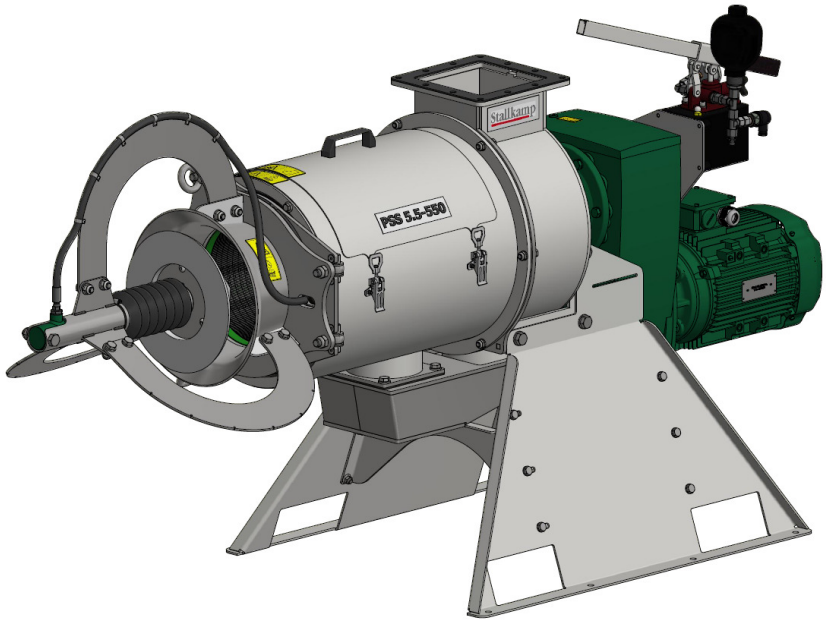
Stallkamp

OPERATING MANUAL

Press screw separator

PSS 4-550-M1603
PSS 5.5-550-M1603



Version 2

Document no.: 8090107 Version: February 2019

Space for notes:

General notices

- **The technical specifications, weights and measures are to be considered approximate and not binding.**
- **Pictures are for illustration purposes and can deviate from the actual product.**

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2 DECLARATION OF CONFORMITY PURSUANT TO MACHINERY DIRECTIVE 2006/42/EC (ORIGINAL, GERMAN VERSION)

Manufacturer: Erich Stallkamp ESTA GmbH

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Authorised representative for the composition of the technical documentation:

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In der Bahler Heide 4, 49413 Dinklage, Germany

Product name: Press screw separator PSS-M1603

Type: PSS 4-550-M1603; 4.0 kW;

PSS 5.5-550-M1603; 5.5 kW;

We hereby declare that the products listed above conform to the pertinent regulations of the EC Directive:

Machinery Directive 2006/42/EC

Including all amendments and compliant with the pertinent regulations of the directive on electromagnetic compatibility:

EMC Directive 2004/108/EC

The following harmonised standards have been applied:

EN ISO 12100: 2010, Safety of machinery – General principles for design

EN 809:2002-06-01, Pumps and pump units for liquids – Common safety requirements

EN 60204-1:2007-06, Safety of machinery – Electrical equipment of machines – Part 1: General requirements

EN 61000-6-1:2007, Electromagnetic compatibility (EMC) Part 6-1: Generic standards – Immunity for commercial environments

EN 61000-6-2:2005, Electromagnetic compatibility (EMC) Part 6-2: Generic standards – Immunity for industrial environments

Dinklage, dated 4. April 2019

Stallkamp
Erich Stallkamp ESTA GmbH
D-49413 Dinklage-Germany
In der Bahler Heide 4, Industriegeb. West

Erich Stallkamp ESTA-GmbH, Dipl.-Ing. (FH) H. Ansorge (AL-TPR, Authorised representative for GL)

This declaration is not an assurance of characteristics in the sense of the German law on product liability. The safety instructions provided in the product documentation must be observed. If any conversions or modifications are made to the product, this declaration shall lose its validity with immediate effect.

3 GENERAL INFORMATION

Our devices are developed according to the current state of technology, manufactured with great care and subject to a continual quality control. This operating manual should help you to get to know the device and to employ its proper operational possibilities.

The operating manual contains important notices in order to operate the device safely, appropriately and cost-effectively. It is necessary to observe the operating manual to ensure the reliability and long lifespan of the device and to avoid hazards.

The operating manual does not take local, on-site requirements into consideration; the operator is solely responsible for ensuring that these are observed, including by external installers.

3.1 Designation of notices in the operating manual

In the operating manual, safety instructions warning of dangers to persons are identified with the general hazard symbol according to DIN 4844-W9.

In the operating manual, warnings about electrical voltage are identified with the safety signs according to DIN 4844-W8.

All other notices which might restrict the functional reliability of the device or represent a danger for the machine if not observed are marked with the word:

ATTENTION!

This machine unit may not be operated beyond the values defined in the technical documentation with respect to pumped liquid, delivery flow rate, rotational speed, density, pressure, temperature as well as motor power output or other instructions contained in the operating manual or contract documentation. If you have any queries, please consult the manufacturer.

The rating plate displays the most important operating data and the machine serial number. We request that this always be specified in the event of enquiries, subsequent orders and when ordering spare parts.

Provided that additional information or notices are required or in case of damage, please contact our local field sales employee or contact us directly.

3.2 Unauthorised conversion and spare part manufacture

Conversions and modifications to the devices and their machine units are only permissible with the explicit approval of the manufacturer. The use of non-"genuine spare parts" abrogates all liability.

4 SAFETY

This operating manual contains fundamental notices which must be observed during installation and operation as well as when performing maintenance work on the device.

It is therefore absolutely necessary that the installer as well as the responsible specialist personnel and operator read these instructions before installation and commissioning, and that they are continually available at the location where the machine is operated.

Not only the safety instructions in this operating manual must be observed, but also the warning signs and regulations of the respective professional association in the latest version.

4.1 Qualification of the personnel

The personnel performing the operation, maintenance, inspection and installation must be appropriately qualified for this work.

Area of responsibility, competence and the monitoring of the personnel must be precisely regulated by the operator. If the necessary skills are not available to the personnel, then they should be appropriately trained and instructed.

Furthermore, the operator must ensure that the personnel fully understands the contents of the operating manual.

4.2 Dangers if the safety instructions are not observed

Failure to observe the safety instructions can endanger persons as well as the environment and the machine. Failure to observe the safety instructions results in the loss of all claims for damages.

Specifically, failure to observe instructions can, for example, result in the following dangers:

- Failure of important functions of the device or system.
- Endangerment of persons due to electrical, mechanical, chemical or other exposure.
- Endangerment of the environment due to leakage of hazardous materials.

WARNING SIGNS

Observe all notice and warning signs. Dangerous gases can escape when stirring the manure.

DANGER OF POISONING!

If the liquid manure is stored below slatted floors, the presence of persons in buildings during agitation or pumping is only permissible with sufficient ventilation. Therefore, windows and doors must be open and the ventilator set to full power.

4.3 Safety-conscious work

Observe all safety instructions presented in this operating manual, the existing national regulations for accident prevention as well as possible internal work, operation and safety regulations of the company at all times.

Safety instructions for the operator and attendant:

- ✓ If hot or cold machine parts can pose a hazard, then these parts must be protected on site against contact.
- ✓ Contact protection for moving parts may not be removed while the machine is in operation.
- ✓ Any leakage of dangerous materials must be conducted away so that there is no endangerment to persons and environment. Observe statutory provisions.

4.4 Safety instructions for maintenance, inspection and installation work

The operator has to ensure that all maintenance, inspection and installation work is carried out by authorised and qualified specialist personnel.

Fundamentally, all work on the machine can only be carried out when the machine is at a standstill.

Directly after completion of the work, all safety and protection equipment must be reattached or made functional.

5 GUARANTEE

This section contains the general particulars for the guarantee. Contractual agreements are always treated with priority and are hereby not rescinded. The period of guarantee is a component of Stallkamp's general terms and conditions. Agreements deviating from this must be specified in writing in the order confirmation.

5.1 General

Stallkamp is obligated to repair every defect to products sold by Stallkamp under the condition:

- ✓ that it is a quality defect of the material, manufacture or design;
- ✓ that the defect is reported in writing to Stallkamp or the Stallkamp representative within the period of the guarantee;
- ✓ that the product is employed exclusively in the specified operating conditions described in the operating manual and employed for the intended purpose;
- ✓ that the monitoring device integrated in the product is correctly connected (temperature protection);
- ✓ that genuine Stallkamp parts are used.

5.2 Exclusion of liability

No guarantee or liability is assumed for damage to the device if one or several of the following points are applicable:

- A faulty configuration of the device on our part because of inadequate or incorrect information from the ordering party or operator.
- Failure to observe the safety instructions, regulations or the necessary requirements in this operating manual which apply according to German law.
- Installation, disassembly or repair of the device not in keeping with the regulations.
- Inadequate maintenance.
- Possible chemical, electrical or electrochemical influences.
- Wear.

Since maintenance has an influence on the safety and functional capability of the device, it is an integral component of the guarantee. The operator of the device is obligated to have the manufacturer himself or a service approved by the manufacturer perform maintenance work according to the regulations of the manufacturer, including the necessary changing of oil and the repair and replacement of wearing parts. The operator is thus obligated to maintain a maintenance and revision list, which facilitates monitoring of the mandatory inspection and maintenance work **(see Point 14)**.

We expressly emphasise that this device is a fluid flow engine in which the protective coating is exposed to constant wear from the abrasive contents of the medium being pumped and should consequently be classed as a wearing part. Wear, damage and secondary damages which result from external influences on the protective coating are expressly excluded from the guarantee. The use of devices and/or the field of application and reliability for the application must be verified by the operator and does not form part of the guarantee.

The liability of Stallkamp thereby excludes any liability for personal damages, material damages or financial losses.

The manufacturer reserves the right to modify the performance, specifications or configuration data without prior information.

6 PSS-M1603 PRODUCT DESCRIPTION

6.1 General description

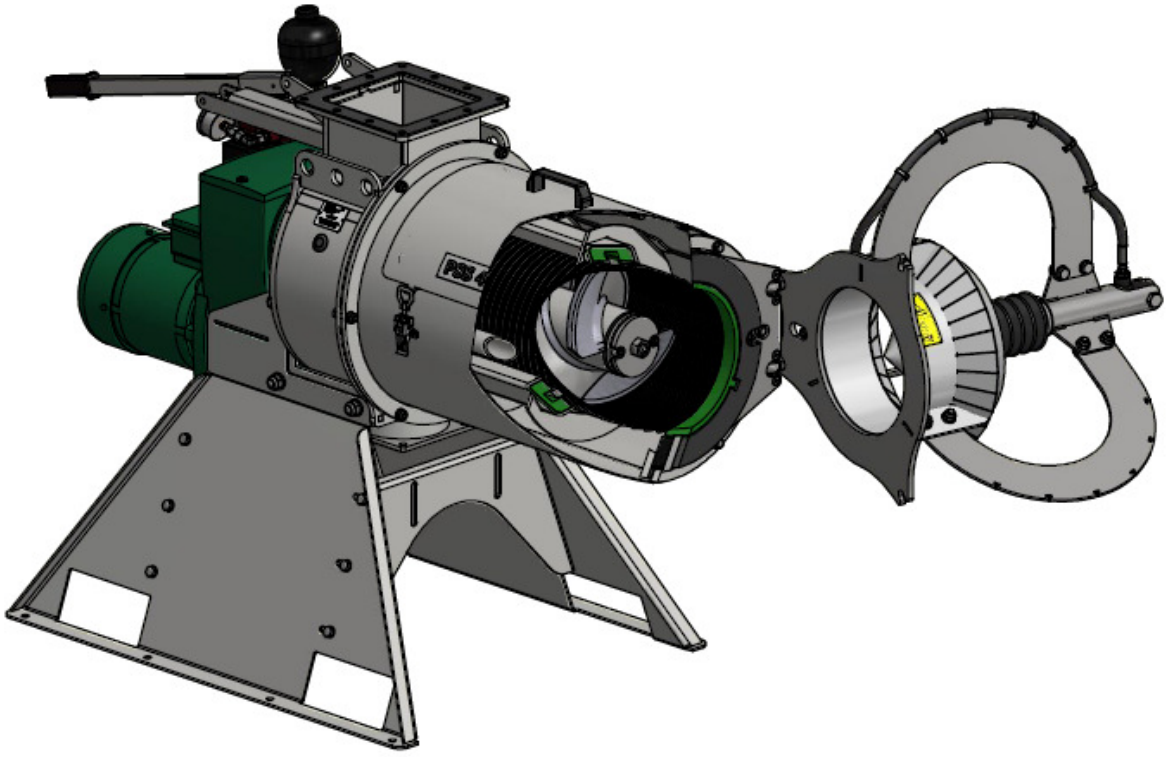
This operating manual applies to the standard model of the Stallkamp press screw separators. The separator must not be operated in explosive environments.

