Erection Work, Operating and Maintenance Instructions

Machine: **FibreSolve FSRe3**

Year built: 2007

Customer name: DONG TIEN Paper(VIETNAM)
Order no.: PF U618/06

Issued: PF/Tian Miao, 2007-07

Checked: PF/Liu Gang, 2007-07

TABLE OF CONTENTS

1 INTRODUCTION

This manual is part of the Andritz AG technical documentation for the plant. It is intended as a supplement to the training provided, to supply the basic knowledge required for proper, safe and economical use of the equipment delivered by Andritz AG. Observing these instructions helps avoid hazards and reduce repair and downtime costs, as well as increasing the reliability and useful life of machines.

1.1 Use

Target group

This operating manual is intended for users with a knowledge of mechanical engineering and is for the exclusive use of the operator and his personnel.

Personnel entrusted with work on the machine must have read and understood these operating instructions and comply with them. This refers in particular to the following tasks:

- Handling, starting and stopping
- Troubleshooting
- Maintenance and upkeep
- Transport
- Maintenance and disposal of process materials, cleaning of machine and area around the machine.

The following sections are especially important:

- the Chapter on SAFETY,
- the safety instructions contained in various other chapters

Supplementary instructions

The mill operator shall complete this manual by adding national regulations on safety at work, health protection and environmental protection.

Instructions on any special operational conditions concerning work organization, sequence of work/operations and the personnel assigned to the job shall also be added. This includes instructions on supervising and reporting obligations.

Safekeeping

Keep the entire operating manual near the place where the machine is installed and within easy reach.

1.2 Standards and guidelines

The machine/plant has been built in accordance with state-of-the-art standards and the recognized safety rules. The equipment conforms to the equivalent European standards.

1.3 How to use the manual

Presentation

- Chapter and paragraph headings are printed in capitals in the continuous text.

  Chapter on SAFETY

- Designations of indicating and handling elements are written in inverted commas in the continuous text.

  Operate switch ”xxx”

- Lists without numbering do not require operations to be carried out in a certain order.

Pictograms

The following pictograms are used in the manual:

Warning signs

Warning signs are shown with an explanation of the type of hazard.

The meanings of the different graduations of hazards are described in the Chapter on SAFETY.

Marks an instruction on handling of the machine or system.

Marks a useful piece of information

Marks a cross-reference to another Chapter with absolute path indication.

e.g.  /MACHINE/SAFETY

Work steps (operations)

Work steps are presented in tables. Work steps are numbered and must be carried out in the order specified.

Numbering of pages, tables and figures

Pages	Consecutive numbering of Chapters	2-1
Tables	Tab.+ Consecutive numbering of Chapters	Tab. 2-1
Figures	Fig. + Consecutive numbering of Chapters	Fig. 2-1

Abbreviations

Tab.	Table
Fig.	Figure

Illustrations and graphic charts

The illustrations and graphic charts show the basic design of the machine. This may not necessarily correspond exactly to the design supplied.

Detailed information on the equipment supplied

➨ /ENGINEERING DOCUMENTATION/DRAWINGS AND PART LISTS/PARTS BOOK

➨ /SUPPLIER DOCUMENTATION

1.4 Warranty and guarantee

Andritz AG's general terms of delivery and sale shall apply.

Guarantee and liability claims towards Andritz AG shall become void if personal injury or material damage is caused by one or several of the following:

- Use of the machine/system for any purpose other than its designated use.
- Non-conformity of erection work, start-up and handling of the machine/system.
- Non-observance of the safety instructions in the manual.
- Non-authorized structural changes to the machine/system.
- Non-observance of the maintenance and upkeep instructions.

In the event of a claim for repair under guarantee, ANDRITZ AG reserves the right to assess the damage to the machine/system.

1.5 Manufacturer's name and address

Andritz AG
Stattegger Strasse 18
A-8045 Graz

Our Service Department will be pleased to help you and can be contacted at:

Andritz AG
Stattegger Strasse 18
A-8045 Graz

Pulp Technology Service Department

Tel.: +43/316-6902-2759
Fax: +43/316-6902-424
e-mail: Karl.Eickhoff@andritz.com

In case of emergency outside working hours:

Tel.: +43 316 6902-0

1.6 Copyright

2 SAFETY

2.1 General safety regulations

The chapter on safety contains general safety regulations which must be observed when working on the machine/plant.

The chapters dealing with individual tasks in the operating manual contain further safety regulations in addition to those provided here. These are marked by DANGER SIGNS.

Safety instructions on components not supplied by Andritz AG are contained in the descriptions of the components provided by sub-suppliers.

➡/ SUPPLIER DOCUMENTATION

The safety instructions supplement ANDRITZ AG's operating instructions.

All safety instructions must be observed. Disregarding the safety instructions may cause a risk to life and limb, environmental pollution hazards and/or damage to property.

Andritz requires the operator to provide the following:

- The operator must compile a comprehensive general safety program. Anyone working at or in the vicinity of the machine must have received training for working on plants of this type and on the process running there, including where to mount barriers and markings.

2.2 Danger and warning signs

The entire SAFETY chapter is of extreme importance and relevant to safety. The information in this chapter, therefore, is not marked with special danger symbols.

In the Chapters on ERECTION WORK, START-UP, OPERATION, and MAINTENANCE in this Manual, warnings are marked by a pictogram. The following warning signs are used:

DANGER

This symbol indicates there may be a risk to life and limb.

Non-compliance with the warning signs may lead to serious health problems or even fatal injuries, and can cause extensive damage to property.

WARNING

This symbol points to an imminent health risk, as well as a risk of environmental pollution and of damage to property.

Non-compliance with the warning signs may cause moderate health problems and/or extensive environmental pollution and damage to property.

CAUTION

This symbol points to a dangerous situation.

Non-observance of these signs may cause environmental pollution and damage to property.

Further symbols and pictograms used are described in the INTRODUCTION.

2.3 Designated use

The FibreSolve should only be used according to the specifications forming part of the purchase order.

Use of the machine/plant for any other purpose is considered contrary to its designated use.

Any modifications to the scope of supply made without the agreement of Andritz AG are considered contrary to the designated use.

The term designated use also covers adherence to the operating instructions, compliance with the operating, inspection and maintenance conditions and with the regulations on cleaning and upkeep.

2.4 General remarks on machine/plant safety

The machine/plant has been built in accordance with state-of-the-art standards and the recognized safety rules. Nevertheless, its use may constitute a risk to life and limb of the user or of third parties, or cause damage to the machine/plant and to other material property.

The machine/plant may only be operated when in perfect condition and with due consideration to safety and the risks involved. All protective devices and the emergency cut-out devices must be in place and fully functional.

Malfunctions and unforeseen changes to the machine/plant must be remedied immediately.

2.5 Hazardous applications

The machine was developed specially for the process specified in the sales contract. All changes to this process must be checked and approved because Andritz knows in detail the chemical and biological properties of the numerous materials that can be processed in this machine. The machine as-sold is not suitable for safe processing of hazardous materials unless additional precautions are taken.

Before processing materials that are already combustible, explosive, toxic, or hazardous in other ways or which can become hazardous in a reaction, the operator must conduct a thorough hazard analysis and risk evaluation of the entire process. This includes drawing up of contingency plans for handling process errors and faults.

In particular, the following must be observed:

1. If combustible or potentially explosive materials are to be processed, all electric motors, cabling and operating elements MUST be explosion-proof. Furthermore, maintenance work on the plant MUST be performed using non-sparking tools. Smoking is forbidden.
2. If the material processed is toxic, appropriate safety measures MUST be implemented.

2.6 User's obligations

Designated use

The user of the machine is responsible for its designated use.

Work instructions

In addition to the operating instructions, applicable legal stipulations in the user countries and other rules governing safety at work, health and environmental protection must be observed and personnel instructed in these matters.

Qualification of personnel assigned

The machine/plant may only be operated, maintained and serviced by authorized, skilled personnel with hands-on training.

Personnel must be of the legal minimum age.

Any person undergoing training or in apprenticeship or under instruction may only work on the machine/plant after receiving instruction on the theory and only under the supervision of an experienced person.

Instructions

The customer's operating and maintenance personnel is to be instructed by qualified persons after completion of the installation work.

The user undertakes to have new, additional operating and maintenance personnel instructed in machine/plant operation and maintenance to the same extent and applying the same care, and with due consideration to the safety instructions.

Workers entrusted with the transportation, erection work, start-up, operation, and maintenance of the machine/plant must have read and understood the operating instructions, especially the chapter on SAFETY, the safety instructions concerning a certain activity, as well as the safety instructions issued by sub-suppliers.

Definition of fields of responsibility

The user shall be responsible for:

- definition of the machine operator's responsibility and his right to give instructions,
- Definition of the contents and of responsibility for keeping the records on functioning and any failure of the monitoring equipment (log book),
- personnel areas of responsibility in terms of operating, tooling, maintenance and upkeep.

Inspections

The operator undertakes

- to check at regular intervals whether the safety instructions and regulations governing work on the machine are observed,
- to carry out regular training to confirm the level of knowledge of the operating and maintenance personnel.

Attaching safety devices

The operator shall ensure that all regulations relevant to security are observed and that all symbols and signs are mounted in the production area in accordance with local regulations.

- Safety devices and regulations (see Chapter 2.8)

In addition, Andritz recommends mounting the following devices, symbols and signs, in as far as these are not already included in the local regulations.

- Markings on the floor for vehicle routes, protective fencing and danger areas (yellow)
- Fencings and covers
- Railings (foot, centre and chest height)
- Emergency lighting
- Shut-off device for drive motor
- Signs on fire-fighting equipment
- Signs for emergency calls
- Direction arrows to exits
- Direction arrows to escape routes
- Signs to first-aid post
- Emergency-OFF button

The national fire protection regulations must be observed.

2.7 General obligations of personnel

To avoid personal and material damage, all persons working on the machine shall observe the following safety instructions:

- Observe the safety regulations in the operating instructions and on the machine.
- In the event of a safety-relevant functional disorder, stop and secure the part of the plant affected. Report disorders and have them repaired immediately.
- Do not perform any work in a manner disregarding safety considerations.
- Use only the machine accesses, paths and passages foreseen for this purpose.
- Do not touch moving and rotating parts and/or reach out beyond them.
- Keep the machine and the workplace clean. Do not place tools and other objects on the machine/plant.
- Do not wear any garments/pieces of jewellery which might get stuck on moving machine/plant parts. This includes ties, scarves, rings and necklaces.
- Do not wear long hair hanging down.
- Familiarize yourself with the function and any failure of machine monitoring equipment (log book) before starting work.
- No smoking in the vicinity of the machine/plant.
- Wear personal protective apparel when working on the machine/plant (see section 2.9).

