ENGLISH INSTALLATION- AND MAINTENANCE MANUAL

Akvasmart Rotor Spreader Hex

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For a thorough introduction of Your AKVA product, we ask that all users read this entire manual. If questions occur, contact us!

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This document can also be read and downloaded from our website, see www.akvagroup.com/products/user-manuals.

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1 Safety

Safety for the users of our equipment is top focus when AKVA group ASA develop new products and product manuals.

We strongly recommend that everyone who are going to be using the AKVA product, all who perform any type of repairs, service or other maintenance to AKVA products, and all who work in areas where such products are installed, are aware of the contents in this manual.

This recommendation is based on both personnel safety as well as a desire to keep AKAV products in order, and to avoid risk of damages as a result of not following safety instructions.

1.1 Safety symbols

These safety symbols are used in this manual:

- **Information**

- **Show caution, danger of minor personnel injuries and damages to equipment.**

- **Danger! Will cause dangerous situations and danger for personnel.**

- **Personal safety equipment, such as helmet, antiskid foot wear and floating garments, are mandatory to wear when working on and by the cage and when occupying areas where equipment is lifted above sea level.**

1.1.1 Other symbols used in this manual

Go to or see page or section for further instructions or more information.
1.2 General safety

This manual describes how Akvasmart Rotor Spreader Hex should be installed as well as maintenance procedures that trained users can execute. Tasks beyond these instructions should only be performed by AKVA service personnel, or after written notice approval from AKVA group.

1.3 Personnel safety

Farm owner where Akvasmart Rotor Spreader Hex units are installed, is responsible for complying applicable safety laws and regulations in the current country, such as correctly designed and installed safety devices. Farm owner is also responsible for that all employees are informed about and understand the content of this manual. All users of this product must know about:

- How the Akvasmart Rotor Spreader Hex works with the rest of the feeding system.

- Which safety considerations that must be taken regarding installation, use, maintenance and other task with and around the rotor spreader hex.

- How the rotor spreader hex works and how to install, use and maintain it.

- How to maintain the rotor spreader hex according to procedures described in this manual.

Owner and farm manager are responsible for that all personnel working with or around the rotor spreader hex read and understand the entire content of this manual, especially dangers and consequences related to misuse.

To prevent personnel injuries and equipment damages during installation, maintenance and repairing processes, it is crucial that all instructions provided in this manual are followed.

All applicable safety laws and regulations in the country where the equipment is installed must be complied with.
Personal safety equipment, such as antiskid foot wear and floating garments, are mandatory to wear when working on and by the cage, for instance when working on the rotor spreader hex. When occupying areas where any equipment is being lifted above sea level, it is also mandatory to wear hard helmet.

Troubleshooting must, on some occasions, be carried out with main power turned on. At such occasions, it is very important that all personnel staying around this (and other rotating equipment), wears appropriate safety gear, minimum helmet and floating garments. To ensure safe operations, perform all tasks according to descriptions in this manual.

As a main rule power for the entire feeding system must be turned off and secured in off position during any work, such as installation, maintenance and repairs.

1.4 Equipment safety

Make sure that all parts are delivered according to the service note. If the order is not complete, or if any defects are discovered, contact AKVA immediately.

Check all equipment after periods of bad weather for damages. Make sure that all suspensions are intact, that surrounding equipment are OK, check nets especially. If any damages have occurred, they must be repaired at once, contact AKVA group for assistance if needed.

If any of the equipment, ropes or other belonging parts are being moved to a new location, it is decreed by law to disinfect everything to prevent contamination. We recommend rinsing with fresh water after disinfection, because the disinfectants are strong chemicals that may damage the surface materials.
1.5 Safe lifting operations

Plan the lifting operation and prepare a lifting plan.

Only the banksman and his team are to lead the operation.

A suitable communications system is to be deployed and checked by the banksman before lifting.

Check the adverse weather conditions before lifting.

Before any lifting takes place, check all certificates for the crane, shackles and accessories.

