

AUTOBLASTER CNC



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1. Introduction

The following paper includes a technical drawing with construction, maintenance and repairs. The operators of sandblasting table, supervising manager and service technicians must be familiar with the following operating manual. Reliable and trouble-free work of the device depends to a great extent on proper use and maintenance of the machine.

1.1 Subject of this operating manual

The subject of this operating manual are rules that govern the use and maintenance of automatic sandblasting table Autoblaster CNC. This operating manual is intended for operators of this device, supervisors, technical staff and management. It includes basic information about the construction of the device and health and safety requirements which must be followed when using and repairing the machine.

ATTENTION!
The manufacturer is not liable for defective operation of the device or for any resulting damages.

1.2 Operating principle

Automatic sandblasting table Autoblaster CNC is used to control the movement of sandblasting head by means of dedicated software. In order to use this machine connect this machine to the computer with dedicated software, and to electrically controlled pressure sandblasting machine.

1.3 Technical details

Power supply	~230 V / 50 Hz (Europe), ~110 V 60 Hz (USA)
Input power	500 W
Working range	1150 mm x 1250 mm or 1600 mm x 1250 mm
Head movement speed	< 10 cm/s
Weight	150 kg
Sandblasting	Connecting electrically controlled sandblasting machine is required
Dimensions	1700 x 1600 x 1850 mm or 2100 x 1600 x 1850
Working temperature	+10 C - +40 C

2. Safety measures

ATTENTION!
The manufacturer is not liable for any body injuries resulting from non-compliance with these safety measures or insufficient care during installation, use, maintenance and repair of this machine, even if these recommendations have not been clearly expressed.

2.1 General safety measures

1. Apply safe work practices and follow the local requirements and labour safety rules.
2. If any of the rules below does not apply to local law, apply the stricter law.
3. Installation, use, maintenance and repairs may be conducted only by authorised, trained and specialised personnel.
4. Switch off the power supply before starting any maintenance works, repairs, adjustments or checks other than regular ones.
5. People who are in the area (or room) in which acoustic pressure level exceeds 90 dB should wear ear protection.
6. Keep children away from the device.
7. Follow the manufacturer's instructions as regards recommended work parameters.
8. Use the machine for its intended purpose only.

9. If you encounter any irregularities in machine's work, contact the service immediately.

2.2 Safety measures during installation

1. Keep the automatic sandblasting table on a firm and flat surface.
2. Before starting work make sure that all transport securing elements have been removed and all the components are stable.
3. Electrical connections must comply to local regulations.
4. After connecting the sandblasting machine make sure that hoses which feed and receive abrasive are installed properly. Any leakage caused by improper installation may pose a danger during operation of the machine.

2.3 Safety measures during work

1. Use consumables which are of a correct type and are recommended by the manufacturer.
2. Persons who switch on the machine should take adequate safety measures in order not to cause any danger to third parties.
3. Do not use the machine if any irregularities in its work have been observed.
4. Keep hands away from the rails and the sandblasting head during its work.

3. Installing and starting the machine

3.1 Installation and levelling of the machine

The machine must be placed on a flat, firm surface and levelled. Levelling means adjusting machine legs with a wrench.