2.8 Safety devices

The machine/plant must not be operated without effective safety equipment.

Safety equipment must not be circumvented, dismantled or made unserviceable during operations. The safety equipment is there to protect operating personnel.

Safety equipment and access thereto must be kept clear.

Emergency-off switch, emergency cut-out

The machine/plant must have emergency-off buttons to stop it in case of an emergency.

Indicative, warning and prohibiting signs

Indicative, warning and prohibiting signs must be observed. They must be checked regularly for legibility and completeness and they must not be removed or obstructed.

2.9 Personal protective apparel

General protective apparel

Operating personnel must use and carry personal protective equipment along with them in accordance with the national regulations or as specified by the plant operator.

It should be compulsory to wear hard-toed boots throughout the entire mill premises.

In adddition to the regulations applying, we recommend using the following safety equipment for certain work:

Activity	Safety equipment		
Time spent in the immediate vicinity of the machine while it is running			
Taking pulp samples			
Field installation and maintenance work for which parts of the machine have to be removed			

Tab. 2-1 Recommended safety equipment for certain work

Key to symbols

	Protective clothing to prevent the pulp from coming into contact with the skin		Safety shoes as protection against foot injuries
	Gloves to prevent hand injuries		Ear protection to prevent damage to hearing
	Goggles to prevent eye injuries		Standard hard hat as protection against head injuries

Tab. 2-2 Purpose of the safety equipment

2.10 Safety at the machine installation site

A suitably large, clear, and unconfined working area must be created on all sides of the machine. Pipework, ducting, etc. must be laid such as not to impede access to the machine.

All operating and maintenance areas of the machine must have adequate lighting and ventilation. (industrial lighting)

The foundation must be dimensioned to withstand the pressure load of the machine. The vicinity of the machine and escape routes must be kept clear. Area around machine must be marked as danger zone. It must be possible to enter and leave the operating area unimpeded.

Make sure machine and surrounding area are kept clean. In particular, oil and grease on the floor and on machine elements may cause slipping. This is therefore a considerable source of injuries, as are tools that have not been put down in a safe place. The operating area must be clear of waste materials, tools and other extraneous objects.

The floor around the machine must be provided with a non-slip finish.

In order to prevent any falls from or damage to the machine, it is forbidden to climb onto machine elements or on the machine (except for the treading areas provided). Use ladders or similar equipment in accordance with recognised standards.

Ramps, platforms and lifts must be used to avoid injury or excessive physical effort.

2.11 Temperature

If the pulp used is warmer than 65°C, the safety sign "Danger - Hot Surface" must be mounted on the chest (see Section 2.8), and all of the necessary safety measures must be implemented by the operator (e.g. hand protection, training. etc.).

2.12 Noise

The total noise emissions from all machines in the production room can restrict spoken communication and impair hearing.

The machine is designed such that no operator is required in the immediate vicinity of the machine during normal operation. Appropriate hearing protection should be worn throughout maintenance and adjusting work while the machine is running.

2.13 Electrical equipment

All work on the electrical equipment, without exception, must be carried out by skilled electricians.

Any form of contact with electrical equipment may cause fatal injuries.

Before beginning any maintenance or repair work, the operator must disconnect the energy supply to all drives securely. This can be achieved with a maintenance switch, lockable racks in the MCC, or with other suitable measures that comply with the safety regulations.

Employees performing work on live parts should be accompanied by an assistant who can operate the emergency switch if necessary.

Users of medical electronic equipment, such as pacemakers, must not enter the electric danger zone.

Machine must be earthed to avoid electrostatic loading. Machine, gears and motors must be connected to the earthing system.

2.14 Welding work

In general, welding work is only permitted after consulting Andritz AG. Any welding work that is described in detail in the maintenance instructions is excluded from this ruling.
When performing welding work, always observe the relevant safety regulations and the appropriate safety regulations for work performed in enclosed and confined spaces.

DANGER

HOT WORK PERMIT REQUIRED!

Danger of fire or explosion!
There is a considerable risk of fire or explosion during welding work. Always take the appropriate fire precautions before beginning work, e.g. keep fire extinguishers at the ready.

All motors should be disconnected before carrying out electric welding work.

During arc welding work the grounding should never be allowed to run over the rolling bearings. An earthing cable is to be connected up in the immediate vicinity of the welding area.

2.15 Fluids, (liquids, gases, vapour or smoke)

Unintended chemical reactions may take place in fibre pulps during a prolonged standstill and hazardous fumes may be produced.

The machine must be thoroughly cleaned after prolonged stoppages.

The area must be adequately ventilated.

Before beginning work on the machine, ensure that no liquids, gases, vapours or smoke can enter the working area from feed pipes, discharge pipes or shafts.

If it is not possible to reliably exclude the risk of liquids, gases, vapours or smoke flowing in, all persons working in the danger zone must be equipped with a safety harness and a safety rope. Each worker must be monitored by a second person outside the danger zone.
It must always be possible to evacuate a worker from the danger zone without delay.

2.16 Oils and greases

The safety instructions for the products concerned must be observed when handling oil, grease and other chemical substances.

Suitable skin protection is required when handling aggressive media. See manufacturers' information for the type of skin protection required.

Also observe relevant requirements for disposal.

2.17 Work in enclosed vessels and in confined spaces

Definition

All operating equipment that is closed off towards the surrounding atmosphere is considered an enclosed vessel. This includes shafts, channels, pipework and cavities in machines.

Procedure

Step	Procedure
1	**The safety measures must be defined in writing before beginning any work.** The safety measures must be defined by a competent expert in this field.
2	**Permit to enter an enclosed vessel, to be issued by a supervisor who is present at all times.** This supervisor must check personally that the measures defined in writing are implemented and thus, that it is safe to enter the enclosed vessel.
3	**Permanent supervisor available for rescue measures.** There must always be someone present who is well versed in the required protective and safety measures. This person must be capable of rescuing whoever is inside the enclosed vessel or of fetching help without actually leaving the place of the incident.
4	**Approval for re-start to be given by permanent supervisor.**

Tab. 2-3 Working in enclosed vessels - procedure

Specimen permit to enter an enclosed vessel, see section 2.18

Emptying and cleaning

The enclosed vessel must be disconnected effectively from all pipes leading to and from it.

Possible cleaning methods:

- Flushing out
- Steaming out
- Using high-pressure cleaning equipment.

If high-pressure cleaning equipment is used in a potentially explosive atmosphere, the cleaning lance must always be made of non-sparking material.

The enclosed vessel should only be cleaned mechanically in exceptional cases as this work requires someone to enter the vessel.

Ventilation – protective breathing equipment

The ventilation system must be sized such as to maintain the concentration of noxious substances below the maximum concentration permitted in the work place and also to ensure that sufficient oxygen is available. This will ensure that it is possible to work without protective breathing equipment and that there is no risk of fire or explosion. Ventilation is only permitted with air. It is forbidden to ventilate using pure oxygen or air with an increased oxygen content!

If the concentration of noxious substances exceed the maximum permitted value, suitable protective breathing equipment must be used.

Protective breathing equipment		
Oxygen content	**Harmful substance concentration**	**Safety measures**
> 17%	< MAC at place of work	None
> 17%	> MAC at place of work < Retaining capacity	Filter mask
> 17%	> MAC at place of work > Retaining capacity	Independent protective breathing equipment
< 17%		Independent protective breathing equipment
	> 50% of lower explosion limit	Entry is forbidden

Rules for ventilation

- Solvent vapours are heavier than air, thus they must be extracted by suction at the lowest point of the vessel.
- Fresh air should be blown in close to the respiratory organs.
- Ventilating efficiency should be monitored with measuring instruments.
- If substances presenting a fire hazard are extracted, the risk of explosion must be considered.

Further regulations and measures

Gas bottles

It is forbidden to take gas bottles or liquid fuel (liquid gas) into an enclosed vessel. (e.g. welding equipment, lamps or soldering tools).

Safety harness

If it is necessary to enter an enclosed vessel in which there is a danger of fire or of harmful work substances being present or a risk of oxygen deficiency, the person entering the vessel should be roped up with a safety harness.

The following points must be observed:

- The end of the rope must be secured outside the vessel.
- Each worker must be monitored by a second person outside the danger zone.
- It must always be possible to evacuate a worker from the danger zone without delay.
- If the only rescue route is upwards, use only approved rescue equipment, such as cable winches or manual lifting devices.

In the presence of working substances that may ignite, rescue ropes must either be plastic-sheathed steel ropes or ropes with at least equivalent heat-resistance properties.

If roping up is not possible, suitable escape hatches must be available that will allow anyone inside the vessel to climb out without assistance from outside.

2.18 Permit for work in enclosed / confined spaces

Object / location / point at which work is performed: . . . . . .
Type of work: . . . . . .
Supervisor . . . . . .

Preparatory protective measures

Which substances are or were present?

Amount / concentration . . . . . .

What substances can form?

Amount / concentration . . . . . .
Existing equipment . . . . . .
Equipment brought in . . . . . .

Access ports to be cleared:

No. / size . . . . . .

Definition of safety measures

Vessel to be emptied yes ☐ no ☐ Type: . . . . . .
Residue to be removed yes ☐ no ☐ Type: . . . . . .
Ventilation: natural ☐ technical ☐ Type: . . . . . .
Air analysis required . . . . . yes ☐ no ☐
Protective breathing equipment required . . . . . yes ☐ no ☐
Equipment available or brought in . . . . . yes ☐ no ☐
if so, what are the safety measures? . . . . . .
Personal protective apparel required . . . . . yes ☐ no ☐
if so, what protection measures? . . . . . .
Explosion protection measures required . . . . . yes ☐ no ☐
if so, what protection measures? . . . . . .
Look-out personnel . . . . . yes ☐ no ☐
Required rescue equipment . . . . . yes ☐ no ☐

Safety measures cancelled

by . . . . . .
Safety measures mentioned were observed: . . . . . .

Approved

from _____ at _____ hrs to _____ at _____ hrs

_____ _____

(Supervisor) (Contractor or sub-contractor)

3 TECHNICAL DATA

3.1 Data

Operating data	**FibreSolve FSRe3**	
	Motor power	110 kW / 50 Hz
	Nominal speed	1000 rpm
	Rotor speed:	315 rpm
	Maximum operating temperature	70 °C
Sealing water	Flow rate	0.5 -5 l/min
	Pressure	1.5 bar
	Temperature	<20°C
	Quality	75 microns (fresh water)
Weights	Screening plate (4 units)	94 kg
	Annular channel	430 kg
	Rotor (Pulping element)	260 kg

4 DESCRIPTION

4.1 Field of application

The FibreSolve™ is used for continuous pulping and coarse screening of unsorted waste paper.

