Not Binding Operating and Assembly Instruction Macerator

This operating and assembly instruction is only for general information.

Type

I 110 with flush connection

I 110 without flush connection
Not Binding Operating and Assembly Instruction Macerator

This operating and assembly instruction is only for general information.

Type
I 110 with flush connection
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Subsidiaries
1.1 General notes

➢ Always keep the operating and maintenance instructions close by the machine.
➢ If problems cannot be solved with reference to the operating and maintenance instructions, please contact the manufacturer.

Observe the following points in addition to these operating and maintenance instructions:
• Prohibition, warning and mandatory signs, warning notes on the machine
• Relevant laws and ordinances
• Statutory provisions on accident prevention
• Corresponding harmonised standards and regulations

1.2 Safety and warning notes

➢ Comply with safety and warning notes for safe and efficient use of the product.

Signal words for specific dangers and (possible) consequences are explained below. These are supplemented by symbols (pictograms) if necessary.

1.2.1 Warning notes

<table>
<thead>
<tr>
<th>Signal word</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOTICE</td>
<td>Caution for machine! Possible danger. Material damage can occur.</td>
</tr>
<tr>
<td>CAUTION</td>
<td>Caution for people and machine! Possible danger. Minor injury or damage to property can occur.</td>
</tr>
<tr>
<td>WARNING</td>
<td>Warning for people! Possible danger. Death or serious injury can occur.</td>
</tr>
<tr>
<td>DANGER</td>
<td>Danger for people! Possible danger. Immediate risk of severe or fatal injury.</td>
</tr>
</tbody>
</table>

1.2.2 Danger symbols

- Warning: Suspended load.
- Warning: Dangerous electrical voltage.
1.2.3 Information symbols

NOTICE

Ensure environmental protection.
Wear eye protection.

➢ Instruction to act/take measures
➢ List item

1.3 Dangers that can be caused by the machine

seepex machines are built in accordance with the state of the art.
Nevertheless, there is a residual risk, because the machine works with:
➢ Mechanical movements that pose a danger
➢ Electrical voltages and currents

We have used design measures and applied safety technology to minimise the risk to the health of people posed by this danger.

1.4 Qualification of the personnel

This handbook is intended for:
➢ Owner
➢ Operators
➢ Setters
➢ Maintenance personnel

1.5 Authorised people

People authorised to undertake operation, set up and maintenance are instructed and trained specialists employed by the owner/manufacturer.

Detailed technical knowledge is essential for performing any work on the machine.

The owner is responsible for:
➢ Personnel training
➢ Compliance with safety regulations
➢ Compliance with operating and maintenance instructions

The operator must:
➢ Have received instruction
➢ Read and understood the relevant parts of the operating instructions before starting work
➢ Know the safety devices and regulations
1.5.1 Tasks and information for the owner/operators

- Regularly check and maintain the machine, replacing all parts in good time which no longer guarantee safe operation.
- It is essential to comply with the procedure described in the operating instructions for shutting down the machine.
- On completion of work, attach all safety and protective devices and make sure they are functioning.

1.5.2 Safety notes for maintenance, inspection and assembly work

- Do not work on the machine or system unless it is stationary and depressurised.
- Switch off the master switch and pull out the power plug before starting work on live components.
- Comply with the procedure for shutting down the machine as described in the Shut-down chapter.
- Decontaminate (de-toxify) machines that are used for pumping media that can be harmful to health.
- Refer to the Initial start-up chapter before repeated start-up of the machine.

1.6 Personal protective equipment

- Wear personal protective equipment and/or additional equipment for your own safety.
- Avoid/limit risks by the use of collective technical protective equipment or by organisational measures at work.

1.7 Safety and protective devices

- Prior to start-up, bolt seepex machines onto a concrete foundation so as to ensure stability.
- Starting and stopping devices must be clearly recognisable. Take appropriate measures to avoid defects.
  - No protective device is necessary for checking and/or setting the shaft seal.
  - Hot surfaces are identified with a danger symbol on the machine.

1.8 Foreseeable misuse

Serious personal injury and damage to property can be caused by:

- Incorrect use
- Incorrect installation or operation of the machine
- Impermissible removal of necessary protective equipment
1.9 Designated use

- Only use seepex machines if they are in perfect condition and in compliance with the operating and maintenance instructions.
- Do not start up the machine unless the system in which the machine is installed is in accordance with the provisions of the applicable guidelines and statutory regulations.
- Equivalent sustained sound pressure level at workplaces of operating personnel C75 dB (A). Cavitation-free operation of the machine and screwed connection to concrete foundation are essential.
- seepex machines are components that are exclusively intended for pumping media in accordance with the technical data (→ chapter 3). Written approval must be obtained from the manufacturer before other media are pumped.
- Refer to the information on the type plate and the operating instructions for technical data (→ chapter 3), and comply with them.
- The operating instructions are assigned to the seepex machine based on the commission number.

1.10 Warranty

- Warranty in accordance with our terms and conditions of delivery and order confirmation.
- It is a condition of the machine warranty that the machine must correspond to the listed operating instructions in accordance with the type plate/data sheet.
- All wearing parts are excluded from the warranty.
- These operating instructions are subject to copyright. Reproduction is not permitted and will be punished. Contravention will be pursued through the courts.
2.1 General description

**seepex macerators consist of:**

- Cutterhead assembly
- Shear plate, rotating cutter head knives
- Macerator casing drive

**Characteristic features**

- The fixed shear plate has round or long-hole openings.

2.2 Mode of operation and principle of maceration

- The macerator serves to chop solids and textiles.
- The optimum cutting effect is the result of the minimal space between the shear plate and the knives.
- The material is chopped and not torn.

2.3 Constructive design

**Range I**

<table>
<thead>
<tr>
<th>Item</th>
<th>Denomination</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANT</td>
<td>Drive</td>
</tr>
<tr>
<td>102</td>
<td>Drive shaft</td>
</tr>
<tr>
<td>200</td>
<td>Lantern</td>
</tr>
<tr>
<td>SDE</td>
<td>Cutterhead assembly</td>
</tr>
<tr>
<td>500</td>
<td>Cutter casing</td>
</tr>
<tr>
<td>900</td>
<td>Shear plate</td>
</tr>
<tr>
<td>905</td>
<td>Cutting head</td>
</tr>
</tbody>
</table>

**Range U**

<table>
<thead>
<tr>
<th>Item</th>
<th>Denomination</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANT</td>
<td>Drive</td>
</tr>
<tr>
<td>102</td>
<td>Drive shaft</td>
</tr>
<tr>
<td>SDE</td>
<td>Cutterhead assembly</td>
</tr>
<tr>
<td>500</td>
<td>Cutter casing</td>
</tr>
<tr>
<td>900</td>
<td>Shear plate</td>
</tr>
<tr>
<td>905</td>
<td>Cutting head</td>
</tr>
</tbody>
</table>
3.1 Data sheet

3.2 Declaration

- Data sheet and declarations are commission specific documents and not part of this not binding operating and assembly instruction.
4.1 Safety

**CAUTION**

Damage to property/injuries due to incorrect transport
Slight injury or damage to property can occur
- Comply with the safety notes and transport notes on the packaging.
- Use suitable means of transport, lifting devices and tools.
- Use protective equipment.

4.2 Transport

4.2.1 Dimensions, weights and center of gravity
- Note the dimensional drawing (chapter 5.6).

4.2.2 Symbols

- Meaning of symbol

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>🔝⇩</td>
<td>Top</td>
</tr>
<tr>
<td>🥂</td>
<td>Fragile item</td>
</tr>
<tr>
<td>🔴</td>
<td>Against moisture protect</td>
</tr>
<tr>
<td>🔩</td>
<td>Centre of gravity</td>
</tr>
<tr>
<td>🔴</td>
<td>Lashing points</td>
</tr>
</tbody>
</table>

4.2.3 Sling points (AP) for lifting devices

**WARNING**

Warning of suspended load.
Death of serious injury can occur.
- Use the lashing points (AP) for lifting devices.
- Note the centre of gravity (dimensional drawing, chapter 5.6).
4.2.4 Unpacking the machine

- Comply with the symbols and notices on the packaging.
- Remove the screwed connection between the machine and packaging.
- Remove the machine with a lifting machine/industrial truck.

