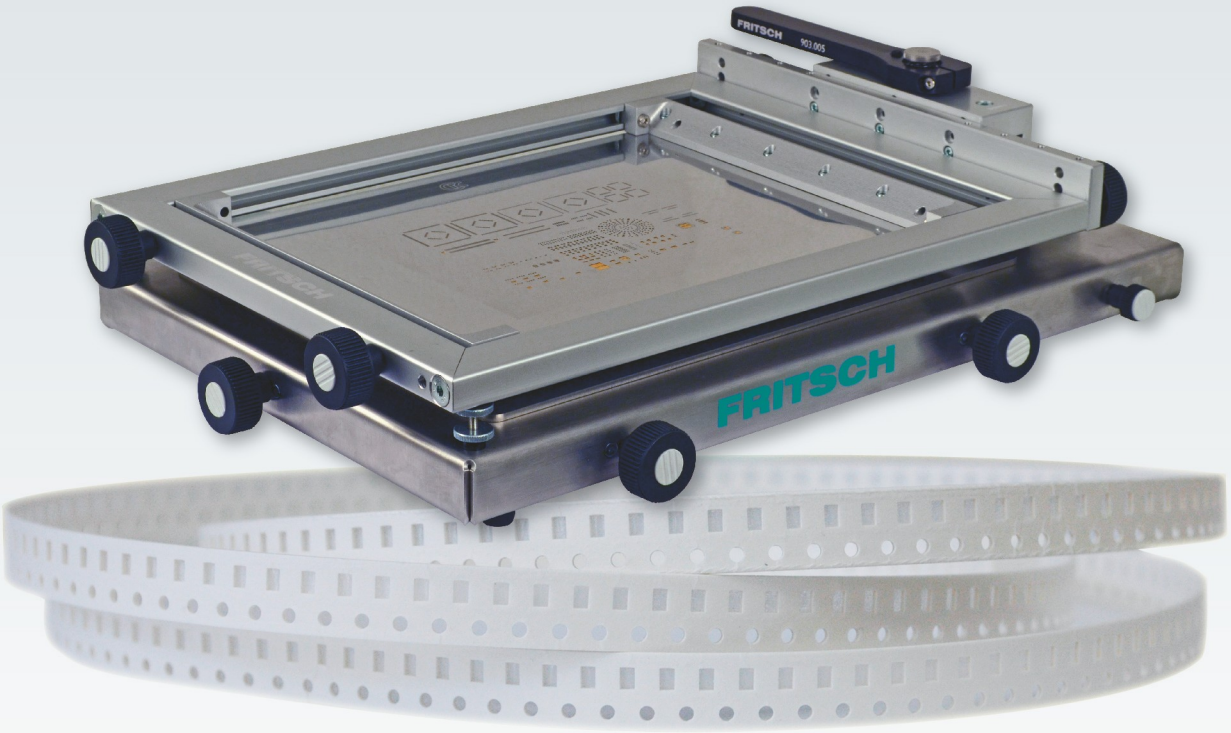
# FRITSCH

COMPLETE AND FLEXIBLE SMT SOLUTIONS

Stencil Printer manual
903.005




Instruction manual

# Contents

# 1 Introduction

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# 2 General

Before installation, connection to the mains or starting this equipment please read all of these instructions.

These instructions should always be available to operators, as they are necessary for the safe operation of this equipment and because they can assist in diagnosing any problems that might occur.

This manual contains informations of the stencil printer and is the translated English version.

- For use by the user and associated personnel.
- Copying and distribution is permitted only for internal company use.

## 2.1 Intended use

The stencil printer is constructed for the following intended use:

- the manual application of solder paste on PCBs

Only in the manual described utilization is allowed.

The FRITSCH Gmbh assumes no liability for damages made by not correct use of the machine.

## 2.2 Standard text symbols

This manual uses different symbols to characterize important information:

### Attention

This symbol shows the user, that the FEEDER could be damaged if the user doesn't follow the exact procedure.


### Warning

Marks, if the user could be hurt or the machine could severely damaged when the user doesn't follow the exact procedure.

### Important

The marked information should be read carefully to ensure a correct function of the machine.