Press screw separator PSS 4/5.5-550-M1603 comprising:

- Stainless steel separator housing
- Right-threaded and double-threaded press screw made of V2A 1.4301 stainless steel, hardened with tungsten carbide coating.
- Screen basket made of V2A 1.4301 stainless steel with defined clearance
- Drive motor 400/690V, 50 Hz, 4.0 kW, speed 26 rpm or 5.5 kW, 28 rpm
- Temperature of medium being separated up to max. 50°C -> separation without restrictions as long as the motor is not running in the overload range.

6.2 Functional principle

The Stallkamp press screw separator separates solid and liquid fractions from thick and thin raw liquid.



The raw liquid enters the separator via the inlet port. The horizontally aligned screw conveys the raw liquid to the screen basket. Gravity then forces the liquid fraction of the raw liquid to pass through the screen basket, where it collects in the housing and is returned to a tank via the outlet port.

The solid fraction of the raw liquid in contrast remains in the screen basket. The rotating screw collects this fraction from the screen basket and conveys it to the outlet. A small clearance between the screen basket and the screw guarantees thorough cleaning of the screen basket. The solids conveyed to the outlet are squeezed by the adjustable counterpressure of the pressing cone in order to extract any remaining liquid from the solids.

The precipitator efficiency and the throughput depend on the following factors:

- The nature of the raw liquid
- The selection of the screen basket mesh width/type
- The setting of the pressing cone pressure
- The nature of the screen and the screw

6.3 Proper use of the PSS-M1603

The separator is designed for a wide range of applications in which the solid and liquid fractions of pumpable mixed substances need to be separated, for example in the processing of cattle and pig manure or biomass where the solid and liquid fractions of a solid-liquid mixture need to be separated with the objective of:

- reducing the volume of the natural fertiliser;
- reducing the offensive smell when spreading fertiliser;
- recovery of the solid fraction for bedding material or fertiliser;
- composting the solids;
- recovery of the liquid for biogas systems with dry fermentation;
- reducing the nutrients for sprinkling of the liquid.

The separation depends on the solid fraction and the viscosity of the liquid.

6.4 Technical data

Press screw separator PSS-M1603 comprising:

- Separator type: PSS-M1603 separator
- Three phase motor: 400/690 V, 50 Hz, 3 ph., 1440 rpm
- Protection category: IP55
- Insulating category: F = 155°C
- Motor power output: 4.0 kW, 4-pole
  5.5 kW, 4-pole
- Nominal current: 8.0 A (4 kW)
  10.7 A (5.5 kW)
- Gear seal: Radial shaft seal ring
- Press screw: Ø 260 mm, inclination 250-260 mm, 26/28 rpm.
- Screen basket: V2A stainless steel, 1.4301, clearance 0.35 / 0.50 / 0.75 / 1.00
  optional HD screen (reinforced) for solids with DM content > 28%
- max. operating pressure: 0.2 bar
- Dimensions: 2150 mm x 760 mm x 1120 mm 4 kW
  2200 mm x 760 mm x 1120 mm 5.5 kW
- Weight: 450 kg

6.5 Type plate PSS-M1603

The type plate displays the most important power and specification data:

Stallkamp CE

Erich Stallkamp ESTA GmbH

Industriegebiet West

49413 Dinklage, Germany

Mach. type:	PSS 4-550 / 4 kW
Mach. no.:	0301/000000
Year of manufacture:	2016

Service: +49(0)4443/96 66-57

High tech 4 liquids

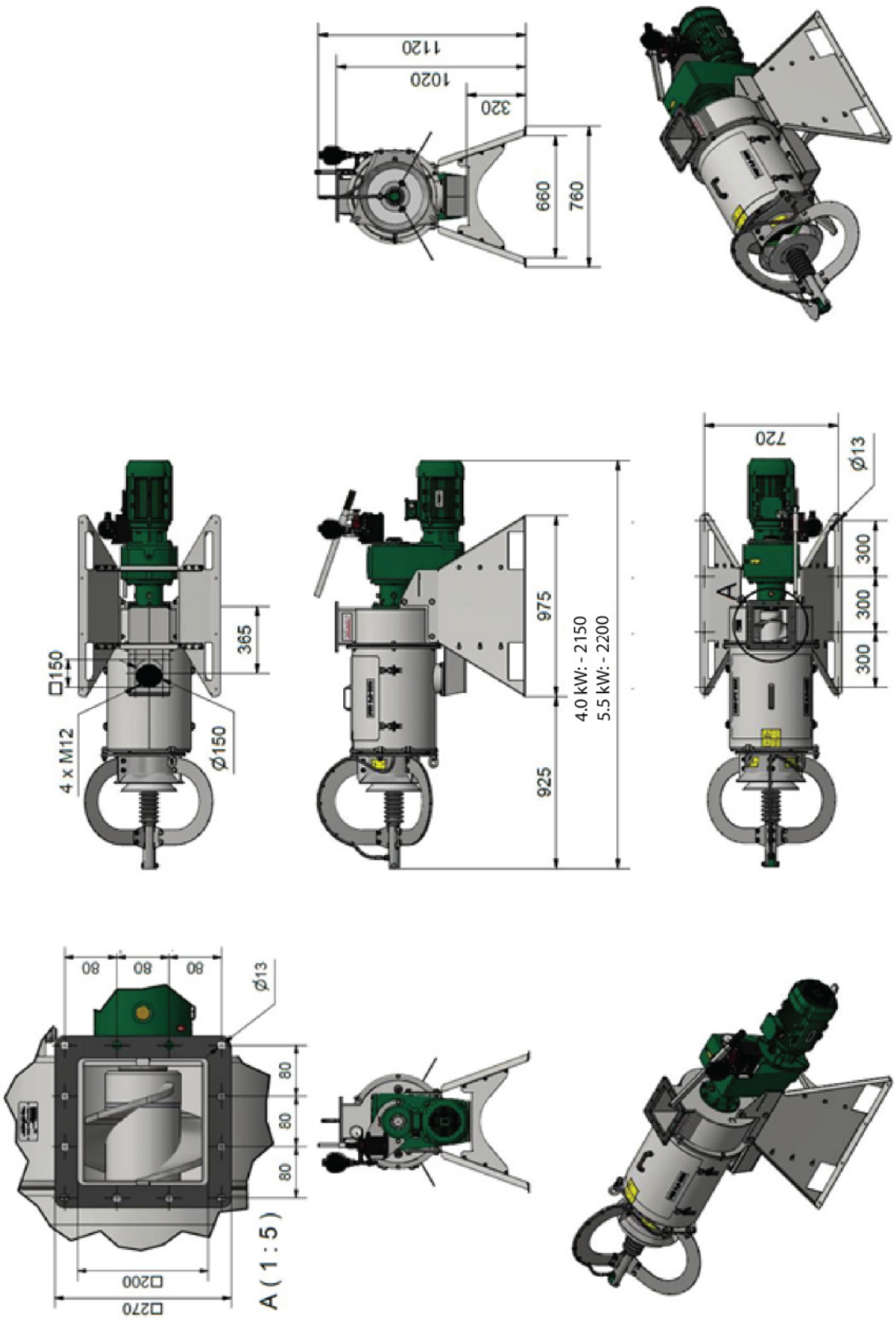
Classification: (e.g. PSS 4-550)

Motor/serial number: (e.g. 0301/000000)

Year of manufacture: (e.g. 2016)

In case of technical queries about the device, the above type plate data must be specified

7 DIMENSIONS OF THE PSS-M1603



8 INSTALLING THE PSS-M1603

8.1 Scope of delivery

The Stallkamp separator is delivered completely assembled. The supply and disposal lines are installed by the customer. The following components can be optionally delivered with the separator:

- Switch box for separator and optional pump
- Hopper incl. float switch
- Supply pipe support with overflow pipe support

8.2 Set-up and installation

8.2.1 Transport

To allow safe transport, the separator is equipped with fixing holes and lifting slots for forklift trucks. Please use appropriate means of transport for installation (crane, forklift truck, telehoist load lugger, chains, belts, etc.) in order to guarantee safe installation.

8.2.2 Installation site

The installation site for the separator must comply with the following criteria:

- The separator must be firmly anchored in order to avoid unintentional movement or tilting.
- If the separator is being installed on a frame, the statics must be sufficient for the separator and if applicable the storage tank when completely full.
- Sufficient access must be permitted for adjustments and maintenance work. It is recommended to keep a clearance of at least 1 m around the separator.
- It must be possible to expel and dispose of the solids freely.
- All disposed of liquids must be able to drain away without pressure.

8.3 Electrical connection

The electrical connection may only be carried out by a certified electrician. The VDE regulations (German Association for Electrical, Electronic & Information Technologies) must be observed. The existing mains voltage and frequency must match the data on the Type Plate of the motor.

The motor of the separator is splash-proof according to IP55. The technical connection conditions of the local energy authorities must be observed during connection. The use of a motor protection device is a prerequisite. The feed line must be secured in accordance with regulations.

When connecting, ensure that the motor turns in the right direction. If necessary, swap two of the phases (L1, L2, L3) with each other to switch the direction of rotation.

When using a Stallkamp control box, please observe the enclosed manual and the wiring diagram.

8.4 Drive motor

Remove the plug from the vent once the separator has reached its final working position. If the separator is moved, this ventilation must be blocked again.

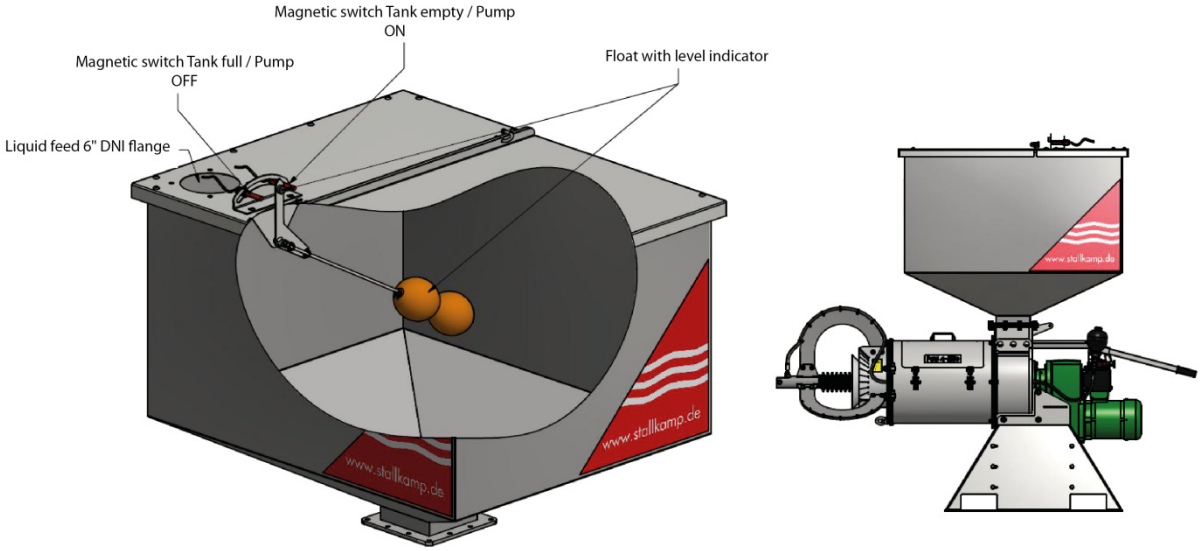
8.5 Connecting the supply and disposal lines

8.5.1 Supply line

The separator may only be operated with a maximum pressure of 0.2 bar (equivalent to approximately 2 m liquid column). This can be done with a hopper or an E-A-E pipe support.

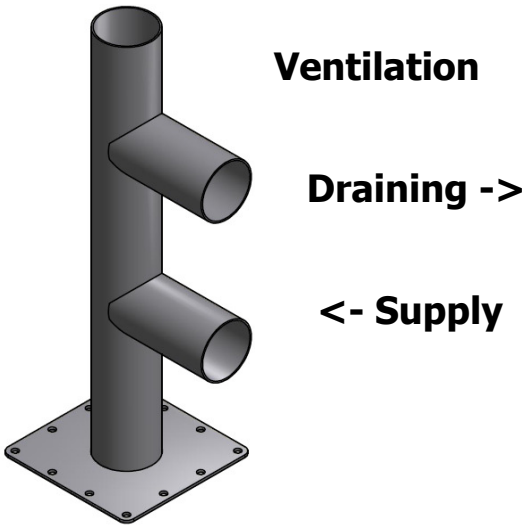
8.5.1.1 Hopper

The hopper must be filled by a supply pump. To regulate the fill level, the pump is turned on and off via a float switch. The switching on and off times can be adjusted by moving the magnet switches in the slot.



