SERIES 20

INSTALLATION AND MAINTENANCE MANUAL
(Revision 5)
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2. INTRODUCTION

This manual is intended to provide all the necessary information for the installation, operation and maintenance of Fontaine-Aquanox Gates. It is intended to contractors responsible for the installation, to owners and to operators of the equipment, to preventive maintenance supervisor and to potential repairers to clearly diagnose problems and to make proper basic adjustment.

2.1. WARNINGS

⚠️ It is important to read this manual before starting any work on the gates.

⚠️ It is very important not to exceed the 178N (40 lb) on the gate actuator, either to open or close the gate.

⚠️ The seals are factory calibrated. Any changes to this setting will void the warranty.

⚠️ When installing the equipment, always apply an anti-seize on the stainless steel fasteners.

⚠️ Reduce as much as possible the contact between stainless steel and carbon steel to prevent corrosion contamination. See Appendix 3 for additional information on contamination of stainless steel.

⚠️ At all times when working on gates, make sure to comply with local safety standards and wear personal protective equipment.
3. RECEIVING

Despite all the precautions taken during packing, some damage may have occurred during transportation of the goods to their destination. We recommend that you follow the following instructions when receiving your equipment.

Ensure the conformity of the delivered goods before signing the bill of lading.

**Look for any anomaly concerning the delivery** (damage, missing items in relation to bill of lading, broken pallet, parcel damaged, dented part, deformed pipe, etc.) as this may be a sign of events that may have caused greater damage. Indicate on the bill of lading any abnormality detected, otherwise no claim will be accepted.

After the receipt of the goods, and within 5 working days, verify with the bill of lading that all equipment has been received. Also verify the equipment tag. They must match the items listed on the bill of lading. No claims for missing parts will be accepted after the period of 5 working days.

⚠️ Contact **Fontaine-Aquanox** to report any anomalies found or missing parts.

4. STORAGE

Cover and protect all equipment that will not be installed immediately.

- Leave the equipment attached to the pallet;
- Cover with a canvas or tarp;
- Store in a dry, and flat area;
- Do not stack the gates;
- Place the stems and pipes on wooden blocks;
- Place the other parts in a safe place;
- Protect from dust and sand;
- Avoid exposure to UV rays;
- For long-term storage, place inside in a dry and temperate area;
- Refer to the electric actuator documentation for specific storage instruction for this type of equipment.
5. GLOSSARY FOR RISING STEM WITH OPEN FRAME (MODEL 204)

Figure 1
6. GLOSSARY FOR NON-RISING STEM WITH CLOSED FRAME (MODEL 202)

Figure 2
7. PREPARATION FOR INSTALLATION

7.1. NEW CONCRETE WALL

Verify the flatness of the wall on which the gate will be installed. A plumb line, a laser or a straight edge can be used.

- On the whole contact surface between the gate frame and the wall, a maximum variation of 3 mm (1/8'') between the peaks and troughs is the tolerable limit;
- The maximum allowable warp is 3 mm (1/8'') on the total length for each side;
- Maximum vertical alignment of 3 mm (1/8'') over the entire length of the side;
- The wall must be uniform and flat within a tolerance of ± 3 mm (1/8''); imperfections must be rectified and/or filled with a suitable leveling grout.

Verify the distance between the invert and the operating floor. A maximum difference of ± 20 mm (¾'') between the measured distance and the installation drawing is acceptable for the proper operation of the gate.

7.2. EXISTING CONCRETE WALL

For an installation on an existing concrete wall, make sure that the quality of the concrete meets the minimum installation requirements.

- Verify if there is any concrete spalling;
- Verify the porosity of the concrete;
- Verify the existence of cracks that may compromise the structural integrity of the installation or may create leaks;
- Verify the concrete resistance (refer to the installation drawing to validate the required strength and type of anchor to use).

⚠️ If corrective work is needed, contact a qualified professional.

For gates with stem through the top slab

Verify the alignment of the hole in the floor. It should be centered with the stem attachment point of the slide. See the gate installation drawing for the hole diameter in the floor. The stem should not touch the sides of the hole (ref. Figure 3).
8. SERIES 20 GATE INSTALLATION WITH FLOOR MOUNTED ACTUATOR

⚠️ The side seals are factory adjusted. Any modification of this adjustment will void the warranty.

