbinox@orbinox.com
ORBINOX COMERCIAL, ORBINOX CANADA, ORBINOX USA, ORBINOX UK, ORBINOX INDIA, ORBINOX GERMANY, ORBINOX CHINA
**www.orbinox.com**

ORBINOX
VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES

# EXTENSIONS

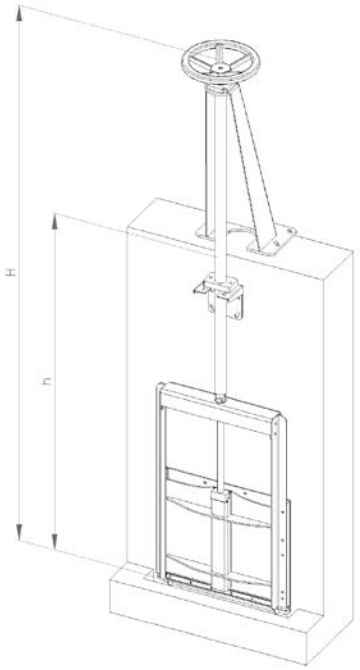
Tube extensions are used to allow operation of the gate remotely. Connections to the slide gate are by means of square nuts or fixed couplings.

Should the length of the extension exceed 2-3 meters, dedicated polyethylene guides will be provided and must be utilised with the appropriate wall brackets and fixings, as illustrated.



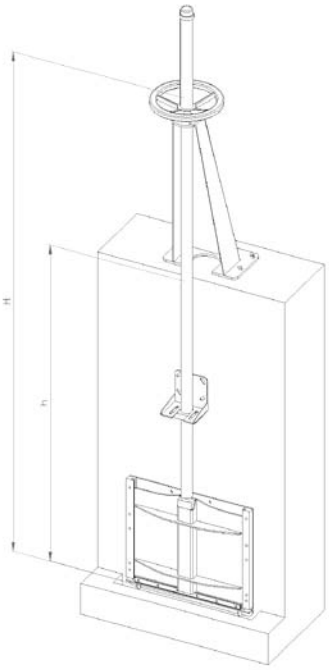
## Non-rising stem

Slide gate with a self-contained frame. The extension does not support axial load, thus less wall supports are required. As a general rule, one support every 3-4 meters of extension should be used.




## Rising stem

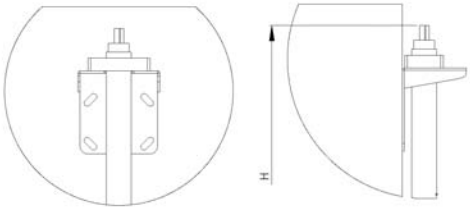
Slide gate with open frame. The extension supports the axial load, thus wall supports must be considered to avoid buckling. One support every 2 meters of extension is necessary.



