Gremac e1 operating manual

eGremac e1r (wheeled vehicle)

Gremac e1k (tracked vehicle)

Gremac e1h (hook lift)

EN

Version: 2.1 / 17.12.2023

Table of contents

Contact addresses

Service + Production

Gremac Maschinenbau GmbH & Co. KG
Hansbauer-Weg 7
89441 Medlingen
Phone: +49 (0) 44 07 – 3 28 20 44
gremac.net / info@gremac.net

Foreword

These operating instructions are intended to make it easier to get to know the machine and to use it for its intended purpose.
The operating instructions contain important information on how to operate the machine safely, properly and economically. Observing them helps to avoid hazards, reduce repair costs and downtime, and increase the reliability and service life of the machine.
In addition to the operating instructions, the applicable national regulations for accident prevention and environmental protection must be observed.
The operating instructions must always be available at the place of use of the machine/plant.
The operating instructions must be read and applied by every person involved in work with/on the machine/plant, e.g. operation, including setup, troubleshooting in the work sequence, removal of production waste/disruptive materials, maintenance, disposal of operating and auxiliary materials.

1. Operation, including set-up, troubleshooting workflow, removal of production waste/disruptive materials, maintenance, disposal of operating and auxiliary materials.
2. Maintenance (servicing, inspection, cleaning) and/or
3. Transportation
4. Dismantling / disposal

is commissioned.

The operator of the plant must prepare operating instructions in understandable language and form for the plant. In addition to the operating instructions and the binding accident prevention regulations applicable in the country of use and at the place of use, the recognized technical rules for safe and professional work must also be observed.

Product description

The trommel screen is used for machine screening of various materials.
The machine is available in the following variants:

1. Wheeled mobile with road approval
2. Chain mobile
3. Hook lift

The basic design of all machine types is identical. They essentially differ only in terms of different equipment features.
A machine basically consists of these components:

1. A machine frame made of steel profiles and sheet steel, on which all other components are mounted.
2. A sieve drum with bearing and drive with different hole diameters, or additionally with adjustable sieve linings.
3. A movable material hopper with belt discharge.
4. A conveyor belt under the drum to pick up the fine material.
5. A folding conveyor belt for discharging the fine material
6. A folding conveyor belt for discharging the overflow material
7. A chassis with braking system and lighting for mobile version
8. A track drive as an alternative to the undercarriage.
9. A power generator, if no stationary power connection is available.
10. Various doors and trim parts
11. Axles and drawbar (wheelmobile)
12. Chain running and drive hydraulics (chain mobile)

Functional description

Machine

Separation of the input material is done by a screening drum. The fine material falls through the holes (different sizes or screen linings available). The material is moved by a screw from the inlet to the outlet by the rotation of the drum. The fine material is transported on the conveyor belt under the drum to the discharge belt for fine material and discharged to the side. The overflow material is discharged from the end of the drum by a discharge belt to the tail.

Influencing factors

These factors influence the sorting:

1. Drum speed: The motor is equipped with speed control. Increasing the speed of rotation accelerates the conveyance of the machine. As a result, the throughput rate increases and, under certain circumstances, the quality of the sorting decreases due to the shorter residence time of the material in the machine.
2. The feeding of the machine has a strong influence on the screening process. Sloshing or excessive feeding in terms of quantity lead to a reduction in screening performance and quality. Make sure the hopper is filled with as uniform a layer height as possible.

Intended use

The trommel screen may only be used as intended.
The trommel screen in various designs is intended for classifying and screening of screenable, pre-loosened and dry screening material.

The following materials may be used as screenings:

1. Soil excavation
2. Bark mulch
3. Gravel
4. Sand
5. Wood chips
6. Green waste
7. Biowaste
8. Other dry screenable materials

The machine must stand level and free during operation in the outdoor area (no directly adjacent sieve hills). Inside industrial buildings, the machine may only be operated directly from the mains (no genset operation). The building must have sufficient height for safe loading. Only the attached supports and not the support wheel may be used to ensure safe standing.

The screenings are loaded into the hopper by means of an earth-moving machine or other equipment. Manual loading is not as intended.

It is necessary to follow the steps described in the operating instructions.

In the event of deviations, it is necessary to carry out a new risk assessment in accordance with the Machinery Directive and to document the changes in the relevant documents.

Use of the machine for purposes other than those specified is prohibited.

Other intended uses include setting up the machine (bringing it into the operating position), performing cleaning and maintenance work, and troubleshooting, fault elimination and repair in accordance with the operating instructions.

Observe the following instructions to ensure trouble-free operation:

To prevent damage to the machine, please observe the following points: (Failure to do so will void the warranty).

1. The fed material may only be fed to the machine in a loose, pressed-on state.
2. Heavy, large foreign materials must be removed before feeding to the machine.
3. The dust load in the effective area of the machine must not exceed the legally applicable limit values of the user country (in Germany, the Federal Immission Control Act must be observed).
4. Long bulky parts must be removed or dissolved / crushed.
5. Discharge speed of the conveyor belts must be adapted to the performance of the machine and the screening material.

Requirements for maintaining the functionality of the machine:

1. Maintenance, servicing and inspection plans/logs must be kept and adhered to in order for warranty claims to be granted. Access to maintenance records must be possible at all times by the manufacturer.
2. Malfunctions, failures, damage or defects to parts or assemblies must be reported to the manufacturer in writing within 24 hours if warranty claims are made.

In the event of malfunctions, damage or faults in one or more of the following components, the machine must be shut down immediately to prevent consequential damage:

1. Electrical damage / fault on electrical drive components.
2. Mechanical damage / fault on safety equipment.
3. Mechanical damage / fault on drive elements / assemblies.
4. Mechanical damage/fault on bearings and couplings.
5. In the event of malfunctions, damage or faults on other elements or groups, the machine can continue to be operated until the time of repair after confirmation by the manufacturer.
6. Elements or assemblies of other manufacturers listed in this operating manual which have been installed in the machine are subject to the operating, maintenance, servicing and inspection instructions of the respective manufacturers, unless otherwise described. Any promises to the contrary regarding deviations from these documents provided require confirmation by the respective manufacturer.
7. Any promises to the contrary concerning deviations from the properties/conditions described in this operating manual and the maintenance, servicing and inspection plans/protocols provided by the manufacturer must be confirmed in writing by the manufacturer.
8. The operating, maintenance, repair and inspection instructions valid at the time of delivery of the machine apply.
9.

The validity remains for the user as long as the manufacturer has not provided the customer with more current operating, maintenance, servicing and inspection instructions and indicated compliance. The manufacturer reserves the right to make changes to the operating, maintenance, servicing and inspection instructions as well as technical changes in the interest of progress.

Inadmissible use / foreseeable misuse

Reasonably foreseeable misuse exists, in particular, due to the introduction of screening material not approved for this machine (e.g. flammable or explosive substances, very moist or wetting screening material, stones or metal above a certain grain size).

Materials containing very coarse components (grain size > 300 mm), in particular coarse stones, concrete, metal parts (> 10 kg) or highly flammable materials must not be checked in.

It is forbidden to operate the trommel screen inside unsuitable buildings (e.g. insufficiently high industrial halls) or in the area of dangerous explosive atmospheres. Inside buildings, genset operation is not allowed. Operating the machine in a non-horizontal position is not as intended.

Furthermore, the machine must not be set up in the area of electrical overhead lines.

Operation of the machine using only the support wheel is not as intended. It is not permitted to transport the machine while it is loaded or to move it manually (by hand) or with an unsuitable tractor.

It is forbidden to interfere with the moving machine parts (e.g. screening drum).

Furthermore, there is always the possibility that existing protective devices are dismantled or the existing sensors are manipulated or triggered by means other than the components intended for this purpose.

The **misuse** mentioned must be explicitly prohibited in the operating instructions as well as by written operating instructions. Furthermore, the use of the equipment must be explicitly limited to the above-mentioned intended use in the operating instructions.

This documentation refers exclusively to the operation of the system in the configurations described. In the event of changes to the assemblies of the configuration, the risk assessment must be repeated for the affected system parts or, in the event of significant changes within the meaning of the Product Safety Act, for the respective machine.

In principle, it is possible and customary to replace individual components installed on the system with components of identical design. This does not constitute a significant change / substantial modification within the meaning of the EC Machinery Directive or the Product Safety Act.

The manufacturer is not liable for defects in machinery or equipment and personal injury, even to those parts of the equipment that were not supplied by the manufacturer, which are caused by one or more of the following causes:

1. When used for a purpose other than that described under “Intended use”.
2. In case of modifications to mechanics / electrics / control system by the customer or a third party without authorization by the manufacturer.
3. Failure to comply with specifications for operating materials and non-original spare parts.
4. Failure to observe the operating instructions and the operating, maintenance and inspection instructions contained therein or missing and/or incomplete maintenance records specified by the manufacturer.
5. Influence of unpredictable physical quantities (e.g. vibrations, mass, etc.) on the machine/plant.
6. Influence of natural forces and/or variables and/or operating conditions/conditions that cannot be influenced by the manufacturer, as well as inadequate maintenance/maintenance due to a lack of or inadequate maintenance strategy.
7. Improper use and/or operation or removal of guards.
8. Damage caused by feeding the wrong sieve material.
9. Natural or increased wear or wear on parts / assemblies of the plant / machine, caused by operating conditions of the machine / plant.
10. Incorrect or incomplete documentation of other manufacturers’ products that are a part of the machine.
11. Consequential damage caused by one or more of the causes described under “improper use”.

Safety instructions

Principle

1. The machine/plant is built in accordance with the state of the art and recognized safety regulations. Nevertheless, your use may cause danger to life and limb of the user or third parties or impairment of the machine and other material assets.
2. Only use the machine/system when it is in perfect working order and for its intended purpose, in a safe and hazard-conscious manner and in compliance with the operating instructions! In particular, faults that may affect safety must be rectified by trained specialist personnel.
3. Never operate the machine or system at a higher speed than specified.
4. Intended use also includes observing the operating instructions and complying with the inspection and maintenance conditions.

Organizational measures

1. Always keep the operating instructions within easy reach at the place of use of the machine / system!
2. Complementary to the operating instructions, observe and instruct generally applicable legal and other binding regulations for accident prevention and environmental protection!
3. Such obligations may also concern, for example, the handling of hazardous substances or the provision/wearing of personal protective equipment.
4. Supplement the operating instructions with instructions including supervisory and reporting obligations to take account of special operational features, e.g. with regard to work organization, work processes, personnel deployed.

5. The personnel assigned to work on the machine must have read the operating instructions, and in particular the safety instructions, before starting work. During the work operation it is too late. This applies in particular to personnel working on the machine only occasionally, e.g. during setup, maintenance.
6. At regular intervals, the safety and danger-conscious work of the personnel must be checked in compliance with the operating instructions.
7. Always wear the prescribed “personal protective equipment” (e.g. safety goggles, hard hat, hearing protection foot protection respiratory protection and any other necessary protective equipment)
8. Observe all safety and danger instructions on the machine/plant!
9. Familiarize yourself with the emergency stop functions of the machine or system.
10. Keep all safety and danger notices on/at the machine complete and in legible condition!
11. In the event of safety-relevant changes to the machine/plant or its operating behavior, shut down the machine/plant immediately and report the fault to the responsible office/person!
12. Protective devices (protective grids, protective hoods or covers) must not be removed under any circumstances.
13. Damaged switches and protective devices must be replaced immediately.
14. Do not make any changes, additions or conversions to the machine/plant which could affect safety without the manufacturer’s approval! This also applies to the installation and adjustment of safety devices and to welding on load-bearing parts.
15. Carefully reassemble and fasten parts to be dismantled for transport purposes before recommissioning!
16. For recommissioning, proceed only in accordance with the operating instructions!
17. Never bypass limit switches or other safety switches.
18. Spare parts must comply with the technical requirements specified by the manufacturer. This is always guaranteed with original spare parts.
19. Replace hydraulic hoses at specified or appropriate intervals, even if no safety-relevant defects are apparent!
20. Do not make any program changes (software) to programmable control systems!
21. Prescribed intervals or intervals specified in the operating instructions for recurring tests/inspections must be observed.
22. Make the location and operation of fire extinguishers known!
23. Observe the fire alarm and fire fighting possibilities!
24. By means of a risk assessment, the operator of the plant must determine and arrange for the type, scope and deadlines for required inspections.

Personnel selection and qualification

- Work on/with the machine/plant may only be carried out by reliable personnel. Observe the legally permissible minimum age!
- Only use trained and instructed personnel, clearly define the responsibilities of the personnel for operation, setup, maintenance and repair!
- Ensure that only authorized personnel work on the machine!
- Define the machine operator’s responsibility and enable him to reject instructions from third parties that are contrary to safety requirements!
- Personnel who are to be trained, instructed or who are undergoing general training may only work on the machine/plant under the constant direction and supervision of an experienced person!
- Work on the electrical equipment of the machine/plant may only be carried out by a qualified electrician in accordance with the electrotechnical regulations.
- Only personnel with special knowledge and experience in hydraulics may work on hydraulic equipment!
- Work on the electrical components of the machine may only be carried out by trained and instructed electricians.