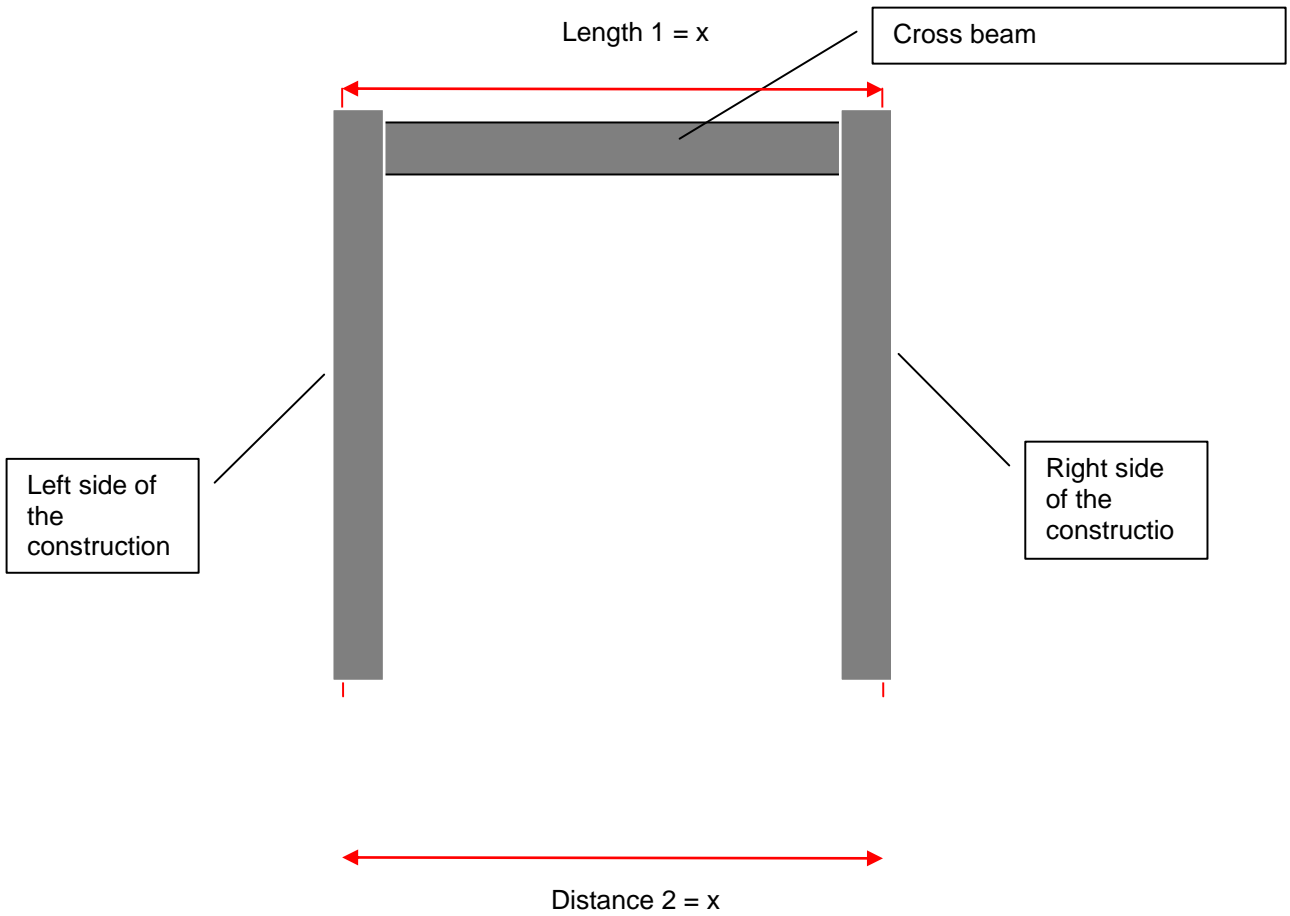


3.2 Rail adjustment

Rail adjustment must be carried out after installing and placing the machine. In order to adjust rails you need to

- a. loosen screws which hold the sides of the construction with the cross beam
- b. adjust the construction sides with a wrench so that they are parallel to each other
- c. after parallelism calibration tighten the loosened screws





3.3 Cable connection

Plug main power supply cable into 230 V grounded socket. Plug the sandblasting machine control lines one by one into the sockets in the control unit which is located on the back of the machine:

- Sandblasting machine vacuum



- Power supply

- Abrasive level sensor

- Sandblasting machine control

ATTENTION: Due to the presence of sensitive electronic modules, additional ground with a separate PE cable (6-10 mm diameter) is recommended.

ATTENTION: In places with high voltage drops or power failures, 800-1000 W uninterruptible power supply (UPS) is recommended.

