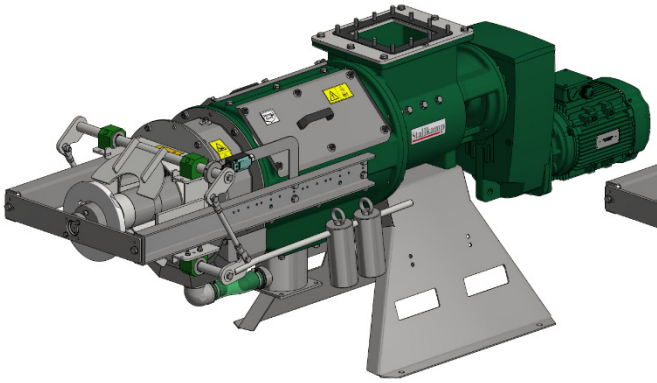
Stallkamp

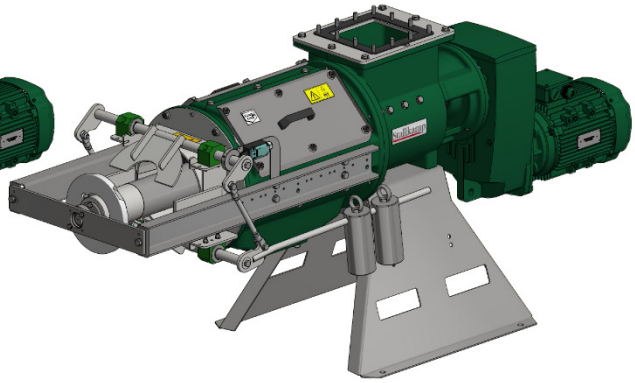
OPERATING MANUAL

Press Screw Separator

PSG 3.0/4.0/5.5-600 M1706/M2110
PSG 5.5-750 M1706/M2110



PSG 5.5-750



PSG 3.0/4.0/5.5-600

Document no.: 8090144 Version: June 2018

Space for notes:

General notices

- **The technical specifications, dimensions and weights are to be considered approximate and non-binding.**
- **Pictures are for illustration purposes and may deviate from the actual product.**

Date saved: 25/10/2021 15:56:00
Date printed 29/10/2021
BA_Separator PSG M1706+M2110_englischV2_8090144oE_EN(UK)

1 TABLE OF CONTENTS

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

Manufacturer: Erich Stallkamp ESTA GmbH

In der Bahler Heide 4
49413 Dinklage
Germany

Tel.: (0049) 04443 / 9666-0
Fax.: +49 (0) 4443 / 96 66-60

Authorised representative for the composition of the technical documentation:

Dipl.-Ing. (FH) Heiko Ansorge

In der Bahler Heide 4
49413 Dinklage
Germany

Product name: Press screw separator PSG - M1706 and M2110

Types: PSG 3.0-600 M1706 and M2110; 3.0 kW

PSG 4.0-600 M1706 and M2110; 4.0 kW

PSG 5.5-600 M1706 and M2110; 5.5 kW

PSG 5.5-750 M1706 and M2110; 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 2014/30/EU

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 61000-6-1:2016-05, Electromagnetic compatibility (EMC) Part 6-1: Generic standards – Immunity for commercial environments

EN 61000-6-2:2006-03, Electromagnetic compatibility (EMC) Part 6-2: Generic standards – Immunity for industrial environments

Dinklage, dated 29. October 2021

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

Dipl.-Ing. (FH) H. Ansorge (AL-TPR, authorised management board representative)

This declaration is not an assurance of characteristics pursuant to the German Product Liability Act. The safety notices 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 state-of-the-art devices are developed and manufactured with great care and subject to continuous quality control. This operating manual should help you to become familiar with the device and to make use of its intended applications.

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 regulations into consideration; the operator is solely responsible for complying with those regulations, and also that any installation personnel employed do so.

3.1 Identification of notices in the operating manual

In the operating manual, safety notices drawing the attention to dangers to persons are identified with the general hazard symbol as per DIN 4844-W9.

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

All other notices whose disregard might restrict the functional reliability of the device or represent a danger for the machine are highlighted 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 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.

If additional information or notices are required or in case of damage, please contact your 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" voids any 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 imperative that the installer as well as the responsible specialist personnel and owner read this manual before installation and commissioning, and that it is continually available at the location where the machine is operated.

Not only the safety notices 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.

The area of responsibility, competence and monitoring of personnel must be closely regulated by the owner. If the personnel do not possess the necessary knowledge, they should be trained and instructed accordingly.

Furthermore, the owner must ensure that personnel fully understand the contents of the operating manual.

4.2 Dangers if the safety notices are not observed

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

Specifically non-observance may, for example, result in the following dangers:

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

WARNING SIGNS

All notice and warning signs must be observed. Dangerous gases can escape when stirring the manure.

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

Safety notices for the owner and operator:

- ✓ If hot or cold machine parts are potentially hazardous, these parts must be protected on site to prevent contact.
- ✓ Contact protection for moving parts must not be removed while the machine is in operation.
- ✓ Leakages of dangerous transported material must be discharged so that there is no endangerment to persons and environment. Statutory provisions must be observed.

4.4 Safety notices for maintenance, inspection and installation work

The owner must ensure that all maintenance, inspection and installation work is carried out by authorised and qualified specialist personnel.

Work on the machine must strictly 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 WARRANTY

This section contains the general specifications for the warranty. Contractual agreements are always treated with priority and are not nullified by this. The warranty period 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 information

Stallkamp undertakes to rectify 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 warranty;
- ✓ that the product is used exclusively in line with the operating conditions specified in the operating manual and used 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 warranty is honoured 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 owner.
- Failure to observe the safety notices, 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 warranty. The operator of the device undertakes to have the manufacturer itself or a service provider 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 turbomachine in which the protective coating is exposed to constant wear from the abrasive contents of the pumping medium and should consequently be classed as a wearing part. Wear, damage and consequential damage due to external influences on the protective coating are expressly excluded from the warranty. The use of the device and/or the field of application and resistance to the application must be verified by the operator and does not form part of the warranty.

The liability of Stallkamp thereby excludes any liability for personal injury, property damage or financial losses.

The manufacturer reserves the right to modify the performance, specification or configuration data without prior notice.

6 PRODUCT DESCRIPTION FOR PSG-M1706/M2110

6.1 General description

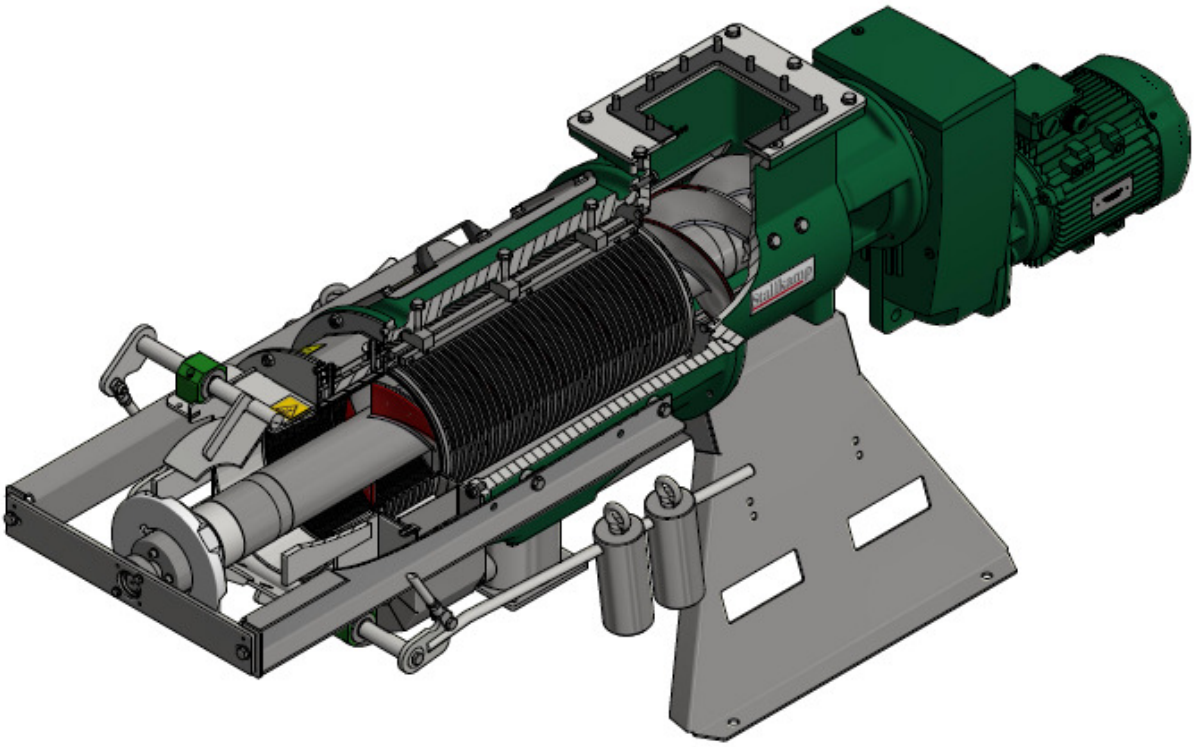
This operating manual applies to the standard model of the Stallkamp press screw separators PSG. The separator must not be operated in potentially explosive atmospheres.

Press screw separator PSG comprising:

- Press screw separator with a cast iron housing having three scraper bars in the feed area and two large cleaning holes on the sides.
- Drive motor, encapsulated by an additional intermediate chamber of the separator housing
- Tungsten carbide plated stainless steel screw with counter bearing
- Stainless steel screen basket with defined clearance
- Solids outlet made from stainless steel with two weight-loaded flaps
- Thin phase outlet with 6" standard square flange
- Stainless steel subframe
- Additional water removal screen (PSG 5.5-750 only)
- 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 fitting. 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 fitting.

The solid fraction of the raw liquid in contrast remains in the screen basket. This fraction on the screen basket is removed by the rotating screw and conveyed to the outlet. A small clearance between the screen basket and the press screw guarantees thorough cleaning of the screen basket. The solids conveyed to the outlet are squeezed by the adjustable counterpressure of the outlet flaps in order to extract any remaining liquids from the solids.

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

- The nature of the raw liquid
- The selection of the screen basket mesh width/type
- Counterpressure setting for the outlet flaps
- Nature of the screen basket and press screw

6.3 Proper use of the PSG-M1706/M2110

The separator is designed for a wide range of applications in which the solid and liquid fractions of various mixtures of substances that are able to be pumped need to be separated; for example, in the processing of cattle and pig manure or bio-mass where the solid and liquid fractions of a solid-liquid mixture need to be separated with the objective of:

- reducing the volume of natural fertiliser;
- reducing unpleasant odours when spreading fertiliser;
- recovery of the solid fraction for bedding material or fertiliser;
- composting the solids;
- recovery of the liquid for biogas plants 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 PSG-M1706 comprising:

- Separator type: Separator PSG-M1706/M2110
- Three phase motor:

Power	kW	3.0	4.0	5.5
Rotational speed	1/min	1435	1440	1460
Voltage Δ/Y	V	230 / 400	230 / 400	400 / 690
Nominal current Δ/Y	A	10.6 / 6.1	14.0 / 8.1	10.8 / 6.3

- Protection category: IP55
- Insulating category: F = 155°C
- Gear: Flat gear
i = 47.27
n2 = 30 1/min
- Gear seal: Radial shaft seal ring
- Press screw: Ø254 mm, inclination 260-280mm,
- Screen basket: Stainless steel, 1.4301, clearance 0.35 / 0.50 / 0.75 / 1.00
with an additional water removal screen as an option
- max. operating pressure: 0.5 bar
- Dimensions (LxWxH):
Weight: 2240 mm x 870 mm x 975 mm, 600 kg (PSG 3.0/4.0 – 600)
2310 mm x 870 mm x 975 mm, 610 kg (PSG 5.5 – 600)
2410 mm x 870 mm x 975 mm, 650 kg (PSG 5.5 – 750)

