



# Installation, Operation and Maintenance Manual

## RB Weir Gate

<b>INSTALLATION, OPERATION AND MAINTENANCE MANUAL</b>		05-2010 Edition Revision -
<b>MODEL</b>	<b>RB WEIR GATES</b>	 <b>ORBINOX</b> <small>VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES</small>

## INDEX

	<u>Page</u>
Introduction .....	3
Handling and Storage .....	3
Installation .....	4
• Weir Gate installation .....	4
• Concrete Wall Mounted .....	4
• Concrete Round Manhole Wall Mounted .....	8
• Wall Thimble Mounted .....	8
• Installation of Stem Extension, Stem Guides and Floor Stand .....	9
Operation .....	11
Maintenance .....	12
• Cleaning and lubrication .....	12
• Seal replacement .....	13
• Sizes 8"x8" to 48"x48" .....	13
• Sizes 49"x49" to 80"x80" .....	15
Trouble shooting .....	17

ORBINOX reserves the right to change specifications without notice.

**ORBINOX CANADA, ORBINOX USA, ORBINOX SPAIN, ORBINOX UK, ORBINOX FRANCE, ORBINOX GERMANY, ORBINOX INDIA, ORBINOX CHINA**

**WWW.ORBINOX.COM**

<b>INSTALLATION, OPERATION AND MAINTENANCE MANUAL</b>		05-2010 Edition Revision -
<b>MODEL</b>	<b>RB WEIR GATES</b>	 <b>ORBINOX</b> <small>VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES</small>

## INTRODUCTION

This manual describes the recommended procedures for installation, operation, maintenance and safety precautions for Orbinox RB model weir gates. Please read thoroughly all the instructions in the manual prior to installation, and contact an Orbinox representative in case of any questions. The manual makes reference to the "General Arrangement Drawing" (GAD). The GAD is the drawing that is sent to and approved by the customer prior to the production of the weir gate. **Orbinox assumes no responsibility or liability if the slide gate is not installed, operated and maintained in strict accordance to the procedures described in this manual.**

## HANDLING AND STORAGE

Standard safety procedures should be followed to prevent personal injury or equipment damage. Additionally, the following instructions shall be followed during handling and storage to prevent any damage of the product:

- Stems have precision surfaces and should never be used as a mean to lift the slide gate.
- Special care shall be taken on any machined surface when lifting the gate.
- Equipment shall be stored in a dry, clean and even area on a raised even wood surface to prevent distortion of the frame. Do not stack slide gates.
- Stems and extensions that are shipped separately shall be supported over their entire length to prevent any bending or distortion while in storage.

ORBINOX reserves the right to change specifications without notice.

**ORBINOX CANADA, ORBINOX USA, ORBINOX SPAIN, ORBINOX UK, ORBINOX FRANCE, ORBINOX GERMANY, ORBINOX INDIA, ORBINOX CHINA**

**WWW.ORBINOX.COM**

<b>INSTALLATION, OPERATION AND MAINTENANCE MANUAL</b>		05-2010 Edition Revision -
<b>MODEL</b>	<b>RB WEIR GATES</b>	 <b>ORBINOX</b> <small>VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES</small>

## INSTALLATION: CONCRETE WALL MOUNTED

### Required Materials:

Orbinox RB Weir Gates are installed by means of Anchor Bolts. Depending on the size and working conditions they shall be either of the mechanical or chemical type. Note that as standard, anchor bolts and construction sealant are not supplied with the weir gate.

In order to get the expected performance of the anchor bolts, the minimum concrete strength shall be 3,000 PSI (20.7 MPa).

In order to avoid leakage between the concrete wall and the frame, construction sealant shall be used. (Sikabond Construction Sealant or equivalent, 200ml per meter of opening perimeter).

The following table gives a general description of the required anchor bolt types for the different gate sizes and pressure conditions. For detailed information about the type, size and quantity of the required anchor bolts, or any other specific installation notes or materials, please refer to the notes on the 'General Arrangement Drawing'.

RB Size	Water Pressure	Anchor Bolt Type	Recommended (Hilti or equivalent)
<b>RB - 3 Side Sealed</b> 6" x 6" - 80" x 80" (150mm x 150mm - 2000mm x 2000mm)	Seating and Un-Seating (Bi-Directional)	Stud Type Mechanical Anchor Bolts	Hilti 'Kwik 3'
<b>RB - 4 Side Sealed</b> 6" x 6" - 48" x 48" (150mm x 150mm - 1200mm x 1200mm)	Seating and Un-Seating (Bi-Directional)	Stud Type Mechanical Anchor Bolts and Bolt Type Mechanical Anchor Bolts	Hilti 'Kwik 3' and Hilti 'HSL'
<b>RB - 4 Side Sealed</b> 52" x 52" - 80" x 80" (1300mm x 1300mm - 2000mm x 2000mm)	Seating and Un-Seating (Bi-Directional)	Chemical Anchor Bolts	Hilti 'HVU'

ORBINOX reserves the right to change specifications without notice.