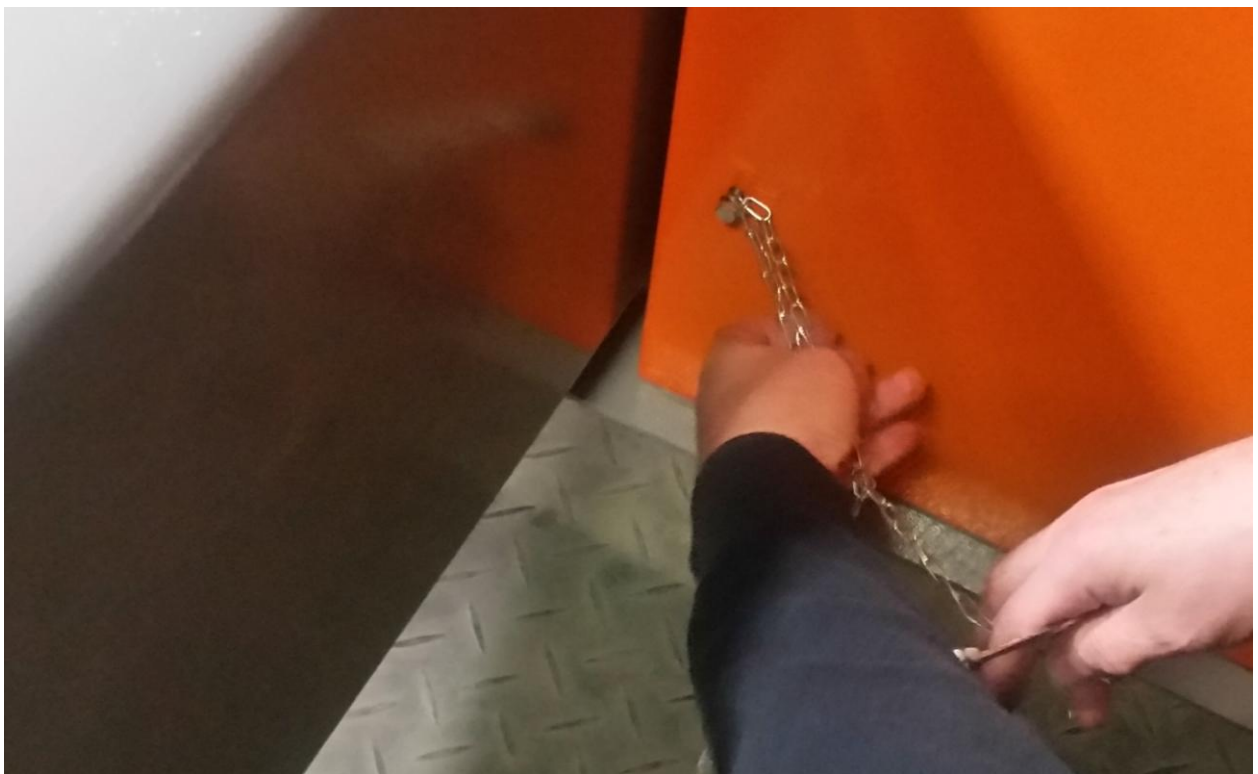
3.4 Interference eliminator connection

Connection of the sandblasting machine vacuum with the control unit must be secured with an interference eliminator. It must be installed between the control unit and the vacuum power supply plug.



3.5 Ground chain connection

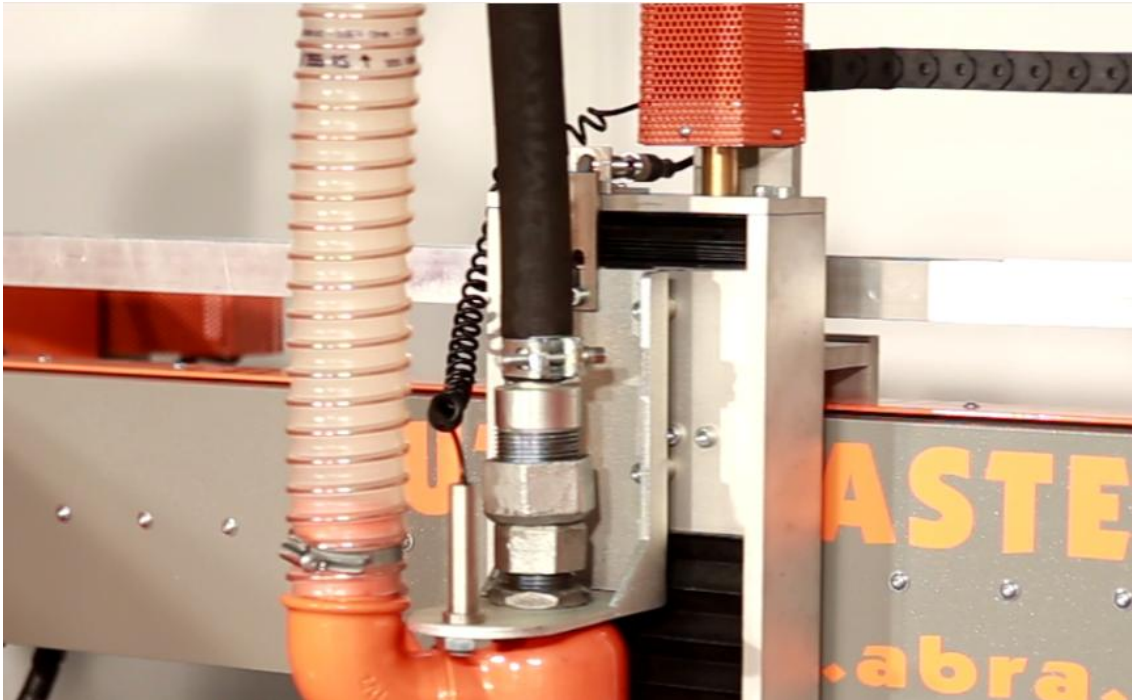
Attach Autoblaster CNC leg to the included turntable.



3.6 Hose connection

Use the abrasive hose to connect the abrasive valve with the sandblasting head. Use the extractor hose to attach the abrasive vessel to the sandblasting head. Use a proper clamp to mount both hoses. Use flexible mounting to put the hoses on the frame.

ATTENTION: After mounting the hoses cannot block the machine's work. After starting the machine make sure that the head is able to move along the whole working area freely.



3.7 Starting the machine

The machine must be connected to electrical installation with protective ground and residual current device. Turn on and off the machine with a switch located on the box on the back of the machine. Safety switch is located on the side of the machine.

Before starting the machine make sure that all the fuses in the control unit are ON.



Start the machine with the main switch located on the control unit on the back of the machine.