6.5 Type plate PSG-M1706/M2110

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

Stallkamp CE

Erich Stallkamp ESTA GmbH

Industriegebiet West

49413 Dinklage, Germany

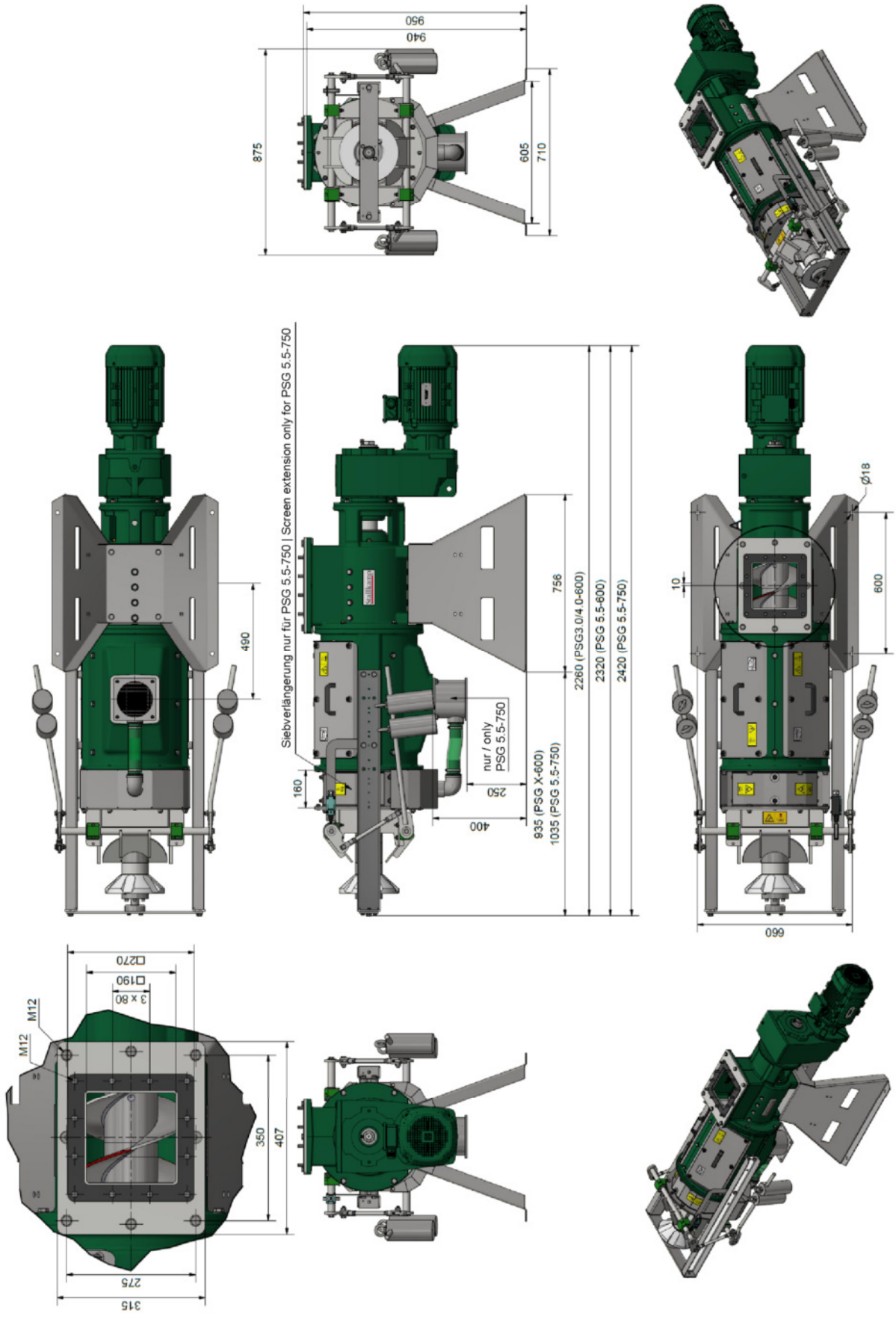
Mach. type:	PSG 5.5-750 / 5.5 kW
Mach. no.:	0313/000000
Year of manu-facture:	2018

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

High tech 4 liquids

Classification: (e.g. PSG 5.5-750)
Motor/serial number: (e.g. 0313/000000)
Year of manufacture: (e.g. 2018)
In case of technical queries about the device, the above type plate data must be specified.

7 DIMENSIONS OF THE PSG M1706/M2110



8 INSTALLING THE PSG-M1706/M2110

8.1 Delivery scope

The Stallkamp separator is delivered completely assembled. The supply and discharge 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 fitting with overflow pipe fitting

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, telescopic handlers, chains, belts, etc.) in order to ensure 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.
- Adequate accessibility must be provided for adjustments and maintenance work. It is recommended to keep a clearance of at least 1 m around the separator. Make sure that the press screw is pulled approx. 1.5m forward out of the separator for maintenance work.
- Solids must be able to be ejected and discharged freely.
- All discharged liquids must be able to drain 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.

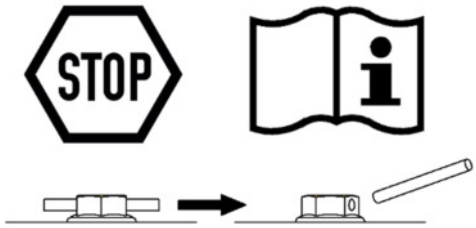
The motor of the separator is splash-proof according to IP55. The technical connection conditions of the local energy supply company must be observed during connection. The use of a motor protection device is a prerequisite. The feed line must be secured in accordance with regulations.

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 Gear 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.



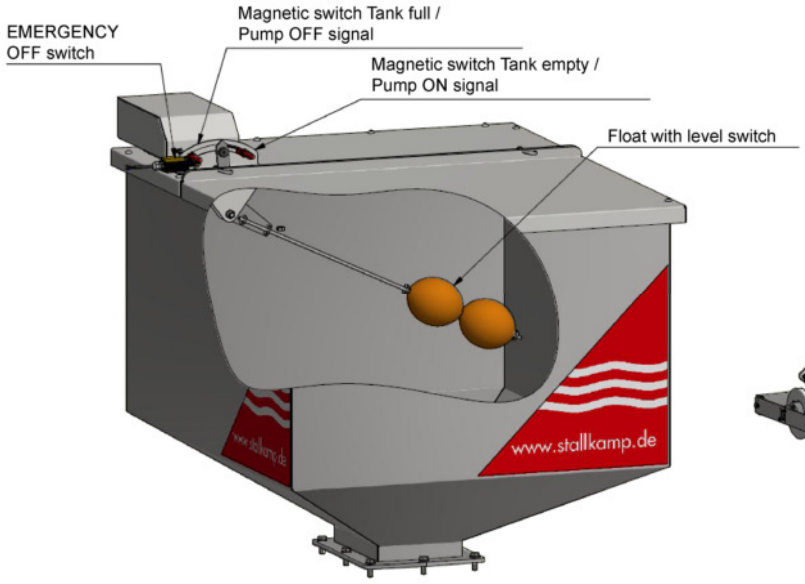
8.5 Connecting the supply and disposal lines

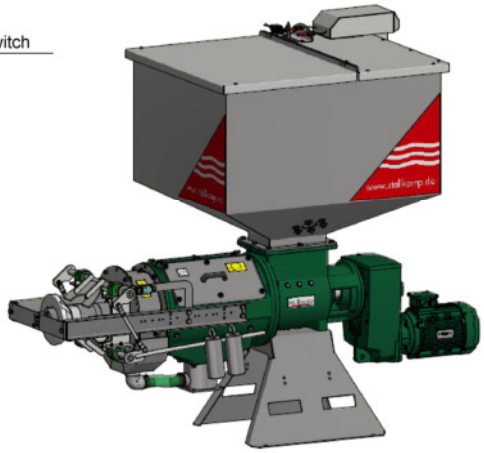
8.5.1 Supply line

The separator may only be operated with a maximum pressure of 0.5 bar (equivalent to approximately 5 m liquid column). This can be done with a hopper or an I-O-I pipe fitting.

8.5.1.1 Hopper

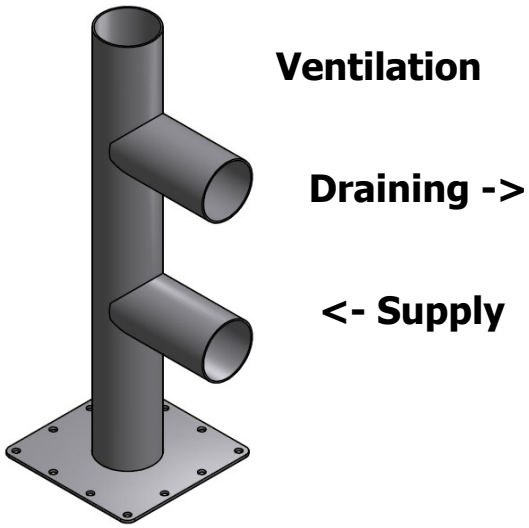
The hopper must be filled by a supply pump. To regulate the fill level, the pump is turned on and off via a float switch. The switching on and off times can be adjusted by moving the magnetic switches in the slot.





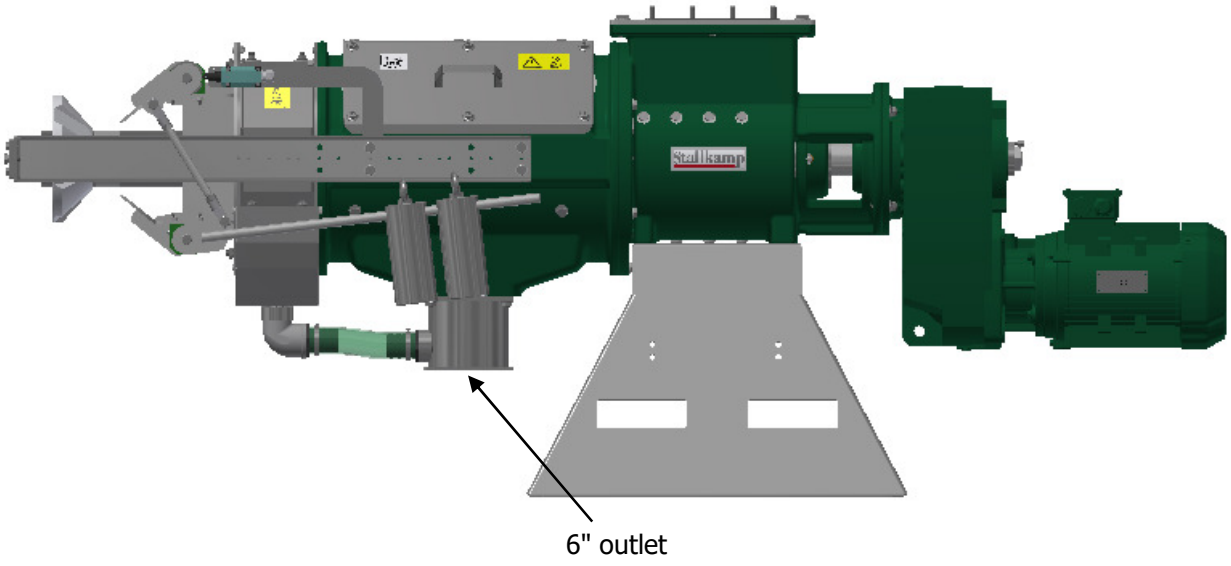
8.5.1.2 Supply pipe fitting with overflow pipe fitting