**ORBINOX CANADA, ORBINOX USA, ORBINOX SPAIN, ORBINOX UK, ORBINOX FRANCE, ORBINOX GERMANY, ORBINOX INDIA, ORBINOX CHINA**

**WWW.ORBINOX.COM**

<b>INSTALLATION, OPERATION AND MAINTENANCE MANUAL</b>		05-2010 Edition Revision -
<b>MODEL</b>	<b>RB WEIR GATES</b>	 <b>ORBINOX</b> <small>VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES</small>

## INSTALLATION: CONCRETE WALL MOUNTED

continued

### Step 1: Concrete wall surface inspection

Concrete wall surface shall be inspected before starting the installation of the weir gate:

- The concrete construction shall be flat, level and plumb, and shall be in accordance to ACI 117-06 standard. If necessary, use non-shrink grout in order to meet the specified standard.
- Concrete wall surface shall be dry (so the construction sealant sets effectively). If it is necessary, the wall can be dried with the help of a blowtorch or a hot air fan.

### Step 2: Pre-installation of the weir gate

- Position the weir gate against the wall and line up with the channel (see Figure 1).
- Drill and install an anchor bolt on each side of the gate (see Figure 2). After installing the first anchor bolt, and prior to drilling the hole of the other side, make sure the frame is perfectly leveled.

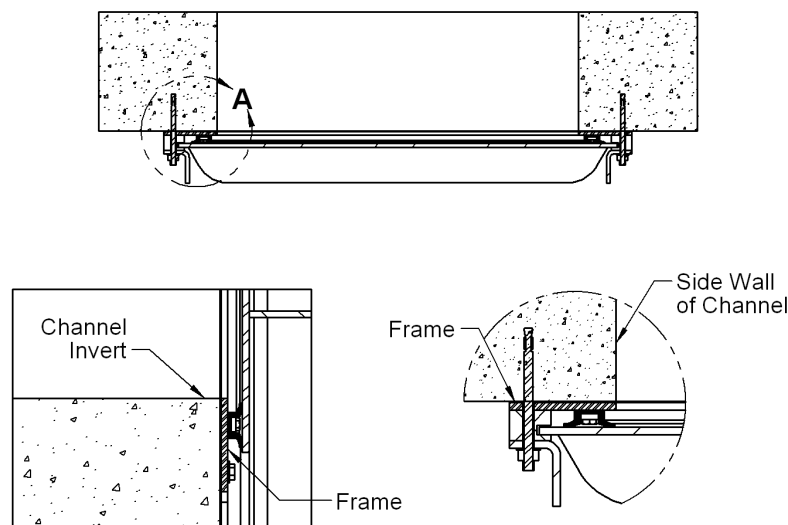


Figure 1

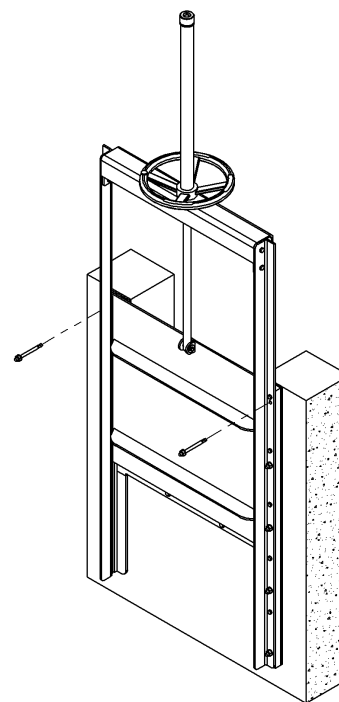


Figure 2

ORBINOX reserves the right to change specifications without notice.

ORBINOX CANADA, ORBINOX USA, ORBINOX SPAIN, ORBINOX UK, ORBINOX FRANCE, ORBINOX GERMANY, ORBINOX INDIA, ORBINOX CHINA

**WWW.ORBINOX.COM**

<b>INSTALLATION, OPERATION AND MAINTENANCE MANUAL</b>		05-2010 Edition Revision -
<b>MODEL</b>	<b>RB WEIR GATES</b>	 <b>ORBINOX</b> <small>VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES</small>