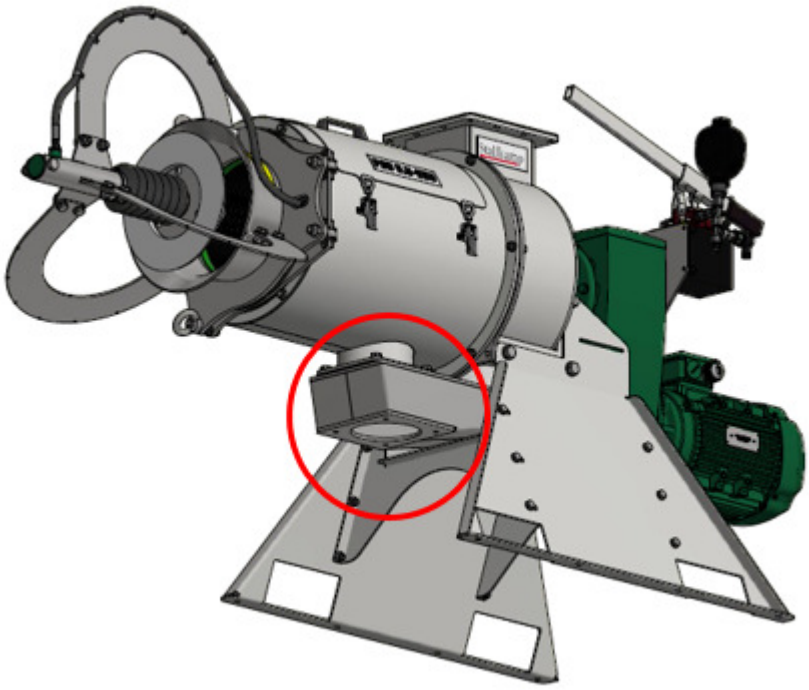
8.5.1.2 Supply pipe support with overflow pipe support

Alternatively, the separator can also be supplied via a supply pipe support with overflow pipe support. This is done by connecting the 4" supply pipe support to the supply pump. The 4" overflow pipe support must feature a pressure-free return line. If liquid exits the ventilation line, the latter should be extended with a 4" tube.



8.5.2 Disposal line

The separate thin stage exits the separator via the disposal fitting.



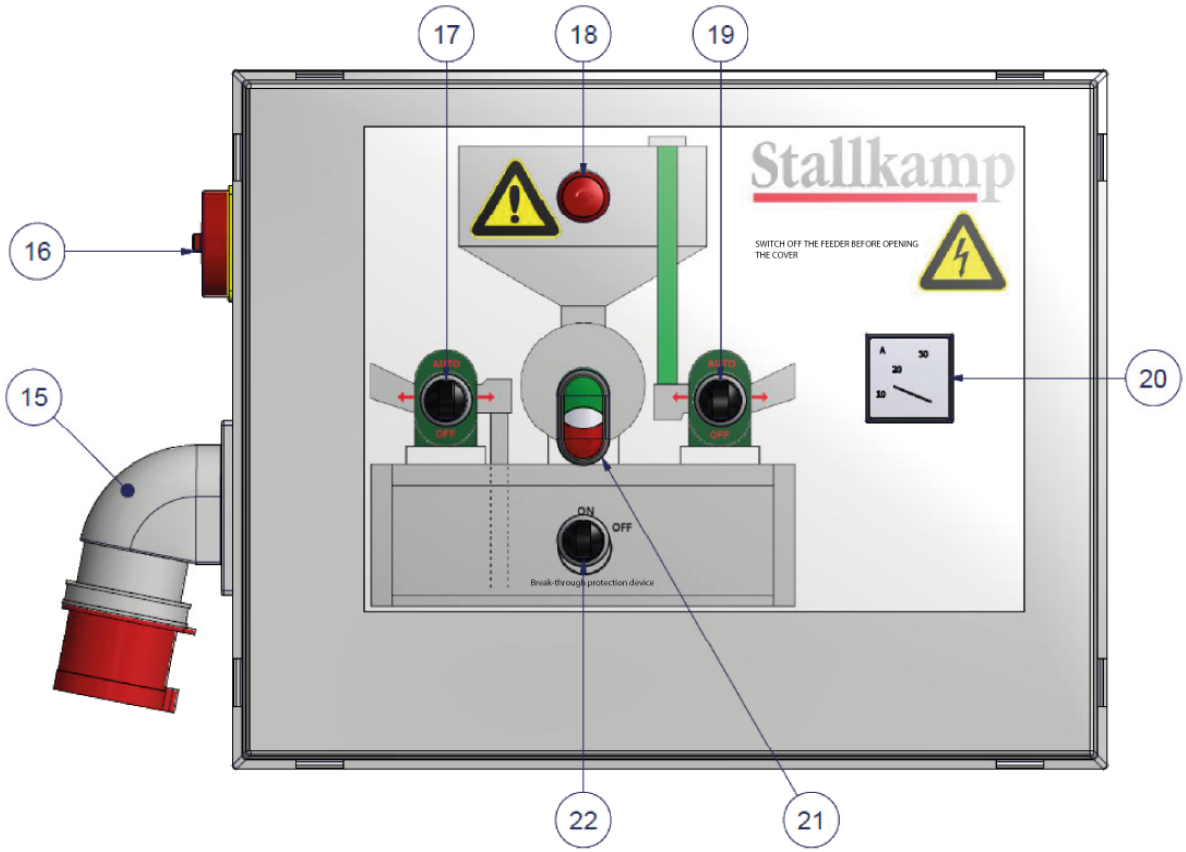
The outlet is equipped with a 6" DIN flange.

The liquid must be unpressurised and able to drain down freely.

8.6 Control system

The separator can be optionally equipped with a control system. Please refer to the documents included with the control system. The following section provides a description of the individual components and functions.

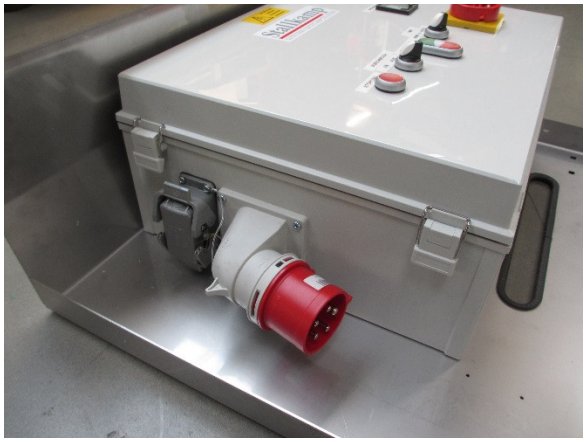
8.6.1 External components



(15) Power supply / CEE connector

The control system is supplied with power from a CEE connector. Depending on the control system, it can be a 16 A, 32 A or 63 A connector. 32 A connectors also have a phase inverter (illustrated on the right).

The power supply must be protected appropriately depending on the connector!



(16) Main switch

To switch on the machine, turn the main switch to "ON". Turn the main switch back to "OFF" to switch off the machine.

(17) Collection tank DKP selector switch (optional)

This selector switch serves for controlling the pump leading to the collection tank. The following positions can be selected:

AUTO: The pump switches on/off automatically via the float switch.
MANUAL: The pump can be controlled manually according to the arrow direction.
OFF: The pump is switched off and does not respond to the float switch.

For the separation to operate, the selector switch must be set to AUTO. The MANUAL positions should only be used for emptying the tank and pipe following the separation operation.

(18) Fault indicator / switch

The red lamp illuminates in the case of a fault. The fault can be acknowledged using the built-in switch-key after it has been rectified. If the separator is supplied with power for the first time or the main switch is turned to the "ON" position, the switch-key must be pressed only once.

You can find an overview of all possible faults and their troubleshooting in *10 Malfunctions.*

(19) Hopper DKP selector switch (optional)

This selector switch serves for controlling the pump leading to the hopper. The following positions can be selected:

AUTO: The pump switches on/off automatically via the float switch.
MANUAL: The pump can be controlled manually according to the arrow direction.
OFF: The pump is switched off and does not respond to the float switch.

For the separation to operate, the selector switch must be set to AUTO. The MANUAL positions should only be used for emptying the tank and pipe following the separation operation. When using a centrifugal pump, manual operation is only possible in the flow direction of the hopper.

(20) Ammeter

The current power consumption of the separator can be monitored with the ammeter. Make sure that the power consumption is not too high. Please follow the points in *9 Operating and commissioning the PSS-M160*

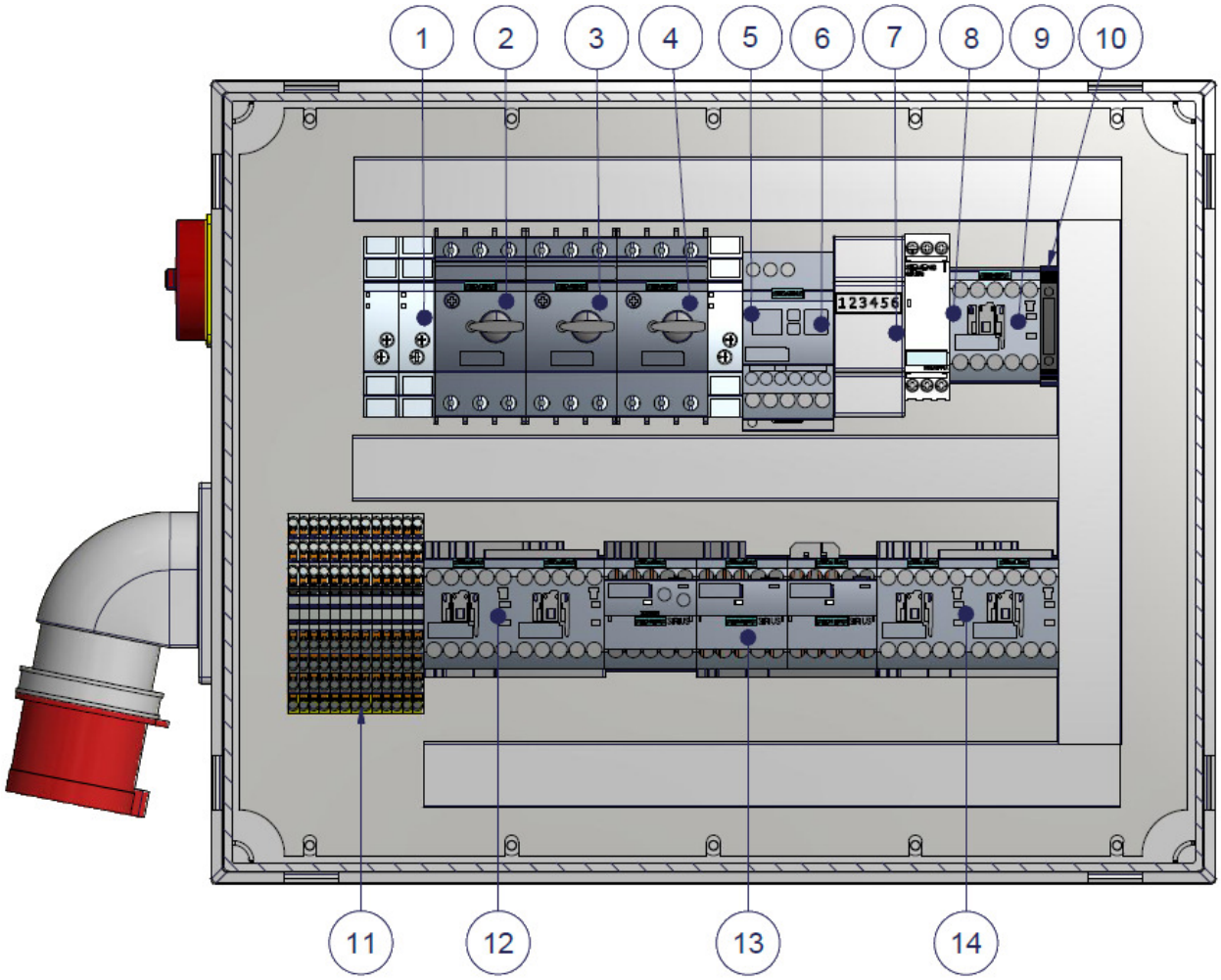
(21) Start/Stop separation

The separation is started (green) or terminated (red) by means of the dual switch-key. Please follow the points in *9 Operating and commissioning the PSS-M160*

(22) Break-through switch

The break-through switch allows you to deactivate the current monitoring and an external signal for the fault message.

8.6.2 Internal components



(1) Time relay for collection tank

The two time relays serve for monitoring the pumping and idle time of the DKP of the collection tank. A fault occurs if the time taken is longer than specified. The following faults can be prevented or minimised by the timing monitoring. You can find a detailed list in *10 Malfunctions.*

Pumping time: If the pumping time is longer than specified, it indicates that the filling level of the collection tank is not lowering or that the EMPTY/EMERGENCY OFF detector is not sending any signals. This can minimise faults or wear in the DKP.

Idle time: If the idle time (time between two pumping operations) is longer than specified, it indicates that there is little liquid coming out of the separator or that the FULL detector is not transmitting a signal.

The pumping and idle times must be determined during operation and adapted to the medium. Set the time relays a bit longer than necessary to avoid false alarms. However, if the time is set too long, it will also take longer to identify any faults.

To set the time relays, proceed as follows:

The time range can be set from the top potentiometer.
It is recommended to set this to "100 s" or "10 min".

The bottom potentiometer shows the upper time range as a percentage.