4.3 Temporary storage/Corrosion protection

If stored temporary for longer periods

- additional corrosion protection is necessary.
- Discuss required corrosion protection measures with seepex.
- Store in dry, closed rooms that are free of frost to protect against ambient influences.

4.4 Disposal

---

**NOTICE**

Environmental protection
Material damage can occur.

- Drain the pumping medium and dispose of it in accordance with the regulations.
- Dispose of the machine with regard to its composition and existing regulations.
5.1 Mounting tools/Lifting gear

CAUTION

Macerator falling.
Slight injury or damage to property may occur.
- Observe sling points for lifting device.
- Observe dimensions, weights and center of gravity.
- Use suitable mounting tools/lifting gear.

5.2 Space requirements.

Define space requirements under consideration of the following factors:
- Dimensions and weight.
- Required transport and lifting gear.
- Pipeline course

5.2.1 Heavy solid collection separator

NOTICE

Heavy components that cannot be chopped (e.g. metals, stones)
Damage to the cutting tools
- Separate components prior to entry
- Connect seepex heavy solid collection separator upstream
- Open emptying flap and remove solids.

5.3 Installing the fully assembled macerator.

- as per technical data (Chapter 3).
- Observe dimensional drawing.

Zero-potential assembly of macerator
- Even out unevenness with suitable underlay.
  - Applies to assembly on foundations/bearing-type fixtures.
  - All surfaces of macerator contact surfaces rest on foundation/bearing-type fixture.

Correct seat of drives
- All drives are aligned and assembled ready for operation.
- Align/fasten drive unit if the drive has been shifted during transport/installation of the macerator.

CAUTION

Safety and protective devices
Slight injury or damage to property may occur.
- Attach protective device and put into operation.
5.4 seepex macerator power supply

---

**DANGER**

Line voltage and rated frequency.
Death or serious injury will occur.
- Observe type plate on macerator.
- Note manufacturer's regulations (Chapter 13).
- Observe safety regulations.

---

5.5 Pipelines

5.5.1 Inlet and outlet connection

- Please refer to the dimensional drawing for the position, nominal width and standard.
- Observe flow direction of liquid.

5.5.2 Pipeline dimensioning

- Observe specifications on the pressure in the inlet and outlet connection.
- Observe technical data (Chapter 3).
- Nominal width of pipeline = nominal width of macerator inlet and outlet connection.

5.5.3 Residue-free pipelines

---

**NOTICE**

Damage to property from assembly residue.
Loss of warranty claim if not observed.
- Keep all pipelines free of contaminants.
- Remove any welding splatter, screws, steel shaving etc.

---

5.5.4 Zero-potential assembly

- Assembly pipelines and other components on the macerator with zero potential.
# Master Copy

## 6.1 Commissioning report

Send commissioning report online to [www.seepex.com](http://www.seepex.com)

**Must be specified with every order!**

<table>
<thead>
<tr>
<th>Commission:</th>
<th>Model:</th>
</tr>
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<tr>
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</table>

**From:**

- Contact person: ………………………
- Tel.: …………………………………
- Fax: …………………………………
- E-mail: ………………………………

<table>
<thead>
<tr>
<th>Customer Service:</th>
<th>Germany</th>
<th>Phone: +49 2041.996-231</th>
</tr>
</thead>
<tbody>
<tr>
<td>seepex GmbH</td>
<td></td>
<td>Fax: +49 2041.996-431</td>
</tr>
<tr>
<td>Postfach 10 15 64</td>
<td>Rest of</td>
<td>Phone: +49 2041.996-224</td>
</tr>
<tr>
<td>D-46215 Bottrop</td>
<td>Europe</td>
<td>Fax: +49 2041.996-424</td>
</tr>
<tr>
<td><a href="mailto:service@seepex.com">service@seepex.com</a></td>
<td>Outside</td>
<td>Phone: +49 2041.996-120</td>
</tr>
<tr>
<td></td>
<td>Europe</td>
<td>Fax: +49 2041.996-432</td>
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**Address of plant:**

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<th>Address of plant:</th>
<th>Phone: +49 2041.996-224</th>
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<tbody>
<tr>
<td></td>
<td>Fax: +49 2041.996-424</td>
</tr>
<tr>
<td></td>
<td>Phone: +49 2041.996-120</td>
</tr>
<tr>
<td></td>
<td>Fax: +49 2041.996-432</td>
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</tbody>
</table>

**Delivery date:**

**Date of installation:**

**Assembly check carried out on:**

**Please enter operational data:**

- Conveying liquid:
- Temperature:
- Fuse level/motor protection or power consumption
  - Frequency control: □ no □ yes
    - If yes:
      - □ Supplied by seepex
      - □ Supplied by customer

- Frequency:
- Speed:
- Power consumption:

______________  ______________________
Place, date      Signature / company stamp
6.2 Measures before commissioning

- Note the technical data (→ chapter 3.).

6.2.1 Checking pipelines

- Check flange screwed connections (SCH).

<table>
<thead>
<tr>
<th>Design: I</th>
<th>Design: U</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Diagram" /></td>
<td><img src="image2.png" alt="Diagram" /></td>
</tr>
</tbody>
</table>

**NOTICE**

Ensure unrestrained flow of liquid.
Breakdown and/or irreparable damage to the macerator.
- Open all shut-off elements prior to switching on the macerator.

6.2.2 Protective devices on the macerator

**DANGER**

Missing protective device.
Danger from drawing in and crushing.
- Equip macerator with protective device. Protective devices designed to prevent touching surfaces or moving parts must be regarded as adequate if testing with test finger is not possible taking into account penetration possibility, strength and shock resistance.
- Observe country-specific protective regulations.
- Fit touch protection on macerators with open suction casing. These safety clearances protect persons who try to reach into danger zones without additional help and under the conditions specified for the different situations of reaching up, down or through parts.
Touch protection is only necessary on shaft seals if parts are situated on the rotating shaft.

6.2.3 Electrical/hydraulic connections

**DANGER**

Dangerous voltage.
Death or serious injury can occur.
- Note safety regulations.
- Disconnect motor from all sources of energy.
- Secure electrical connections against restarting.
6.2.4 Direction of rotation check

- The direction of rotation of the macerator’s drive shaft is clockwise when viewed from the drive unit.
- Note direction of rotation indicated on the type plate.

Flow direction

6.2.5 Additional devices - optional

- Refer to additional devices (→ chapter 12.1).

6.3 Initial commissioning/repeated commissioning

Macerator start-up

- Start macerator prior to feeding the conveying product
  - so that the knives are cleared of any residue.

Start-up macerator - pump

Macerator - pump combination

- First start macerator, then the pump.
  - Solids may clog the holes of the shear plate and block the macerator.

**NOTICE**

Macerator dry running.
Breakdown and/or irreparable damage to the macerator.

- Fill casing on inlet side with liquid.

6.3.1 Heavy components that cannot be chopped

**NOTICE**

Heavy components that cannot be chopped (e.g. metals, stones)
Damage to the cutting tools

- Separate components prior to entry.
- Connect seepex heavy solid collection separator upstream
- Open emptying flap and remove solids.

6.3.2 Avoid macerator dry running

**NOTICE**

High temperature between knife and shear plate.
Irreparable damage to cutting elements
Complete failure of macerator.

- Ensure that the cutter casing is filled with water when starting up.
- In the event of shaft seals, flush them with rinsing liquid.
6.3.3 Pressure in the macerator

**NOTICE**

High pressure.
Breakdown and/or irreparable damage to the shaft seal or macerator.

- Observe pressure in the macerator as specified in the technical data (→ Chapter 3).

6.4 De-commissioning

Protect macerator and auxiliary equipment from the following:
- Frost,
- deposit of solids,
- sediments of the liquid,
- corrosion on parts that come into contact with the liquid.

6.4.1 Switch off macerator

**DANGER**

Dangerous voltage.
Death or serious injury can occur.

- Note safety regulations.
- Disconnect motor from all sources of energy.
- Secure electrical connections against restarting.

6.4.2 Empty out macerator

- Empty out macerator
  - Note dismounting / reassembly (→ Chapter 9).