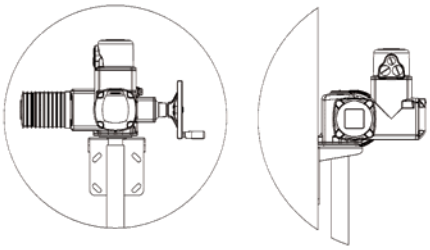
# MODEL MU

ORBINOX
VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES

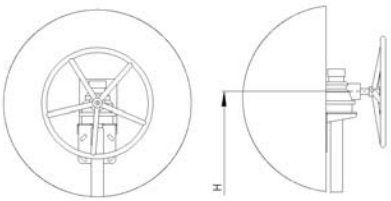
## WALL SUPPORT AND SQUARE NUT



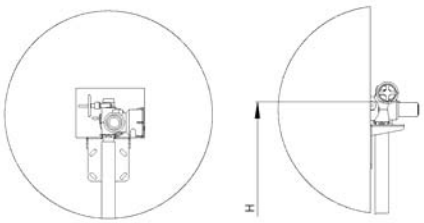

## WALL SUPPORT AND HANDWHEEL



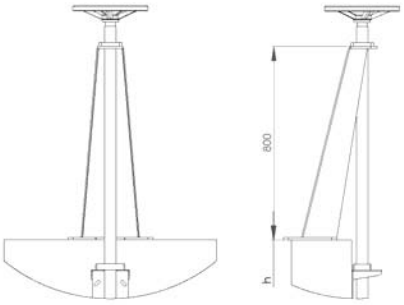
## BEVEL GEAR ON WALL SUPPORT



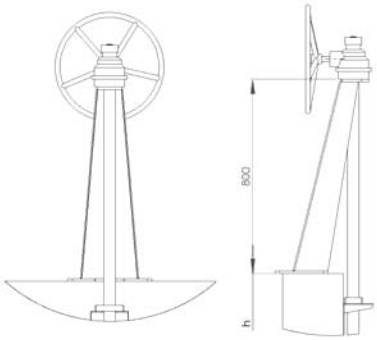

## ACTUATOR ON WALL SUPPORT




## HANDWHEEL ON INCLINED PEDESTAL



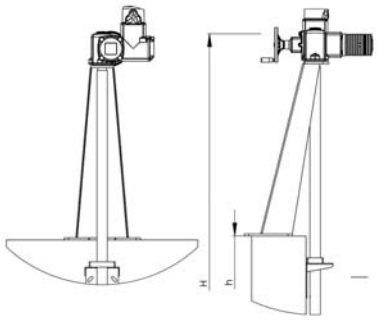

## BEVEL GEAR ON INCLINED PEDESTAL



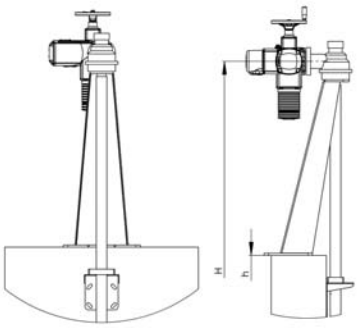
# MODEL MU

ORBINOX
VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES

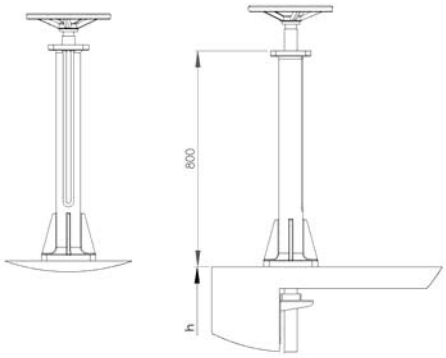
## ACTUATOR ON INCLINED PEDESTAL



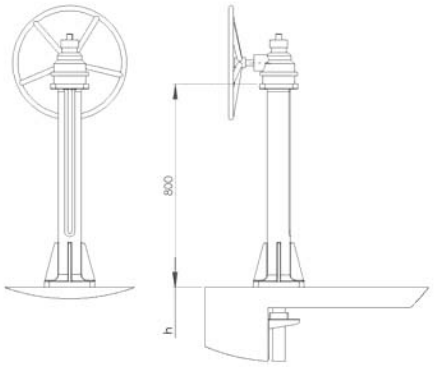

## BEVEL GEAR WITH ACTUATOR ON INCLINED PEDESTAL



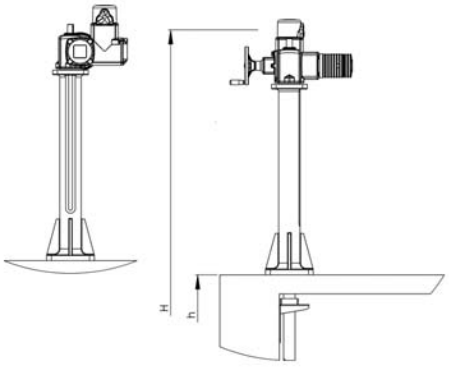

## HANDWHEEL ON STRAIGHT PEDESTAL



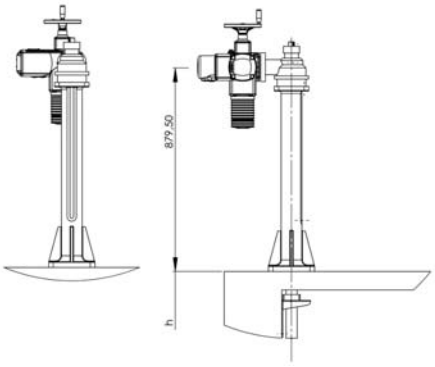

## BEVEL GEAR ON STRAIGHT PEDESTAL




## MOTOR ON STRAIGHT PEDESTAL



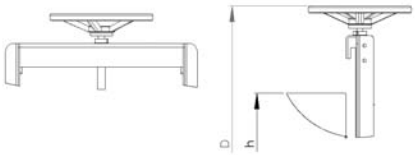

## BEVEL GEAR AND MOTOR ON STRAIGHT PEDESTAL



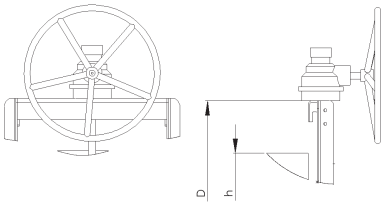
# MODEL MU

ORBINOX
VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES

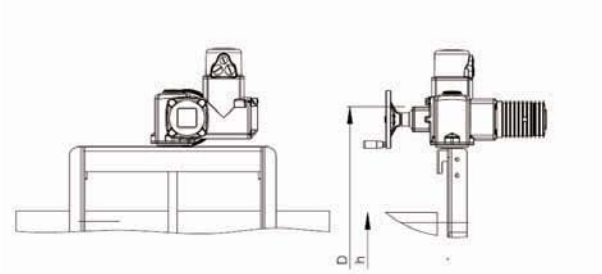
## HANDWHEEL ON FRAME



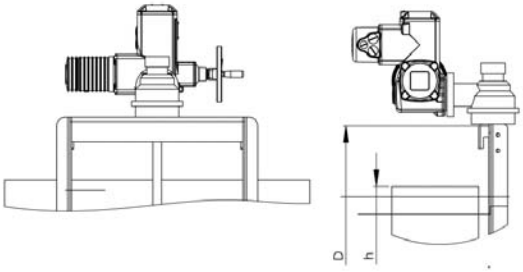

## BEVEL GEAR ON FRAME



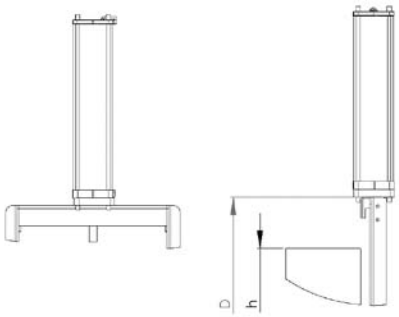

