



# **ZEMMLER® MULTI SCREEN® MS 1600**

**Operating Manual**



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# 1 General information

## Notice!



Please read the operating manual carefully before bringing the machine into service, to assure a maximum utilization. You will be better informed about the mode of operation and functionality of the machine.

Please read the manual and keep it safe.

Please observe and follow all safety instructions.

## Notice!



All contemplated technical data and instructions refer to series-production status of the double trommel ZEMMLER® MULTI SCREEN® MS 1600 dated:

March 2019

## 1.1 Field of application

The double trommel ZEMMLER® MULTI SCREEN® MS 1600 is a mobile double trommel. This machine classifies bulk material in 2 (optional 3 fractions) in one working stage with high volumetric flow.

The ZEMMLER® MULTI SCREEN® MS 1600 has been designed to screen various materials like compost, soil, sand, cinder, gravel, ballast, wood chips, waste, stones as well as mineral waste down to 2 mm grain size.

The maximum grain size being handled is  $\leq 170$  mm.

## 1.2 Information about the machine

Description	ZEMMLER® MULTI SCREEN® MS 1600
Machine no.	MS1600-153
Year of manufacturing	09//2019
Manufacturer / Distributor	Zemmler Siebanlagen GmbH Nobelstraße 11 03238 Massen-Niederlausitz Germany
	 +49 3531 7906 0
	 +49 3531 7906 11
	 info@zemmler.de
	 www.zemmler.de

## 1.3 Scope of delivery



The ZEMMLER® MULTI SCREEN® MS 1600 is standard equipped with the following accessory:

- Operating and service manual of machine (1x)
- EC declaration of conformity (1x)
- Operating manual (1x)
- Hitch (trailer hitch ball or draw bar eye (40mm / 50mm))
- Emergency-Stop-Key (2x)
- Screen change key (2x)
- Padlock (5x)
- Brake shoe (2x)

## 2 Documentation

The documentation about the double trommel consists of the following parts:

### Operating manual

1. The operating manual (abbreviated „ OM “) informs about function, assembling, bringing into service, transportation, handling, service, maintenance and removal from service of the machine.  
The operating manual is no text book but a reference book.
2. The operating manuals of modification parts and –machines are added at this operating manual’s addendum. See *appendix Fehler! Textmarke nicht definiert.*
3. The spare part list consists of component groups, flow charts and electro documentation. They contain circuit diagrams. These documentations provide the technical staff of the operator assistance by ordering expendable and spare parts.



### Notice!

At correspondence with staff of Zemmler Siebanlagen GmbH, please use machine parameter according to *chapter 1.2 –Information about machine*

### 2.1 Operating manual



This operating manual is an essential part of the machine and mandatory for a successful and save service of the machine.

The operating manual includes important advices to work the double trommel save, appropriate and efficient. Paying attention to the operation manual helps avoiding danger, reduces repair costs and down time and increases reliability and durability.

The operating manual must be available at the operator of the machine and has to be read and applied by any staff member working with or by the machine:

1. operation, troubleshooting at working process, disposal of utilities and additive,
  2. attendance (service, care, maintenance), quality assurance and/or transportation
- e.g.

### 2.2 Target audience

The operation manual is a reference book for informing service personnel and operator. If necessary for expert staff working for maintenance, troubleshooting and quality assurance on the double trommel. This operating manual is to disburden a save and professional operating of the machine.

## 2.3 Use of operating manual



### Notice!

This operation manual contains basic or continuative information about a discussed subject. Cross references link to the related chapter.

e.g.: " Realization, see *chapter 6.3 – title* "

Explanation: The instruction is in chapter 6, article 6.3.

Premise for working at/ with the double trommel is an understanding for the functions of the double trommel.

Attention should be paid to safety aspects, relevant for operating the double trommel as well as check-ups and maintenance. Therefore, begin studying *chapter 3 – safety advices* of the operation manual.

Further emphases for operating personnel about operating are *chapter 4 – General description, chapter 6 – Putting into operation and chapter 8 – Operating.*

Are the operation personnel responsible for maintenance of the double trommel, *chapter 11 – Maintenance and servicing* gives instructions for realization.

This operating manual is also a help for operators of this double trommel, to make organizational measures to assure a secure operation of the machine and to generate an efficient and top-quality production.

Most important information for the operator is written in *chapter 3 – Safety advices* and *chapter 6 –Bringing to service*. These described demands should be taken in account by conception the working area and defining the work process.

### 2.3.1 Symbols and warning notices within the operating manual

The accident prevention regulations and common safety advices have to be complied during service of the double trommel. Important advices like safety related advices are marked by equivalent symbols.

The symbols and structural elements of the operating manual have the following appearance and meanings:



#### Caution – Danger for people!

This symbol marks common work safety advices. Consequence of non-observance will cause danger for life and living.

Pay close attention to the work safety advices and behave very careful in these cases.

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**Warning – Danger due to electric voltage!**

This symbol marks common work safety advices. Consequence of non-observance will cause danger for life and living by electric voltage.

Pay close attention to the work safety advices and behave very careful in these cases.



**Warning – Danger due to crushing of body or body parts!**

This symbol marks common work safety advices. Consequence of non-observance will cause danger for life and living by crushing due to conveyor belts.

Pay close attention to the work safety advices and behave very careful in these cases.



**Warning – Danger by retracting body or body parts!**

This symbol marks common work safety advices. Consequence of non-observance will cause danger for life and living by retracting at the drum or carrier idlers.

Pay close attention to the work safety advices and behave very careful in these cases.



**Attention – Damage to double trommel!**

This symbol marks all safety advices linking to regulations, instructions or sequence of operation which have to be strictly followed. Consequence of non-observance will cause in damaging or destroying the double trommel and/or other machine parts as well as false production.



This symbol emphasizes examples of use and other useful information of this operating manual.



**Duty of instruction!**

This symbol marks all advices referring to certain instructions, which have to be strictly followed. Consequence of non-observance will cause in damaging or destroying the double trommel and/or other machine parts as well as false production.

## 2.4 Identification of documentation

This submitted operating manual refers to the double trommel according to identification sheet (chapter 1.2). For a clear allocation, each page's footer of the operating manual is labeled with the serial number and date of manufacturing. The complete identification includes the following information: MS1600.119.01.18

## 2.5 Guarantee of commitment and warranty

The machine documentation including all of its parts is copyrighted. Each and every application outside the restrictions of the law of copyright without our permission is forbidden and chargeable. This in particular reckons for duplication and editing.

An abandonment of the operating manual to a third party is forbidden and obligates to pay damage.

All information and advices for the service and maintenance of the machine considering our current experiences and knowledge in all conscience. We reserve the right to all technical changes due to the improvement of this particular machine. Only these spare parts, approved by us and listed in the spare part book, are being allowed to use.

We are liable for possible mistakes or default, under exclusion further demands, within the liability of guarantee of the main agreement. Claims for damages exist likewise in extend arranged duties of compensation of the main agreement.

Translations are done at best knowledge. We cannot take liability for mistranslation.

The delivered German version of this documentation remains authoritative.

The textual and graphical descriptions do not necessary match the scope of delivery respectively a spare part order. The drawings, graphics and photomontage do not accord the scale 1:1.

### 2.5.1 Warranty

#### **Warranty:**

Beyond legal warranties for defects of the distributor, we as manufacturer guarantee under the following premises an acceptable durability of proper use Zemmler Siebanlagen GmbH products.

The warranty expanse to the function of Zemmler Siebanlagen GmbH products and covers all defects, detectable to fabrication or material failures.

#### **We do not take liability for secondary damages!**

We do not take liability for damage to property or persons caused by faulty operating or ignoring of all safety advices. In such cases any claim of warranty expires.

#### **Condition of warranty:**

Our warranty consists exclusively in a free repair of our product and or in a free spare part delivery to the first – end customer within our chosen time of warranty.

The costs, expenses, postage and suchlike of the warranty recipient will not be substituted. A claim of warranty is only accepted at sight of the default component. The exchange of a default component will be exclusive by Zemmler Siebanlagen GmbH or by a service company, authorized by us.

A claim of warranty expires once repairs are done by not authorized service companies and/or use of not original spare parts.

**Time of warranty:**

The time of warranty is 12 month or 1000 working hours, depending on what case occurs first. It starts with the day of delivery to the first - end customer. In case of complains or warranty, please contact the distributor or manufacturer

Zemmler Siebanlagen GmbH.

**Caveat emptor and limitation of liability:**

All exchangeable parts, like screws, connection pins and so on are excluded of this warranty Further more we take no liability for damage caused by:

3. improper and inappropriate use
4. wear parts (belts, rubber straps, stripper, screens, brush elements)
5. faulty and sloppily use
6. No observance of maintenance advices, operating advices, changes, inspection and self-repair chemical and physical as well as damage on the machine surface due to improper use, like damage by sharp objects.

### 3 Safety advices

#### 3.1 Preface to safety

The chapter *Safety advices* give an overview about all safety relevant aspects for operating the double trommel.

General safety advices bear on to safety-related condition of the double trommel. This is postulate for operation and maintenance as well as handling operating materials and auxiliary materials.

Beyond general advices, in each individual chapter of the operating manual are explanations given of procedure or instruction on how to act, if necessary, are labeled with concrete safety advices.

Primary attention to all safety advices (in general and concrete) enables an efficient protection of personnel as well as environmental danger and a safe and undisturbed service of the double trommel.

Zemmler Siebanlagen GmbH advices operator, by the means of given operating manual, to adjust work flows of the service according to set up a safety concept or to adjust a current safety concept. Essential adjustments or advices for realization of this concept should be configured in written form within the operating manual for individual areas of operation.

The double trommel meets the highest presently valid norms of technology and is generally safe to operate. We construct and produce our machines according to machine guidelines 2006/42/EG.

It may be danger potential of the machine if it is operated by uneducated personnel, improper or non-intended use.

These each person operating or maintaining the machine must have read and understood the operating manual before fulfilling its tasks. This also applies to person who have on such or similar machine or had been educated by Zemmler Siebanlagen GmbH.

It is recommended to the owner, to receive a written confirmation of the personnel of having noticed the content of the operating manual. Notice of the content of the operating manual is a premise to protect persons of danger as well as avoiding other faults.

The operating manual has to be accessible at any time to operating and maintenance personnel!

Finally accountable for an accident free service is the owner or of the owner authorized personnel which have to operate the machine according to the owner's assignment.

Information about operational safety refers to presently valid ordinance of the European Union. Adequate laws and country ordinances have to be observed and complied in other countries. The current stand of laws has to be assessed by the owner for both at European Union and other countries.

Beside the safety advices of the operating manual all general valid safety and accident prevention instructions must be observed and followed.

All specifications of the operating manual are boundless to obey!

### 3.2 Operational safety

By following all advices for operational safety, danger to persons, environment and or the double trommel can be avoided.

Ignoring these advices can cause under certain circumstances the following:

7. Danger to persons due to mechanical, electrical or chemical reaction
8. Endangering environment
9. Breakdown of the double trommel and or other machine components

Ignoring the safety regulations can lead to loss of any kind of claim of damages!

### 3.3 Conventional usage



The operating safety of the double trommel is only ensured by correct usage according to the information of the operating manual.