Safety instructions for specific operating phases

1. Familiarize yourself with the work environment at the work site before starting work. The working environment includes, for example, the obstacles in the working and traffic areas.
2. Take measures to ensure that the machine/plant is only operated in a safe and functional condition!
3. Only operate the machine when all protective devices and safety-related equipment, e.g. detachable protective devices, emergency stop devices, sound insulation, suction devices, are present and functional!
4. Remove all tools or other foreign objects from the operating area before starting the system.
5. Check the machine/plant for externally visible damage and defects at least once per shift. Immediately report any changes that have occurred (including those in operating behavior) to the responsible office/person. If necessary, stop the machine immediately and secure it.
6. Before starting work, all rotating machine parts must be inspected daily for foreign bodies that have wound up and all moving elements must be inspected for trapped foreign bodies and removed if necessary (fire hazard).
7. In the event of malfunctions, shut down the machine/system immediately and secure it! Eliminate faults immediately.
8. Observe switch-on and switch-off procedures, control displays according to the operating instructions!
9. Do not switch off or remove the suction and venting devices while the machine is running!
10. Before switching on the machine/plant, make sure that nobody can be endangered by the starting machine/plant!
11. Never switch on the machine/plant before all other persons in the area of the machine/plant have been warned and have moved away from the operating area.
12. Keep the operating area free of obstacles that someone could trip over and fall onto a working machine or system.
13. Never sit or stand on objects with which you could fall against the machine or system.
14. Never leave the machine/plant unmonitored during operation.
15. Make sure that you do not bring fingers, hands or other body parts into the machine or plant or close to moving parts when control circuits are active!
16. Refrain from any mode of operation which impairs the stability of the machine!
17. Air, hydraulic and electrical connections must be switched off when the machine or system is not in operation.
18. Protective devices may only be opened after the machine or system has come to a standstill.

Special work within the scope of use of the machine

Maintenance activities as well as troubleshooting in the work flow

1. Observe the setting, maintenance and inspection activities and deadlines specified in the operating instructions, including information on the replacement of parts/parts equipment. This activity may only be performed by qualified personnel.
2. All repair work must always be carried out when the machine is at a standstill.
3. Inform operating personnel before starting to perform special and maintenance work! Name the supervisor!
4. For all work concerning the operation, production adjustment, conversion or setting of the machine/plant and your safety-related equipment as well as inspection, maintenance and repair, observe switch-on and switch-off procedures according to the operating instructions and notes for maintenance!
5. Secure the maintenance area as far as necessary!
6. If the machine/plant is completely switched off during maintenance and repair work, it must be secured against being switched on again unexpectedly:

Lock main command devices and remove key and/or place warning label on main switch.
Note: For maximum protection, the power source should be locked with a lock for which only one person has the key. This prevents anyone from inadvertently turning on the power to the machine or equipment while it is being serviced.

7. Keep all handles, steps, railings, platforms, ladders free of dirt!
8. Clean and purge the machine/plant according to the instructions in this manual.
9. After cleaning, check all fuel, engine oil, hydraulic oil lines for leaks, loose connections, chafing and damage! Immediately rectify any defects found!
10. Always tighten screw connections that have been loosened during maintenance and repair work!

Notes on special types of hazards

Electrical energy

1. Three-phase sockets must have a right-hand rotating field (VDE0100, part 600, ABS 14).
2. Only use original fuses with specified amperage! In case of malfunctions in the electrical power supply, switch off the machine/plant immediately!
3. Work on electrical systems or equipment may only be carried out by a qualified electrician or an electrically instructed person (EUP) under the direction and supervision of a qualified electrician and in accordance with electrical engineering regulations.
4. Machine and system parts on which inspection, maintenance and repair work is carried out must be disconnected from the power supply, if required. First check the disconnected parts for voltage, then ground and short-circuit and insulate adjacent live parts!
5. The electrical equipment of a machine/plant must be inspected/tested regularly. Defects, such as loose connections or scorched cables, must be rectified immediately.
6. If it is necessary to work on live parts, call in a second person to operate the emergency stop or main switch with voltage release in an emergency. Close off the work area with a red and white safety chain and a warning sign. Only use voltage-insulated tools!
7. When working on high-voltage assemblies, connect the supply cable to ground after disconnecting the voltage and short-circuit the components, e.g. capacitors, with a ground rod!

Gas, dust, steam, smoke

1. Only carry out welding, flame-cutting and grinding work on the machine/plant if this has been expressly approved. There may be a risk of fire or explosion!
2. Before welding, burning and grinding, clean the machine/plant and its surroundings from dust and flammable substances and ensure sufficient ventilation (risk of explosion!).
3. When working in confined spaces, observe existing national regulations if necessary!

Hydraulics, pneumatics

1. Work on hydraulic equipment may only be carried out by persons with special knowledge and experience in hydraulics!
2. Check all lines, hoses and screw connections regularly for leaks and externally visible damage! Remove any damage immediately! Oil splashing out can cause injuries and fires.
3. Depressurize system sections to be opened and pressure lines (hydraulic, compressed air) according to the module descriptions before starting repair work!

4. Lay and install hydraulic and compressed air lines properly! Do not mix up the connections! Fittings, length and quality of hose assemblies must meet the requirements.

Noise

1. Machine enclosures and soundproofing devices on the machine/plant must be in the operating position during operation.
2. Wear the prescribed personal hearing protection!

Oils, fats and other chemical substances

1. Be careful when handling hot operating and auxiliary materials (risk of burns or scalding)!
2. When handling oils, greases and other chemical substances, observe the safety regulations applicable to the product!

Operating instructions

Please observe the notes in the respective sections, which are marked by an additional warning symbol.

Transportation

Stationary and chain mobile version

Suitable industrial trucks or cranes can be used to lift the machine. These hoists may only be attached to the attachment points provided for this purpose. Please note that if the floor is uneven, the machine must be properly secured to prevent it from slipping/rolling sideways!
All relevant safety regulations must be observed during all transport, lifting or shifting operations. This also includes that only tested and suitable lifting equipment may be used!
As a general rule, never reach under a suspended load. The machine can be moved very slowly with suitable securing devices or drive vehicles, provided that the intended transport route is appropriately secured.

Safety regulations

1. Only use suitable, undamaged and fully functional means of transport with sufficient carrying capacity!
2. Observe transport dimensions and transport weight (max. set-up weight).
3. Attach the necessary transport safety devices and transport equipment.
4. Only attach transport / slinging equipment at the points provided for this purpose.
5. Secure against slipping.
6. Pay attention to the center of gravity.
7. Avoid jerky settling.
8. Comply with accident prevention regulations and local regulations.
9. Transport the machine carefully, do not lift, support or push on sensitive parts such as the control cabinet, conveyor belts, panelling, etc.

Transport preparations

1. Remove screenings and other loose parts in the machine
2. Secure moving machine parts

Wheel mobile version

Please ensure that only towing vehicles with the necessary towing capacity and the appropriate connections for lighting are used.

For road transport, a towing vehicle with sufficient towing capacity and drawbar load is required.

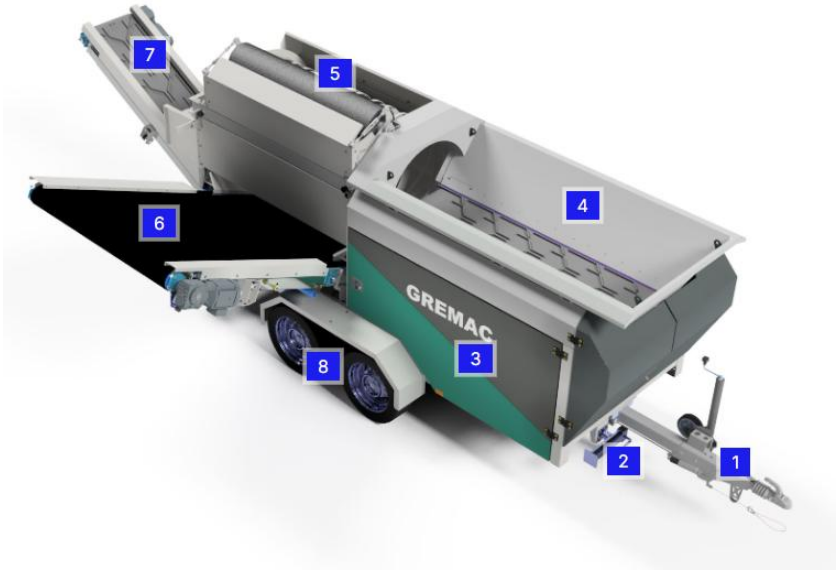
Storage

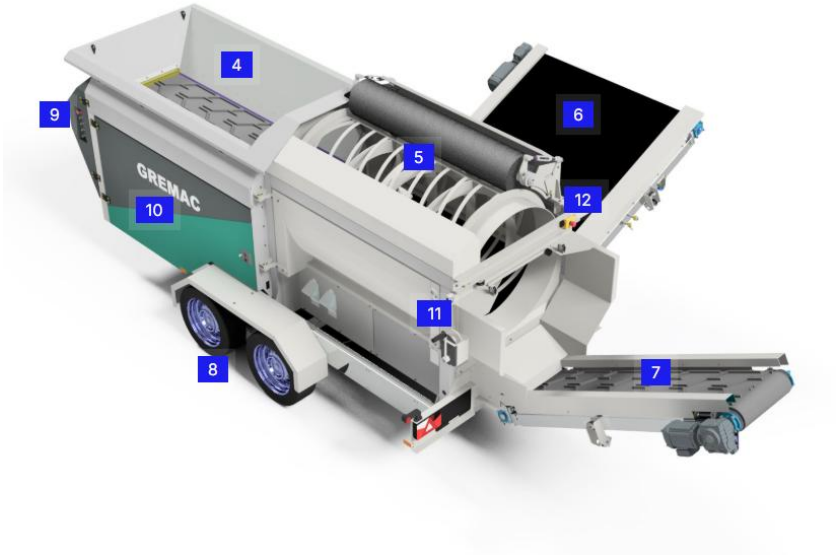
For longer-term storage, please observe the following instructions.

1. Storage should be in a closed room.
2. Protect the machine from moisture.
3. Condensation due to high humidity and fluctuating temperatures must be avoided.
4. Before and after an extended period of storage, all bearing points must be lubricated in accordance with the maintenance and inspection schedules.
5. After a longer storage period, all parts (cables, rubber) that are subject to a natural aging process must be checked for suitability / usability.
6. Observe the storage instructions of the respective generator manufacturer.

Machine overview

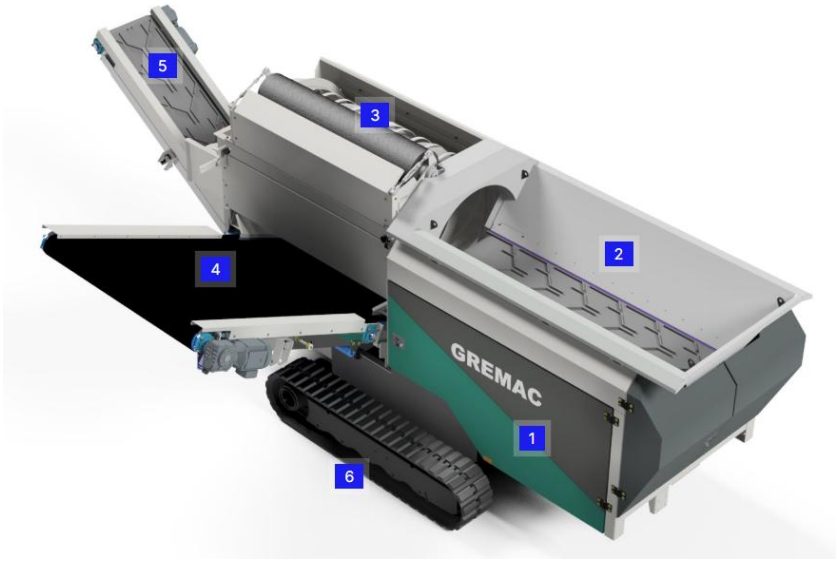
Gremac e1r (wheel mobile)

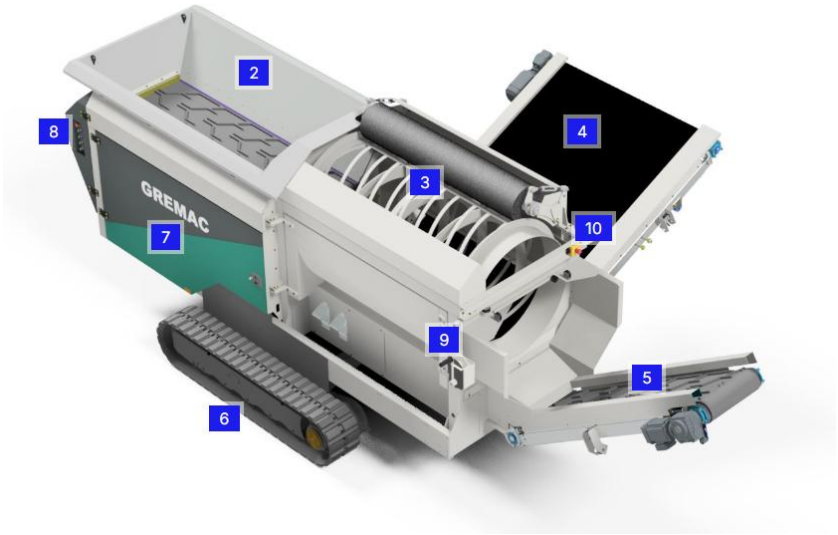




1. Drawbar with hand brake and support wheel
2. Support foot
3. Right flap (parking space for power generator)
4. Bunker
5. Sieve drum with cleaning brush
6. Conveyor belt for screenings
7. Conveyor belt for oversize
8. Chassis with road approval
9. Control panel
10. Left flap (control cabinet)
11. Hand crank for tail conveyor
12. Emergency stop at the rear of the machine

Gremac e1k (tracked version)





1. Right flap (parking space for power generator)
2. Bunker
3. Sieve drum with cleaning brush
4. Conveyor belt for screenings
5. Conveyor belt for oversize
6. Chain drive
7. Left flap (control cabinet)
8. Control panel
9. Hand crank for tail conveyor
10. Emergency stop at the rear of the machine

Gremac e1h (hook lift)

1. Hook lift frame
2. Right flap (storage space for aggregate)
3. Bunker
4. Sieve drum with cleaning brush
5. Conveyor belt for screenings

All other functional elements correspond to the e1r/e1k.

Commissioning

Lineup

Before commissioning, the following conditions must be met:

1. – The surface on which the machine is installed must be level and have sufficient load-bearing capacity.
2. – Installation in the vicinity of overhead power lines is prohibited or a sufficient distance must be maintained.
3. – The machine must be aligned horizontally with the mechanical supports. The support wheel must be completely unloaded.
4. – Ambient temperatures of more than 35°C must be avoided. They may lead to the motor no longer being able to dissipate sufficient heat to the environment, causing the machine to shut down.