### Tips and Tricks

This symbol marks useful information and helpful hints for the user.

## 2.3 Customer service

There is a return to factory service available for FRITSCH SMD Pick & Place equipment. In the unlikely event of your machine needing to be repaired please send it to your supplier, area representative or direct to us.
To accept a repair item, we use a RMA form. Please request this form before returning the goods to us. Without RMA we can not ensure that the repairs are carried out correctly. For a quick and inexpensive repair a meaningful error description is essential. Please refer to this RMA form.

## 2.4 Warranty and Liability

Please regard the "Sales terms and delivery conditions". These are available after fulfillment of the contract. We don't furnish a guarantee or warranty in cause of damages at material or hurts of people because of

- Incorrect use of the machine
- Wrong setup, installing and operating of the machine or incapable service
- Use of the machine with defective safety equipment
- Nonobservance of the service manual in regard to transport, stocking, setup, installation and service of the machine
- Unlicensed modifications at the machine
- Incorrect or incomplete repairs
- Destructive force effect at the machine in cause of foreign objects or external use of force
- Use of non-original spare parts

# 3 Safety

FRITSCH machines may only be operated, repaired and maintained by skilled personnel.

## 3.1 Responsible behavior

**Consider please the following guidelines for responsible behavior:**

- While maintenance, follow the instructions in the attachment.
- Keep away from moving parts.
- Before operating or try to repair the machine, all manuals and signs has to be read and understood.
- Make sure, that the relevant qualifications and the functions and safety components of the machine are present. If it is necessary, ask a superior.
- Do not misuse the machine. Apply the machine only after its sense of use according to the manual.
- Repairing the devices is only permitted to service technicians of the FRITSCH GmbH.
- Consider if necessary also the special safety regulations of your country.

## 3.2 User training

- Only trained and competent persons are allowed to actuate the machine.
- The persons in authority for rebuild, installation, operation, service and repair have to be exactly identified.

## 3.3 Safety and maintenance


### Warning

To maintain the required operational safety please note the following:

- Keep parts of the body away from moving parts.
- Non conformance with these instructions can lead to death, severe injuries or considerable damage!
- Do not open the housing.
- Do not use the equipment for purposes other than those it was intended for as outlined in the operating instructions.
- The repair of this equipment may only be carried out by persons authorised by the manufacturers FRITSCH GmbH.
- Please also observe any relevant country specific safety rules.

## 3.4 Operating conditions

Please consider the following operation conditions for the stencil printer:

Adequate carrying capacity of the table and space

Ambient conditions: 20°C...25°C, dust and oil-free air as possible.

## 3.5 Operating and maintenance

The stencil printer does not contain any parts requiring routine maintenance.

To ensure trouble free operation over a number of years please observe the following points:

- Please keep the work space clean. Contamination of the stencil printer could lead to premature wear. Examples: corrosion of metal parts or erosion of moving parts.
- Please check regularly the moving parts of free movement. If there is a rough-running you can use a lubricant.

### Please note !

Should you have any problems with your stencil printer or need some advice on its use we shall be happy to be of assistance to you.
The SD903.005 does not contain any parts requiring routine maintenance.

# 4 System components

The stencil printer comprises several system components that are briefly described in the following.


## 4.1 Adjusting knobs for X, Y and Theta adjustments

### 4.1.1 Adjusting knob 1a

- The X direction of the table can be adjusted with adjusting knob 1a.

### 4.1.2 Adjusting knob 1b

- The Y direction of the table can be adjusted by turning the two adjusting knobs 1b in the same direction.
- The Theta rotation can be set by turning the two adjusting knobs 1b in opposite directions.