6.4.3 Dismantling the macerator

- Dismantling the macerator
  - Note dismounting / reassembly (→ Chapter 9).

6.4.4 Storing/Protecting the macerator from corrosion

**NOTICE**

Damage to property from missing corrosion protection.
Damage to property may occur from corrosion.

- Discuss suitable corrosion protection measures with seepex.
  - Keep commission no. of macerator ready.
7.1 Preventive measures

The maintenance personnel must have these operating instructions, follow them and also require corresponding qualifications.

---

**DANGER**

**Dangerous voltage.**
Death or serious injury can occur.

- Note safety regulations.
- Disconnect motor from all sources of energy.
- Secure electrical connections against restarting.

---

7.1.1 Macerator standstill

**NOTICE**

**Macerator standstill.**
Production failure due to wear.

- Obtain replacement cutterhead assembly.

---

7.2 Lubrication

---

<table>
<thead>
<tr>
<th>Item</th>
<th>Denomination</th>
<th>Lubricant</th>
<th>Fill volume</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cutterhead assembly</td>
<td>NLGI class 1,5 - 3</td>
<td>200 cm³</td>
<td>Relubrication via lubrication nipple</td>
</tr>
<tr>
<td>2</td>
<td>Drive</td>
<td>Refer to manufacturer's documentation (chapter 13..)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Knives/shear plate</td>
<td>Conveying medium</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shaft seal</td>
<td>Note dismantling/reassembly shaft seal (chapter 9.4).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

7.3 Inspection

<table>
<thead>
<tr>
<th>Component</th>
<th>Interval</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cutterhead assembly</td>
<td>Every 600-800 operating hours at least every 3 months</td>
<td>refill the lubricants Relubrication app. 35 cm³</td>
</tr>
<tr>
<td>Shaft seal</td>
<td>Every week</td>
<td>Visual check for leaks</td>
</tr>
<tr>
<td>Drive unit</td>
<td>Every 3000 operating hours, at least every 6 months</td>
<td>Comply with manufacturer's documentation</td>
</tr>
</tbody>
</table>
See the macerator's technical data (Chapter 3) for its application.

<table>
<thead>
<tr>
<th>Operational malfunction</th>
<th>Causes</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macerator not chopping</td>
<td>Flow rate is not reached</td>
<td>Set cutter clearance.</td>
</tr>
<tr>
<td></td>
<td>Motor gets too warm</td>
<td>Put lubricant (liquid soap) between shear plate/</td>
</tr>
<tr>
<td></td>
<td>Shaft seal not tight</td>
<td>knives.</td>
</tr>
<tr>
<td></td>
<td>Macerator loud</td>
<td></td>
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<tr>
<td></td>
<td>Macerator does not start up</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Friction between shear plate/headstock too</td>
<td></td>
</tr>
<tr>
<td></td>
<td>large.</td>
<td></td>
</tr>
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<td>X</td>
<td>X</td>
<td>Set cutter clearance.</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>Put lubricant (liquid soap) between shear plate/</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>knives.</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>Deburr and clean contact surfaces on bearing</td>
</tr>
<tr>
<td></td>
<td>Suction line or shaft seal leaking.</td>
<td>housing. If necessary, exchange shear plate.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>Seal untight parts.</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>Maceration degree too high.</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>Check suction head, if necessary increase pipe</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>diameter on suction line and insert larger</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>filters, fully open valve on suction side,</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>reduce speed.</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>Incorrect speed.</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>Correct speed (data sheet).</td>
</tr>
</tbody>
</table>
### Table of contents:

1.0 Disassembly  
2.0 Reassembly  
3.0 Lubrication

The sectional drawing "Headstock Assembly" and parts list can be taken from Point 9.

**Mounting tools**

Some mounting tools are required for the disassembly and reassembly. Refer to the document OM.SPT.__ regarding these tools.

### 1.0 Headstock Assembly - Disassembly

#### 1.1 Headstock (905)

#### 1.2 Shear Plate (900)

#### 1.3 Shaft Sealing (SEA)

Disassembly of the shaft sealing see document OM.SEA.__.

### 1.4 Drive Shaft (102)

After disassembly of the lock nut (106) and locking plate (107) the drive shaft (102) will be pressed out of the bearing housing (100).

### 2.0 Headstock Assembly - Re-assembly

#### 2.1 Bearing Housing (100)

Check lip seal (127) for damage / replace it if necessary, press it in and fill it with grease 1). Press in the external bearing rings (151 and 104).

#### 2.2 Drive Shaft (102)

Press the internal bearing ring onto the drive shaft (102) and fill it with grease 1).  

Cover the thread (G) on the drive shaft (102) with a bonding sheet to protect it against damage during the further assembly. Before re-assembly fill the internal bearing ring (104) with grease 1).
Adjust the bearing with lock nut (106) without clearance / pre-clamping and lock it with a new locking plate (107). Fill the external bearing area A and B with grease 1).

2.3 Shaft Sealing (SEA)

Assembly of the shaft seal (SEA) as described in document OM.SEA.__.

2.4 Shear Plate (900)

Burr and clean the seat-engaging surface in the bearing housing (100).

Installation position of the shear plate (900) with grooves as illustrated (detail X).

2.5 Headstock (905)

2.5.1 Adjustment of the distance between knives

A - Slip ring (380), fitting discs (112) with a total thickness of 3 mm (dimension "P"), headstock (905), conical unit (909) must be slipped on the drive shaft (102). Screw down with hexagon nut (M20 / not self-locking and no component of the headstock assembly). Do not use the self-locking hexagon nut (142), because this hexagon nut can only be used once for the re-assembly acc. to Point 2.5.3.

B - Measure the distance between the knife "C" in the headstock (905) and the shear plate (900) using a thickness gauge.

C - Dismantle the headstock (905) again.

D - Reduce the fitting disc (112) in such a way that the distance between the knife "C" in the headstock (905) and the shear plate (900) is 0.05 mm up to max. 0.2 mm (dimension "M").

E - Repeat the assembly "A" with reduced fitting discs (112) as ascertained in "D" and check the distance between knife and shear plate as follows:

E1- **CAUTION**

The knives in the headstock (905) must not touch the shear plate (900), because of danger to destroy knives and shear plate.

F - Dismantle headstock (905) again. Continue assembly acc. to Point 2.5.2.
2.5.2 Headstock (906), split ring (903) - Re-assembly

Continue assembly as illustrated and observe particularly:
Fill the shaft sealing (SEA) at area "L" with grease ¹).

Split ring (903):

The outer diameter of the mounted split ring (903) must not contact the inner diameter of the shear plate (900) because there is the danger of the split ring (903) to be destroyed.
Perhaps loosen and newly adjust shear plate (900). Additionally, safeguard screws (906) by means of a screw locking device / an adhesive of medium strenght.
In addition, safeguard the self-locking hexagon nut (142) by a screw locking device / an adhesive of medium strenght.
Rechecking acc. to Point 2.5.1, item E1.

2.5.3 Closing Casing (ASG) / Cover Plate (APL)

Re-assembly see document OM.MAI.__.

3. Lubrication of Headstock Assembly

The lubrication of the bearing depends on design, range and size. See document OM.MAI.__, Point 7.2.1.3.

¹) quality of grease see document OM.MAI__, Point 7.2.1.3.
9.1 Macerator Dismantling / Reassembly

Range: I
Size: 110

9.1.1 Prepare macerator for dismantling

**DANGER**

Dangerous voltage.
Death or serious injury can occur.
- Note safety regulations.
- Disconnect motor from all sources of energy.
- Secure electrical connections against restarting.

**WARNING**

Tilting or falling macerator.
Death or serious injury can occur
- Attach cutter casing (500) to secure the macerator.

**CAUTION**

Oozing liquid.
Slight injury or damage to property may occur.
- Wear suitable protective clothing.
- See the technical data (→ chapter 3) for the corresponding design of the macerator casing.
- Drain pipelines on inlet and outlet sides, or shut off behind macerator connections.
- Block/remove existing flushing connection (SSÜ).
- Remove screw fitting (514).
- Remove cleanout (510) and seal (517).
- Drain liquid from cutter casing (500).