⚠️ Always apply an anti-seize on the stainless steel fasteners.

1- Verify for warping of the gate. Make sure the side seals are parallel at ± 3 mm (1/8 "). Dimension " A " should not be greater than 3 mm (1/8") than dimension "B" to allow adequate sliding of the slide, (ref.: Figure 4).

![Figure 4](image)

2- Place the gate as per the installation drawing. Level the gate by using as a reference the side frame. The side frame should be vertically plumbed. Verify the alignment with the hole in the top floor slab (if applicable). Mark and drill the two anchor holes closest to the center on the top seal frame (identified A1 & A2 on Figure 4) and install the two anchors. ⚠️ See Appendix 1 Caution for chemical anchoring.

3- Install the gate on the two anchors (after curing of concrete if chemical anchors), level and bolt the gate. Mark and drill the two anchor holes positioned on the outside of the bottom seal frame (identified A3 & A4 on Figure 4) and install the two anchors.

4- Verify the straightness of the bottom seal using a straight edge or a stretched cord from one corner to the other. A 2mm (1/16") deformation is acceptable. Adjust as needed using intermediate anchors.

5- Mark and drill the missing holes and remove the gate.
6- Clean the wall from concrete dust.

7- Install the remaining anchors.

8- Clean the gate frame with a degreaser.

9- Bond the wall gasket with a contact adhesive to the frame or insert the wall gasket onto the anchors bolts.

10- Install the gate on the anchor rods and screw the nuts. Partially tighten the 4 anchor placed at the 4 corners of the gate face. The frame extensions should not touch the wall. Otherwise, the wall is uneven and must be corrected.

11- Tighten the anchor evenly all around the frame. For model 202, gates with yoke, do not tighten at this point the anchor of the frame extensions. Refer to Figure 5 for the anchor tightening sequence. Proceed with a rotary tightening sequence until a uniform torque is obtained. Make sure the frame extensions do not come in contact with the wall before the outline anchors are completely tightened.

12- Tighten the frame extension anchors to place in the same plane as the lower part of the frame (use a plumb bob, a laser or a straight edge).

For 202 models, gates with frame extensions and yoke.

Insert the 76 mm x 76 mm (3” x 3”) wall spacers into the frame extension anchor bolts holes or bond the wall spacers to the frame extensions.

Apply anti-seize on each anchor rods before installing the gate.

If 202 models, gates with frame extensions and yoke:

Insert the 76 mm x 76 mm (3” x 3”) wall spacers into the frame extension anchor bolts holes or bond the wall spacers to the frame extensions.

Take care not to over tighten the gate anchors as this may affect operating forces and gate leakage.

13- Clean with clear water the side and bottom seals and the gate to remove any residual metal or concrete. Ensure that the environment in which the gate is installed is properly cleaned and there is no more residue (boards, metal rods, etc.) that may affect the proper function of the gate.

Figure 5
9. MODEL 202&203 GATE INSTALLATION WITH YOKE MOUNTED ACTUATOR

Because of transportation constraints, it may happen that the gate is shipped without the operating elements fully assembled. It is strongly recommend completing the assembly before the gate is lowered into the channel, unless the lifting height is not sufficient or if the total length of the assembly exceeds 6m (20’). Refer to next section related to assembly of the lifting components if applicable.

⚠️ The side seals are factory adjusted. Any modification of this adjustment will void the warranty.

⚠️ Always apply an anti-seize on the stainless steel fasteners.

1- Place the gate as per the installation drawing. Level the gate. Mark and drill the two anchor holes closest to the center of the top seal frame (identified A1 & A2 on Figure 4) and install the two anchors. ⚠️ See Appendix 1 Caution for chemical anchoring.

2- Install the gate on the two anchors (after curing of concrete if chemical anchors), level and bolt the gate. Mark and drill the two anchor holes positioned on the outside of the bottom seal frame (identified A3 & A4 on Figure 4) and install the two anchors. ⚠️ See Appendix 1 Caution for chemical anchoring.

3- Verify the straightness of the bottom seal using a straight edge or a stretched cord from one corner to the other. A 2mm (1/16”) deformation is acceptable. Adjust as needed using intermediate anchors.

4- Mark and drill the missing holes and remove the gate.