The double trommel is a system build specifically for screening bulk goods into 3 fractions. At this, attention has to be paid for its maximum and minimum grain size as well as the maximum humidity of the bulk good. Please look at *chapter 12 – Technical information*

Every other or exceeding usage will not be conventional! Here from resulting damage will be the liability of the owner. This is also applied for unauthorized changes on the machine.

Part of conventional usage is adherence of starting-, operating- and maintenance regulations, prescribed by Zemmler Siebanlagen GmbH. Also the authorized bulk goods as well as listed operating materials and auxiliary materials.

Furthermore, only original spare parts are allowed to be disposed. Wrong or faulty spare parts can lead to damage of the machine.

Maintaining the manufacturer's guidelines for operation, maintenance and cleaning are essential for conventional usage. By unauthorized usage and non-appropriate appliance will result in exclusion of liability.



#### **Notice!**

Our specialist will kindly answer your questions concerning bulk goods and the according screens to assure an efficient utilization of the machine.

### 3.4 Danger signs on the double trommel screen

Signs attached directly on the machine or associated secondary installations like danger signs, direction of rotation arrows, operation signs e.g. must be absolutely observed. It is forbidden to remove this sign and they have to be kept readable.

The symbols of the danger signs have the following appearance and meaning:



Warning – Danger by retracting body or body parts



Warning - Risk of hand injury!



Warning – Danger due to crushing of body or body parts



Wearing ear protection



Wearing helmet



Wearing glove



Secure by using padlock

### 3.5 General safety advices about the technical condition of the machine

The machines construction and manufacturing meets current state and regulations of technology.

To avoid danger and ensure efficient capacity it is forbidden to make changes or remodeling on the machine which are not explicit authorized by Zemmler Siebanlagen GmbH. This also applies for program editing of the programmable system control.

Arbitrary changes or remodeling especially those endangering personnel, environment or the machine are generally forbidden

In this operating manual stated set points respectively its ranges must not be exceeded.

To be used spare parts must meet technical demands defined by Zemmler Siebanlagen GmbH. This is warranted by original spare parts

The owner is beholden to keep the machine in an acceptable and operating safe condition. In particular all safety installations and interlocks must be easy to access and constantly

checked for unobjectionable operation.

### **3.6 General safety advices for operator**

The operating manual is an essential part of the machine. The operator provides correspondence for the operating personnel to have noticed the guidelines.

The operating manual has to be updated by the operator according to national regulations about accident prevention and environment protection. Including information about obligatory supervision and notification requirement regarding operating characteristics like work organization, work flow and personnel.

Beside effective and binding regulations (accident prevention and safety at work) of the country of operator as well as sight of usage all authorized regulations for safe and proper operation have to be paid attention to.

The operator has to commit the operating personnel to wear personal riot gear as far local regulations envisage so.

First aid equipment has to be placed within reach! The places of fire extinguishing devices have to be announced!

Fire detectors and fire-fighting possibilities shall be provided.

Only appoint trained and instructed personnel. Competences of personnel for operating, mounting, maintaining and servicing have to be clearly structured.

A machine operator has to be chosen to take responsibility for the entire machine and personnel. Educating, instructing or schooling personnel in general is only allowed to operate the machine under permanent supervision of experienced specialists.

### **3.7 General safety advices for operating personnel**

Only authorized, educated and instructed personnel are allowed to operate and maintain the machine. The personnel have to be instructed about possible danger.

Instructed personnel is, who is informed about the assigned task and possible danger at incorrect behavior and if necessary semi-skilled as well as taught about needful protection and precaution.

Specialist is who is, based on job training, knowledge and experiences as well as knowledge of relevant stipulation, able to judge the assigned duties and detects possible danger.

If the personnel not educated as necessary, it has to be accordingly taught. This can be by Zemmler Siebanlagen GmbH by order of the owner.

Competency for operation and maintenance must be clearly defined and adhere in order to avoid inexplicit competences in the aspect of safety.

The machine must be operated and maintained by persons who are expected to do a reliable duty. To be of no consequence every method of operation has to be banned which endangers persons, environment or the machine. Persons under the influence of drugs, alcohol or pharmaceuticals affecting the ability to response are not allowed to operate the machine at all.

Employee selection must consider minimum age, protection of minors of respective country and if applicable thereupon founded specific to profession regulations.

The operator has to make sure that no unauthorized persons operate the machine.

Unauthorized persons like visitors must not get in touch with the machine. They must keep an adequate safety clearance.

To avoid person damage work wear of operating and maintaining personnel must meet accident prevention regulations and suggestions of Employer's Liability Insurance Association (no wide sleeves, low breaking strength et cetera).

According to implemented workings personnel body protection gear has to be worn like eye protection, ear protection, protective clothing.

### 3.8 Behavior in case of danger and accidents



**In case of danger or accidents the machine can be shut down by emergency-stop switch (see fig. 3-1).**

The emergency-stop function causes an immediately stop of the machine irrespective the present position of machine parts.

Activate safety devices only in case of emergency. Do not use them to normally stop the machine.

Always be prepared for accidents and fire!

Keep first-aid supplies (first-aid box, eye rinse bottle et cetera) and fire extinguisher in reach.

Personnel must be familiar with handling and location of safety devices, accident enunciator, first-aid facilities and rescue facilities. Hereby the best possible assistance at accidents and defense of danger can be assured.

### 3.9 Safety advices for maintenance

Accomplish maintenance duties only at stand still of machine.

For all maintenance duties, pay attention to shut down procedure and essential safeguards as describes in this operating manual.

At all operating disruption assures that all safeguards work properly.

Maintenance cycle and repeating check of engine, hydraulic system and technical equipment have to be planed and arranged respectively commissioned be the owner.

At breakdown of the machine, operation has to be immediately suspended; the machine has to be run empty and turned off. The affected parts have to be repaired or exchanged.

After installation work and maintenance all safety devices have to be checked if installed correctly and work properly.

Safety devices must not be bypassed or set out of function.

Certain maintenance duties can only be done by specialists. This applies especially for hydraulic and electric components.

### 3.10 Location of safety installations

The ZEMMLER® MULTI SCREEN® MS 1600 is equipped with five emergency stops and five door safety sensors.

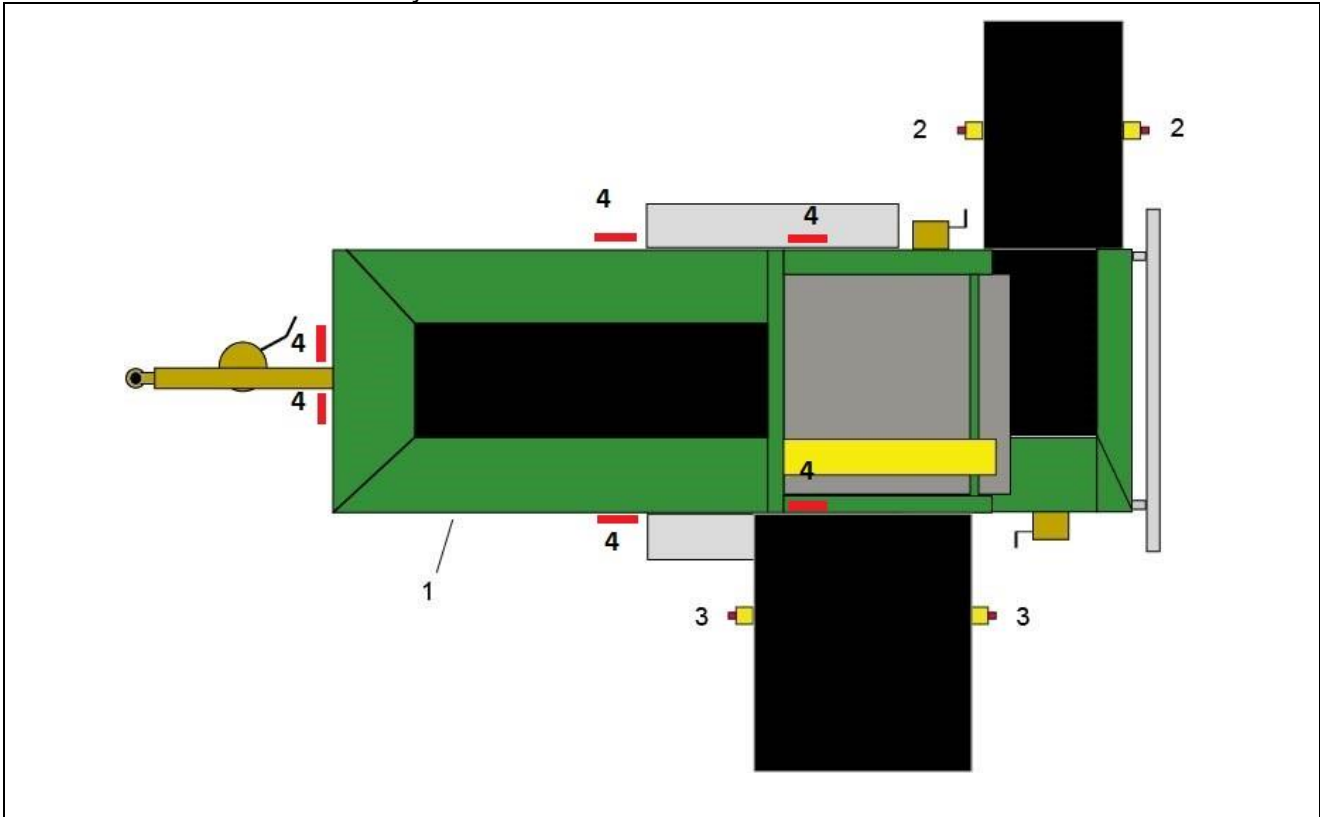


fig. 3-1: Location of safety installations

- 1) Emergency stop on control unit
- 2) Emergency stop on conveyor belt coarse fraction  
(right and left on supporting frame)
- 3) Emergency stop on conveyor belt fine fraction  
(right and left on supporting frame)
- 4) Door safety sensors



**Notice!**

All screwed on coverings must only be demounted for service and maintenance. All coverings and slides (optional) must be mounted for operation.

### 3.11 Safety advices – door safety sensors

The door safety sensors supervise the closed doors during the operation of the machine. If one of the doors will be opened the machine stop and the motors go out.

### 3.12 Safety advices for work position on the double trommel



The only objects within the working position are the ones needed for the particular working stage.