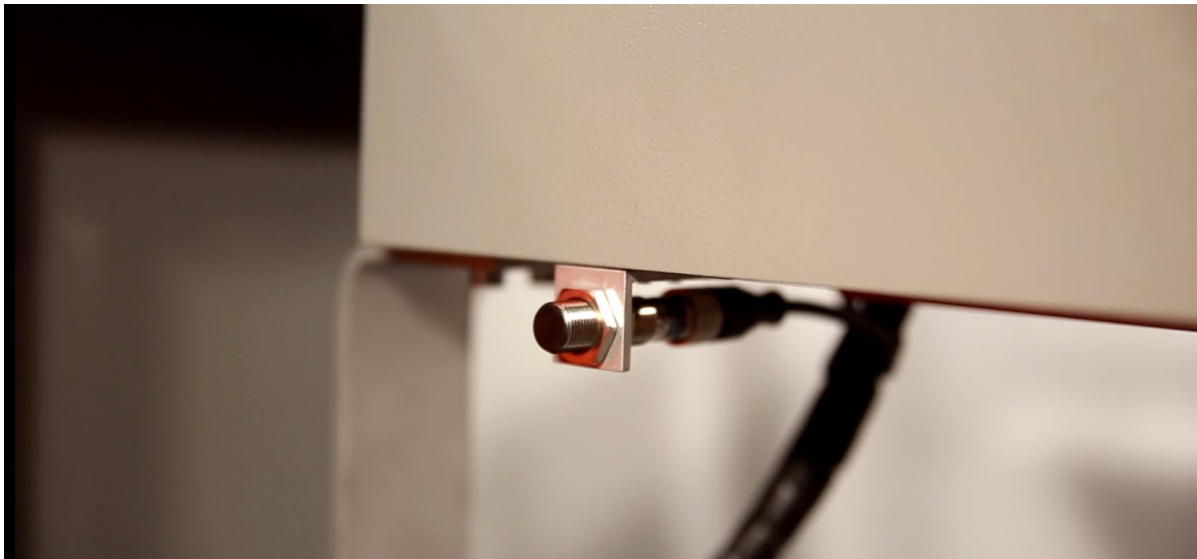
Safety switch is located on the side of the machine.



ATTENTION: Do not use safety switch in order to stop the sandblasting process without serious reasons. Using safety switch when it is not necessary may result in destruction of sandblasted surface. Safety switch stops the engines and the sandblasting machine, but remains of the abrasive in the cable may still go through the sandblasting nozzle.

3.8 Detector calibration

After starting the machine and its positioning, lights on all three detectors should be yellow. If any detector after positioning is off or the machine cannot be positioned, loosen the screws which hold the detector, move the head manually to the positioning point (the machine must be off). Switch on the machine again and move the detectors closer until the light is on.



4. Starting the software and work mode selection

After turning the power on, the controller will switch on automatically.



After starting the program, the first thing you need to do is to reset the system position. Information that you need to do it is shown at the bottom of the screen (on the information bar).

ATTENTION: Resetting is obligatory after starting the machine and in case of mechanical lock of the machine during work. Skipping this operation may result in incorrect operation of the machine.

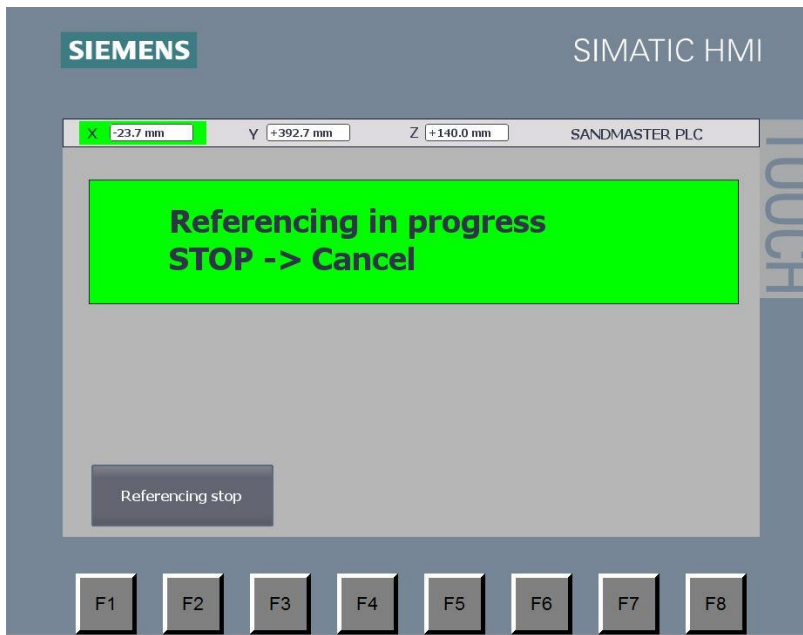
After resetting you can go to work mode selection. In case of Autoblaster CNC the only available mode is “sandblasting”.

After pressing **Referencing** button all axes will be set in the starting position. Positioning starts from lifting the sandblasting head. Next the machine positions itself on X axis and then on Y axis.

When positioning is successful, a message to perform positioning disappears from the main screen.