5- Clean the wall from concrete dust.

6- Install the remaining anchors.

7- Clean the gate frame with a degreaser.

8- Bond the wall gasket with a contact adhesive to the frame or insert the wall gasket onto the anchors bolts.

9- Insert the 76 mm x 76 mm (3” x 3”) wall spacers into the frame extension anchor bolts holes or bond the wall spacers to the frame extensions.

⚠️ Apply anti-seize on each anchor rods before installing the gate.

10- Install the gate on the anchor rods and screw the nuts. Partially tighten the 4 anchor placed at the 4 corners of the gate face. The frame extensions should not touch the wall. Otherwise, the wall is uneven and must be corrected.

11- Tighten the anchor evenly all around the frame. Do not tighten at this point the anchors of the frame extensions. Refer to Figure 5 for the anchor tightening sequence. Proceed with a rotary tightening sequence until a uniform torque is obtained. Make sure the frame extensions do not come in contact with the wall before the outline anchors are completely tightened.

12- Tighten the frame extension anchors to place in the same plane as the lower part of the frame (use a plumb bob, a laser or a straight edge).
Take care not to over tighten the gate anchors as this may affect operating forces and gate leakage.

13- Clean with clear water the side and bottom seals and the gate to remove any residual metal or concrete. Ensure that the environment in which the gate is installed is properly cleaned and there is no more residue (boards, metal rods, etc.) that may affect the proper function of the gate.

10. ASSEMBLING THE LIFTING COMPONENTS (WHEN NEEDED ON MODELS 202&203)

Always apply an anti-seize on the stainless steel fasteners.

1. The gate should lay on the ground on a flat surface. Make sure to have enough free space around for circulation and installation of the operating components. Once fully assembled, the gate will need to be raised in vertical position and lowered into the channel.
2. Assemble the frame extensions using the flanges at the end, each side of the gate frame.
3. Bolt the top cross member (yoke) on which the operating mechanism will be installed. The yoke slides between the upper ends of the two frame extensions.
4. If the installation drawing shows one or more stem guide(s) across the frame, they can be installed at this time.
5. If the installation drawing shows a stem extension (pipe), it must be bolted to the slide.
6. The threaded stem can now be put in place.
   a. Rising stem. Slide the stem through the center hole of the yoke, the non-threaded portion down toward the slide. Bolt the stem to the slide (or to the stem extension).
   b. Non-rising stem. Slide the stem through the yoke. The end with keyway is at the top. The bronze lift nut is installed on the slide at the factory. Screw in the stem in the nut approximately 6 turns.
7. The operating system (gearbox or electric actuator) can now be installed on the stem and yoke. In general, the operator will be shipped already bolted on a stainless steel mounting plate. Manually engage and turn the operator onto the stem until the mounting plate is close enough to be bolted to the yoke.

Be careful to solidly hold the actuator until the drive nut threads are fully engaged on the stem.

8. Loosely fix the mounting plate on the yoke with the bolts, washers and nuts.
9. Using the crank or handwheel to turn the drive nut until the mounting plate is in full contact with the yoke. Tighten the bolts.

At this stage, the alignment of the operating mechanism is not critical. Final alignment will be done when the gate is in place in the channel. All bolts and nuts must be sufficiently tight to securely lift the gate and move it to its position in the channel.
11. INSTALLATION OF LIFTING COMPONENTS FOR RISING STEM (MODEL 203&204)

11.1. ALIGNMENT OF STEM ON SELF CONTAINED GATES (MODEL 203)

1. Close the gate and remove all compression stress on the stem by starting the opening rotation until there is no compression or tension on the stem.

2. The actuator must be properly aligned with the stem attachment point on the door to prevent any lateral stress or bending the stem or stem extension. In the upstream-downstream direction, the actuator position is adjusted by the yoke bolting position in the slotted holes at each ends. Sideways, the adjustment can be made by the position of the mounting plate on the yoke (slotted holes).

3. Adjustment is done by slacking the bolts just enough to allow movement of the yoke in the upstream-downstream directions and lateral movement of the mounting plate.

4. Drop a plumb line from the yoke, beside the stem, down to the door. Adjust the actuator position until the stem is vertical in both axes within a tolerance of 1mm per meter (0.012”/ft). Maximum 10mm (3/8”) total.