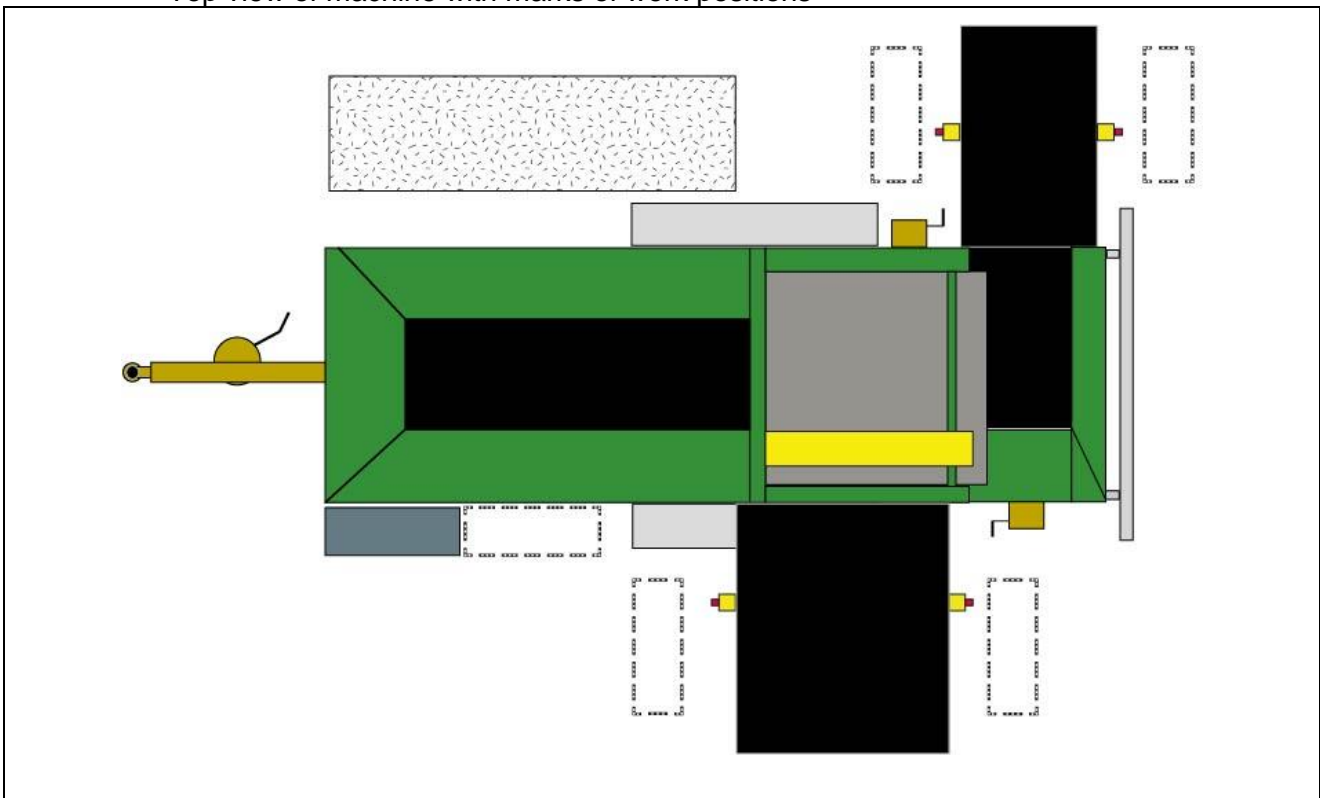
The operator must always be within spitting distance of the machine and supervises the operation. The machine must not run without supervision.

Upon completion of operation, the machine must be run empty and turned off.

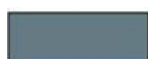
Secure machine against unintended restart.

fig. 3-2 displays alignment of working position, operating position and feeding position for operation personnel.

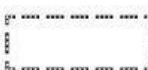
Top view of machine with marks of work positions



**fig. 3-2: Alignment of work positions**



Work position for operation of machine.



Work position for rigging, accomplish visual inspection and monitoring check instruments during operation, service, maintenance, cleaning as well as troubleshooting.



Feeding area of machine

### 3.13 Safety advices – Cover protection



**Caution!**

Open the cover protection just for service and maintenance, secure it through protection elements.

Before each service the operator has to visual inspect the entire machine and the light bar has to be dismantled.



**fig. 3-3: Cover protection and protection elements**

### 3.14 Safety advices for emissions

#### 3.14.1 In general



**Caution!**

Operating the machine can cause emission. Under certain operating conditions these emissions can endanger the health of the personnel.

The operator has to take care of abiding the permitted maximum emission values.

#### 3.14.2 Noise emission



**Caution!**

Operating the machine causes noise emission. These emissions are over mandatory threshold.



These emissions can endanger the health of personnel. The operator has to assure that its employees wear adequate ear protection.

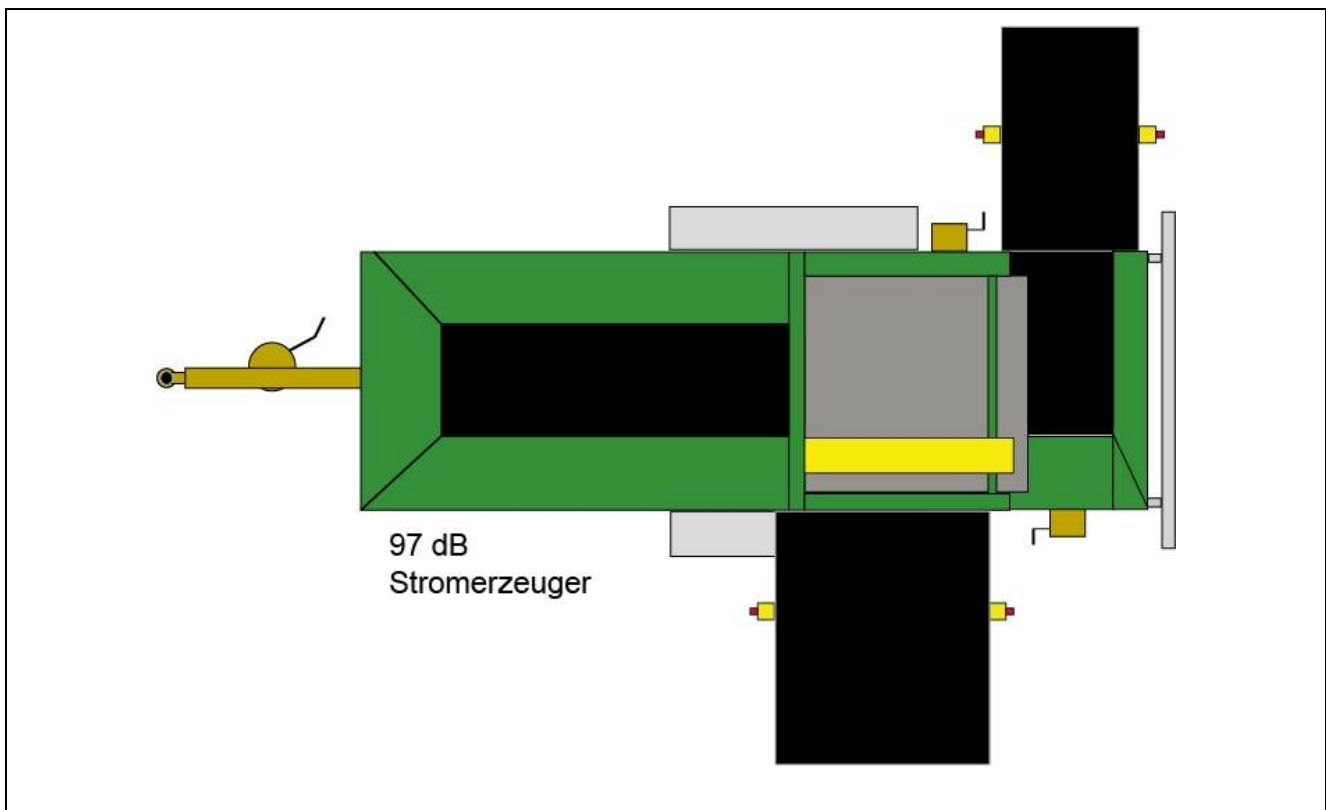


fig. 3-4: Noise value



**Notice!**

The values listed above may vary depending on operating conditions (screening of debris e.g.).

## **4 General description**

### **4.1 General description of the mobile double trommel**

The double trommel ZEMMLER® MULTI SCREEN® MS 1600 is a mobile screening machine. It classifies bulk load into two or optional three factions within one working stage with a high capacity.

The ZEMMLER® MULTI SCREEN® MS 1600 has been designed to screen various materials like compost, soil, sand, cinder, grit, gravel, wood chips, waste, stones, mineral waste et cetera or golf sand down to 2 mm grain size.

The maximum grain size being handled is  $\leq 170$  mm.

### **4.2 Brief description of the screening process**

The bulk load is dumped into the silo. The feeding belt carries the material into the double drum. Due to rotation of the double trommel and the adequate screens, the material is classified while it is yielding to the end of the double drum. The rotation of the double drum leads to an extended dwell time of the material within the machine. This enables a classification of larger volume flow rate at compact construction. The resulting two factions are dumped on two different sides of the machine. All two conveyor belts direct the screened material on three angle of repose.

Optional it is possible to install an ring for the third fraction to get a fine, middle and a coarse product. The material of the coarse product is let out in the back of the machine.

### 4.3 Assembly overview

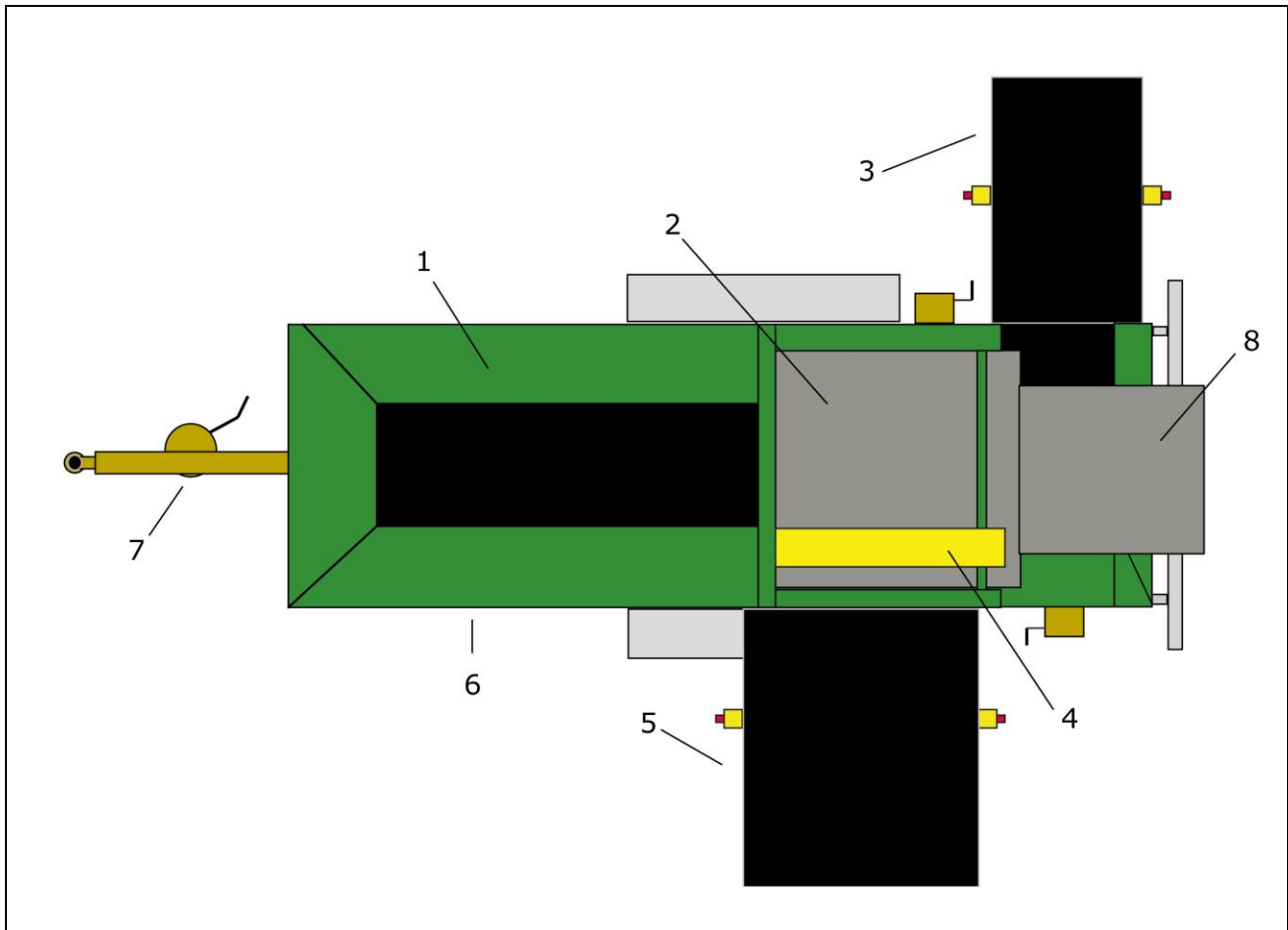


fig. 4-1: Assembly overview (top view)