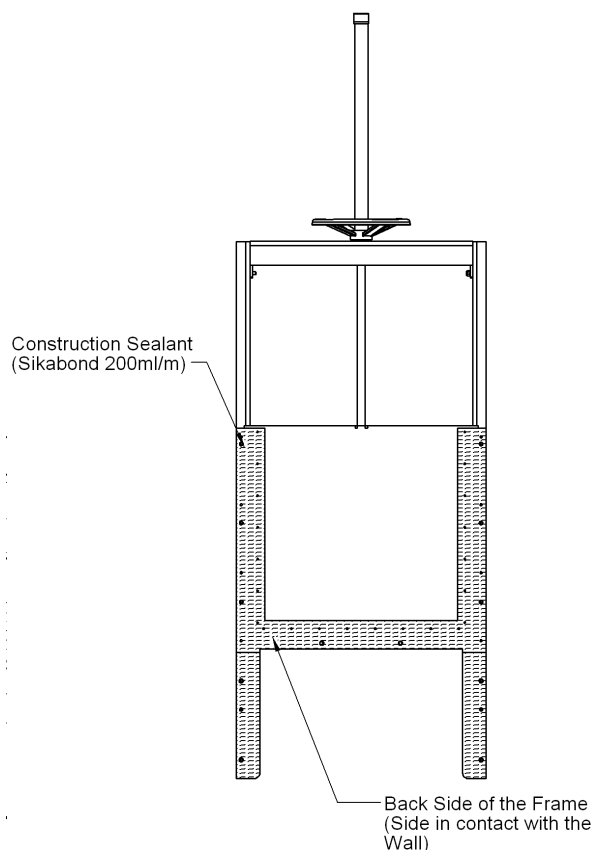
## INSTALLATION: CONCRETE WALL MOUNTED

continued

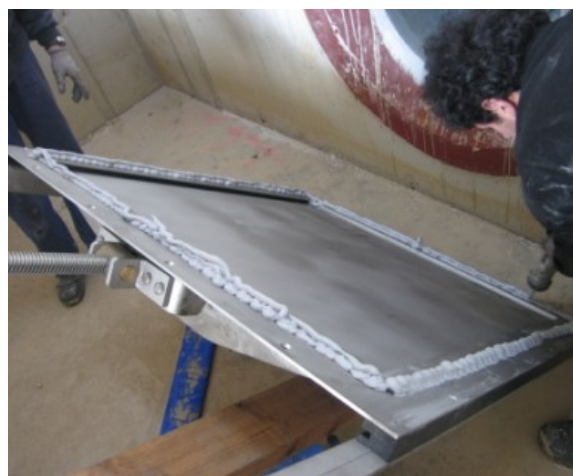
### Step 3: Construction sealant application (Sikabond or equivalent)

In order to avoid leakage between the frame and the wall, construction sealant shall be applied on the frame:

- Remove the weir gate from the wall (first remove the nuts of the anchor bolts).
- Apply construction sealant all around the perimeter of the frame. Sikabond (200 ml/m) or equivalent construction sealant shall be used (See Figure 3 and Figure 4). Be sure not to get sealant on the gate's seals, guides, and/or stem, as this may cause leakage or damage.
- Re-install the weir gate on the wall and tighten both anchor bolts.



**Figure 3**



**Figure 4**

ORBINOX reserves the right to change specifications without notice.

**ORBINOX CANADA, ORBINOX USA, ORBINOX SPAIN, ORBINOX UK, ORBINOX FRANCE, ORBINOX GERMANY, ORBINOX INDIA, ORBINOX CHINA**

**WWW.ORBINOX.COM**

### INSTALLATION: CONCRETE WALL MOUNTED

continued

#### Step 4: Final installation of the weir gate

- Drill and install the rest of the anchor bolts (see Figure 5).

**CAUTION!:** If the weir gate is not completely in contact with the wall, do not over-tighten the anchor bolts. Over tightening may bend or distort the frame. If the wall flatness and levelness is according to the specified standards, the construction sealant will fill in the remaining void (see Figure 6).

- Apply construction sealant around the frame in order to fill in any existing gap between the wall and the frame (this step is only for esthetics). Wipe away the excess sealant to leave a smooth finish.

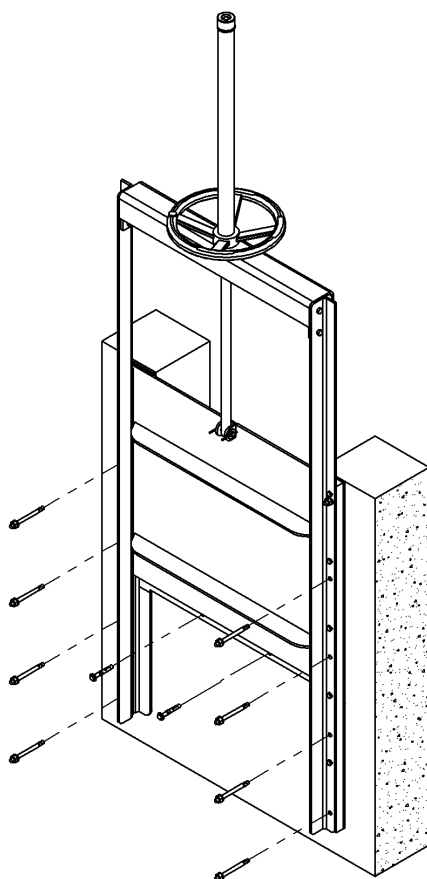


Figure 5

Do not overtight  
Anchor Bolt

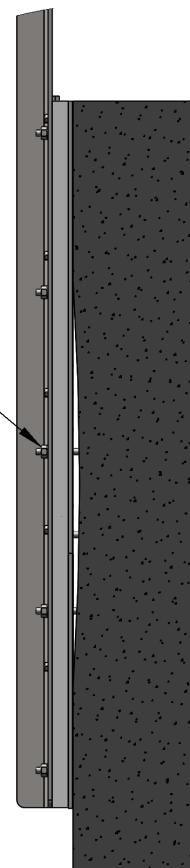


Figure 6

ORBINOX reserves the right to change specifications without notice.