E.g.:

Top potentiometer: 100 s
Bottom potentiometer: 60 %

Set time: 100 s x 60 % -> 60 s or 1 min

The following values are factory set:

Pumping time: 5 min
Idle time: 25 min

(2) Collection tank DKP motor protection switch

(3) Separator motor protection switch

(4) Hopper DKP motor protection switch

Make sure that the motor protection switch is set properly. Take the value to be set from the motor type plate. If the setting is too high, the motor can get overloaded, and this could lead to a motor/gear fault. For operation, the motor protection switch lever must be set to "ON". In case of an overload, the motor turns to "OFF" and the system switches to fault mode. In order to rectify the fault, please follow the points in *10 Malfunctions.*

(5) Time relay for hopper

The time taken for filling the hopper is also monitored analogously to the time monitoring of the collection tank. You can find a list of possible errors in *10 Malfunctions.*

The pumping time must be determined during operation and adapted to the medium. Set the time relay a bit longer than necessary to avoid false alarms. However, if the time is set too long, it will also take longer to identify any faults.

To set the time relay, proceed as follows:

The time range can be set from the top potentiometer.
It is recommended to set this to "100 s" or "10 min".

The bottom potentiometer shows the upper time range as a percentage.

E.g.:

Top potentiometer: 100 s
Bottom potentiometer: 60 %

Set time: 100 s x 60 % -> 60 s or 1 min

The following values are factory set:

Pumping time: 5 min

(6) Current measuring relay

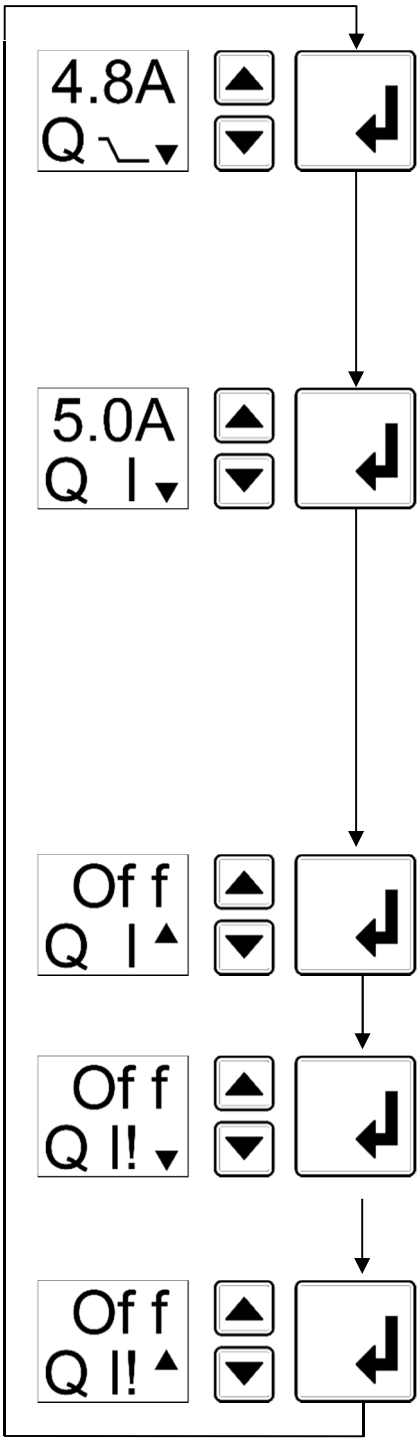
The current measuring relay monitors the power consumption of the separator. If the power consumption is too low, it can indicate a broken pipe or lack of liquid. Monitoring can be deactivated via the "Breakthrough switch" selector switch in the cover. This is necessary when the separator is put into operation. Please follow the points in *9 Operating and commissioning the PSS-M1603.* To set the current measuring relay, proceed as follows:

Assembly:

① Display – shows current values/parameters

② Arrow keys – for changing parameter values

③ SET key – click to navigate through the menu. Please note, if you press and hold (> 3 s), you enter the "Set" menu. To return to the menu, press the key again for 3 s. A time bar appears.



Home
In operation, the current power consumption of the individual phases I1 / I2 / I3 is displayed alternately.

The arrow ▼ indicates a fault. This means that the separator is consuming less power than the allowed limit.

The arrow ◄ indicates that no fault exists. The power consumption is higher than the allowed limit.

Limit for insufficient power consumption (I▼)

If the power consumption of the separator falls below the set value, the separator switches to fault mode (breakthrough switch on "ON").

To adjust the settings, observe the power consumption of the separator during operation. Set the value approx. 1A less than the current power consumption. However, never set it below the following value

PSS 4-550 / 4 kW -> 4.0 A

PSS 5.5-500 / 5.5 kW -> 5.0 A

Limit for excess power consumption (I▲)

This value must be on "OFF". If not, click and hold ▲ until "OFF" appears.

Warning limit for insufficient power consumption (I!▼)

This value must be on "OFF". If not, click and hold ▼ until "OFF" appears.

Warning limit for excess power consumption (I!▲)

This value must be on "OFF". If not, click and hold ▲ until "OFF" appears.

The following parameters are stored in the SET menu, and may only be modified by the service personnel.

Parameter	Value
Hyst	0.1 A
OnDel	3 s
Del	3 s
RSDel	3 m
I▲	no
I >>≡	no
Mem ?	no
↶ ?	no
?	Is
◘ ?	NC

(7) Separator operating hours

(8) Phase sequence relay

(9) Contactor relay

(10) Fuse

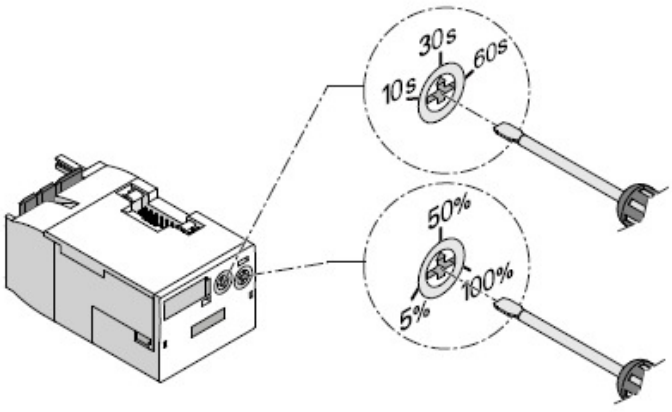
(11) Terminal blocks for connecting motors and sensors.

Please refer to the documents included with the switch box.

(12) Collection tank DKP (reversing) contactor

(13) Separator contactor / star-delta module

If the star-delta module is installed, you have to set the time to **10s** and **50%**.



(14) Hopper DKP (reversing) contactor

9 OPERATING AND COMMISSIONING THE PSS-M1603

9.1 Prior to commissioning: safety instructions

To avoid damaging the machine and/or potentially fatal injury to persons, you have to observe the following points before initial commissioning and during operation:

(1) Check the separator and present accessories for optimum stability

(2) Remove foreign bodies and tools from the danger zone.

(3) Inspect all safety equipment/devices

(4) Check the oil level of the drive motor and fill up if necessary. Lubricate the bearing.

(5) Check that the supply and disposal lines are connected correctly and have no leaks. Pressure-free drainage is essential.

(6) Check the direction of rotation.

(7) Check that the motor protection switch is set correctly.

(8) If the machine is equipped with accessories, please observe the operating manual of the individual components.

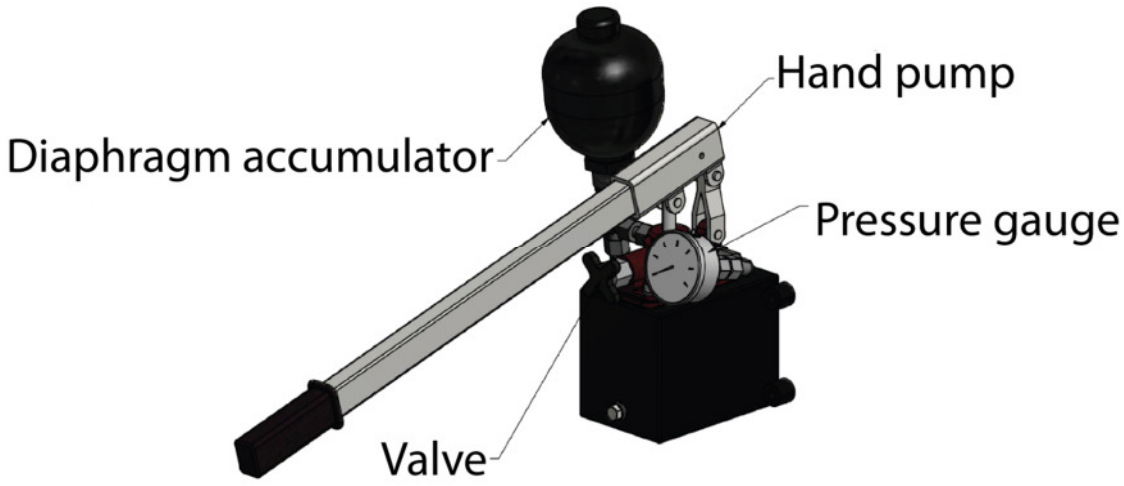
9.2 Initial commissioning

The following describes how the separator is put into operation. When using a hopper, it is recommended to only fill it slightly at first after the separator has been switched on.

In order to achieve an optimum separation result, it is important that the liquid to be separated is mixed well and homogeneous prior to commissioning. Further agitation is necessary if the liquid separates again during separation.

Close the valve on the hand pump. Operate the hand pump until the conical head closes and the system pressure is approx. 10 bar. Switch the break-through switch on the control system to "Off". Fill the separator with liquid and start it. The conical head moves after a short time and the solid comes out.

Careful as a small amount of liquid may leak out of the conical head during start-up!



As soon as the separator is in operation, switch on the break-through switch again. If necessary, adjust the current measuring sensor or the time relay (see *8.6 Control* system)

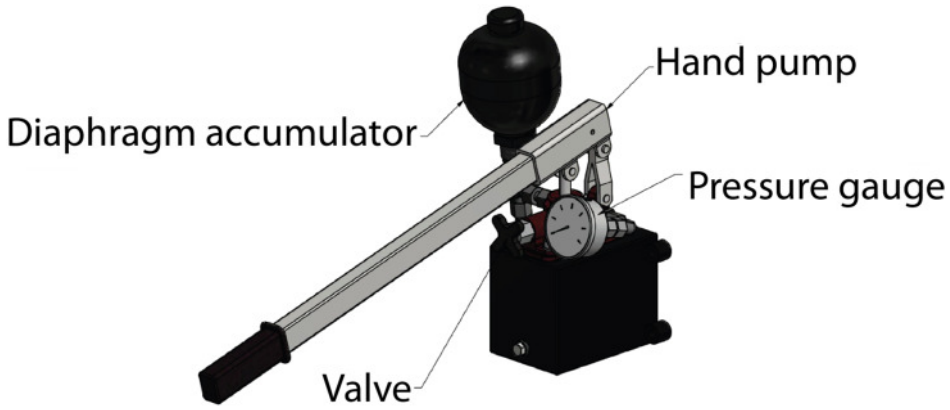
9.3 Adjusting the DM content of solids

To regulate the DM content in the solid cake, you have to set the counterpressure. A higher counterpressure leads to a dry solid. If the counterpressure is reduced the moisture content in the solids increases.

Please note:

- A dry solid leads to:
  - increased wear of the screen and press screw
  - higher power consumption. Make sure you don't exceed the maximum permissible power consumption.
  - lower throughput
- An HD screen is required from a DM content of 28% in the solids. The use of a standard screen at about 28% DM content in solids may cause the screen to break!
- If too little counterpressure is applied, there's a risk of breakage at the outlet!
- The change in counterpressure decelerates the output of solids.

The current counterpressure can be read on the manometer. To increase the pressure, use the hand pump. To minimise the pressure, open the valve slowly and close it at the desired pressure.



Pay attention to the power consumption of the separator. Excess pressure can overload the motor! In that case, reduce the pressure.

9.4 Starting separation

There must be a plug in the outlet when the separation is started. If this is the case, the pumps can be switched to AUTO mode when using a hopper or continuous operation when using a supply pipe support.

Pressing the start button starts the separation.

9.4.1 Break-through protection device

If the separator runs without any significant problems, the break-through protection device can be switched on. If the plug is broken or if there is insufficient supply of liquid, the separator and the supply plump are turned off automatically.

9.5 Stopping separation

Switch off the supply pump and continue separating until the separator has no more liquid. Then switch off the separator. Turn the main switch to "O". If necessary, you can feed the remaining liquids by switching the pump to manual operation.

9.6 Winter operation and extended periods of inactivity

At temperatures under 0°C or during extended periods of inactivity (> 1 weeks), the separator should be completely cleared of liquids and fixed phases following operation. In addition, the pump and lines must be drained of liquids.

Separator

Eliminate all pressure from the conical head. Switch the separator to manual operation to remove a large part of the solid matter. Complete cleaning is only possible by opening the outlet flap, see *11.3 Press screw and screen* basket replacement.