9.1.2 Empty macerator


9.1.3 Dismantling

9.1.3.1 Macerator - dismantling

Alternative A

- Remove screw fitting (SCH) on pipelines (FLA).
- Remove pipelines (FLA).
- Remove screw fitting (SCH) on macerator feet.
- Observe de-commissioning instructions (→ chapter 6.4).

Alternative B

- Remove screw fitting (SCH) on pipelines (FLA).
- Remove screw fitting (SCH) on macerator feet.
- Remove macerator.
- Observe de-commissioning instructions (→ chapter 6.4).

9.1.3.2 Dismantling the drive (ANT)

- Remove screw fitting (562, 563, 564).
- Remove the drive (ANT).
- Remove screw fitting (242).
- Remove cover plate (240).

- Remove set screw (150).
- Remove coupling (149) and distance ring (153).
- Remove screw fitting (231, 232).
- Remove mounting flange (201).
9.1.3.3 Cutterhead assembly (SDE) - dismantling

- Remove screw fitting (506, 507).
- Remove drive casing (200) with cutterhead assembly (SDE).
- Remove O-ring (501).
- Remove lubrication nipple (128).
- Remove screw fitting (124, 125, 250, 251).
- Remove cover plate (120), seal (122) and lip seal (126) from drive casing (200).
- Remove cutterhead assembly (SDE) and O-rings (350).
- Follow cutterhead assembly (SDE) dismantling instructions (→ chapter 9.1.10).

9.1.4 Reassembly

**WARNING**

Tilting or falling macerator.
Death or serious injury can occur
- Attach cutter casing (500) to secure the macerator.

9.1.4.1 Cutterhead assembly (SDE) - mounting

- Follow cutterhead assembly (SDE) reassembly instructions (→ chapter 9.1.10).
- Check O-ring (350) for damage and replace if necessary.
- Insert O-ring (350) in drive casing (200).
- Insert cutterhead assembly (SDE) in drive casing (200).
- Align seal (122), lip seal (126) and cover plate (120) with cutterhead assembly (SDE).
  - Observe the lubrication nipple (128) installation position on the side opening of the drive casing (200).
  - Note flushing connection (SSÜ) position.
- Mount screw fitting (124, 125, 250, 251).
- Mount lubrication nipple (128) on connection plate (120).
9.1.4.2 Assembling the drive (ANT)

- Insert O-ring (501) in cutter casing (500).
- Insert drive casing (200) with cutterhead assembly (SDE) in the cutter casing (500).
- Mount drive casing (200) with screw fitting (506, 507).

9.1.4.3 Macerator - reassembly

Alternative A

- Place pipeline (FLA) on macerator.
- Mount screw fitting (SCH) on pipelines (FLA).
- Mount screw fitting (SCH) on macerator feet.
- Assemble flushing connection (SSÜ).
Alternative B

- Insert macerator between pipelines (FLA).
- Mount screw fitting (SCH) on pipelines (FLA).
- Mount screw fitting (SCH) on macerator feet.
- Assemble flushing connection (SSÜ).
9.4 Single acting mechanical seal

9.4.1 Safety

**WARNING**

 Shaft seal is leaky. Leakage may escape into the atmosphere.

- Take safety measures to protect persons and the environment.
- Wear suitable protective clothing.
- Dispose of leakage appropriately.
- Note applicable regulations when handling hazardous substances.

9.4.2 Operating conditions and material combination

- Adjust in accordance with the particular application
  - Refer to technical data (chapter 3).

9.4.3 Design

- Single acting mechanical seal

9.4.4 Commissioning

**NOTICE**

 Dry running of the mechanical seal. Damage to property may result.

- The mechanical seal must be laid in liquid medium before being commissioned.

Circulation, flushing and/or flushing pipe

- Additional flushing or circulation pipe of the shaft seal in medium not necessary.
- Flushing pipe is possible in certain circumstances and following consultation with seepex.

Adjust shaft seal

- It is absolutely vital to adjust at the application site in a manner appropriate for the operating conditions.
- Refer to the sectional drawing of the shaft seal for setting measurements.
- Set the setting measurements of the shaft seal to the drive shaft (102).

9.4.5 Maintenance

No maintenance is required if the machine is operated according to the regulations.
9.4.6 Dismantling mechanical seal

- Use bolts (351) as forcing-off bolts, (detail X).
  - Two additional threaded holes made in housing (333).
- Push shaft seal (SEA) out of cutter casing (SDE) using forcing-off bolts (351).

- Dismantle mechanical seal (330).

9.4.7 Reassembly of mechanical seal

Shaft seals are high-quality precision parts. This means they must be installed carefully. Careful handling and utmost cleanliness are essential.

- Use of installation aids such as oil/grease is not permitted.
- Reassemble mechanical seal (330).

- Fill bearing area "B" with grease up to top edge of bearing before installation of shaft seal (SEA).
9.4.8 Flush connection for shaft seal

**NOTICE**

Irreparable damage due to overheating/penetration of the product.
Material damage can occur.
- Connect flush connection before commissioning.

Flushing medium: water

Flushing pressure (Dp): 0.5 bar above the pressure in the bearing housing

Flushing volume (QSp):

Connection fittings:
A barrier chamber supply unit without/with flow meter must be installed for applying flushing/barrier liquid to the shaft seal.
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<thead>
<tr>
<th>Stck.</th>
<th>Qty. / Item</th>
<th>Benennung</th>
<th>denomination</th>
</tr>
</thead>
<tbody>
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<td>1</td>
<td>bearing housing</td>
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<td>bearing housing</td>
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<td>Antriebswelle</td>
<td>drive shaft</td>
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<tr>
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<td>taper roller bearing</td>
<td>Kegelrollenlager</td>
<td>taper roller bearing</td>
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<td>Wellenmutter</td>
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<tr>
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<td>locking plate</td>
<td>Sicherungsblech</td>
<td>locking plate</td>
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<td>set of fitting discs</td>
<td>Passscheibensatz</td>
<td>set of fitting discs</td>
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<td>Abschlussplatte</td>
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<td>Dichtung</td>
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<td>sectional drawing No. 075-007A2</td>
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<td>denomination Qty. / Item</td>
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<tr>
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<td></td>
<td>Zur Beachtung bei Ersatzteilbestellungen für notwendige Reparaturen! Die Reparatur im eigenen Hause erfordert fachlich geschultes Personal, sowie eine Prüfeinrichtung zur Funktionsprüfung der Schnideeinheit.</td>
<td>Please observe when ordering spares for necessary repairs! The repair in the own workshop requires technically trained staff as well as a testing device for an inspection of the function of the headstock assembly.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Der Kauf einer komplett überholten, fertig montierten und funktionsgeprüften Ersatzschneideinheit ist aus o.g. Grund konstengünstiger und gewährleistet die Funktionssicherheit.</td>
<td>For the a.m. reason the purchase of a completely overhauled, fitted and function tested spare headstock assembly is less expensive and provides security of function.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Senden Sie uns zur Überholung ihre zu reparierende Schnideinheit zurück und fordern Sie eine überholte oder neue Schnideinheit an.</td>
<td>To overhaul your headstock assembly to be repaired, please return it to us and ask for an overhauled or new spare headstock assembly.</td>
</tr>
</tbody>
</table>
10.1 Spare parts list

10.2 Sectional drawing and parts list
Version for copying

10.1 Spare parts list

Spare parts can be ordered online or requested from www.seepex.com

<table>
<thead>
<tr>
<th>No.</th>
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<th>Component</th>
<th>Material</th>
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<tr>
<td>380</td>
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Customer service:
seepex GmbH
Postfach 10 15 64
D-46215 Bottrop
service@seepex.com

Germany
Tel +492041.996-231
Fax +492041.996-431

Rest of Europe
Tel +492041.996-224
Fax +492041.996-424

Outside Europe
Tel +492041.996-120
Fax +492041.996-432

Type: I and U 25-110

Sender:
Contact: .........................................................
Tel.: ...........................................................
Fax: ...........................................................
E-mail: ........................................................