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



8.5.2 Disposal line

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



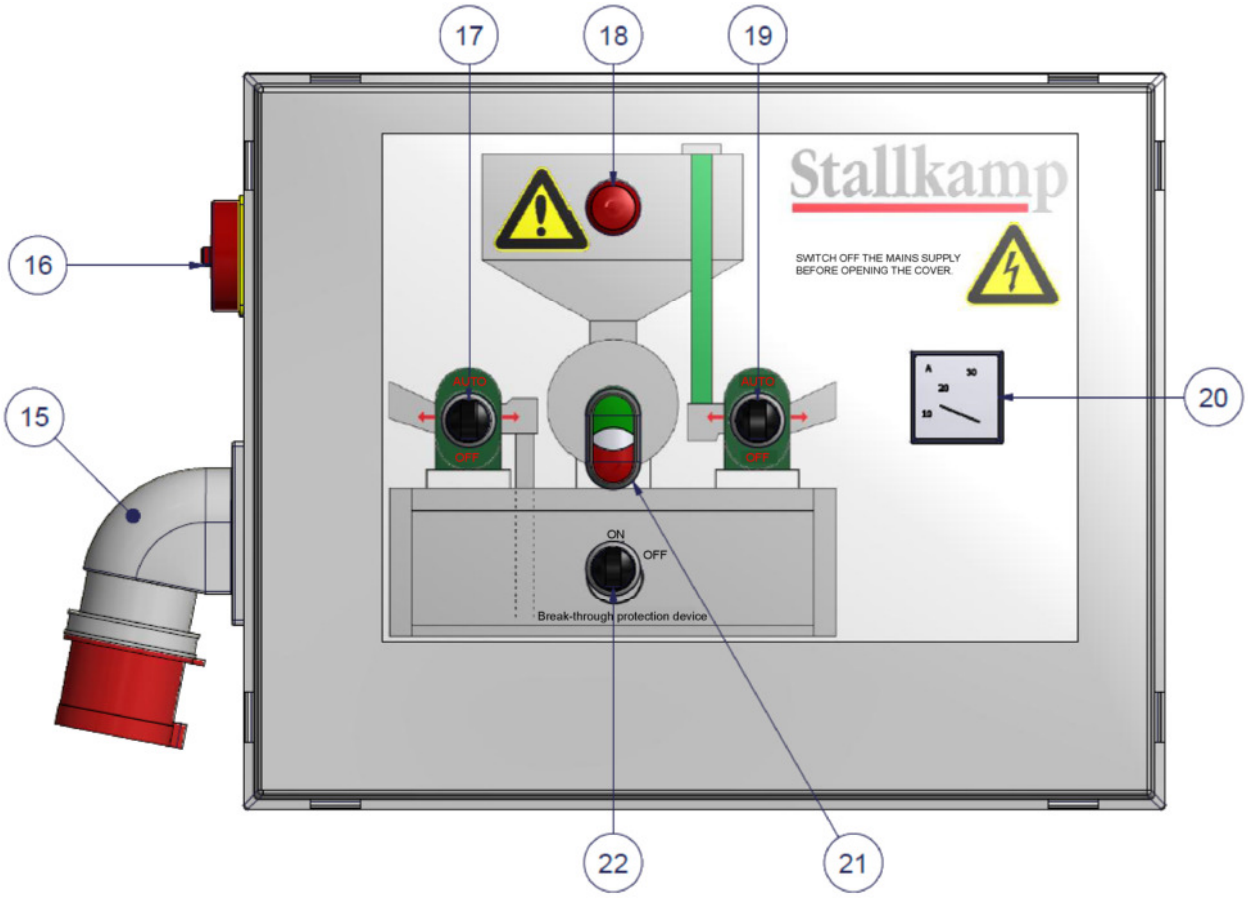
The outlet is equipped with a 6" DIN flange.

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 observe the documents included with the control system. The following section provides a description of the individual components and functions.

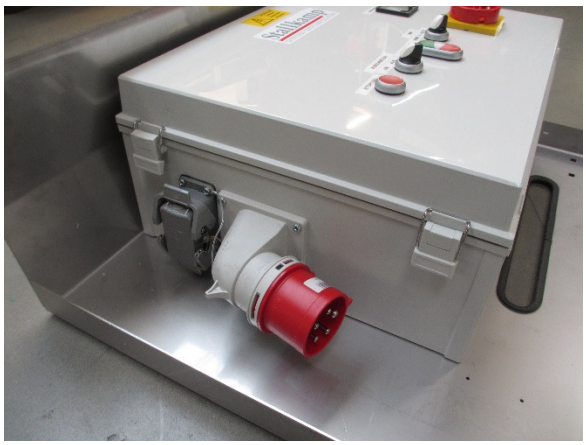
8.6.1 External components



(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 secured 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 disconnect the machine from the power supply.

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

(20) Amperemeter

The current power consumption of the separator can be monitored with the amperemeter. Make sure that the power consumption is not too high. Please follow the points in *9 Operating and commissioning the PSG-M1706.*

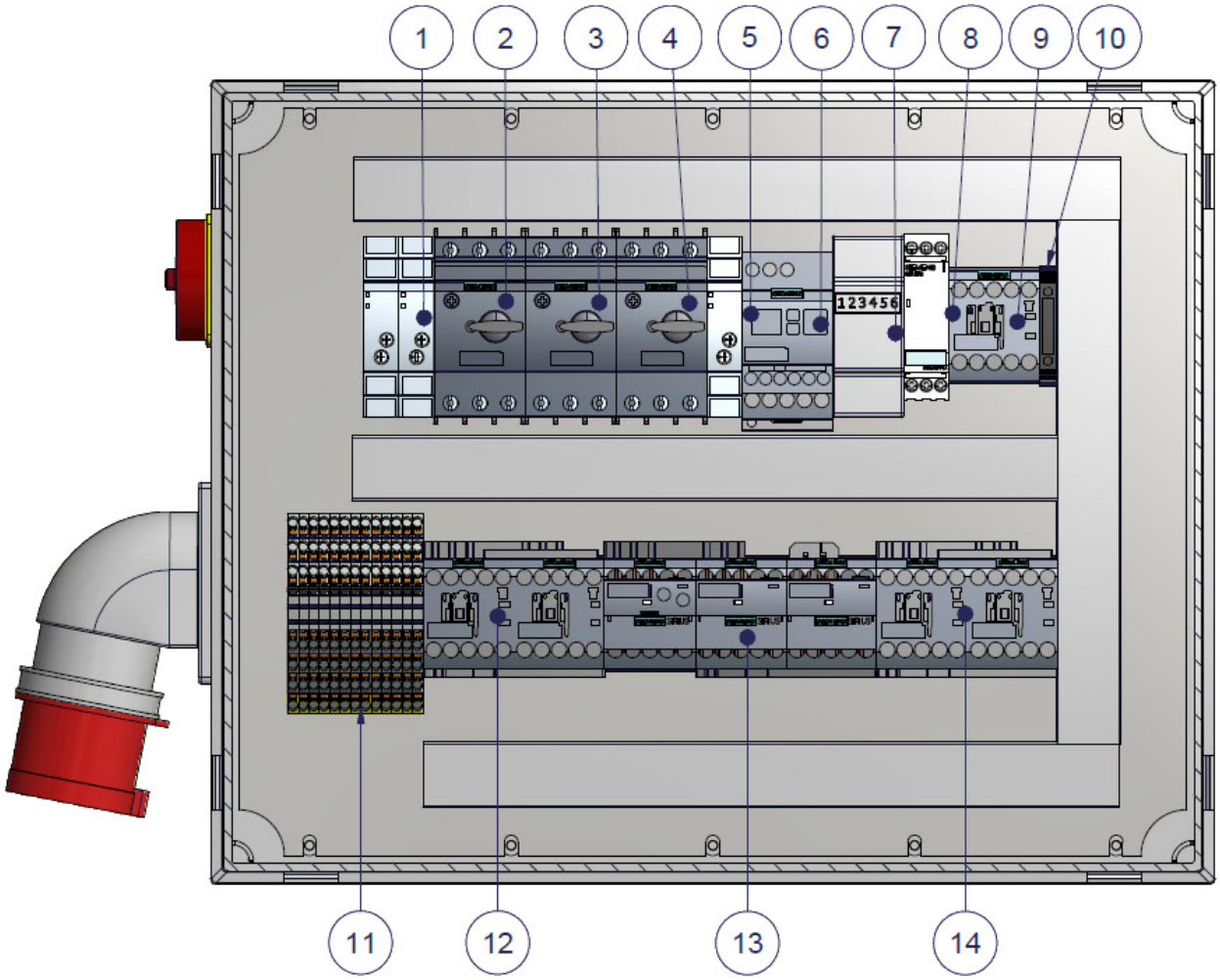
(21) Start/Stop separation

The separation is started (green) or terminated (red) by means of the dual switch. Please follow the points in *9 Operating and commissioning the PSG-M1706.*

(22) Break-through switch

The break-through switch allows you to deactivate the current monitoring, flap position 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 time monitoring. You can find a detailed list in *10 Malfunctions.*

Pumping time: If the pumping time is longer than specified, it indicates that the fill 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, if necessary, 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 using 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 a motor overload, this 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, if necessary, 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 using 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

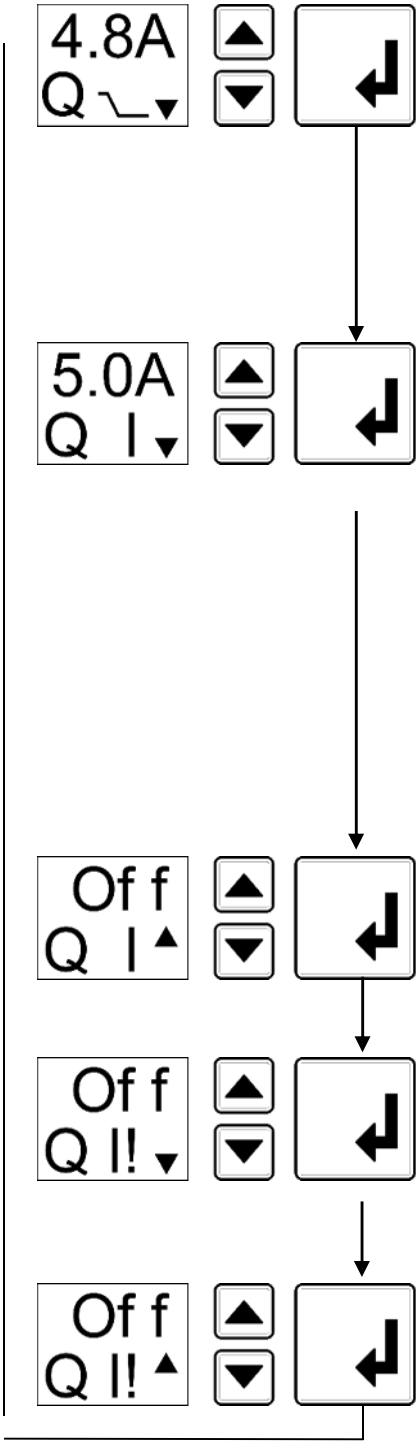
The current measuring relay monitors the power consumption of the separator. If the power consumption is too low, it can indicate a breach or lack of liquid. Monitoring can be deactivated via the "Break-through switch" selector switch in the cover. This is necessary when the separator is put into operation. Please follow the points in *9* Operating and commissioning the PSG-M1706*.* To set the current measuring relay, proceed as follows:

Layout:

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

PSG 3-600 / 3 kW -> 3.0 A

PSG 4-600 / 4 kW -> 4.0 A

PSG 5.5-600/750 / 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 counter

(8) Phase sequence relay

(9) Contactor relay

(10) Fuse

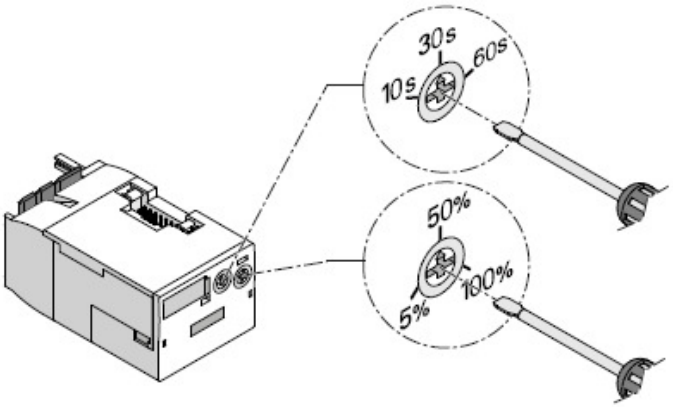
(11) Terminal blocks for connecting motors and sensors.

Please observe the documents included with the switch box.

(12) Collection tank DKP (reversing) contactor

(13) Separator contactor / star-delta module

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



(14) Hopper DKP (reversing) contactor

9 OPERATING AND COMMISSIONING THE PSG-M1706/M2110

9.1 Prior to commissioning: Safety notices

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 protection devices/equipment.

(4) Check gear motor oil level is adequate and top up if necessary. Lubricate the bearing.

(5) Check that the supply and discharge 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 / recommissioning

The following describes how the separator is put into operation when it is new or after a prolonged standstill. 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, the liquid to be separated must be mixed and homogeneous prior to commissioning. Further agitation is necessary if the liquid separates again during separation. For a good separation result, it is crucial that the solid/liquid mixture to be separated is mixed before separation!

A long machine lifespan can only be ensured if the screen basket and the press screw are not subjected to excessive stress. In order to avoid such stress, large foreign bodies (stones, metal parts, cleaning cloths, pieces of wood, etc.) must be prevented from entering the separator!