All lifts shall be vertical unless authorized in writing by qualified personnel.

All lifting accessories shall be inspected for tearings, fractures and other flaws.

Observe safe clearances of all overhead obstructions.

No load to be left suspended if crane is unattended.

Identify the drop zones of the whole lift and exclude people from them.

Check that there is adequate rear clearance around slewing circle to prevent persons being trapped by counter weights.

The weight of the load must be known and all safe working loads never exceeded.

Stop briefly when the load is off the ground and check stability of both crane and load.
2 Information

This user manual is part of the equipment that belongs to the Akvasmart Rotor Spreader Hex, also named “rotor spreader hex” in this manual. Keep the manual for as long as the rotor spreader hex is used, and make sure that all changes to the equipment are being noted in the back of this manual.

Thank you for choosing AKVA group ASA as supplier for your rotating feed spreader. Do not hesitate contacting us for more information regarding installation, use or maintenance for Akvasmart Rotor Spreader Hex or any other AKVA product.

The purpose of this manual is to make the user able to install and maintain the Akvasmart Rotor Spreader Hex in a safe and cost efficient way. The manual describes how to install and maintain the product, and will hopefully answer most day to day questions. If there is anything relevant missing in this manual, please contact AKVA group for assistance and help to find a satisfying solution to any problems. Contact AKVA group’s service department, your subcontractor, your local AKVA office or our main office in Norway for assistance and help.
2.1 How to use this manual

This manual describes how to install and maintain the Akvasmart Rotor Spreader Hex in the best and safest possible way. This entire manual must be read and understood by ALL users prior to installing and using the product.

The table of contents is found before the first main section. The headlines in this table function as links to their respective section in the pdf-file.

Section 1 is the most important section in this manual, and includes safety precautions ensuring safest possible use.

Section 2 contains information on AKVA group and rotor spreader hex, as well as this manual instruction.

Section 3 describes assembling of the hex rotor spreader, and how to safely install the rotor spreader hex is explained in section 4. Maintenance and safety regulations for locating and removing pellet blockages inside the rotor spreader hex are described in section 5, and how to safely remove the rotor spreader hex from a cage is described in section 6.

Four appendixes are found in the back of the manual: Index, a deviation form for registration of all deviations that occur with the product and belonging equipment, pages for notes about new and extra information and lastly AKVA contact information.

This entire manual must be read and understood, as well as used as aid during installation and maintenance of the Akvasmart Rotor Spreader Hex.
2.2 About AKVA group

AKVA group is present in all markets with offices in Norway, Chile, Denmark, Scotland, Spain, Greece, Iran, Iceland, Canada, Australia and Turkey. AKVA group is a unique partner with the capability to offer both cage farming and land based aquaculture operations with complete technical solutions and service.

Technology for sustainable biology:
By developing technology focused on solving the biological challenges, we contribute to the continued development of a sustainable industry. Good operational performance and fish welfare are paramount in achieving good results, and investing in our technology will help deliver both.

OUR MISSION:
Solutions and services that optimize production and enables a sustainable, cost-efficient and safe aquaculture industry.
AKVA group is a global technology and service partner that deliver technology and services that helps solve biological challenges within the aquaculture industry. Good operational performance and fish welfare ensures sustainability and profitability for the customer. This is the premise for everything we deliver, from single components to services and complete installations. In-depth aquaculture knowledge, extensive experience and a high capacity for innovation characterizes and enables us to deliver the best solutions for both land based and cage based fish farming.

OUR VISION:
2.3 About Akvasmart Rotor Spreader Hex Base

One of the most important factors for gentle feed handling is regulating transport air speed. “Speed kills” also when it comes to feed systems, and reduction of transport air speed provides significant reduction in feed dust and pellet breakage. Using the Air Control System combined with the highly effective, low friction start Akvasmart Rotor Spreader Hex allows reduction in air speed while still getting excellent feed spread.