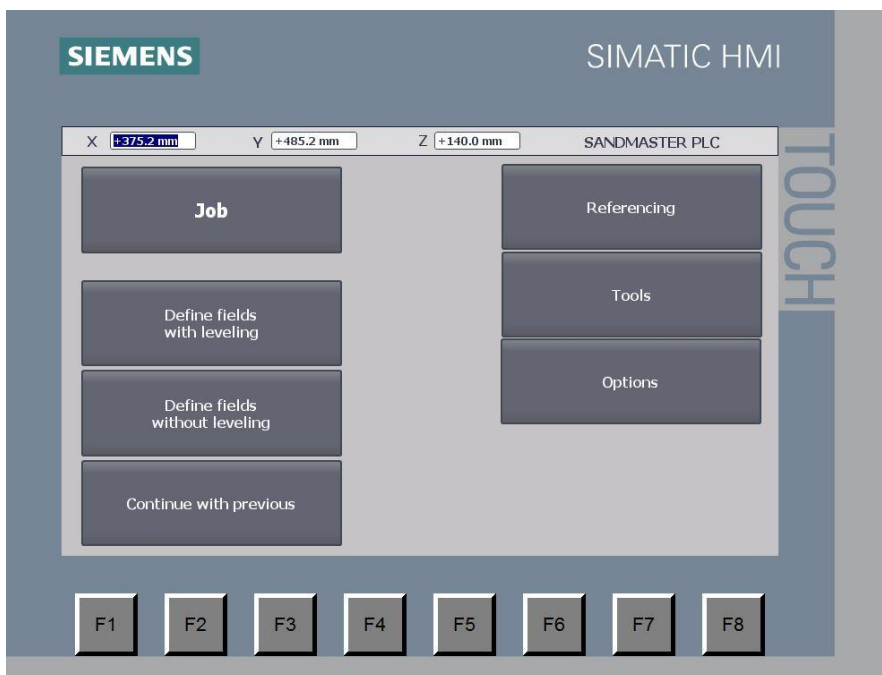


ATTENTION: In order to stop positioning press **Referencing stop**



5. Sandblasting

After positioning the control panel main screen will appear:



Start sandblasting from defining fields for sandblasting. Start marking fields by pressing **Defining fields** button. After defining all fields start sandblasting by pressing **Job** button. All the steps are described in the following sections:

5.1 Defining fields

Defining fields takes place by means of three modes:

- Defining fields with levelling
- Defining fields without levelling
- Continue the previous

5.1.1 Slab levelling

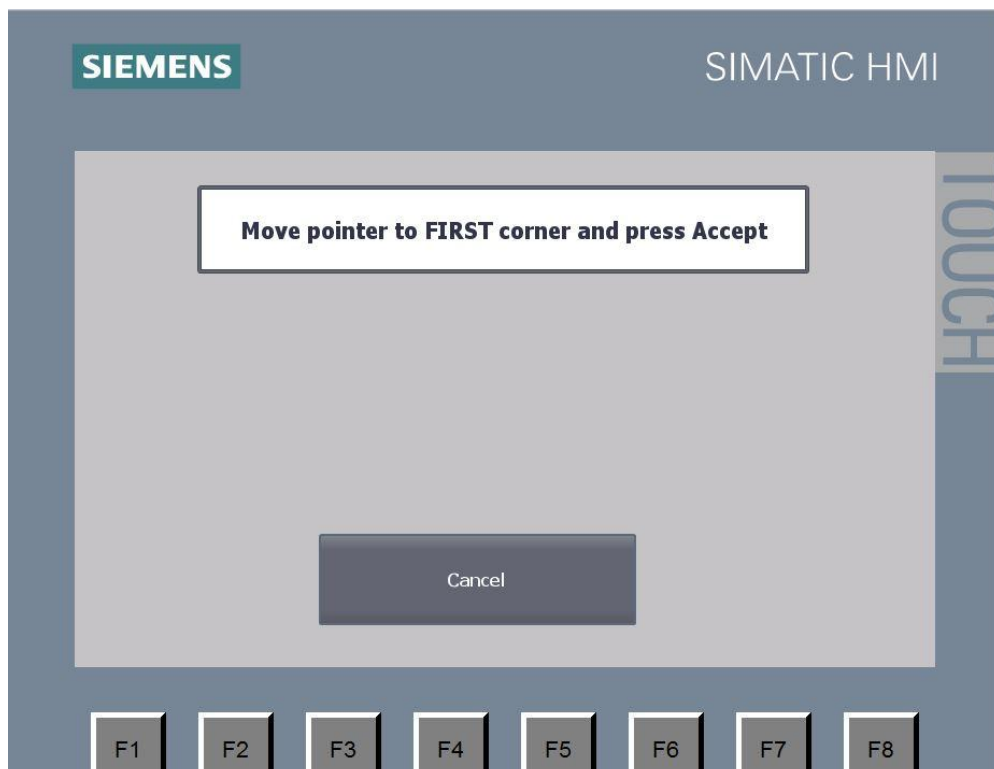
After selecting this mode we can sandblast slabs which for some reasons have not been placed parallel to the table level or have a sloping surface. After marking (in a computer program) unevenness in placing a slab, the sandblasting head automatically adjusts its height over the slab as programmed.

Messages with a request to define three points of the plane will appear on the control panel.