ORBINOX CANADA, ORBINOX USA, ORBINOX SPAIN, ORBINOX UK, ORBINOX FRANCE, ORBINOX GERMANY, ORBINOX INDIA, ORBINOX CHINA

**WWW.ORBINOX.COM**

<b>INSTALLATION, OPERATION AND MAINTENANCE MANUAL</b>		05-2010 Edition Revision -
<b>MODEL</b>	<b>RB WEIR GATES</b>	 <b>ORBINOX</b> <small>VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES</small>

## INSTALLATION: ROUND MANHOLE MOUNTED

Follow the instructions of “Concrete Wall Mounted” installation. Anchor bolts shall be installed perpendicular to the surface.

## INSTALLATION: WALL THIMBLE MOUNTED

### Required Materials:

Orbinox Wall Thimble Mounted RB Weir Gates are installed by means of Hex Bolts. In order to avoid leakage between the wall thimble and the frame, construction sealant shall be used. (Sikabond Construction Sealant or equivalent, 200ml per meter of opening perimeter). For detailed information about the size and quantity of the required bolts, or any other specific installation notes or materials, please refer to the notes on the ‘General Arrangement Drawing’. Note that as standard, bolts and construction sealant are not supplied with the slide gate.

### Installation:

- The concrete construction shall be flat, level and plumb, and shall be in accordance to ACI 117-06 standard. If necessary, use non-shrink grout in order to meet the specified standard.
- Apply construction sealant all around the perimeter of the frame. Sikabond (200 ml/m) or equivalent construction sealant shall be used.
- Partially tighten the four corner bolts, and check that the weir gate is perfectly lined up with the wall thimble opening.
- Install the rest of the bolts, and evenly tighten all of them.

ORBINOX reserves the right to change specifications without notice.

**ORBINOX CANADA, ORBINOX USA, ORBINOX SPAIN, ORBINOX UK, ORBINOX FRANCE, ORBINOX GERMANY, ORBINOX INDIA, ORBINOX CHINA**

**WWW.ORBINOX.COM**



<b>INSTALLATION, OPERATION AND MAINTENANCE MANUAL</b>		05-2010 Edition Revision -
<b>MODEL</b>	<b>RB WEIR GATES</b>	

## INSTALLATION: STEM EXTENSION, STEM GUIDES AND FLOOR STAND

Once the weir gate has been installed, the stem extension, stem guide(s) and the floor stand shall be installed (when applicable). The following procedure shall be followed:

1. Connect the stem extension (item 3) to the shaft (item 1) on top of the yoke (see Figure 7 and Detail A).
2. Insert all stem guides from the top of the stem extension (when applicable). Align stem extension, and especially make sure that it is aligned with the vertical axis of the opening (see Figure 7). The maximum misalignment shall be 1/8" (3mm). For 2" Sqr. Nut operated gates, the stem guides shall be inserted onto the stem extension from the bottom.
3. Next, install all stem guides (drill and tighten anchor bolts). Refer to General Arrangement Drawing for dimensions.
4. Position the floor stand and the operator. Engage the shaft of the stem extension with the operator. Make sure that the stem extension is perfectly aligned and parallel to the wall surface, adjusting the offset if necessary of the Stem-Guides' UHMWPE inserts (see Figure 8). Once, the stem extension is perfectly aligned, install the floor stand (drill and tighten anchor bolts).

ORBINOX reserves the right to change specifications without notice.

**ORBINOX CANADA, ORBINOX USA, ORBINOX SPAIN, ORBINOX UK, ORBINOX FRANCE, ORBINOX GERMANY, ORBINOX INDIA, ORBINOX CHINA**