The unique Akvasmart Rotor Spreader Hex is designed to provide excellent feed spread in cages. With adjustable light weight aluminum rotor pipes that allow for 20-30% less start up and rotation air than similar feed spreaders. This means less dust and breakage, power consumption, back pressure, air temperature, noise and wear and tear on the feed pipes.

The unique ventilated Zenon bearing requires no regular cleaning and does not corrode. The Akvasmart Rotor Spreader Hex base is made of foam filled Polarcirkel PE pipes, which makes it extremely stable in rough seas. It will never sink, and with no parts sticking out below the hex base, the danger of damaging surrounding equipment and net is eliminated.

Technical specifications:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
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<tbody>
<tr>
<td>PE pipe dimension</td>
<td>90mm</td>
</tr>
<tr>
<td>Max pellet size</td>
<td>25mm</td>
</tr>
<tr>
<td>Recommended rotation speed</td>
<td>50-100 rpm *</td>
</tr>
<tr>
<td>Spread diameter (adjustable)</td>
<td>Ø = approx. 5-18m*</td>
</tr>
<tr>
<td>Materials</td>
<td>PEHD, Stainless Steel, Alum.</td>
</tr>
<tr>
<td>Height above water</td>
<td>1.5m</td>
</tr>
<tr>
<td>Draft</td>
<td>0.1m</td>
</tr>
<tr>
<td>Total weight</td>
<td>35kg (77 lbs)</td>
</tr>
</tbody>
</table>

*Depending on feed system and pellet size
3 Assembly

Read through this entire manual, and be sure that the contents is understood completely before assembling the Akvasmart Rotor Spreader Hex.

Execute all instructions in listed order, to ensure correct assembly.

If the bearing bolts are tightened with incorrect torque, the Akvasmart Rotor Spreader Hex will not function as expected. If torque is too loose, the bearing may loosen. If torque is too tight, the bearing will bend and break.

The assembly process is not complete before both of the through bolts crossing the base in the tube clamps are tightened properly.

Make sure that all parts are delivered according to the service note.

The assembling must be done on shore or in the barge or on a boat.
### 3.1 The Akvasmart Rotor Spreader Hex parts

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
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<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Hex Base</td>
<td>10</td>
<td>Through Bolt</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Rotor Spreader</td>
<td>11</td>
<td>Washer M10</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Union House</td>
<td>12</td>
<td>Screw Hex Head M10x80</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Pipe Joint Union 90mm</td>
<td>13</td>
<td>Nut Nylock M10</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Bearing</td>
<td>14</td>
<td>90mm Outlet pipe</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Tube Clamp</td>
<td>15</td>
<td>Hose Clamp T-bolt</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Screw M8x25</td>
<td>16</td>
<td>Screw Hex Socket M8x80</td>
<td></td>
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<tr>
<td>8</td>
<td>Crimped Tube</td>
<td>17</td>
<td>Screw Hex Socket M8x25</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Hex Clamp</td>
<td></td>
<td></td>
<td></td>
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![Diagram of Akvasmart Rotor Spreader Hex](image.png)
Hex clamp (9):

The open part (arrow) has to point towards the base opening, where the feed is being sent through.

When delivered, this should be correctly positioned on one of the crimped tubes. Make sure that this is done correctly for the rotor spreader hex to function as expected.

Connection through the base:

3: Union house
4: Union
6: Feeding hose clamps
10: Through bolt
16: Screw hex socket M8x25
3.2 Assembling the Akvasmart Rotor Spreader Hex

**Necessary assembling tools:**

- Hex key: 6mm (Allen key)

- Sockets: 13mm and 17mm (13mm wrench)

- 2 ratchets

- Torque wrench for correct Nm-values

- Pipe Joint Union (item.no.: 0102179)
Procedure:

The numbers inside parenthesis (..) refer to numbers in the illustration in section 3.1 The Akvasmart Rotor Spreader Hex parts.

1. After reading this user manual, unpack the rotor spreader hex parts and make sure that all parts are delivered according to the service note.