Must be included in every order or enquiry!
Commission: ________________________________ Type: ________________________________

Delivery address:

Place, date Signature / company stamp
## Spare parts

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<th>Material</th>
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<td></td>
<td></td>
</tr>
<tr>
<td>910</td>
<td>1</td>
<td>Felt ring</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

______________________________  ______________________________
Place, date  Signature / company stamp
Master copy

Spare parts can be ordered online or requested from www.seepex.com.

Must be specified with every order!

Commission: Mark tool!

Sender:

Contact: .........................................................
Tel.: ..........................................................
Fax: ..........................................................
E-mail: ......................................................

Customer service: Germany Tel +492041.996-231
seepex GmbH Fax +492041.996-431
Postfach 10 15 64 Rest of Europe Tel +492041.996-224
D-46215 Bottrop Fax +492041.996-424
service@seepex.com Outside Europe Tel +492041.996-120

Delivery address:

For installation of: Cutterhead assembly Bearing

Tool no. W50 [ ] W51 [ ] W52 [ ] W53 [ ]

Denomination: Mounting socket Sleeve Pin Pin

Order no. MSO HUL BOL BOL

For installation of: Drive shaft Shaft sealing

Tool no. W54 [ ] W55 [ ]

Denomination: Profile key Sleeve

Order no. SPO HUL
12.1 Zusatzeinrichtungen/Technische Information

- Zusatzeinrichtungen und technische Informationen sind kommissions-spezifische Dokumente und nicht Bestandteil dieser unverbindlichen Betriebs- und Montageanleitung.
13.1 Herstellerunterlagen / Zulieferer

- Hersteller- und Zuliefererunterlagen sind kommissionsspezifische Dokumente und nicht Bestandteil dieser unverbindlichen Betriebs- und Montageanleitung.
Not Binding Operating and Assembly Instruction Macerator

This operating and assembly instruction is only for general information.

Type
I 110 without flush connection
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   1.2 Safety and warning notes
       1.2.1 Warning notes
       1.2.2 Danger symbols
       1.2.3 Information symbols
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   1.4 Qualification of the personnel
   1.5 Authorised people
       1.5.1 Tasks and information for the owner/operators
       1.5.2 Safety notes for maintenance, inspection and assembly work
   1.6 Personal protective equipment
   1.7 Safety and protective devices
   1.8 Foreseeable misuse
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   1.10 Warranty

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1.1 General notes

- Always keep the operating and maintenance instructions close by the machine.
- If problems cannot be solved with reference to the operating and maintenance instructions, please contact the manufacturer.

Observe the following points in addition to these operating and maintenance instructions:
- Prohibition, warning and mandatory signs, warning notes on the machine
- Relevant laws and ordinances
- Statutory provisions on accident prevention
- Corresponding harmonised standards and regulations

1.2 Safety and warning notes

- Comply with safety and warning notes for safe and efficient use of the product.

Signal words for specific dangers and (possible) consequences are explained below. These are supplemented by symbols (pictograms) if necessary.

1.2.1 Warning notes

- **NOTICE**
  Caution for machine!
  Possible danger.
  Material damage can occur.

- **CAUTION**
  Caution for people and machine!
  Possible danger.
  Minor injury or damage to property can occur.

- **WARNING**
  Warning for people!
  Possible danger.
  Death or serious injury can occur.

- **DANGER**
  Danger for people!
  Possible danger.
  Immediate risk of severe or fatal injury.

1.2.2 Danger symbols

- **Warning:**
  Suspended load.

- **Warning:**
  Dangerous electrical voltage.
1.2.3 Information symbols

Ensure environmental protection. Wear eye protection.

- Instruction to act/take measures
  - List item

1.3 Dangers that can be caused by the machine

seepex machines are built in accordance with the state of the art. Nevertheless, there is a residual risk, because the machine works with:

- Mechanical movements that pose a danger
- Electrical voltages and currents

We have used design measures and applied safety technology to minimise the risk to the health of people posed by this danger.

1.4 Qualification of the personnel

This handbook is intended for:

- Owner
- Operators
- Setters
- Maintenance personnel

1.5 Authorised people

People authorised to undertake operation, set up and maintenance are instructed and trained specialists employed by the owner/manufacturer.

Detailed technical knowledge is essential for performing any work on the machine.

The owner is responsible for:

- Personnel training
- Compliance with safety regulations
- Compliance with operating and maintenance instructions

The operator must:

- Have received instruction
- Read and understood the relevant parts of the operating instructions before starting work
- Know the safety devices and regulations
1.5.1 Tasks and information for the owner/operators

- Regularly check and maintain the machine, replacing all parts in good time which no longer guarantee safe operation.
- It is essential to comply with the procedure described in the operating instructions for shutting down the machine.
- On completion of work, attach all safety and protective devices and make sure they are functioning.

1.5.2 Safety notes for maintenance, inspection and assembly work

- Do not work on the machine or system unless it is stationary and depressurised.
- Switch off the master switch and pull out the power plug before starting work on live components.
- Comply with the procedure for shutting down the machine as described in the Shut-down chapter.
- Decontaminate (de-toxify) machines that are used for pumping media that can be harmful to health.
- Refer to the Initial start-up chapter before repeated start-up of the machine.

1.6 Personal protective equipment

- Wear personal protective equipment and/or additional equipment for your own safety.
- Avoid/limit risks by the use of collective technical protective equipment or by organisational measures at work.

1.7 Safety and protective devices

- Prior to start-up, bolt seepex machines onto a concrete foundation so as to ensure stability.
- Starting and stopping devices must be clearly recognisable. Take appropriate measures to avoid defects.
- No protective device is necessary for checking and/or setting the shaft seal.
- Hot surfaces are identified with a danger symbol on the machine.

1.8 Foreseeable misuse

Serious personal injury and damage to property can be caused by:

- Incorrect use
- Incorrect installation or operation of the machine
- Impermissible removal of necessary protective equipment
1.9 Designated use

- Only use seepex machines if they are in perfect condition and in compliance with the operating and maintenance instructions.

- Do not start up the machine unless the system in which the machine is installed is in accordance with the provisions of the applicable guidelines and statutory regulations.

- Equivalent sustained sound pressure level at workplaces of operating personnel C75 dB (A). Cavitation-free operation of the machine and screwed connection to concrete foundation are essential.

- seepex machines are components that are exclusively intended for pumping media in accordance with the technical data (→ chapter 3). Written approval must be obtained from the manufacturer before other media are pumped.

- Refer to the information on the type plate and the operating instructions for technical data (→ chapter 3), and comply with them.

- The operating instructions are assigned to the seepex machine based on the commission number.

1.10 Warranty

- Warranty in accordance with our terms and conditions of delivery and order confirmation.

- It is a condition of the machine warranty that the machine must correspond to the listed operating instructions in accordance with the type plate/data sheet.

- All wearing parts are excluded from the warranty.

- These operating instructions are subject to copyright. Reproduction is not permitted and will be punished. Contravention will be pursued through the courts.
2.1 General description

*seepeX macerators consist of:*
- Cutterhead assembly
- Shear plate, rotating cutter head knives
- Macerator casing drive

*Characteristic features*
- The fixed shear plate has round or long-hole openings.

2.2 Mode of operation and principle of maceration

- The macerator serves to chop solids and textiles.
- The optimum cutting effect is the result of the minimal space between the shear plate and the knives.
- The material is chopped and not torn.

2.3 Constructive design

**Range I**

<table>
<thead>
<tr>
<th>Item</th>
<th>Denomination</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANT</td>
<td>Drive</td>
</tr>
<tr>
<td>102</td>
<td>Drive shaft</td>
</tr>
<tr>
<td>200</td>
<td>Lantern</td>
</tr>
<tr>
<td>SDE</td>
<td>Cutterhead assembly</td>
</tr>
<tr>
<td>500</td>
<td>Cutter casing</td>
</tr>
<tr>
<td>900</td>
<td>Shear plate</td>
</tr>
<tr>
<td>905</td>
<td>Cutting head</td>
</tr>
</tbody>
</table>

**Range U**

<table>
<thead>
<tr>
<th>Item</th>
<th>Denomination</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANT</td>
<td>Drive</td>
</tr>
<tr>
<td>102</td>
<td>Drive shaft</td>
</tr>
<tr>
<td>SDE</td>
<td>Cutterhead assembly</td>
</tr>
<tr>
<td>500</td>
<td>Cutter casing</td>
</tr>
<tr>
<td>900</td>
<td>Shear plate</td>
</tr>
<tr>
<td>905</td>
<td>Cutting head</td>
</tr>
</tbody>
</table>
3.1 Data sheet

3.2 Declaration

- Data sheet and declarations are commission specific documents and not part of this not binding operating and assembly instruction.
4.1 Safety

**CAUTION**

Damage to property/injuries due to incorrect transport
Slight injury or damage to property can occur

- Comply with the safety notes and transport notes on the packaging.
- Use suitable means of transport, lifting devices and tools.
- Use protective equipment.