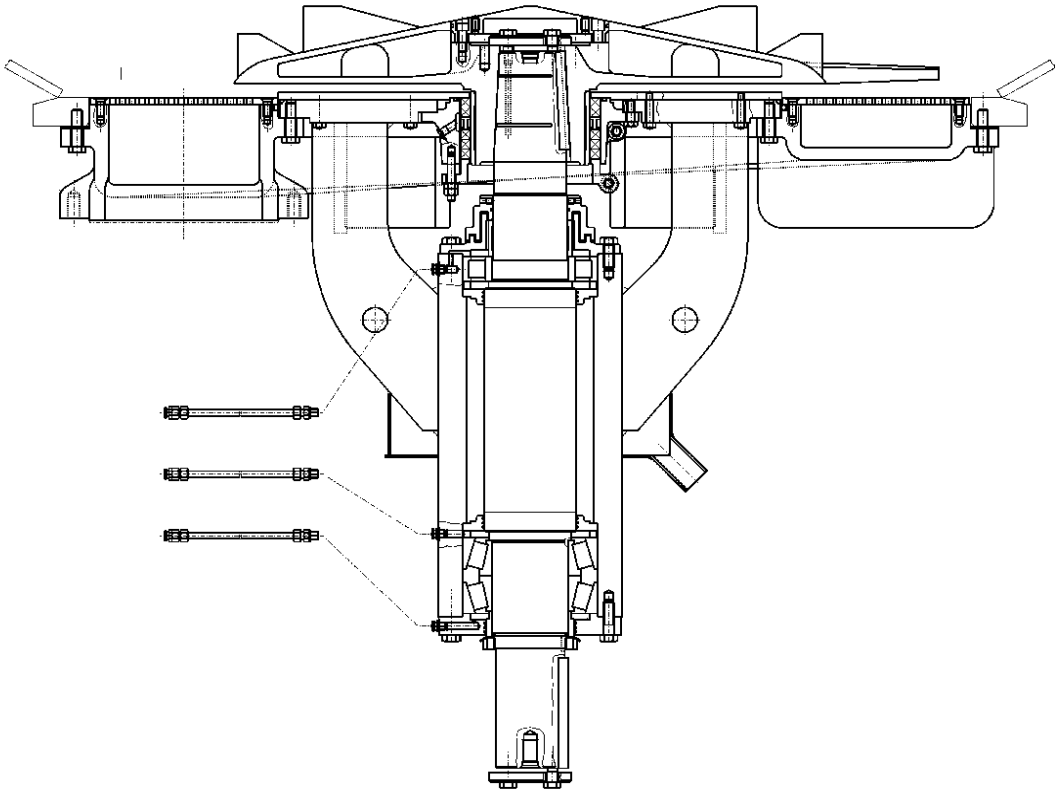

Fig. 4-1 FibreSolve FSRe3

4.2 Main plant components

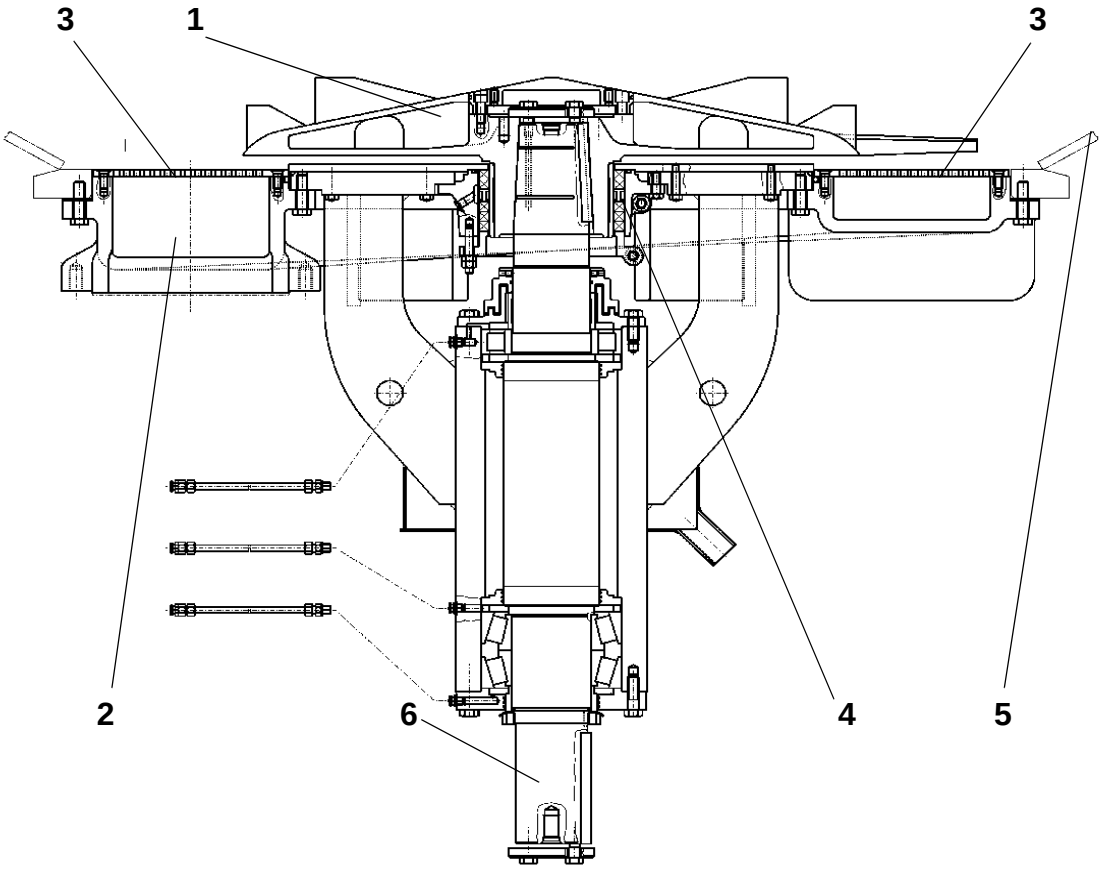

Fig. 4-2 FibreSolve FSRe3

Item	Component	Item	Component
1	Rotor	4	Seal
2	Annular channel	5	Pulping tank (not shown)
3	Screening plate	6	Drive (not shown)

Rotor (Item 1)

Function: The pulping wheel generates a turbulent current in the pulping tank.

Design: The pulping wheel is a welded structure made of stainless steel and rests on the hub of the gear shaft.

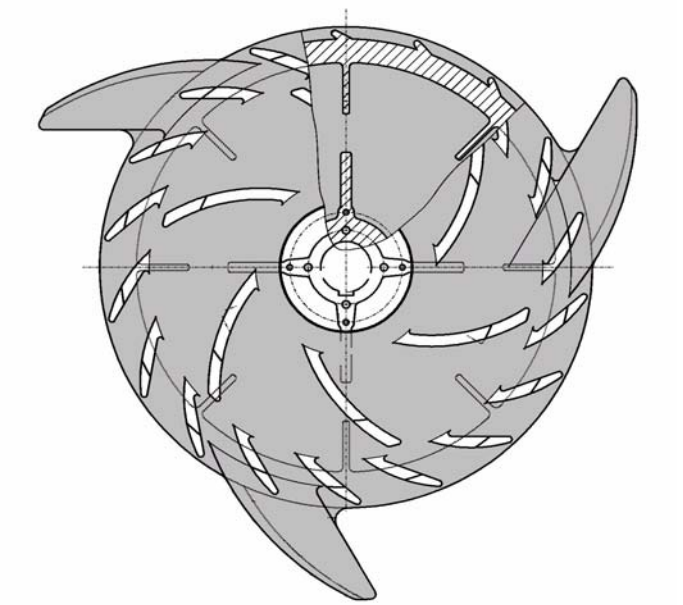

Fig. 4-3 Pulper wheel (Symbolic illustration)

Annular channel (Item 2)

Function: The pulp suspension is sucked into the annular channel through the screening plate by a self-priming pump and brought to the pump itself.

Design: Welded stainless steel structure.

Screening plate (Item 3)

Function: The screening plates cover the annular channel and only allow pumpable suspension to reach the pump.

Design: The screening plates are bolted to the annular channel.

Seal (Item 4)

Function: The seal (Item 5) prevents the pulp from escaping from the pulping tank.

Design: Stuffing box with packing rings and one lantern ring.

Pulping tank (Item 5)

Function: The pulping tank forms the working area in which the pulp is dissolved.

Design: Welded structure made of acid-proof stainless steel. Chutes or a splash guard can be welded to the top side of the pulping tank. The shell of the pulping tank has a transmitter flanged on to measure the filling level. As an option, the pulping tank can be fitted with two drainage connections.

5 ERECTION WORK and TRANSPORT

5.1 General

This chapter describes certain steps for transport, storage and installation of the FibreSolve™ which may be the responsibility of the machine operator.

Activities which are carried out by ANDRITZ AG, including works assembly, are not the subject of this description.

5.2 Safety regulations

DANGER

Disregarding the safety regulations may cause a risk to life and limb.
If the safety regulations are disregarded, this may cause a risk to life and limb and damage to the machine or its components.
All safety instructions in this section must be strictly observed.

General safety instructions

All applicable accident prevention rules must be observed.

The applicable regulations for work in enclosed and confined spaces must be observed (➡ /SAFETY).

Potential risks caused by gases and vapours forming must be analysed in detail. The appropriate safety measures must be implemented.

Do not exceed permissible crane loads and weights on lifting gear and ropes/shackles. Secure loads to prevent them from falling.

Do not step or walk below suspended loads. Standing below suspended loads is dangerous and thus, strictly forbidden.

Jolts must be avoided. This refers especially to the handling of pre-assembled machines.

Qualification of personnel assigned

Transport and unloading is to be carried out by personnel specially familiar with such work.

Workers entrusted with lifting and conveying equipment must have the required national qualification.

Start-up may only be carried out by trained, skilled workers.

Personal protective apparel

The following protective equipment must be worn when carrying out field installation and transport work:

- Hard hat
- Protective clothing
- Protective gloves
- Protective shoes
- Goggles

5.3 Transport

DANGER

During transport or loading/unloading there is a risk to life and limb from falling machine components and also a danger that machine components may be damaged.

Do not lift machine and transport crates except at the points marked for lifting by crane or forklift.

If the entire machine is lifted and there are several different types of lifting lug available, personnel should only use suitable lugs (according to the transport sketch) for the work in hand.