2. Lay the base (1) down on a flat surface.

3. Lift the 3 crimped tubes (8) up towards the centre of the hex base, and make sure that the hex clamp opening points up.

4. Attach the two loose crimped tubes to the hex clamp (9) with M10x80 bolts (12) with belonging washers (11) and nuts (13). Use two 17mm pipes to tighten the bolts, one on each side of the bracket, one locked, and one open ratchet.

5. After attaching crimped tubes to the hex clamp, the bolts in the connection between the crimped tubes and the hex base must be tightened. Use two 17mm pipes to tighten the bolts, one on each side of the bracket, one locked, and one open ratchet.
6 Lift the bottom pipe part of the rotor spreader (2) inside the base (1). It may be necessary to loosen the bolts around the feed hose clamps, to be able to move the bottom pipe part into the clamp.

7 Place the bearing plate on top of the hex clamp (9). Attach the bearing plate to the clamp with three M8x25 bolts (7), use a 6mm hex key.

![Make sure to attach Hex Clamp in correct direction!]

8 Place the bearing (5) on top of the bearing plate, and attach it with the three M8x25 bolts (17) from the underside of the bearing plate. Use a 6mm torque wrench and tighten the bolts one by one to **torque 6 Nm**.

![If these bearing bolts are tightened with incorrect torque, the bearing will not function as it should. If they are tightened too much, the bearing will bend.]

![](image-url)
9 Use the hose clamp (15) to lock the outlet pipe (14). Tighten the hose clamp with a 13mm wrench and tighten with torque 13Nm (use torque wrench).

The spread area is adjusted by:
- point the outlet pipe downwards to reduce the spread area
- point the outlet pipe upwards to increase the spread area

After assembling is finished, it is important to tighten the through bolts (10) to make sure the clamps stay in place. Use the 6mm hex key.
3.3 Outlet pipe

1. Tread the hose clamp (2) over the connecting pipe (3).
2. Tread the outlet (1) over the connecting pipe (3).
3. Tighten the hose clamp (2) over the end of the outlet pipe (1) that is tread over the connecting pipe (3).

The spread area is adjusted by the outlet pipe:
- pointing it downwards reduces the spread area
- pointing it upwards increases the spread area
4 Installation

Always follow safe practice when working on or by the cage edge and when lifting equipment in and out of the cage.

When connecting the Akvasmart Rotor Spreader Hex to the feeding pipe, make sure that the main power switch is turned off and locked in off position (lock-out/tag-out).

Before any lifting takes place, check all certificates for the crane, shackles and accessories and make sure that they are sufficient for lifting the planned load.

Personal safety equipment, such as antiskid foot wear and floating garments, are mandatory to wear when working on and by the cage, for instance when working on the rotor spreader hex.

When occupying areas where rotor spreader hex units or any other equipment are being lifted above sea level, it is mandatory to wear hard helmet.

We recommend using the knot "clove hitch with two half hitches" when attaching the ropes to the cage edge.
4.1 Lifting Akvasmart Rotor Spreader Hex into a cage

Please note that a controlled drop is preferred when installing the Akvasmart Rotor Spreader Hex in the cage, to avoid disturbing the fish.

Procedure:

1. Read through this entire procedure and section 1.5 Safe lifting operations before commencing this lifting process.

2. When the rotor spreader hex is completely assembled, it may be brought to the cage edge for installation. For safe and balanced lift, attach three approved hoisting straps to the rotor spreader around the hexagonal base and each of the three crimped tubes, as shown:

3. Attach all three lifting straps to the approved crane and control that everything is properly attached and safe.

4. Lift the rotor spreader hex according to instructions, from the boat over to the cage inside.

5. Attach one safety rope between rotor spreader hex and cage edge before releasing the three straps.
4.2 Connect to feeding hose

**Necessary tools:**
- Pipe joint tool (item no.: 0102179)

**Procedure:**

1. Place rotor spreader hex next to the PE feeding pipe and hold it up as vertically as possible before connecting it to the pipe.