- 1 Silo (optional extended feeder)
- 2 Double drum
- 3 Conveyor belt of coarse fraction
- 4 Cleaning brush
- 5 Conveyor belt of fine fraction
- 6 Engine and operation panel
- 7 Chassis
- 8 Optional extension of coarse product

## 4.4 Assembly

### 4.4.1 Silo

The Silo consists of the feeding hopper and a conveyor belt, which moves the screening material into the double drum. Optional it is possible to install an extension for the feeder up to 350mm.

Cubage:	1,6 m <sup>3</sup> (optional 2,5 m <sup>3</sup> )
Belt width:	800 mm

### 4.4.2 Double trommel

The sorting drum consists of two tightly joined drums. The mesh size of the screens can be changed by choosing different sizes of wire screens.

Outside diameter:	Outside diameter:
Inside diameter:	Inside diameter:
Outside screening surface:	Outside screening surface:
Inside screening surface:	Inside screening surface:

Optionally, the double trommel can be upgraded for a further classification by an extension.

### 4.4.3 Conveyor belt for fine fraction

The conveyor belt for the smallest classification ejects the screenings on the left hand side on dump.

Belt width:	1.000 mm
Belt length:	3.250 mm
Belt type:	Belt EP250/2 3+1

### 4.4.4 Conveyor belt for coarse fraction

The conveyor belt for the middle classification ejects the screenings on the right hand side on dump.

Belt width:	600 mm
Belt length:	3.250 mm
Belt type:	Belt EP 400/3 2+1

## 4.5 Control unit

### Notice!



The ZEMMLER® MULTI SCREEN® MS 1600 is equipped with a main control unit. In case of further questions about operation, please contact Zemmler Siebanlagen GmbH and name the alternative of control unit.



Read directions of control unit carefully to avoid errors at application.

Contrary to our expectations, please contact Zemmler Siebanlagen GmbH when unintelligibility accrues.



fig. 4-2: Control unit

- 1 Control panel and status display
- 2 Operating hours counter
- 3 Main switch
- 4 Kinco Display

### 4.5.1 Control panel and status display

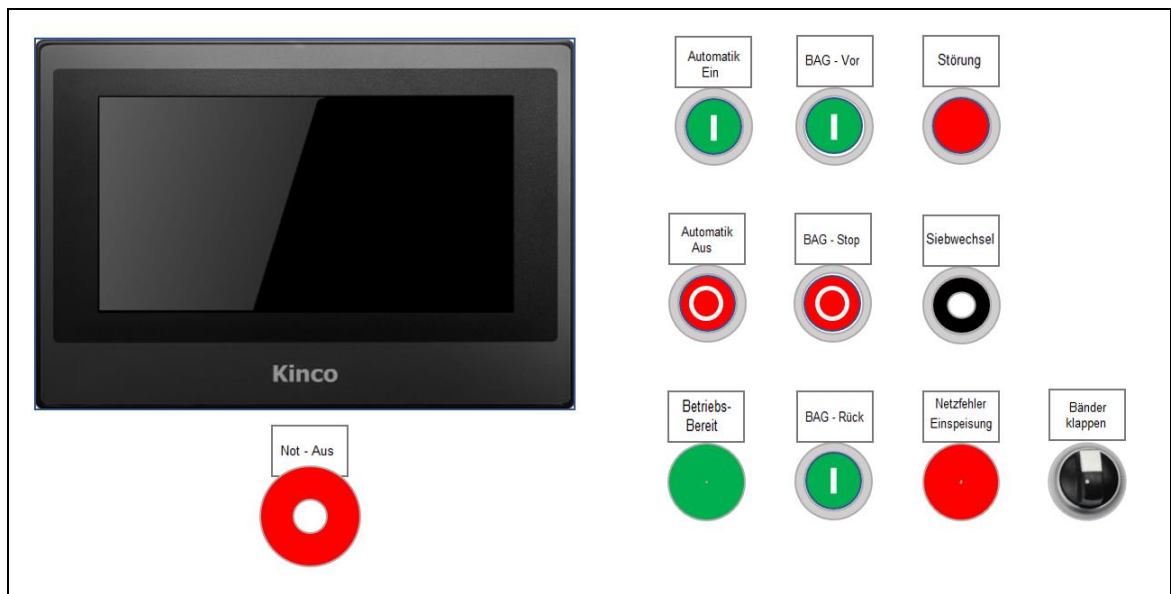


fig. 4-3: Control panel and status display

<b>Automatic ON</b>	Machine starts up, conveyor belts und trommel drive up
<b>Automatic OFF</b>	Machine shuts down, conveyor belts and trommel turn off
<b>Ready</b>	flashing when starting up, system is ready for charging permanently lit
<b>FB</b>	FB runs forwards, in inching mode increase of the speed
<b>faster/forwards</b>	
<b>FB-Stop</b>	FB stops
<b>FB</b>	In inching mode decrease of the speed
<b>slower/backwards</b>	FB runs backwards by keeping it pressed and after the FB stop was pressed
<b>Malfunction / Reset (light function)</b>	Taster für „Reset“ nach einer Störung oder bei Vorliegen einer Störung
<b>Emergency Stop</b>	Machine is completely shut down and comes to a standstill
<b>Infeed power supply error (light function)</b>	If it lights up red permanently, an incorrect rotating field is present.
<b>Remote control optional</b>	Rotary switch for turning on/off the remote control;
<b>Screen change</b>	Activate screen change with key switch MS2

## 4.5.2 Display



### Hint!

Visualization and functional description can be found in the separate instructions in this manual!



#### 4.6 Remote control (optional)

To activate the remote control, press button 4 on the remote control. At the top right is the EMERGENCY STOP button.

Perform the following steps within 5 seconds:

1. Pull the emergency stop switch.
2. Press button 4 briefly, the LED flashes red.
3. Press button 4 again until the LED flashes green.

Wait until the LED flashes green slowly.

The remote control is connected to the machine.



fig. 4-4: Remote control

To turn off the remote control, press the EMERGENCY STOP button.



**Hint:**

If the status LED flashes red, an acoustic signal sounds and the transmitter vibrates, you need to change the battery. Otherwise the transmitter will switch off in a few minutes. Only recharge the battery with the corresponding charger.

## 5 Transportation



### Attention!

The transportation of the double trommel is only allowed to haul with an approved traction.

Please note valid instructions of governmental traffic regulations.

### 5.1 Preparation of the machine for transportation

In preparation for transportation, the following criteria have been fulfilled:

1. Any material has to be removed from silo, double drum and conveyor belts.
2. Clean belts and double drum neatly to prevent loose material to fall down and affect traffic.
3. Check machine for eventual damage that could affect safety of transport.
4. Damage has to be reported to responsible personnel, to correct the damage before next operation.
5. Indicate size of draw bar eye when ordering order to avoid disordered traction engine.
6. Mount light bar on the machine and check functionality.
7. Before transportation on public roads, check if the machine meets governmental traffic regulations.
8. Attach all supply pipes appropriate to traction engine and check all functions.



### Attention!

Check all extended fractions to be locked in transportation security and all standard fractions are secured with transportation security devices.

Before transportation, the machine has to be checked for functioning condition and road safety.

Visual inspection of entire machine has to be done before transportation.



**fig. 5-1: Example transportation**

## 6 Putting into operation

### 6.1 Initial operation

After installation, initial operation and a test run of the machine, done by Zemmler Siebanlagen GmbH the double trommel is handed out to the owner. Thereafter the machine can be operated considering the operating manual and the effective labor protection and accident prevention regulations.



#### **Attention!**

Before operating the machine, it has to be checked for functioning condition and operating safety.

Before each service the operator has to visual inspect the entire machine and the light bar has to be dismantled.

### 6.2 Putting into operation after maintenance or breakdown

The machine can be brought back to operation after all service and maintenance procedures have been correctly completed.



#### **Attention!**

Before operating the machine, it has to be checked for functioning condition and operating safety.

Before each service the operator has to visual inspect the entire machine and the light bar has to be dismantled.

Check that all tools, utilities and packages are removed.

Ensure that all secure arrangements and stabilization occur according to guidelines of bringing into service.

### 6.3 Putting into operation after longer idleness

In case of a longer idleness the entire machine has to be cleaned.

Before bringing the machine into operation after a longer idleness the machine has to be again visually inspected. Safety protections have to be installed and have to be checked for functioning.

## 6.4 Putting into operation after transportation

Putting the machine into foreseen working position with the traction engine after transportation.

The further procedure will be explained in *chapter 28 Readiness for service*.



**fig. 6-1: Working mode (left)**



**fig. 6-2: Working mode (right)**

## 7 Readiness for operation



### Attention!

The operator is responsible for third party within the working area.

The first installation and initial operation should always be done by customer service of Zemmler Siebanlagen GmbH.

Unauthorized installation work is forbidden.



### Caution – tilting danger of double trommel!

Installing the double trommel on soft grounds or uneven grounds may cause the machine to tilt during operating.

Assure for enough solid and even grounds.

### 7.1 Installing the machine

1. Set the double trommel on even and solid grounds.
2. Pull handbrake which is located on the left front side of the machine.
3. Place brake pads before or behind wheels to prevent inadvertent rolling of the machine. The brake pads are located at the wheels; please see fig. 7-1.
4. Lower landing gear which is located on the rear and front of the machine.



fig. 7-1: Landing gear in transportation position



### Attention – tilting danger of double trommel!

In case of soft grounds, increase contact area of support legs.