Do not step or walk below suspended loads.

Delivery

The FibreSolve™ is supplied pre-assembled. Machine components and auxiliary materials are packed in crates.

Transport sizes and weights are stated in the shipping documents.

Largest supply weights:
➡/TECHNICAL DATA

Acceptance

- Check whether supply is complete (against shipping documents and packing lists) and in perfect condition.
- In the event of transport damage or short supply, do not accept goods but notify forwarder and ANDRITZ AG's shipping department.
- If there is a hidden defect or any damage, notify forwarder and ANDRITZ AG's shipping department within two weeks.

5.4 Storage

The following instructions must be observed if the system is not to be installed immediately.

- Please inform ANDRITZ AG's shipping department.
- Provide weather protection for stored machine components. In particular, avoid wide variations in temperature and ensure that the equipment is kept clean.
- Incidentals should be protected against damage and unauthorized withdrawal by storing in a lockable room.
- Packing should not be removed until field installation work begins.

5.5 Erection Work

General

WARNING

Disregarding the sequence plan and the installation instructions may result in hazardous situations causing a danger to life and limb, as well as machine damage.
The sequence of erection work is important and must be strictly observed.

Completion of the various steps must be documented in the certificate of completion of erection work.

The sequence of erection work is shown in step-by-step tables. Individual activities are numbered in their order of precedence.

Required documentation at installation site

The following supplementary documentation must be available at the beginning of field installation work:

- Foundation and arrangement drawing
- Pipe connection diagram
- Documentation on electrical, measuring and control equipment
- Packing lists for each individual consignment

Preparations

Foundation

Foundation prepared according to ANDRITZ AG's foundation plan.

The following preparations have to be made prior to placing the FibreSolve™ on the foundation:

- Mark axes and elevations on the foundation.
- Check the workmanship of the foundation before beginning erection work.

Preservation

Corrodible machine parts are protected with "Cortec VCI 369" preservative grease.

The preservative grease need not be removed.

DANGER

Machines or machine components may fall during transport at installation site.
Do not lift machine and transport crates except at the points marked for lifting by crane or forklift.
Do not step or walk below suspended loads.

DANGER

Parts of the body may be caught or crushed during installation work.
Do not insert your hand below suspended loads.
Wear your personal protective apparel.

Mounting the motor

Prepare the foundation, position and adjust the motor as follows:

Step	Activity
1	Secure the rag bolts (Item 1) centrally at the ground flange of the slide rail (Item 2).
2	Lift the slide rail onto the foundation.
3	Move the slide rail with shims into position and align according to the foundation drawing.
4	Grout in the lower part of the rag bolts (Item 11) only with non-shrink grouting compound (Item 3) and tighten the hex nuts (Item 4) a little.
5	Check alignment of the slide rail after the grouting compound at the rag bolts has hardened.
6	Set up shuttering.
7	Then complete the base casting layer with non-shrink grouting compound (Item 5).
8	When the grouting compound has hardened completely (Item 5), tighten the hexagon nuts (Item 4) according to the torque table provided in the Chapter on "Maintenance".

Fig. 5-1 Foundation for the motor

:

Step	Activity
9	Place the motor with the vee-belt pulley onto the slide rail and bolt the two together according to the torque table in the chapter on "Maintenance".
10	Mount and tension the V-belts (see ➡ /MAINTENANCE).
11	Place the bracket (Item 6) on the slide rail and tighten the bolts (Item 7) slightly.
12	Place the motor (Item 8) with V-belt pulley on the bracket and screw together with the bolts (Item 9) according to the torque table provided in the Chapter on "Maintenance".
13	Mount and tension the V-belts (see ➡ /MAINTENANCE).

Tab. 5-1 Foundation for the motor

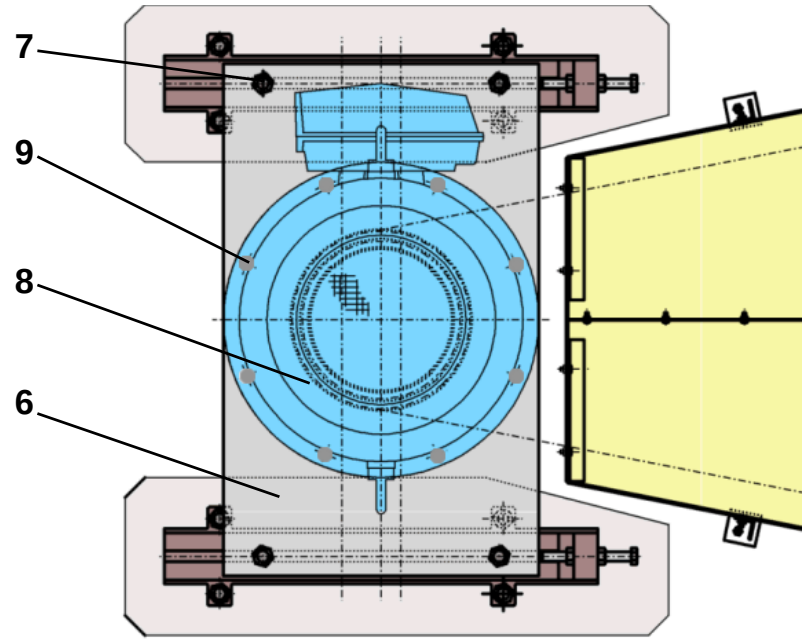

Fig. 5-2 Mounting the motor

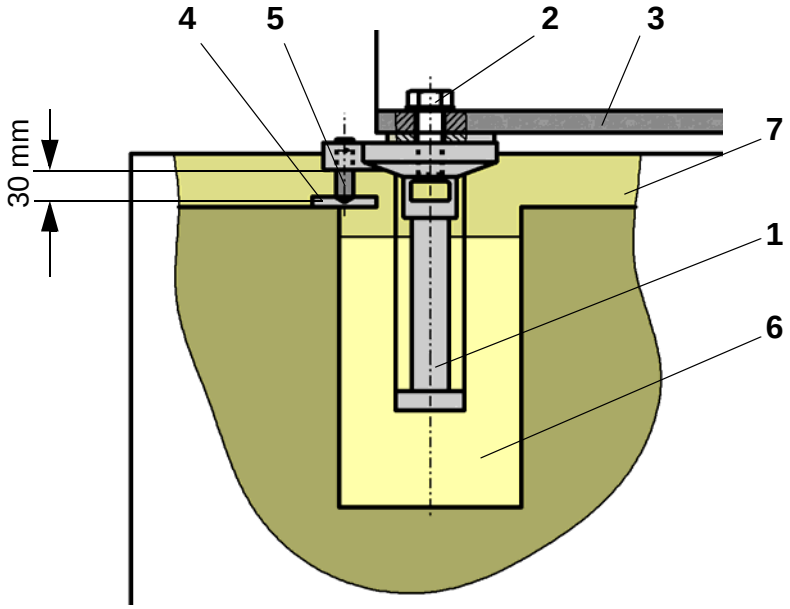

Fig. 5-3 Foundations for the foundation rails

Mounting the pulping tank

Prepare the foundation, position and adjust the pulping tank according to the following table:

Step	Activity
1	Secure the rag bolts (Item 1) centrally at the ground flange of the pulping tank (Item 2).
2	Lift the pulping tank onto the foundation.
3	Move the pulping tank with shims into position and align according to the foundation drawing.
4	Grout in the lower part of the rag bolts (Item 11) only with non-shrink grouting compound (Item 3) and tighten the hex nuts (Item 4) a little.
5	Check alignment of the pulping tank after the grouting compound at the rag bolts has hardened.
6	Set up shuttering.
7	Then complete the base casting layer with non-shrink grouting compound (Item 5).
8	When the grouting compound has hardened completely (Item 5), tighten the hexagon nuts (Item 4) according to the torque table provided in the Chapter on "Maintenance".

Tab. 5-2 Foundations for the pulping tank™

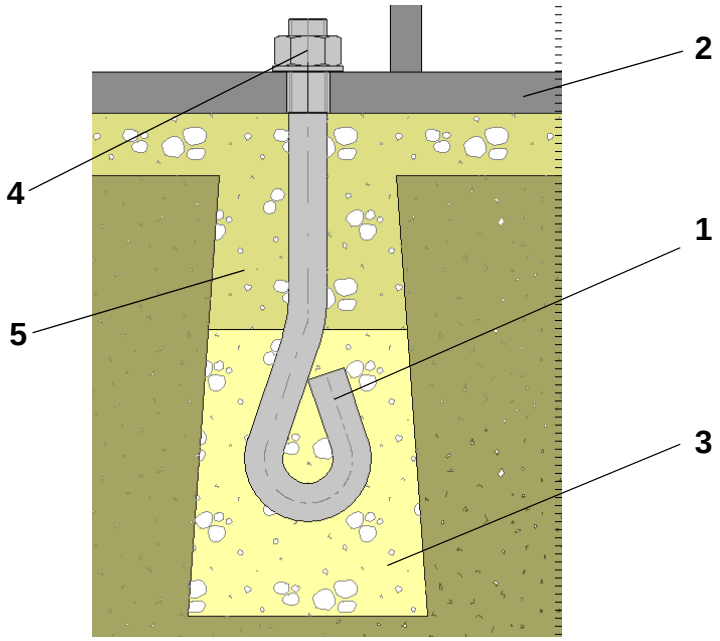

Fig. 5-4 Foundations for the pulping tank

5.6 Connections

Ducts

All connections and connecting dimensions at the FibreSolve™ are shown in the arrangement drawing.

CAUTION

Errors in the installation of pipework and hoses may result in risks to life and limb and in damage to the machine.

Mount all pipes stress-free and free of vibration.

The pipework must be mounted such that it does not stress the machine during operation (e.g. by heat expansion of the pipes).

Sampling ports

Sampling fittings are to be provided in the pipes carrying the pulp.

Instruments

The instrumentation (instruments, actuators and control devices) of the FibreSolve™ is to be installed according to the flow sheet.

For information on installation and connections, see:

➡/SUPPLIER DOCUMENTATION/

Electrical equipment

- Complete electrical installations according to electrical documentation provided by Andritz AG.

Safety devices

The following safety devices are to be provided by the operator:

- Emergency-off button near the FibreSolve™ drive
- Automatic monitoring of sealing water
- Device for safe disconnecting of all drives from the power supply during maintenance and repair work. This can be achieved with a maintenance switch, lockable racks in the MCC, or with other suitable measures that comply with the safety regulations.

5.7 Inspections and remaining work

Sense of rotation of motor

Prerequisites

- Motor is connected to power supply.
- V-belts have not been mounted.