For commissioning, proceed as follows:

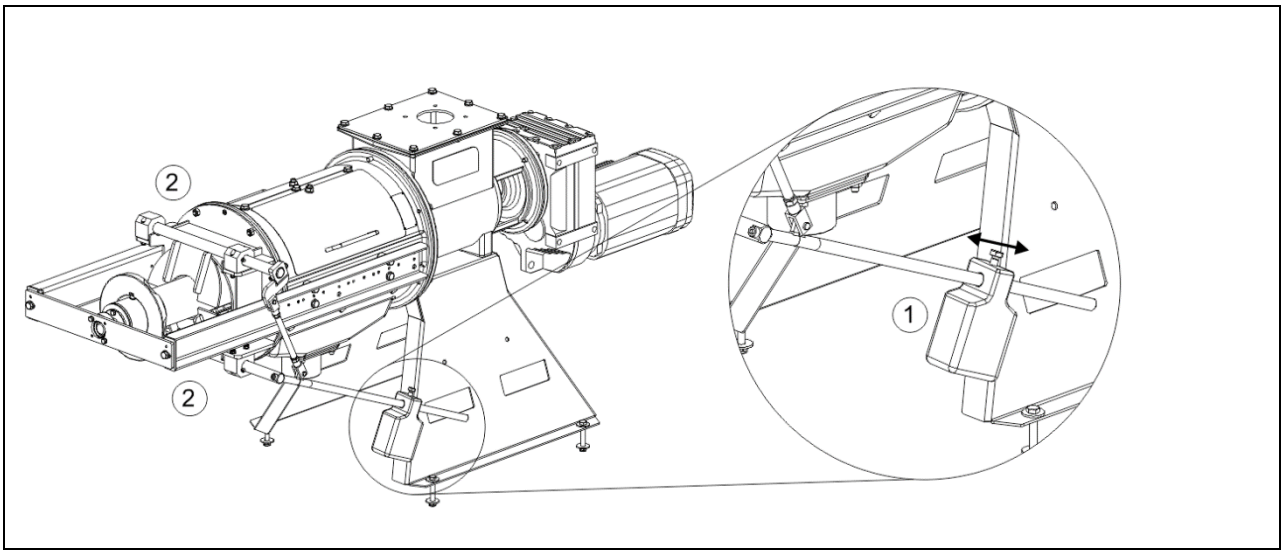
1. Switch off the monitoring functions on the control system (see *8.6 Control* system)
2. Create a plug (see *9.3.1 Plug* formation)
3. Switch the separator and pump(s) to auto mode. Observe the plug during the process.
4. Set the outlet flap pressure. (see *9.3 Setting the* outlet flap pressure)
5. Activate the monitoring functions (see *8.6 Control* system*).*

9.3 Setting the outlet flap pressure

When modifying the flap pressure, please note that the effect of an applied setting lasts several minutes. Only apply changes in small increments and with the appropriate reaction time!

Plug formation depends on the force acting on the outlet flaps and the medium to be separated.

An unnecessarily high flap pressure causes unnecessary wear of the screen basket and press screw.



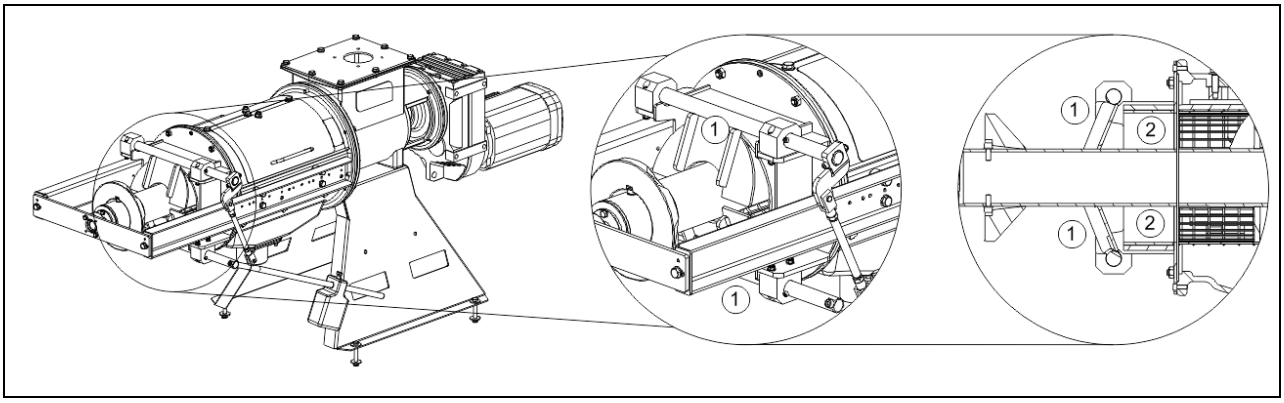
Moving the weight (1) on the rod changes the outlet flap pressure (2). The desired consistency of the dry mass is therefore adjustable.

Towards the outlet flap:	less pressure, less dry, soft plugs
Away from the outlet flap:	more pressure, drier, hard plugs

9.3.1 Plug formation

If there is no solid plug in the outlet area, it must first be ensured that the outlet flaps are in the closed position. Then briefly flood the separator with the medium to be separated by switching on the feed pump. Then switch on the separator first.

Depending on the medium to be separated, the pump must be switched on briefly approx. 6 times while the separator is running before a plug begins to form, which in turn will open the flaps at the outlet.



It is also possible to create an artificial plug.

Risk of injury!

Through rotating parts. Only generate when the machine is at a standstill. The power supply must be disconnected from the mains supply!

Material (straw, hay, silage, cleaning cloths, etc.) is manually stuffed behind the relieved outlet flaps. Proceed as follows:

1. Relieve outlet flaps (1): decrease weight (3)
2. Manually open the outlet flaps (1): lift and secure the weight rod (4).
3. Create an artificial plug: stuff the material directly behind the opened flaps (2).

4. Close outlet flaps: lower the weight rod (4), mount the weights (3).

   ⚠ Risk of injury or crushing of hands when closing the flaps!

5. Sett the outlet flap 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 fitting.

Pressing the start button starts the separation.

9.4.1 Break-through protection device

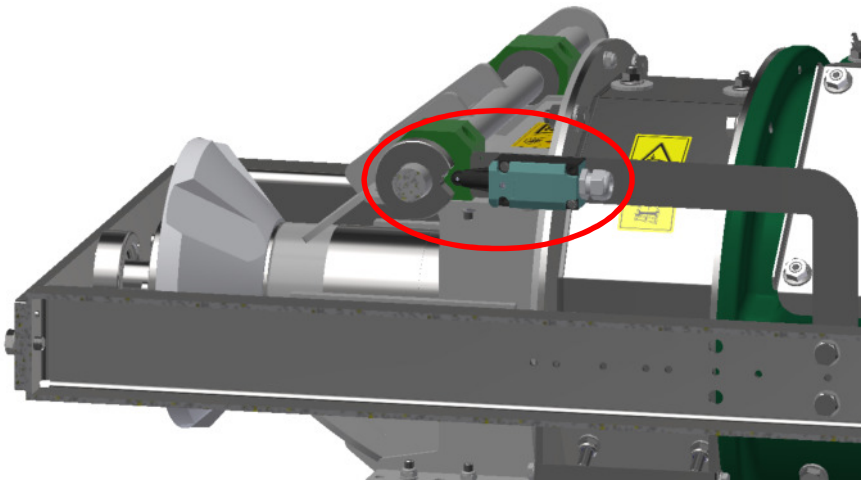
If the separator runs without any significant problems, the break-through protection device can be switched on. If there is a breach in the plug or if there is insufficient supply of liquid, the separator and the supply plump are turned off automatically.

9.4.2 Set the break-through switch of the flaps.

If the separator has formed a plug and the flaps only move minimally, the setting cam of the break-through switch can be fixed.

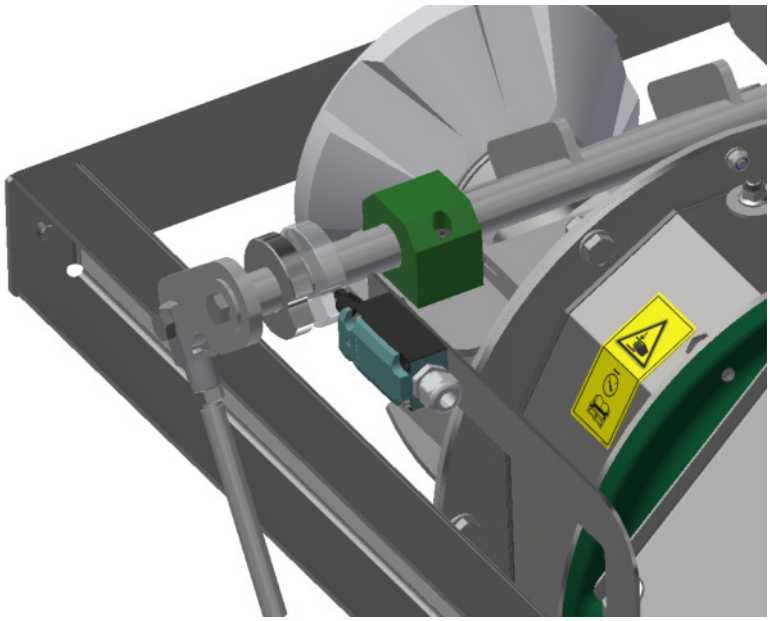
To do this, loosen the set screw and turn the switching cam with the hole facing the switch. Make sure that the switching cam is level with the switches and that the hole is centred facing the switch roller to compensate slight flap movements. Tighten the set screw firmly again.

If the flap now opens or closes, the separator is switched off via the switch. This function is only assured if the switch is correctly set and activated.



The lever arms are hidden for better display.

If the cam switch is moved sideways, the break-through switch can be completely deactivated.



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 week), the separator should be completely cleared of liquids and solid 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 flaps, see *11.3 Press screw and screen* basket replacement.

Rotary lobe pump/positive displacement 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 sales representative.

10.1 General faults

Fault	Cause	Remedy
Separator / rotary lobe pump turns in the wrong direction	Phases are wrongly connected	- Switch the two phases round
Control system has no power Fault circuit breaker triggers	Incorrect electrical connection	- Check electrical connection (see 8.3 Electrical connection)
No liquid is sucked in	Lobe worn out	- Replace lobe
	Incorrect direction of rotation	- Switch phases round
	Pump does not rotate	- Check for blockages/foreign bodies
	No negative pressure	- Check lobe for wear - Fill rotary lobe pump with water - Check suction hose
Solid matter is too wet	Outlet flap pressure is too low	- Increase outlet flap pressure. Observe separator power consumption! (see *9.3 Setting the* outlet flap pressure)
Solid matter is too dry	Outlet flap pressure is too high	- Reduce outlet flap pressure. Risk of breach if pressure is too low. (see *9.3 Setting the* outlet flap pressure)
The dryness of the solid varies widely	The medium to be separated has a varying consistency.	- Mix medium thoroughly
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 clogged up	- Clean the screen - Select a different gap width
	Screen and/or screw is worn out	- Replace screen and/or screw.
	Supply rate is too low	- Check the flow rate of the supply pump. - Check supply line.

10.2 Control system fault

Fault	Cause	Remedy
Control system does not respond 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.
	Phases are incorrectly connected	Turn the CEE connector. Press the switch.
	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.
	A time relay has triggered.	Check the set times on the time relay (see 8.6 Control system). Press the switch. See below for more details.
	External signal.	Rectify the fault of the external signal. Press the switch.
Hopper time relay	No liquid is fed	Check (suction) line for leakage 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 leakage and resolve problem.
		Medium is too thin and runs right through the separator. Use a smaller gap width.
		Check the separator for breach at outlet and resolve problem.
	Pump does not switch off when the tank is full	Check the Max. switch. Replace it if necessary.
Time relay for the **collection tank pumping time**	No liquid is fed	Check (suction) line for leakage 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.

Time relay for the **collection tank idle time**	The tank fill level does not increase.	Check the performance of the separator.
		Leakage 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	Wrong settings	Check the settings (see 8.6 Control system)
	Separator has no liquid	Check the liquid feed
	Breach at outlet	Check the outlet. Increase the pressure if necessary.

11 MAINTENANCE OF THE PSG-M1706/M2110

The specified maintenance and inspection work must be performed regularly. This work may only be carried out by trained, qualified and authorised personnel. The operator of the device undertakes to have the manufacturer itself or a service provider 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** PSG-M1706**).**

Danger to life!

All work in this chapter may only be carried out when the machine is at a standstill and with the mains plug disconnected and secured against being switched on again!

11.1 Maintenance intervals

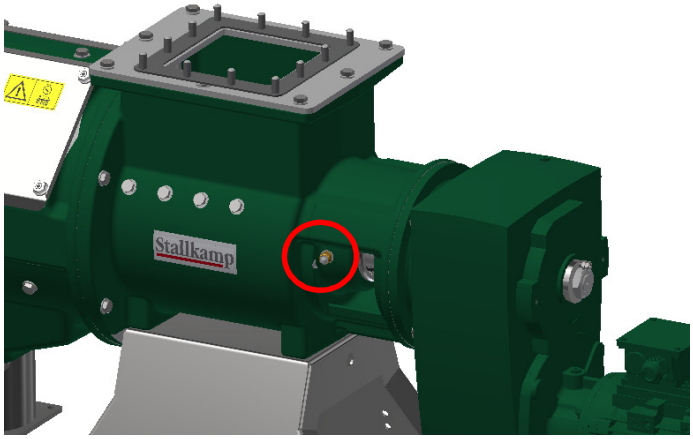
The separator must be inspected for damage each time it is taken into operation. In addition, the secure fitting of all screws and other fixing devices must be checked.