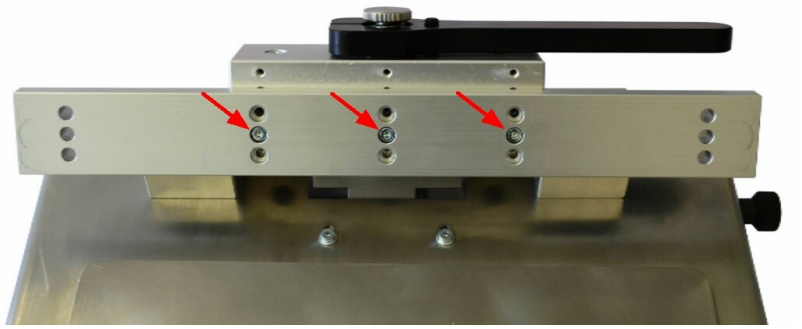
## 4.2 Frame fixture

The stencil printer can be equipped with different frames for the fixture of stencils by way of its frame fixture (2).

The different frames available for fixing the stencils in place are listed under Optional accessories.

### Tips and tricks

The frame fixture can be assembled in various positions where needed (see red arrows in the picture).



**Frame fixture**

### 4.2.1 Tilt mechanism

The frame fixture is equipped with a tilt mechanism in order to be able to tilt the frame with the stencil upwards. This is necessary to place the PCB in the stencil printer.

- When the tilt mechanism is opened, it clicks into the upper position
- A locking knob (3) has to be pulled to close the mechanism.


**Tilt mechanism**

**Attention**

The tilt mechanism must be held open with your other hand whilst pulling the locking knob to prevent it from falling shut.

#### 4.2.1.1 Adjusting the tilt mechanism

The degree of tilt of the stencil printer's tilt mechanism can be altered by way of an adjustment screw (5). By doing so, this enables the stencil printer to adapt to various stencil frames. With frames of varying weights, the tilt mechanism must be adjusted such that the stencil is positioned parallel to the PCB.

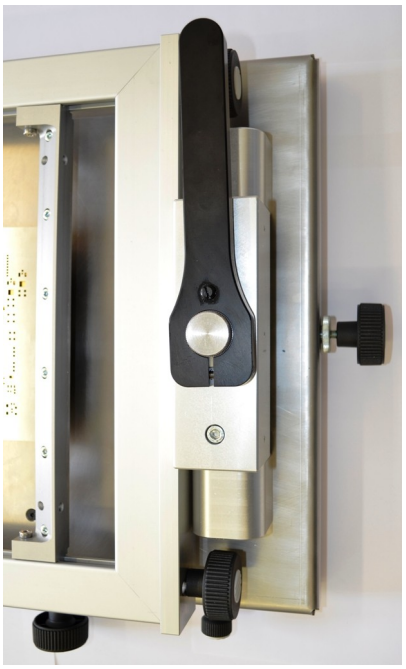

**Adjusting the tilt mechanism**

## 4.3 Parallel stencil lift

The stencil printer is equipped with a parallel stencil lift.

- Rotating the lever (4) a half turn in clockwise direction causes a lift of 2mm.

**Stencil lift bottom**



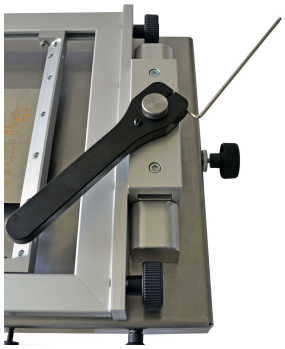
**Stencil lift top**

- The lever has a locking device at the top and bottom to enable repeated lifting.

## 4.4 Adjustable PCB thickness

The stencil printer can be adjusted to varying PCB thicknesses.

- The stencil printer can be adjusted to the thickness of the PCB by way of lever (4).
  - The thickness of the PCB is reduced by turning the lever (4) clockwise.
  - The thickness of the PCB is increased by turning the lever anticlockwise.
  - A quarter turn corresponds with a change in thickness of 1 millimetre.
- After the right PCB thickness has been set, the locking device of the lever can be loosened using a 3mm Allen☐ key.



Locking device loosened

Lever removed

Lever adjusted

- The lever (4) can now be removed and adjusted.
- After that, the lever (4) can be clamped back in using the 3mm Allen®key.

### Important

Whilst the locking device of the lever (4) is being tightened, it must be pushed downwards.

## 4.5 Supporting points

The stencil printer has supporting points so that the stencil remains parallel to the stencil printer whilst the soldering paste is being applied with the scraper. These supporting points must be adjusted before printing such that they support the frame used.