Checking sense of rotation:

CAUTION

Risk of injury from rotating parts!
Clothing and parts of the body can be caught up in rotating parts.

The sense of rotation should be checked according to the following table:

Step	Activity
1	Switch motor on briefly.
2	The sense of rotation must correspond to the directional arrow on the machine.
3	Switch motor off again.
4	Mount and tension the V-belts (see ➔ /MAINTENANCE).

Tab. 5-3 Checking the sense of rotation of the motor

Coupling

- Mount coupling according to data provided by coupling manufacturer.

➔/ SUPPLIER DOCUMENTATION

The tolerances observed when aligning the coupling are to be recorded in the erection work report on the coupling.

Certificates ➔ /ATTACHMENTS/CERTIFICATES

Other work

Other work to be completed:

- Clean the machine.
- Mount safety covers (V-belt cover, etc.).
- Mount sealing water channel and splash guard.

5.8 Cold test (preparation for initial start-up)

Prerequisites

The following utilities must be available:

- Electric power
- Sealing water (the pipe must be flushed out and connected up).

Cleaning

- Clean the pulping tank and flush out the pipework.

Lubrication

- Initial filling of lubricant according to lubricating schedule (bearings, etc.).

CAUTION

Damage to machine due to use of wrong lubricants.
Only use lubricants with the properties listed in the lubrication schedules.

Cold test

The checks to be performed must be carried out according to the cold test report and ticked off after completion.

6 START-UP

6.1 General

This Chapter describes the preparations and steps required for initial start-up of the FibreSolve™ FSRe3.

6.2 Safety regulations

DANGER

Disregarding the safety regulations may cause a risk to life and limb.
If safety regulations are disregarded, this may cause a risk to life and limb and damage to the machine or its components.
All safety instructions in this section must be strictly observed.

General safety instructions

All applicable accident prevention rules must be observed.

The applicable regulations for work in enclosed and confined spaces must be observed (➡ /SAFETY).

Potential risks caused by gases and vapours forming must be analysed in detail. The appropriate safety measures must be implemented.

Qualification of personnel assigned

Start-up may only be carried out by skilled workers with the appropriate training.

Personal protective apparel

The following protective equipment must be worn when carrying out start-up and erection work:

- Hard hat
- Protective shoes
- Protective clothing
- Goggles
- Protective gloves

6.3 Prerequisites for start-up

The following must be checked before start-up:

- Erection work completed.
- Cold test completed.
- Installation site has been cleared and cleaned.
- Power and water supply are available.
- Check supply of sealing water to stuffing box.
- All safety guards mounted.
- First filling of lubricants (gearing, bearings, etc.) provided.
- Direction of rotation has been checked
- All electric interlocks are functional and checked.
- All personnel know the location of the EMERGENCY OFF switch.
- All control circuits have been installed and tested.
- Process control system (DCS) installed and tested.
- The pulping tank has been cleaned and all pipes flushed out thoroughly.

6.4 Start-up

Proceed according to the following table at start-up:

Step	Activity
1	Turn on supply of sealing water.
2	Open valves for the gear cooling water.
3	Fill the pulping tank with approximately 50% of the water volume required for pulping.
4	Switch on drive and fill in the remainder of the water with the motor running.
5	Monitor the power consumption at the ammeter. Power consumption should be approximately 10 - 20% below the nominal current of the motor.
6	Stop the motor after approximately 15 minutes and check the temperature of the gear and the stuffing box seal.
7	Drain water off.

Tab. 6-1 Start-up

WARNING

Risk of injury if the tank spills over.
Suitable measures (sensors, etc.) must be implemented to prevent the tank from spilling over.

7 OPERATION

7.1 General

This chapter describes the activities required for starting, operating and stopping the FibreSolve™. Possible malfunctions and troubleshooting methods are also presented.

7.2 Safety regulations

DANGER

Disregarding the safety regulations may cause a risk to life and limb.
If safety regulations are disregarded, this may cause a risk to life and limb and damage to the machine or its components.
All safety instructions in this section must be strictly observed.

General safety instructions

All applicable accident prevention rules must be observed.

The regulations for work in containers and enclosed spaces must be observed.

Qualification of personnel assigned

The equipment may only be operated by qualified personnel.

Operating personnel must know where the emergency-off switches and the escape routes are located.

Operating personnel must have been instructed in the function and possible failure of machine monitoring equipment, and in carrying out maintenance and inspection work (shift log book, maintenance inspection records).

Personal protective apparel

The following personal protective equipment/apparel shall be used when performing work on the machine (e.g. troubleshooting):

- Hard hat
- Protective gloves
- Protective shoes
- Goggles
- Protective clothing

7.3 Control via DCS

The FibreSolve™ is started up and stopped entirely from the DCS. The FibreSolve™ and all auxiliary units are started and stopped with the group start and stop function.

WARNING

Risk of injury if the tank spills over.

Suitable measures (sensors, etc.) must be implemented to prevent the tank from spilling over.

Operating display

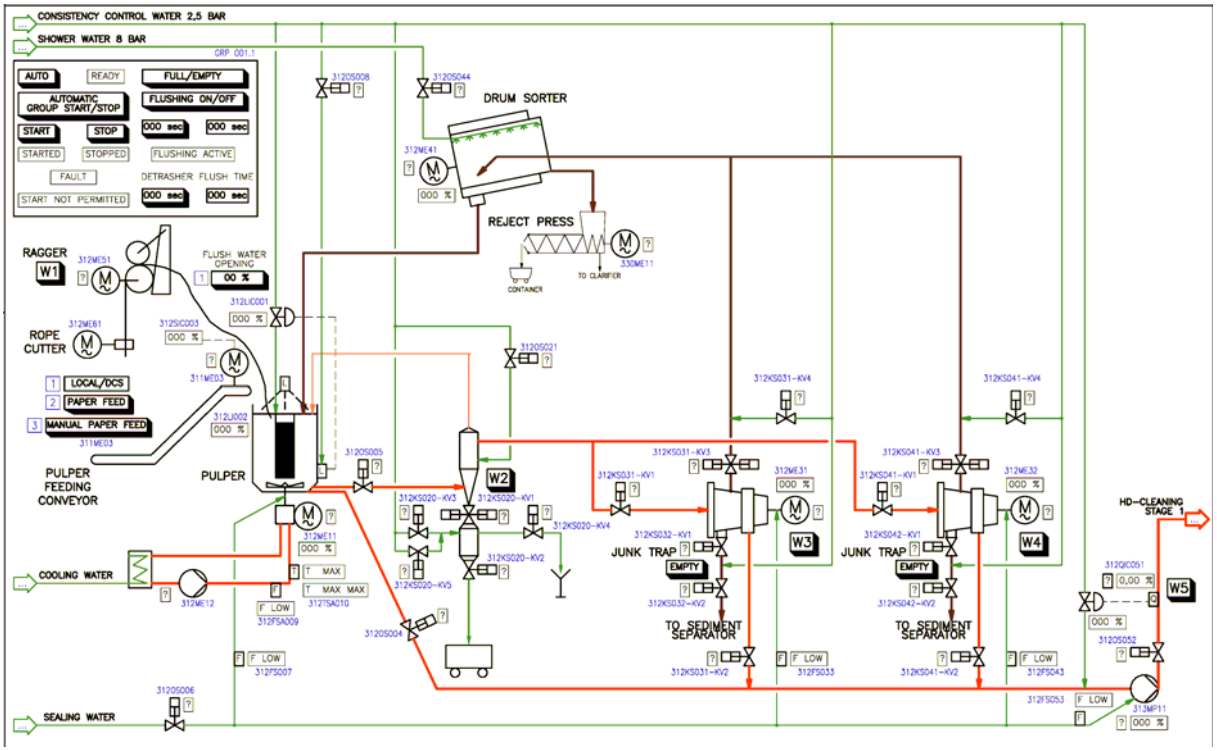

Fig. 7-1 Operating display

Manual start-up If the FibreSolve™ is to be started up manually, proceed as described in the section on process control and instrumentation.

7.4 Normal operation

During operation, operating personnel must make sure that data are recorded in the shift log book and data recording sheets, and also carry out the following work.

CAUTION

The amount of foreign matter in the pulper must not exceed 0.5 per cent of the overall filling quantity.

Heavy objects, such as bolts, tools and the like, must be removed from the pulper immediately!

Daily jobs and checks

The following work has to be performed in normal operation:

	Activity
Consistency of the fibre pulp suspension	Check or adjust
Level in pulping tank	Check or adjust
Sealing water supply to stuffing box seal	Check

In case of a malfunction, proceed according to section 7.6 (Operating faults and troubleshooting).

7.5 Re-start after emergency stop

Prerequisites for starting

In the event of power failures or emergency shutdown the machine should not be started up again until the following requirements are met:

- Danger or fault has been eliminated
- EMERGENCY-OFF switch has been reset

WARNING

The chemicals added may cause hazardous fumes.

Contact with the pulp or breathing in the fumes can result in dangerous situations.

Personal protective apparel must be worn.

Personnel working with the fibre stock should not be allergic to it.

7.6 Operating malfunctions and troubleshooting

Malfunction	Cause	Remedy
Increased power consumption by pulping element drive Unusual noises	Foreign objects or dirt between pulper wheel and screening plates or disc	Switch FibreSolve™ off. Empty the pulping tank and remove foreign objects.
	Pulping element bearing worn	Replace bearing (➔ /MAINTENANCE)
Feed is too low	Level in pulping tank is too high	Reduce level in pulping tank
	Vanes of pulper wheel are worn	Repair pulper wheel (➔ MAINTENANCE)
	Consistency in pulping tank is too high	Increase water supply
Stuffing box becoming too hot	Too little flow of sealing water	Set sealing water flow
	Sealing water supply is clogged	Switch FibreSolve™ off. Clean the sealing water feed.
	Stuffing box gland is too tight	Loosen the screw fitting at the stuffing box gland. Set sealing water flow (➔ /MAINTENANCE).
Pulp escaping at the stuffing box seal	Sealing water pressure is too low	Increase sealing water pressure.
	Stuffing box packing is worn.	Replace stuffing box packing. (➔ /MAINTENANCE).
	Shaft protection sleeve is worn.	Switch FibreSolve™ off. Replace the shaft protection sleeve (➔ /MAINTENANCE).
Bearing of gear is overheating	Insufficient lubrication	Re-grease bearing
	Bearings are worn	Replace bearing (➔ / SUPPLIER DOCUMENTATION).

Tab. 7-1 Operating malfunctions and troubleshooting

8 MAINTENANCE

8.1 General

This chapter describes the maintenance and upkeep work on the FibreSolve™, which is the responsibility of the machine operator.