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 Lubricating the locking bush

The locking sleeve of the screw shaft must be lubricated daily through the filler neck of the housing (approx. 1 to 3 cm³)! The lubrication point is located on the left side (product flow) at the height of the screw shaft, in front of the filler neck.

When separating for food and feed production, use only food-grade grease.



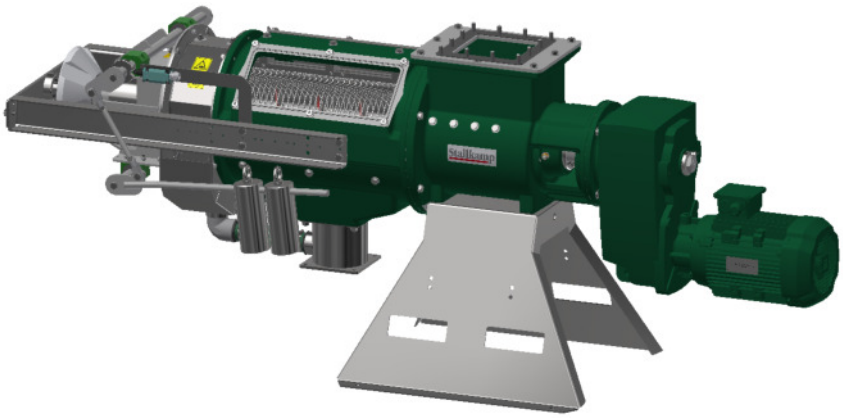
11.1.2 Recommendation: every 14 days

11.1.2.1 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!



View towards the screen basket.

11.1.3 Recommendation: every 3 months

11.1.3.1 Check the power consumption at the amperemeter

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

11.1.4 Recommendation: every 6 months in continuous operation

11.1.4.1 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.

11.1.5 Recommendation: every 12 months

11.1.5.1 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.

11.1.5.2 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)

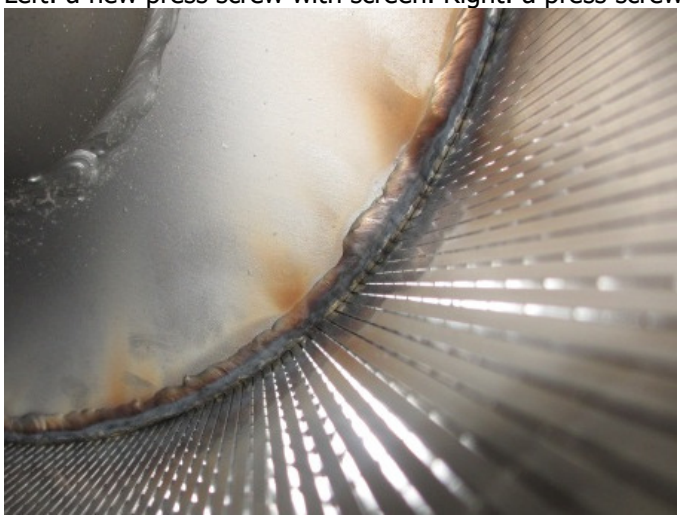
11.1.5.3 Visual inspection and cleaning of the separator

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.

11.2 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.

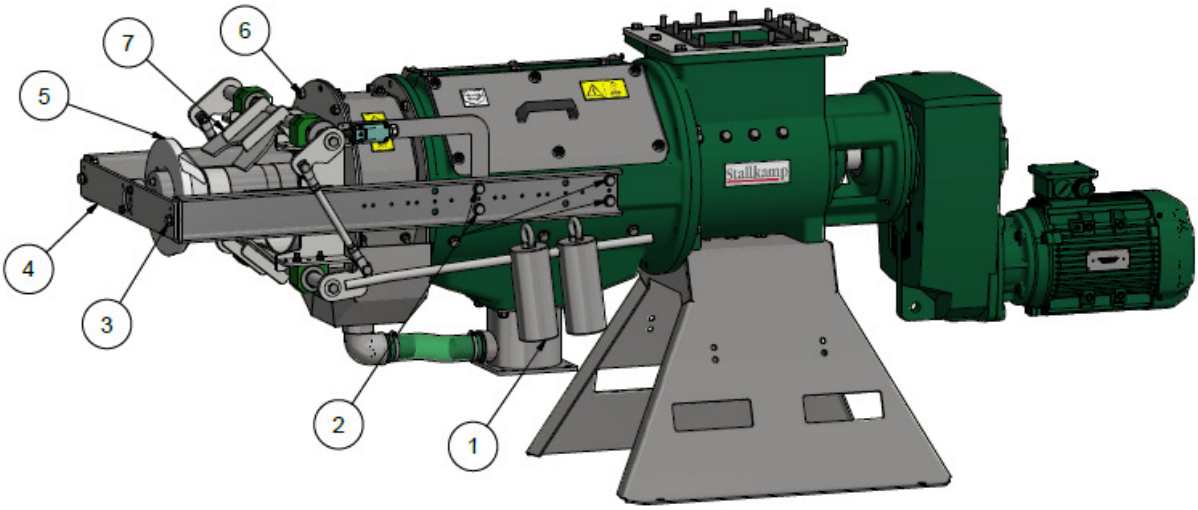


11.3 Press screw and screen basket replacement

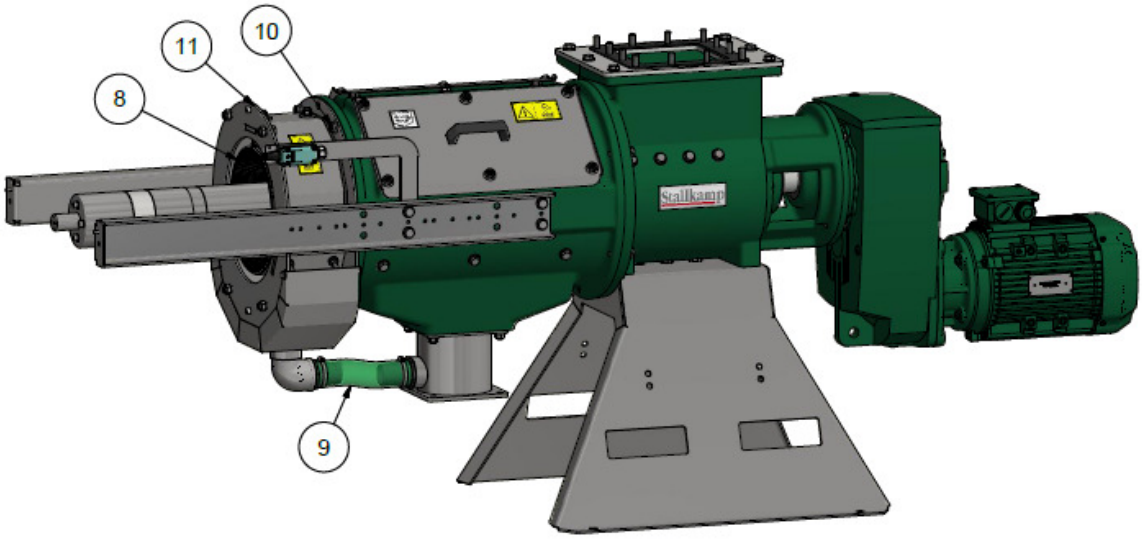
To replace the press screw and/or the screen basket, switch off the pump and let the separator run empty. Switch off the machine and secure it against being switched on again. Thoroughly clean the machine during the entire installation process to ensure trouble-free operation later on. Proceed as follows for installation:

1. Remove the weights (1) from the flap lever. Open it to remove solid residues from the outlet.
2. Loosen the screw (3) on the cross brace (4) to remove it.
3. Push the milling cone (5) slightly towards the screen basket. Loosen the screws underneath to remove the milling cone.
4. Loosen the screws (6) on the ejection head (7) to remove it.

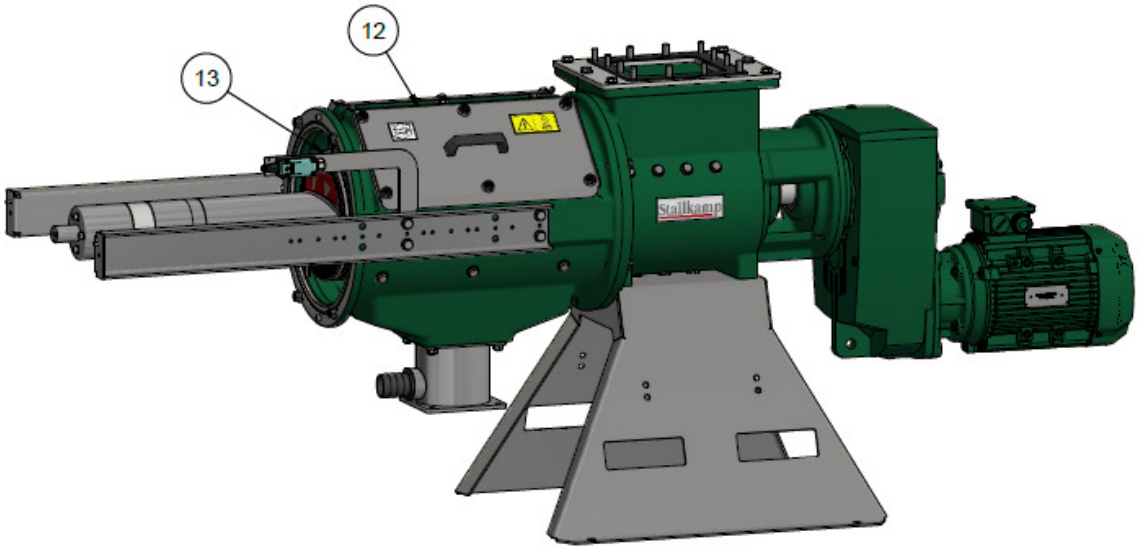
Never loosen the screws (2) on the support for the cross brace (4). This is set in the factory to ensure optimum guidance of the press screw.



5. Remove the screen basket (8). Mark the installation position. (only for PSG 5.5-750)
6. Loosen the hose (9) and the screws (10) to remove the screen extension. (only for PSG 5.5-750 **M1706**)



7. Open the cleaning opening (12) to push out the screen basket (13). Mark the installation position of the screen basket.

