US05
Ultrasonic sieve system

Translation of the original operating instructions

Gema
Documentation US05 Ultrasonic sieve system

© Copyright 2011 Gema Switzerland GmbH
All rights reserved.

This publication is protected by copyright. Unauthorized copying is prohibited by law. No part of this publication may be reproduced, photocopied, translated, stored on a retrieval system or transmitted in any form or by any means for any purpose, neither as a whole nor partially, without the express written consent of Gema Switzerland GmbH.

OptiFlex, OptiTronic, OptiGun, EasyTronic, OptiSelect, OptiFlow and SuperCorona are registered trademarks of Gema Switzerland GmbH.

OptiStar, OptiMatic, OptiMove, OptiMaster, OptiPlus, OptiSpray, MultiTronic and Gematic are trademarks of Gema Switzerland GmbH.

All other product names are trademarks or registered trademarks of their respective holders.

Reference is made in this manual to different trademarks or registered trademarks. Such references do not mean that the manufacturers concerned approve of or are bound in any form by this manual. We have endeavored to retain the preferred spelling of the trademarks, and registered trademarks of the copyright holders.

To the best of our knowledge and belief, the information contained in this publication was correct and valid on the date of publication. Gema Switzerland GmbH makes no representations or warranties with respect to the contents or use of this publication, and reserves the right to revise this publication and make changes to its content without prior notice.

Printed in Switzerland

Gema Switzerland GmbH
Mövenstrasse 17
9015 St.Gallen
Switzerland
Phone: +41-71-313 83 00
Fax.: +41-71-313 83 83
E-Mail: info@gema.eu.com
Homepage: www.gemapowdercoating.com
# Table of contents

## General safety regulations

- Safety symbols (pictograms) ................................................. 3
- Proper use ........................................................................... 3
- Product-specific safety measures ........................................... 4
  - General information .......................................................... 4
  - Special instructions ............................................................ 5
  - Safety precautions ............................................................. 5
  - Operator's obligations ......................................................... 5
  - Selection of operating personnel ....................................... 6
  - Emergency action .............................................................. 6
  - Modifications to the sieve ............................................... 6
  - Repairs .............................................................................. 6

## About this manual

- General information ............................................................ 7

## Function description

- Field of application ............................................................... 9
- Utilization ............................................................................ 9
- Powder supply variants ....................................................... 9
- Main benefits of the US05 Ultrasonic sieve system ................. 10
- US05 Ultrasonic sieve system - overview ............................. 11
- US05 Ultrasonic sieve system ........................................... 11
- US05 Ultrasonic sieve system - components ....................... 11
- SGL4 Ultrasonic sieve generator ......................................... 12
  - Front panel ........................................................................ 12
  - Indicator elements ............................................................ 12
  - Device connections .......................................................... 13
- Ultrasonic sieve ................................................................. 14
- Ultrasonic sieve - overview ................................................. 14
- Sieve clothing ..................................................................... 14

## Technical data

- US05 Ultrasonic sieve system ........................................... 15
  - Maximum screening capacity ........................................... 15
- SGL4 Ultrasonic sieve generator ......................................... 16
  - Electrical data .................................................................. 16
  - General data ..................................................................... 16
  - Dimensions ...................................................................... 16
  - Converter ......................................................................... 17
  - Electrical data .................................................................. 17

## Start-up and operation

- SGL4 Ultrasonic sieve generator ......................................... 19
  - Preparation ........................................................................ 19
  - Intensity and job settings .................................................. 20
# Table of contents

- Automatic switch-on (remote operation) .......................................................... 21
- Use ................................................................................................................. 25
- Consequences of inappropriate utilization .................................................... 25
- Shutdown and disassembly ........................................................................... 25
- Ultrasonic sieve ................................................................................................ 25
- Ultrasonic sieve - converter ........................................................................ 25
- Sieve ............................................................................................................... 26
- Color change ................................................................................................... 28

## Maintenance and cleaning

- SGL4 Ultrasonic sieve generator .................................................................... 31
- Periodical check ............................................................................................. 31
- Cleaning .......................................................................................................... 31
- Ultrasonic sieve ................................................................................................ 32
- Periodic checks ............................................................................................... 32
- Scheduled maintenance ................................................................................ 32
- Cleaning .......................................................................................................... 32
- Service ............................................................................................................ 33
- Sieve ............................................................................................................... 34
- Replacing the ultrasonic sieve ....................................................................... 34
- Mounting the screen ..................................................................................... 35

## Decommissioning, storage

- Introduction .................................................................................................... 39
- Safety rules ...................................................................................................... 39
- Requirements on personnel carrying out the work ......................................... 39
- Shut-down ........................................................................................................ 39
- Temporary shutdown .................................................................................... 39
- Final shutdown ............................................................................................... 39
- Storage conditions .......................................................................................... 40
- Storage duration ............................................................................................ 40
- Space requirements ....................................................................................... 40
- Physical requirements .................................................................................... 40
- Hazard notes .................................................................................................. 40
- Maintenance during storage ......................................................................... 40
- Maintenance schedule ................................................................................ 40
- Maintenance works ....................................................................................... 40

## Packing, transport, disposal

- Introduction .................................................................................................... 41
- Requirements on personnel carrying out the work ......................................... 41
- Packing material ............................................................................................ 41
- Selection of packing material ....................................................................... 41
- Transport .......................................................................................................... 41
- Data concerning goods to be transported .................................................... 41
- Loading, transferring the load, unloading .................................................... 41
- Disposal .......................................................................................................... 42

## Fault localization

- US05 Ultrasonic sieve system ....................................................................... 43

## Spare parts list

- Ordering spare parts ...................................................................................... 45
- US05 Ultrasonic sieve system - Spare parts list ........................................... 46
- US05 Ultrasonic sieve system - Spare parts .................................................. 47
General safety regulations

This chapter sets out the fundamental safety regulations that must be followed by the user and third parties using the US05 Ultrasonic sieve system.