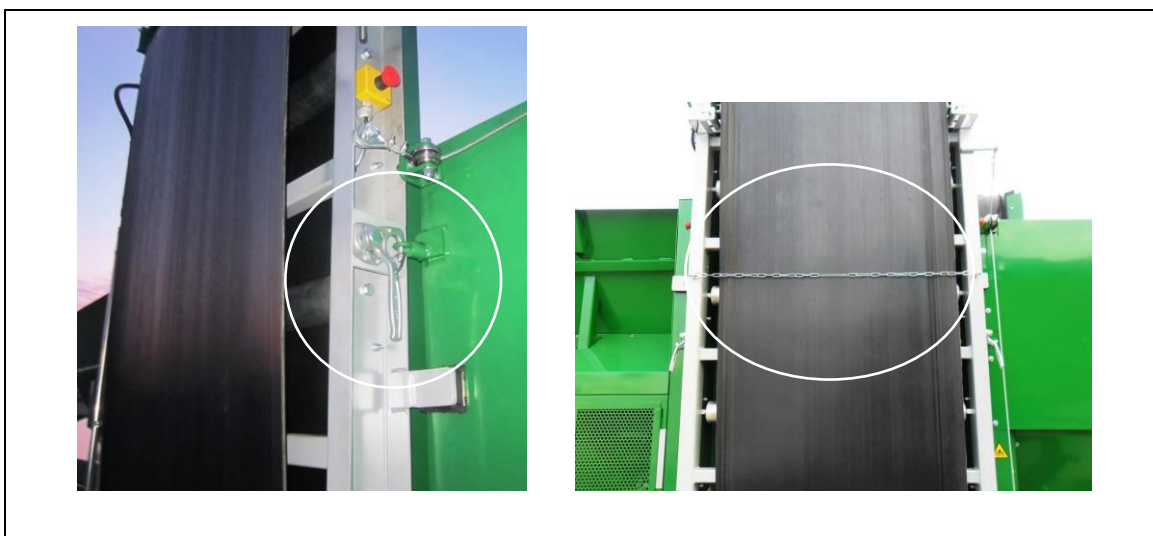


**Attention – squeezing danger**

By pulling out the support legs there is a danger of squeezing of the foots.  
Have always a safe distance to the support legs.

5. Disconnect machine from traction engine.

**7.1.1 Transportation safety device of fine fraction**



**fig. 7-2: transportation safety device of fine fraction**



**Notice!**

All fraction belts have transportation safety devices which have to be removed by hand.

**7.1.2 Transportation safety device of coarse fraction**



**fig. 7-3: Transportation safety device of coarse fraction**

## 8 Operating



### Attention!

Before operating the machine, it has to be checked for functioning condition and operating safety.

Before each service the operator has to visual inspect the entire machine and the light bar has to be dismounted.

### 8.1 Folding out the conveyor belt of fine fraction



### Attention!

Pay heed to the fact that there will be no persons within the working area during fold out of conveyor belt!

This can cause injuries.



### Caution – damaging the double trommel!

Pay heed to the fact that there will be no tall objects underneath the conveyor belt.

This can cause damage on the machine.

### Folding out the fine fraction (1<sup>st</sup> fraction):

1. Put the crank on the rope winch (fig. 8-1)
2. Remove transportation security devices of the conveyor belt of the fine fraction.
3. The belt is folded out completely by turning the crank to the left.



fig. 8-1: Crank/ rope winch of fine fraction



**Attention!**

Before unfolding the belt of the fine fraction remove all security devices. (see chapter 7.1.1)

**8.2 Folding out conveyor belts of coarse fraction**



**Attention!**

Pay heed to the fact that there will be no persons within the working area during fold out of conveyor belt!

This can cause injuries.



**Caution – damaging the double trommel!**

Pay heed to the fact that there will be no tall objects underneath the conveyor belt.

This can cause damage on the machine.

**Folding out the coarse fraction (2<sup>nd</sup> fraction):**

1. Put the crank on the rope winch (fig. 8-2)
2. Remove transportation security devices of the conveyor belt of the coarse fraction.
3. The belt is folded out completely by turning the crank to the left.
4. After folding out the belt, install the guide plates (fig. 8-2 right)



**fig. 8-2: Coarse fraction with guide plates**



**Caution – danger**

Pay attention that the surface of the machine can be slippery under certain conditions (weather, condition of material)

This can cause injuries.

### 8.3 Operating with power generator

Before starting the generator ensure that the engine compartment is prevented against pollution/ particulate emissions and heat. It is possible to realize it with a flexible metal tube, otherwise it may can result a damage on the machine which is not included in the warranty.



fig. 8-3: Use of metal tube

#### 8.3.1 Starting the power generator

1. Open the door (see fig. 8-4) and save the door with the rod.



fig. 8-4: Control unit door opened



**Warning – Risk of crushing bodies or body parts!**

No safety of the door through the rod leads to a crushing hazard between the door and the frame of the machine.

Safe the doors always with the rod.

2. Install the grounding rod in a distance of 10 – 20 m to the machine.



**Caution – electric voltage**

Check the electricity supply and control the electric safety devices.

Use the grounding rod.

3. The operation manual of the power generator explains how to start the generator.
4. Unlock the secured emergency stop with a key and the machine is ready to use if necessary.



**Hint!**

**It may occur that the RCDs of the unit and the mains do not harmonize with each other.**

## 8.4 Operating on electric supply mains



**Caution – electric voltage**

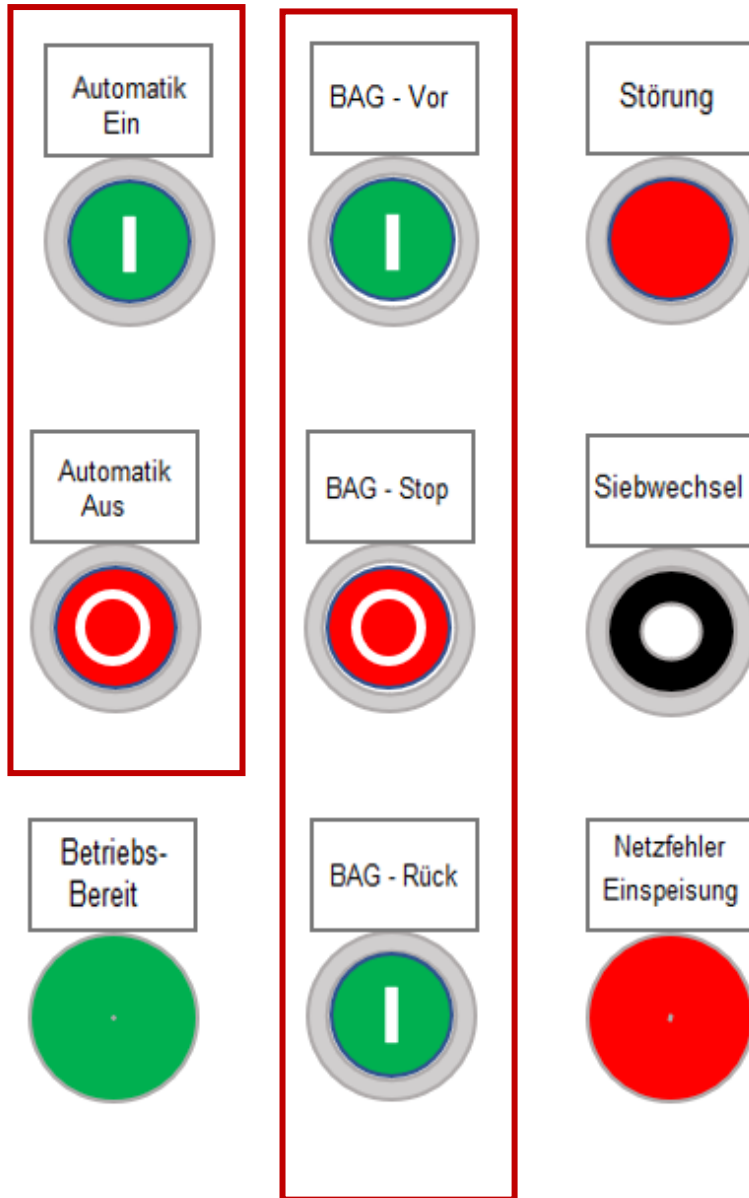
Check the electricity supply and control the electric safety devices.

1. Open the door (fig. 8-4) and save the door with the rod.
2. Install the grounding rod in a distance of 10 – 20 m of the machine.
3. Connect the machine with a cable and insert in CEE 16 Ampere.
4. Unlock the secured emergency stop with a key and the machine is ready to use if necessary.

## 8.5 Start the screening process

4. Press the "Automatic On" on the keypad. Conveyor belts and the trommel start moving one after the other. The "Ready" light flashes. The horn sounds.
5. If "Ready" lights up continuously, the screening process can begin.
6. To achieve the desired screening results and to avoid overfilling of the feeding hopper, the FB speed can be adjusted with "FB faster" and "FB slower".

In addition, the speed of the trommel can be adjusted via the display -> *belts*.



## 9 Shutdown

When machine is taken out of operation, it must run completely empty. This means that no further screening material are fed into the machine and the conveyor belts of the two fractions must run empty.

1. Press the "Automatic OFF" on the keypad. The belts and the trommel stops one after the other.
2. Turn off the generator.
3. Turn off the main switch.



### Notice!

The machine has to be visually checked.

### 9.1 Folding in conveyor belt of fine fraction



#### Attention!

Pay heed to the fact that there will be no persons within the working area during fold in of conveyor belt!

This can cause injuries.

Check all security devices of their function.



#### Caution – damaging the double trommel!

Pay heed to the fact that there will be no tall objects around the conveyor belt.

This can cause damage on the machine.

1. Put the crank on the rope winch (fig. 8-1)
2. The belt is folded in completely by turning the crank to the right.
3. Secure the transportation security devices.

## 9.2 Folding in conveyor belt of coarse fraction



### **Attention!**

Pay heed to the fact that there will be no persons within the working area during fold in of conveyor belt!

This can cause injuries.

Check all security devices of their function.



### **Caution – damaging the double trommel!**

Pay heed to the fact that there will be no tall objects around the conveyor belt.

This can cause damage on the machine.

1. Before folding in the coarse fraction, deinstall the guide plates (see figure 8-2).
2. Put the crank on the rope winch (fig. 8-1)
3. The belt is folded in completely by turning the crank to the right.
4. Secure the transportation security devices.

## 10 Troubleshooting

Failure	Cause	Repair
Generator		Read the manual of the generator. Please contact Zemmler Siebanlagen GmbH
Engine stops	Fuel	Check fuel level of the generator. Read the manual of the generator. Please contact Zemmler Siebanlagen GmbH
Fraction belt cannot be folded out	Transportation device Rope winch	Reinstall all transportation devices  Check the rope for damaging or things which affect their function  Please contact Zemmler Siebanlagen GmbH
Conveyor belts do not start	Electric Control unit	Control Emergency-stop bottoms Please contact Zemmler Siebanlagen GmbH Please contact Zemmler Siebanlagen GmbH
Double trommel does not start	Overloaded trommel Chain electric	Control Emergency-stop bottoms Clean out drum and afterwards restart Please contact Zemmler Siebanlagen GmbH Please contact Zemmler Siebanlagen GmbH
Whelmed silo	Feeding belt to slow	Adjust speed of feeding belt <i>see chapter 8</i>
Whelmed double drum	Feeder belt to fast Trommel to slow	Adjust speed of feeder belt <i>see chapter 8</i> <i>Adjust speed of trommel</i> <i>see chapter 8</i>
Light bar	Ex function	Check plug and socket Please contact Zemmler Siebanlagen GmbH

## 11 Service and maintenance

### 11.1 General service and maintenance

The consequent procedure of maintenance and abidance of all time intervals are an important premise for a reliable functionality of the machine.