2. Smear silicon grease on outside of the end of the feeding pipe and inside the union house (green color) where the O-ring is being pressed in.

3. Place the end of the feeding pipe in to the union house.

4. Fasten the union (blue color) to the union house by hand force firstly, then use pliers or a large spanner to tighten the connection properly.
4.3 Placing Akvasmart Rotor Spreader Hex in the cage

To obtain best possible spread of pellets inside the cage, we recommend placing the rotor spreader hex as centered in the cage ring or edges as default position.

However, best position of the rotor spreader hex inside a cage will vary from cage to cage and from site to site according to wind conditions and currents in each location. Make sure that no pellets are blown outside the cage edge during high winds, and keep track of real time ocean currents, to make sure none of the pellets are sent out of the cage net by these.

Use three ropes to fasten the rotor spreader in the cage edge, and to keep the rotor spreader in position. Using three ropes also allows easy moving around inside the cage due to wind and current changes.
Procedure:

1. After connecting rotor spreader hex to the feed pipe, attach three ropes to three corners of the base:

2. Move the rotor spreader to the desired position by pulling and releasing the various ropes.

3. Fasten the ropes properly to the cage rail, using recommended knot.
5 Maintenance

Always follow safe practice when working on or by the cage edge and when lifting equipment in and out of the cage.

When connecting the Akvasmart Rotor Spreader to the feeding pipe, make sure that the main power switch is turned off and locked in off position (lock-out/tag-out).

Before any lifting takes place, check all certificates for the crane, shackles and accessories and make sure that they are sufficient for lifting the planned load.

Personal safety equipment, such as antiskid foot wear and floating garments, are mandatory to wear when working on and by the cage, for instance when working on the rotor spreader.

When occupying areas where rotor spreaders are being lifted above sea level, it is also mandatory to wear hard helmet.

Regular maintenance on the rotor spreader hex bearing is important in order to maintain an even rotation during feeding. AKVA group recommend bearing inspection minimum every sixth month. Clean and change when required.

*Regularly
Definition for this manual:
At least every 6 months and in between and after periods with bad weather and with more movements in the water.
5.1 Bearing cleaning

Remember that if bearing bolts have incorrect torque, the Akvasmart Rotor Spreader Hex will not function as expected. If torque is too loose, the bearing may loosen. If torque is too tight, the bearing will bend and break.

Necessary tools:
- Hex key 6mm
- Torque wrench 6mm

Procedure:
1. First, turn off the feeding system’s main power switch and secure it in off position with a personal padlock.
2. Release two of the positioning ropes and use the third rope to pull the rotor spreader hex to the cage edge.
3. Unscrew the 3 hex bolts below the bearing, and keep the bolts in a safe place!
4. Remove the bearing.
5. Clean the bearing in warm, mild degreasing soap water.
6. Inspect the bearing properly.
7. If the bearing is OK, reattach it. Replace bearing if necessary.
8. Reattach all 3 bolts before tightening. Use torque wrench to tighten the bolts one by one to torque 6Nm.

If the bolts are tightened too hard, the bearing house will bend.
5.2 Tightening bolts and connections

Tighten all bolts and connections in the Akvasmart Rotor Spreader Hex *Regularly. This is especially important for the bearing, which may twist and lose its function if the bolts are not properly tight.

5.2.1 Tighten bolts

**Necessary tools:**
- Hex key 6mm
- Torque wrench 6mm
- 17mm ratchet pipe
- 17mm pipe socket

**Procedures:**

All 3 bolts in the bearing has to be tightened *Regularly, and even when the bearing is not inspected. Tighten each bolt with torque 6 Nm.

Bolts in the hex base connection opening are tightened with a 6mm hex key. Tighten two bolts both inside and outside of the base.