4.2 Transport

4.2.1 Dimensions, weights and center of gravity

- Note the dimensional drawing (chapter 5.6).

4.2.2 Symbols

- Meaning of symbol

```
Top | Fragile item | Against moisture protect | Centre of gravity | Lashing points
---|-------------|--------------------------|-------------------|-----------------```

4.2.3 Sling points (AP) for lifting devices

**WARNING**

Warning of suspended load.
Death of serious injury can occur.

- Use the lashing points (AP) for lifting devices.
- Note the centre of gravity (dimensional drawing, chapter 5.6).

Range I | Range U
--------|--------
AP      | AP
4.2.4 Unpacking the machine

- Comply with the symbols and notices on the packaging.
- Remove the screwed connection between the machine and packaging.
- Remove the machine with a lifting machine/industrial truck.

4.3 Temporary storage/Corrosion protection

If stored temporarily for longer periods

- additional corrosion protection is necessary.
- Discuss required corrosion protection measures with seepex.
- Store in dry, closed rooms that are free of frost to protect against ambient influences.

4.4 Disposal

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental protection</td>
</tr>
<tr>
<td>Material damage can occur.</td>
</tr>
</tbody>
</table>

- Drain the pumping medium and dispose of it in accordance with the regulations.
- Dispose of the machine with regard to its composition and existing regulations.
5.1 Mounting tools/Lifting gear

CAUTION

Macerator falling.
Slight injury or damage to property may occur.

- Observe sling points for lifting device.
- Observe dimensions, weights and center of gravity.
- Use suitable mounting tools/lifting gear.

5.2 Space requirements.

Define space requirements under consideration of the following factors:
- Dimensions and weight.
- Required transport and lifting gear.
- Pipeline course

5.2.1 Heavy solid collection separator

NOTICE

Heavy components that cannot be chopped (e.g. metals, stones)
Damage to the cutting tools

- Separate components prior to entry
- Connect seepex heavy solid collection separator upstream
- Open emptying flap and remove solids.

5.3 Installing the fully assembled macerator.

- as per technical data (Chapter 3).
- Observe dimensional drawing.

Zero-potential assembly of macerator

- Even out unevenness with suitable underlay.
  - Applies to assembly on foundations/bearing-type fixtures.
  - All surfaces of macerator contact surfaces rest on foundation/bearing-type fixture.

Correct seat of drives

- All drives are aligned and assembled ready for operation.
- Align/fasten drive unit if the drive has been shifted during transport/installation of the macerator.

CAUTION

Safety and protective devices
Slight injury or damage to property may occur.

- Attach protective device and put into operation.
5.4  seepex macerator power supply

DANGER

Line voltage and rated frequency. Death or serious injury will occur.
➢ Observe type plate on macerator.
➢ Note manufacturer's regulations (Chapter 13).
➢ Observe safety regulations.

5.5  Pipelines

5.5.1 Inlet and outlet connection

➢ Please refer to the dimensional drawing for the position, nominal width and standard.
➢ Observe flow direction of liquid.

5.5.2 Pipeline dimensioning

➢ Observe specifications on the pressure in the inlet and outlet connection.
➢ Observe technical data (Chapter 3).
➢ Nominal width of pipeline = nominal width of macerator inlet and outlet connection.

5.5.3 Residue-free pipelines

NOTICE

Damage to property from assembly residue. Loss of warranty claim if not observed.
➢ Keep all pipelines free of contaminants.
➢ Remove any welding splatter, screws, steel shaving etc.

5.5.4 Zero-potential assembly

➢ Assembly pipelines and other components on the macerator with zero potential.
Commissioning / De-commissioning

6.1 Commissioning report

Send commissioning report online to www.seepex.com

Must be specified with every order!

Commission: ___________________________ Model: ___________________________

Contact person: ............................................
Tel.: ..............................................................
Fax: ...............................................................
E-mail: ...........................................................

Customer Service:                      Address of plant:
seepex GmbH                             Germany Phone: +49 2041.996-231
Postfach 10 15 64                       Fax: +49 2041.996-431
D-46215 Bottrop                          Rest of Europe Phone: +49 2041.996-224
service@seepex.com                       Fax: +49 2041.996-424

Outside Europe Phone: +49 2041.996-120
Fax: +49 2041.996-432

Delivery date: _________________________
Date of installation: ___________________
Assembly check carried out on: ___________

Please enter operational data:

Conveying liquid: _______________________
Temperature: ___________________________
Fuse level/motor protection or power consumption

Frequency control
☐ no
☐ yes If yes:
☐ Supplied by seepex
☐ Supplied by customer

Frequency: ___________________________
Speed: _______________________________
Power consumption: ___________________
6.2 Measures before commissioning

➢ Note the technical data (→ chapter 3.).

6.2.1 Checking pipelines

➢ Check flange screwed connections (SCH).

<table>
<thead>
<tr>
<th>Design: I</th>
<th>Design: U</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCH</td>
<td>SCH</td>
</tr>
<tr>
<td>SCH</td>
<td>SCH</td>
</tr>
</tbody>
</table>

**NOTICE**

Ensure unrestrained flow of liquid.
Breakdown and/or irreparable damage to the macerator.
➢ Open all shut-off elements prior to switching on the macerator.

6.2.2 Protective devices on the macerator

**DANGER**

Missing protective device.
Danger from drawing in and crushing.
➢ Equip macerator with protective device. Protective devices designed to prevent touching surfaces or moving parts must be regarded as adequate if testing with test finger is not possible taking into account penetration possibility, strength and shock resistance.
➢ Observe country-specific protective regulations.
➢ Fit touch protection on macerators with open suction casing. These safety clearances protect persons who try to reach into danger zones without additional help and under the conditions specified for the different situations of reaching up, down or through parts.

Touch protection is only necessary on shaft seals if parts are situated on the rotating shaft.

6.2.3 Electrical/hydraulic connections

**DANGER**

Dangerous voltage.
Death or serious injury can occur.
➢ Note safety regulations.
➢ Disconnect motor from all sources of energy.
➢ Secure electrical connections against restarting.
6.2.4 Direction of rotation check

➢ The direction of rotation of the macerator's drive shaft is clockwise when viewed from the drive unit.
➢ Note direction of rotation indicated on the type plate.

Flow direction

Design: I

Design: U

6.2.5 Additional devices - optional

➢ Refer to additional devices (→ chapter 12.1).

6.3 Initial commissioning/repeated commissioning

Macerator start-up

➢ Start macerator prior to feeding the conveying product
  – so that the knives are cleared of any residue.

Start-up macerator - pump

Macerator - pump combination

➢ First start macerator, then the pump.
  – Solids may clog the holes of the shear plate and block the macerator.

**NOTICE**

Macerator dry running.
Breakdown and/or irreparable damage to the macerator.

➢ Fill casing on inlet side with liquid.

6.3.1 Heavy components that cannot be chopped

**NOTICE**

Heavy components that cannot be chopped (e.g. metals, stones)
Damage to the cutting tools

➢ Separate components prior to entry.
➢ Connect seepex heavy solid collection separator upstream
➢ Open emptying flap and remove solids.

6.3.2 Avoid macerator dry running

**NOTICE**

High temperature between knife and shear plate.
Irreparable damage to cutting elements
Complete failure of macerator.

➢ Ensure that the cutter casing is filled with water when starting up.
➢ In the event of shaft seals, flush them with rinsing liquid.
6.3.3 Pressure in the macerator

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
</table>
| High pressure.  
Breakdown and/or irreparable damage to the shaft seal or macerator.  
➢ Observe pressure in the macerator as specified in the technical data (→ Chapter 3). |