Rotary lobe pump

In manual operation, the rotary lobe pump can be run backwards to pump the liquid out of the line. For almost complete emptying, the slide must be opened at the connecting piece and the pump should convey towards the connecting piece.

Increased wear can result, if the separator and rotary lobe pump are allowed to run dry for an excessively long time.

10 MALFUNCTIONS

Troubleshooting work should only be carried out by suitably trained personnel. Please observe the safety instructions (see *4 Safety*).

If your fault is not listed or cannot be rectified, please contact us or our representative.

10.1 General faults

Fault	Cause	Remedy
Separator / rotary lobe pump turns in the wrong direction	Phase terminals are connected wrongly	- Switch two phases round
Control system has no power Fault circuit breaker triggers	Wrong electrical connection	- Check electrical connection (see 8.3 Electrical connection)
No liquid is sucked in	Lobe worn out	- Replace lobe
	Wrong direction of rotation	- Switch phases round
	Pump does not rotate	- Check for blockages/debris
	No underpressure	- Check lobe for wear - Fill rotary lobe pump with water - Check suction hose
Solid matter is too wet	Cone pressure is too low	- Increase pressure. Observe separator power consumption!
Solid matter is too dry	Cone pressure is too high	- Reduce pressure. Danger of breakage if pressure is too low.
Throughput is too low	Incorrectly inserted screen	- Rotate the screen by moving the motor-side contact surface towards the outlet (only if there is a fault during initial commissioning)
	Screen is tight	- Clean the screen - Select a different clearance width
	Screen and/or screw is worn out	- Replace screen and/or screw.

10.2 Control system fault

Fault	Cause	Remedy
Control system does not react and the red error control lamp is not lit	Main switch to "Off"	Turn the main switch to "ON".
	Electrical connection faulty	Check the electrical connection to ensure that all phases + N conductors are present.
	Fuse defect	Replace the fuse in the control system.
The red error control lamp lights up	Power supply was interrupted.	Press the switch-key.
	Phases are connected wrongly	Turn the CEE connector. Press the switch-key.
	Motor protection switch has triggered.	Inspect the motor protection switch. Examine why the switch has triggered and resolve the problem. Turn the switch back to "ON".
	Collection tank emergency OFF	Check the fill level and pump output. Rectify the fault. Press the switch-key.
	A time relay has triggered.	Check the set times on the time relay (see 8.6 Control system). Press the switch-key. For further details, see below.
	External signal.	Rectify the fault of the external signal. Press the switch-key.
Hopper time relay	No liquid is fed	Check (suction) line for leaks and resolve problem.
		Pump defect. Rectify fault.
	Hopper fill level does not increase.	Pump flow rate is too low. Check pump for wear and resolve problem. Check (suction) line for leaks and resolve problem.
		Medium is too thin and runs right through the separator. Use a smaller clearance width.
		Check the separator for breakage at outlet and resolve problem.
	Pump does not switch off when the tank is full	Check the Max switch. Replace it if necessary.
Collection tank pumping time time relay	No liquid is fed	Check (suction) line for leaks and resolve problem.
		Pump defect. Rectify fault.
	Pump does not switch off when the tank is empty.	Check the Min switch. Replace it if necessary.

Collection tank idle time time relay	The tank fill level does not increase.	Check the performance of the separator.
		Leak between separator and collection tank. Rectify the fault.
	The pump does not switch on.	Check the Max + EMERGENCY OFF switch. Replace it if necessary.
Current measuring relay triggers	Cylinder settings	Check the settings (see 8.6 Control system)
	Separator has no liquid	Check the liquid feed
	Breakage at outlet	Check the outlet. Increase the pressure if necessary.

11 PSS-M1603 MAINTENANCE

The specified maintenance and inspection work must be performed regularly. These tasks may only be carried out by trained, qualified and authorised personnel. The operator of the device is obligated to have the manufacturer himself or a service approved by the manufacturer perform maintenance work according to the regulations of the manufacturer, including the necessary changing of oil and the repair and replacement of wearing parts. The operator is thus obligated to maintain a maintenance and revision list, which facilitates monitoring of the mandatory inspection and maintenance work **(see 14 Maintenance and revision list for** the PSS-M160**).**

11.1 Maintenance intervals

The separator must be inspected for damage every time it is taken into operation. In addition, the secure positioning of all screws and other fixing devices must be verified.

Thorough and regular maintenance and inspection of the wearing parts extends the service life considerably. Worn parts must be replaced as fast as possible to avoid consequential damage.

11.1.1 Recommendation: every 14 days

11.1.1.1 Lubricate the sealing elements

The separator has a lubricating point (lubrication nipple) with an outlet which controls the seal. The seal must be lubricated with a waterproof, high-performance lubricant.

Important:

The lubrication must always be performed when the machine is running and to be specific:

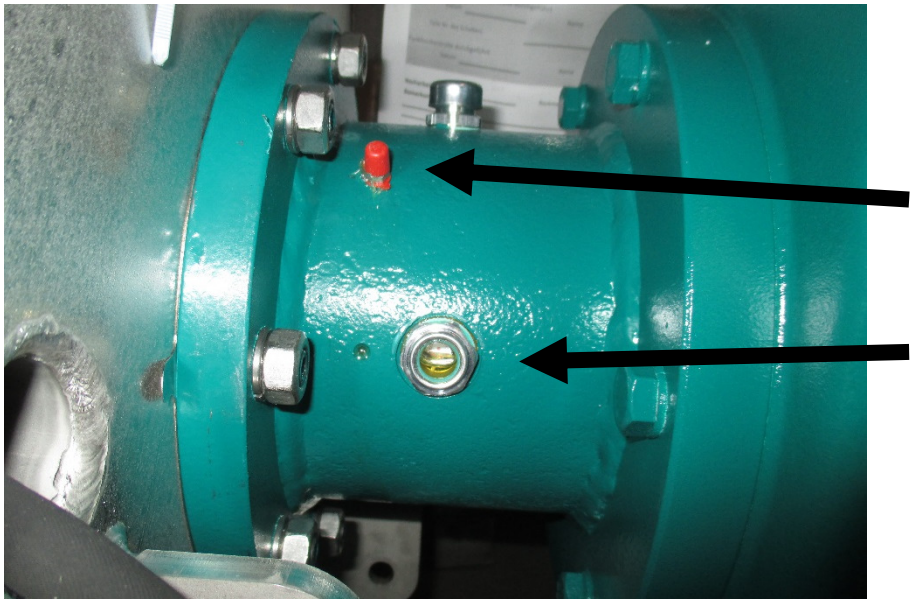
1.) after medium to long operational pauses (14 days to 4 weeks) when commissioning

2.) after every use

The fill level should not exceed 2-4 strokes with respect to the hand lever press.

11.1.1.2 Oil level visual inspection

Check the oil level of the bearing by examining the inspection glass. Ensure that the separator is level. The inspection glass must be approximately covered half way with oil. If the inspection glass shows more or less oil, it points to a defective seal. To prevent further damage, please contact us or our responsible sales representative.



11.1.1.3 Cleaning the screen basket

Carry out a visual inspection to make sure the screen works properly. During proper operation, you should be able to see the press screw moving.

If necessary, remove the screen basket and clean it (see *11.3* Press screw and screen basket replacement*).*

Depending on the medium used, the nature of the press screw and the screen basket, it may be necessary to clean the screen basket more frequently!

11.1.2 Recommendation: every 3 months

11.1.2.1 Check the power consumption at the ammeter

Power consumption is constant during normal operation. Occasional current fluctuations are caused by the consistency of the medium being conveyed. If a constantly increased power consumption is measured, please contact our sales representative.

11.1.2.2 Hydraulic system visual inspection

The hydraulic system must be inspected for damages or leaks. Any existing damages or leaks must be rectified.

11.1.3 Recommendation: every 6 months in continuous operation

11.1.3.1 Check the shaft seal

The shaft seal is a wearing part and must be replaced at the latest every 4,500 operating hours when the separator is in continuous operation. Please contact us or our responsible sales representative.

11.1.4 Recommendation: every 12 months

11.1.4.1 Controlling the gear oil

The oil filling in the gearbox must be checked once annually. If oil is missing or contaminated with water or other media, the separator must be taken out of operation immediately. In this case, the oil must be changed immediately and the shaft seals must be exchanged.

11.1.4.2 Checking the tightening torque of all screw connections

Every 9,000 operating hours or at least once annually, we recommend checking the secure positioning of the screw connections in the scope of maintenance work. The tightening torques for stainless steel screws in Nm for different thread sizes are shown below:

(M8 = 18 Nm, M10 = 33 Nm, M12 = 57 Nm, M16 = 135 Nm, M20 = 150 Nm)

11.1.4.3 Visual inspection and cleaning of the separator

Every 9,000 operating hours or at least once annually we recommend checking the separator for damage and soiling in the scope of maintenance work. Deposits, blockages and fibrous materials adhering to the opened separator must be removed. The separator can be rinsed with a hose pipe but not with a pressure cleaner. Damaged components must be exchanged immediately. Please contact our sales representative.

11.1.5 Recommendation: Every 6 years

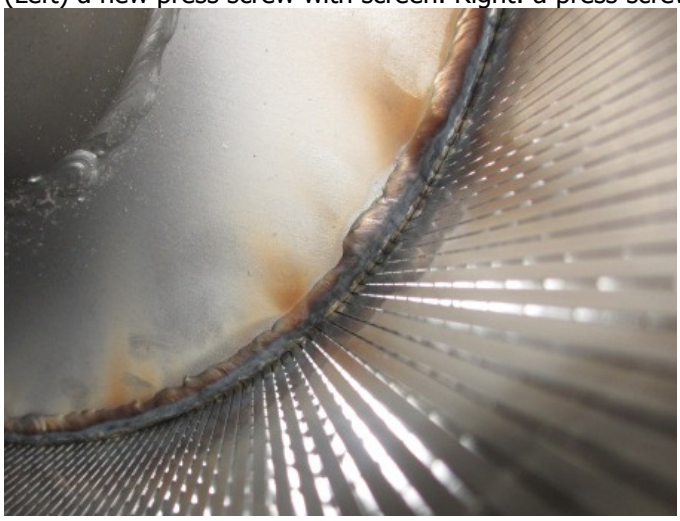
11.1.5.1 Replacing the hydraulic hose

The hydraulic hose must be replaced by a new one after a maximum of 6 years. Replacement is required if damages are noted before this period elapses.

11.2 Control of the clearance width between the screw and the screen

The clearance width between the screw and the screen can be controlled in the scope of a visual inspection through the outlet. If the gap between the press screw and the screen basket is too large, it can result in reduced throughput.

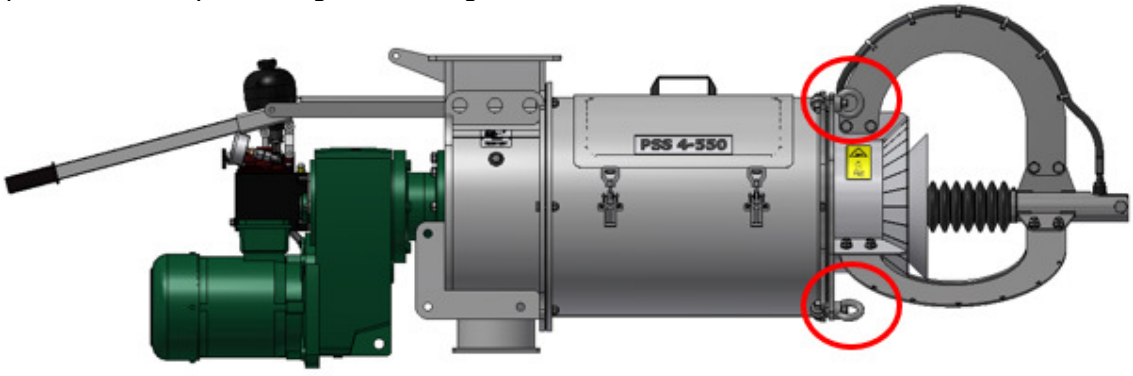
(Left) a new press screw with screen. Right: a press screw showing signs of wear.