5. Once satisfied with the alignment, the yoke must be levelled in both directions using a calibrated 24” or 48” spirit level. Use the mounting plate to check level sideways. Level can be checked on the yoke in the upstream-downstream direction.

6. After levelling the yoke, re-check the stem alignment with the plumb line. Re-adjust if needed.

7. Tighten the bolts on the mounting plate and yoke. The bolts holding the yoke with the frame sides must be tighten with a torque of 136 N.m (100 lb-ft).
11.2. INSTALLATION WITH PEDESTAL AND RISING STEM (204)

A ) MOUNTING WITH A HOLE IN TOP SLAB:

1- Ensure the flatness of the floor on the overall pedestal contact surface.

2- Find the center of stem attachment point of the gate on the top slab hole using a plumb bob or a laser.

3- From the center of stem attachment point just found, mark with 3 or 4 marks at 2mm + R (R + 1/16 ”) (R being the radius of the pedestal or half of its diameter (ref.: Figure 8).

4- Center the pedestal within the marks previously made and mark the position of the anchor holes. Drill the holes and insert anchors.

5- Level the top flange of the pedestal on the X and Y axes using stainless steel shims of the appropriate thickness.

B ) MOUNTING WITH ACTUATOR SUPPORT:

1- Locate the position of the actuator support using a plumb line or a laser aligned with the center of the stem attachment point on the gate.
2- Ensure the flatness of the floor on the entire surface of contact between the actuator support and the concrete (wall and floor).

3- Maintain the support position and check the level in the X and Y axes. Also check the vertical alignment of the actuator support with the stem attachment point on the gate. Correct concrete if needed.

4- Anchor actuator support in position.

Installation of lifting components for rising stem … continued

1- Mark on the wall the stem guide elevations from the gate invert (refer to the gate installation drawing).

2- Install and bolt the pipe extensions on the gate. Use the installation drawing to position the pipe extensions in the correct order, in the case where more than one pipe extension is required.

3- Install and bolt the stem to the last pipe extension.

4- Install the actuator on the lift rod. Rotate the lifting nut to engage on the thread.
   ▲ Firmly hold the actuator until the lifting nut is fully engaged on the threads.

5- Lower the actuator until it is near the pedestal surface and engages the 4 bolts of the mounting flange. Continue to lower the actuator until it sits firmly on the mounting surface. Tighten the bolts.

6- Place all lifting components under tension with one of the following methods:
   A. Secure the gate in closed position with a clamp between the slide and the bottom frame.
   B. Open the gate until it sits on the stoppers.

7- Apply a force of 178 N (40 lb) to the actuator so that all the lifting elements are in tension.

8- Install the stem guides at the elevations noted in step 1. ▲ See Appendix 1 Caution for chemical anchoring.

9- Once the stem guides are anchored, proceed with final alignment using the bolts located on each side. Tighten into position.
11.3. STOP NUT INSTALLATION

⚠️ The stop nut is required only for manual gates with rising stems.

⚠️ Not installing or not installing properly the stop nut can cause excessive leakage or damage to the gate components.

1- Fully close the gate to install the stop nut using one of the following two methods:

   A. Closing the gate under dry condition
      1- Place on the gate bottom seal a thin strip of plastic (the thickness of a plastic bag) of about 50 mm (2") wide at each corner.
      2- Using the actuator, close the slide until to two plastic strips are well jammed between the slide and the bottom seal.
      3- Continue to close the gate slide 2 to 3mm (1/8") to compress the bottom seal.

      **The gate is now fully closed**

   B. Closing the gate with water pressure
      1- Using the actuator, close the gate until the water flow stops. Never apply more than 178 N (40 lb) on the actuator.

      **The gate is now fully closed**

2- Using the depth measuring blade of a Vernier caliper, measure the distance A1 between the end of the gate stem and the contact surface (top of the lifting nut) (ref.: Figure 10)

3- Open the gate about 300mm (12").

4- Screw the stop nut on the stem until the distance from the top of the stem and the bottom of the stop nut is equal to distance A1.

5- Secure the stop nut into position by tightening the set screws.

