ROTOX®

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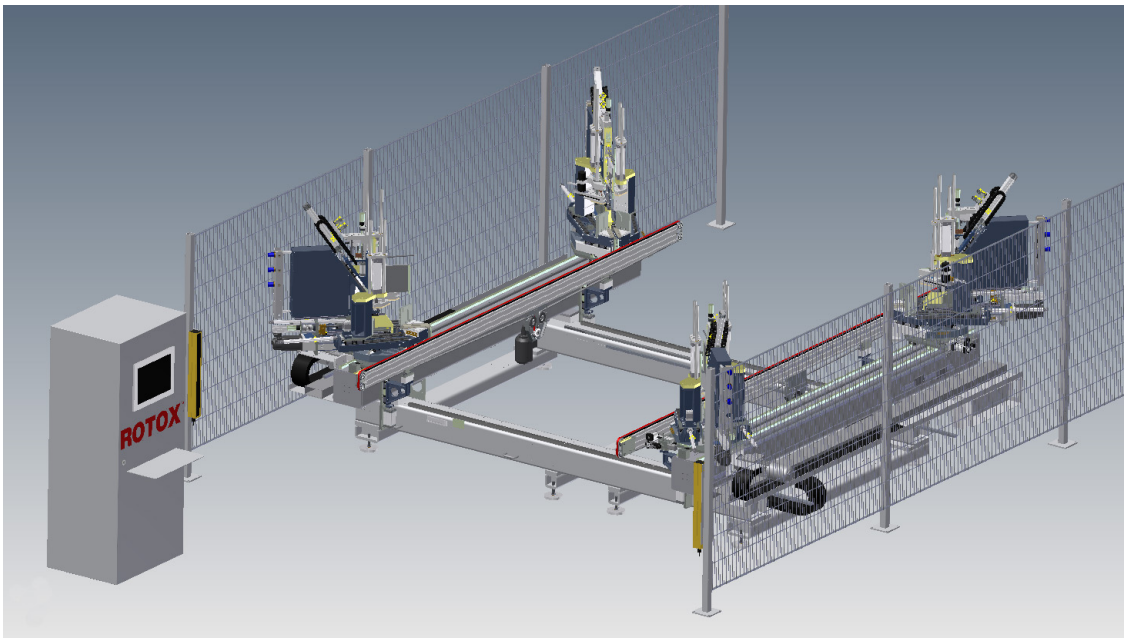
Operating instructions

Multi-head welding machine SMH 510



Note: The supplied machine may deviate from the image

Keep for future utilisation!

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Machine type: Multi-head welding machine SMH 510

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1. Notes on the operating instructions

These instructions contain important information being the precondition for a safe and economic working with the machine. Prior to installing and putting the machine into operation the operating instructions must be read carefully. All persons being charged with the transport, storage, operation and maintenance of the machine, must know the content of the operation and safety instructions. Furthermore the operator must observe the directives for the use of work equipment as well as for accident prevention and environment protection.

The present operating instructions contain the description of equipment which is available as an accessory and is not included in the scope of delivery of the standard model. The descriptions in question are indicated with the annotation “Option”. Before reading the operating instructions, please check the equipment provided at your machine and take the appropriate chapters into account.

The operating instructions do not contain any information on repairs. Generally repairs should be carried out by the competent customer service (address see Chap. 9).

The operating instructions are to be kept for future utilisation. In case of resale of the machine the operating instructions are to be handed over to the purchaser.

We reserve the right for changes of this machine regarding design, technology and equipment. Please understand that no claims can be put forth from any information and figures included in the present document.

The following symbols are used in the present operating instructions or on the machine. Please consider the explanations to become familiar with the meaning of the symbols.

Warning symbol:
This symbol indicates a possibly imminent danger which may lead to serious injury or death.

Caution symbol:
This symbol indicates a dangerous situation which may lead to light injury or to material damages.

Warning of serious injury from hot surfaces.