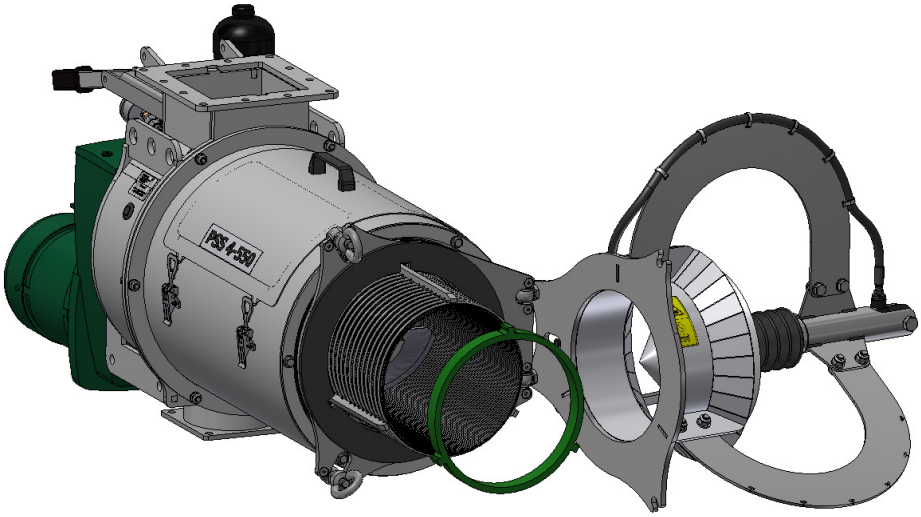
11.3 Press screw and screen basket replacement

To replace the press screw and/or the screen basket, proceed as follows:
(*** These steps can be skipped when replacing the screen basket)

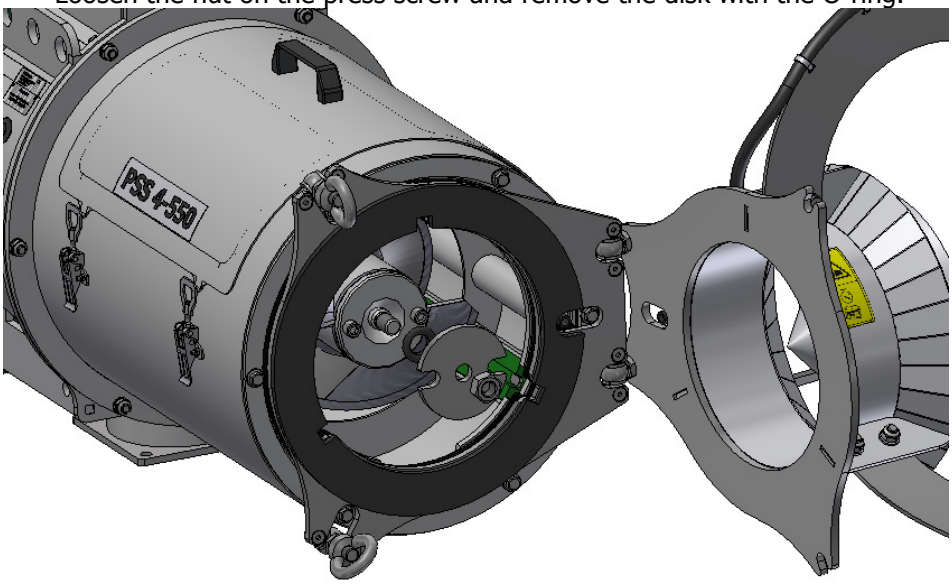
1. Switch off the supply pump and continue separating until all the liquid has been processed.
2. Relieve the pressure with the hydraulic hand pump and allow the separator to run for approx. 30 seconds.
3. De-energise the machine.
4. Open the outlet by loosening the two ring nuts.



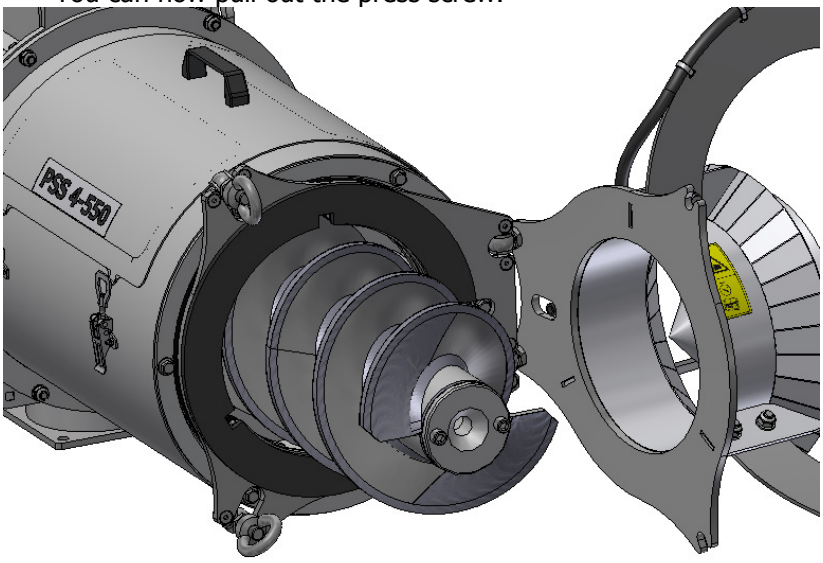
5. Remove the spacer ring. You can now pull out the screen. (If reusing, take note of how the screen was installed.)



6. *** Loosen the nut on the press screw and remove the disk with the O-ring.

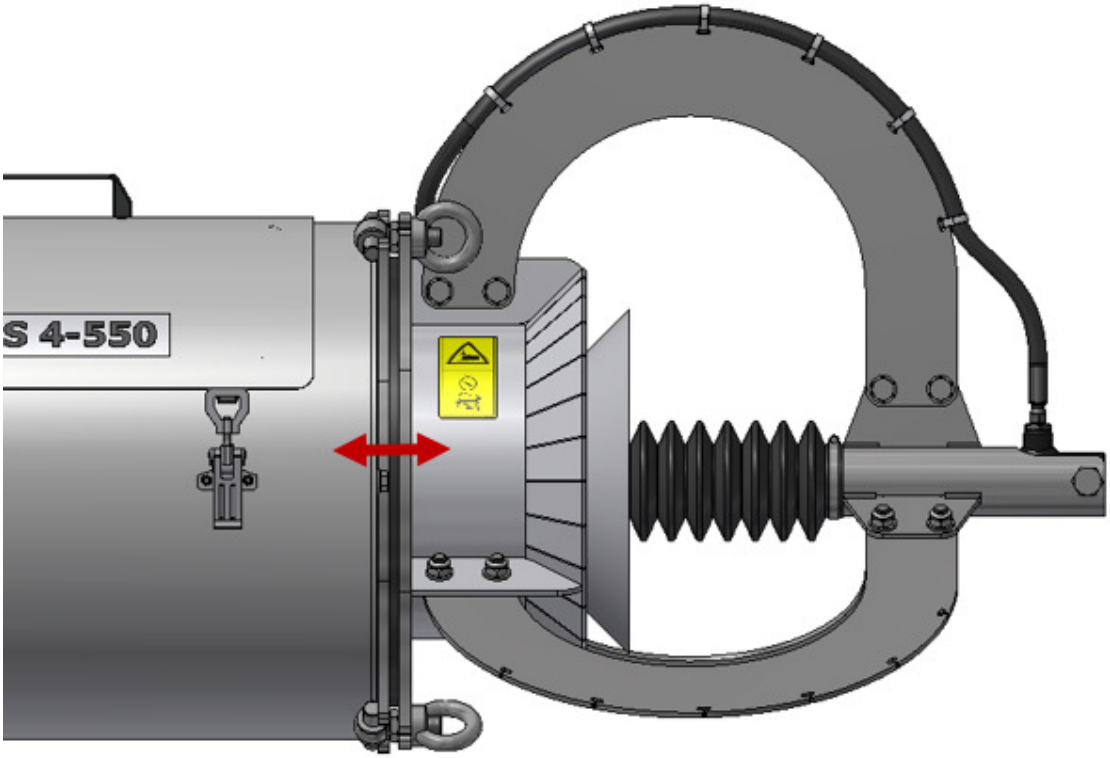


7. *** You can now pull out the press screw.



8. Clean the separator from the inside to remove any residues.
9. *** Take the new press screw. Lubricate the bearing surfaces with fitting lubricant and insert the new press screw gently. Secure the press screw again with the O-ring, disc and nut.
10. Slide in the new screen. Pay attention to the installation position of the screen. If a marking is present, it must reflect the direction of rotation of the press screw. If the separator has a low throughput, you can turn the screen for better performance.
    When using the old screen, install it the same way as it was before.

11. Insert the spacer ring back on and close the flap. Make sure that the screen doesn't get deformed in the process (**see 11.4 Adjusting the axial play of** the screen)



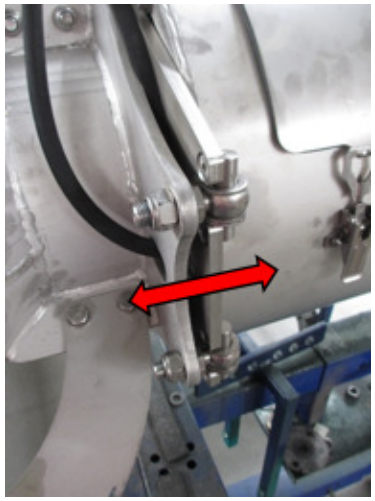
12. The machine can be taken into operation again.

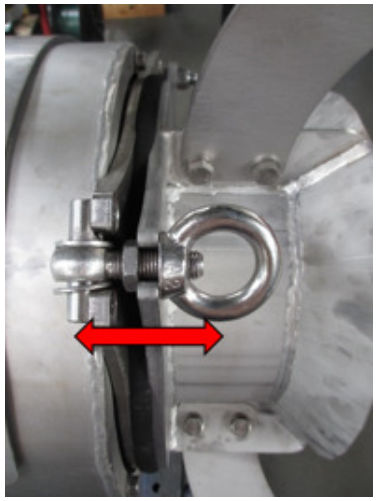
11.4 Adjusting the axial play of the screen

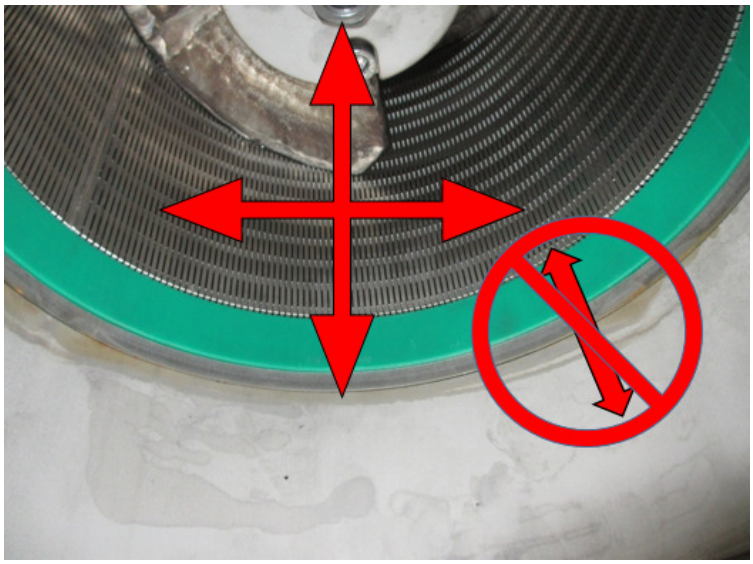
The nuts on the eye screws enable you to set the gap between the contact surface of the outlet and the spacer ring. This should be as low as possible so that the screen does not move forward during later operation. However, the screen must not be deformed!

A deformed screen can lead to high wear of the screen!

Set the gap in such way that the spacer ring can move slightly to the side, however one shouldn't be able to move it forwards or backwards.







11.5 Recommendation at end of the lifespan

At the end of its lifespan, the device can be disposed of normally as scrap. The oils should be removed in advance and disposed of as waste oil. The device is composed of various metals: steel, aluminium, copper and stainless steel. Dismantling it into the metal groups considerably increases returns.

12 NOTICES

12.1 Regulation of the professional association

The following accident prevention regulations of the Agricultural Professional Association can be found in Paragraph 2.8 under "Special provisions for pits and canals":

Paragraph 2.8

§ 1 Protection against falling in

(1) Pits, ditches, canals, wells and other similar pits in the house and courtyard area must be protected with fences or coverings to prevent persons from falling in. If these are not deeper than 100cm, other safety precautions suffice.

§ 2 Openings

(1) If removal and entry openings, etc., are opened, it must be guaranteed that persons and objects cannot fall in.

(2) Pits and canals that are customarily entered must have facilities which permit risk-free entry. The openings of these pits and canals must be dimensioned in such a way to allow the rescue of any accident victims.

§ 3 Entry

(1) Before entry and during the presence in pits and canals, ensure that sufficient respiratory air is present and that plant facilities are reliably protected against being switched on. The handling of naked flames is not permitted.

(2) Entry for the recovery of an accident victim is only permissible if two other persons secure the entering person with a rope which is firmly anchored outside the tank.

§ 4 Tanks and canals for animal faeces

(1) For tanks and canals in the open air, it must be guaranteed by suitable measures that fermentation gas cannot flow into the buildings.

(2) Closed tanks in the open air must have vent openings on opposite-lying sides.

(3) If tanks and canals are found in the buildings – also under slatted floors – it must be guaranteed that fermentation gases are conducted away from the buildings.

(4) If tanks and canals in the buildings are furnished with agitating, pumping and rinsing plants, facilities for the removal of fermentation gases must be present which automatically switch on when the agitator and rinsing works are taken into operation. They may only be switched off after conclusion of the work process. The gases conducted away must not endanger persons.

(5) Canals must be designed so as to avoid any unnecessary whirling up of the faeces.

(6) Operating stations for agitating, pumping and rinsing equipment etc. must be built up over the floor.