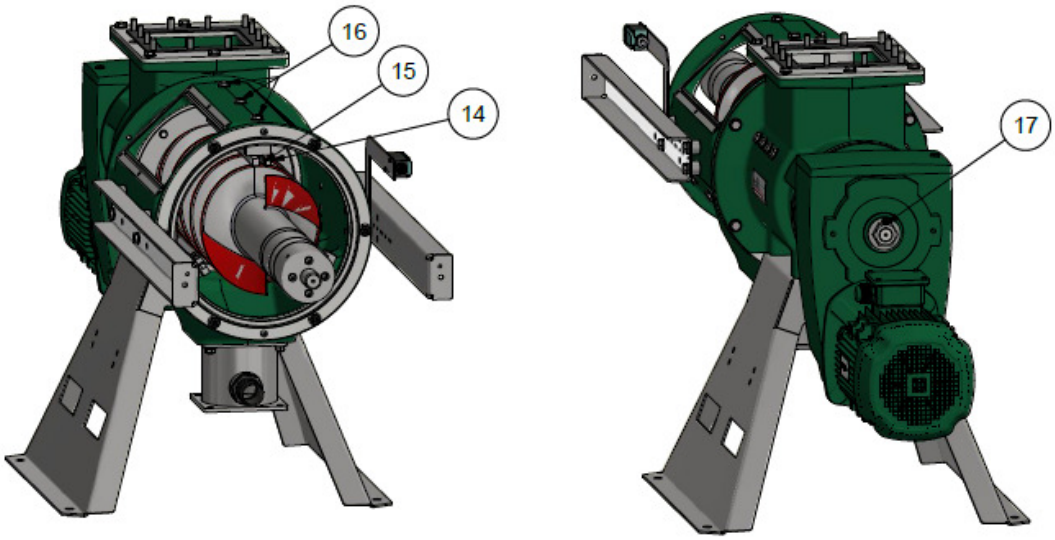


8. Loosen the screws (14) on the wear plates (15) and replace them when installing a new screen basket.

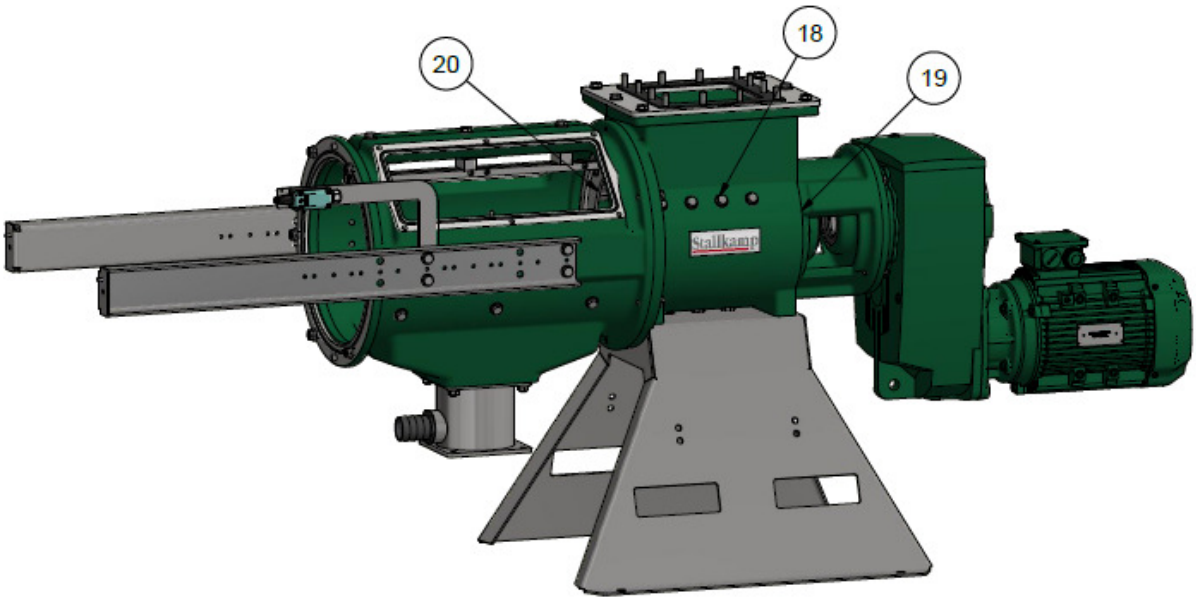
Never loosen the screws (16) for fixing the guide rails. These are preset at the factory. Loosening the screws can lead to increased wear on the screen basket and press screw.

9. Loosen the locking screw on the set screw (17) to remove it. The press screw can now be pushed out in the direction of the ejection head.

Never use force! Impacts or unnecessary force can adversely affect the screw, and precision can no longer be ensured.
Do not hit the shaft end with a hammer to drive out the press screw. Use a suitable punch (e.g. plastic block, brass mandrel).

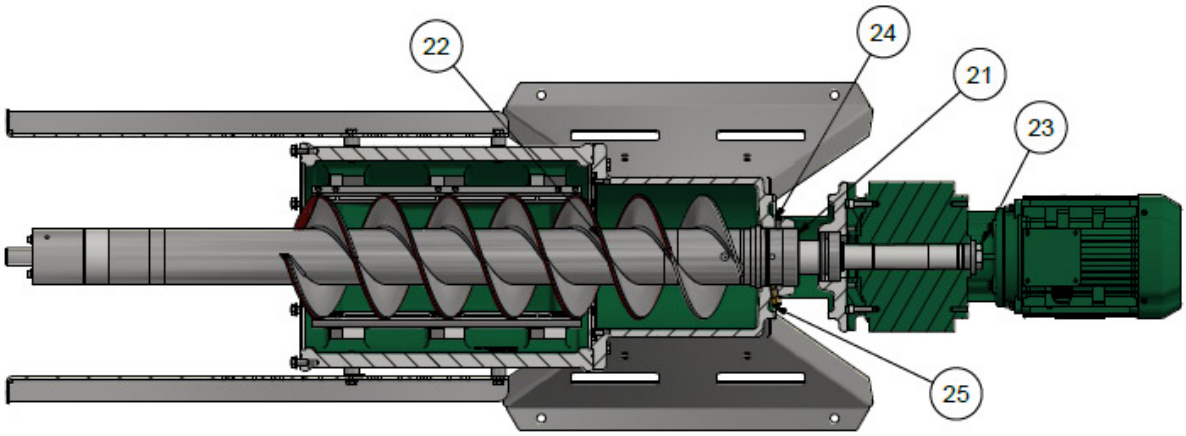


10. Check the three strippers (18), stripper ring (19) and the sealing bush (20) for wear. Replace them if necessary.



11. **PSG M1706:** Push in the sealing bush (21). However, make sure that it does not lie completely against the frame.
    PSG M2110: Push the sealing bush (21) in as far as it will go. Turn the set screw (24) on the sealing bush (21).
12. Grease the press screw (22) at its bearing points. Carefully insert the press screw and make sure that the feather key is properly positioned. Avoid hitting the thread, slide bearing and guide rails.
13. Fit the locking bush and the adjustment screw (23). The adjustment screw must not touch the gear with full force. To do this, tighten the adjustment screw with sufficient force. Then loosen and tighten the nut again by hand. To fix, tighten the clamp screw on the nut so that the adjustment screw is secured against getting loose by itself.
14. **PSG M1706:** Turn the set screw (24) on the sealing bush (21). Lubricate the sealing bush (25).

    PSG M2110: Lubricate the sealing bush (25).



15. Reassemble the screens, screen extension and outlet in reverse order. If you reuse the previously removed screen baskets, reinstall them in the same position.

11.4 Recommendation at end of the lifespan

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

12 NOTICES

12.1 Regulation of the professional association

The accident prevention regulations of the German Agricultural Professional Association stipulate the following 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 100 cm, other safety precautions will suffice.

§ 2 Openings

(1) If removal and entry openings and suchlike are opened, it must be ensured 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 entering and while present in pits and canals, ensure that sufficient respiratory air is present and that operational equipment is 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 ensured by suitable measures that fermentation gases cannot flow into the building.

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

(3) If tanks and canals are located in buildings – also under slatted floors – it must be ensured that fermentation gases are discharged out of the buildings.

(4) If tanks and canals in buildings are fitted with agitators, pumping and rinsing plants, facilities for the discharge of fermentation gases must be present which automatically switch on when the agitators, pumping and rinsing equipment are commissioned. They may only be switched off after conclusion of the work process. The discharged gases must not endanger persons.

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

(6) Operating stations for agitators, pumping and rinsing equipment etc. must be positioned over the floor, however.

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

(8) Operating instructions must be permanently attached to the operating stations.

§ 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.

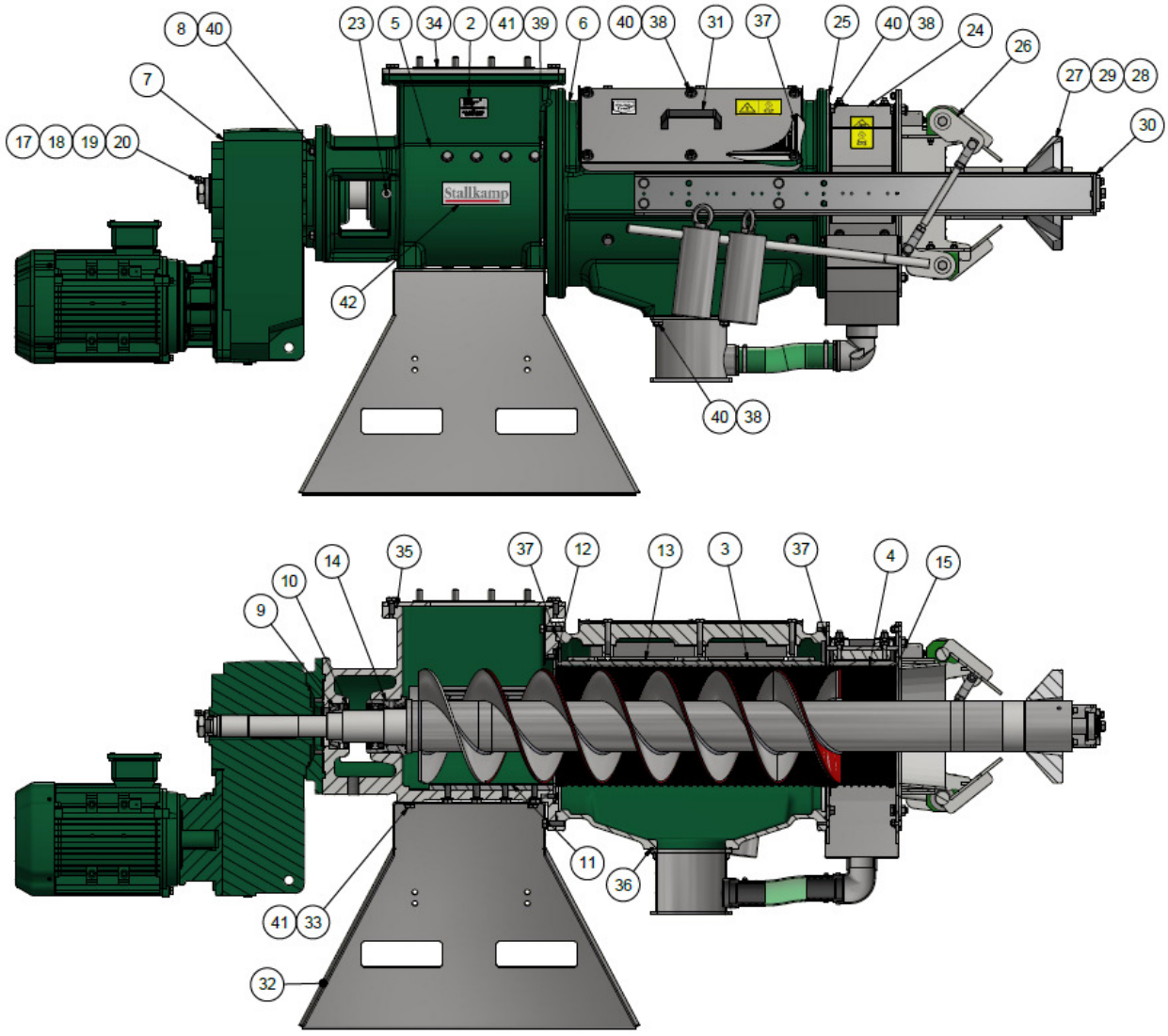
§ 6 Warning signs

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

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

13 SPARE PART DRAWINGS OF THE PSG-M1706/M2110

13.1 Overview, Drg. 36-001

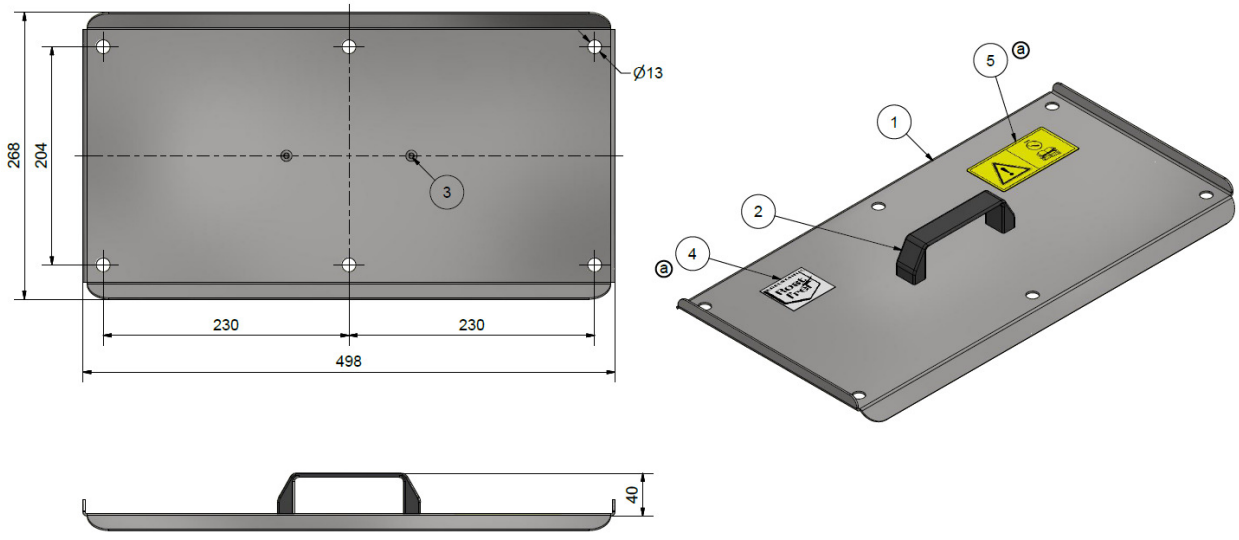


13.2 Spare and wearing parts

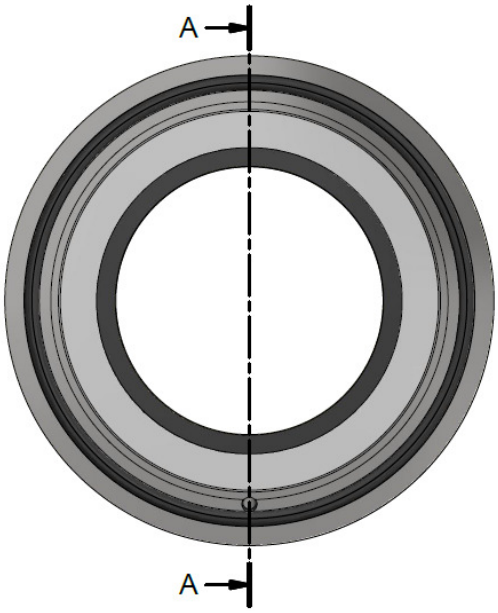
Item	Part no.	Description	Notice
3		Screen basket, Ø254, l=600	
	5501130	Clearance 0.25 mm	
	5501131	Clearance 0.50 mm	
	5501132	Clearance 0.75 mm	
	5501133	Clearance 1.00 mm	
4		Screen basket, Ø254, l=151	For screen extension, PSG 5.5-750
	7091043	Clearance 0.50 mm	
	7091044	Clearance 0.75 mm	
	7091045	Clearance 1.00 mm	