Warning of laser radiation.

Warning of dangerous voltage.

Information symbol:
This symbol indicates information regarding the appropriate and correct handling of the machine.

Observe the regulations for environmental protection.

2. Safety instructions

The present chapter contains instructions which have to be considered and observed by all means for the safe operation and during maintenance of the machine in order to avoid

» serious injury to the operator or third persons,
» heavy damage of the machine,
» damage of other material property or
» a reduction of the efficiency of the machine.

2.1 Intended use

The multi-head welding machine SMH 510 may only be used for right-angled welding of a maximum of 4 bars made of PVC hollow profile lengths to make a frame. The maximum heat plate temperature is 280°C.

When delivered the machine is adjusted to the profiles specified in writing in the confirmation of order, all required supports are adjusted to these profiles. Therefore only these profiles may be welded. In case of conversion to other profiles always contact the machine manufacturer for consultation.

The dimensions of the profiles to be machined must correspond to the permissible data contained in Chap. 3.4 “Technical data”.

Any other materials (e.g. aluminium, steel) or profiles must **not** be machined with this machine. Any other machining processes of PVC profiles deviating from the above mentioned ones cannot be carried out.

The workpieces must be inserted manually. The positioning of the welding heads, the welding process and the output transport of the profiles are carried out automatically.

A perfect machining result can only be achieved by using the tools being adapted to the workpiece and the machine. Therefore, do only use original ROTOX welding foils (order no. of the tools see Chap. 10 “Spare parts list”).

Before putting the SMH 510 into operation the machine is to be safeguarded against any unintended access to the dangerous spots according to the instructions contained in Chapter 5.6.

Any use of the welding machine SMH 510 deviating from the above description is considered as not being the intended use and is not permitted. The liability for damages and accidents resulting from a non-intended use lies solely with the owner of the machine!

Danger of considerable material damage, serious personal injury or death due to modifications carried out at the machine or the safeguarding equipment!
It is not permitted to carry out any modification at the machine or at the safeguarding equipment. Operating the machine without the safeguarding equipment is not permitted (see Chap. 3.1 „Design of the machine“ and Chap. 5.6 “Installation of the safeguarding equipment”).

2.2 Requirements as to the operator

The machine may only be operated by persons who:

» can carry out the works safely on their own or who, subsequent to previous instruction, are under supervision of a person being familiar with these works.
» recognise dangers arising from the utilisation of the machine,
» are charged with these works,
» have knowledge in welding hollow profile lengths made of PVC.
» have knowledge in using a PC and Windows XP.

Adjustment and lubrication works may only be carried out by skilled specialists. For this reason certain functions of the operator software are provided with various levels of privilege (user levels, depending on the logged-in user). The respective privilege levels should be adapted to the qualification and internal responsibility of the personnel and be made accessible accordingly.

Erection, putting into operation and repair works may only be carried out by fitters of ROTOX GmbH or by an authorized sales and service office.

Children and adolescents under 18 years of age are not allowed to operate the machine! This does not apply to adolescents over 16 years of age, if it is indispensable for their professional training and if they are under supervision of a specialist.

2.3 Work place

The machine SMH 510 only disposes of one work place. This work place is located in front of the machine at the control panel outside of the danger area being secured by the safety fence and the light barrier.

Nobody is allowed to stay within the danger area during machine operation.

To insert the bars the danger area must be entered by passing the safety light barrier.