Accessibility

If the machine is to be installed in one place for a longer period of time, it must be ensured that all parts requiring maintenance are easily accessible. Likewise, the safety area of 5 m all around must be observed.

Electrical connection

The machines are designed according to VDE regulations. Before connecting to a power supply, check whether a suitable connection exists. If you have any questions about this, please contact the electrician responsible for the stationary power installation.

Connection values

The values for the respective machine type can be found in the technical data.

Connecting the machine to the mains

Before connecting the machine, check that the mains voltage and frequency are suitable for the machine (see nameplate). In case of deviations, do not connect the machine.
The colors of the individual wires of the supply line:
Yellow/green: protective conductor
Blue: Neutral
Black-brown-black: are the 3 three-phase phases (outer conductors), designation in the circuit diagram L1, L2, L3
Purple/white: Control lines 24V/0V

Operation of the machine with a power generator

When using the machine with a power generator, please observe the information sheet “Use of a power generator with trommel screen machines”.

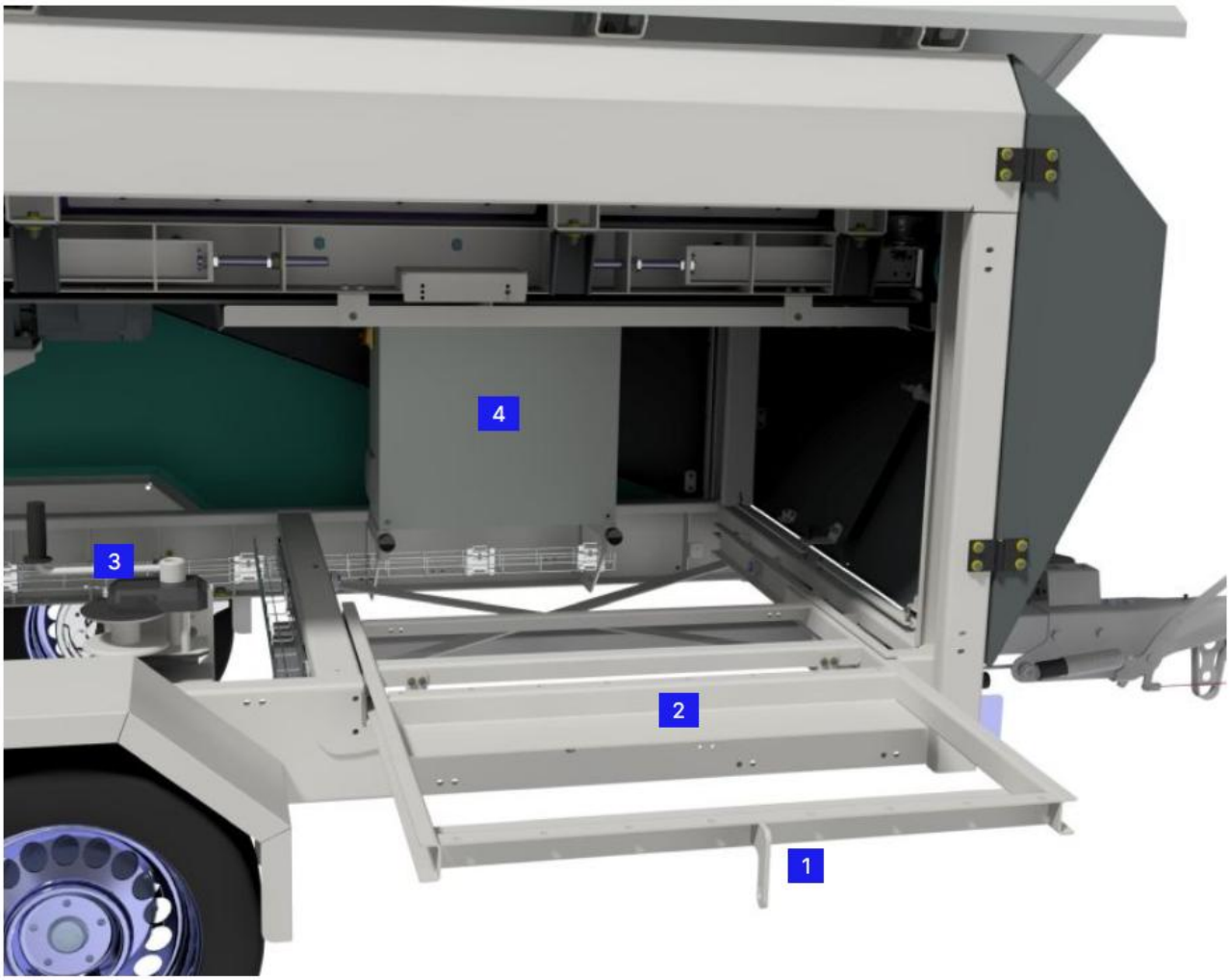
Control / System integration

1. During electrical installation, make sure that the direction of rotation of the mains is correct.
2. In the event of an emergency stop, all three phases (L1, L2, L3) must be disconnected from the power supply. Stopping by switching off the control current is not permitted. Observe the applicable regulations.
3. A protection test according to VDE must be carried out by a qualified electrician before commissioning. In the event of a fault or malfunction, all transport systems must also be stopped The principles of functional safety must be taken into account.
4. The machine must be included in the emergency stop circuit. No additional hazards may result from this integration.
5. For the design of safety-related systems, the applicable national and international standards and laws must be observed.

For further technical details of the gearmotors / frequency inverters or other electrotechnical components, refer to the documentation of the respective manufacturers in the appendix, as well as relevant technical standards and regulations.

Drawer for power generator

The machine has a pull-out on the right side of the machine to accommodate a power generator. To select the right power generator, please refer to the information sheet on using a power generator.



1. Safety latch
2. Extract for power generator
3. Hand crank for conveyor belt for screen fraction
4. Control cabinet

Maximum dimensions of the generator

Length: 950 mm
Width: 590 mm
Height: 645 mm
Weight: max. 250 kg

When using a generator, care must be taken to ensure that the exhaust gases can reliably escape from the engine compartment. An exhaust system is mandatory for this purpose.

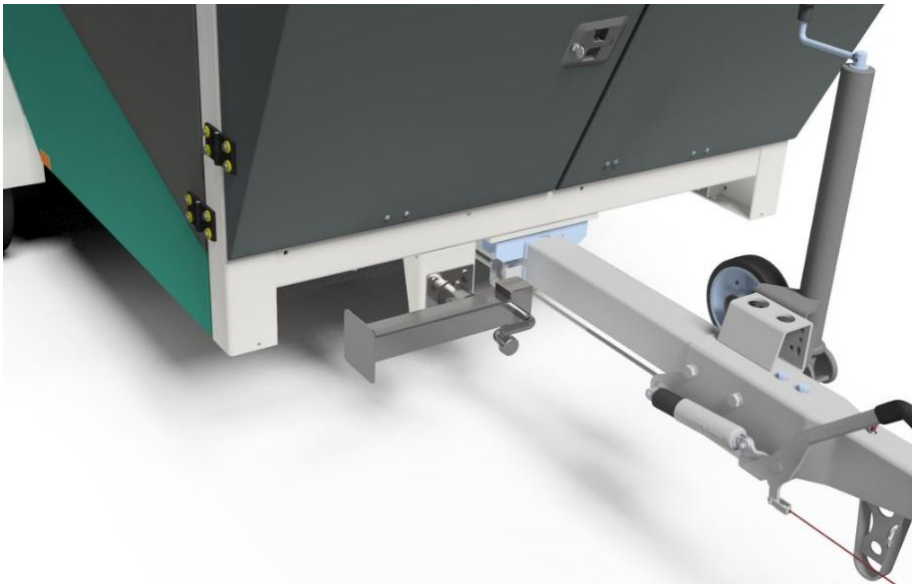
Before releasing the safety latch, make sure that the machine is on a level surface and not hanging in the direction of the pull-out. There is a risk of injury if the drawer slides out in an uncontrolled manner.

Settings and operation

The machine must be set up on a level and load-bearing surface. In particular, the area under the support feet and must have sufficient load-bearing capacity. The area under the support feet can be increased with suitable substructure material

The machine must not be placed on the support feet or operated while it is attached to the vehicle. Otherwise, high forces would be generated at the drawbar during loading, which could lead to damage. This also applies to the jockey wheel. When the machine is ready for operation, the support wheel on the towing device must be unloaded. The maximum load of the support wheel of 250 kg must not be exceeded under any circumstances. Otherwise, this will result in damage to the machine.

Use the four mechanical support feet to align the machine horizontally. Make sure that the axle is unloaded.
Beams or slabs must be used to prevent the support feet from sinking.
Before disconnecting the machine, the handbrake must be pulled (wheel-mobile machine only).



Hold the support on the support tube with one hand and pull out the bolt on the connection to the machine. Attention: the support can now be completely removed from the rotary axis. Make sure that the support does not fall down.
Rotate the support from the horizontal to the vertical position and insert the bolt into the hole provided until the locking ball is visible on the back of the hole. Now turn the crank clockwise to extend the support. To retract, turn them counterclockwise. Locking in transport position is done in reverse order.

Attention: Before starting to drive, all supports must be brought into transport position and the correct seating of the plug pin must be checked. The support must always be completely retracted in the transport position.

Energy supply

The machine can be supplied with power by a power generator or also stationary with a CEE – 16 A – three-phase cable.

Switching between the supply forms is done by reconnecting the CEE – 16 A three-phase plug. The machine must be switched off before disconnecting the plug. For this purpose, the main switch must be in the “OFF” position.

The plug is located on the right side of the machine at the generator parking position. The main switch is located on the right side of the control cabinet.

After establishing the connection and, if necessary, starting the generator, the main switch must be switched to the “ON” position. The controller is now supplied with power and starts. After this, the control unit is ready for operation. After power is applied, the controller is in emergency stop mode to prevent components from starting up automatically.

Emergency stop

The machine has three emergency stop switches (on the control panel, on the right rear of the machine, on the cable remote control). Pressing the red buttons activates the emergency stop. The machine stops immediately. All drives are switched off. If a power generator is used, it will continue to run even though the emergency stop is activated. The generator must be stopped at the device itself.

(Fig. Emergency stop on the control unit)

As soon as the emergency stop has been activated, the “Stop/Reset” key flashes red. To deactivate the emergency stop, it must be pulled out to unlock it. To reset, the “Stop/Reset” key must be held down for at least 3 seconds. After this, the red display goes out and the “Start” key flashes green. The machine is now ready for takeoff.

Operating unit

The functions of the machine are operated via the control panel on the left front of the machine.

Buttons and displays on the operating unit

1. Emergency stop (Pressed: Emergency stop activated; Pulled: Emergency stop deactivated)
2. Stop/reset button with LED
3. Start button with LED
4. Hopper band on/off with LED
5. Bunker belt speed adjustment
6. Screen drum on/off with LED
7. Sieve drum speed adjustment
8. Fine goods conveyor on/off with LED
9. Fine material belt speed adjustment
10. Overcorn band on/off with LED
11. Oversize grain belt Speed adjustment

LED signals

Stop/Reset button (1)

1. Flashing red: Emergency stop actuated
2. Lights up permanently red: Fault

Start button (3)

1. Flashing green: Machine ready to start
2. Lights up permanently green: Machine started

Component selector switch (4, 6, 8, 10, 12)

1. Flashing white: Fault
2. Light permanent: Component started / running

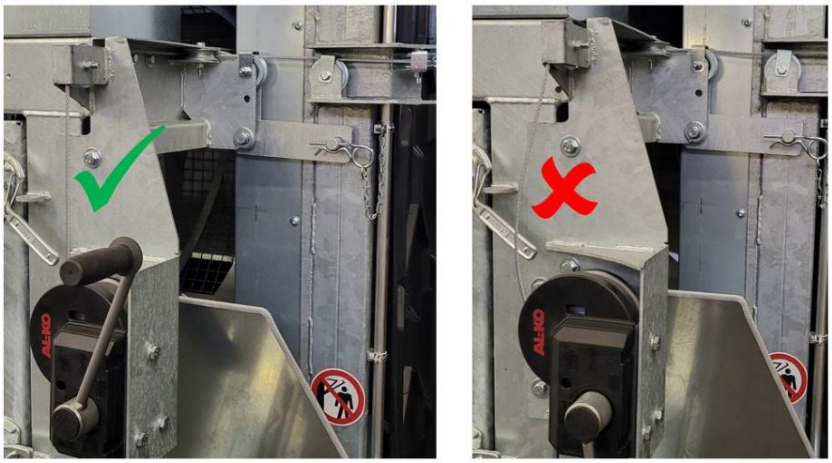
Folding and unfolding conveyor belts

The folding conveyor belts are each operated by a manual rope winch. An electric winch is available as an option.

Attention: It is forbidden to stay under the conveyors during the folding process!

Before operating the manual wire rope winch/electric wire rope winch, remove the transport lock. This is located on the left side of the conveyors.

Caution: Before removing the transport lock, make sure that the cable of the winch is taut. If the rope is not tensioned, there is a risk that the conveyor belt will fall down after the transport lock has been released, resulting in serious injuries.



(Fig. winch; on the left, tensioned rope, on the right, untensioned rope).

The figure above shows a correctly tensioned rope on the left side. In the right picture, the rope is not correctly tensioned. Under no circumstances should the transport lock be removed here.

If the chain/rope is sagging, the transport lock must not be removed under any circumstances! For manual folding, turn the hand crank until the rope is taut. Make sure that the rope winds up correctly on the rope drum.

Caution: Never touch the rope during operation. There is a risk of injury from being pulled into the cable winch

The manual folding can be set to the desired position by turning the crank handle. Lower the conveyor belts until the securing chains/securing ropes bear the load of the conveyor belt and the rope of the rope winch is relieved.
The slope of the stockpile belts in working position may be between 10 and 30°. If the material is not transported properly, reduce the angle.