The supporting points comprise two knurled screws, the height of which can be set as required. As soon as the screws have been adjusted, they can be secured against moving by means of knurled nuts.

**Supporting points**

## 4.6 Scraper

The stencil printer is supplied together with a scraper.

- The scraper is for applying the soldering paste to the stencil.

**Scraper**

### Tips and tricks

There are various types of hand scrapers available to improve the printing process.

## 4.7 Optional accessories

### 4.7.1 Frame

There are various frames available for holding stencils

The various frames are listed in the following:

#### 4.7.1.1 Stencil holder frame

The simplest way of holding a stencil for the stencil printer is the stencil holder frame.

**903.203 - Stencil holder frame**

- It is meant to hold the stencil in place without having to use clamps.
- The holder frame was developed for the holding of so-called “prototype stencils”.
  - These are frequently available from PCB suppliers at low cost.
- Due to the fact that the “prototype stencils” are slightly larger than the PCB to be printed and that they have no holes for holding them, the stencils are held in place by clamping.

**Important**

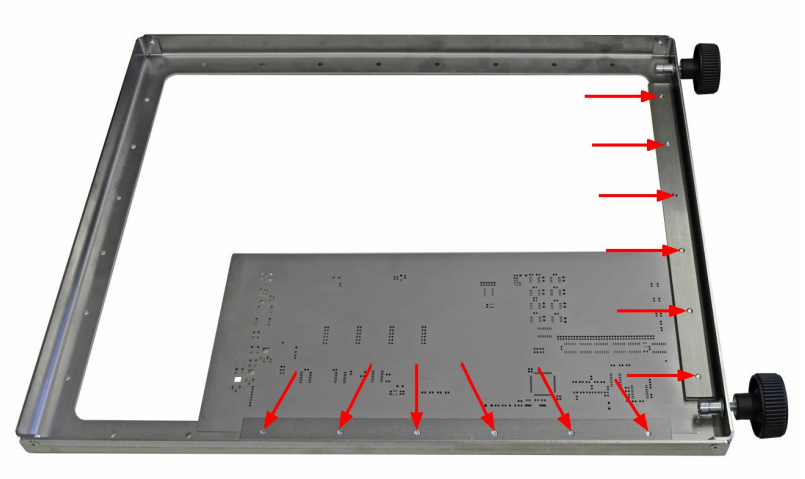
Depending on the size of the stencil, the parallel stencil lift cannot be used optimally.

**Attention**

No guarantee can be provided that all available “prototype stencils” can be held in place with the stencil holder frame..

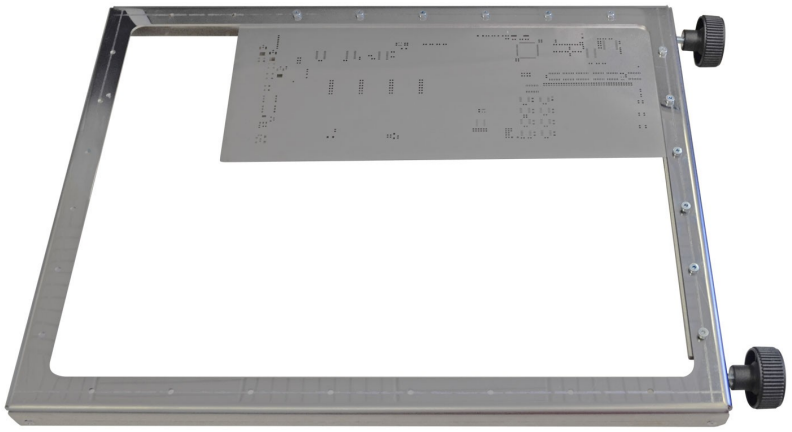
4.7.1.1.1 Assembling the stencil

- The clamping screws must first be loosened (see red arrows in the picture) with a 3mm Allen®key before the stencil can be placed in the frame.
- Next, the stencil can be pushed under the clamping strip.



**Putting in the stencil**

- Now the clamping screws can be tightened again so that the stencil is firmly in place.
  - It is easier to tighten the clamping screws when the frame is turned over.