(7) Closed rooms in which there are operating stations may not have openings to the tanks and canals.

(8) Operation instructions must be permanently attached to the operating stands.

§ 5 Removal of animal faeces from tanks and canals

(1) No smoking and no naked flames are allowed in the immediate proximity of removal openings during the agitating and removal of faeces.

(2) In the buildings in which there are open tanks and canals, the presence of persons and animals during agitation and removal is only permissible with sufficient ventilation.

§ 6 Warning signs

(1) Easily visible warning signs must be attached to openings of tanks and canals which indicate the danger of gases.

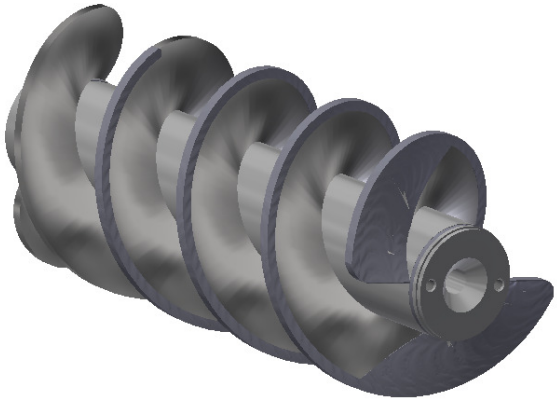
(2) Refer to the "Information Sheet with Notice, Warning, Mandatory, Prohibition and Rescue Signs" of the Federal Association of Agricultural Professional Associations.

13 SPARE PARTS LIST FOR THE PSS-M1603, 4.0/5.5KW

Overview of the screen baskets

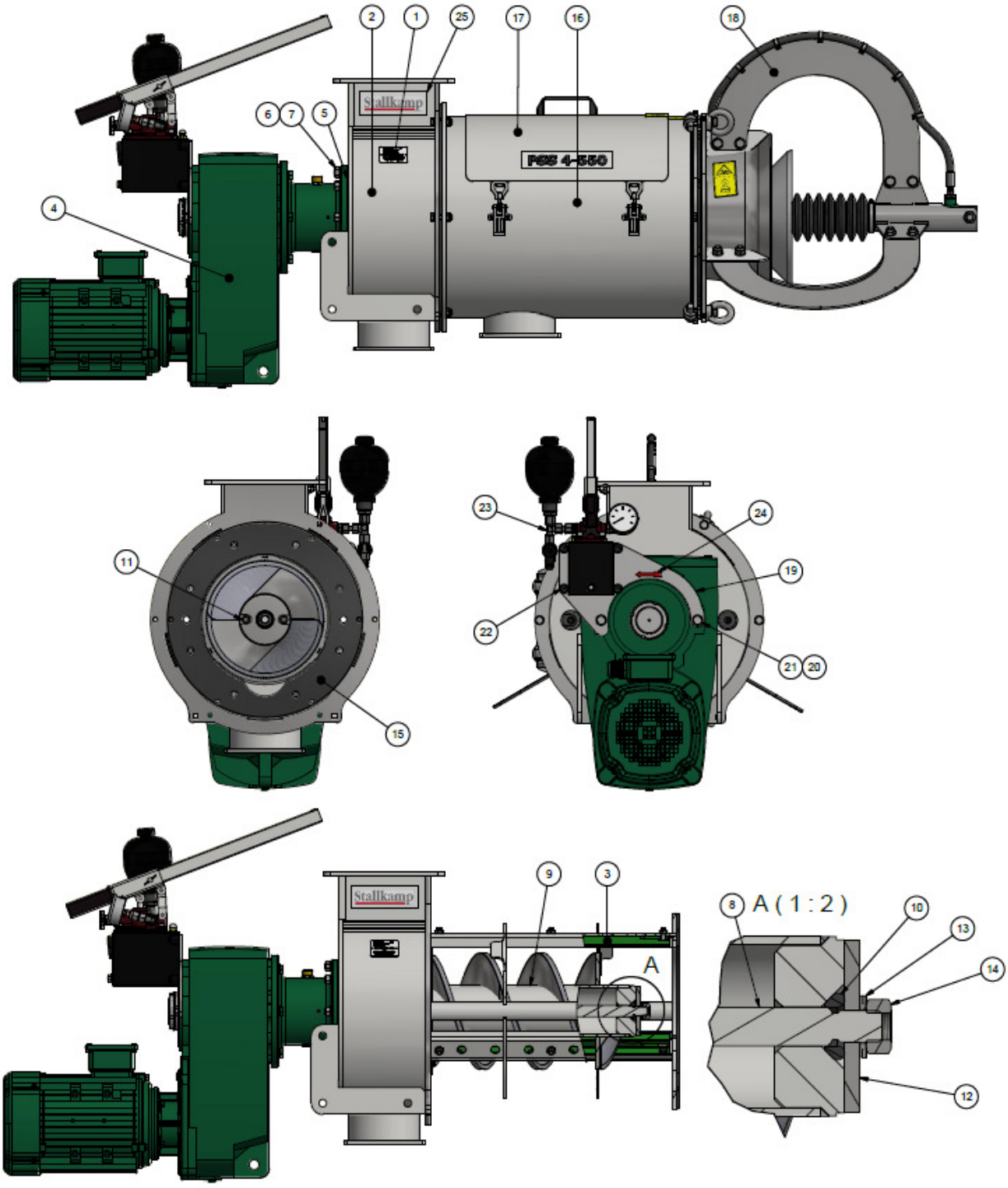
Clearance width	Standard	HD (includes spacer ring)
0.35	5501071	6090417
0.50	5501072	6090418
0.75	5501073	6090419
1.00	5501074	6090420

Press screw spare part, part no. 6090520

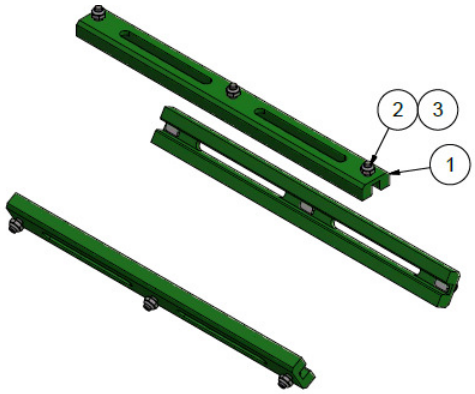


Stallkamp devices may only be repaired by specialists that have been trained by the manufacturer of this device (Erich Stallkamp ESTA-GmbH). To access our spare parts price lists, please contact your sales representative.