Starting the machine

Manual operation

1. Red LED of the “Stop/Reset” key (2) flashes: Unlock all emergency stop buttons and press the “Stop/Reset” button for 3 sec. The red LED goes out and the “Start” key (3) starts flashing green.
2. Manual operation of a single component: Select the respective component by turning the switch (4, 6, 8, 10, 12) to the right. By pressing the “Start” key (3), the control starts the respective selected components. The speed can be adjusted via the respective potentiometer.

Automatic operation

1. Red LED of the “Stop/Reset” key (2) flashes: Unlock all emergency stop buttons and press the “Stop/Reset” button for 3 sec. The red LED goes out and the “Start” key (3) starts flashing green.
2. Automatic mode: Select all components by turning the switches (4 +6 + 8 + 10 + 12) to the right. The controller now switches to automatic mode. By pressing the “Start” button (2), the control starts all components of the machine starting with the stockpile conveyors, then the screening drum and finally the hopper.

Start-up warning

The machine is equipped with a horn, which signals the start-up in automatic mode. Three warning signals sound before the components start up. In manual mode, there is no start-up warning. Before starting the machine, always make sure that there are no persons in the danger zone.

Stop machine

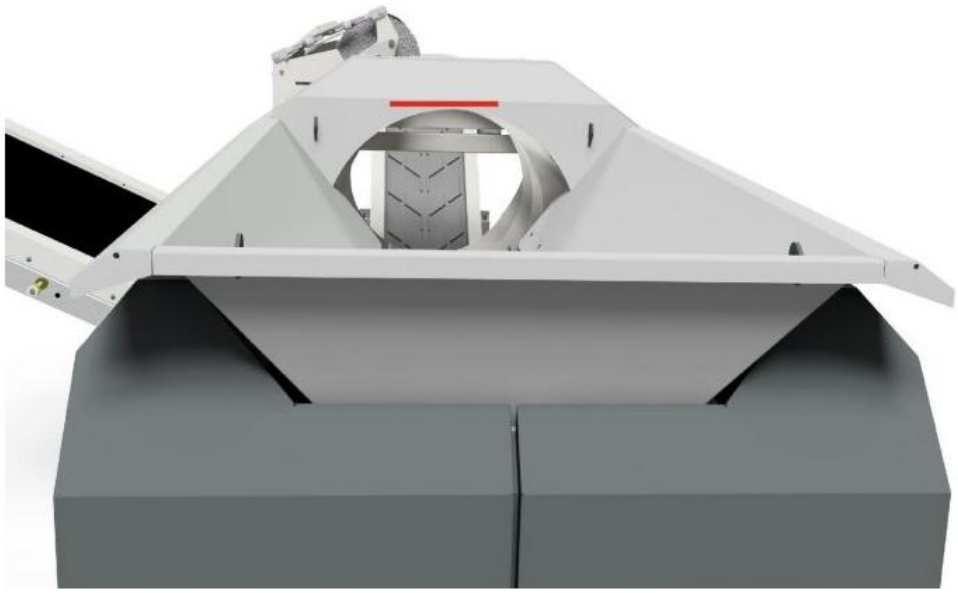
The machine is stopped by pressing the “Stop/Reset” key (2). The machine is also stopped as soon as a selector switch (4, 6, 8, 10, 12) of the components is switched on or off. This is for safety to exclude incorrect operation.
If a problem occurs with a component during startup (e.g. blockage), the controller makes several attempts to start the component. If this is not successful, the machine is stopped and a fault indication is given.

1. The LED of the selector switch of the affected component indicates a with fault by a flashing signal.
2. The LED of the “Stop/Reset” key lights up red continuously.

For more information on the fault, refer to the Troubleshooting chapter.

Bunker filling

The machine is filled by means of a wheel loader, excavator or upstream conveyor belt. Care must be taken to ensure that the bunker is not overfilled. This can lead to a malfunction. The optimum filling height should not exceed the upper edge of the drum surround.



To prevent damage to the machine, the machine may only be filled with screenings containing parts that do not exceed the following data.

Weight: max. 10 kg (Hard: e.g. stones, metal); max. 15 kg (Soft: e.g. wood, clod of earth)

Size: max. Edge length: 30 cm

If the machine is permanently operated with large screenings, it is recommended to use a stone grid (order code W003.A055) on the hopper. It serves for pre-separation of large pieces (>200 mm) and thus for protection of the machine and increase of throughput.

Load dependent hopper control

When the load limit of the drum drive is reached, the hopper and thus the material feed to the drum is stopped to prevent overfilling and thus standstill. The feed is automatically restarted when the load limit is undershot. If, after three reversals, there is still an overload on the hopper drive, the machine is stopped and a fault message is issued (hopper belt selector switch flashes).

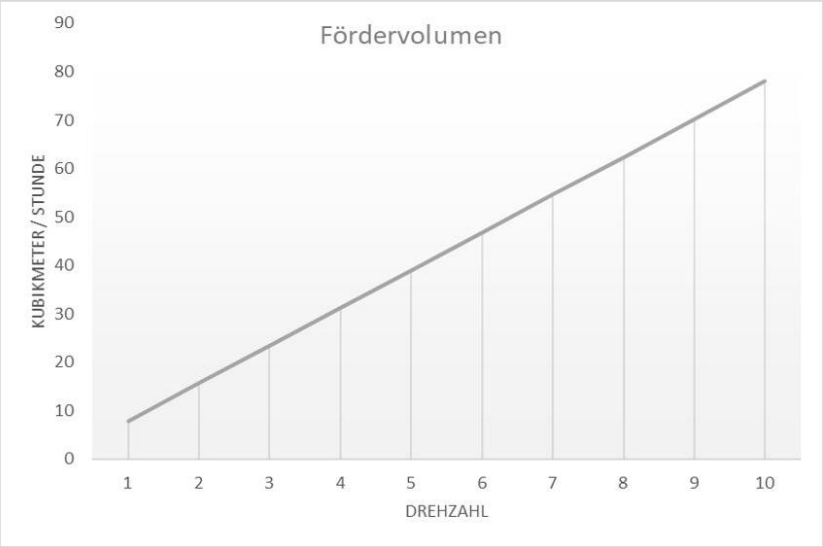
Bunker Autoreverse

When the load limit of the hopper drive is reached, the hopper is automatically reversed briefly and restarted in the conveying direction. In case of overfilling of the hopper or very large impurities in the screenings to be processed, this prevents bridging and ensures a better material flow.

The function can also be executed manually by holding down the Start key. After three seconds, the hopper reverses as long as the key is held down. After releasing the key, the hopper conveys again in the direction of the screening drum.

Conveying speed

The conveyor speed of the hopper belt can be set on the control unit. The theoretical delivery volume (permanent 100% filling) can be found in the table below. The setting should always be selected when the hopper is full and is therefore the maximum throughput capacity.



Depending on the material to be screened, it is necessary to adjust the conveyor speed of the hopper belt in order to achieve optimum screening performance of the machine.

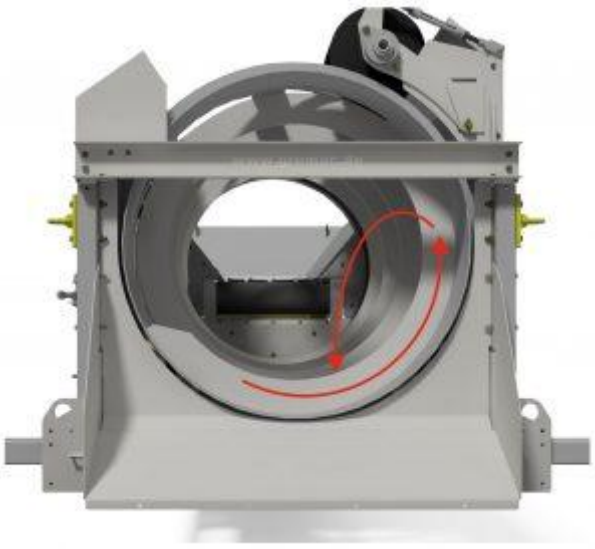
Bunker top

A hopper attachment (order code: W003.A054) is available to facilitate filling with large buckets and to prevent spillage onto the rear of the machine. It does not serve to increase the volume of the bunker and thus increase the filling.

Sieving capacity

Achieve optimum screening performance

The screening capacity of the machine depends on the material to be screened, the condition of the material to be screened (e.g. dry, wet, glued) and the desired screen cut. The hopper speed and drum speed must be selected so that the drum is not overfilled.



(Fig. Material circulation)

The rotational movement of the drum takes the screenings upwards on the right side. The higher the drum speed is selected, the further it is transported upwards with it and falls back down at the peak of acceleration, thus forming a circulating rotary motion. This achieves optimum mixing, cleaning by friction and ultimately optimum sieving.

Screening material with a high proportion of parts > 40 mm

The drum must not be filled higher than the center of the vertical (blue mark) to avoid blockages by screenings and the wear and damage caused by heavy parts falling down.

Screening material with a high proportion of parts < 40 mm

The drum may be filled above the vertical of the drum (Blue mark). Here, the degree of separation must be taken into account and, if necessary, the hopper speed must be reduced.

Sieve section

Depending on the desired sieve cut, the drum can be equipped with different sieve mats. Mesh sizes from 5 x 5 mm to 50 x 50 mm are available.

The procedure for replacing the sieve mat can be found in the chapter “Replacing sieve mats”.

The shape of the screenings essentially influences the screening. So-called runaways in the screenings, i.e. larger pieces than the desired screen cut, are often due to an elongated shape or excessive speed of the screening drum.

If the desired sieving result is predominantly too large, the sieve mat with the next smaller mesh size must be used. Deviations in the screen section cannot be completely prevented in the case of drum screens and therefore do not constitute a warranty case.

Possible causes	Elimination
The oversize still contains a lot of screenings smaller than the screen cut.	– Too much material in the drum. Lower bunker speed. – Drum speed too low, increase speed. – Material too sticky. Allow material to dry.
There are many larger pieces in the screen fraction.	– Screen mesh too large. Mount sieve mat with smaller sieve mesh on drum. – Too high drum speed creates “punctures”. Reduce speed. – Too little screenings in the drum, refill material.

Conveyor belts

The machine has four conveyor belts

1. Bunker conveyor belt
2. Conveyor belt for oversize
3. Conveyor belt for fine material

Preventive measures

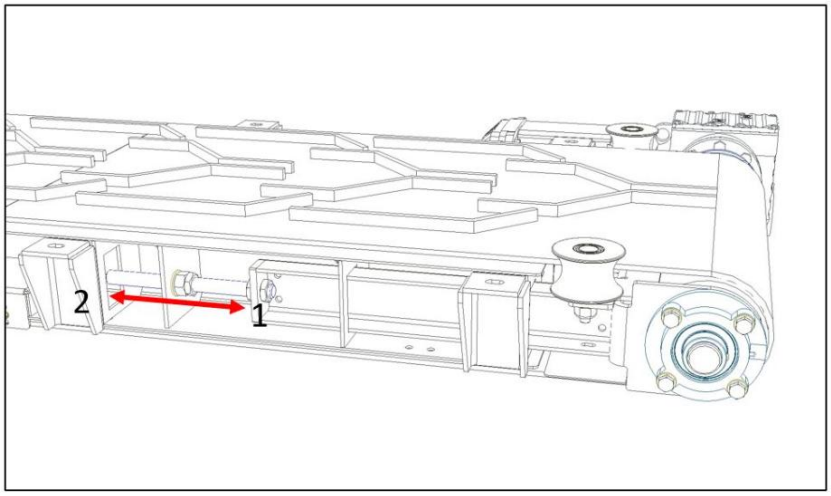
1. Regularly remove dirt and buildup from the conveyor belts.
2. Before starting work, check the tension and belt tracking of the conveyor.
3. Regularly maintain the wipers and bearings of the conveyor belts.
4. Replace worn wipers and seals early.
5. Lubricate the adjusting spindles regularly.

Possible causes	Elimination
Conveyor belt runs to one side	– Check for contamination under the belt and remove it. -correct the run of the conveyor belt.
Motor protection trips / frequency inverter shows “E-triP” error	– The conveyor has a heavy duty gear. – Remove any buildup on the conveyor belt and any blockages. – Check the run of the belt. – At low temperatures, there is a risk of heavy walking due to freezing of the conveyor belt. If necessary, thawing must take place before use.

Possible causes	Elimination
Conveyor belt has been started, but it does not move.	– Check the setting of the conveyor belt speed. – Check the frequency inverter to see if it has been stopped manually. And press the “Start” key on the frequency inverter if necessary.

Belt tension adjustment

The conveyors have four adjusting spindles for tensioning the belt and correcting the belt run.



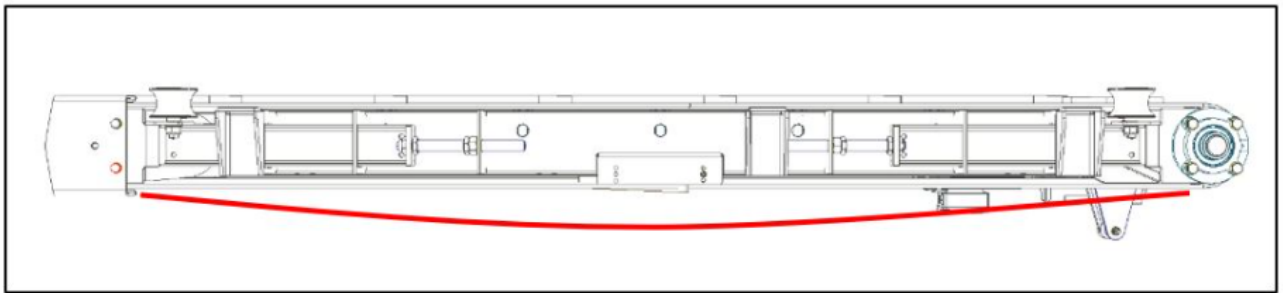
The belt is tensioned by adjusting the adjusting spindles in the direction of the drum (1). The belt is slackened by adjustment in direction (2).