6- Lower the gate into the closed position until the stop nut sits on the contact surface of the lifting nut and rechecks the distance A1. Do not apply a force greater than 178 N (40lb) on the actuator. Reposition the stop nut if necessary.
11.4. LIFTING STEM LUBRICATION AND CLEANING

1- Open the gate to expose the stem threads.
2- Thoroughly clean the stem thread using a plastic or stainless steel brush to prevent contamination of the stem. See Appendix 3 for additional information on stainless steel contamination.
3- Lubricate the stem threads with the proper grease (ref.: Appendix 2 Stem lubrication)

11.5. STEM COVER INSTALLATION

A ) ON A GEAR BOX OR ELECTRIC ACTUATOR:
   1- Close the gate. Screw the stem cover on the actuator.
   2- To prevent water from entering the actuator, seal the base of the tube fitting with silicone.

B ) ON A HAND WHEEL WITH THRUST BEARING:
   1- To prevent water from entering the actuator and to maintain the stem cover in position, apply silicone on the inside face of the hand wheel hub.
   2- Insert the stem cover and allow drying without moving.

11.6. GRADUATED RULER INSTALLATION

1- Fully close the gate
2- Clean the stem cover with mild soap (⚠️ do not use solvent).
3- Let dry.
4- Apply the adhesive ruler on the stem cover. The "0" of the ruler must align with the upper end of the gate stem when the gate is fully is closed.
12. INSTALLATION OF LIFTING COMPONENTS FOR NON-RISING STEM (MODEL 202)

12.1. INSTALLATION WITH PEDESTAL AND NON-RISING STEM

A) MOUNTING WITH A HOLE IN TOP SLAB:

1- Ensure the flatness of the floor on the overall pedestal contact surface.

2- Find the center of stem attachment point of the gate on the top slab hole using a plumb bob or a laser.

3- From the center of stem attachment point just found, mark with 3 or 4 marks at 2mm + R (R + 1/16”) (R being the radius of the pedestal or half of its diameter (ref.: Figure 12).

4- Center the pedestal within the marks previously made and mark the position of the anchor holes. Drill the holes and insert anchors.

5- Level the top flange of the pedestal on the X and Y axes using stainless steel shims of the appropriate thickness (ref.: Figure 11)
B ) MOUNTING WITH ACTUATOR SUPPORT:

1- Locate the position of the actuator support using a plumb line or a laser aligned with the center of the stem attachment point on the gate.

2- Ensure the flatness of the floor on the entire surface of contact between the actuator support and the concrete (wall and floor).

3- Maintain the support position and check the level in the X and Y axes. Also check the vertical alignment of the actuator support with the stem attachment point on the gate. Correct concrete if needed.

4- Anchor actuator support in position.

*Installation of lifting components for non-rising stem … continued*

1- Mark the wall, with a horizontal line, the elevation of the stem guide position from the invert (refer to the gate installation drawing).

2- Mark with a vertical line the center of the stem on each of the corresponding horizontal lines for every stem guide position.

3- Install all stem guides.

4- Bolt the first extension pipe on the gate and insert it into the corresponding stem guide.

5- Adjust the stem guide in the "front to back" axis using the bolts located on each side.

6- Repeat with the other extension pipes if applicable (refer to the gate installation drawing).

7- Install the actuator on the stem, engage the 4 bolts of the mounting flange. Tighten the bolts.

8- Turn the actuator to align the stem and operating nut key ways.

9- Insert the key.

10- Install the cap on the top of the actuator (if applicable).

11- To prevent water from entering the actuator, seal the base of the cap with silicone.

12- Close the gate for the stem cleaning and lubrication.

13- Thoroughly clean the stem thread using a plastic or stainless steel brush to prevent contamination of the stem. See Appendix 3 for additional information on stainless steel contamination.

14- Lubricate the stem threads with the proper grease (ref.: Appendix 2 Stem lubrication)
12.2. INSTALLATION FOR NON-RISING STEM WITH FLOOR OPERATING NUT

1- Find the center of stem attachment point of the gate on the top slab hole using a plumb bob or a laser.

2- Mark the wall, with a horizontal line, the elevation of the stem guide position from the invert (refer to the gate installation drawing).

3- Mark with a vertical line the center of the stem on each of the corresponding horizontal lines for every stem guide position).

4- Bolt the first extension pipe on the gate and insert it into the corresponding stem guide.

5- Adjust the stem guide in the "front to back" axis using the bolts located on each side.