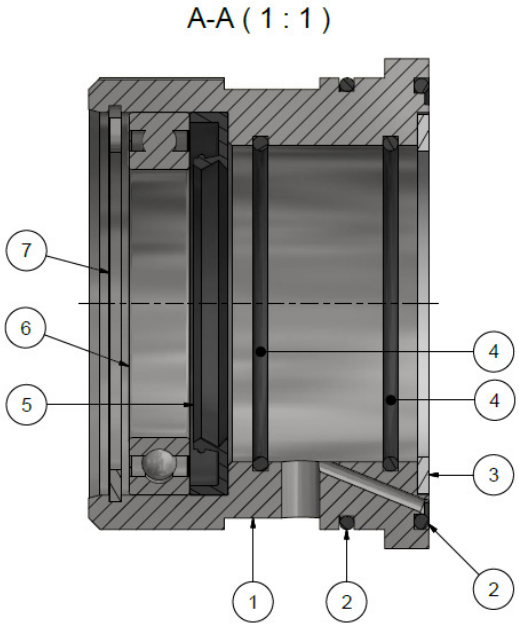
9	5180193	Tapered roller bearings on supply side	d/D/H = 60x100x30 mm
10	5190269	Shaft seal ring	d/D/H = 70x100x10 mm
11	6090608	Stripper bars for filling part	275 mm long 1 set (3 pieces incl. screws and washers) See *13.8 Stripper for filling part,* Drg. 36-001-064
12	6090724	Stripper ring for filling part incl. screws and washers	Inside Ø 254 mm, outside Ø 340 mm, thickness 6 mm See *13.13 Stripper ring for filling part incl. screws and washers*, Drg. 6090724
13.2 13.3	6090725	Wear plates incl. screws	LxWxH 60x15x3 mm 1 set (9 plates , 18 screws) see *0* *Guide rail incl. screws and wear plates*, Drg. 36-003, item 2+3
14	6090551 (M1706)	Sealing and bearing bush (complete)	See *13.4 Sealing and bearing bush for PSG-M1706,* Drg. 36-001-041
	6091074 (M2110)	Sealing and bearing bush (complete)	See *13.5 Sealing and bearing bush for PSG-M2110, Drg.* 34-0926-001
15	 6090582 6090547	Press screw Ø254 for PSG 3.0/4.0/5.5-600 for PSG 5.5-750	

13.3 Cover with handle, Drg. 36-001-036

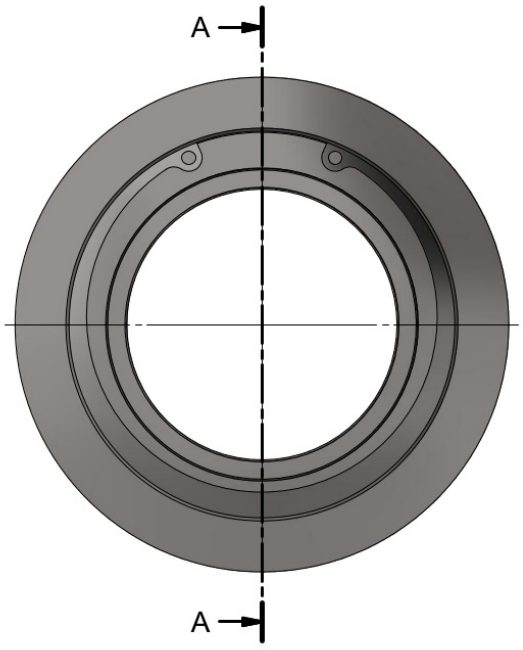


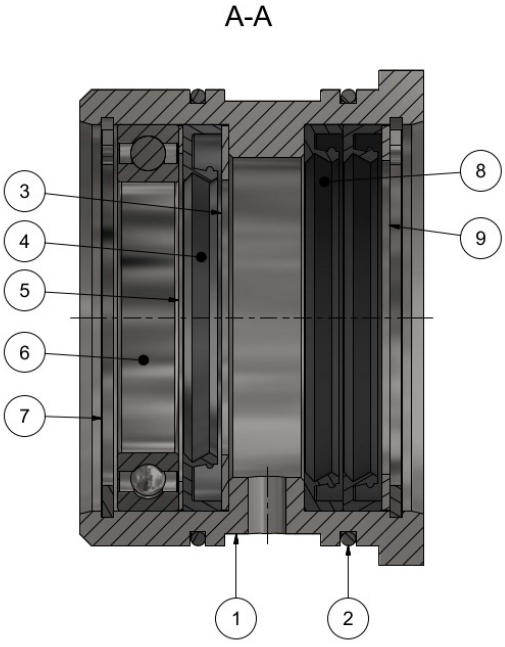
13.4 Sealing and bearing bush for PSG-M1706, Drg. 36-001-041