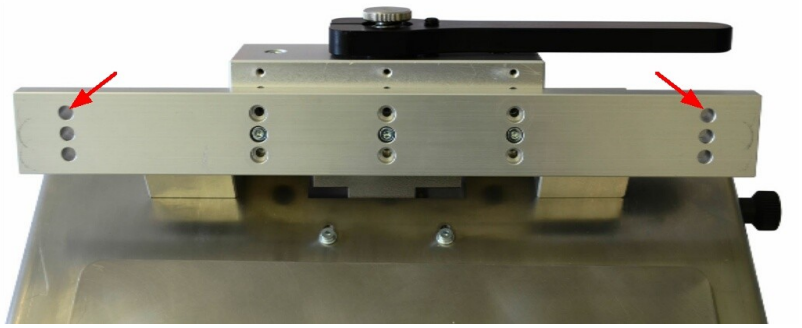


**Clamping the stencil**

- The stencil holder frame can now be assembled into the stencil printer

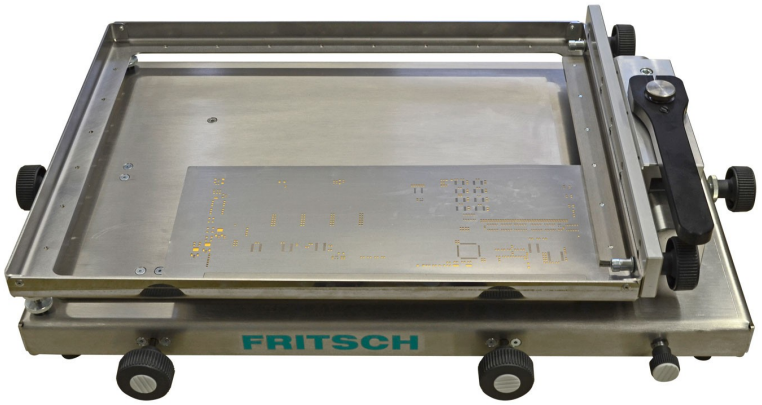
4.7.1.1.2 Assembling the stencil holder frame

- The stencil holder frame is screwed onto the frame holder for assembling into the stencil printer.
- The frame holder has several holes for affixing the stencil holder frame (see red arrows in the picture).
  - The stencil holder frame can be affixed to the holder at different heights depending on the thickness of the PCB and the PCB holder used.



**Frame holder**

- The threaded pins of the stencil holder frame are inserted into the corresponding holes of the holder to affix it.
- Now the frame can be held in place with the corresponding knurled nuts (see red arrows in the picture).




**Assembled stencil holder frame**

### 4.7.1.2 Stencil clamp frame

With the stencil clamp frame, it is possible to hold and clamp “prototype stencils”.


**903.204 - Stencil clamp frame**

- It is meant for holding the stencils by clamping them from two sides.
- The clamp frame was developed to holding so-called “prototype stencils”.
  - These are frequently available from PCB suppliers at low cost.
- Due to the fact that the “prototype stencils” are slightly larger than the PCB to be printed and that they have no holes for holding them, the stencils are held in place in the clamp frame by two clamps.

## Attention

No guarantee can be provided that all available “prototype stencils” can be held in place with the stencil clamp frame.

## Important

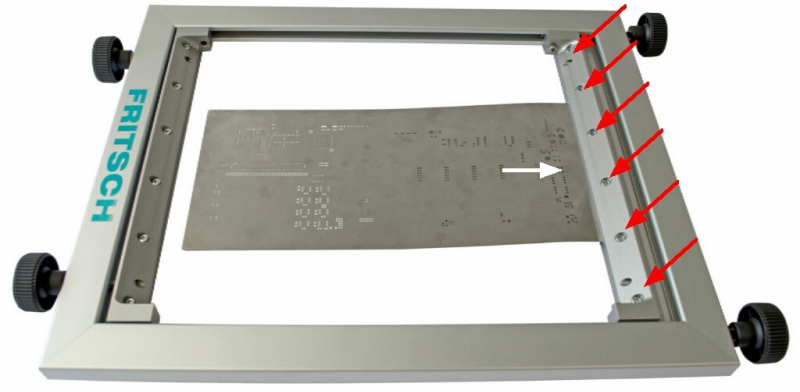
The magnetic holders are required to use the stencil clamp frame in the stencil printer for double-sided printing.