These safety regulations must be read and understood before the US05 is put into operation.

Safety symbols (pictograms)

The following warnings with their meanings can be found in the Gema Switzerland operating instructions. The general safety precautions must also be followed as well as the regulations in the operating instructions.

DANGER!
Danger due to electrically live or moving parts. Possible consequences: death or serious injury

WARNING!
Improper use of the equipment could damage the machine or cause it to malfunction. Possible consequences: minor injuries or damage to equipment

INFORMATION!
Useful tips and other information

Proper use

1. The US05 Ultrasonic sieve system is built to the latest specification and conforms to the recognized technical safety regulations and is designed for the normal application of powder coating.

2. Any other use is considered non-compliant. The manufacturer shall not be liable for damage resulting from such use; the user bears sole responsibility for such actions. If the US05 is to be used for other purposes or other substances outside of our guidelines then Gema Switzerland GmbH should be consulted.

3. Observance of the operating, service and maintenance instructions specified by the manufacturer is also part of
conformity of use. The US05 should only be used, maintained and started up by trained personnel, who are informed about and are familiar with the possible hazards involved.

4. Start-up (i.e. the execution of a particular operation) is forbidden until it has been established that the US05 has been set up and wired according to the guidelines for machinery (2006/42 EG). EN 60204-1 (machine safety) must also be observed.

5. Unauthorized modifications to the US05 ultrasonic screening system exempt the manufacturer from any liability from resulting damage.

6. The relevant accident prevention regulations, as well as other generally recognized safety regulations, occupational health and structural regulations are to be observed.

7. Furthermore, the country-specific safety regulations also must be observed.

<table>
<thead>
<tr>
<th>Explosion protection</th>
<th>Protection type</th>
<th>Temperature class</th>
</tr>
</thead>
<tbody>
<tr>
<td>II 2 D</td>
<td>IP6x</td>
<td>Sieve converter, zone 21, T140 °C</td>
</tr>
<tr>
<td>II 3 D</td>
<td></td>
<td>Ultrasonic sieve generator, zone 22, T80 °C</td>
</tr>
</tbody>
</table>

**Product-specific safety measures**

**General information**

The US05 Ultrasonic sieve system is part of the plant and therefore integrated in the safety concept of the plant.

The supplied product is a system usually consisting of the following components: screening frame and resonator covered with metal mesh, converter, HF-cable and generator.

The design of the screening resonator corresponds to the current state of technology and is operationally safe.

Only the components originally supplied by the manufacturer may be used.

Any faults which might affect operational safety must be remedied immediately.

**WARNING:**
The resonator and converter get hot during operation!

If it is to be used in a manner outside the scope of the safety concept, then corresponding measures must be taken.

**NOTE!**
For further information, see the more detailed Gema safety regulations!
Special instructions

This operating manual must be carefully read before the system is taken into operation. Lack of knowledge about operation and maintenance could cause damage to the unit.

The operating manual should always be kept ready to hand wherever the equipment is used. Additional copies can be ordered at any time from your supplier.

No items such as spirals, deflectors etc. must be attached to the sieve or in its immediate vicinity (minimum distance of 50 mm).

The screening mesh can become contaminated by powder residue. It should therefore be cleaned in order to ensure that the effectiveness of the ultrasound is not impaired.

For operation in an Ex-area, please refer to the instructions in the appendix.

Safety precautions

- Do not allow any heavy objects to drop onto the screening surface that could damage the screening fabric.
- The ultrasonic system must not be taken into operation if:
  a) the sieve has been exposed to abnormal mechanical influences, such as dropping or hard shocks (mechanical damage)
  b) a fault is displayed on the generator

The manufacturer rejects all liability for any damage which arises as a result of failure to install safety devices which are recommended by the manufacturer for safe operation, and which could have been avoided if said safety devices had been installed.

Operator's obligations

The operator must allow only the following persons to handle the screening machine:

- Persons familiar with basic regulations concerning occupational safety and accident prevention.
- Persons briefed on how to use the screening machine.
- Persons who have read and understood this operating manual.

The requirements of EC directive 89/655/EEC on use of work equipment (council directive dated 30th November 1989 regarding minimum safety and health requirements for use of equipment by staff at workplaces) must be complied with.
Selection of operating personnel

Screening work with the ultrasonic screening system must only be carried out by trained or well instructed personnel.