**WWW.ORBINOX.COM**

### INSTALLATION: STEM EXTENSION, STEM GUIDES AND FLOOR STAND

continued

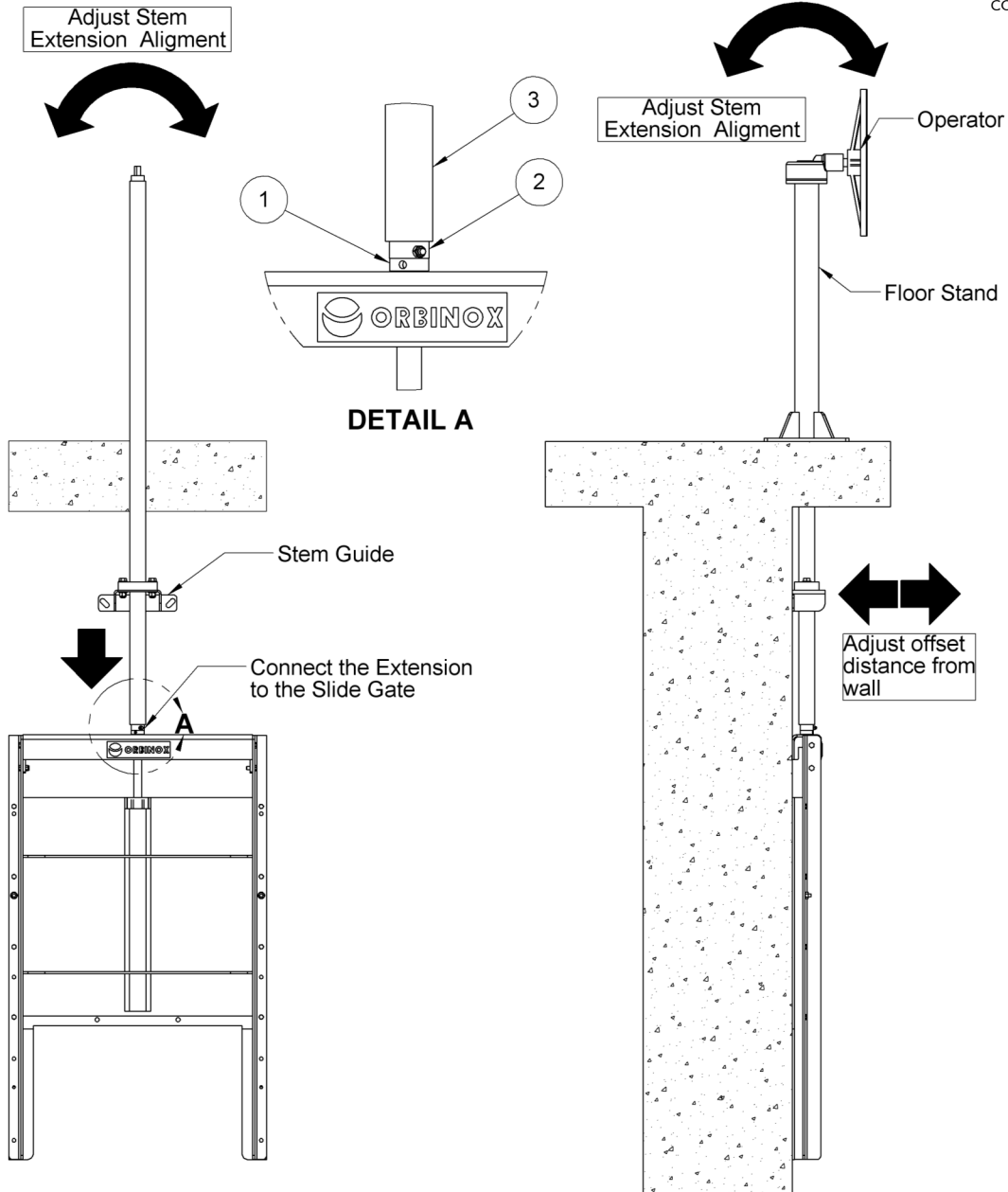


Figure 7

Figure 8

ORBINOX reserves the right to change specifications without notice.

ORBINOX CANADA, ORBINOX USA, ORBINOX SPAIN, ORBINOX UK, ORBINOX FRANCE, ORBINOX GERMANY, ORBINOX INDIA, ORBINOX CHINA

**WWW.ORBINOX.COM**

<b>INSTALLATION, OPERATION AND MAINTENANCE MANUAL</b>		05-2010 Edition Revision -
<b>MODEL</b>	<b>RB WEIR GATES</b>	 <b>ORBINOX</b> <small>VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES</small>

## OPERATION

### Initial Operation:

- Before cycling the weir gate, make sure there are no foreign deposits or materials on the seals, guides or sealing area. Gate seals could be damaged if the area is not cleaned and coated with a light grease. Please refer to section "Materials needed for maintenance and seal replacement" on page 12 for detailed information about the grease type.
- **Manual:**
  - Apply a light grease on the stem before initial operation after the installation. If the operation is difficult due to high torque, stop operation of the gate and check stem alignment.
- **Electric Motor:**
  - Refer to the Electric Motor Instruction Manual section before cycling the weir gate. Manually open the gate approximately 5" before the initial electric motor operation. Check the motor rotation to assure proper direction of the slide travel according to the motor operation switch (open/close).
  - Special attention should be taken when the gate is almost fully open or fully closed. If the gate does not stop once the fully open or fully closed position is reached, stop immediately and adjust the limit and torque switches (Refer to motor manual).

### Operation:

- **CAUTION! Do not force the operator to close the gate, as it may cause damage to the stem and it does not improve the sealing system.**
- The RB weir gate is closed by a clockwise rotation, and opened (downwards) by a counter-clockwise rotation of the operator.
- The travel of the weir gate is limited with the use of Stop-Washers. The Stop-Washers are factory installed, so there is no need of on-site adjustment. For self-contained frame configurations, the slide is stopped by the yoke when it is fully closed.
- The RB weir gate is designed to be self-locking, so that the slide maintains its position in open, close or intermediate positions.

ORBINOX reserves the right to change specifications without notice.

**ORBINOX CANADA, ORBINOX USA, ORBINOX SPAIN, ORBINOX UK, ORBINOX FRANCE, ORBINOX GERMANY, ORBINOX INDIA, ORBINOX CHINA**

**WWW.ORBINOX.COM**

<b>INSTALLATION, OPERATION AND MAINTENANCE MANUAL</b>		05-2010 Edition Revision -
<b>MODEL</b>	<b>RB WEIR GATES</b>	 <b>ORBINOX</b> <small>VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES</small>

## MAINTENANCE: CLEANING AND LUBRICATION

Orbinox model RB weir gates need practically no maintenance. In order to assure maximum performance of the weir gate, the following maintenance inspections shall be carried out periodically (every 6 months):

- Stem and stem nut shall be cleaned and greased. In some configurations, the stem may be in contact with water and dirt. Under these conditions, the threads of the stem and/or stem nut may wear, and they shall be checked every 3 months.
- Clean the gate with clear water and remove any deposits, especially on the seals and in the guides.
- Check the seals and make sure they are not damaged. Seals shall be replaced if damaged. See section 'Maintenance: Seal Replacement' for detailed procedures about seal replacement.
- **Seals shall be wet while operating.** If the weir gate has not been used for a long period of time under dry conditions, the seals shall be wetted with clear water before operating the weir gate. Operating the gate with dry seals may damage the seals. Additionally, more torque may be required to operate the weir gate.