This chapter defines working which has to be done by operating personnel or qualified specialists.

After each operation of the double trommel all parts have to be checked for abrasive wear and damage. Replace defect parts immediately or let it be changed by specialists to avoid damage of other parts. If separating protectors have to be removed, they have to be remounted after contact.

An abstract and an overview of the work are listed in the maintenance schedule.



**The daily and weekly service can be accomplished by an authorized machine operator. The hourly service must be accomplished by an authorized mechanic. All further maintenance tasks and troubleshooting, not listed in this operating manual or not being done by itself, have to be accomplished by Zemmler Siebanlagen GmbH-Service.**



#### **Notice!**

To order spare parts, please indicate type of machine and data of type plate.



#### **Notice!**

Please read service and maintenance instructions of engine producer. These are part of maintenance procedure and are **not** listed in this manual.

### 11.2 Safeguard at service and maintenance

At all workings every listed safeguard and if applicable; recommended shutdown procedures must be observed and followed.

At workings for which safeguards (like cladding panels) have to be removed, one emergency stop has to be pressed.

For several specific works it is necessary to install additional security devices.

### 11.3 Emptying the machine

For realization of maintenance required during operation of machine it must be completely empty. This means no further bulk must be fed to the machine and all belt conveyor of all three fractions must run empty.



**Notice!**

The machine must always be run empty. The visual check is to be done from the review of the double trommel and conveyor belts.

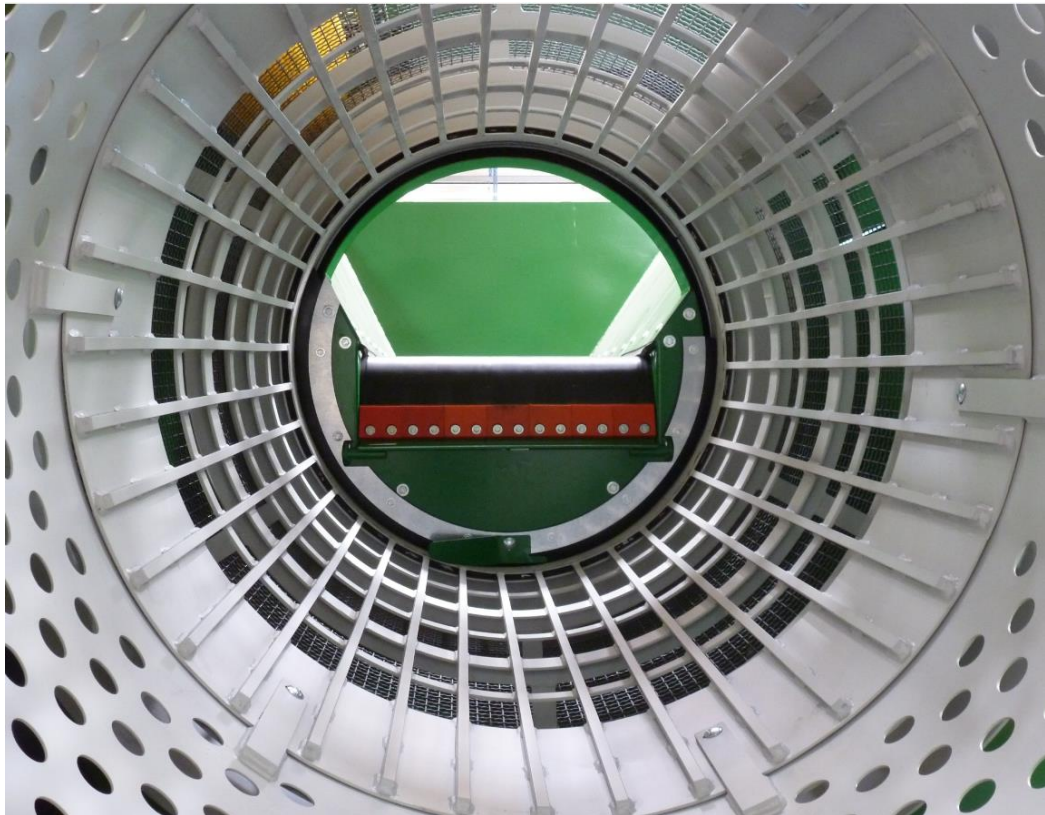


fig. 11-: Visual check of double trommel

**11.4 Securing the machine**

1. Turn off engine.
2. Press emergency stop and pull out the key.
3. Main switch on "OFF". The control unit has to be secured by a padlock for accidental restart.

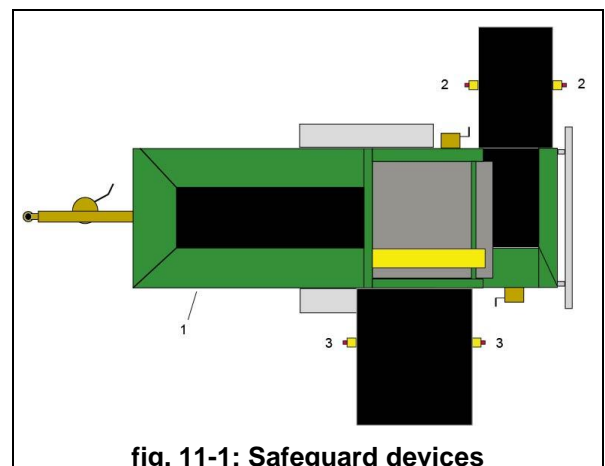


fig. 11-1: Safeguard devices

**11.5 Maintenance after initial operation**

The first maintenance after initial operation occurs exclusively by specialists of Zemmler Siebanlagen GmbH. Subsequent maintenances can be seen from maintenance schedule.

## 11.6 Maintenance schedule



### Attention – damaging the double trommel!

Before every start of production all safety devices must be checked for correct function. The scheduled checks must be done by trained personnel.



### Notice!

Subsequent maintenances are important for perpetuation of function and guarantee claims.

interval	pos. no.	component / description	page	
in phases	A daily (10h)	A1	Visual check of entire machine	46
		A2	Visual check of all fluids of machine	46
		A3	Sound check	46
		A4	Visual check of all wear parts and belt scraper	46
		A5	Cleaning – Removing sticking material from all belts	46
	B weekly(50h)	B1	Check cleaning brush of double trommel	47
		B2	Visual check of belt conveyor	47
		B3	Check lubrication points	47
	C 100 h	C1	Maintenance by operator	48
	D 250 h	D1	Maintenance by operator	49
	E 500 h	E1	Maintenance by an authorized mechanic or charged maintenance by Zemmler	50
	F 1000 h	F1	Maintenance by an authorized mechanic or charged maintenance by Zemmler	51
	G 1500 h	G1	Maintenance by an authorized mechanic or charged maintenance by Zemmler	52
	H 2000 h	H1	Maintenance by an authorized mechanic or charged maintenance by Zemmler	53

**Tab. 11-1: Overview of maintenance schedule**

### 11.6.1 Maintenance A – daily

**A1** Make daily visual checks of entire machine.

Shut down the machine if leakage, suspect sounds, visible and hidden damages (like cracks) occur and secure the machine.

Change all defect machine parts considering all aspects of safety. Use conforming to standards tools and spare parts.

If necessary contact customer service of Zemmler Siebanlagen GmbH.

**A2** Make daily visual checks of all fuel levels of machine. (just for a use of aggregate)

Pay special attention to all pressurized machine parts.

In case the tank had run empty, follow the service and maintenance instructions of the engine producer.

Repair leakage considering all aspects of safety. Use conforming to standards tools and spare parts.

If necessary contact customer service of Zemmler Siebanlagen GmbH.

**A3** Make daily sound checks of entire machine.

Pay special attention to wear parts.

Shut down and secure machine if suspect sound occur. Change all defect machine parts considering all aspects of safety. Use conforming to standards tools and spare parts.

If necessary contact customer service of Zemmler Siebanlagen GmbH.

**A4** Make daily visual checks of all wear parts.

Shut down the machine if leakage, suspect sounds, visible and hidden damages (like cracks) occur and secure the machine.

Change defect machine parts considering all aspects of safety. Use conforming to standards tools and spare parts.

If necessary contact customer service of Zemmler Siebanlagen GmbH.

**A5** Clean belt conveyors neatly from sticky material if needed.

## 11.6.2 Maintenance B – monthly



### **Vorsicht – Verletzungsgefahr!**

Tragen Sie bei allen Wartungsarbeiten immer Arbeitsschutzkleidung, Arbeitsschutz Handschuhe und Schutzbrille.

- B1** Make weekly check of cleaning brush. The cleaning brush must always engage the meshes of the drum to realize a high cleaning efficiency.
- If broken brush elements are detected, secure the machine and change the defect brush elements considering all aspects of safety. Use conforming to standards tools and spare parts.
- B2** Make weekly visual checks of all belt conveyors.
- If cracks or other damages exist, change defect machine parts considering all aspects of safety. Use conforming to standards tools and spare parts.
- If necessary contact customer service of Zemmler Siebanlagen GmbH.
- B3** Grease the entire machine weekly (see chapter 11.10).
- Lubrication must be conducted with the appropriate tools and fluids (see chapter 11.11).
- If cracks or other damages exist, change defect machine parts considering all aspects of safety. Use conforming to standards tools and spare parts.
- If necessary contact customer service of Zemmler Siebanlagen GmbH.





**11.6.4 Maintenance after 250 h**

		Check	Adjustment	Change
Check bearing		‘		‘
Drive pulleys		‘		‘
Lighting				
Belt conveyor				
Coarse fraction	skew run	‘	‘	
	wear out	‘		‘
Fine fraction	skew run	‘	‘	
	wear out	‘		‘
Feeder belt	skew run	‘	‘	
	wear out	‘		‘

Machine no.	
Date:	Mechanic:
Operating hours:	h

Remarks:

Realized by:
Signature





**11.6.6 Maintenance after 1000 h**

		Check	Adjustment	Change
Check bearing		‘		‘
Drive pulleys		‘		‘
Lighting				
Belt conveyor				
Coarse fraction	skew run	‘	‘	
	wear out	‘		‘
Fine fraction	skew run	‘	‘	
	wear out	‘		‘
Feeder belt	skew run	‘	‘	
	wear out	‘		‘

Machine no.	
Date:	Mechanic:
Operating hours:	h

Remarks:

Realized by:
Signature



**11.6.7 Maintenance after 1500 h**

		Check	Adjustment	Change
Check bearing		‘		‘
Drive pulleys		‘		‘
Lighting				
Belt conveyor				
Coarse fraction	skew run	‘	‘	
	wear out	‘		‘
Fine fraction	skew run	‘	‘	
	wear out	‘		‘
Feeder belt	skew run	‘	‘	
	wear out	‘		‘

Machine no.

Date:

Mechanic:

Operating hours:

h

Remarks:

Realized by:

Signature



## 11.7 Screen change



### Warning - retraction of bodies or body parts

Danger of retracting of body parts while rotating the double trommel.  
Special care while working on the trommel.