6.4 De-commissioning

Protect macerator and auxiliary equipment from the following:

• Frost,
• deposit of solids,
• sediments of the liquid,
• corrosion on parts that come into contact with the liquid.

6.4.1 Switch off macerator

<table>
<thead>
<tr>
<th>DANGER</th>
</tr>
</thead>
</table>
| Dangerous voltage.  
Death or serious injury can occur.  
➢ Note safety regulations.  
➢ Disconnect motor from all sources of energy.  
➢ Secure electrical connections against restarting. |

6.4.2 Empty out macerator

➢ Empty out macerator  
   – Note dismounting / reassembly (→ Chapter 9).

6.4.3 Dismantling the macerator

➢ Dismantling the macerator  
   – Note dismounting / reassembly (→ Chapter 9).

6.4.4 Storing/Protecting the macerator from corrosion

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
</table>
| Damage to property from missing corrosion protection.  
Damage to property may occur from corrosion.  
➢ Discuss suitable corrosion protection measures with seepex.  
   – Keep commission no. of macerator ready. |
7.1 Preventive measures

The maintenance personnel must have these operating instructions, follow them and also require corresponding qualifications.

---
**DANGER**

**Dangerous voltage.**
Death or serious injury can occur.
- Note safety regulations.
- Disconnect motor from all sources of energy.
- Secure electrical connections against restarting.

---
**NOTICE**

**Macerator standstill.**
Production failure due to wear.
- Obtain replacement cutterhead assembly.

7.1.1 Macerator standstill

---
**NOTICE**

**Macerator standstill.**
Production failure due to wear.
- Obtain replacement cutterhead assembly.

7.2 Lubrication

<table>
<thead>
<tr>
<th>Item</th>
<th>Denomination</th>
<th>Lubricant</th>
<th>Fill volume</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cutterhead assembly</td>
<td>NLGI class 1,5 - 3</td>
<td>200 cm³</td>
<td>Relubrication via lubrication nipple</td>
</tr>
<tr>
<td>2</td>
<td>Drive</td>
<td>Refer to manufacturer's documentation (chapter 13.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Knives/shear plate</td>
<td>Conveying medium</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shaft seal</td>
<td>Note dismantling/reassembly shaft seal (chapter 9.4).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7.3 Inspection

<table>
<thead>
<tr>
<th>Component</th>
<th>Interval</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cutterhead assembly</td>
<td>Every 600-800 operating hours at least every 3 months</td>
<td>refill the lubricants Relubrication app. 35 cm³</td>
</tr>
<tr>
<td>Shaft seal</td>
<td>Every week</td>
<td>Visual check for leaks</td>
</tr>
<tr>
<td>Drive unit</td>
<td>Every 3000 operating hours, at least every 6 months</td>
<td>Comply with manufacturer's documentation</td>
</tr>
</tbody>
</table>
See the macerator’s technical data (Chapter 3) for its application.

<table>
<thead>
<tr>
<th>Operational malfunction</th>
<th>Causes</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macerator not chopping</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow rate is not reached</td>
<td>Friction between shear plate/headstock too large.</td>
<td>Set cutter clearance. Put lubricant (liquid soap) between shear plate/knives.</td>
</tr>
<tr>
<td>Motor gets too warm</td>
<td>Wrong or faulty shear plate</td>
<td>Deburr and clean contact surfaces on bearing housing. If necessary, exchange shear plate.</td>
</tr>
<tr>
<td>Shaft seal not tight</td>
<td>Suction line or shaft seal leaking.</td>
<td>Seal untight parts.</td>
</tr>
<tr>
<td>Macerator loud</td>
<td>Maceration degree too high</td>
<td>Check suction head, if necessary increase pipe diameter on suction line and insert larger filters, fully open valve on suction side, reduce speed.</td>
</tr>
<tr>
<td>Macerator does not start up</td>
<td>Incorrect speed.</td>
<td>Correct speed (data sheet).</td>
</tr>
</tbody>
</table>
Dismantling / Reassembly

9.1.10 Macerator cutting unit dismantling/reassembly
Macerators with flexible coupling
Range: I and U
Size: 110

9.1.10.1 Dismantling

Dismantling headstock (905)
- Remove screw fitting (142, 143).
- Remove conical unit (909), headstock (905), felt ring (910) and fitting discs (112) from bearing housing (100).

- Remove screw fitting (906, 907).
- Remove pressure ring (903) and felt ring (904) from headstock (905).

Dismantling shear plate (900)
- Remove socket screw (906) and spring washer (907).
- Remove shear plate (900) from bearing housing (100).

Dismantling shaft seal (SEA)
- Remove shaft seal (SEA).
  - Follow instructions in shaft seal dismantling/reassembly document (⇒ chapter 9.4).

Dismantling drive shaft (102)
- Remove lock nut (106) and lock washer (107).

- Remove drive shaft (102) from bearing housing (100).
- Remove taper roller bearing (151) and lip seal (127).
9.1.10.2 Reassembly

- Remove burrs and edges.
- Clean bearing housing (100).
- Clean drive shaft (102).
- Check lip seal (127) for damage and replace if necessary.

Preparing bearing housing (100) for assembly

- Press in lip seal (127) and fill with grease.
  - Note lip seal (127) position.
  - Refer to maintenance document (→ chapter 7.0) for grease filling grade.
- Insert bearing outer races (151) in bearing housing (100).

Preparing drive shaft (102) for assembly

- Cover thread (G) of drive shaft (102) with adhesive film.
- Press bearing inner race (151) onto drive shaft (102) and fill with grease.
  - Refer to maintenance document (→ chapter 7.0) for grease filling grade.

Assembling bearing housing (100)

- Push drive shaft (102) into bearing housing (100).
- Fill bearing inner race (104.2) with grease and press into bearing housing (100).
  - Refer to maintenance document (→ chapter 7.0) for grease filling grade.
- Push taper roller bearing (104.1) onto drive shaft (102).
- Mount lock washer (107) and lock nut (106).
  - Adjust bearings until free of clearance / pre-clamping.
Installing shaft seal (SEA)

- Insert shaft seal (SEA).
  - Follow instructions in shaft seal dismantling/reassembly document (→ chapter 9.4).

Assembling shear plate (900)

- Deburr and clean the contact surface on bearing housing (100).
  - Note fitting position of shear plates (900) (detail "X").
- Install shear plate (900) on bearing housing (100) with screw fitting (906, 907).

Installing headstock (905)

**CAUTION**

- Irreparable damage to cutter and shear plate. Damage to property can occur.

- Cutter in headstock (905) may not come into contact with shear plate (900).

Preparing headstock (905) for assembly

- Push fitting discs (112) with 3 mm total thickness (dimension "P") and headstock (905) onto drive shaft (102).
- Install headstock (905) and conical unit (909) with hexagon nut (142).

- Check dimension "M" between cutter in headstock (905) and shear plate (900).
  - Use feeler gauge (WF).
- If the distance between the headstock (905) and the shear plate (900) is not between 0.05 mm and 0.2 mm (dimension "M"), refer to the following section.

Correcting the distance between headstock (905) and shear plate (900)

- Remove hexagon nut (142).
- Remove conical unit (909) and headstock (905).
- Reduce fitting discs (112).
Dismantling headstock (905)

- Remove screw fitting (142).
- Remove conical unit (909), headstock (905) and reduced fitting disc set (112).
- Soak felt ring (904) in oil bath.
  - Use ISO VG 220 oil quality.
- Insert felt ring (904) in pressure ring (903).
- Mount pressure ring (903) on headstock (905) with socket screw (906) and spring washer (907).
  - Secure socket screw medium tight with adhesive.
- Fill shaft seal (SEA) in area "L" with oil.
  - Refer to maintenance document (→ chapter 7.0) for grease filling grade.
- Soak felt ring (910) in oil bath.
  - Use ISO VG 220 oil quality
- Mount reduced fitting disc set (112), felt ring (910), headstock (905) and conical unit (909) with screw fitting (142, 143).

Lubricating cutting unit (SDE)

- Refer to the maintenance document (→ chapter 7) for bearing lubrication.
9.1 Macerator Dismantling / Reassembly

Range:  I
Size:   110

9.1.1 Prepare macerator for dismantling

**DANGER**

Dangerous voltage.
Death or serious injury can occur.

- Note safety regulations.
- Disconnect motor from all sources of energy.
- Secure electrical connections against restarting.