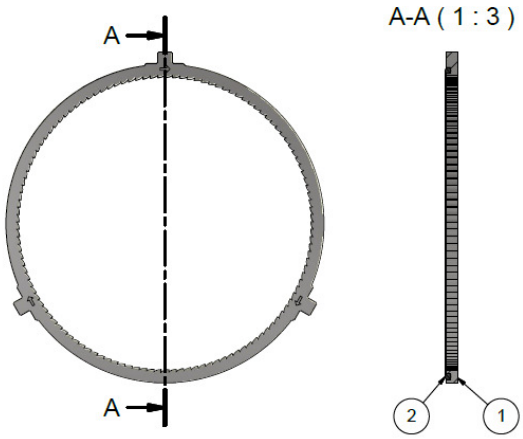
13.1 Separator, Drg. 6090636



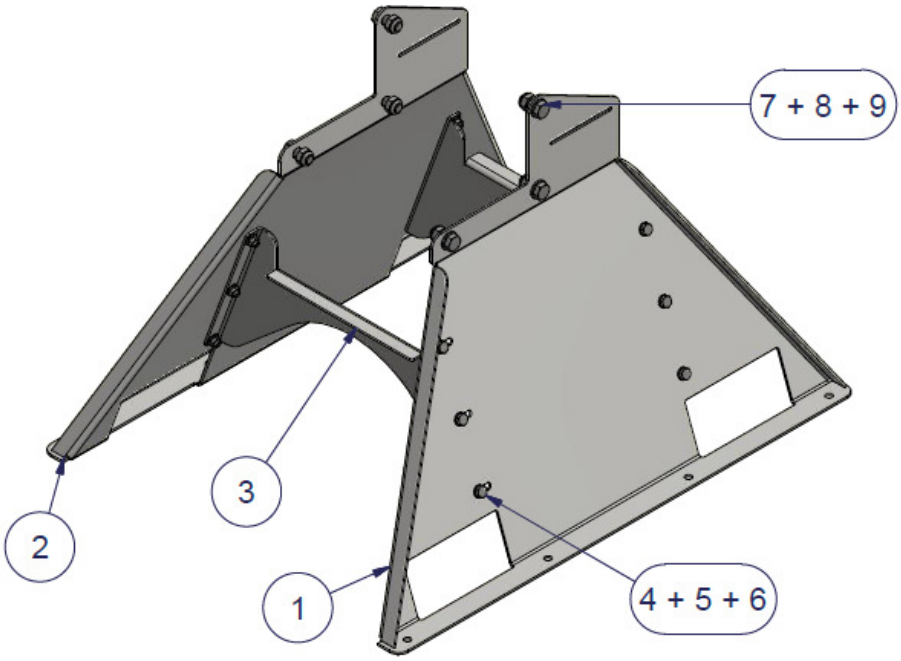
13.2 Screen guide rails, Drg. 6090680



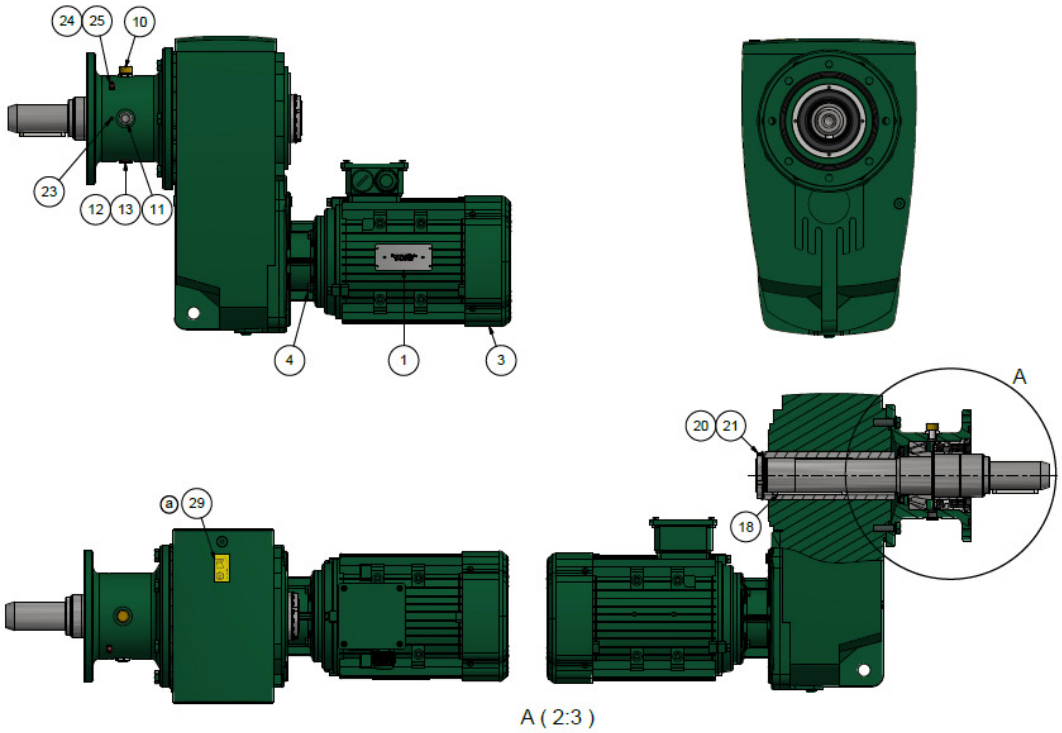
13.3 Wear ring, Drg. 6090531

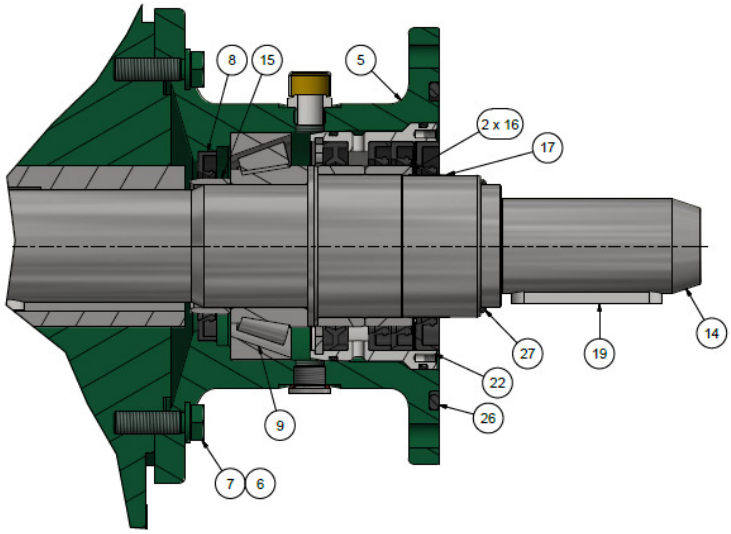


13.4 Foot for separator, Drg. 6090478

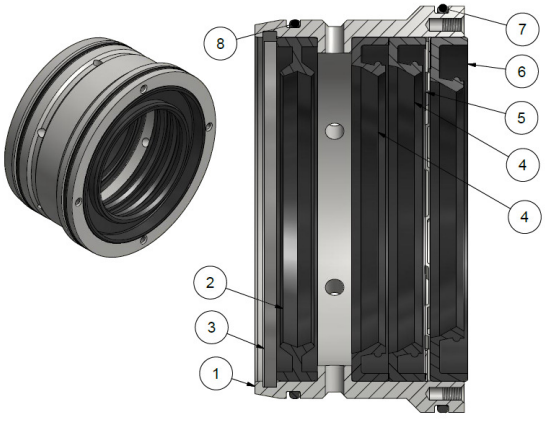


13.5 Drive unit, Drg. 6090535

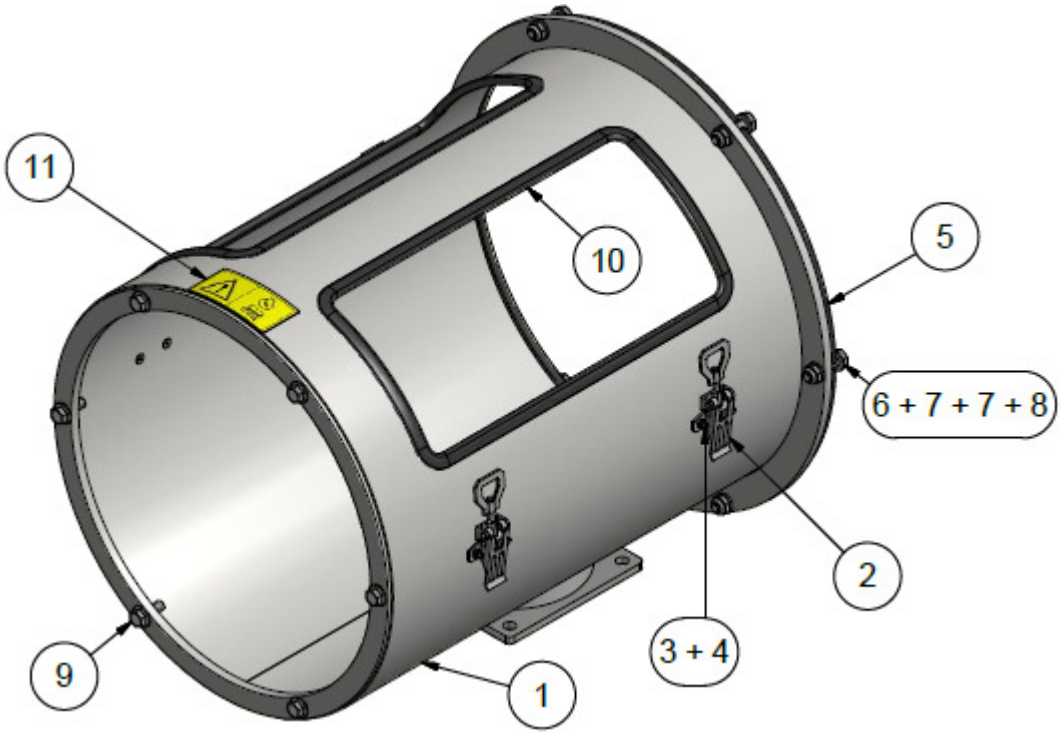




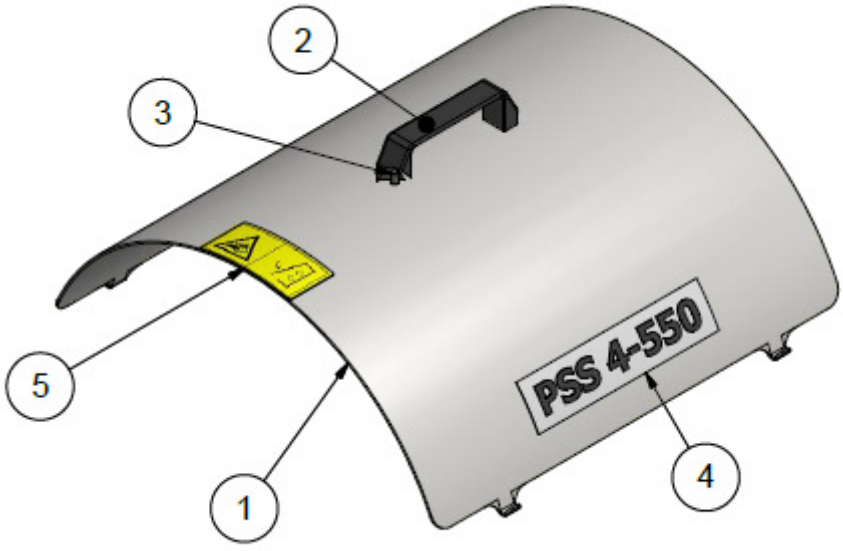
13.5.1 Seals packet for drive unit, Drg. 34-0726-021



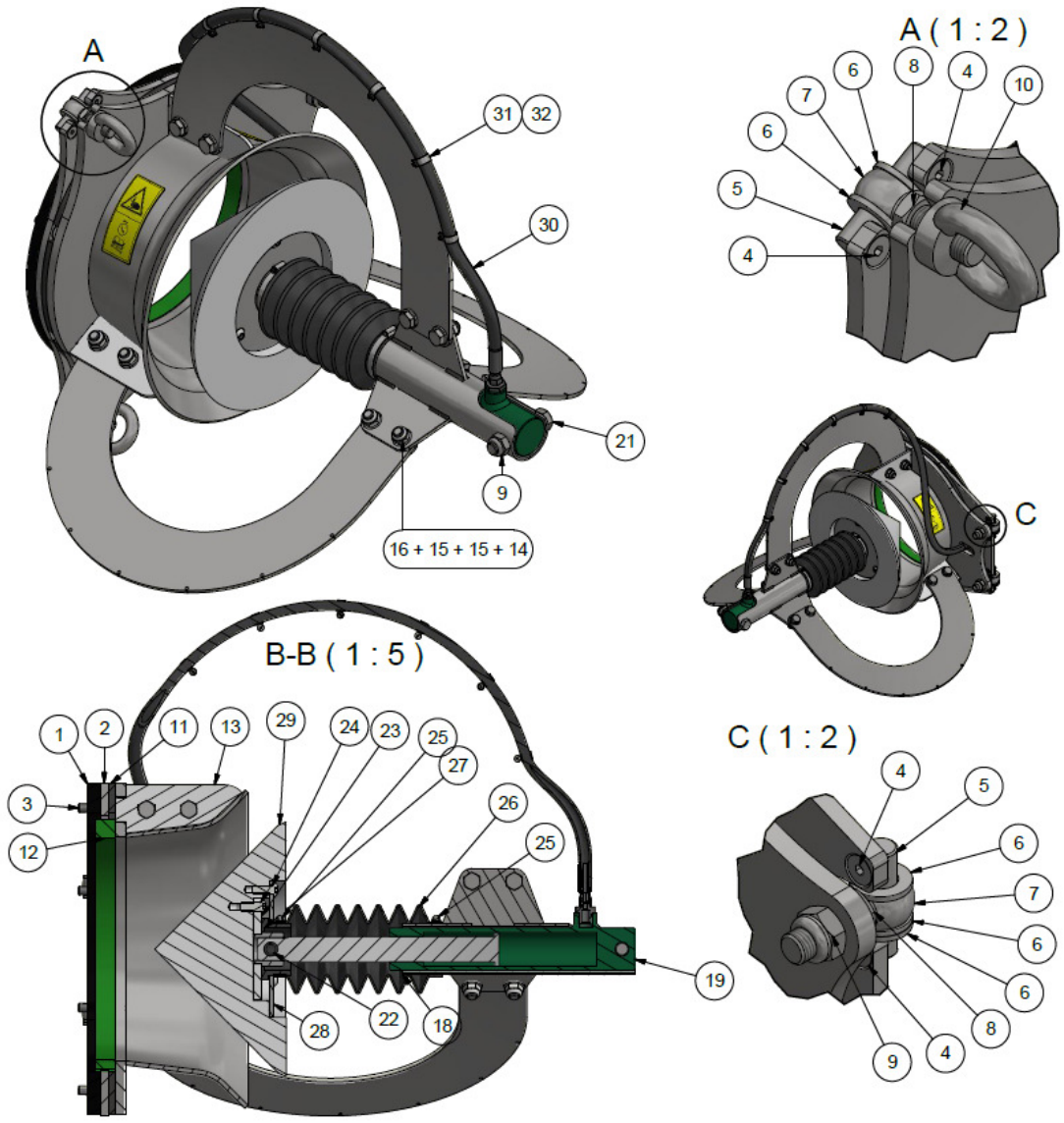
13.6 Housing for separator with 6" outlet, Drg. 6090610



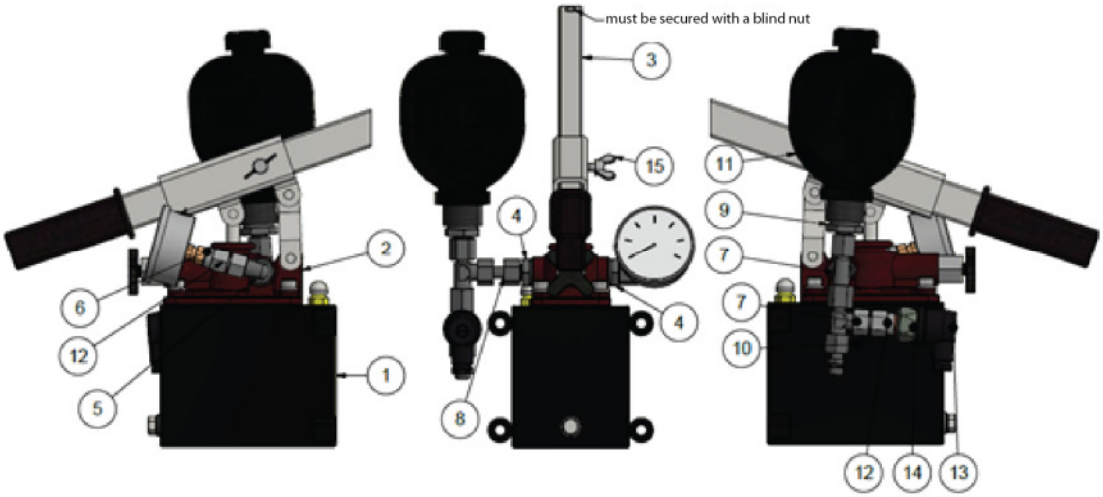
13.6.1 Opening flap for housing, Drg. 6090400



13.7 Hydraulic pressing cone, Drg. 34-0693-030



13.8 Hydraulic unit for separator, Drg. 6090519



14 MAINTENANCE AND REVISION LIST FOR THE PSS-M1603

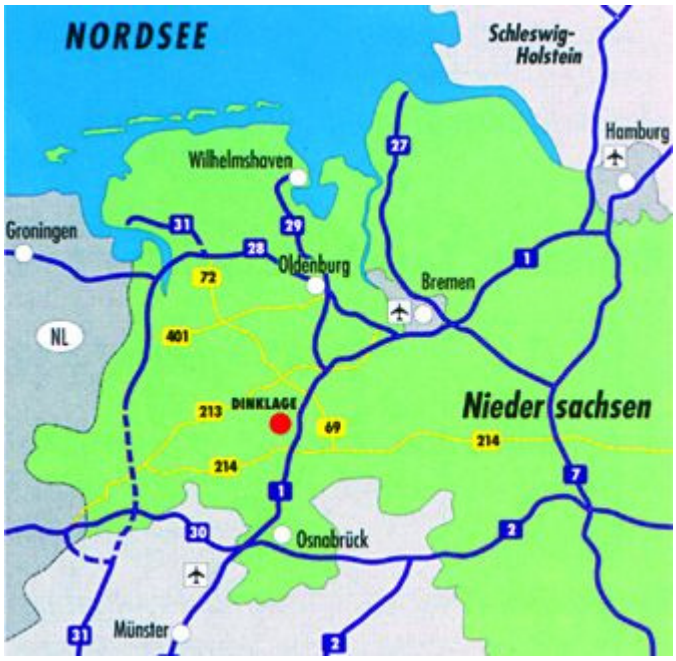
Each person must properly enter all maintenance and revision work in the list and confirm it with his or her own signature and that of the person responsible.

This list must be submitted to the supervisory bodies of the professional association, the TÜV and the manufacturer on request.

Maintenance/revision on device with the machine no.	Notes	Date	Signature of installer	Signature of person respon-sible

Maintenance/revision on device with the machine no.	Notes	Date	Signature of installer	Signature of person respon-sible

You can find us here



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- Agitating technology
- Stainless steel tanks
- Separation technology

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