All activities mentioned in this chapter must be performed at the correct time.

The ANDRITZ AG service department is at your disposal for troubleshooting, as well as for extensive maintenance and repair work.

➡/ INTRODUCTION

Repair work on the plant components must be carried out at the manufacturer's works.

Workers trained and authorized by Andritz AG may carry out repairs on site after obtaining consent from AAG.

8.2 Safety regulations

DANGER

Disregarding the safety regulations may cause a risk to life and limb.
If the safety regulations are disregarded, this may cause a risk to life and limb and damage to the machine or its components.
All safety instructions in this section must be strictly observed.

General safety instructions

All applicable accident prevention rules must be observed.

The applicable regulations for work in enclosed and confined spaces must be observed (➡ /SAFETY).

Potential risks caused by gases and vapours forming must be analysed in detail. The appropriate safety measures must be implemented.

Sufficient space for maintenance work must be included right away in the arrangement drawing.

Maintenance and service work is not permitted while the machine is in operation.

Do not exceed permissible crane loads and weights on lifting gear and ropes/shackles. Secure loads against falling down.

Do not step or walk below suspended loads. Standing below suspended loads is dangerous and thus, strictly forbidden.

Machine must be thoroughly cleaned before carrying out any maintenance work.

Use only original spare parts.

When carrying out maintenance and repair work, use only new-value fixtures in perfect condition and new seals.

Safety guards

After completion of maintenance work, all required safety guards must be mounted again.

Energy supply

Before beginning any maintenance or repair work the operator must disconnect the energy supply to all drives securely. This can be achieved with a maintenance switch, lockable racks in the MCC, or with other suitable measures that comply with the safety regulations.

Lighting

The operator shall ensure that adequate lighting is provided (with extra-low voltage bulbs) during service and repair work.

Qualification of personnel assigned

Maintenance and upkeep must be carried out by specially trained, skilled personnel only.

All work on the electrical equipment, without exception, must be carried out by skilled electricians.

Personal protective apparel

The following protective equipment must be worn when carrying out cleaning and maintenance work:

- Hard hat
- Protective gloves
- Protective shoes
- Goggles
- Protective clothing

Welding work

In general, welding work is only permitted after consulting Andritz AG.

When performing welding work, always observe the relevant safety regulations and the appropriate safety regulations for work performed in enclosed and confined spaces.

DANGER

HOT WORK PERMIT REQUIRED!

Danger of fire or explosion!
There is a considerable risk of fire or explosion during welding work. Always take the appropriate fire precautions before beginning work, e.g. keep fire extinguishers at the ready.

All motors should be disconnected before carrying out electric welding work.

Gases, steam or smoke

Before beginning any service work, ensure that no gas, vapour or smoke can enter the working area from feed pipes, discharge pipes or shafts.

If it is not possible to reliably exclude the risk of gas, steam or smoke flowing in, all persons working in the danger zone must be equipped with a safety harness and a safety rope. Each worker must be supervised by a second person outside the danger zone. It must always be possible to evacuate a worker from the danger zone without delay.

8.3 Regular maintenance

For machines operating continuously (24 hours/day, 7 days/week), a prescheduled maintenance period every two weeks is recommended. During these periods the machine should be shut down, thoroughly cleaned, and checked for wear.

Machines operating less than 24 hours a day should undergo these routine checks and be cleaned at each shutdown.

General machine checks

The following checks should be made when the machine has been shut down:

Component	Checks
Sealing water supply	Examine for leaks and check flow rate.
Pulping element	Clogging between the rotor and the screening plate.

Tab. 8-1 General machine checks

In the course of general machine checks, all additional units should also be checked to guarantee that the entire plant functions satisfactorily. For these checks, the attached maintenance and upkeep instructions provided by the manufacturer must be observed.

➡ /SUPPLIER DOCUMENTATION

Malfunctions and inadmissible changes found during these checks must be rectified immediately.

Cleaning

Machine must be cleaned as follows before carrying out any maintenance work:

- Empty the pulping tank completely.
- Clean the FibreSolve™ thoroughly on the inside and outside.

 **WARNING**	**Toxic gases and vapour can form or collect in the container.** **The regulations for work in containers and enclosed spaces must be observed!** **Complete entry permit!**
 **WARNING**	**Contact with the pulp may cause skin damage and burning.** **Persons working with the pulp should not suffer from any allergic condition to such substances!** **Personal protective apparel must be worn.**
 **CAUTION**	**Do not use caustic agents for cleaning.** **Make sure no water, steam or other cleaning agents enter electrical components.**

8.4 Maintenance schedule

In addition to the work outlined below, maintenance has to be carried out in accordance with section 8.3 and normal operation work.

/OPERATION

Every 2 weeks

The following maintenance work is to be carried out every 2 weeks.

Component	Activity
V-belt	• Check tension
Stuffing box	• Check sealing water.
Pulper wheel	• Check for damage and wear.
Screening plates	• Check for wear.

Tab. 8-2 Every 2 weeks

Quarterly

The following maintenance work is to be carried out at quarterly intervals.

Component	Activity
V-belt	• Check for wear.

Tab. 8-3 Quarterly

Annually

The following maintenance work is to be carried out at annual intervals.

Component	Activity
Screws/bolts	• Check that screws/bolts are firm and tighten if necessary.
Stuffing box	• Check for function and wear.
Emergency-OFF button	• Check function.

Tab. 8-4 Annually

8.5 Fasteners

Screw/bolt material

Bolts and screws are manufactured in several classes of material. The heads of these screws and bolts are marked to show the strength class. Damaged or lost fasteners should only be replaced with fasteners of the same material.

Check

Unless they are suitably tightened, screws/bolts can work loose or fail under operating conditions. This is why all connecting screws/bolts must be checked in the course of maintenance work.

- During the first six months: every 2 to 2½ months
- After the first six months: 6-monthly

Tighten

During checks and maintenance work it is imperative to tighten all connecting screws/bolts to the torque specified for each one in the drawings or in the table below.

Pre-stressing forces and tightening torques in the table apply to normal screwed/bolted connections. Please contact Andritz AG if you have special requirements.

		Pre-stressing forces (kN)						Tightening torques (Nm)					
Class (Mat.no.)		5.6	8.8	A4-50	A4-70	A4-80	C3-80 1.4057.05	5.6	8.8	A4-50	A4-70	A4-80	C3-80 1.4057.05
Thread	M10	12	26	9	18	24	26	20	42	16	34	45	42
	M12	18	38	12	27	35	38	34	73	27	59	78	73
	M16	33	70	23	49	66	70	83	177	67	143	190	177
	M20	51	110	36	77	103	110	163	347	130	279	373	347
	M24	74	158	52	111	148	158	280	598	225	481	642	598
	M30	118	251	82	-	-	251	559	1,193	449	-	-	1,193
	M36	172	366	120	-	-	366	970	2,070	780	-	-	2,070
	M42	235	502	-	-	-	502	1,548	3,301	-	-	-	3,301
	M48	309	660	-	-	-	660	2,333	4,978	-	-	-	4,978

Tab. 8-5 Tightening Torques and Pre-Loads for Set Screws (coarse thread)

The thread and screw head should be lubricated with an appropriate lubricant (for example Molyslide Plus from Loctite).

CAUTION

Wrong torque tightening may cause machine damage and hazards leading to personal injury.
The above pre-loads and tightening torques must be observed.

8.6 Spare parts

A list of the spare parts required for the FibreSolve™ can be found in the parts book.

➔ /.../TEILEHANDBUCH

Details on spare parts from sub-suppliers are also included in specifications from component suppliers.

➔ /SUPPLIER DOCUMENTATION

8.7 Lubrication

Before start-up, check whether all lubrication points, in particular the bearings and gears, have been filled with the appropriate lubricants (see separate lubrication schedule).

Details on lubrication are also included in specifications from component suppliers.

➔ /SUPPLIER DOCUMENTATION

Please also observe maintenance instructions on the maintenance signs and rating plates attached to machine and components.

CAUTION

Improper disposal of waste oil is an environmental risk!
Do not add foreign matter such as solvents, brake fluid or cooling liquid.
Collect leaking oil and dispose of properly without causing environmental pollution.
Oil based on vegetable raw materials should always be collected and disposed of separately.

8.8 Lubrication schedule

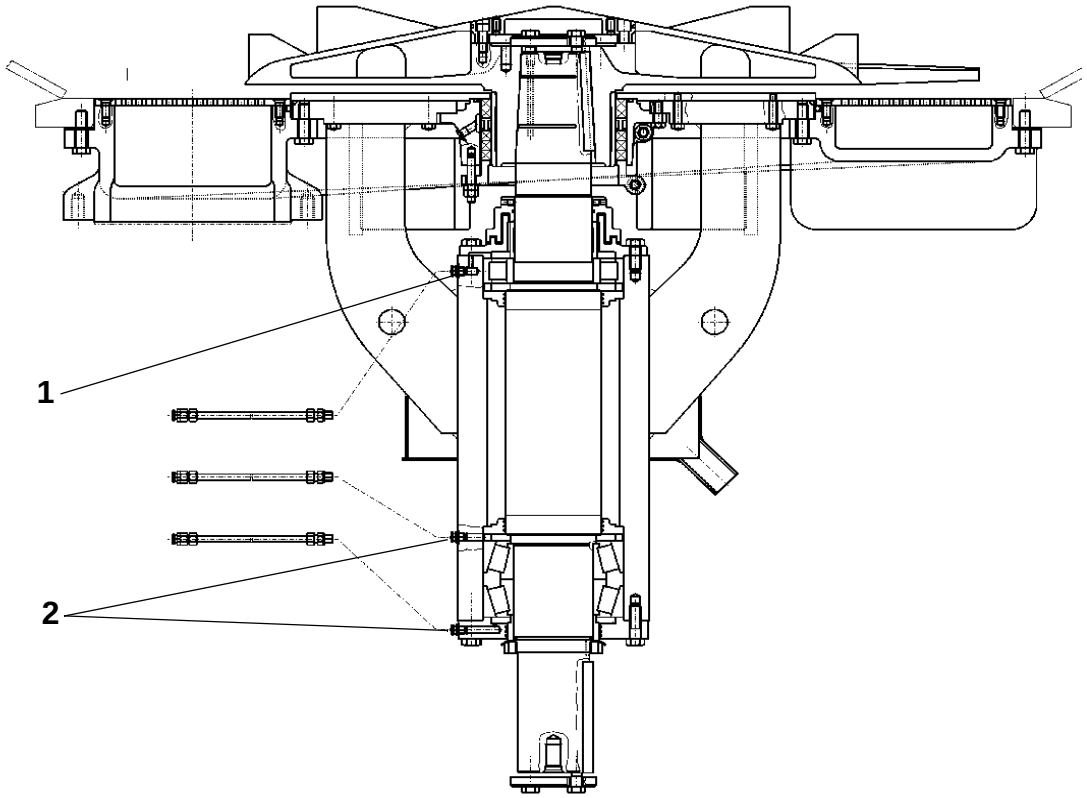

Fig. 8-1 FibreSolve FSRe3

		Lubricating point			Quantity / grammes		Intervals / Operating hours	
Item	**Structural component**	**No.**	**Designation**	**Recommended lubricant**	**First filling**	**Refill**	**Refill**	**Oil/Grease change**
1	Rotor bearing	1	Cylindrical roller bearing	NLGI Class 2 DIN 51818 (Mobilux EP 2)	86 g	17 g	150 h	8000 h
2	Rotor bearing	2	Tapered roller bearing	NLGI Class 2 DIN 51818 (Mobilux EP 2)	125 g	25 g	150 h	8000 h

8.9 Installation and removal of rotor

WARNING

Toxic gases and vapour can form or collect in the container.
The regulations for work in containers and enclosed spaces must be observed!
Complete entry permit!