Staff qualification

<table>
<thead>
<tr>
<th>Activity</th>
<th>Persons</th>
<th>Specially trained staff</th>
<th>Briefed operating staff</th>
<th>Persons with specialized training (mechanical / electrical engineering)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td>Shipping</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Commissioning</td>
<td>X</td>
<td>--</td>
<td>X</td>
<td>--</td>
</tr>
<tr>
<td>Fault localization and remedy during commissioning</td>
<td>--</td>
<td>--</td>
<td>X</td>
<td>--</td>
</tr>
<tr>
<td>Setup and rigging</td>
<td>--</td>
<td>--</td>
<td>Assembly</td>
<td>--</td>
</tr>
<tr>
<td>Operation</td>
<td>--</td>
<td>X</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Scheduled maintenance</td>
<td>--</td>
<td>X</td>
<td>X</td>
<td>--</td>
</tr>
<tr>
<td>Fault localization and remedy during operation and maintenance</td>
<td>X</td>
<td>--</td>
<td>X</td>
<td>--</td>
</tr>
<tr>
<td>Disposal</td>
<td>X</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

Legend:  X.. Permissible --.. Prohibited

Emergency action

<table>
<thead>
<tr>
<th>Incident</th>
<th>Action</th>
</tr>
</thead>
</table>
| Electric shock                                | Switch off the installation.  
|                                              | Disconnect the mains plug.  
|                                              | Notify a doctor.  
|                                              | Perform first aid.                                                      |
| Smoke generation, unusual noises, unusual generation of heat | Switch off the installation.  
|                                              | Disconnect the mains plug.  
|                                              | Contact the Technical Service Department of Gema.                      |
| Fire in the electrical system                 | Disconnect the mains plug.  
|                                              | Extinguish the fire with an appropriate fire extinguisher. Raise the alarm with the works fire brigade or the local fire brigade.  
|                                              | Contact the Technical Service Department of Gema.                      |

Modifications to the sieve

Modifications, additions or conversions which might affect safety are strictly forbidden without the permission of the manufacturer.

Repairs

NOTE!
It is permitted to carry out repairs to the screening fabric.  
Defective screens should be sent for repair to Gema Switzerland.
About this manual

General information

These operating manual contains all important information which you require for the working with the US05 Ultrasonic sieve system. It will safely guide you through the start-up process and give you references and tips for the optimal use of your new powder coating system.

Information about the function mode of the individual system components - booth, gun control unit, manual gun or powder injector - should be referenced to their corresponding documents.
Function description

Field of application

The US05 Ultrasonic sieve system is built exclusively for electrostatic coating with organic powders. Any other use is considered non-compliant. The manufacturer shall not be liable for damage resulting from such use; the user bears sole responsibility for such actions.

Utilization

The US05 Ultrasonic sieve system with the corresponding SGL4 Ultrasonic sieve generator is used for the ultrasonic supported sieving of coating powder. It is used exclusively inside the OptiSpeeder powder container of Gema's Opticenter OC02 powder management centre.

Powder supply variants

The screen can be used to filter fresh powder (FP) and/or recycled powder (RP), depending on the OptiSpeeder version.

Variant 1 (FPS / RPS)

- Fresh and recycled powder are screened.
- Max. screening capacity for 15 guns at 250 µm = 3-4 kg/min. (depending on powder)

Variant 2 (FPS / RP)

- Only fresh powder passes through the screen.
- Max. screening capacity for 30 guns at 250 µm = 3-4 kg/min. (depending on powder)
- FPS / RC
**Variant 3 (FP / RPS)**
- Only recycled powder passes through the screen.
- Max. screening capacity for 30 guns at 250 µm = 3-4 kg/min. (depending on powder)

**Variant 4 (FP / RP)**
- Fresh and recycled powder do not pass through the screen.
- The container is closed by means of a standard cover.

**Main benefits of the US05 Ultrasonic sieve system**
- Removal of powder accumulations (loosening of the coating powder)
- Efficient powder throughput even with fine meshes and small screen areas.
- Quick and easy cleaning
- Low power consumption
- Quiet operation
- Compliant to ATEX
US05 Ultrasonic sieve system - overview

US05 Ultrasonic sieve system

The ultrasonic screening system US05 is installed and operated in powder management systems of type OptiCenter.

US05 Ultrasonic sieve system - components

1 Ultrasonic generator
2 HF-cable
3 Converter
4 Sieve
5 Sieve cover
6 Screen holder
SGL4 Ultrasonic sieve generator

Front panel

The SGL4 Ultrasonic sieve generator is located in a strong housing. The operating elements (keys) and display elements (LEDs) are freely accessible and described in the corresponding chapters.

1. Display
2. Indicator elements
3. Plus/minus buttons (Increase / reduce values)
4. SELECT button (menu navigation)
5. Switch ultrasonic operation ON / OFF
6. not active
7. Lights up if ultrasonic operation is active (HF-output 1)
8. not active
9. Lights up if ultrasonic operation is externally controlled

Indicator elements

Operating indicator

1. US ON 1
2. US ON 2
3. REMOTE CONTROL

SGL4 Ultrasonic sieve generator - Front panel

SGL4 Ultrasonic sieve generator - Operating indicator
**Error display**

<table>
<thead>
<tr>
<th>Lights</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>FAILURE 1</td>
</tr>
<tr>
<td>11</td>
<td>FAILURE 2</td>
</tr>
</tbody>
</table>

**SGL4 Ultrasonic sieve generator - Error display**

10 Lights up in the event of a fault (HF-output 1)
11 not active

**Device connections**

**SGL4 Ultrasonic sieve generator - Front side**

1 Connection for HF-cable
2 Connection for superordinated control unit
3 Mains cable
4 Power switch

**WARNING:**

By increasing the intensity, the temperature on the sieve increases too! It must be guaranteed by means of temperature measurement that the allowed maximum temperature for the material to be sieved is not exceeded!
Ultrasonic sieve

Ultrasonic sieve - overview

1. Sieve
2. Converter
3. Cover
4. HF-cable connection

Sieve clothing

For professional new or restored sieve clothing, please contact Gema Switzerland GmbH.
**US05 Ultrasonic sieve system**

**Maximum screening capacity**

NOTE!
The screening capacity (throughput) depends on the mesh width.
- The ratio between the number of used guns (P) and effective screening capacity must not exceed the permissible limit.