Correct belt tension

The correct belt tension is set when there is no slip between the belt and the drum. In this case, the belt may have a small sag on the underside. This has no negative effect on the function of the conveyor.

Excessive belt pretension, on the other hand, results in unnecessarily high loads on the bearings and mechanical components and leads to increased wear.

The belt tends to change length due to temperature fluctuations, which affects the belt tension. Therefore, regularly check the tension of the belts in case of large temperature changes.



Adjustment of the belt run

The straight running of the belt can be corrected by adjusting the adjusting spindles. Make corrections only while the conveyor is running. The adjustment must be made in small steps. Do not adjust more than half a turn of the adjusting nuts on the spindles and observe for some time how the correction has worked out before making another correction.

The adjustment must always be as uniform as possible in order to avoid incorrect positions of the drive and deflection pulleys.

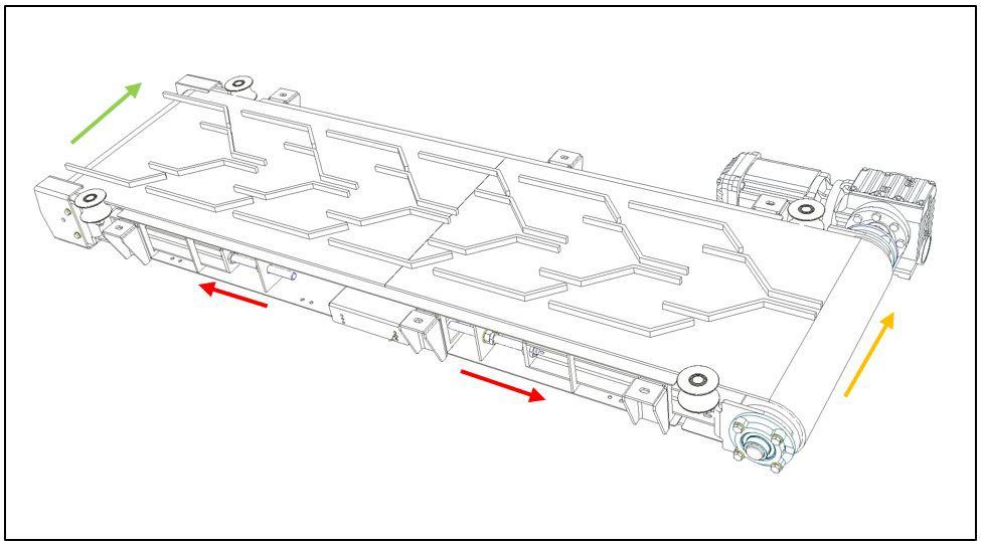


Fig. Correction of the belt run to the right by tensioning the belt on the left side.

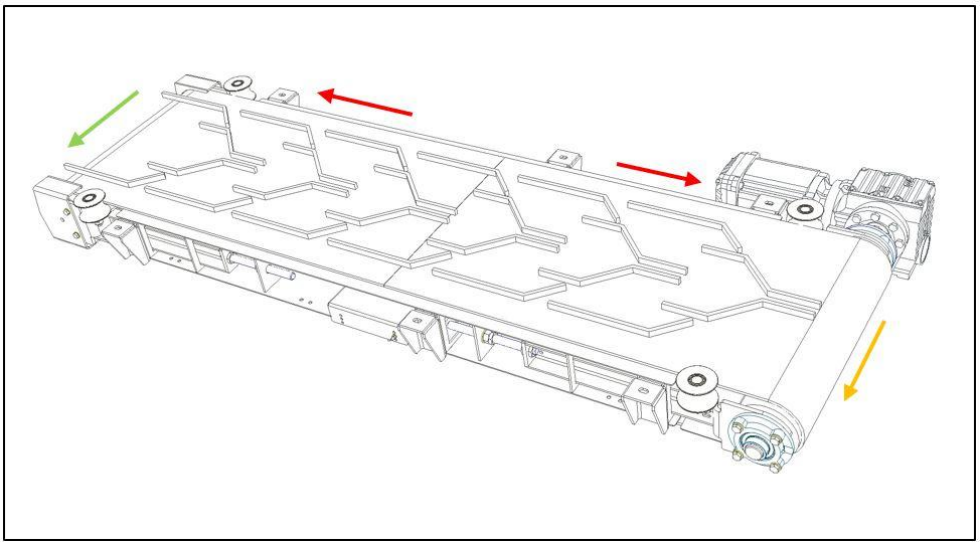
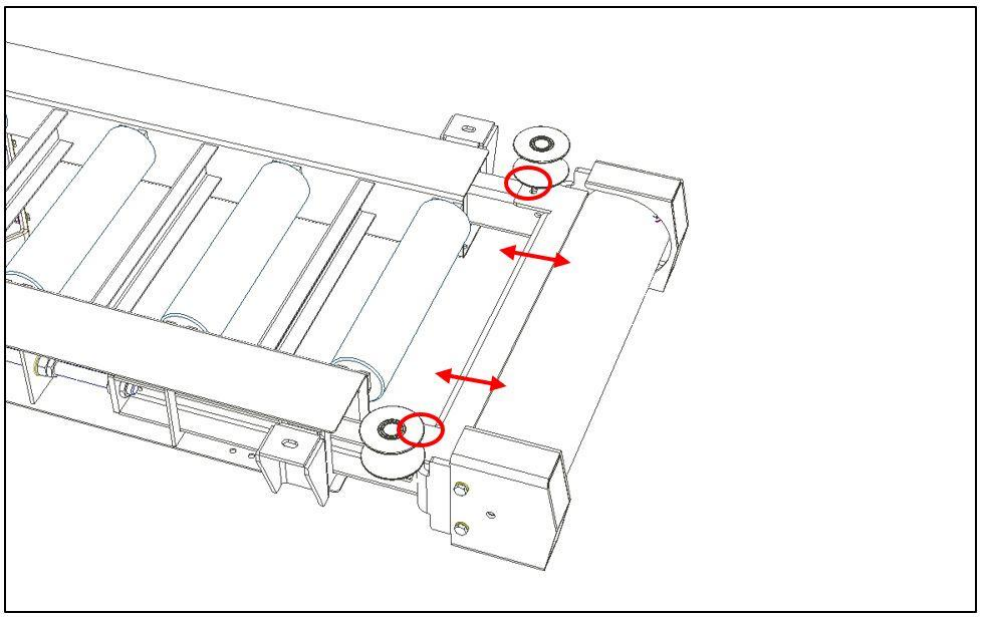


Fig. Correction of the belt run to the left by tensioning the belt on the right side.

Adjustment of the drum scraper

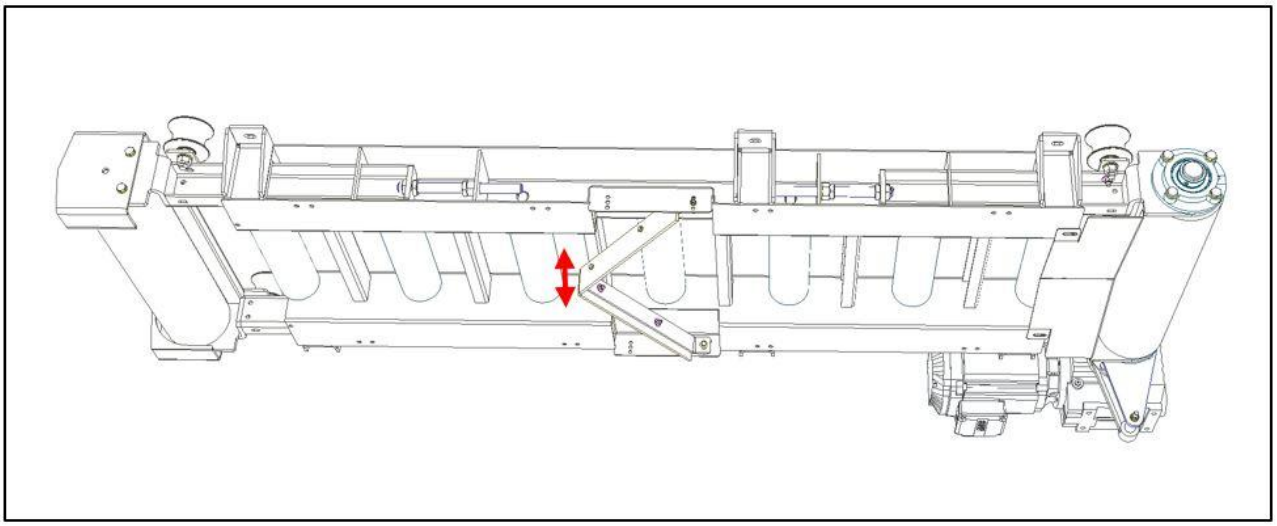
The deflection drum has a drum scraper. To ensure correct function, the strip edge to the drum should be between 1 and 3 mm. The wiper can be moved by loosening the fastening screws on both sides.



(Fig. Drum scraper)

Adjustment of the belt scraper

The internal scraper is floating and rests on the belt by its own weight. The scraper must be checked regularly for wear and support on the belt.



(Fig. Belt scraper)

Screen drum

The machine has a screening drum with core perforation. A sieve mat with the desired sieve perforation is clamped onto the base body. Alternatively, sieve drums with fixed perforation are available.

1. Drum body
2. Cleaning brush

Preventive measures

1. Regularly remove dirt and buildup from the drum and cleaning brush.
2. Before starting work, check the correct setting of the drum drive and drum impellers.
3. Regularly maintain the components of the drum.
4. Replace a worn chain, drive sprocket, idlers and other components early.

Causes of malfunctions

Possible causes	Elimination
Drum rotates too slowly	– Increase the speed on the control unit.
The drum makes loud scraping sounds	– Check the correct setting of the drive to the drum. – Check the impellers for complete contact with the treads of the drum. – Check baffles for distance from the drum.
Frequency inverter shows error “E-triP	– The sieve drum has a heavy duty gear. – Eliminate adhesions and blockages, if any. – Check the running of the drum.
Drum does not rotate smoothly.	– Slippage between drum chain and drum. – Check the wear of the drive chain.
Screen perforation clogged, clogs very quickly.	– Adjustment of the cleaning brush not correct. – Screening material too wet. – Cleaning brush stuck and must be cleaned.
Significantly larger parts are found in the sieve fraction	– The sieve mat is damaged, large parts get through. – The fastening of the sieve mat has come loose, as a result of which it has slipped and the closure no longer rests on the filler plate.

Replace sieve mat

Remove the cable remote control from the control cabinet before starting work. Guide the remote control downwards out of the machine. Lean the control cabinet door only and close the side panel. Open the side door on the drum.

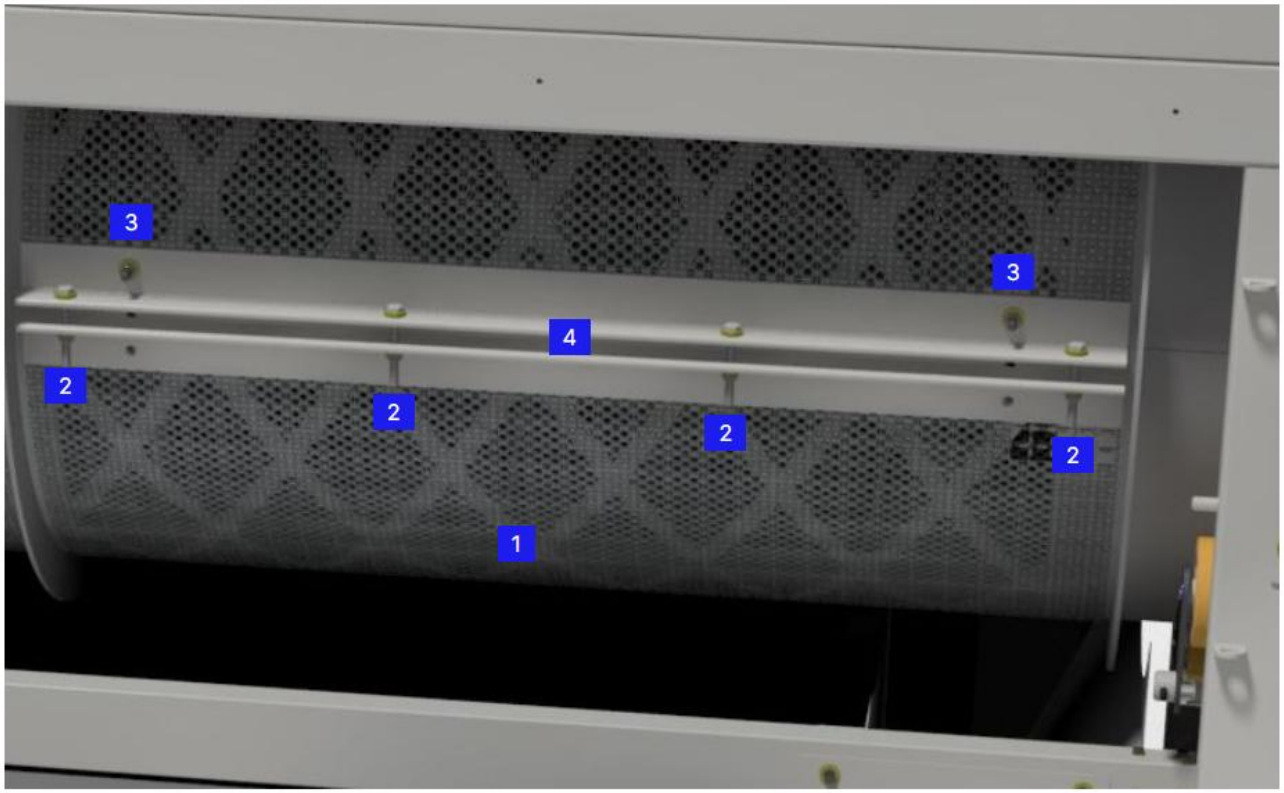
Always secure the maintenance door to the hopper with the safety rope provided. If the machine is tilted or there is a gust of wind, there is a risk that the maintenance door will close in an uncontrolled manner, resulting in injury.