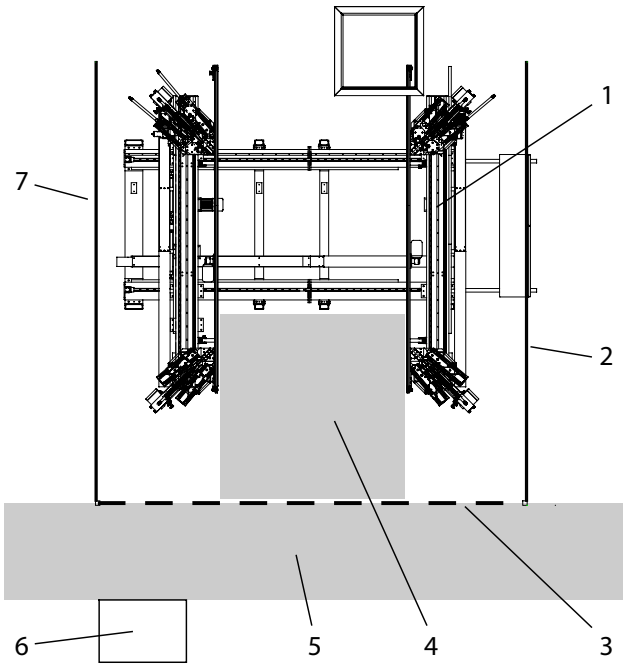

Figure 2.3: Work place

1 welding machine
2 safety fence right side
3 safety light barrier
4 work place when inserting the bars
5 work place during operation
6 control box with control panel
7 safety fence left side

When inserting the bars and removing the frame, the operator must make sure to have a secure foot-hold on a non-slip surface.

The work place must never be left the machine being switched on.

2.4 Residual dangers of the machine

Even in case of use in the manner intended due to the design related to the purpose of application of the machine, the following residual dangers exist:

» The connection to the electric mains having been established, the connection terminals L1, L2 and L3, the conductors of the power supply line at the main switch as well as the socket in the control box are always current-carrying (even the main switch being switched off)! They are marked with a warning sign.

» Danger of burn injury from the hot welding foils when reaching into the machine and when cleaning and changing the welding foils.

» Danger of tripping when crossing the machine stand tubes to insert long profile lengths.

» When inserting and removing the profiles there is the danger of cutting oneself at the sharp-edged restriction knives.

2.5 Safety instructions

» The machine may only be operated according to its intended use in compliance with Chap. 2.1.

» Consider the instructions relating to the check-up and operating ability of the safety light barrier contained on the sticker at the electrical control box. If the safety light barrier shows any defect, do not continue to work with the machine!

» Bars may only be welded, if correctly inserted and clamped.

» The machine is equipped with hot welding foils. These cause most serious burn injury. Do not come close to the welding foils and do not reach into the machine.
Do keep any inflammable objects away from the heat plates; fire hazard!

» Pay attention to the welding points of the workpieces, as they are hot.

» Worn or damaged welding foils must be replaced immediately.
Before changing, make sure that the welding foils have cooled.
Danger of fumes detrimental to health emerging from inappropriate welding foils during high-temperature welding (Option)! Do only use the approved welding foils showing the designation “for high-temperature welding”. Any other welding foil must not be used for high-temperature welding.

» The utilisation of the machine by unauthorised persons is to be prevented. Any unauthorised operation of the machine can be prevented by placing a padlock at the main switch. The key must be removed and kept in a safe place.

» Before starting any works at the machine

- the machine must be switched off at the emergency-stop switch or the main switch. The main switch must be secured against unauthorised restarting. Furthermore the machine is to be separated from the compressed air supply!
  Attention: in case of an incident unpressurized pneumatic processing units might make movements unexpectedly due to their own weight or jamming. Such movements may lead to serious injury!
- the access to the working area of the machine is to be blocked off for unauthorised persons (attach or put up an information sign indicating the works at the machine)!
- it has to be made sure that all parts of the machine which might have to be touched have cooled to ambient temperature!

» The machine must not be cleaned with steam or chemical diluting agents.

» The electrical equipment must not get in contact with water or humidity!

» For the exchange of heavy machine parts, only load suspension devices and stop devices intended for this purpose may be utilised!

» Repair works at the electrical equipment of the machine may only be carried out by a skilled electrical fitter!

» Repair works at the pneumatic equipment of the machine may only be carried out by a skilled pneumatics specialist!