After setting the head on the right height in the plane defining point, press **Accept** button. The system will ask to confirm 3 points one by one. When three points are defined correctly, the system will go to another stage – defining sandblasting fields.

ATTENTION: In order to define the plane select three points located at substantial distance from each other.

ATTENTION: Selecting this mode will cancel previously defined fields.

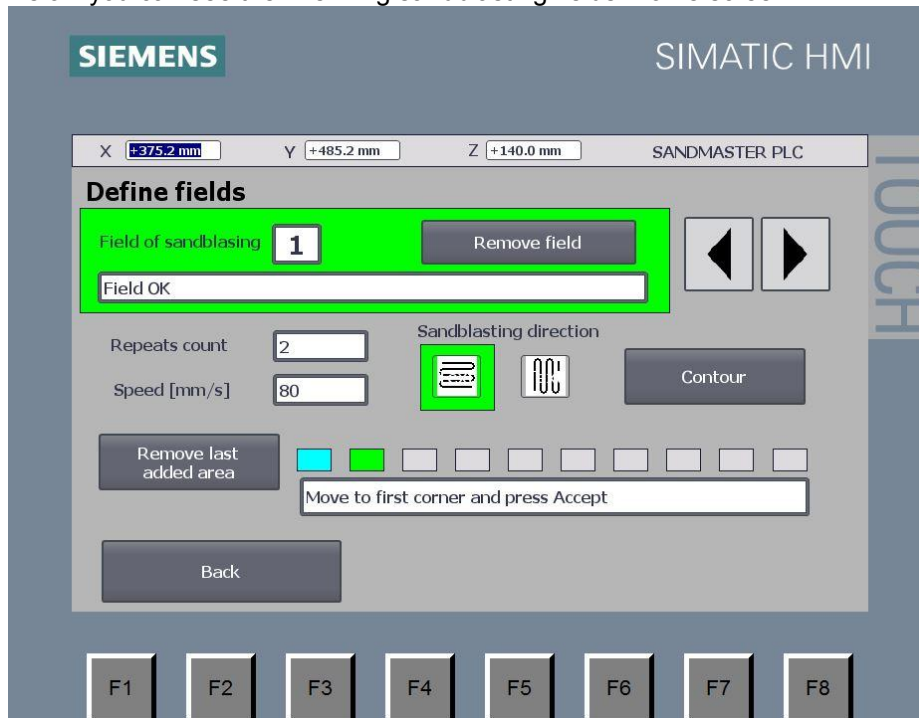


5.1.1.1 Head passes

On the right side of the screen we can see a motion controller for setting the right position of the head on XYZ axes. The same motion control light is displayed on all levels of program settings where head movement is possible. In order to make a movement, move the cursor in a given direction. The head will be moving in the direction indicated with the speed directly proportional to the deviation of the cursor from the central position.

5.1.1.2 Defining sandblasting fields

Below you can see the “Defining sandblasting fields” home screen.

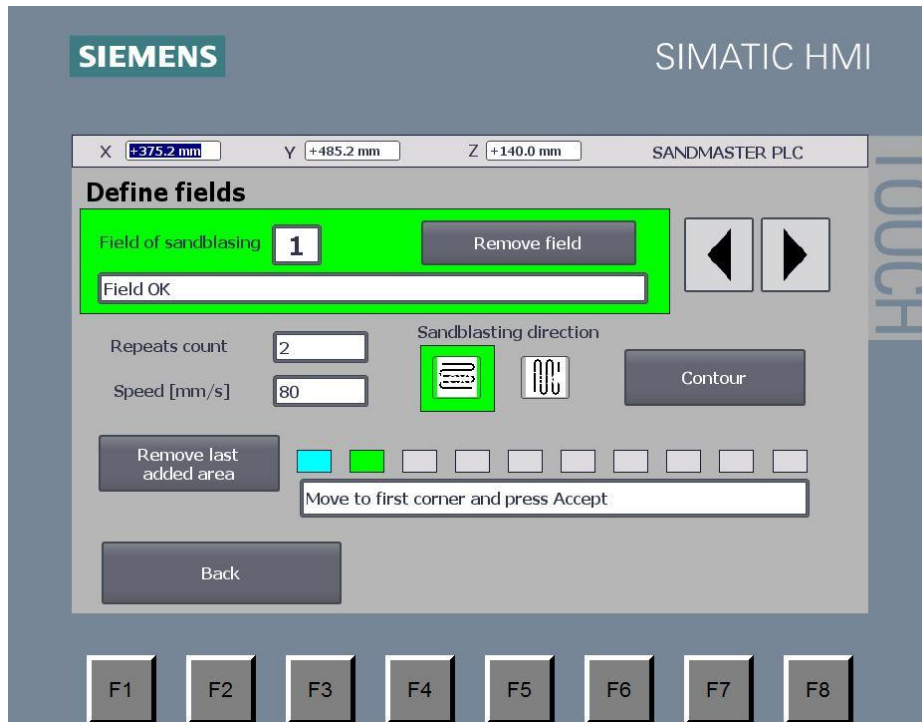


You can define any number of independent sandblasting fields. The screen is divided into 3 parts. The top part shows defined fields whereas the bottom part shows parameters of defined fields. The motion controller is on the right.