The machine must be energized to use the remote control, but the machine must not be started. Unlock the emergency stop by pressing the “Stop/Reset” button for 3 sec.

Let the drum rotate with the help of the remote control until the connection point of the sieve mat is at working height. Operate the emergency stop on the remote control to be able to work safely on the machine.

While the drum is rotating and as long as the machine is energized and switched on, do not reach into rotating parts under any circumstances. There is a risk of injury!

Only operate the cable remote control if the danger area can be seen and no person is present in the danger area. Secure the work area against unauthorized access.



1. Screen mat
2. Connecting screws (4x)
3. Mounting screws
4. Terminal strips

Secure the connection point of the screen mat with screw clamps, chain hoist or other suitable means to prevent uncontrolled springing open after removing the clamping screws.

Remove the clamping screws and carefully loosen the tools described above.

The sieve mat is still attached to the drum by two fastening screws.

Unlock the emergency stop and rotate the drum using the remote control. Pull the sieve mat out of the machine parallel to the rotation of the drum.

If the attachment of the sieve mat is at working height, stop the rotation of the drum and press the emergency stop. Loosen the fastening screws of the sieve mat on the drum and remove the sieve mat.
Attach the new screen mat to the drum. Unlock the emergency stop and turn the drum in the opposite direction using the remote control. Parallel to the drum rotation, insert the sieve mat into the machine. After reaching the working position, stop the drum and press the emergency stop. Fasten the sieve mat using the clamping screws and check the correct fit of the sieve mat.
After replacement, the machine can be put back into working position.

The edges of the sieve mats may have sharp edges. There is a risk of injury here! Always use suitable gloves when handling the sieve mats.

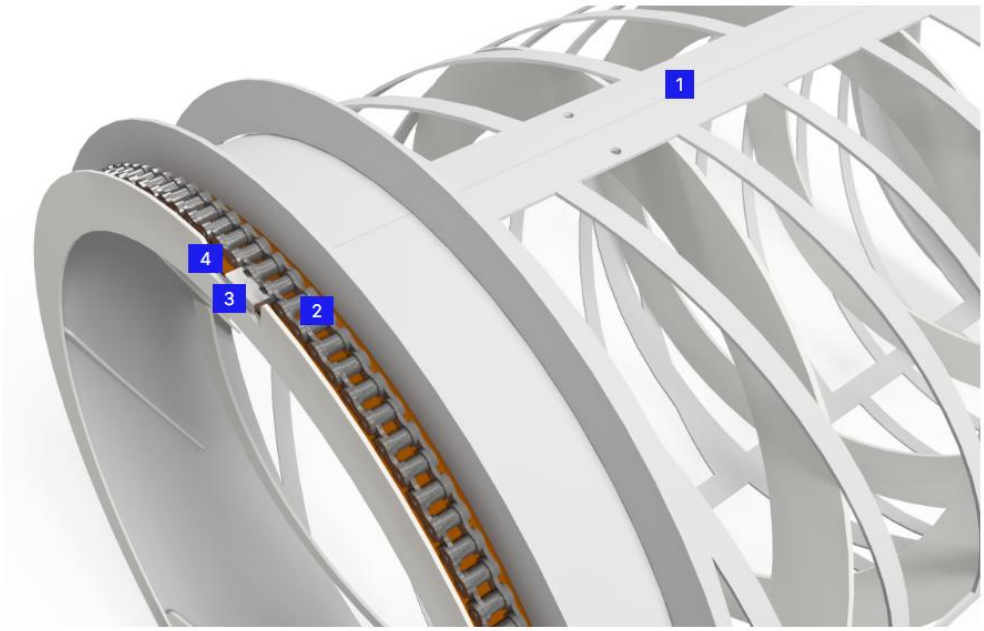
The sieve mats are made of spring steel wire, which has a resistance when placed on the drum. Always make sure that the ends of the screen mat are secured.

There is a risk of injury due to uncontrolled bouncing of the sieve mat!

Drum chain

Power is transmitted to the drum via a roller chain tensioned on the drum, in which the drive wheel engages. Between the chain and the drum body, an inserted rubber mat creates the necessary friction to prevent slippage of the chain and to compensate for concentricity tolerances.

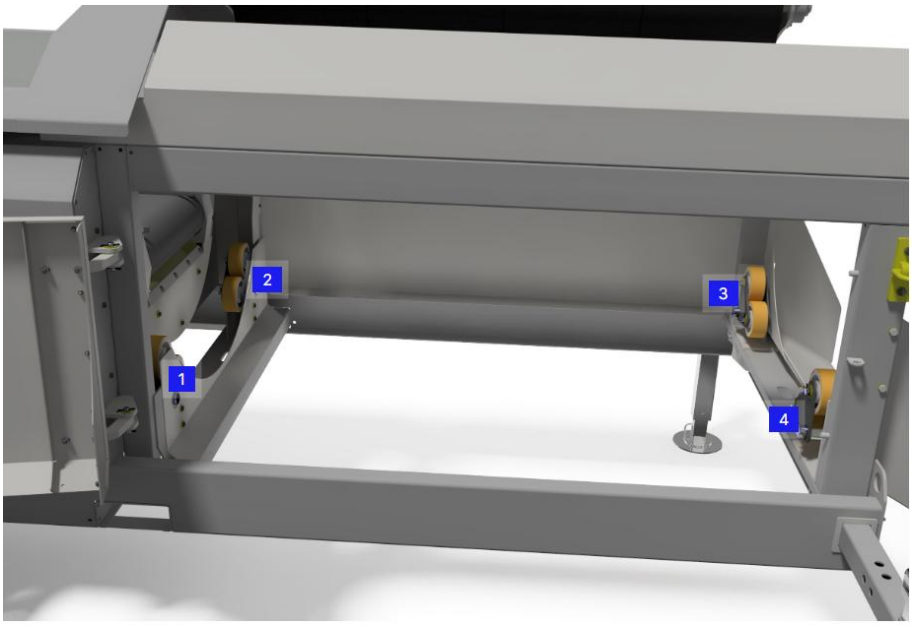
The two ends of the chain are connected by a chain lock at the cutout of the drum. To replace the chain requires a special tool for tensioning.



1. Drum body
2. Chain
3. Chain lock with stop block
4. Rubber mat

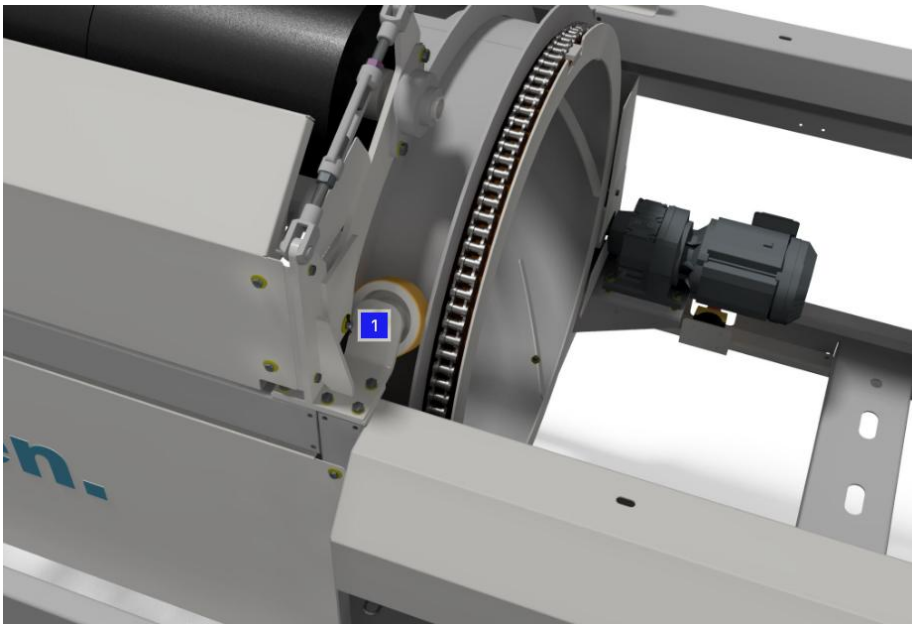
Drum bearing / support rollers

The functionality of the rollers and wear must be checked regularly. The diameter of the rollers is 125 mm. Replacement must take place when the diameter is 115 mm.



Swing arm with rollers (1-4)

The drum is guided in the axial direction by a roller next to the cleaning brush.

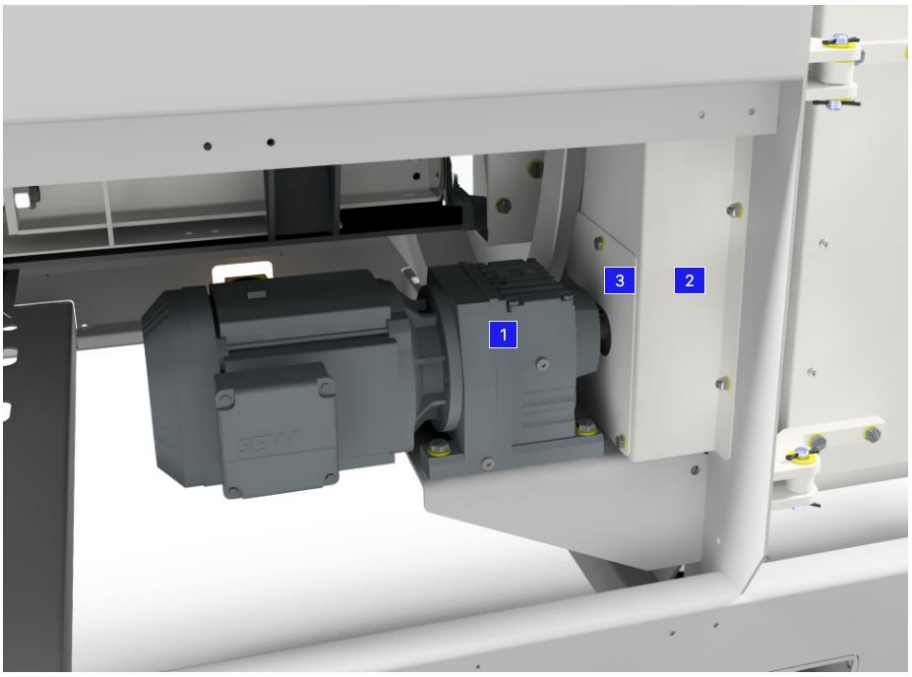


1: Axial guide roller

Adjust drum drive

The power transmission from the gear motor to the drum is provided by a chain drive. Correct engagement of the sprocket is necessary to minimize wear. In case of loud running noises and stagnant movement, the alignment of the drive wheel must be adjusted.

1. Remove the protection on the drive
2. Loosen the fastening screws of the motor so that it can be moved on the base plate. The screws should be hand-tight, so that a clear resistance is felt during displacement.

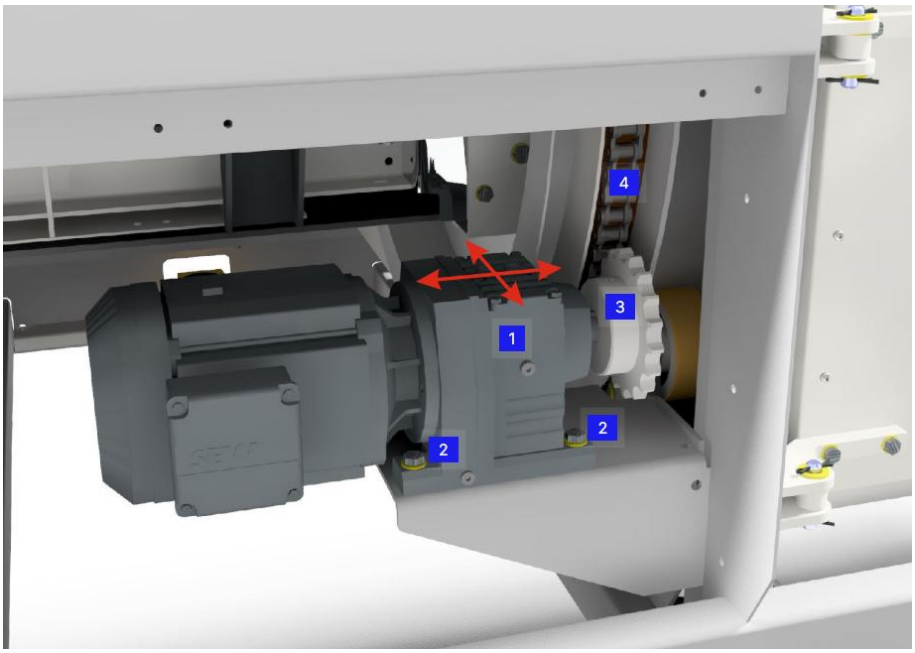


1. Gear motor – screen drum drive
2. Protective cover
3. Control cover

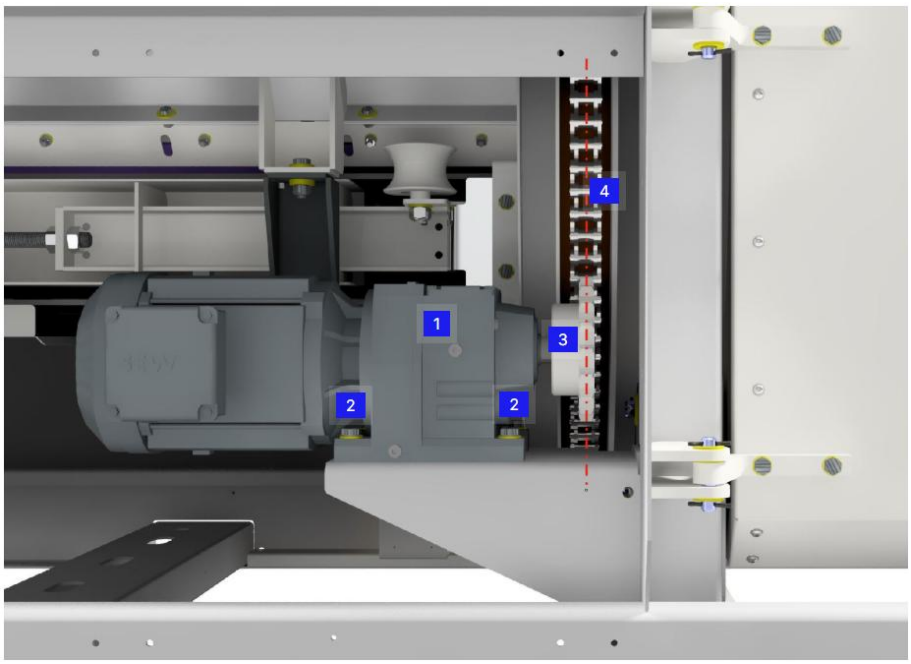
The fastening screws may only be loosened, but not completely removed. Otherwise, there is a risk of the motor crashing and causing injuries.