4.7.1.2.1 Mounting the stencil

- Before the stencil can be placed in the frame, it must first be prepared as follows:
  - The clamping screws (see red arrows in the picture) must be loosened with a 3mm Allen®key.
  - The knurled screws (see green arrows in the picture) must be loosened so that the clamping jaw (see yellow arrow in the picture) is completely loose.
  - The clamping screws (see blue arrows in the picture) must be loosened with a 3mm Allen®key so that the clamping jaw (see white arrow in the picture) can be moved.

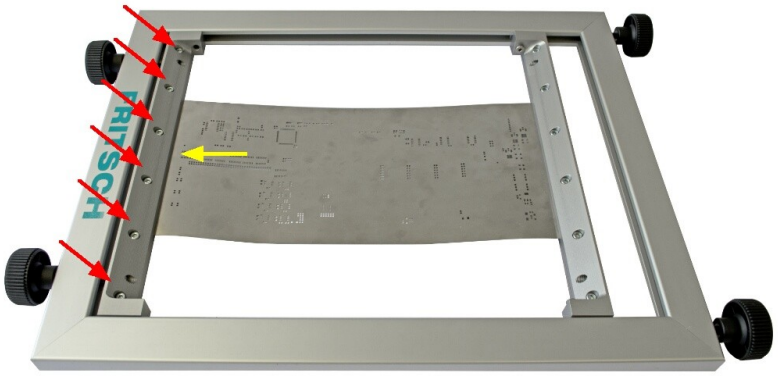

**Loosening the screws**

- Now the stencil can be pushed under the clamping strip of the first clamping jaw (see white arrow in the picture).
- Now the clamping screws (see red arrows in the picture) of the first clamping jaw can be tightened with a 3mm Allen®key.



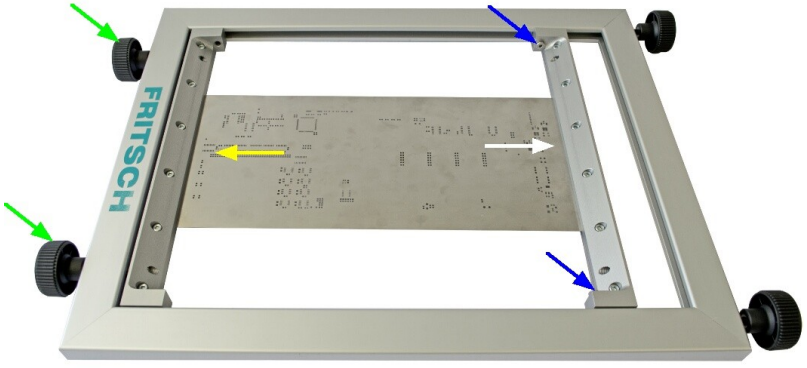

**Inserting the stencil**

- Next, the stencil needs to be pushed under the clamping strip of the second clamping jaw (see yellow arrow in the picture).
- Now the clamping screws (see red arrows in the picture) of the second clamping jaw can be tightened with a 3mm Allen®key.




**Clamping the stencil**

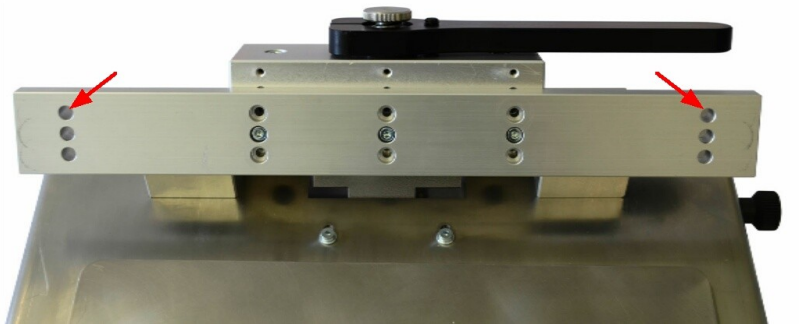
- The stencil is now pre-tensioned by moving the first clamping jaw (see white arrow in the picture) by hand.
- Whilst the stencil is being pre-tensioned, the clamping screws have to be tightened up (see blue arrows in the picture).
- Lastly, the knurled screws (see green arrows in the picture) must be tightened up according to the desired tension of the stencil.
  - By tightening up the knurled screws, the stencil is tensioned by way of the second clamping jaw (see yellow arrow in the picture) moving.
- The stencil holder frame can now be mounted into the stencil printer.