Removing the rotor

Proceed according to the following table when removing the rotor:

Step	Procedure
1	Empty pulping tank and flush out.
2	Shut down all drives at all poles and secure against accidental start.
3	Clean the machine (see section 8.3).
4	Detach bolts (Item 1) and remove the cap (Item 2) together with the O-ring seal.
5	Detach bolts (Item 4) and remove the disc (Item 3).
6	Screw two ring bolts (Item 5) into the rotor.
7	Attach the rotor to a crane by suspending from the ring bolts and lift the rotor upwards out of the pulping tank.

Tab. 8-6 Removing the rotor

DANGER

Parts of the body may be caught or crushed during installation work.
Do not insert your hand below suspended loads.
Wear your personal protective apparel.

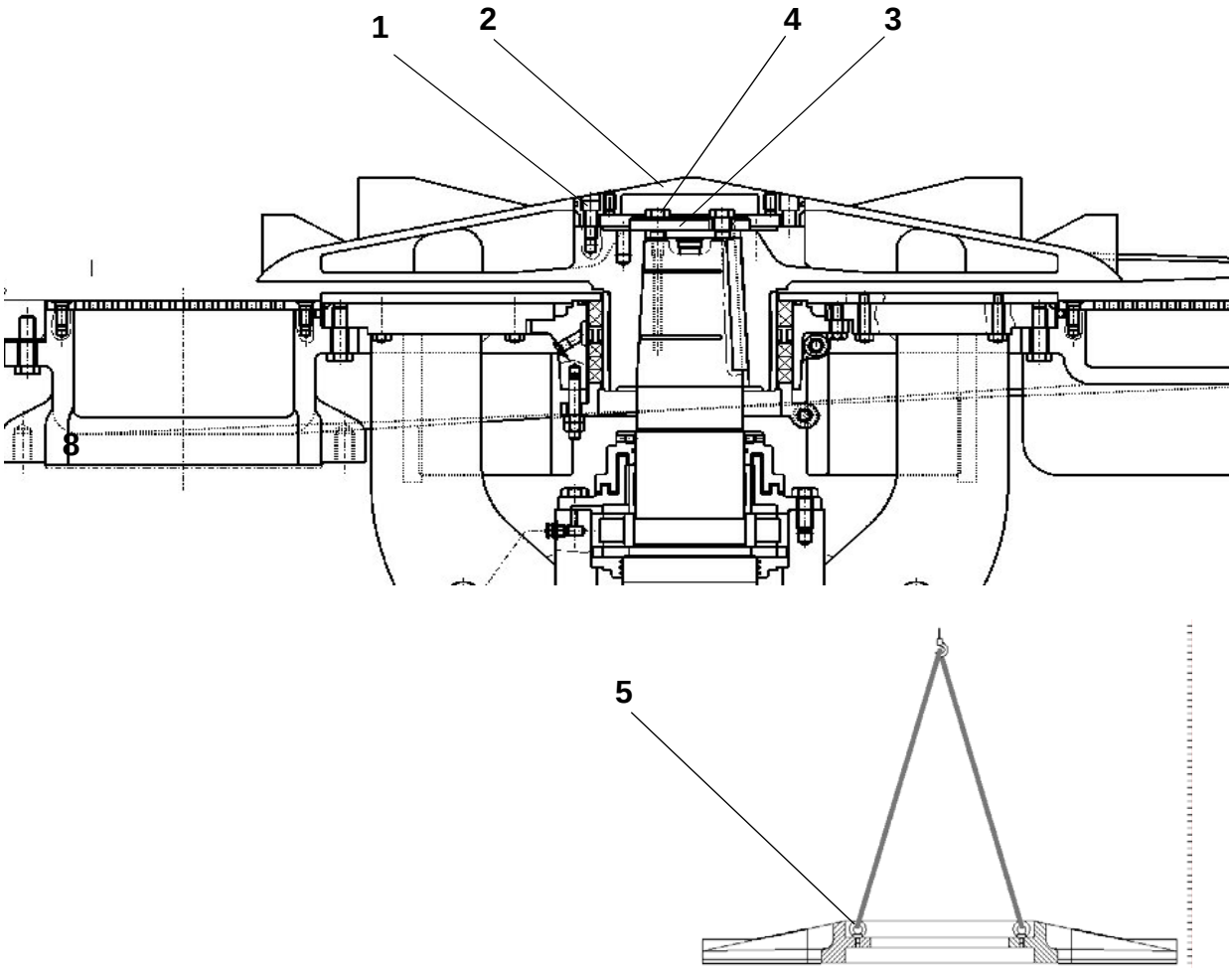

Fig. 8-2 Removing the rotor

Installing the rotor The rotor is installed in reverse order to the above.

- Before assembly, check the build-up welding on the rotor and renew if necessary.
- Check screen gap setting (see 8.10.)
- Check all seals for damage and wear before installing.

8.10 Installation and removal of hub

Removing the hub Remove the hub according to the following table:

Step	Procedure
1	Remove the rotor (see section 8.9).
2	Detach bolts (Items 1, 2) and remove the conical spring washer (Item 3).
3	Mount pull-off device and press the hub off the shaft.
4	Screw the ring bolts (Item 4) into the hub.
5	Attach the hub to a crane by suspending from the ring bolts and lift upwards out of the pulping tank.

Tab. 8-7 Removing the hub

CAUTION

When lifting the hub out and in, ensure that the hub protection sleeve is not damaged.

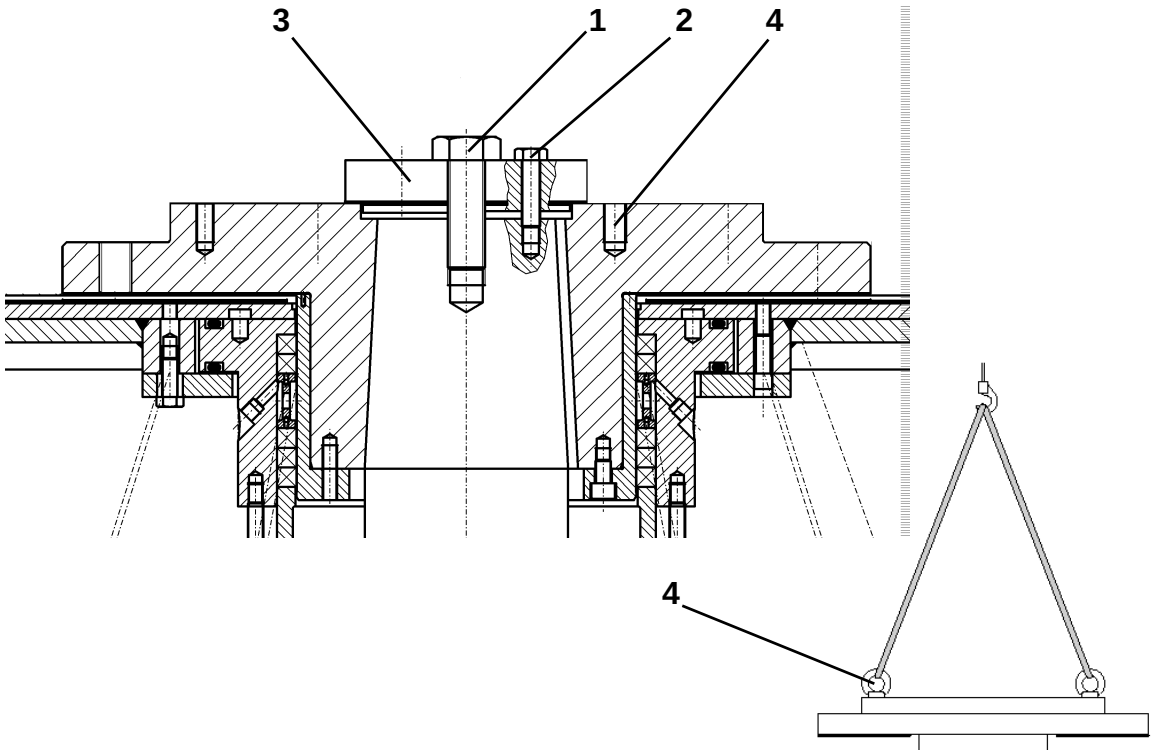

Fig. 8-3 Removing the rotor

Mounting the hub The hub is mounted in reverse order to the above.

Before assembly, check the build-up welding on the hub and renew if necessary.

8.11 Installation and removal of screening plates

Removing the screening plates

Remove the screening plates according to the following table:

Step	Procedure
1	Empty pulping tank and flush out.
2	Shut down all drives at all poles and secure against accidental start.
3	Clean the machine (see section 8.3).
4	Remove the pulping wheel (see section 8.9).
5	Detach fastening screws (Item 1).
6	Attach the screening plate segments (Item 2) to a crane with clevises (Item 3) and lift upwards out of the pulping tank.