Align the drive wheel centrally to the chain on the drum. The gear wheel is axially floating. The motor must be aligned so that the shaft protrudes >10 mm on both sides of the gearwheel. Turn the drum by hand until the highest point (due to tolerances) of the drum is in contact with the drive wheel. Push the motor towards the drum until the drive wheel engages completely with the chain. Lightly tighten the screws of the motor mounting.

To check the correct setting, run the drum slowly using the cable remote control. Readjust if necessary. After adjustment, tighten the motor mounting screws and replace the protective cover.



1. Gear motor – screen drum drive
2. Mounting screws
3. Gear
4. Drum chain



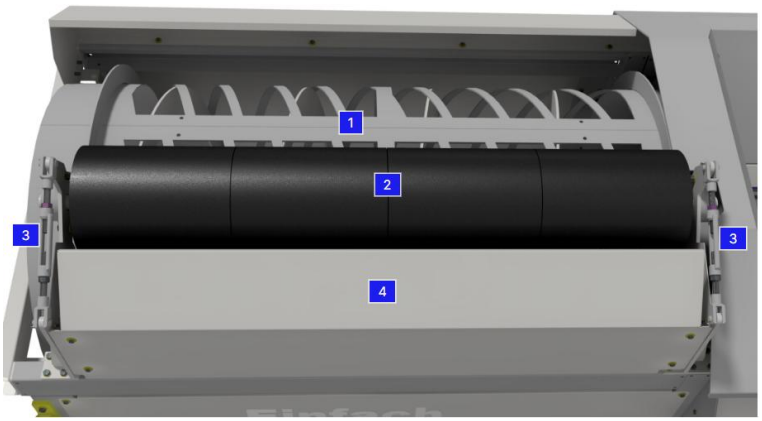
(Fig. Center alignment of the sprocket on the drum chain).

The chain drive is subject to natural wear. If the ‘wear limit of the chain and the drive wheel is reached, the components must be replaced.

Adjust cleaning brush

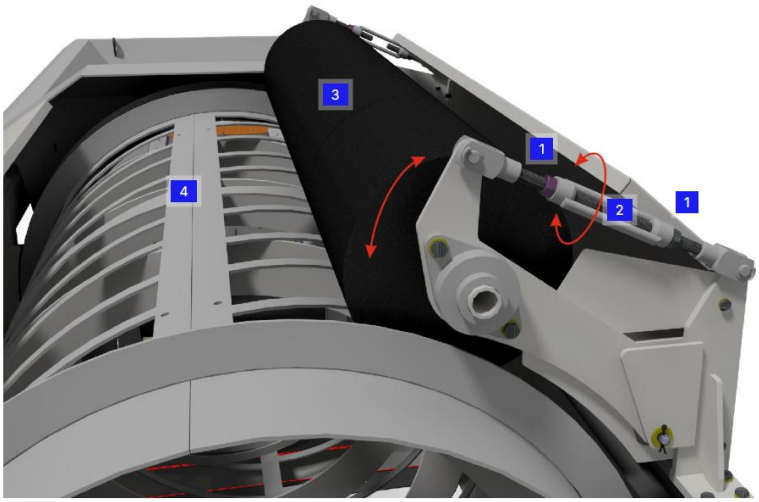
For proper operation of the cleaning brush is possible to adjust the depth of penetration into the drum. Depending on the sieve mat and the material to be sieved, the bristles of the brush must protrude between 5 and 10 mm through the sieve mat into the drum.

There is an adjustment mechanism on both sides of the cleaning brushes.



1. Screen drum
2. Cleaning brush
3. Adjustment mechanism
4. Protective cover

The depth of brush engagement with the drum can be adjusted by turning the set screw. Before adjustment, the locking nut must be loosened and tightened again after adjustment. The bristles should be immersed at least 5mm into the sieve mat for good function.

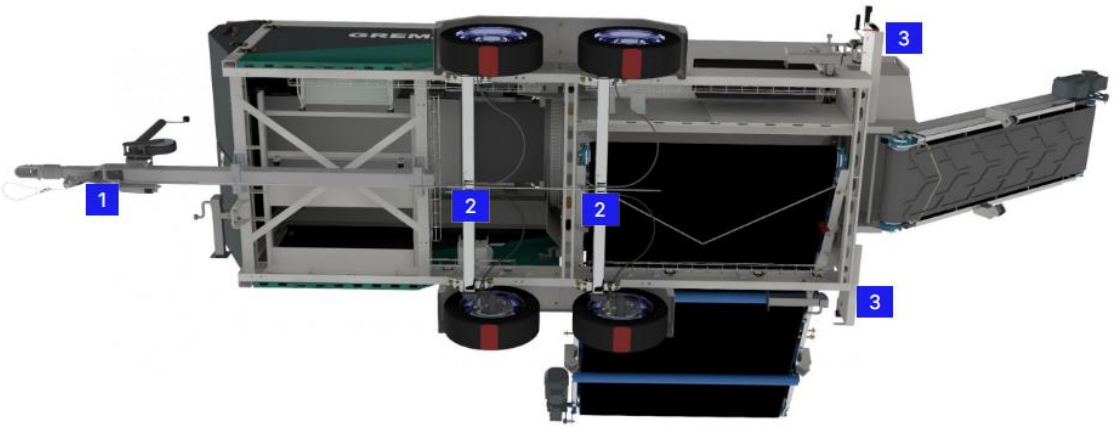


1. Lock nuts
2. Adjustable fork
3. Cleaning brush
4. Screen drum

The cleaning brush is subject to natural wear. When a diameter of <200 mm is reached, the cleaning brush must be replaced.

Chassis + lighting (only wheeled version)

The wheel-mobile machine is mounted on a chassis of the company Alko.



1. Drawbar with overrun device
2. Tandem axles
3. Lighting

Preventive measures

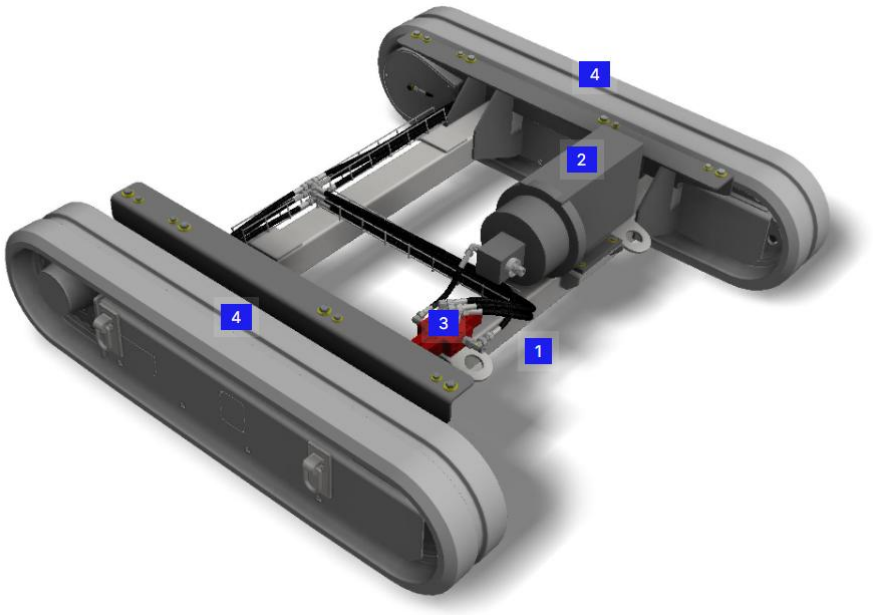
1. Observe the manufacturer's maintenance instructions
2. Participation in road traffic is only permitted with fully functional landing gear and lighting.
3. Participation in road traffic is only permitted with a cleaned machine in order to prevent soiling of the road and endangering other road users by screenings falling out of the machine.
4. For periodic technical inspections, the respective regulations in the country of use apply.

Possible causes	Elimination
Machine hits the vehicle hard during braking, braking performance insufficient.	– Brake pads are worn and need to be replaced. – The overrun travel of the overrun device is too large and must be readjusted.
Machine tends to lurch while driving.	– Tire pressure too low and must be corrected. – Support load too low. At least 4% of the trailer load is required, more than 25 kg is not required. – Hitch height too low. Standard height of the trailer hitch: 430 mm – Machine very dirty center of gravity has changed a lot. Machine must be cleaned – Reduce the driving speed
When flashing, the complete lighting flickers	– The ground connection to the vehicle is interrupted or bad. – The ground connection must be repaired. – Check the plug connection to the vehicle for dirt and good contact.

Possible causes	Elimination
No working lighting	– Plug connection to the vehicle not plugged in. – Defective plug, must be replaced. – Water in the plug, must be dried.
Support wheel bearing is melted/defective	– The jockey wheel moved along during the journey. Always turn the jockey wheel completely upward into the drive position. – The jockey wheel was overloaded. Do not use the jockey wheel as a support during operation. Use the support feet of the machine.

Chain drive (Only chain mobile version)

The track-mobile machine is mounted on a Trackone crawler.



1. Hydraulic tank (40 l), not shown
2. Hydraulic drive
3. Valve terminal
4. Chain drive

Preventive measures

1. Observe the manufacturer’s maintenance instructions.
2. Clean the drive regularly.

Possible causes	Elimination
Hydraulics running, no movement of the machine.	– Not enough hydraulic oil, top up oil. – Incorrect direction of rotation of the drive. Check and have direction of rotation changed. – Defective valve. Check valves.
Hydraulic drive does not start	– Check status display on frequency inverter, reset error. – Check potentiometer setting. – Check power supply. – Check emergency stop, check remote control.
One direction of travel is not possible.	– Check valve.

Maintenance

Definitions

In order to ensure long, trouble-free operation, it is necessary to comply with all the maintenance and inspections described. All contents described here are based on the DIN31051 and DIN31052 standards as well as VDI guideline VDI2890.

The maintenance intervals relate to normal use and thus normal load. Operational influences or side effects, and the type of operation may make it necessary to shorten the maintenance intervals. If necessary, consult the manufacturer.

The general definitions and terms described here are explained in more detail in order to provide better understanding of the maintenance and inspection plans.

Terms

Maintenance
Maintenance means all measures to restore the target condition (functionality) of the machines. These measures include: Servicing, inspection and repair.

Maintenance
Servicing includes all measures to maintain the condition of the machines. It includes activities such as cleaning, preserving, lubricating, supplementing, changing (replacing auxiliary materials and small parts) and adjusting.

Inspection
Inspection includes all measures for assessing the
actual condition of the machines. The purpose of the inspection is to identify any necessary repair measures at an early stage so that they can be prepared and carried out. The determination and assessment of damage that has already occurred is considered inspection.

Repair
Repair includes all measures that are necessary in order to restore the machines to a functional state (e.g. after a damage/fault).

Wear
In terms of maintenance, the reduction in the amount of wear and tear due to physical and/or chemical effects is understood.
Wear is the price that must be paid to use the facilities. No systems can operate without wear. The goal of maintenance is to recognise wear, to have influence on it and to create new wear margins through repair.
Due to external influences or boundary conditions, such as maintenance status, corrosive air circulation, dust and the type of operation, whether with partial load or occasionally with overload or impact load, wear can vary from case to case. Also included is a sudden change in the wear margin, for example due to a break, which does not have to be directly dependent on time. It follows that inspections cannot be based solely on time periods.

Wear margin

This means, in terms of maintenance, the supply of resources necessary to fulfil the function of the machine.

Use
This means, in terms of maintenance, the use of the machines as intended and in accordance with the generally recognised rules of technology, whereby goods and/or services are created while reducing the amount of wear and tear.

Error
This means, in terms of maintenance, the unintended interruption (or impairment) of the functional fulfilment of the machines.

Failure
This means, in terms of maintenance, the unintended interruption of the functioning of the machines.

Damage
This means, in terms of maintenance, the condition of resources after falling below a certain limit of the wear and tear level, which causes an impairment of functionality that is impermissible with regard to use.

Error
Failure to meet specified requirements/function fulfilment through a characteristic value (e.g. temporary interruption of the drive due to a loose contact in the connector). For further explanations, see DIN31051.

Time-limited part
Parts and/or assemblies, the lifespan of which is shortened in relation to the lifespan of the parent parts and/or assemblies and cannot be extended with technically possible and economically justifiable means.

Wear and tear part
Parts and/or assemblies that are used in places where wear is unavoidable due to operational reasons, in order to protect other parts and/or assemblies against wear, and which are conceptually intended for replacement.

Reserve part
Spare part that is clearly assigned to one or more machines, is not used independently in this sense, is scheduled and kept available for maintenance purposes and can usually be repaired economically.

Consumable
Spare part that is clearly assigned to one or more machines, is not used independently in this sense, is scheduled and kept available for maintenance purposes and its repair is generally not economical.

Small part
Spare part, which is generally usable, predominantly standardised and of low value.

