ENGLISH INSTALLATION- AND MAINTENANCE MANUAL

Akvasmart Rotor Spreader

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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 web site, 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 footwear 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

This manual describes how Akvasmart Rotors Spreaders 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 ASA.

1.3 Personnel safety

Farm owner where Akvasmart Rotor Spreaders 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 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

- How the Akvasmart Rotor Spreader works and how to use it

- How to maintain the Akvasmart Rotor Spreader according to procedures described in this manual.

Owner and farm manager are responsible for that all personnel working with or around the Akvasmart Rotor Spreader 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.
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.

Troubleshooting must, on some occasions, be carried out with 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 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.

1.5 Equipment safety

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.

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.

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.
2 Information

This user manual is part of the equipment that belongs to the Akvasmart Rotor Spreader, also named “rotor spreader” in this manual. Keep the manual for as long as the rotor spreader 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 or any other AKVA product.

The purpose of this manual is to make the user able to install and maintain the Akvasmart Rotor Spreader 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 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 Akvasmart Rotor Spreader, as well as this manual instruction.

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

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 rotor spreader allows reduction in air speed while still getting excellent feed spread.

The Akvasmart Rotor Spreader is designed to achieve optimal feed spread in the cage, and its simple lightweight construction is unique when considering air requirements to achieve best feed distribution. The Akvasmart Rotor Spreader uses 20-30% less air than equivalent feed spreaders. This means less dust and breakage on the feed, as well as lower energy consumption.

Our unique ventilated Zenon bearing has extra low friction, does not corrode and requires minimal maintenance. The Akvasmart Rotor Spreader is very stable in high sea due to its low center of gravity, and is easy to hold position in the cage. Due to the low weight, the Akvasmart Rotor Spreader is also easy to mount without using lifting equipment.

### Technical specifications:

<table>
<thead>
<tr>
<th>Rotor Spreader</th>
<th>RS-63C</th>
<th>RS-90C</th>
<th>RS-110C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PE pipe dimension:</strong></td>
<td>63mm (2&quot;)</td>
<td>90mm (3&quot;)</td>
<td>110mm (4&quot;)</td>
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<tr>
<td><strong>Max pellet size:</strong></td>
<td>12mm (1/2&quot;) *</td>
<td>25mm (1&quot;) *</td>
<td>25mm+ (1&quot;) *</td>
</tr>
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<td><strong>Recommended RPM:</strong></td>
<td>50-100 *</td>
<td>50-100 *</td>
<td>50-100 *</td>
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<tr>
<td><strong>Spread diameter (adjustable):</strong></td>
<td>Approx. 4-12m Ø * Approx. 12-40’ Ø *</td>
<td>Approx. 5-18m Ø * Approx. 16-60’ *</td>
<td>Approx. 5-18m Ø * Approx. 16-60’ *</td>
</tr>
<tr>
<td><strong>Materials:</strong></td>
<td>Stainless Steel/Alum. Rotor/POM (Delrin) Polyform buoy</td>
<td>Stainless Steel/Alum. Rotor/POM (Delrin) Polyform buoy</td>
<td>Stainless Steel/Alum. Rotor/POM (Delrin) Polyform buoy</td>
</tr>
<tr>
<td><strong>Height above water:</strong></td>
<td>1.2m (4’)</td>
<td>1.2m (4’)</td>
<td>1.4m (4’6&quot;)</td>
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<tr>
<td><strong>Draft:</strong></td>
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<tr>
<td><strong>Total weight:</strong></td>
<td>Approx. 30kg (66 lbs.)</td>
<td>33kg (73 lbs.)</td>
<td>38kg (84 lbs.)</td>
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* Depending on feed system and feed type
3 Assembly

Read through this entire manual, and be sure that you understand the contents properly before the assembling is commenced.

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

The assembling must be done on shore or in the barge/on a boat.