### Spare parts:

Orbinox does not recommend stocking any spare parts by the owner of the equipment as the weir gates are designed for a very long life cycle. If a repair part is required, please contact an Orbinox representative and provide the following information:

- Orbinox S/O number.
- "Orbinox General Arrangement Drawing" number.
- Project name (if applicable).
- Vendor's company name.

### Materials needed for maintenance and seal replacement:

Material	Type	Recommended or equivalent
Grease	Silica-Gel Silicone Grease	Verkosil G-2
Glue	Instant adhesive	Loctite 495

ORBINOX reserves the right to change specifications without notice.

**ORBINOX CANADA, ORBINOX USA, ORBINOX SPAIN, ORBINOX UK, ORBINOX FRANCE, ORBINOX GERMANY, ORBINOX INDIA, ORBINOX CHINA**

**WWW.ORBINOX.COM**

<b>INSTALLATION, OPERATION AND MAINTENANCE MANUAL</b>		05-2010 Edition Revision -
<b>MODEL</b>	<b>RB WEIR GATES</b>	 <b>ORBINOX</b> <small>VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES</small>

## MAINTENANCE: SEAL REPLACEMENT (8"X8" TO 48"X48")

- **Step 1:** From the closed position unscrew the nuts and remove the washers of the lateral anchor bolts (items 1 and 2).
- **Step 2:** Unscrew bolts (item 3) that hold together the frame guides (item 4), UHMWPE guides (item 5) and frame. Proceed with caution, as major components of the gate are no longer secured.
- **Step 3:** Remove frame guides (item 4), UHMWPE guides (item 5), slide (item 7), yoke (item 6) and stem (item 8) as one unit.
- **Step 4:** Unscrew bolts (items 9) and remove retainers (items 10 and 11).
- **Step 5:** Remove seal (item 12) and replace it by the new seal.

Note 1: After installing the new seal, apply grease on it to ease operation.

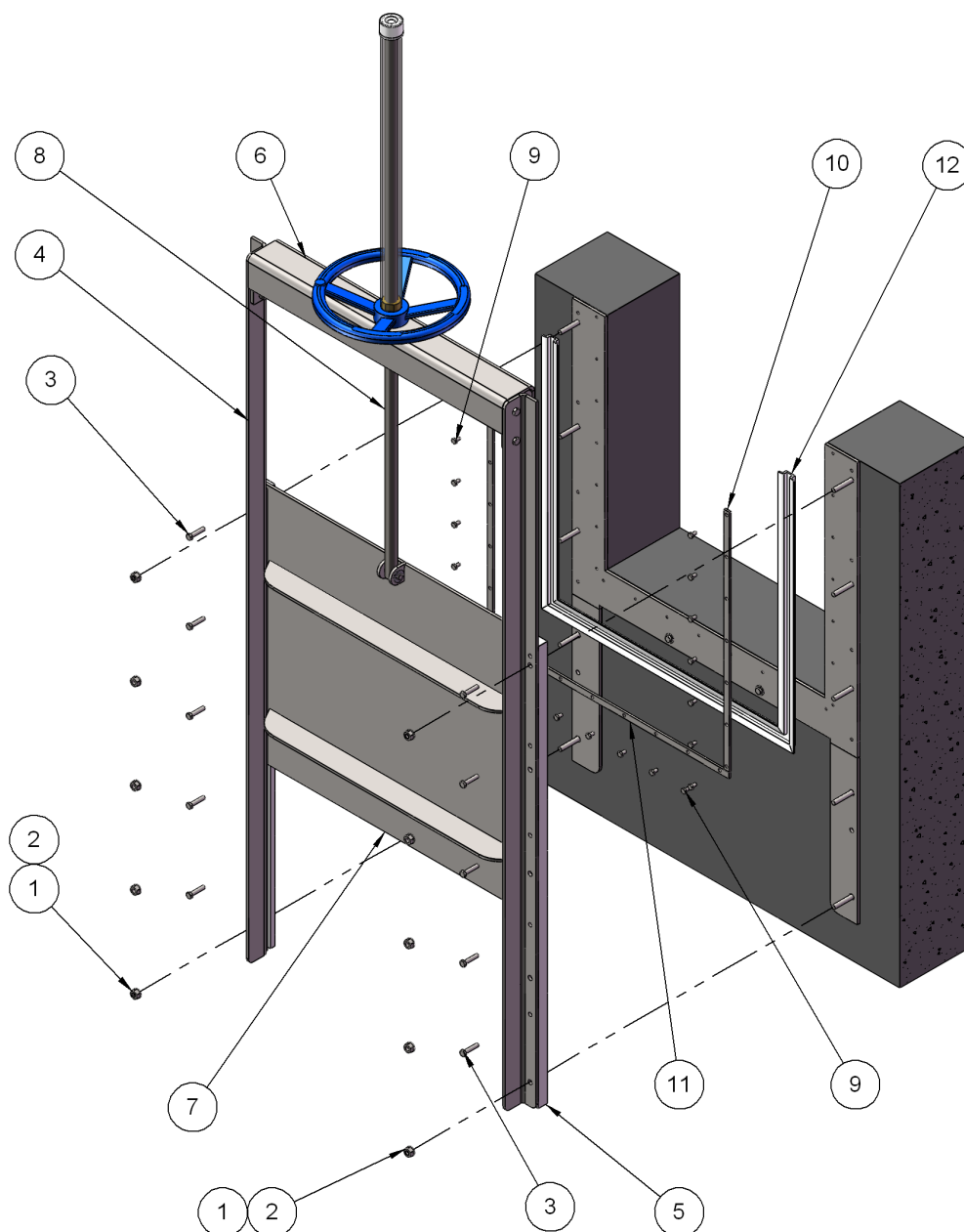
### Reassembly:

- Follow Steps 5 to 1.

Note: To reassemble in Step 3, first place one of the UHWMPE guides (item 5) on the anchor bolt rods. Next, take the yoke, stem, slide and frame guides as one unit, and attach the other UHWMPE guide onto it. Finally, mate the whole unit to the previously positioned UHWMPE guide.

### MAINTENANCE: SEAL REPLACEMENT (MU 8"X8" TO 48"X48")

continued



ORBINOX reserves the right to change specifications without notice.

ORBINOX CANADA, ORBINOX USA, ORBINOX SPAIN, ORBINOX UK, ORBINOX FRANCE, ORBINOX GERMANY, ORBINOX INDIA, ORBINOX CHINA

**WWW.ORBINOX.COM**

<b>INSTALLATION, OPERATION AND MAINTENANCE MANUAL</b>		05-2010 Edition Revision -
<b>MODEL</b>	<b>RB WEIR GATES</b>	 <b>ORBINOX</b> <small>VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES</small>

## MAINTENANCE: SEAL REPLACEMENT (49"X49" TO 80"X80")

- **Step 1:** Start from the open position.
- **Step 2:** Unscrew bolts (item 1) with caution, as the slide is no longer secured.
- **Step 3:** Unscrew bolts and nuts (items 10 and 11) and remove lateral guides (item 12).
- **Step 4:** Remove the slide (item 5).
- **Step 5:** Unscrew bolts (item 6) and remove the seal retainer (items 7 and 8).
- **Step 6:** Remove seal (item 9) and replace it by the new seal.

Note 1: After installing the new seal, apply grease on it to ease operation.

### Reassembly:

- Follow Steps 6 to 1.

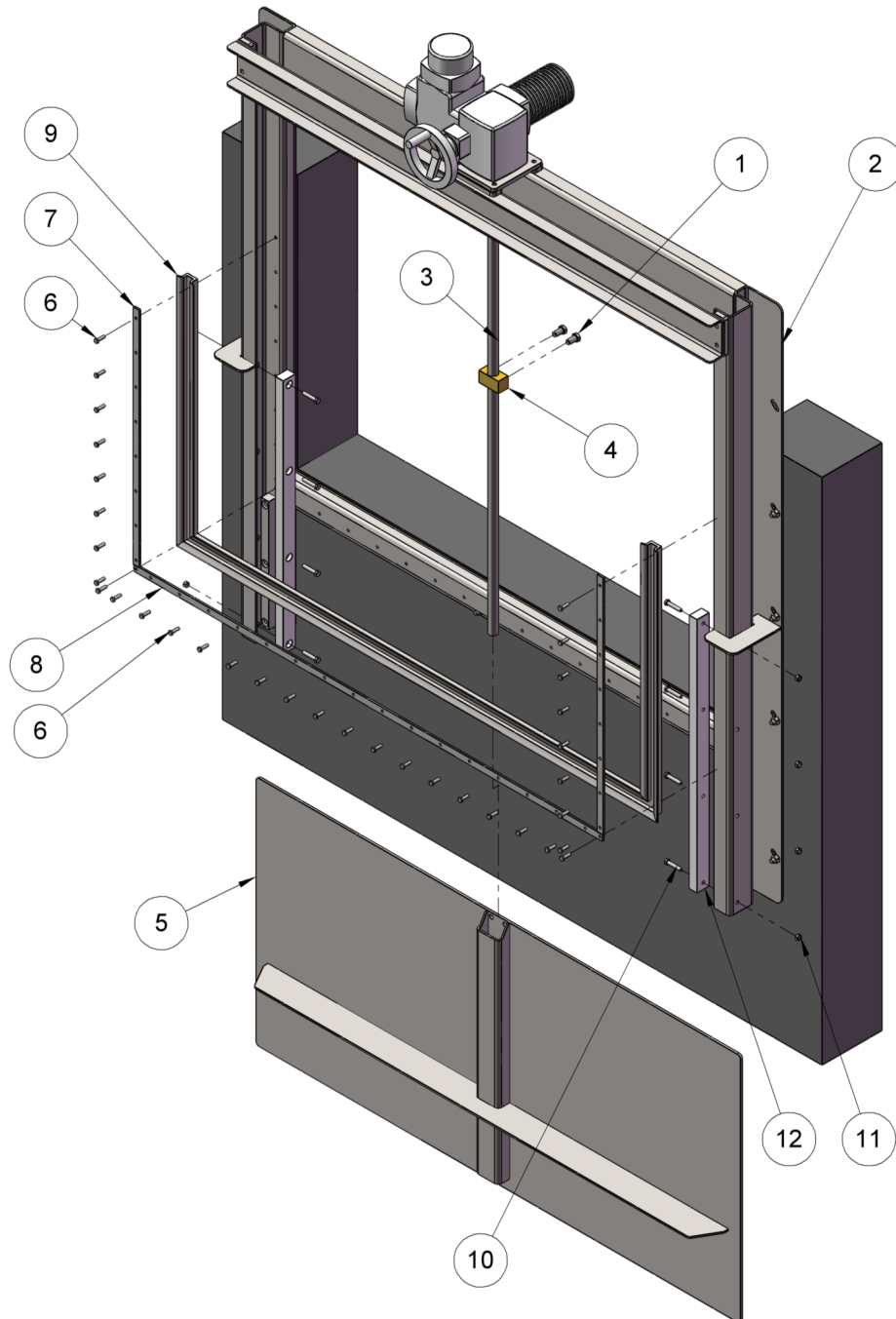
ORBINOX reserves the right to change specifications without notice.