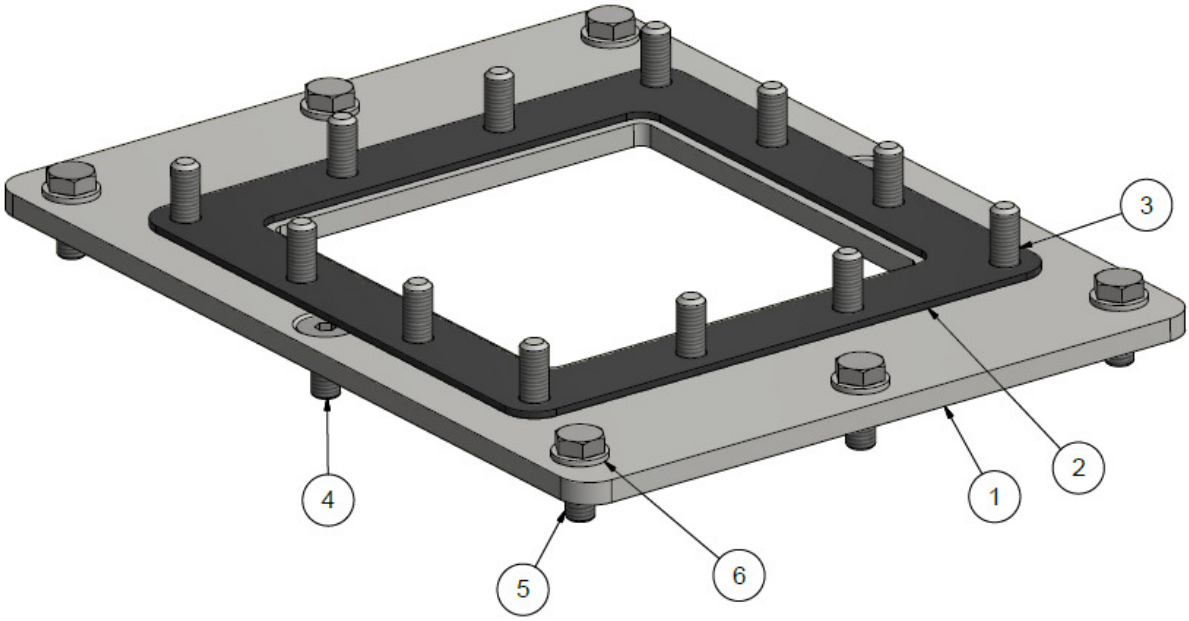


13.5 Sealing and bearing bush for PSG-M2110, Drg. 34-0926-001

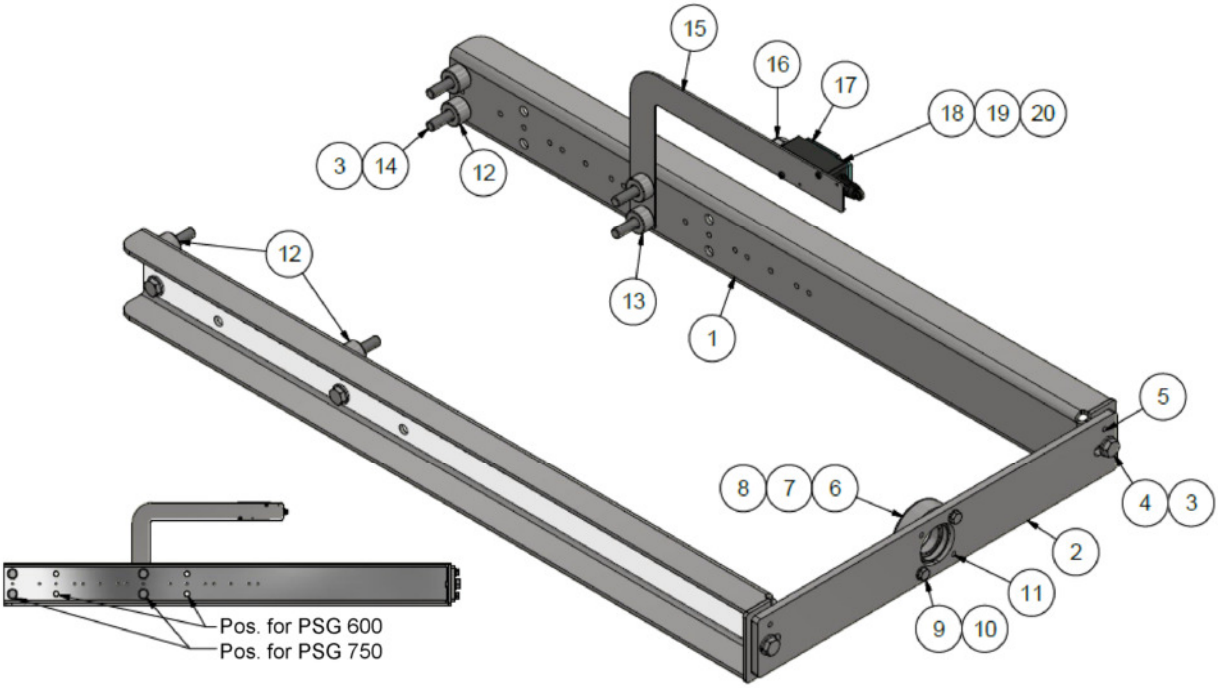




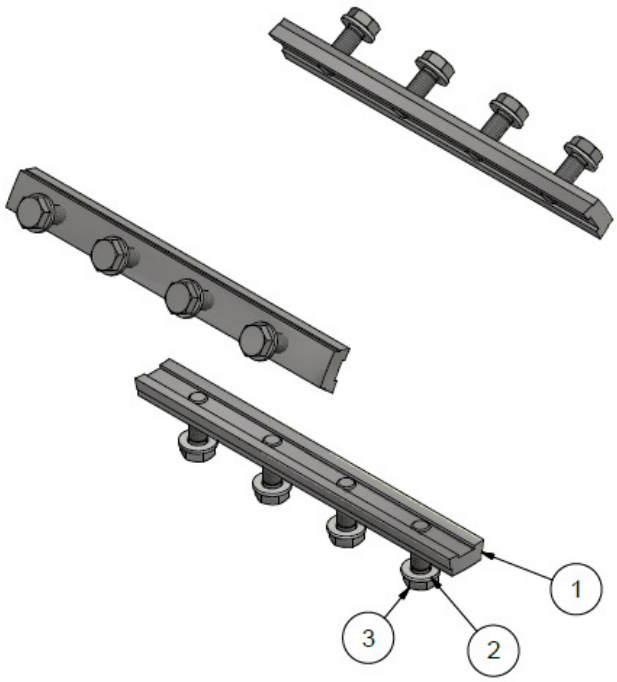
13.6 Hopper adapter, Drg. 36-001-055



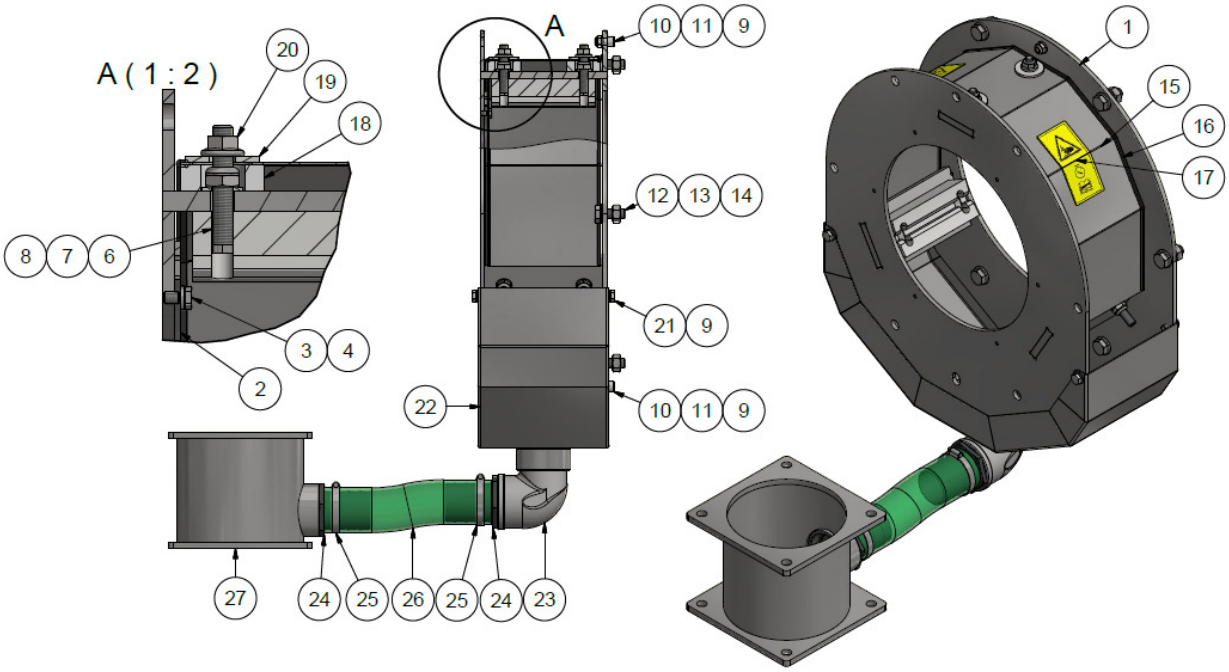
13.7 Front bearing, Drg. 36-001-059



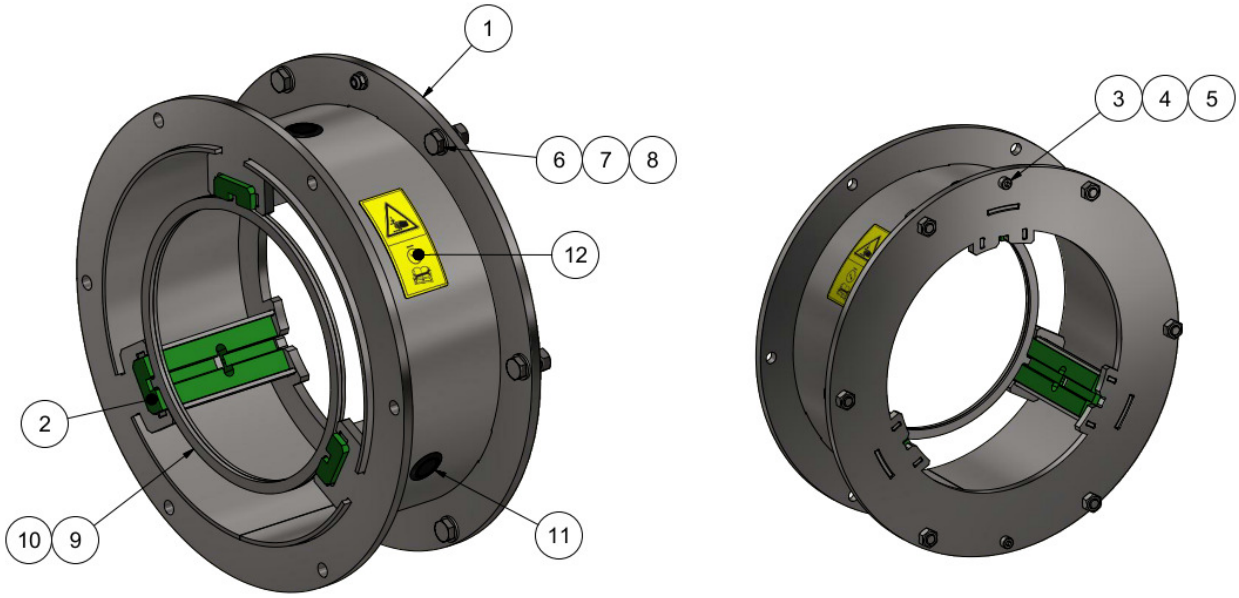
13.8 Stripper for filling part, Drg. 36-001-064



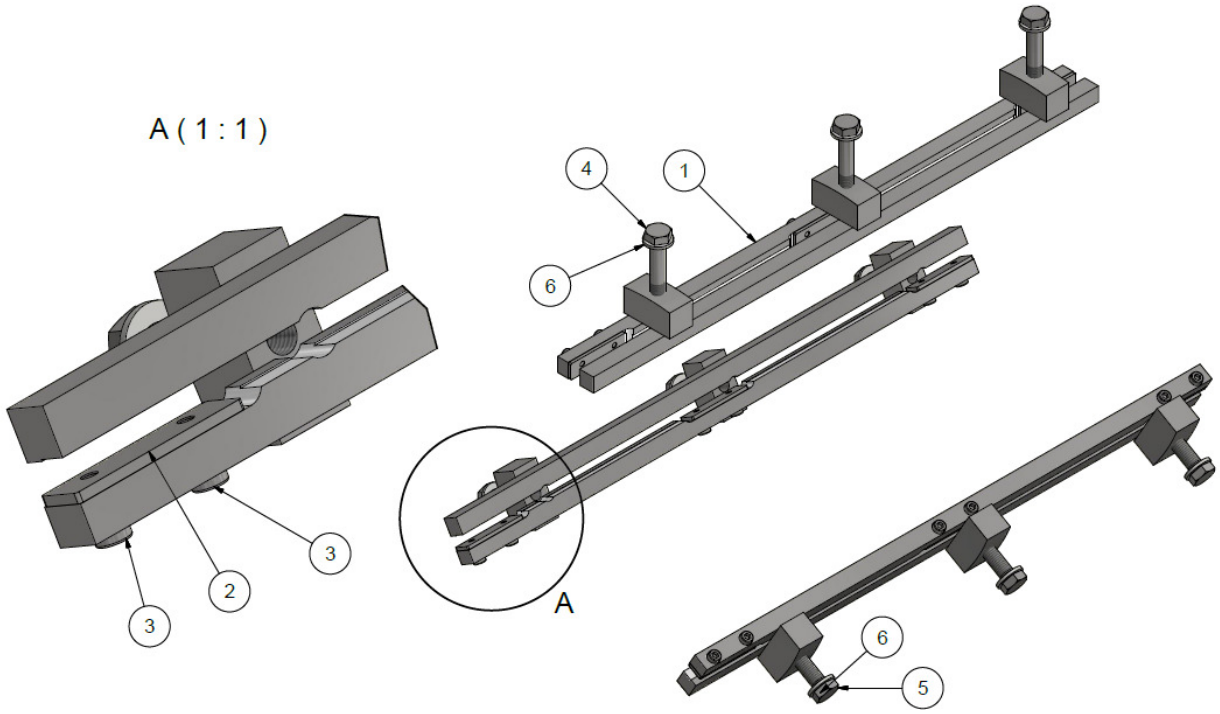
13.9 Screen extension for PSG-M1706, Drg. 36-002



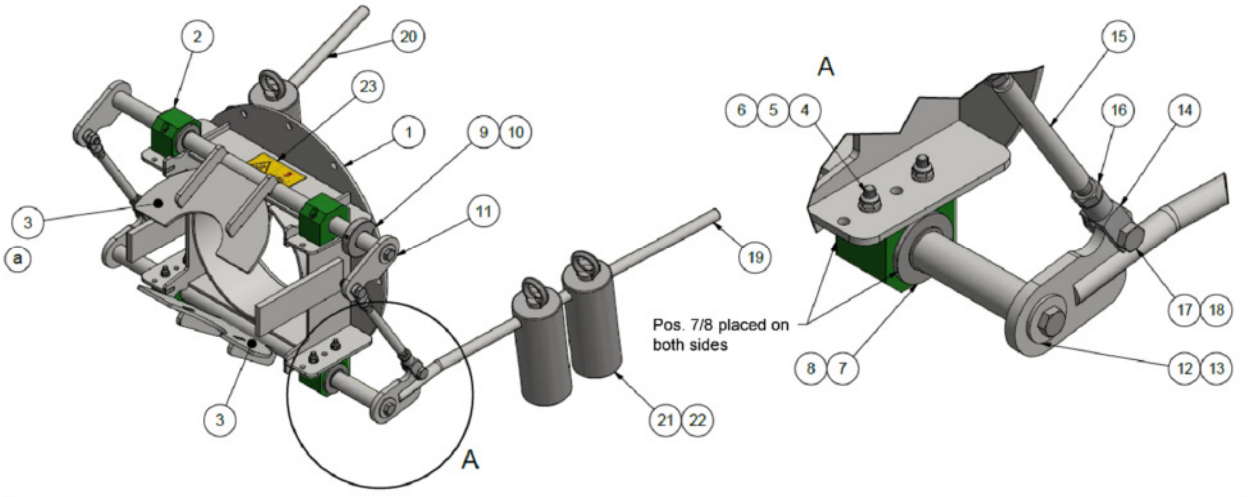
13.10 Screen extension for PSG-M2110, Drg. 34-926-005



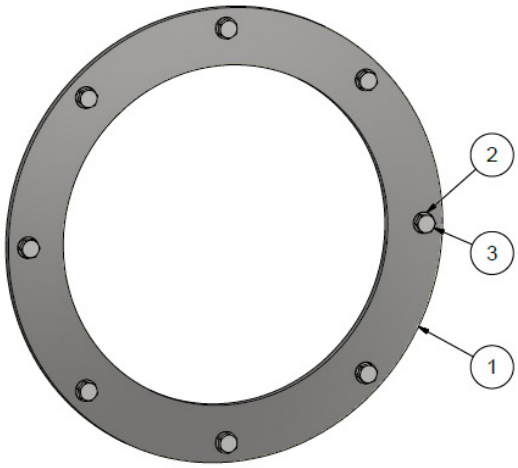
13.11 Guide rail incl. screws and wear plates, Drg. 36-003



13.12 Separator outlet pipe, Drg. 36-014



13.13 Stripper ring for filling part incl. screws and washers, Drg. 6090724



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.

14 MAINTENANCE AND REVISION LIST FOR PSG-M1706/M2110

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 their supervisor.

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

Maintenance/revision on the device with the machine no.	Notes	Date	Signature of installer	Signature of supervisor

You can find us here

Stallkamp

...Lead by innovative technology

Dinklage is in the heart of Germany's Oldenburg Münsterland.

From the A1 exit no. 65, Lohne Dinklage, towards Dinklage, in Dinklage towards Vechta, then Industriegebiet West.

- Pump technology
- Agitating technology
- Stainless steel tanks
- Separation technology

Erich Stallkamp ESTA GmbH
In der Bahler Heide 4 – Industriegebiet West – 49413 Dinklage, Germany
Tel. +49 (0) 4443 / 96 66-0 – Fax +49 (0) 4443 / 96 66-60
info@stallkamp.de – http://www.stallkamp.de

Stallkamp – the competent solution for every application