3.1 Necessary assembling equipment

- A compressor for inflating the buoy
- A knife for removing any burrs in the buoys center opening
- A tape measure for measuring the buoys centerline circumference
- 2 x M10 spanners/wrenches for attaching the weight bolts
- 1 x M6 hex key for attaching the bearing
- A screwdriver for attaching the outlet pipe hose clamp.
3.2 Buoy for buoyancy

Thread the flat buoy onto the weight pole. The air nipple must point upwards.

If this is difficult, carefully remove any burrs around the opening of the buoy center hole with a knife.

Inflate the buoy with a compressor. The buoy is properly inflated when the centerline/split-line has a circumference of:
- CF63: 50” (1.27m)
- CF90: 50” (1.27m)
- CF110: 60” (1.52m)

These values make sure that 50% of the buoy is above water and 50% below water, only with these proportions the rotor spreader stands with a 90 degree angle in the water surface. Remember that the buoy and the bottom stability weight is the only buoyancy force of the rotor spreader.
3.3 Weight for stability

The Akvasmart Rotor Spreader may be delivered with a stability weight cover with rounded edges that protects the net and other surrounding equipment against the sharp edges of the weights.

The cover is mounted when the stabilization weight is mounted to the rotor spreader, or it may be installed later if desired. Subsequent assembly requires that the weight is removed.

3.3.1 Assembling stability weight (without cover)

1. Align the stability weight hole with the weight pole hole.

2. Insert the M10x80 Allen bolt.

3. Lock with the M10 nut.
3.3.2 Assembling stability weight with protection cover

1. Tread the protection cover over the rotor spreader pole, with the flat end pointing downwards towards the weight end.

2. Follow the instructions in section 3.3.1 Assembling stability weight (without cover).

3. Tread the protection cover over the weight.

4. Place the lid (shown as the green part in the illustration below) in the opening of the bottom of the protection cover.

5. Fasten the lid by inserting the lock ring (the red part in the image below).
3.4 Bearing for even rotation

1. Attach all 3 M8 Allen screws before tightening.
2. Tighten the bolts one by one to maximum 6Nm.

![Warning]

*If these are overtightened, the bearing house will bend and the bearing will become useless.*

3.5 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 Installing Akvasmart Rotor Spreader in a cage

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 from 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.
4.1 Lifting Akvasmart Rotor Spreader into a cage

Please note that a controlled vertical drop is preferred when installing the Akvasmart Rotor Spreader in the cage, to avoid the stability weight to touch surrounding equipment and disturbing the fish.

Procedure:

1. Read through this entire procedure and section 1.4 Safe lifting operations before commencing this lifting process.

2. When the rotor spreader is completely mounted, it may be brought to the cage edge for installation. Attach approved hoisting to the rotor spreader in the opening between the straight and the bent pipe, as shown:

3. Lift the rotor spreader according to instructions, from the boat over to the cage inside.
4.2 Connecting the Akvasmart Rotor Spreader to the feeding system

**Necessary equipment:**
- Rotary Spreader Mounting tool (item No.: 0102179)

**Procedure:**

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

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

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

4. Screw the union (blue colour) into the union house using hand force firstly, then use pliers or a large spanner to tighten the connection.
4.3 Adjusting the Akvsmart Rotor Spreader in the water

Necessary equipment:
- Rotary Spreader Mounting tool (item No.: 0102179)

Procedure:
1. Remove the hoisting strap.

2. Leave the Akvsmart Rotor Spreader in the water and for a while to stabilize in the water.

3. If the pole does not stand perpendicularly on the water surface, it will be necessary to proceed tentatively adjustments, little by little, in order to get the spreader as straight up on the water surface to achieve best possible use for the rotor spreader.

   Take the rotor spreader out from the water, and either:

   a. twist the union and twist the rotor spreader, or

   b. pull the weight in the bottom of the pole the opposite direction of the displacement.