## ACTUATOR ON FRAME



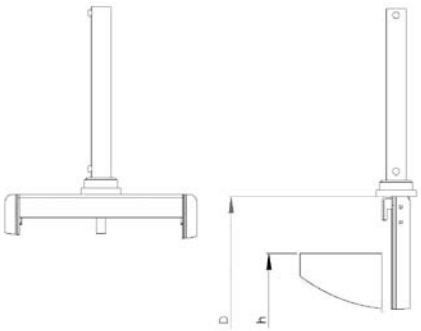

## BEVEL GEAR AND ACTUATOR ON FRAME




## PNEUMATIC CYLINDER ON FRAME



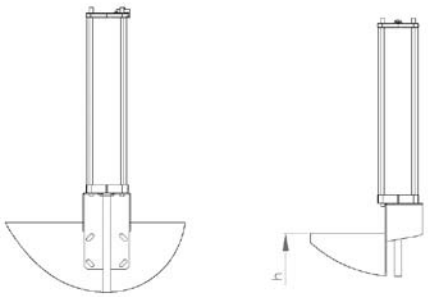

## HYDRAULIC CYLINDER ON FRAME



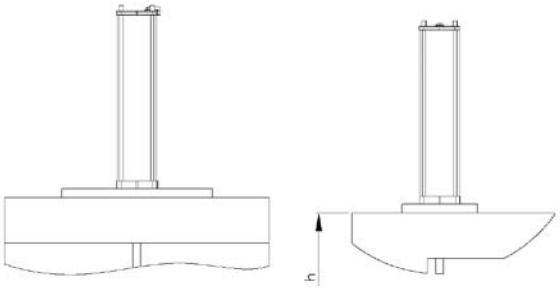
# MODEL MU

ORBINOX
VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES

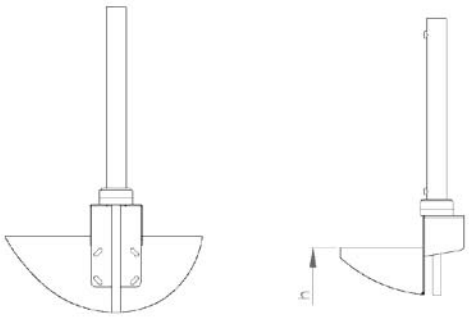
## PNEUMATIC CYLINDER ON WALL SUPPORT



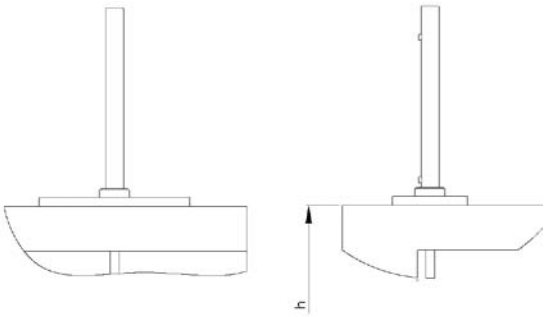
## PNEUMATIC CYLINDER ON FLOOR SUPPORT



## HYDRAULIC CYLINDER ON WALL SUPPORT



## HYDRAULIC CYLINDER ON FLOOR SUPPORT



# MODEL MU

ORBINOX
VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES

Slide gate with resilient sealing featuring on 4 sides.

Fabricated slide gates can be adapted for any application.
Please provide the information requested on this sheet.

1. Number of pieces: _____

2. Orifice size:
   Width (mm): _____
   Height (mm): _____

3. Head oh water:
   On-seat: _____
   Off-seat: _____

4. Operating level: _____

5. Fabrication material:
   ☐ AISI 304
   ☐ AISI 316
   ☐ AISI 316 Ti
   ☐ Carbon Steel
   ☐ Others: _____

6. Actuator:
   ☐ Hand wheel
   ☐ Bevel geal
   ☐ Electric
   ☐ Hydraulic
   ☐ Pneumatic
   ☐ Others: _____

7. Type of elevation:
   ☐ Rising stem
   ☐ Non rising stem

8. Wall fixing:
   ☐ Wall fixing with anchor bolts
   ☐ Wall thimble fixing
   ☐ Embedded in concrete