**Tensioning the stencil**

4.7.1.2.2 Mounting the stencil clamping frame

- To mount the stencil clamping frame into the stencil printer, it is screwed up to the frame holder.
- The frame holder has several holes for holding the stencil holder frame (see red arrows in the picture).
  - The stencil holder frame can be affixed to the holder at different heights depending on the thickness of the PCB and the PCB holder used.



**Frame holder**

- The threaded pins of the stencil holder frame are inserted into the corresponding holes of the holder to affix it.
- Now the frame can be held in place with the corresponding knurled nuts (see red arrows in the picture).


**Mounted stencil clamp frame**

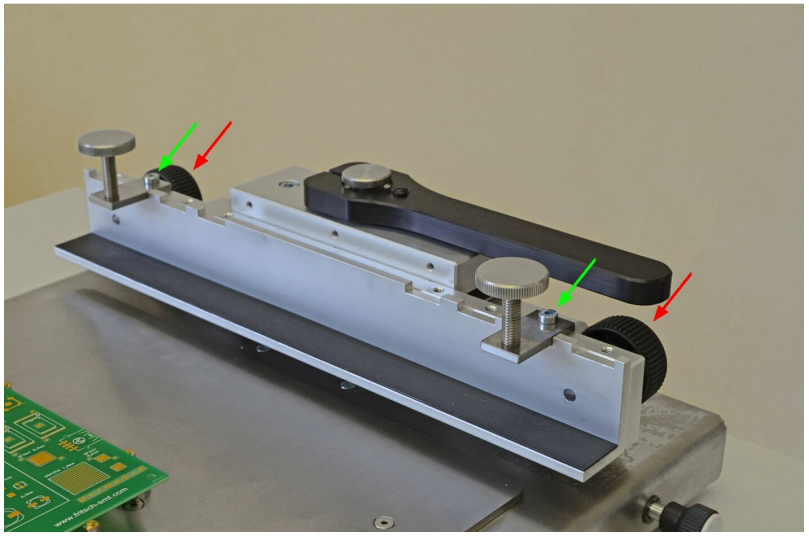
### 4.7.1.3 Stencil clamping for fixed frames

The stencil clamping for stencils in fixed frames enables the use of frames with different dimensions and the direct intake.

**903.205 Stencil clamping for stencils in fixed frames**

4.7.1.3.1 Mounting the stencil clamping

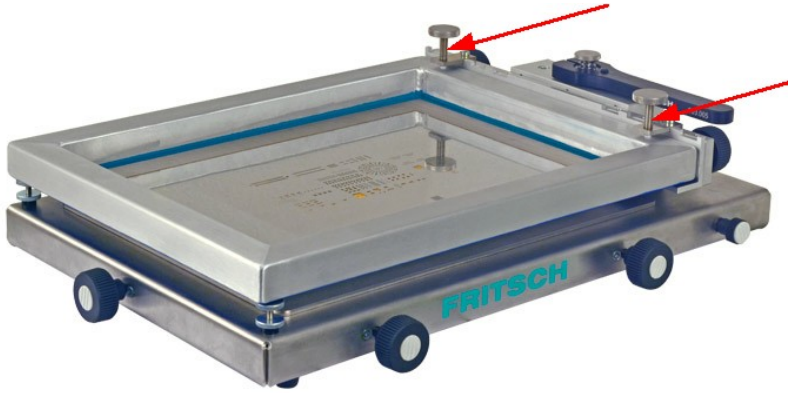
- The stencil clamping can be mounted easily.
- The stencil clamping is fixed by two knurled screws (see pict. red arrows) at the printer.
- In addition the clamping is fixed by two cylinder screws (see green arrows)