6- Repeat with the other extension pipes if applicable (refer to the gate installation drawing).

7- Bolt operating nut on the upper section of the last extension pipe.

8- Close the gate for the stem cleaning and lubrication.

9- Thoroughly clean the stem thread using a plastic or stainless steel brush to prevent contamination of the stem. See Appendix 3 for additional information on stainless steel contamination.

10- Lubricate the stem threads with the proper grease (ref.: Appendix 2 Stem lubrication)
### 13. TROUBLESHOOTING

Never use excessive force on the actuator, permanent damage to seals and lifting equipment may result.

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wood, concrete or other foreign materials on the seals.</td>
<td>Carefully remove what is causing the leak. Check for damage to the seals.</td>
</tr>
<tr>
<td>Leakage</td>
<td>Gate not properly mounted on the anchors.</td>
<td>Tighten the anchor bolts according to anchor manufacturer’s recommendations.</td>
</tr>
<tr>
<td></td>
<td>Top seal anchors too tight.</td>
<td>Partially reduce the tension on the top seal anchors.</td>
</tr>
<tr>
<td></td>
<td>Excess of epoxy around the base of the anchor that prevents a proper compression of the wall gasket.</td>
<td>Remove the gate and remove the excess of epoxy around the bases. Replace the gate.</td>
</tr>
<tr>
<td></td>
<td>Cracks, crumble or porosity in the concrete wall that bypass the seal.</td>
<td>Repair and seal cracks, crumble or porosity.</td>
</tr>
<tr>
<td></td>
<td>The side seal bolts are not well adjusted.</td>
<td>The side seals are factory adjusted. The setting torque is measured to the optimized ratio between the operation force and leakage rate. Therefore, contact Fontaine-Aquanox before adjusting the side seal bolts.</td>
</tr>
<tr>
<td></td>
<td>Stop nut not properly adjusted.</td>
<td>Refer to the installation section to reposition the stop nut.</td>
</tr>
<tr>
<td>Excessive operating force</td>
<td>Stem or lift nut dirty or dry.</td>
<td>Clean and lubricate the threads.</td>
</tr>
<tr>
<td></td>
<td>Wood, concrete or other foreign materials on the seals.</td>
<td>Carefully remove what is causing the leak. Check for damage to the seals.</td>
</tr>
<tr>
<td></td>
<td>Misalignment of the lifting components.</td>
<td>Verify and adjust alignment.</td>
</tr>
<tr>
<td></td>
<td>The gate frame improperly installed or warped.</td>
<td>Verify the frame squareness, contact Fontaine-Aquanox if the frame is warped.</td>
</tr>
</tbody>
</table>
If there are problems in the operation of a gate and troubleshooting described above offers no solution, contact Fontaine-Aquanox (see section 16) and have, if possible, the following information:

- Equipment serial number (indicated on gate slide, or yoke, if any)
- Detailed description of the situation (eg. leakage rate measured on site is considered excessive)
- Photos or videos that can help understand and address the situation

13.1. GATE SETTING

The gate seals were adjusted and tested at the factory and do not require any adjustment after installation. However, the electric actuators need to be field adjusted after the installation. Refer to the electric actuator manual.

14. INSPECTION AND MAINTENANCE

In order to maintain the gates performances at its best, Fontaine-Aquanox recommends the following procedure.

14.1. INSPECTION FREQUENCY

Initial inspection: after 25 operation cycles or two weeks after start up, whichever comes first.
Second inspection: 50 cycles after the initial inspection or six months after start up, whichever comes first.
Subsequent inspections: Every 100 operation cycles or every six months, whichever comes first.
If the gate is used intensively or in extreme conditions, perform inspection every three months.
One complete operation cycle corresponds to the opening and closing of the gate.

14.2. GATE MAINTENANCE

Clean the gate with clean water to get rid of any deposit.
Verify whether the guides and seals are in good condition.

14.3. STEM MAINTENANCE

Verify the stem and lift nut thread conditions in order to detect excessive wear.
Open the gate to expose the stem threads.
Thoroughly clean the stem thread using a plastic or stainless steel brush to prevent contamination of the stem. See Appendix 3 for additional information on stainless steel contamination.

Lubricate the stem threads with the proper grease. Refer to Appendix 2 Stem lubrication.
Verify all bolts and fasteners on the stem.