<table>
<thead>
<tr>
<th>Mesh size (µm)</th>
<th>300</th>
<th>250*</th>
<th>200</th>
<th>140</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throughput (kg/min)</td>
<td>4,5</td>
<td>3,5</td>
<td>1,5</td>
<td>0,8</td>
</tr>
<tr>
<td>Only recycled powder (RPS)</td>
<td>36 P</td>
<td>30 P</td>
<td>12 P</td>
<td>6 P</td>
</tr>
<tr>
<td>Only fresh powder (FPS)</td>
<td>36 P</td>
<td>30 P</td>
<td>12 P</td>
<td>6 P</td>
</tr>
<tr>
<td>Recycled and fresh powder (RPS+FPS)</td>
<td>18 P</td>
<td>15 P</td>
<td>6 P</td>
<td>3 P</td>
</tr>
</tbody>
</table>

* standard version

NOTE!
The above-mentioned powder flow rates refer to standard powder and can differ, depending on powder condition and powder characteristics!
# SGL4 Ultrasonic sieve generator

## Electrical data

<table>
<thead>
<tr>
<th>SGL4 Ultrasonic sieve generator</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electrical connection</strong></td>
<td>230 VAC +/- 10% or 115 VAC +/- 10%</td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td>50/60 Hz</td>
</tr>
<tr>
<td><strong>Max. ultrasonic performance</strong></td>
<td>100 W eff.</td>
</tr>
<tr>
<td><strong>Output voltage</strong></td>
<td>300 V eff.</td>
</tr>
<tr>
<td><strong>Max. output current</strong></td>
<td>0.5 A eff.</td>
</tr>
<tr>
<td><strong>Device fuse</strong></td>
<td>2 A, träge (200-240 V)</td>
</tr>
<tr>
<td><strong>Output frequency</strong></td>
<td>33 – 37 kHz</td>
</tr>
<tr>
<td><strong>Number of operating modes</strong></td>
<td>8</td>
</tr>
<tr>
<td><strong>Amplitude setting (intensity)</strong></td>
<td>50-100%, in 8 steps</td>
</tr>
</tbody>
</table>

**Inputs**
- Ultrasonic ON/OFF, potential-free
- Operating mode selection, potential-free
- Amplitude setting

**Output**
- Alarm output (collective alarm), potential-free

## General data

<table>
<thead>
<tr>
<th>SGL4 Ultrasonic sieve generator</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ambient temperature</strong></td>
<td>0 - 45°C (+32°F - +113°F)</td>
</tr>
<tr>
<td><strong>Max. relative air humidity</strong></td>
<td>80% at 30°C, non-condensing</td>
</tr>
<tr>
<td><strong>Protection type</strong></td>
<td>IP65</td>
</tr>
<tr>
<td><strong>Operating location</strong></td>
<td>interior room, until 2000 m of altitude</td>
</tr>
</tbody>
</table>
| **Approvals**                   | [II 3 D]
|                                 | [BVS 04 ATEX E 193 X] |

## Dimensions

<table>
<thead>
<tr>
<th>SGL4 Ultrasonic sieve generator</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Width</strong></td>
<td>280 mm</td>
</tr>
<tr>
<td><strong>Height</strong></td>
<td>120 mm</td>
</tr>
<tr>
<td><strong>Length</strong></td>
<td>300 mm</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>4.5 kg</td>
</tr>
</tbody>
</table>
## Converter

### Electrical data

<table>
<thead>
<tr>
<th>Converter</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
<td>100 W</td>
</tr>
<tr>
<td>Max. operating temperature</td>
<td>60°C</td>
</tr>
<tr>
<td>Weight</td>
<td>0.41 kg</td>
</tr>
</tbody>
</table>

**Approvals (converter)**

- CE
- Ex II 2 D
- BVS 04 ATEX E 193 X
Start-up and operation

SGL4 Ultrasonic sieve generator

NOTE!
The SGL4 Ultrasonic sieve generator may not be installed at swinging/vibrating elements of the plant! Nonobservance of this information exempts the manufacturer from any liability from resulting damage to persons and equipment!

WARNING:
The textual instructions must be followed step by step, in order to avoid damage!

Preparation

- The SGL4 Ultrasonic sieve generator must be placed on a stable basis

NOTE!
The SGL4 Ultrasonic sieve generator may be installed only until 2000 m of altitude, so that the full electrical tensions protection can be observed in accordance to IEC1010-1!

- Switch off the device (POWER to OFF)
- Connect the ultrasonic sieve connection (HF cable), observe the cable length.
- Connect the mains cable only at sockets with protective earth/ground and with tension in accordance to the type plate

NOTE!
It must be ensured that the mains cable cannot be disconnected under tension!

If this is not possible, the following solutions can be selected:
- Switch off the SGL4 Ultrasonic sieve generator and disconnect it from the mains
- Installation of the entire ultrasonic sieve generator into a control cabinet
- Wire the ultrasonic sieve generator directly on the clamps
- Use plug and socket with mechanical locking device against unintentional disconnecting

The potential equalization must be made with a 4 mm² wire on the rear side of the ultrasonic sieve generator. The parts located around the sieve must be merged into this potential equalization. Usually, these are funnels, cowls, tubes etc.

By installing into a plastic housing, a sufficient grounding is to be ensured by the plant manufacturer or the customer.

If an over-temperature occurs, the ultrasonic sieve generator switches off. After cooling down, the ultrasonic sieve generator switches on automatically.