**ORBINOX CANADA, ORBINOX USA, ORBINOX SPAIN, ORBINOX UK, ORBINOX FRANCE, ORBINOX GERMANY, ORBINOX INDIA, ORBINOX CHINA**

**WWW.ORBINOX.COM**

### MAINTENANCE: SEAL REPLACEMENT (49"X49" TO 48"X48")

continued



ORBINOX reserves the right to change specifications without notice.

ORBINOX CANADA, ORBINOX USA, ORBINOX SPAIN, ORBINOX UK, ORBINOX FRANCE, ORBINOX GERMANY, ORBINOX INDIA, ORBINOX CHINA

**WWW.ORBINOX.COM**



<b>INSTALLATION, OPERATION AND MAINTENANCE MANUAL</b>		05-2010 Edition Revision -
<b>MODEL</b>	<b>RB WEIR GATES</b>	 <b>ORBINOX</b> <small>VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES</small>

## TROUBLE SHOOTING

SYMPTOM	CAUSE	SOLUTION
<ul style="list-style-type: none"> <li>Leakage between weir gate and concrete wall</li> </ul>	<ul style="list-style-type: none"> <li>Concrete wall does not meet the required std.</li> </ul>	<ul style="list-style-type: none"> <li>Un-install the weir gate and fix the wall.</li> </ul>
	<ul style="list-style-type: none"> <li>Not enough construction sealant.</li> </ul>	<ul style="list-style-type: none"> <li>Un-install the weir gate, clean the wall and apply a new layer of construction sealant.</li> </ul>
	<ul style="list-style-type: none"> <li>Loose anchor bolts.</li> </ul>	<ul style="list-style-type: none"> <li>Tighten anchor bolts.</li> </ul>
	<ul style="list-style-type: none"> <li>Incorrect anchor bolts.</li> </ul>	<ul style="list-style-type: none"> <li>Check the 'General Arrangement Drawing' and make sure the right anchor bolts have been installed.</li> </ul>
<ul style="list-style-type: none"> <li>Leakage through the seal</li> </ul>	<ul style="list-style-type: none"> <li>Damaged seal.</li> </ul>	<ul style="list-style-type: none"> <li>Replace seal.</li> </ul>
<ul style="list-style-type: none"> <li>Leakage through the top seal</li> </ul>	<ul style="list-style-type: none"> <li>Foreign material trapped between frame and seal.</li> </ul>	<ul style="list-style-type: none"> <li>Remove the foreign material. Check if there is any damage to the seal.</li> </ul>
	<ul style="list-style-type: none"> <li>Damaged seal.</li> </ul>	<ul style="list-style-type: none"> <li>Replace seal.</li> </ul>
<ul style="list-style-type: none"> <li>Excessive force required to operate the slide gate</li> </ul>	<ul style="list-style-type: none"> <li>Misaligned stem extension, stem guide, or floor stand.</li> </ul>	<ul style="list-style-type: none"> <li>Check and adjust alignment of stem extension, stem guide or floor stand.</li> </ul>
	<ul style="list-style-type: none"> <li>Dirty stem and/or stem nut.</li> </ul>	<ul style="list-style-type: none"> <li>Clean and lubricate stem and/or stem nut.</li> </ul>

ORBINOX reserves the right to change specifications without notice.

**ORBINOX CANADA, ORBINOX USA, ORBINOX SPAIN, ORBINOX UK, ORBINOX FRANCE, ORBINOX GERMANY, ORBINOX INDIA, ORBINOX CHINA**

**WWW.ORBINOX.COM**