Gate and stem maintenance should be performed at each inspection.
15. WARRANTY

ISE Metal inc. warrants that the series 20 Slide Gates it manufactures and delivers to the Buyer are free from defects in material, workmanship and fabrication for a period of 60 months from the date of receipt of the equipment at their installation location. To benefit from this warranty, the Buyer shall promptly report in writing any failure during the warranty period. Provided that the buyer has stored, installed, maintained and used the equipment in a workmanlike manner and has complied with the manufacturer’s instructions and recommendations put forth in the Installation, Operation and Maintenance Manual, at its discretion, ISE Metal will either correct the defect at its factory or provide the required parts. Shipping costs from the factory to the installation site and/or labor on the equipment installation site are not covered by this warranty. Accessories and equipment supplied by ISE Metal inc. with the gates, but manufactured by others will be protected by the warranty offered to ISE Metal by the manufacturers of the equipment which are transferable to Buyer. ISE Metal inc. will not be held responsible for any direct, indirect, consequential, contingent or incidental damages, repairs, replacements or other fixes and adjustments to the equipment nor any labor costs incurred by the Buyer or its subcontractors or others without the prior written consent of ISE Metal Inc. The effects of corrosion, erosion and normal wear and tear are specifically excluded from this warranty. The Buyer shall not use equipment that is considered defective without first obtaining a written consent of ISE Metal inc., otherwise the Buyer uses the equipment at their own risk and responsibility.

ISE Metal Inc. provides no other warranty or makes no other express or implied representation and any implied warranty of fitness for a particular purpose is declared non-existent.

Corrections by ISE Metal inc. of non-compliance described above constitute complete fulfillment of its responsibility in this manner.

16. CONTACT FONTAINE-AQUANOX

If needed, Fontaine-Aquanox can be contacted with the following methods:

Web site: http://www.ISEaquanox.com
Phone: (819) 769-0157 or toll free: 1-855-769-0157
Mailing address: 4065 boul. Portland, Sherbrooke, QC, Canada, J1L 1X9
APPENDIX 1 CAUTION FOR CHEMICAL ANCHORING

Always ensure compliance with the hole diameters and depths recommended by the manufacturer because the cavity becomes the mixing chamber for the resin/hardener according to the volume of the epoxy bag. A non-compliant hole will result in a partial or invalid epoxy curing.

Use an impact wrench when installing the anchor to obtain a homogenous mixture of the two epoxy components. To do so, use a nut, a washer and a lock nut (see Figure 15).

It is very important to stop the impact wrench when the anchor rod reaches the bottom of the hole, because if the rod continues to rotate, the threads will evacuate the epoxy out of the hole. Be sure to wait for the curing time recommended by the manufacturer (proportional to the concrete temperature) before tightening.

Injectable chemical anchor

Always remove the gate before installing the injectable chemical anchors.

Hold the anchor rod centered into the hole and make sure to remove all excess of epoxy around the base of the anchor, because once cured, it will act as a shim and will prevent proper compression of the wall gasket.

Be sure to wait for the curing time recommended by the manufacturer (proportional to the concrete temperature) before tightening.

APPENDIX 2 STEM LUBRICATION

<table>
<thead>
<tr>
<th>Type of grease</th>
<th>Standard</th>
<th>Frequent</th>
<th>Frequently submerge</th>
<th>Food industry</th>
<th>Non toxic</th>
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<tr>
<td>Esso Unirex EP2</td>
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<td></td>
<td></td>
<td></td>
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</tbody>
</table>

* Equivalent greases are also acceptable.
APPENDIX 3 DECONTAMINATION AND PASSIVATION

Contact between stainless steel and carbon steel such as the tooling used during the installation (hammer, wrenches, chain hoist, grinding operation nearby, etc.) may locally contaminate stainless steel creating traces of corrosion. Note that these traces of corrosion are more of an aesthetic nature and generally do not affect the structural integrity of the equipment.

Contamination by nails left on the surface

Contamination caused by grinding nearby

It is possible to remove these traces using a passivation product designed for this purpose on the market. These products are often acid-based, certain precautions must be taken for their use and their possible contact with the sealing system of the gate.

Contact Fontaine-Aquanox for more information on this manner.