**NOTE!**
The power density on the sieve may not exceed 0.1 W/cm²! Therefore, the power output on the generator is limited to 50 W!

For the use and integration of optional performance and amplitude regulations, as well as the adjustment of the start settings, see the corresponding chapters in this manual. Default settings: Mode = OFF; intensity = 50 %.

If the generator enclosure is damaged, it has to be put immediately out of operation and has to be replaced!

**WARNING:**
All plugs may never be disconnected under tension!

If the converter gets too hot, the ultrasonic switches off and the US-RUN LED expires. If the converter temperature drops under the adjusted threshold value, the ultrasonic switches on again and the US-RUN LED illuminates.

The ultrasonic sieve generator is to be set up in such a way that it is protected against impacts, falling down objects, thermal radiation (also solar radiation)!

The ambient temperatures may only be between 0-40 °C!

### Intensity and job settings

Intensity and job settings are saved in the OptiCenter control unit already at the factory. The required screen type can only be selected via a TouchPanel.

<table>
<thead>
<tr>
<th>Ultrasonic screen type</th>
<th>Mesh width</th>
<th>Intensity</th>
<th>Job setting</th>
<th>Job no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>US05-140</td>
<td>140 µm</td>
<td>50 %</td>
<td>Modus G</td>
<td>J0</td>
</tr>
<tr>
<td>US05-200</td>
<td>200 µm</td>
<td>60 %</td>
<td>Modus G</td>
<td>J1</td>
</tr>
<tr>
<td><strong>US05-250</strong>*</td>
<td>250 µm</td>
<td>70 %</td>
<td>Modus G</td>
<td>J2</td>
</tr>
<tr>
<td>US05-300</td>
<td>300 µm</td>
<td>70 %</td>
<td>Modus G</td>
<td>J3</td>
</tr>
</tbody>
</table>

* standard version
Automatic switch-on (remote operation)

The generator is used only in conjunction with an OptiCenter, and automatically comes on when the "spray" or "spray waste" button is pressed.

**NOTE!**
In this process, ensure that the screen generator's main switch is ON.

- The generator outputs ultrasonic energy only if this option has been selected on the OptiCenter panel (see the related display on the panel).
- The intensity corresponding to the mesh size is also selected on the panel (4 settings were saved at the factory).
- **US-RUN** lamp must illuminate, **ALARM** lamp may not be illuminated

**NOTE!**
The status display of the generator indicates the external control by the green REMOTE LED!

- The generator produces ultrasonic on the sieve mesh through the converter
- **US-RUN** lamp must illuminate, **ALARM** lamp may not be illuminated
- Adjust the required intensity

**NOTE!**
The **ALARM** lamp illuminates if the mains voltage is too low (<180 V) and/or the heating inside the equipment is too high!

**Attention, burn danger!**
The sieve may not be touched when the SGL4 Ultrasonic sieve generator is switched on!

**NOTE!**
The SGL4 Ultrasonic sieve generator of the US05 Ultrasonic sieve system may be operated only with the original sieves! The equipment may be operated only by trained and instructed personnel and considering the operating instructions!
Coating without powder recovery (spray waste)

The ultrasonic screen is on.
This button can be used to switch off the ultrasonic screen at any time.

Coating with powder recovery (spray)

The ultrasonic screen is off.
**Screen selection**

If the customer uses more than one screen, the OptiCenter panel displays a relevant choice of mesh sizes.

**NOTE!**
Only previously configured mesh sizes are displayed, however. Refer to "Screen configuration".

1. The selected mesh size remains active until the system is switched on again.

**Screen configuration**

The selected mesh size remains active until the system is switched on again.
2. 

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Powderhopper empty phase 1 40 [s]</td>
</tr>
<tr>
<td>2</td>
<td>Powderhopper clean phase 3 2.0 [min]</td>
</tr>
<tr>
<td>3</td>
<td>Powderhose clean cycle 2</td>
</tr>
<tr>
<td>4</td>
<td>Powderhose clean per injectorblock 20 [s]</td>
</tr>
<tr>
<td>5</td>
<td>Recovery hose clean 180 [s]</td>
</tr>
<tr>
<td>6</td>
<td>Freshpowder demand delay 15 [s]</td>
</tr>
<tr>
<td>7</td>
<td>Supervision freshpowder demand int. 0.5 [min]</td>
</tr>
<tr>
<td>8</td>
<td>Supervision levelsensor by freshpowder demand 5.0 [min]</td>
</tr>
<tr>
<td>9</td>
<td>Time wastepowder in Mode spray (Recycle) 0.1 [s]</td>
</tr>
<tr>
<td>10</td>
<td>Option Freshpowdersystem 0</td>
</tr>
<tr>
<td>30</td>
<td>Option Travisan / SAT 0</td>
</tr>
<tr>
<td>40</td>
<td>Option mode spray manu 0</td>
</tr>
<tr>
<td>50</td>
<td>US-Sieve 1</td>
</tr>
</tbody>
</table>

Number of Injector 1 - 36

3. 

4. Select the ultrasonic sieve using the arrow keys

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>= page up</td>
</tr>
<tr>
<td></td>
<td>= line up</td>
</tr>
<tr>
<td></td>
<td>= line down</td>
</tr>
<tr>
<td></td>
<td>= page down</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>Option mode spray manu 0</td>
</tr>
<tr>
<td>50</td>
<td>US-Sieve 1</td>
</tr>
<tr>
<td>51</td>
<td>US-Mesh: 140 um 1</td>
</tr>
<tr>
<td>52</td>
<td>US-Mesh: 200 um 0</td>
</tr>
<tr>
<td>53</td>
<td>US-Mesh: 250 um 0</td>
</tr>
<tr>
<td>54</td>
<td>US-Mesh: 300 um 0</td>
</tr>
</tbody>
</table>

Number of Injector 1 - 36

5. 