Tab. 8-8 Removing the screening plates

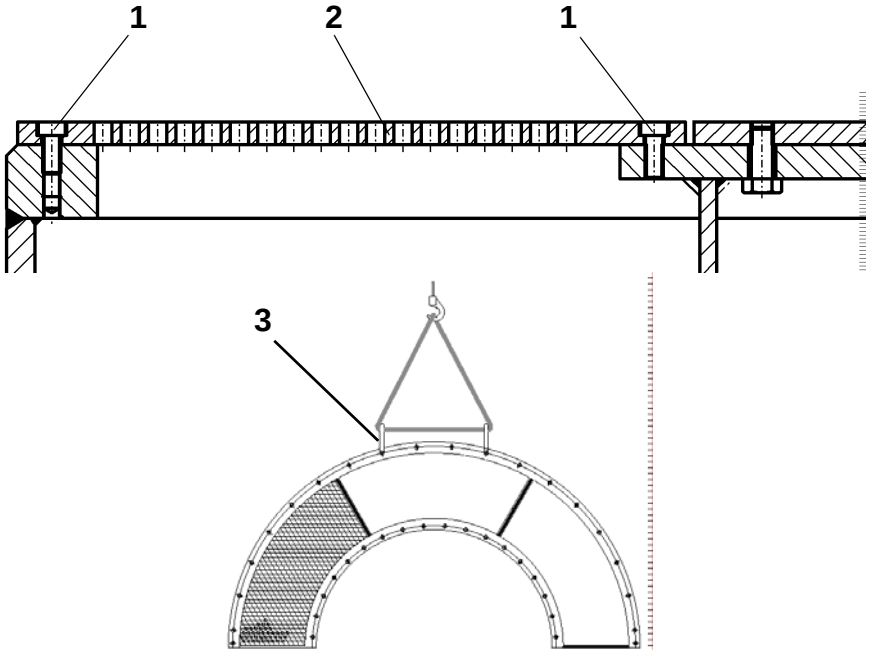

Fig. 8-4 Changing the screening plates

Mounting a screening plate.

The screening plates are mounted in reverse order to the above.

Before assembly, check the build-up welding on the screening plate and renew if necessary.

CAUTION

Glue in the screws for securing the screening plates with medium-strength Loctite.

8.12 Installation and removal of disc

Removing the disc Remove the screening plates according to the following table:

Step	Procedure
1	Empty pulping tank and flush out.
2	Shut down all drives at all poles and secure against accidental start.
3	Clean the machine (see section 8.3).
4	Dismantle the hub (see section 8.10).
5	Detach fastening screws (Item 1, 2).
6	Attach the disc (Item 3) to a crane with ring bolts (Item 4) and lift upwards out of the pulping tank.

Tab. 8-9 Removing the screening plates

DANGER

Stuffing box can fall down!

When detaching the ring, do not unscrew the bolts (Item 5) of the retaining ring (Item 6) for the stuffing box!

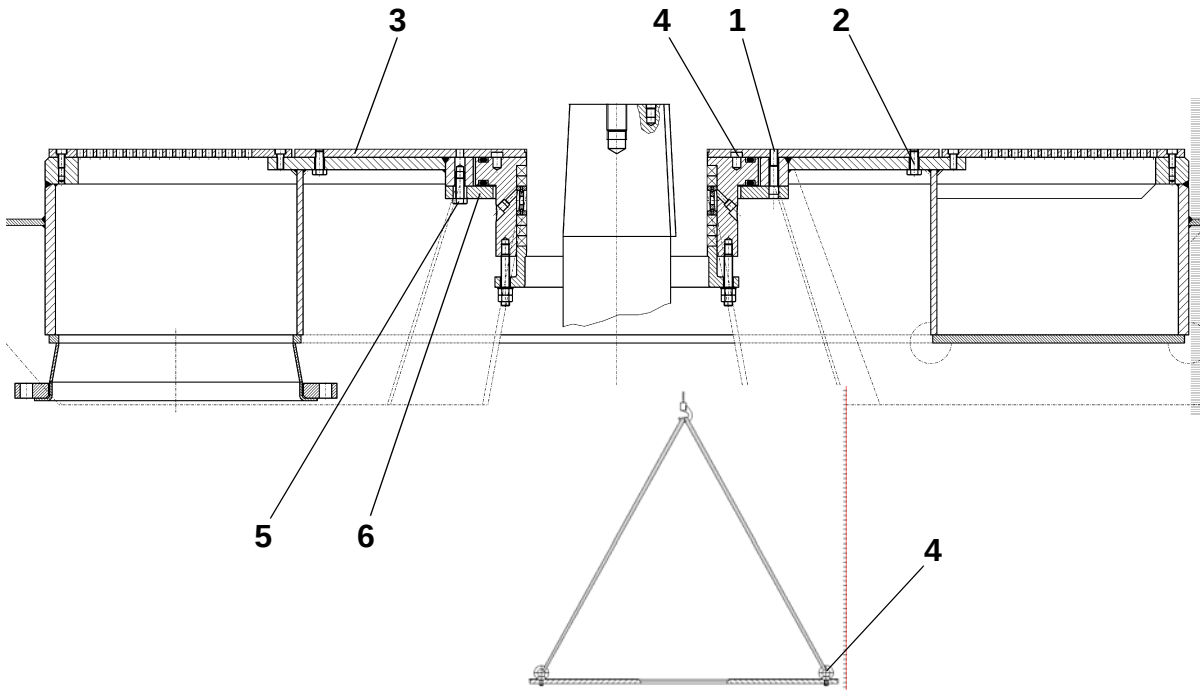

Fig. 8-5 Disc change

Installation of disc The disc is installed in reverse order to the above.

8.13 Installation and removal of gland packing

Removing the stuffing box packing

Proceed according to the following table when removing the packing:

Step	Procedure
1	Empty pulping tank and flush out.
2	Shut down all drives at all poles and secure against accidental start.
3	Clean the machine (see section 8.3).
4	Detach the nuts (Item 1) and pull back the stuffing box gland (Item 2).
5	Remove old stuffing box packings (Item 3).
6	Remove lantern ring (Item 4).
7	Then remove the remaining stuffing box packings.
8	Clean the stuffing box gland, lantern ring and packing area thoroughly.
9	Check hub protection sleeve (Item 5) and replace if worn. **Notches or grooves on the surface of the hub protection sleeve cause excessive wear on the stuffing box packing!**

Tab. 8-10 Removing the stuffing box packing

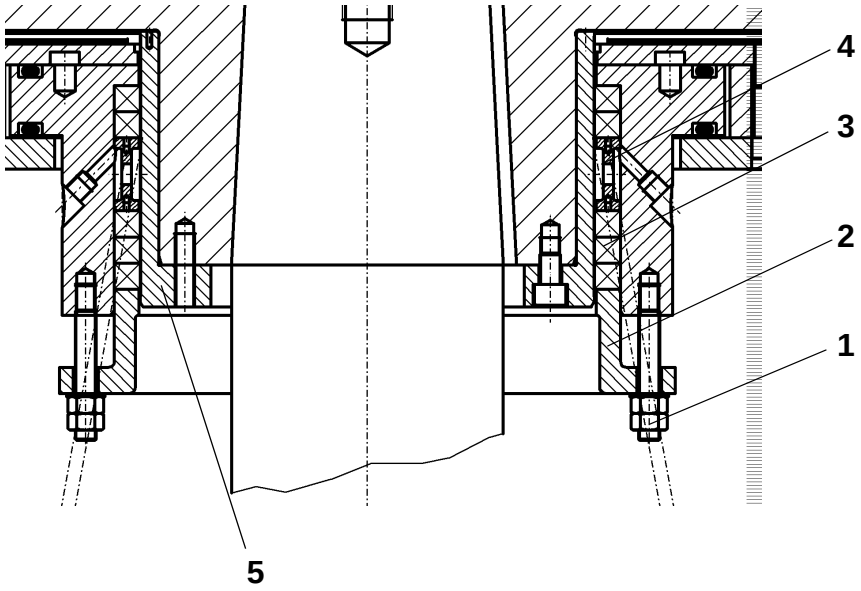

Fig. 8-6 Changing the stuffing box packing

Installing the stuffing box packing

Proceed according to the following table when installing the packing:

Step	Procedure
1	Mark packing (see Fig. 8-7) and cut to the appropriate length. Keep stuffing box clean, do not stretch or squash stuffing box when measuring and cutting.
2	Wrap the packing round the shaft protection sleeve, then push the first packing ring into the stuffing box, starting at the butt joint. The ends of the ring must form a butt joint with no gap.
3	Push the first packing ring right in using a suitable tool. Mount the second packing ring with the butt joint offset by 120 degrees.
4	After inserting the second packing ring, mount the lantern ring.
5	Mount the remaining packing rings with the butt joints offset by 120 degrees.
6	When the stuffing box gland has been installed, tighten all nuts evenly according to the setting guidelines provided below.

Tab. 8-11 Installing the stuffing box packing

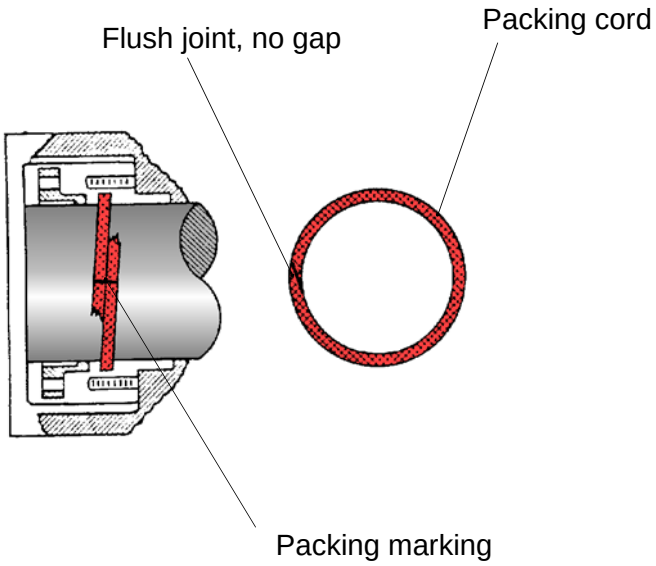

Fig. 8-7 Marking the stuffing box packing

8.14 Setting the stuffing box gland

New packings swell because they absorb water. This increases the surface pressure on the shaft and the large amount of sealing water that escapes at first is then reduced.

CAUTION

The stuffing box packing will be damaged if the stuffing box gland is screwed too tight.
If the stuffing box gland is too tight, this will cause burning on the seal surfaces.

Set the stuffing box gland according to the following table:

Step	Procedure
1	Tighten the screw fitting slightly at the stuffing box gland.
2	Turn on supply of sealing water.
3	Start up the machine.
4	Shut down the machine after a few minutes and check the temperature of the stuffing box seal. The temperature of the seal casing must not exceed 40°C.
5	Tighten the stuffing box gland further until there is less sealing water escaping.

Tab. 8-12 Setting the stuffing box gland

- The stuffing box should be checked at short intervals during the first few hours in operation.
- Set the stuffing box such that the shaft at the stuffing box gland is always moist.
- Loosen the screw fitting at the stuffing box gland if the stuffing box overheats.