**Stencil clamping mounted**

4.7.1.3.2 Mounting the frame

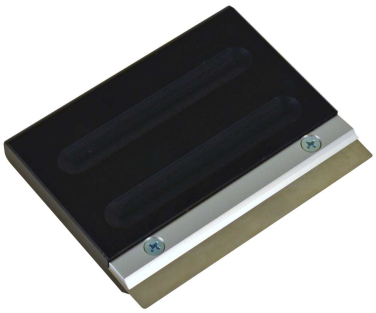
For mounting a fixed frame inclusive stencil it has to be inserted and fixed by the two knurled screws (see pict. red arrows).




**Frame mounted**

## 4.7.2 Hand scrapers

There are two different sizes of scrapers available as optional accessories for the stencil printer.



**SD.0037.00 - hand scraper 110mm**

**SD.0036.00 - hand scraper 255mm**

## 4.7.3 PCB holders

### 4.7.3.1 Magnetic holders for double-sided printing

There are magnetic holders optionally available for printing PCBs on both sides with the stencil printer.

With the magnetic holders, it is possible to hold PCBs that have already been assembled with components on the reverse of up to 18mm in height.

**903.103 - magnetic holders for double-sided printing**

**The magnetic holder set comprises two different PCB supports:**

- PCB support

The PCB supports without spigots are for supporting in the middle of the PCB to prevent them from bending during printing.

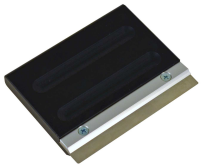
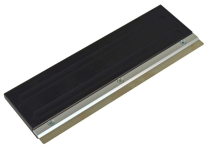
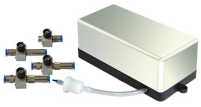
**PCB support**

- PCB support with spigot

The PCB supports with spigots are for supporting the PCB at its edge to be able to repeatedly hold it.

**PCB support with spigot**

# 5 Accessories and spare parts

| | | |
|---|---|---|
|  | 903.203 | Frame holder |
|  | 903.204 | Stencil clamp frame |
|  | 903.205 | Stencil clamp for stencils in fixed frames |
|  | SD.0037.00 | Hand scraper 110mm, metal |
|  | SD.0036.00 | Hand scraper 255mm, metal |
|  | 903.103 | Magnetic-PCB holder set for double-sided printing |
|  | 903.104 | Magnetic-PCB-fixture set for double-sided printing |
|  | 903.105 | Magnetic-PCB supporter set for double-sided printing |
|  | 903.206 | Flexible vacuum-option for safe down-fixation of PCB while printing (903.206).<br>Incl. 4 magnetic suction cups and manual vacuum-deactivating. |

# 6 Technical data

## 6.1 903.005 - Stencil Printer

Dimensions (W x D x H) ..... 640 x 400 x 150 mm, closed
Base ..... 545 x 360 mm
Stencil size ..... max. 460 x 30 x 350 mm
Table/useable area ..... 390 x 290 mm
Adjustment X/Y ..... +/- 7,5 mm
Theta-adjustment ..... +/- 3°
Parallel lift ..... 2 mm
Weight ..... ca. 15 kg zzgl. Optionen

## 6.2 903.203 - Stencil holder frame

Dimensions (W x D x H) ..... 500 x 350 x 30 mm
Stencil size max. ..... 420 x 320 mm
PCB size/useable area max. ..... 380 x 280 mm
Weight ca. ..... 1 kg

## 6.3 903.204 - Stencil clamp frame

Dimensions (W x D x H) ..... 540 x 350 x 40 mm
Stencil size max. ..... 360 x 280 mm
PCB size/useable area max. ..... 330 x 270 mm
Weight ..... ca. 2,3 kg

## 6.4 903.205 - Stencil clamp for stencils in fixed frames

Dimensions (B x T x H) ..... 350 x 45 x 90 mm
Frame size max. ..... 350 x 450 x 33 mm
Weight ca. ..... ca. 0,5 kg

## 6.5 903.103 - Magnetic holders for double-sided printing

PCB underside ..... max. 18mm

# FRITSCH

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