Screen active = 1

6. Activate the used mesh size(s).

7. Press the button $\times$ to exit the parametrization dialog. Any changes are saved.
Use

- only by trained and instructed personnel
- only in technically perfect condition
- safety and conscious of danger
- considering the operating instructions
- in trouble-free and safe environment
- with adherence to the maintenance conditions

Consequences of inappropriate utilization

- Danger to life and limb of the user or a third party
- Impairment of the sieve device and other equipment

Shutdown and disassembly

- Switch off the SGL4 Ultrasonic sieve generator with the main switch
- Disconnect all connections
- Store the SGL4 Ultrasonic sieve generator in a protected place

Ultrasonic sieve

Ultrasonic sieve - converter

The ultrasonic sieve converter may be operated only with the sieve, the cable and the generator released for it. Modifications of the components require the consent of the company Gema Switzerland GmbH!

The locking torque of the converter on the sieve corresponds to 15 Nm (aluminum). If the starting torque is lower, this will lead to heat at the junction point. The connecting surface of the converter at the sieve must be clean and free of grease!

WARNING:
The sieve may not be touched during operating status!
If longer operation takes place, let the system cool down.
- Burn danger!

It is to be provided for a sufficient cooling of the sieve and the converter. In capsuled systems, an additional cooling or power output limitation is necessary!
Sieve

NOTE!
It is important, that nothing sticks on the sieve surface or touches it, e.g. adhesive strips, seal material etc.
When a friction takes place, there may be a risk of higher temperatures!
Modifications require the consent of the company Gema Switzerland GmbH!

Clean the sieve in regular intervals, according to the operator experiences. Too much stucked grain or caked powder leads to a rise of temperature!

Grounding of the components

Earthing takes place via the connection cable.
The potential equalization is done by a 4 mm² wire on the rear side of the SGL4 Ultrasonic sieve generator (1) to the converter (2). The parts located around the resonator must be merged into this potential equalization. Usually, these are funnels, cowls, tubes etc.

Installing the sieve

ATEX note:
The converter and the sieve are to be installed in such a way that, if operational malfunctions take place, impact or sliding sparks to other devices and components are impossible!

NOTE!
Lay out the HF cable in a safe matter!
The installing regulations according to EN 61241-14 have to be observed!
Sieve/converter connection

NOTE!
The plant may be switched on only if the plug locking is closed and the safety screw is tightened well!

WARNING:
All plugs may never be disconnected under tension!

1. Disconnect the plant from the mains (SGL4 Ultrasonic sieve generator etc.)
2. Determine the position of the plug coding
3. Connect the plug
4. Securely tighten the union nut
5. Slide the locking ring forwards and secure it with a size 1.5 Allen key (mandatory requirement in Ex zones)
Color change

On a change of color, the OptiSpeeder container is to be cleaned too.

NOTE!
If an ultrasonic screen has been installed, it is susceptible to damage during cleaning.
- The OptiSpeeder must only be cleaned with the original cover fitted.

1.

2.

3. Original cover
5. The cleaning mode can be started now.
Maintenance and cleaning

SGL4 Ultrasonic sieve generator

The SGL4 Ultrasonic sieve generator does not require a technical maintenance.

Periodical check

The periodic checks include examining all connecting cables. If any damage to the cable insulation is noticed, the affected cable must be replaced immediately.

All fastening screws on the generator and the housing cover must be properly tightened.

The sieve mesh should be checked for fractures and caked powder.

Cleaning

NOTE!
By cleaning the ultrasonic system, no ignitable solvents may be used!

Clean the SGL4 Ultrasonic sieve generator at periodic intervals or if necessary.

- Switch off the SGL4 Ultrasonic sieve generator
- Leave all plug connections connected
- Clean the SGL4 Ultrasonic sieve generator with a multipurpose cleaner and a humid cloth
- Wipe off the SGL4 Ultrasonic sieve generator and switch it on again
Ultrasonic sieve

The ultrasonic generator cannot always prevent the screen fabric from clogging. Consequently, the screening fabric should be cleaned on a regular basis. The intervals should be judged by the operator according to experience.

Periodic checks

For the purpose of preventative maintenance, we recommend a general inspection of all components of the screening unit every 6 months or at appropriate intervals according to the experience of the operator.

In particular, the sieve should be checked for wear, cracks or damage.

Regular visual inspection of the HF-connecting cables, HF-plugs and the screening insert will preserve the performance and efficiency of the ultrasonic system. Special attention should be paid to the HF-plugs. If a lot of dust collects on them, clean the plugs with oil-free compressed air.

The periodic checks include examining all connecting cables. The corresponding parts should be replaced immediately if any damage to cables or wear to plug contacts is discovered.

Scheduled maintenance

Scheduled maintenance helps ensure smooth and efficient production processes. The operating staff can perform these tasks after having been appropriately briefed.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Maintenance interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean the sieve</td>
<td>1 - 2 times daily, or during powder changes.</td>
</tr>
<tr>
<td>Check the screen for damage.</td>
<td>Before the system is turned on.</td>
</tr>
</tbody>
</table>

NOTE!

Some of the tasks mentioned above depend significantly on usage and ambient conditions. The cycles stated above are minimum requirements. Different maintenance cycles are permissible in individual cases. In such cases:
- Revise the details in this operating manual.
- Appropriately brief operating staff.