**WARNING**

Tilting or falling macerator.
Death or serious injury can occur

- Attach cutter casing (500) to secure the macerator.

9.1.2 Empty macerator

**CAUTION**

Oozing liquid.
Slight injury or damage to property may occur.

- Wear suitable protective clothing.
- See the technical data (→ chapter 3) for the corresponding design of the macerator casing.

- Drain pipelines on inlet and outlet sides, or shut off behind macerator connections.
- Block/remove existing flushing connection (SSÜ).
- Remove screw fitting (514).
- Remove cleanout (510) and seal (517).
- Drain liquid from cutter casing (500).
9.1.3 Dismantling

9.1.3.1 Macerator - dismantling

Alternative A

- Remove screw fitting (SCH) on pipelines (FLA).
- Remove pipelines (FLA).
- Remove screw fitting (SCH) on macerator feet.
- Observe de-commissioning instructions (→ chapter 6.4).

Alternative B

- Remove screw fitting (SCH) on pipelines (FLA).
- Remove screw fitting (SCH) on macerator feet.
- Remove macerator.
- Observe de-commissioning instructions (→ chapter 6.4).

9.1.3.2 Dismantling the drive (ANT)

- Remove screw fitting (562, 563, 564).
- Remove screw fitting (242).
- Remove cover plate (240).
- Remove set screw (150).
- Remove coupling (149) and distance ring (153).
- Remove screw fitting (231, 232).
- Remove mounting flange (201).
9.1.3.3 Cutterhead assembly (SDE) - dismantling

- Remove screw fitting (506, 507).
- Remove drive casing (200) with cutterhead assembly (SDE).
- Remove O-ring (501).

- Remove lubrication nipple (128).
- Remove screw fitting (124, 125, 250, 251).
- Remove cover plate (120), seal (122) and lip seal (126) from drive casing (200).
- Remove cutterhead assembly (SDE) and O-rings (350).
- Follow cutterhead assembly (SDE) dismantling instructions (→ chapter 9.1.10).

9.1.4 Reassembly

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<td>Attach cutter casing (500) to secure the macerator.</td>
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9.1.4.1 Cutterhead assembly (SDE) - mounting

- Follow cutterhead assembly (SDE) reassembly instructions (→ chapter 9.1.10).
- Check O-ring (350) for damage and replace if necessary.
- Insert O-ring (350) in drive casing (200).
- Insert cutterhead assembly (SDE) in drive casing (200).
- Align seal (122), lip seal (126) and cover plate (120) with cutterhead assembly (SDE).
  - Observe the lubrication nipple (128) installation position on the side opening of the drive casing (200).
  - Note flushing connection (SSÜ) position.
- Mount screw fitting (124, 125, 250, 251).
- Mount lubrication nipple (128) on connection plate (120).
9.1.4.2 Assembling the drive (ANT)

- Insert O-ring (501) in cutter casing (500).
- Insert drive casing (200) with cutterhead assembly (SDE) in the cutter casing (500).
- Mount drive casing (200) with screw fitting (506, 507).

9.1.4.3 Macerator - reassembly

**Alternative A**

- Place pipeline (FLA) on macerator.
- Mount screw fitting (SCH) on pipelines (FLA).
- Mount screw fitting (SCH) on macerator feet.
- Assemble flushing connection (SSÜ).
Alternative B

- Insert macerator between pipelines (FLA).
- Mount screw fitting (SCH) on pipelines (FLA).
- Mount screw fitting (SCH) on macerator feet.
- Assemble flushing connection (SSÜ).
9.4 Single acting mechanical seal

9.4.1 Safety

**WARNING**

Shaft seal is leaky.
Leakage may escape into the atmosphere.

- Take safety measures to protect persons and the environment.
- Wear suitable protective clothing.
- Dispose of leakage appropriately.
- Note applicable regulations when handling hazardous substances.

9.4.2 Operating conditions and material combination

- Adjust to the relevant application
  - Refer to technical data (chapter 3).

9.4.3 Design

- Single acting mechanical seal

9.4.4 Commissioning

**NOTICE**

Dry running of the mechanical seal.
Damage to property may result.

- The mechanical seal must be laid in liquid medium before being commissioned.

Circulation, flushing and/or flushing pipe

- Additional flushing or circulation pipes are not required where shaft sealing lies in medium.
- Flushing pipes may be possible under special circumstances and after speaking to seepex.

Adjust shaft seal

- It is absolutely vital to adjust at the application site in a manner appropriate for the operating conditions.
- Refer to the sectional drawing of the shaft seal for setting measurements.
- Set the setting measurements of the shaft seal to the drive shaft (102).

9.4.5 Maintenance

No maintenance is required if the machine is operated according to the regulations.
9.4.6 Dismantling of the mechanical seal

- Use bolts (351) as forcing-off bolts, (detail X).
  - Two additional threaded holes made in housing (333).
- Push shaft seal (SEA) out of cutting unit housing (SDE) using forcing-off bolts.
  
- Dismantling mechanical seal (330).

9.4.7 Reassembly of mechanical seal

 Shaft sealings are high-quality precision parts. Their installation is therefore to be undertaken with care. Careful handling and the utmost of cleanliness are prerequisites.

- Assembly aids such as oil/grease are not permitted.
- Reassembly mechanical seal (330).

- Fill bearing area "B" with grease up to top edge of bearing before installation of shaft seal (SEA).
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Zur Beachtung bei Ersatzteilbestellungen für notwendige Reparaturen! Die Reparatur im eigenen Hause erfordert fachlich geschultes Personal, sowie eine Prüfeinrichtung zur Funktionsprüfung der Schneideinheit.

Please observe when ordering spares for necessary repairs! The repair in the own workshop requires technically trained staff as well as a testing device for an inspection of the function of the headstock assembly.

A considérer concernant des commandes des pièces de rechange pour des réparations nécessaires! La réparation dans votre établissement requise du personnel qualifié ainsi qu'un dispositif d'essai pour la vérification du fonctionnement de l'unité sécatrice.

Der Kauf einer komplett überholten, fertig montierten und funktionsgeprüften Ersatzschneideinheit ist aus o.g. Grund kostengünstiger und gewährleistet die Funktionssicherheit.

For the a.m. reason the purchase of a completely overhauled, fitted and function tested spare headstock assembly is less expensive and provides security of function.

L'achat d'une unité sécarice de substitution qui a été réconditionnée complètement, montée pour l'installation et vérifiée de fonctionnement est plus économique pour la raison mentionnée ci-dessus et garantit la sûreté de fonctionnement.

Senden Sie uns zur Überholung ihre zu reparierende Schneideinheit zurück und fordern Sie eine überholte oder neue Schneideinheit an.

To overhaul your headstock assembly to be repaired, please return it to us and ask for an overhauled or new spare headstock assembly.

Nous retourner votre unité sécarice à réparer pour le reconditionnement et demander une unité sécarice refaite ou nouvelle.
10.1 Spare parts list

10.2 Sectional drawing and parts list
### 10.1 Spare parts list

Spare parts can be ordered online or requested from [www.seepex.com](http://www.seepex.com) for Type: I and U 25-110. To make your request, check the box for **Request** and fill out the **Commission** and **Type** fields. For orders, check the box for **Order**. Each order or enquiry must include the **Contact** details:

- Name:
- Tel.:
- Fax:
- E-mail:

**Customer service:**

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<td>+492041.996-431</td>
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<td>+492041.996-224</td>
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<td>+492041.996-120</td>
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Place, date ___________________________ Signature / company stamp ___________________________
**Special tools**

Spare parts can be ordered online or requested from www.seepex.com. Must be specified with every order!

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<tr>
<td>D-46215 Bottrop</td>
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12.1 Zusatzeinrichtungen/Technische Information

- Zusatzeinrichtungen und technische Informationen sind kommissions-
spezifische Dokumente und nicht Bestandteil dieser unverbindlichen 
Betriebs- und Montageanleitung.
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