Maintenance instructions/plan
Contains information on the implementation of maintenance (servicing, inspection, repair) of a technical product as well as information on the product and technical customer service.

Servicing instructions/plan
Contains information on how to carry out the maintenance of a technical product as well as information on the product and technical customer service.

Inspection instructions/plan
Contains information on how to carry out the inspection of a technical product as well as information on the product and technical customer service.

Service instructions/plan
Contains information on how to carry out the repair of a technical product as well as information on the product and technical customer service.

Maintenance principles

Implementation of maintenance/inspection and repair work

To carry out maintenance work, it is necessary to develop a maintenance strategy for the operator of a machine/system. This strategy includes the following points and may need to supplement or expand existing regulations of the individual manufacturers.

• Alignment of maintenance goals with company goals
• Definition of appropriate maintenance strategies/times

If maintenance measures, such as the implementation of servicing measures or the implementation of defined maintenance measures, are taken outside the company, e.g. by the manufacturer themselves or by third parties under their own direction and responsibility, they can only be based on the machine/system itself and on the operating and environmental conditions that are to be assumed as normal.
In order to maintain warranty claims, the consideration of company-specific special conditions and measures of maintenance resulting from the maintenance goals and the maintenance strategy of the company, requires the approval of the manufacturer if the scope of inspection prescribed by servicing/inspection plans is reduced.

Preparatory measures for maintenance measures

We recommend elaborating the inspection strategy according to the DIN31051 and DIN31052 standards as well as the VDI guideline VDI2890 and the standards contained therein.

• Always plan enough time for maintenance measures. Keep in mind that lack of care during servicing/inspections may result in unpredictable malfunctions or failures during production and thus is costs that significantly exceed the costs of servicing/inspection.
Consult the VDI guidelines 3423 to optimise your production times.
It contains the basis for optimising and recording the availability of machines and systems.
• Having spare parts on hand shortens the downtime or repair time considerably. Please ask the manufacturer for advice on which parts should you keep in stock in order to minimise delivery times.

Repair

The following sequence must be followed for repair measures:
1. Search for damage
2. Take security measures
3. Remove the defective assembly/parts
4. If necessary, disassemble the assemblies
5. Check and document the deviation from the target condition
6. Replace or repair the damaged part
7. Assemble / install / adjust
8. Test run, acceptance, release
9. Documentation of the repair

Machine cleaning

The machine should be preferably dry-cleaned. In order to remove adhesive dirt, the machine can be cleaned with a high pressure cleaner or steam jet. Pay attention to the protection class of the electrical and mechanical components.

To prevent damage, do not expose the following components directly to the jet of the high-pressure cleaner:

- **Control cabinet**
- **Control unit**
- **Bearing points**
- **Wired remote control**
- **Other electrical components and connections**

The components described above can be cleaned with a wet cloth.

Servicing information

General cleaning

• Clean the machine/system regularly.
• Rotating parts must be checked for wraps daily and removed if necessary (fire hazard).
• Moving parts must be checked daily for jammed foreign objects and removed if necessary (fire hazard).
• In order to guarantee an optimal sorting result, a needs-based cleaning of the screen grid is necessary.

Attention:
When cleaning, please follow the safety instructions. Observe the regulations for accident prevention!

Lubrication

• All manual lubrication procedures should only be carried out at standstill.
• Use only the types of grease described in this document. Other types of grease are only permitted after consultation with the manufacturer.
• Observe the specified lubrication intervals.
• When lubricating, make sure that the lubricant is applied evenly.
• The resulting grease rims do not have to be removed. In addition to sealing, they ensure effective protection against contamination.

Protective devices / occupational safety

Acceptance at intervals prescribed by the professional associations or other competent authorities on occupational safety / accident prevention regulations.

Pictures of the machine's condition

The following table A contains pictures of the machine's condition / damage / faults that can be determined or occur due to a maintenance/inspection measure on components or assemblies.
All components or assemblies described here must be examined for the specified conditions/damage.

Rows
All parts/assemblies contained in the machine are listed in the rows. The information is generally valid. The respective parts/assemblies must be assigned to the generic terms.

Columns
The respective possible conditions of the parts or assemblies listed in the rows are indicated in the columns.

The respective conditions are marked with an "X". An examination of a part/assembly for a condition that is not

marked with an “X” is not necessary.

Servicing/inspection plan

In the servicing/inspection plan, all components are assigned the conditions to be checked and the measures to be adopted.

The drawings show which assemblies are assigned to the respective parts on the machine.

Service plan

A service plan is available in addition to the servicing plan printed in the operating instructions.

All dates and associated servicing plans are printed out to make work easier. Only the relevant data need to be entered during or after the inspection, servicing or repair.

For warranty claims, the service plan serves only as proof of the inspections that have taken place.

No.	Assembly / Condition	Outbreaks/damage	Attachment	Braking effect	Fracture	Elongation	Tightness/leakage	Torque transmission	Pressure	Flow	Settings	Flow rate	Abrasion/grooves/scratches	Filling quantity and condition	Function	Noise (smooth operation)	Corrosion	Bearing clearance	Cracks	Switchability	Slip	Vibrations	Stability	Voltage	Clearance	Temperature	Unbalance	Uneven running	Deformation	Offset	Wear	Pollution	Completeness	Cooling	Voltage
1	Frame	X	X		X										X		X		X			X						X			X			
3	Flaps		X								X				X		X											X			X	X		
4	Locks	X	X								X				X					X										X	X			
6	Fan wheel	X	X													X															X			
7	Bolt				X	X																X		X				X						
8	Emergency stop facilities		X								X				X					X											X			
9	Conveyors	X	X		X	X					X				X	X	X		X		X			X			X			X				X
10	Shaft/axis					X							X				X										X	X		X				
11	Shaft cover	X	X				X								X													X		X	X			
12	Roller bearings		X										X	X		X	X	X				X	X		X	X		X				X			
13	Sealing	X				X	X								X													X	X		X			
14	Lubrication nipples	X	X							X					X		X		X									X			X			
15	Motor		X													X						X			X	X					X		X	X
16	Gears	X	X				X	X			X			X	X	X	X		X	X	X	X				X	X	X			X	X			
17	Casing				X		X							X			X		X			X				X					X				
19	Adjusting spring		X					X															X							X					
20	Protective covers	X					X								X		X		X									X		X	X	X		
21	Storage						X							X	X	X	X	X				X			X	X		X			X	X			
22	Connection, detachable	X	X			X									X		X		X					X				X				X		
23	Connection, not detachable	X			X	X									X		X		X									X						
24	Wheels	X	X																X									X		X	X			
25	End stop				X						X																	X	X					
26	Cover		X																X													X		
27	Screw				X	X																X						X						
28	Terminal box (electr.)						X										X																	
29	Notification facility	X														X															X			
30	Lubrication device	X	X				X		X	X	X	X		X	X	X										X					X	X		
32	Protective device	X	X		X						X				X		X		X									X			X	X		
33	Support	X	X			X					X				X		X		X			X						X	X	X	X			

Table A -Pictures of the machine's condition-

Maintenance plan

Maintenance plan / Inspection plan	Machine: e1	Operation: Cost centre:
	Manufacturer: H2PRO GmbH & Co. KG	Device number: Serial number: Location:

Ser. No.	Tab. A -No.	**Component** or works to be completed	Measuring and testing devices, operating and auxiliary materials	Frequency / interval	Work carried out / Executor	Date / operating hours /	Comments
1.		**Gears**	Observe the regulations of	every 250	_____	__.__.___	Reserve part
1.1		Casing	the respective	hours	_____	___.___h	
1.1.1		Look for leaks	manufacturer.				
1.1.2		Check oil level and refill if necessary.					
1.1.3		Check smooth operation					
1.1.4		Check temperature					
1.2		Shaft/axis			_____		
1.2.1		Check smooth operation					
1.2.2		Check deformation					
1.2.3		Check wear					
1.3		Sealing			_____		
1.3.1		Check for tightness					
1.3.2		Remove dirt					
		Support	Correct the position for				
1.4		Check connection	adjusting the coupling		_____		Reserve part
1.4.1		Check screws	(1.5) if necessary.				
1.4.2		Check damage					
1.4.3		Check setting					
1.4.4		Coupling (mechanical)	Check for correct settings				
1.5		Check damage	according to the		_____		Time-limited
1.5.1		Check connection	manufacturer's				part
1.5.2		Check setting	instructions and adjust if				
1.5.3		Check function	necessary.				
1.5.4		Check smooth operation					
1.5.5		Check clearance					
1.5.6		Check wear					
1.5.7		Connection (clamping set)					
1.6		Check damages	Retension/check				
1.6.1		Check function	retension/check	every 1000 hours			
1.6.2		Check voltage	(torque: 35 Nm).				
1.6.3		Check deformation	Check displacement.				
1.6.4		Check completeness					
1.6.5							
2.		**Motor**	Observe the regulations of the respective manufacturer.	every 250 hours	_____	__.__.___	Reserve part
2.1		Casing			_____	___.___h	
2.1.1		Check connection					
2.1.2		Check damage					

2.1.3		Check smooth operation					
2.1.4		Check temperature					
2.1.5		Remove dirt		once a day			
2.2		Fan wheel		every 250 hours	_____		
2.2.1		Check damage					
2.2.2		Check smooth operation					
2.2.3		Remove dirt					
2.3		Terminal box			_____		
2.3.1		Check for tightness					
2.3.2		Check corrosion					
3.		**Conveyor belt**		every 250 hours	_____	__.__.___	Reserve part
3.1		Shaft			_____	___.___h	
3.1.1		Check concentricity	max. ±0.5mm				
3.1.2		Check deformation					
3.2		Roller bearings	Observe the regulations of the respective manufacturer, replace the bearings if necessary.	once a day	_____		Time-limited part / Consumable
3.2.1		Check connection					
3.2.2		Check smooth operation					
3.2.3		Check bearing clearance					
3.2.4		Check stability					
3.2.5		Check clearance					
3.2.6		Check temperature	max. 75°C				
3.2.7		Remove dirt					
3.2.8		Check lubrication	Refill or replace lubricant	once a day			
3.2.9		Check the grease nipple			_____		
3.2.10		Check seal	if necessary.		_____		
3.3		Connection		every 1000 hours	_____		
3.3.1		Check damages	retension/check (torque: 27Nm). Check displacement.				
3.3.2		Check function					
3.3.3		Check voltage					
3.3.4		Check deformation					
3.3.5		Check completeness					
3.4		Screws	Note tightening torques.	every 250 hours	_____		Small part
3.4.1		Check damage					
3.4.2		Check connections					
3.5		Cover			_____		
3.5.1		Check damage					
3.5.2		Check function					
3.5.3		Check deformation					
3.5.4		Remove dirt					
3.5.5		Check completeness					
3.6		Metal rubber element			_____		Small part
3.6.1		Check damage					
3.6.2		Check function					
3.6.3		Check stability					
3.6.4		Check deformation					
4.		**Conveyor element (drum)**		once a day	_____	__.__.___	Reserve part
		Screws				___.___	
4.1		Check damage	Note tightening torques.		_____		Small part
4.1.1		Check connections					
4.1.2		Cover					

4.2		Check damage			_____		Reserve part
4.2.1		Check function					
4.2.2		Check deformation					
4.2.3		Remove dirt					
4.2.4		Rubber element					
4.3		Check connection			_____		Consumable
4.3.1		Check damage					
4.3.2		Check wear					
4.3.3		Remove dirt					
4.3.4		Conveyor element (screw)					
4.4		Check damage			_____		Consumable
		Check connection					
4.4.1		Check function					
4.4.2		Remove dirt					
4.4.3		Check deformation					
5.		**Frame**		every 250 hours	_____	__.__.___	
5.1		Connection, not			_____	___.___h	
5.1.1		detachable					
5.1.2		Check damages					
5.1.3		Check function					
5.1.4		Check corrosion					
5.1.5		Check deformation					
5.2		Remove dirt			_____		
5.2.1		Casing			_____		Small part
5.2.2		Check brackets			_____		Small part
5.2.3		Check locks			_____		Small part
5.3		Check end stop			_____		Reserve part
5.3.1		Cover					
5.3.2		Check damage					
5.3.3		Check corrosion					
5.3.4		Check deformation					
5.4		Remove dirt			_____		Reserve part
5.4.1		Protective device					
5.4.2		Check damage					
5.4.3		Check function					
5.4.4		Remove dirt					
5.5		Check completeness			_____		Reserve part
5.5.1		Flap					
5.5.2		Check connection					
5.5.3		Check setting					
5.5.4		Check corrosion					
5.5.5		Check deformation					
5.5.6		Remove dirt					
		Check completeness					
6.		**Power generator**	Observe the regulations of the respective manufacturer.				Reserve part
6.1		Remove dirt					
6.2		Check oil level					
6.3		Check completeness					

All conditions or works to be carried out not listed here according to Table A of the operating instructions must be checked or corrected visually. Any deviations from the target values / operating conditions that have been identified and ascertained must be corrected immediately.

Fault log

Fault log	Machine:	Operation: Cost centre:
	Manufacturer:	Device number: Serial number: Location:

Ser. No.	Tab. A -No.	Components / Assemblies	Malfunction / fault / damage according to operating instructions table A	Date of discovery	Work carried out / Executor	Date / operation hours / duration of repair	Comments

Any deviations from the target values / operating conditions that have been identified and ascertained must be corrected immediately. Reproduction of this log is expressly permitted.

Final decommissioning and disposal

The final decommissioning and disposal require the machine to be dismantled into its individual components. Dispose of all parts of the machine in such a way that damage is not caused to health and the environment.

Entrust a qualified specialist company with the final disposal of the machine.

When the machine is finally decommissioned, dangers from leaking lubricants, solvents, preserving agents, etc. must be expected. Direct contact with the skin can cause burns. There is a risk of injury from open, sharp-edged machine parts.

Uninstalling operations on electrical machines may only be carried out by trained electricians.

Version: 2.1 / 17.12.2023