5.1.1.3 Field visualization

Below you can see an example of 2 defined fields. Currently defined field is marked green. Fields which are not currently defined are marked grey. If a currently defined field changes its colour into red, it means that it has been defined incorrectly. It means that the fields do not have a common part or the shape of the field makes sandblasting impossible.

5.1.1.4 Parameters of defined fields



The figure shows the setting panel for defined fields:

Sandblasting fields – the list which shows defined fields. Highlighted field on the list is an active field which has been selected for sandblasting.

Field areas – the list of areas that make up the field.

Add a sandblasting field – after pressing this button a new field will be added. A new field becomes an active field.

Remove the sandblasting field – after pressing this button an active field will be removed.

Remove the sandblasting area – after pressing this button the marked area will be removed.

Number of repetitions – number of sandblasting passes

Speed – head movement speed when sandblasting (mm/s)

Sandblasting direction – head movement direction when sandblasting.

Back – end of field definition.

In order to add a new sandblasting area to an active field, set the laser marker in one of the corners of a new area and then press **Accept point**. The laser marker will start flashing. Next set the head in the opposite corner of the area and press **Accept point** again. The new area will be added to the list of field areas.

5.1.2 Sandblasting without levelling

After selecting sandblasting without levelling you will go directly to the field definition screen (section 5.1.1.2). Selecting this mode will result in cancelling previously defined fields.

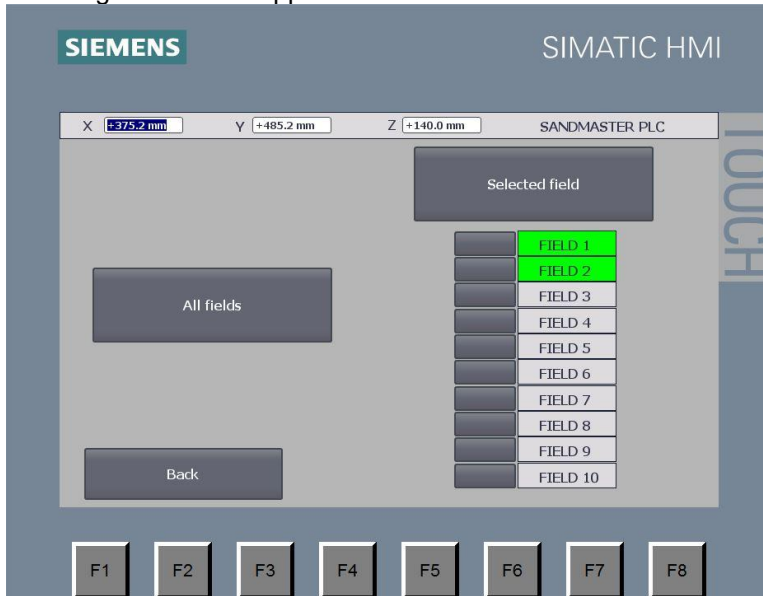
5.1.3 Continue the previous

After selecting this mode you can correct previously defined fields.

5.2 Starting sandblasting

5.2.1 Selecting sandblasting fields

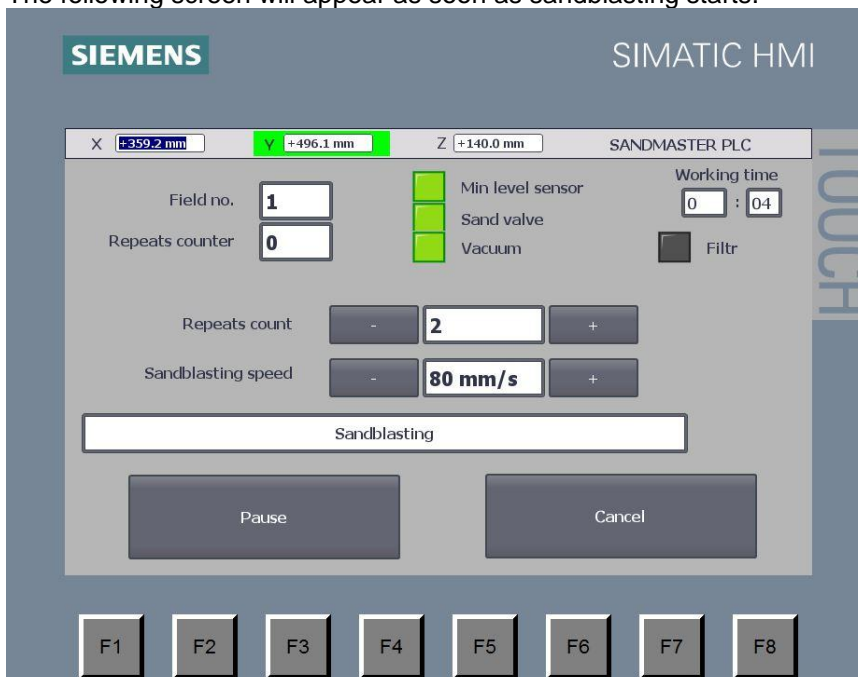
After defining fields, the system is ready to start sandblasting. In order to do this press **Job** button. The following window will appear:



On this screen you can select sandblasting all defined fields or just one field selected from the list. The system will start sandblasting once the choice is made.