Tighten all bolts that connect the crimped tubes to the hex base as well as to the hex clamp. Use the ratchet on one side and pipe on the other side of each bolt.
5.2.2 Tighten the union

The union between the Rotor Spreader Hex and the feeding hose has to be tightened *Regularly.

Required tools:
- Rotary Spreader Mounting tool, item No.: 0102179

Procedure:
Place the pipe joint around the union and tighten properly.
5.3 Handling blockages inside the feeding system

If pellets are sent out from the dosers on the feeding line, but none come out of the rotor spreader outlet, when the feeding software is set to feed, this may indicate a blockage inside the system.

A blockage inside the feeding system will build up a severe internal air pressure inside this system. This pressure will not be set off when turning off the blower, and when the blockage is released, the pressured air will bring the pellets the easiest way out - through the rotor spreader outlet, with risk of creating a dangerous situation for persons staying around the rotor spreader. The compressed pressure must be neutralized as described in this section to avoid injuring personnel.

If no other causes for air and pellet stop are found in the software or other equipment, pipes, feeding pipes and rotor spreader have to be controlled for pellet blockages as instructed in this section. When searching for blockages inside the rotor spreader parts for blockage, use a rubber hammer and knock carefully to the pipes making sure not to damage the materials, to hopefully release the blockage.

If this does not release the blockage, the rotor spreader hex may be disassembled and checked by sticking a steel wire inside the pipes to locate the blockage, and then use the rubber hammer in the area to release it.

*Pellet blockages may easily be avoided by rinsing pipes and feeding pipes daily with the AKVA Feed Pipe Cleaner and AKVA Sponge. Contact Your AKVA sales person or visit [www.akvagroup.com](http://www.akvagroup.com) for more information on these products.*
- The main power may only be turned back on when the rotor spreader hex is disconnected from the feeding pipe and the end of the feeding pipe is attached to the cage edge with ropes or straps, with the end opening pointing in to the cage center, or if the rotor spreader hex’s rotating parts are removed (from bearing and upwards), and no personnel are staying near the opening.

- Nobody may occupy the area around the opening of the rotor spreader hex or feeding pipe when the main power is turned back on. This also applies when the rotating parts are removed from the rotor spreader hex, because the pellets may shoot out with great power when the blockage is released and the pressure has not been neutralized.

- If two or more people are working together with releasing a blockage, clear communication is crucial to avoid dangerous situations caused by mis-communication.

- Only when a blockage is released, all equipment are re-assembled and all of the devices in the feed line are in order, the main power switch may be turned back on, and the feeding process may continue.
Required equipment:
- Rotary Spreader Mounting tool (item No.: 0102179)
- Rubber hammer

Procedure:

1. Control blower, doser and selector in the blocked feeding line. These may not be in order, and be the cause that no pellets exit the system. Repair if broken and control. If pellets are still staying inside the system, proceed to the next step.

2. Control that the AKVAconnect is working as it should. If anything is found wrong here, contact AKVA service personnel for assistance.

3. If software and remaining equipment are working as they should, start controlling the rotor spreader. First of all: turn off the feeding system’s main power switch and secure it in locked position with a personal padlock.

4. Neutralize the pressure inside the system by running the selector to an idle opening. Here, the internal pressure will be released, and the risk for uncontrolled rotating parts will be eliminated, even if the blockage is released.

1. Release two of the positioning ropes and use the third rope to pull the rotor spreader hex to the cage edge.

2. First, remove the outlet (the top part) of the rotor spreader hex from the rest by releasing the bearing. Control this part for blockage with wire and/or carefully knocking on the pipe with a rubber hammer. If the blockage is not found in the rotor spreader hex itself, it will be necessary to check the feed pipes.

Be careful not to damage the rotor spreader pipe material during this procedure!
3 Release the rotor spreader hex from the feeding pipes by releasing the union with the Rotary Spreader Mounting tool. 

*Do not drop the o-ring from inside the union into the water!*

4 Attach the end of the feeding pipe to the cage edge rail, pointing it in towards the cage, with ropes or strips, to ensure that no personnel stays by the opening when the feeding system is started, and to make sure it stays in place during the test procedure.