Cleaning

Proceed as follows to clean the screening insert:

1. Switch the OptiCenter to the standby mode.
2. Switch off the generator.
3. Unplug the connections between the generator and the sieve. For ATEX devices: Disconnect the additional ground cable.
4. Remove the converter from the sieve.
5. Remove the screen from the OptiSpeeder.
6. Clean the sieve frame and screening fabric with soapy water and a sponge.
For more efficient cleaning, it is also possible to do this with an ultrasonic bath.

7. Dry the sieve and fabric with compressed air and reconnect them to the generator. Keep a distance of 15 cm between the compressed air nozzle and the screening fabric in order to prevent damaging the fabric.

Take care not to cause any damage when using a high-pressure cleaner or compressed air; it is better to use a soft brush.

Service

In the event of a fault, the unit must be checked and repaired by an authorized Gema service workshop. The repairs must only be performed by an authorized specialist.

Improper tampering can result in serious danger for user and equipment.
Sieve

The service life of the sieve can be increased by careful cleaning.
Treat the sieve mesh carefully. It consists of very thin wires and is sensitive to small-area pressure, which can occur with compressed air guns, screwdrivers, spatters or similar things.
When blowing off with compressed air, keep a distance from at least 15 cm.
Take care with brooms, brushes and similar things, because bristles can get caught in the mesh.
The cleaning in the ultrasonic bath is to be limited on a time as short as possible.

Replacing the ultrasonic sieve

Sieve mesh
Defective sieve resonators may be sent for repair to the Gema Switzerland GmbH. New sieve resonators and their new sieve meshes can be ordered to the Gema Switzerland GmbH (see therefore the corresponding spare parts list).

Demounting the screen
The newly inset screen is replaced in the following steps:
Mounting the screen

Mounting takes place in the reverse order.

1. [Image of screen assembly]

2. [Image of screw and nut]

3. [Image of mounting piece]

4. [Image of mounting process]
2. 

No scratches or grease! Secure with ERGO no. 4202!

3. 

WARNING: The tightening torque is: 15 Nm

Secure with ERGO number 4202; then tighten with an open-ended wrench.

4. 

Secure with ERGO no. 4202!

5. 

Secure with ERGO no. 4202!
6. Align the connector as illustrated:

**NOTE!**
During tightening of the Allen screw, the HF connector should be moved back and forth slightly to ensure that it is in a defined rotational position.

**WARNING:**
The Allen screw must remain firmly tightened during operation. Otherwise machine vibrations might cause the connector to fail.
Decommissioning, storage

Introduction

Safety rules
Before removing the ultrasonic screen, turn off the generator.

Requirements on personnel carrying out the work
All work should be carried out only by authorized technical personnel.

Shut-down

Temporary shutdown
1. Switch off the generator.
2. Clean and maintain the screen (refer to the chapter titled "Maintenance and cleaning").

INFORMATION!
After a temporary shutdown, commissioning must be performed again. For this, refer to "Commissioning and operation".

Final shutdown
1. Switch off the generator.
2. Remove the connector.
3. Clean the screen and generator.
**Storage conditions**

**Storage duration**
Short-term and medium-term storage (up to 2 years) are permissible without special measures under the ambient conditions specified in the technical data.

Anti-corrosion measures are necessary for longer storage periods.

**Space requirements**
The space needed corresponds to the size of the ultrasonic screen plus the generator.

There are no special requirements concerning distance to neighboring equipment.

**Physical requirements**
Storage must be inside a dry building at a temperature between +5 – 50 °C.

**Hazard notes**
There is no danger to personnel or the environment if the unit is stored properly.

**Maintenance during storage**

**Maintenance schedule**
No maintenance schedule is necessary.

**Maintenance works**
During long-term storage, periodically perform a visual check for corrosion.
Packing, transport, disposal

Introduction

This chapter describes special precautions that must be taken during internal transport of the product if:

- the customer himself must pack, transport and ship the product, such as to have renovations or service work carried out by the manufacturer

or

- the product must be shipped for disposal (recycling).

Requirements on personnel carrying out the work

All work must be carried out by personnel trained in packing machines.

Packing material

Selection of packing material

The original packing material or suitably stable packing must be used.

Transport

Data concerning goods to be transported

The space requirements correspond to the size of the ultrasonic sieve plus the generator plus the packaging.

Loading, transferring the load, unloading

There are no special requirements.
Disposal

Before transporting the ultrasonic screening system, decommission it as described in the chapter titled "Decommissioning and storage".

Observe the transport instructions in the chapter titled "Transport".

Screening-machine and electrical components should be segregated according to variety, and disposed of properly.

**NOTE:**
All the screening machine’s parts as well as ancillary materials and consumables must be segregated according to variety, and disposed of according to local regulations and guidelines. Please contact the manufacturer if you have any questions regarding disposal.
Fault localization

**US05 Ultrasonic sieve system**

Provided next is an overview of possible faults as well as their causes and remedies. In the event of a fault:
- Notify qualified service staff.
- If necessary, inform the manufacturer's customer service department.