5.2.2 Sandblasting

The following screen will appear as soon as sandblasting starts.



On the screen we can see the currently sandblasted field (in green), sandblasting repetition meter, speed and abrasive level sensor status.

5.2.3 Changing pass number

During the process we can change the number of head passes over the sandblasted field. We can do it by pressing the arrows next to the sandblasting meter.

5.2.4 Changing sandblasting speed

If you need to change the head movement speed, use the speed slider.

5.2.5 Stopping the process

If you need to suspend the process temporarily in order to correct the sandblasted material, press **Pause button.** Corundum dosing will be suspended then, but the system will continue its work for some time in order to perform depressurisation of the sandblasting machine.

As soon as the head movement stops, the motion controller panel will appear. This will allow to move the head onto any place and make corrections on the sandblasted slab. In order to return to the sandblasting process press **Renew process** button. The head will return to the place where the process was suspended and will continue sandblasting.

5.2.6 Cancelling the process

After pressing **Cancel** button currently performed work will be cancelled and sandblasting process will be finished (after depressurisation). The system will return to the sandblasting home screen.

5.2.7 Abrasive level sensor

If a sandblasting machine is equipped with corundum level sensor, the system permanently checks how much corundum is left in the vessel. If the sensor shows minimum level, the process will be stopped. The message will be displayed at the bottom of the screen.

After adding corundum press **Renew process** button in order to return to the sandblasting process. The head will return to the place where the process was suspended. Sandblasting will start from that place. As soon as sandblasting is finished, the main menu will be displayed.

5.3 Auxiliaries

This mode allows for any head movement as well as starting the vacuum in order to remove the sandblasting remains from the sandblasted slab. From this screen you can repeat the table axis positioning. Positioning process has been already described.

Attention: After performing positioning from this screen you need to return to the sandblasting home screen before moving the head.

5.4 Parameters

The system allows to set some table work parameters.

Parameter	Value
Default speed [mm/s]	30
Default repeats count	2
Working step [mm]	8
decompression time [s]	6
Recovery time [s]	5
Maximum sandblasting time [min]	4
Minimum sandblasting time with sensor [s]	10
Laser offset [mm]	65
Working without min sensor	NO
X MAX	1200
Y MAX	1200
Z MAX	145
X Zero pos	0
Y Zero pos	0
Z Zero pos	140

Default speed – default sandblasting speed when defining fields (default speed: **80 mm/s**).

Number of repetitions – default number of sandblasting repetitions

Working stroke – single move when the head changes its movement direction (default: **8 mm** with nozzle 5 mm in internal diameter).

Depressurisation time – time required for emptying the system after closing the sandblasting valve (default: **12 s.**).

Transfer time – corundum transfer time after sandblasting is stopped (**40 s** with 50 kg of corundum in the vessel).

Max. sandblasting time – maximum sandblasting time without depressurisation and corundum transfer (**20-25 mins** of continuous sandblasting with 50 kg of abrasive in the vessel).

Laser shift – distance between the centre of the sandblasting head and the laser pointer (default: **50-80 mm**).

6. Maintenance

In order to ensure trouble-free work of the sandblasting table conduct regular and careful maintenance. Pay particular attention to the condition of the nozzles, rails, brushes, hoses and tensioning belts which are prone to wear during work. It is recommended to clean the rails and the frame of the machine after every use.

Autoblaster CNC was designed in such a way that it requires little intervention of the user as regards the operation of the machine and conducting maintenance.

Regular periodic cleaning of the machine and following simple actions (listed below) will result in safe and long life of the machine.

Maintenance activities		
No	Scope of activities	Frequency
1	Changing abrasive nozzle	When the element is worn out
2	Changing abrasive and extractor hoses	When the element is worn out
3	Replacing sandblasting head cover	When the element is worn out
4	Changing sandblasting brush	When the element is worn out
6	Rail parallelism calibration	After half a year
7	Service	Once a year

ATTENTION: ELECTROCORUNDUM '40 abrasive is recommended. Use of any other abrasive will render this guarantee null.

ATTENTION: Check extractor cables regularly. Leaks affect sandblasting quality and filter system work. In case of any leaks in the system, separation system and abrasive filtration become less effective.

7. Warranty

The warranty terms are included in the Warranty Card which is attached to this document.

The warranty does not cover the following consumables:

- brush for collecting abrasive
- nozzle for feeding abrasive (boron carbide)

- short nozzle (tool steel)
- rubber head protection
- head casting
- nozzle fitting
- sliding inserts (in trolleys)
- hose for feeding abrasive
- hose for collecting abrasive