   Repeat this adjusting process until the rotor spreader stays vertically on the water surface.
4.4 Place and attach the Akvasmart Rotor Spreader in the cage

For a best possible pellet spreading inside the cage, we recommend placing the rotor spreader as centred in the cage as possible. For more than one spreader in a cage, please contact AKVA service personnel for assistance with placing.

To keep the Akvasmart Rotor Spreader at the same place inside the cage at all times, it must be attached with three ropes to the cage edge. These ropes are not to keep the rotor spreader upright. Buoy and weight are sufficient for this purpose.

*We recommend using the knot “clove hitch with two half hitches” when attaching the ropes to the cage edge.*

**Required equipment:**

- 3 ropes (for positioning), that are long enough to attach to the cage edge with recommended knot, and to a carabiner.

- 3 safety hooks that fit the holes in the attachment bracket. Item no. 0102135 is delivered with the Akvasmart Rotor Spreader for this purpose.

**The positioning ropes must never be used for lifting the Akvasmart Rotor Spreader out from the water!**
Procedure:

1. Attach the 3 ropes to one safety hook each using recommended knot.

2. When the rotor spreader is placed in the cage, attach the ropes to the bracket with the safety hooks, and loosely to the cage edge.

Make sure to attach the safety hooks properly!

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

4. Attach the ropes to the cage edge with recommended knot. See positioning illustrations in the next page.
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 disconnecting the Akvasmart Rotor Spreader from 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 bearing is important in order to maintain an even rotation during feeding. We recommend bearing inspection minimum every sixth month. Clean and change when required.

Contact AKVA group Service if any questions occur that is not answered in this manual, or if it is desired that AKVA service personnel should perform maintenance to the rotor spreader or any other AKVA products.
5.1 Regular maintenance

Control the rotor spreader bearing every sixth month to make sure that it is not dirty or have contaminations inside. The bearing must also be controlled if it seems to be rotating slower than usually when all other parts of the feeding system are in order, as this may indicate that the bearing is contaminated. Follow instructions in section 5.3 Cleaning bearing for correct control, and clean or change bearing when required.

Register all performed maintenance in the form in section 5.5 Registration of maintenance - Akvasmart Rotor Spreader. Remember to make copies of this form before filling anything out.

5.2 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 either a rubber hammer and knock carefully to the pies making sure not to damage the...
materials, to hopefully release the blockage. The rotor spreader parts 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.

Feed Pipe Cleaner

Pellet blockages may easily be avoided by rinsing feeding pipes daily with the AKVA Feed Pipe Cleaner and AKVA Sponge. Contact Your AKVA sales person or visit www.akvagroup.com for more information on these products.

- The main power may only be turned back on when the rotor spreader 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 spreaders 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 or feeding pipe when the main power is turned back on. This also applies when the rotating parts are removed from the rotor spreader, 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.

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

6. First, remove the outlet (the top part) of the rotor spreader 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 itself, it will be necessary to check the feed pipes.

Be careful not to damage the rotor spreader pipe material during this procedure!
7 Release the rotor spreader 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!*

8 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.

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

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

11 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.

12 If blockage are not found in the rotor spreader 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.
5.3 Cleaning bearing

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

2. Unscrew the 3 hex bolts, *and keep them in a safe place!* and remove the bearing. Clean the bearing in warm, mild degreasing soap water.

3. Inspect the bearing properly.

4. If the bearing is OK, reattach it. Replace bearing if necessary.

5. Reattach all 3 bolts before tightening. Then torque one by one to 6Nm.

*If the bolts are tightened too hard, the bearing house will bend*
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. See Appendix D - Contact information.
### 5.5 Registration of maintenance - Akvasmart Rotor Spreader

Sign for each task after it is performed. Use one form per rotor spreader. 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>
</tr>
</thead>
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<td></td>
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6 Removing Akvasmart Rotor Spreader from a cage

For need for larger repairs and when the Akvasmart Rotor Spreader 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 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 and section 1.4 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 strap between the bent and the straight pipe, as shown:

7 Lift the rotor spreader according to instructions in section 1.4 Safe lifting operations 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.

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