<table>
<thead>
<tr>
<th>Fault</th>
<th>Causes</th>
<th>Fault remedying</th>
</tr>
</thead>
<tbody>
<tr>
<td>The green <strong>US-RUN LED</strong> does not illuminate&lt;br&gt;No sound on the sieve</td>
<td>Mains plug not connected</td>
<td>Connect the mains plug</td>
</tr>
<tr>
<td></td>
<td>Voltage too low or not available on the socket</td>
<td>Check the socket</td>
</tr>
<tr>
<td></td>
<td>Main switch is on <strong>OFF</strong> position</td>
<td>Put the main switch to position <strong>ON</strong></td>
</tr>
<tr>
<td></td>
<td>Fuse is defective</td>
<td>Replace the fuse</td>
</tr>
<tr>
<td></td>
<td>Generator is defective</td>
<td>Send in the generator for repair</td>
</tr>
<tr>
<td></td>
<td>Sieve not connected</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HF cable interruption</td>
<td>Connect the replacement cable</td>
</tr>
<tr>
<td></td>
<td>Short circuit in the HF cable</td>
<td>Connect the replacement cable</td>
</tr>
<tr>
<td></td>
<td>No operating mode selected</td>
<td>Select an operating mode</td>
</tr>
<tr>
<td>The green <strong>US-RUN LED</strong> does not illuminate&lt;br&gt;Ultrasound on the sieve</td>
<td><strong>US-RUN LED</strong> defective</td>
<td>Replace the LED</td>
</tr>
<tr>
<td>Red <strong>ALARM LED</strong> illuminates&lt;br&gt;No sound on the sieve</td>
<td>Mains voltage is too</td>
<td>Check the mains voltage</td>
</tr>
<tr>
<td></td>
<td>Generator overheats</td>
<td>Let the generator cool down</td>
</tr>
<tr>
<td>Fault</td>
<td>Causes</td>
<td>Fault remedying</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>---------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Strong heating up of the sieve</td>
<td>Adjusted intensity is too high</td>
<td>Turn back the intensity or switch to <strong>PULSE</strong> operating mode</td>
</tr>
<tr>
<td></td>
<td>Connecting surfaces of the converter are not clean</td>
<td>Clean the connecting surfaces of the converter/sieve</td>
</tr>
<tr>
<td></td>
<td>Converter is not tightened well</td>
<td>Tighten the converter</td>
</tr>
<tr>
<td>The red <strong>ALARM</strong> indicator on the OptiCenter comes on. No sound on the sieve</td>
<td>The screen generator is inactive or defective.</td>
<td>Turn on the screen generator, or send it in for repairs.</td>
</tr>
<tr>
<td>No powder throughput.</td>
<td>The mesh is too fine</td>
<td>Use a coarser mesh</td>
</tr>
<tr>
<td></td>
<td>The powder dose is too large.</td>
<td>Reduce the dose</td>
</tr>
<tr>
<td></td>
<td>The converter is not connected firmly to the screen.</td>
<td>Connect the converter firmly to the screen. Ensure the correct tightening torque.</td>
</tr>
<tr>
<td>Poor coating results.</td>
<td>Screen is defective</td>
<td>Send the screen to Gema Switzerland for repairs.</td>
</tr>
</tbody>
</table>
Spare parts list

Ordering spare parts

When ordering spare parts for powder coating equipment, please indicate the following specifications:

- Type and serial number of your powder coating equipment
- Order number, quantity and description of each spare part

Example:

- **Type** US05
  - **Serial number** 1234 5678
- Order no. 203 386, 1 piece, Clamp - Ø 18/15 mm

When ordering cable or hose material, the required length must also be given. The spare part numbers of this bulk stock is always marked with an *.

Wearing parts are always marked with a #.

All dimensions of plastic hoses are specified with the external and internal diameter:

Example:

Ø 8/6 mm, 8 mm outside diameter (o/d) / 6 mm inside diameter (i/d)

**WARNING!**

Only original Gema spare parts should be used, because the explosion protection will also be preserved that way. The use of spare parts from other manufacturers will invalidate the Gema guarantee conditions!
### US05 Ultrasonic sieve system - Spare parts list

<table>
<thead>
<tr>
<th></th>
<th>Part Description</th>
<th>Project No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sieve 140 µm - complete</td>
<td>1008 156#</td>
</tr>
<tr>
<td></td>
<td>Sieve 200 µm - complete</td>
<td>1008 155#</td>
</tr>
<tr>
<td></td>
<td>Sieve 250 µm - complete</td>
<td>1008 191#</td>
</tr>
<tr>
<td></td>
<td>Sieve 300 µm - complete</td>
<td>1008 154#</td>
</tr>
<tr>
<td>2</td>
<td>Allen cylinder screw - M5x35 mm</td>
<td>1008 597</td>
</tr>
<tr>
<td>3</td>
<td>Converter</td>
<td>1007 869</td>
</tr>
<tr>
<td>4</td>
<td>Terminal</td>
<td>1007 871</td>
</tr>
<tr>
<td>5</td>
<td>O-ring - Ø 28 x 2,5 mm</td>
<td>263 842#</td>
</tr>
<tr>
<td>7</td>
<td>O-ring - Ø 219,5 x 3 mm</td>
<td>1008 063#</td>
</tr>
<tr>
<td>8</td>
<td>Grip</td>
<td>244 864</td>
</tr>
<tr>
<td>9</td>
<td>Allen cylinder screw - M6x16 mm</td>
<td>216 410</td>
</tr>
<tr>
<td>10</td>
<td>Ultrasonic generator - 100 W</td>
<td>1008 178</td>
</tr>
<tr>
<td>11</td>
<td>Cable with coupling</td>
<td>1008 847</td>
</tr>
<tr>
<td></td>
<td>Thread sealant – ERGO no. 4202</td>
<td>220 507</td>
</tr>
</tbody>
</table>

# Wearing part

* Please indicate length
US05 Ultrasonic sieve system - Spare parts