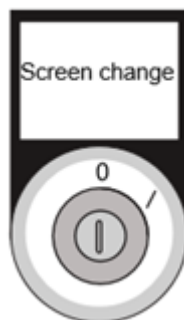
### Notice!

The machine has to be turned off and secured while mounting the wire screens.  
The machine must also be empty.



The trommel remote control is designed as a dead man's button, i.e. only by actively pressing the arrow button the trommel can be operated at a slower speed in inching mode.

In case of danger, release the button.



Activate screen change with key switch MS2 on the control unit. Set the key switch to "I" .

Screen change is active. All other machine functions are deactivated.

The display shows:

**Siebwechsel**



Turn trommel with remote control by pressing upper arrow button in inching mode.

First connect the plug of the cable into the socket. The socket is located on the chassis on the inside.

(Storage: in the direction of travel right feeding hopper door)

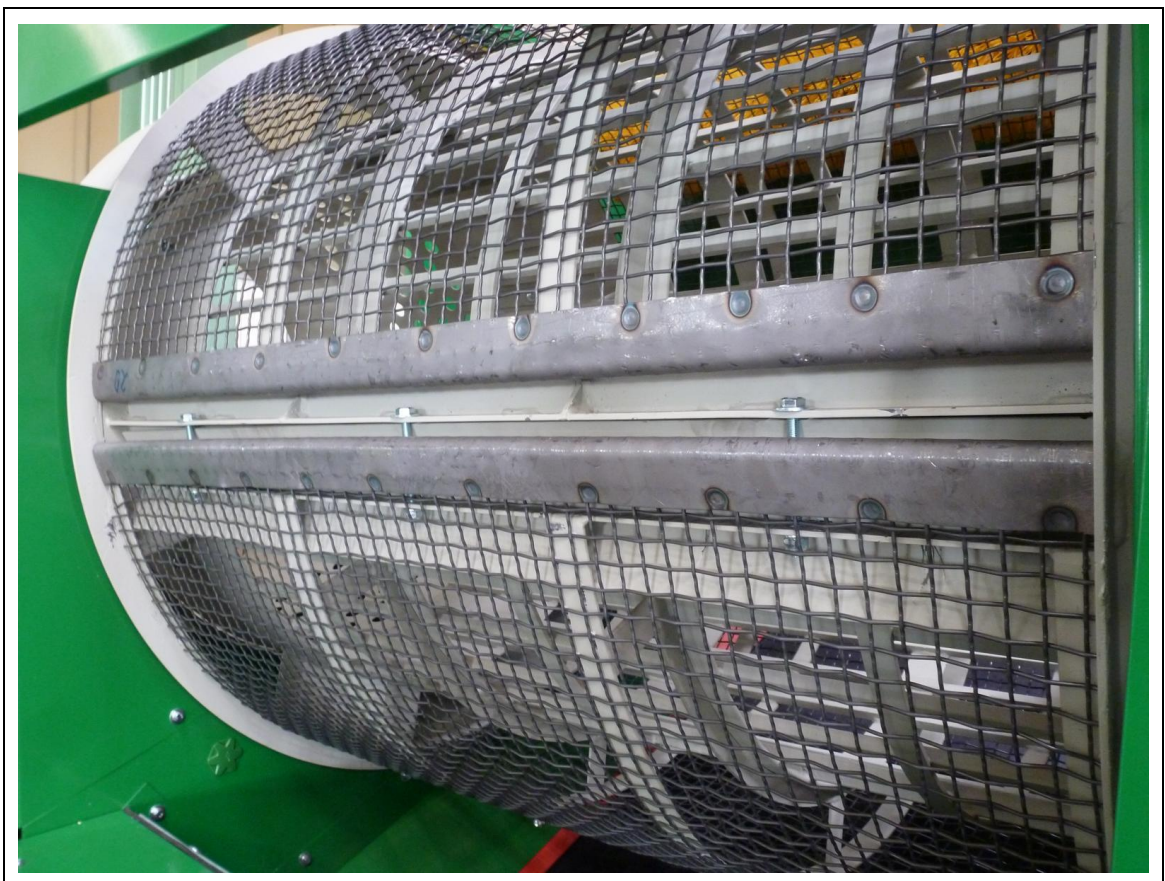
### 11.7.1 Outer wire screens

**Remove wire screens:**

1. Open the right side door of the trommel in the direction of travel.
2. Place the clamping station of the trommel at the mounting height in inching mode and loosen the screws.
3. Loosen both ends of the wire screen with help of the mounting lever out of the clamping station.
4. Carefully pull the screen out of the machine.

**Apply wire screens:**

1. Position clamping station of the trommel by remote control in inching mode just above mounting height.
2. Hook the end of the wire screen without screws into clamping station.
3. Rotate trommel by hand until the pad is completely wrapped around the trommel.
4. Put ends into clamping station with mounting lever and use the screws to tighten the wire screen pad. (see figure 11.2)

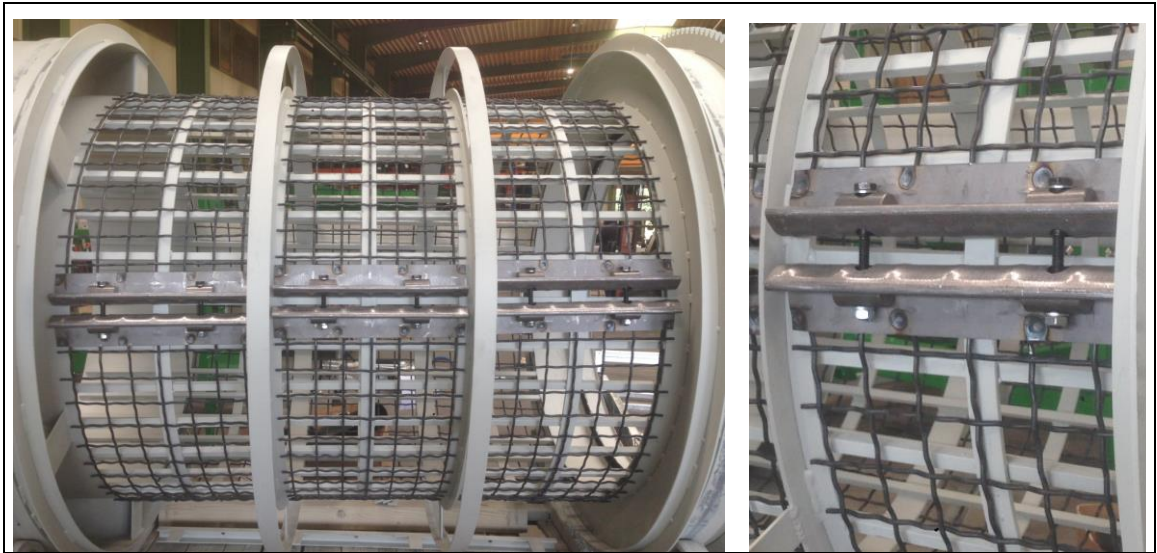


**fig. 11-2: Clamping station of the wire screen pads**

### 11.7.2 Inner wire screens

Before removing the inner screen, the outer screen must be removed.

Different to the outer screen, both ends of the wire screen will be tightened with each other.



**fig. 11-3: Clamping system inner wire screen**

## 11.8 Exchange of brush elements



### Caution – Risk of injury!

Always wear protection clothes, protection gloves and safety goggles when maintaining the machine.

### Exchange of brush elements

1. Disassemble the complete brush alignment by means of the fittings (1).
2. Lift up the alignment with a crane, pulley or other adequate tool from the machine.
3. The two brackets (2) of the brush shaft must be disassembled and removed.
4. It is now possible to take of the brush elements and spacer of the shaft.
5. The brush elements can be reassembled in opposite order.

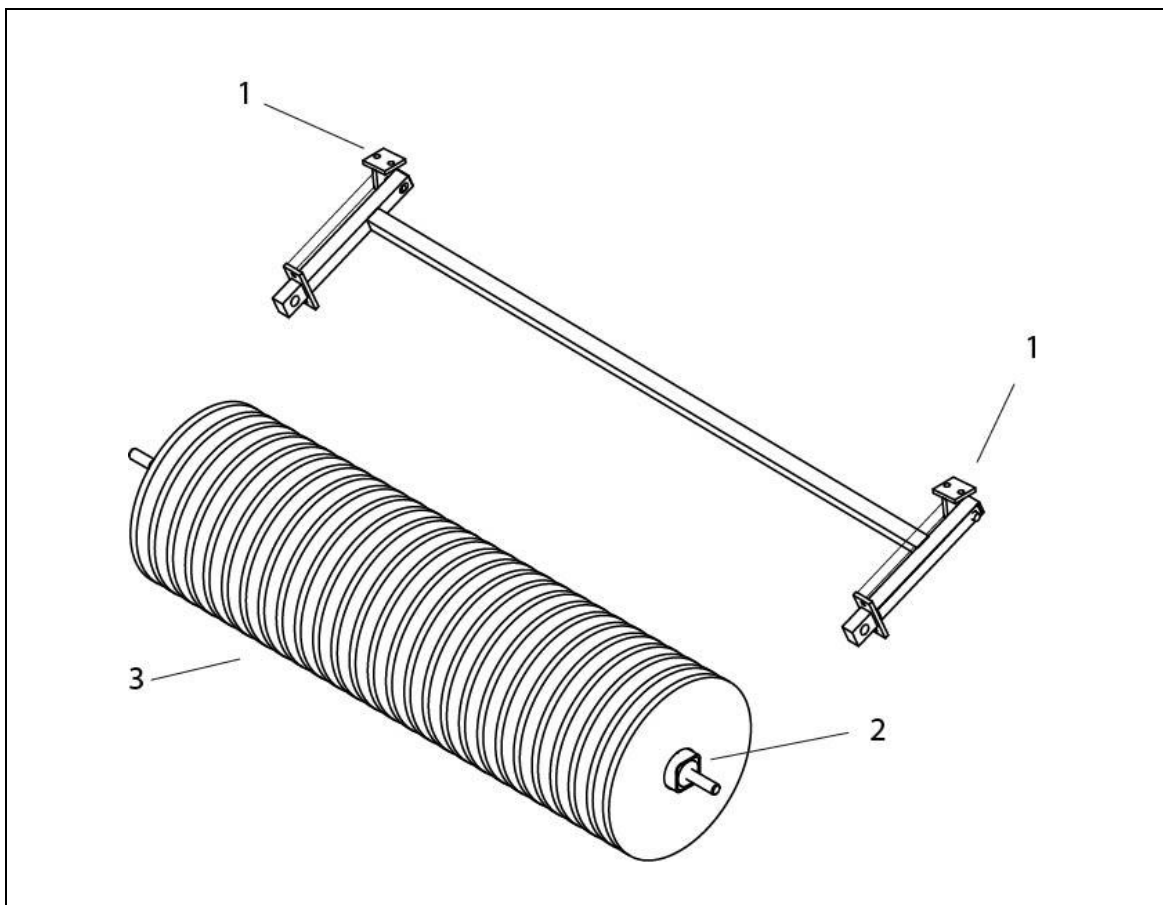


fig. 11-5: Layout of brush elements



### Notice!

If you need new brush elements, please contact Zemmler Siebanlagen GmbH. Our service technician will help you with words and deeds.