5 Use the rubber hammer around on the length of the pipe to release the blockage.

6 Remove the personal padlock and turn the main power back on.

7 Start the feeding system and activate the feed line blower with low air speed. Pellets and air will exit the pipe if a blockage was located here, so make sure that someone observes the outlet when the blower is turned back on.

8 If blockage are not found in the rotor spreader hex itself nor the belonging feeding pipe, please contact AKVA service personnel for further inspections to find out what is stopping the pellets from exiting the system.

See **Appendix D - Contact information** to find your contact.
5.4 Spare parts

**Ball bearings**
Expected life cycle is 600 tons of feed. Change the ball bearing preventively at 80% (480 tons) of this time to ensure the bearing 100% up time. Keep track in AKVAconnect to see when to change the ball bearings.

**Aluminum pipes**
The first pipe is connected to the bearing (spare part kit) and is therefor changed at the same interval as ball bearings (480 tons) The pipe outlet is changed preventively at 1000 tons of feed.

Contact AKVA group to order new parts for YOUR Akvasmart Rotor Spreader Hex. See Appendix D - Contact information.
### 5.5 Registration of maintenance - Akvasmart Rotor Spreader Hex

*Sign for each task after it is performed. Use one form per rotor spreader hex. Fill in deviation form for each deviation.*

*Execute these maintenance tasks every 6 months, twice a year.*

<table>
<thead>
<tr>
<th>Date</th>
<th>Check bearing moveability</th>
<th>Clean bearing</th>
<th>Tighten all bolts and connections</th>
<th>Tighten union</th>
<th>Comments</th>
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</table>
6 Removing Akvasmart Rotor Spreader Hex from a cage

For need for larger repairs and when the Akvasmart Rotor Spreader Hex is going to be moved or discarded, it must be taken out from the water in the cage in a safe way. Follow all procedures in this section for safe moving of the rotor spreader.

Always follow safe practice when working on or by the cage edge and when lifting equipment in and out of the cage.

When disconnecting the Akvasmart Rotor Spreader Hex from the feeding pipe, make sure that the main power switch is turned off and locked in off position (lock-out/tag-out).

Before any lifting takes place, check all certificates for the crane, shackles and accessories and make sure that they are sufficient for lifting the planned load.

Personal safety equipment, such as antiskid foot wear and floating garments, are mandatory to wear when working on and by the cage, for instance when working on the rotor spreader.

When occupying areas where rotor spreaders are being lifted above sea level, it is also mandatory to wear hard helmet.
Procedure:

1. Read through this entire procedure as well as section 1.5 Safe lifting operations before commencing this lifting process.

2. Turn off the feeding system’s main power switch and secure it in locked position with a personal padlock.

3. Release two of the positioning ropes and use the third rope to pull the rotor spreader to the cage edge.

4. Release the rotor spreader from the feeding pipe by releasing the union with the Rotary Spreader Mounting tool. 
   
   Do not drop the o-ring from inside the union into the water!

5. Attach the feeding pipe to the cage edge, so that it can not float away uncontrolled.

6. Standing on the cage edge, lift the rotor spreader as high as necessary to tread the hoisting straps as shown in section 4.1 Lifting Akvasmart Rotor Spreader Hex into a cage.

7. Lift the rotor spreader according to the safety instructions in section 1.4 out from the cage and into the boat.
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# Appendix B - Deviation form

Make copies of this form before filling anything in

<table>
<thead>
<tr>
<th>Deviation control No.:</th>
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<tbody>
<tr>
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<table>
<thead>
<tr>
<th>Unit:</th>
<th>Producer:</th>
<th>Prod.No.:</th>
<th>Purchase year:</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

Deviation description:

Follow up proposition:

Date and signature, declarer:

Follow up directed:

Status:

New action for deviation No.:

Date and signature, follow up:
Appendix D - Contact information

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