### 11.9 Operating fluids



**Attention – damaging the double trommel!**

The listed operating fluids are approved for operating on the ZEMMLER® MULTI SCREEN® MS1600.

Use always fluids which are listed in the manual of the engine manufacturer in order to avoid damages on the machine or components.

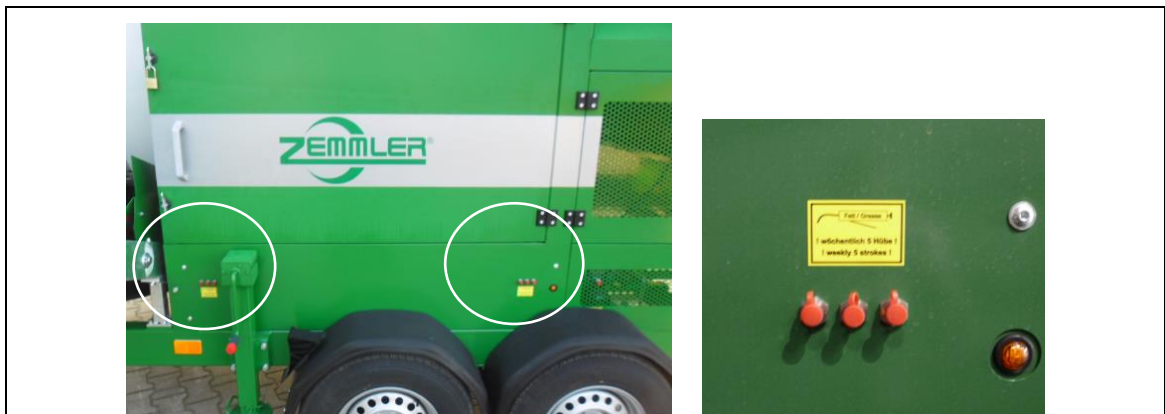
Operating fluid	Amount	Type	Standard
Lubricate grease			ISO 6743



**Notice!**

For questions about alternative operating fluids, please contact the customer service of Zemmler Siebanlagen GmbH.

### 11.10 Position of lubrication points



**fig. 11-6: Lubrication points of fine fraction**



**fig. 11-7: Lubrication points of coarse fraction**



**fig. 11-8: Lubrication points of feeder conveyor belt**

### 11.11 Operating fluids



**Attention – damaging the double trommel!**

The listed operating fluids are approved for operating on the ZEMMLER® MULTI SCREEN® MS1600.

Use always fluids which are listed in the manual of the engine manufacturer in order to avoid damages on the machine or components.

Operating fluid	Amount	Type	Standard
Lubricate grease			ISO 6743



**Notice!**

For questions about alternative operating fluids, please contact the customer service of Zemmler Siebanlagen GmbH.

### 11.12 Remodeling the machine to 3rd fraction machine (optional)



Please observe all safety and protection regulations.



Please secure the emergency-stop- with the key when security devices cannot be installed or are open (like cladding door). For several specific works it is necessary to install additional security devices.



For service and maintenance the machine has to be completely drained. This means further feeding bulk goods in the machine and on the belt conveyors have to run empty.

Assembly instruction:

1. Disconnect the electric supply before uninstall the light strip. Remove the light strip.
2. Remove the top part of the back panel in the area of the coarse fraction.
3. Install the additional ring by lifting it up with a suitable loader. Secure with screws the six adaptor plates.

The disassembly takes place in reverse order.



**Attention!**

Before the transport remove the additional ring and install the back panel.^  
Install the light strip.

Check all extended fractions to be locked in transportation security and all standard

fractions are secured with transportation security devices.  
 Before transportation, the machine has to be checked for functioning condition and road safety.  
 Visual inspection of entire machine has to be done before transportation.

**11.13 Installation of extended feeding hopper (optional)**

Please observe all safety and protection regulations.  
 Use a suitable loader to lift up the metal plates. Insert the plates in the insertion openings and secure it with the connection screws.



fig. 11-9: Mounted extension for 3<sup>rd</sup> fraction and extended feeding hopper

**11.14 Safeguard after maintenance**



**Attention – Damaging the machine!**  
 Check the entire machine by visual inspection for operational readiness.  
 No scattered tools, spare parts, etc.



**Caution - Risk of injury!**  
 Close and secure all access doors to the above visual inspection.  
 Secure all doors with intended padlocks against unauthorized opening.

## 12 Technical information

### 12.1 Lateral view of the machine

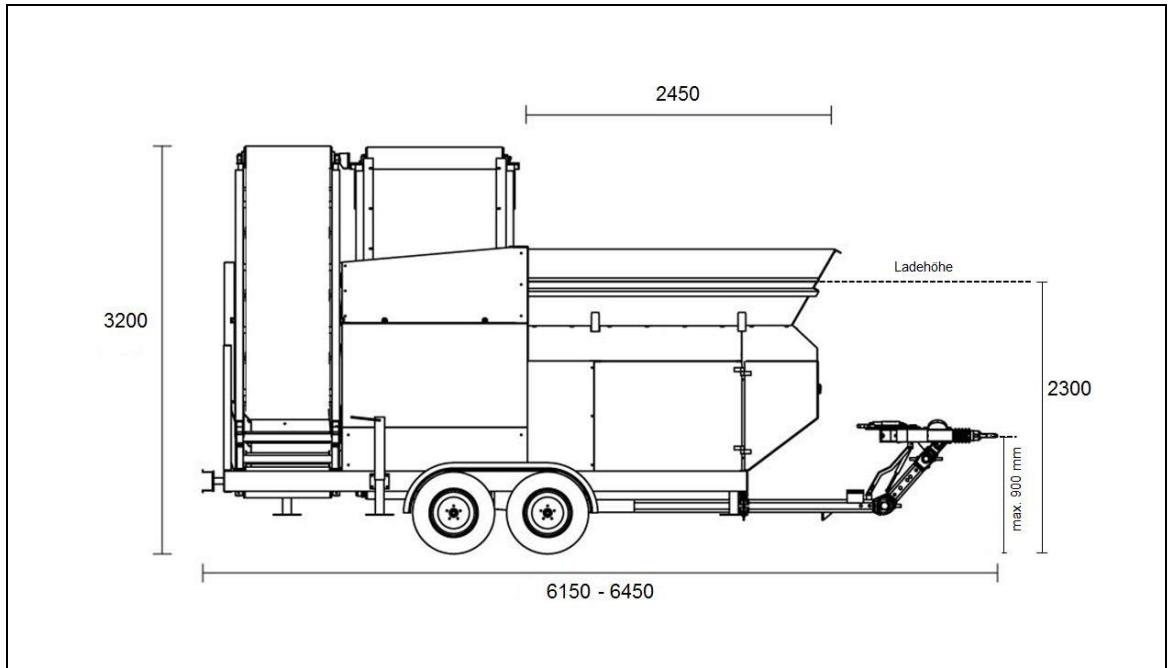


fig. 12-1: Lateral view

### 12.2 Back view of the machine

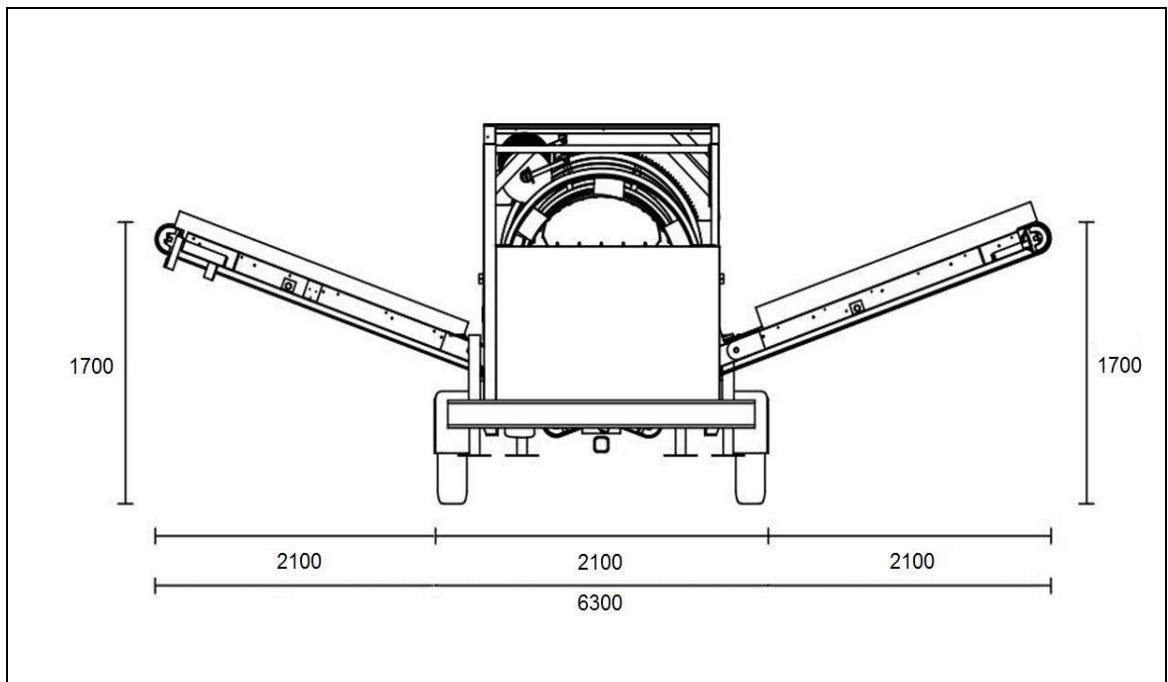


fig. 12-2: back view



### 12.3 Performance data

**Screening materials:**

sand, saw dust, wood chips, stones and gravel sand, compost, soil, glass, coal and cinder, construction waste and recycling materials up to 170 mm

<b>Operating:</b>	1 person
<b>Capacity of double trommel:</b>	about 30 cbm / hour (depending on material, feeding, chosen functions and screen meshes)

### 12.4 General data

**Mobile double trommel ZEMMLER® MULTI SCREEN® MS 1600 - transportation**

Length:	6.150-6.450 mm
Width:	2.100 mm
Height:	3.200 mm
<b>Weight (empty):</b>	about 3.500 kg (standard configuration)

**Mobile double trommel ZEMMLER® MULTI SCREEN® MS 1600 - operation**

Length:	6.150-6.450 mm
Width:	6.300 mm
Height:	2.300 mm

### 12.5 Power generator (optional available)

For regular operation of double trommel ZEMMLER® MULTI SCREEN® a 8kW power generator is sufficient.

By using additional electrical load or 230V auxiliary power plug the power generator shall be construed accordingly powerful.

## 12.6 Type plate

The type and manufacturer plate is located on the right hand side of the chassis.

The data of type plate, in particular the serial number are to be named when ordering spare parts in order to avoid mistakes and to ensure a smooth order process.



fig. 12-3: Type plate (example)



## 13 Final disposal

Machines taken completely out of service have to be disposed according to legal directives. Single components have to be separated about material and element groups and turned in at the point of acceptance.

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