» In case any safeguarding equipment or cover sheets have been removed for maintenance works, these must be replaced by all means the works having been terminated. To avoid personal injury the machine must not be operated without this equipment!

As an option the SMH 510 can be supplied with a scanner to read bar codes. This scanner is provided with a red light laser of class 2 according to DIN EN 60825.
For the utilisation of the scanner the following safety instructions are to be kept by all means:

» The laser beam may be harmful to the retina of the eye. Therefore, do never look directly into the laser beam.

» Do not direct the laser beam towards persons.

» Pay attention to reflections by reflecting surfaces.

» In case of malfunction the scanner must not be used any more. Repair works may only be carried out by the manufacturer.

» The scanner must not be utilised for any other purpose than to read bar codes provided on profile lengths.

2.6 Personal protection equipment

Clothes or hair can get caught in moving machine parts and can be pulled along. This may cause serious injury. Therefore, do always wear tight clothes when operating the machine, operators with long hair must wear a hair net! The wearing of jewellery (necklaces, rings etc.) is not permitted.

During maintenance works, do wear safety gloves!

2.7 Compliance with regulations for environmental protection

During all works at and with the machine the statutory obligations regarding waste avoidance and correct recovery / disposal are to be kept!

Environmentally hazardous lubricants, cooling or cleaning agents must not contaminate the soil or enter the sewerage system! They must be kept, transported and disposed of properly in appropriate containers! In case such agents have been spilled or leaked, they have to be taken up with absorbent material (saw dust, universal binding agent or others). Bound material is to be disposed of according to environment requirements.

Observe the instructions regarding disposal contained in the safety data sheets of the respective agents.

2.8 Behaviour in case of an incorrect operating process and in case of emergency

In case of emergency immediately actuate one of the emergency-stop switches or interrupt the safety light barrier.

The elimination of malfunctions and putting the machine into operation is described in Chap. 6.1.2 “Putting the machine into operation after an emergency-stop”.

3. Product description

The multi-head welding machine SMH 510 may only be used for right-angled welding of a maximum of 4 bars made of PVC hollow profile lengths to make a frame.

The workpieces must be inserted manually. The positioning of the welding heads, the welding process and the output transport of the profiles are carried out automatically.

Equipment options:

» mechanical and electric elements for high temperature and high speed welding
» top and bottom knife heating including controller
» equipment for U-frame welding
» manual bar code scanner
» data transfer to a ROTOX CNC corner cleaner already installed
» gasket form unit

3.1 Design of the machine

The SMH 510 disposes of the following components and safeguarding equipment which are essential for the operator:

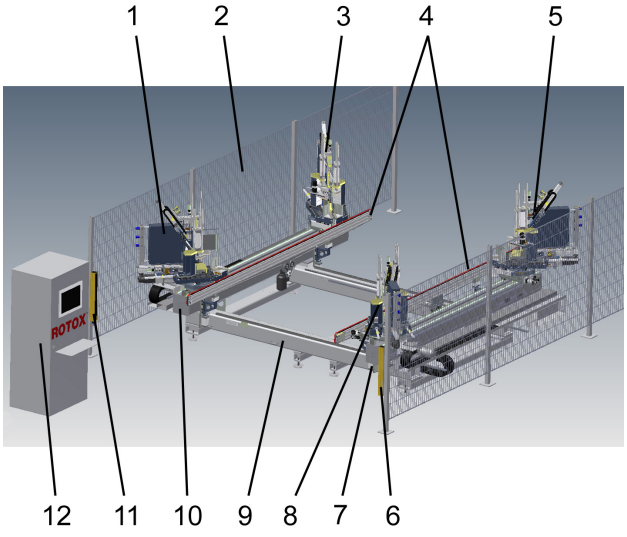

Figure 3.1: SMH 510 with fixed side on the right

1 fixed welding head on movable side with heat plate, profile support and vertical profile clamping
2 safety fence on both sides of the machine
3 movable welding head on movable side with heat plate, profile support and vertical profile clamping
4 transport belts for output transport of the frame e.g. onto a cooling station
5 movable welding head on fixed side with heat plate, profile support and vertical profile clamping
6 safety light barrier
7 pneumatic connection including service unit
8 fixed welding head on fixed side with heat plate, profile support and vertical profile clamping
9 machine stand
10 control box including emergency-stop switch on the movable side
11 safety light barrier
12 control box including control panel and electrical main switch (the electrical main switch does NOT separate the machine from the compressed air supply)

Safeguarding equipment

» safety fence on both sides of the machine (2; Option)
» safety light barrier (6 + 11)
» emergency-stop switch at the control box (10) and the control panel (12)
» heat protection plates at the front heat plates (1 + 8)

Danger of considerable material damage, serious personal injury or death in case of missing safeguarding equipment!
The safeguarding equipment must be installed correctly and has to be operative. The machine must not be operated without this equipment!

3.2 Operating elements

The SMH 510 disposes of the following operating elements:

Figure 3.2-1: Operating elements at the control box (machine with fixed side on the left)

> The layout of the operating elements depends on the fixed side of the welding machine.
> For machines having the fixed side on the right the operating elements are arranged laterally reversed.

1 operating elements in the following order:

Insertion position: Actuate the pushbutton „Insertion position“ to move the machine into its insertion position.

Start-pushbutton to start the machining and special sequences (at the same time the light barrier is reset)

Infeed stop: to stop the CNC-axes

Initial position-pushbutton: The machine moves into initial position and the welding programme in the control system is deleted.

usb port

Machine On: to switch on the machine

Machine Off: to switch off the machine

- actuation without emergency stop: to discontinue the machining sequence e.g. after input of a wrong dimension
- actuation with emergency stop: to discontinue the machining sequence and to reset all emergency-stop sequences e.g. if a displacement drive for removal is not possible

Emergency-stop switch: to interrupt the sequence of work in case of malfunction or emergency (Attention: the heat plate is not switched off!)

2 screen, PC (in the control box)

3 mouse

4 disk drive

5 keyboard

Electric main switch incl. emergency stop function at the control box (the electric main switch does NOT separate the machine from the compressed air supply)

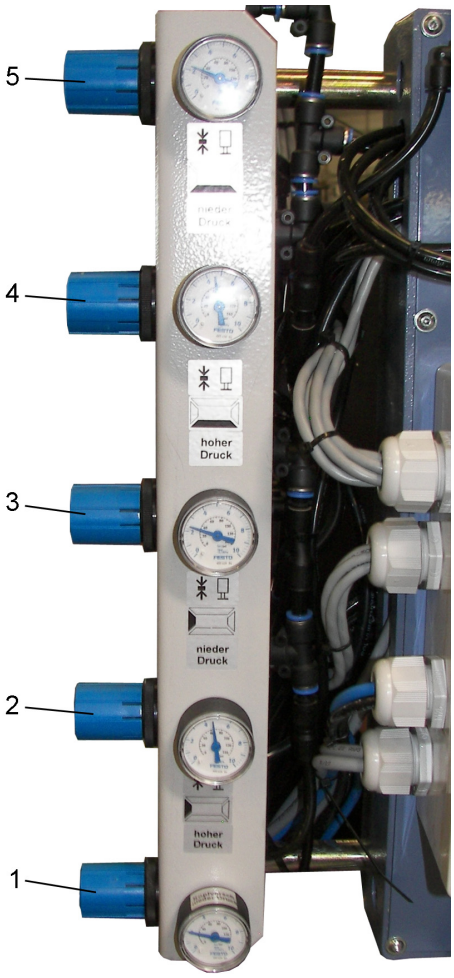

Figure 3.2-2: Pressure controller at each welding head

1 pressure controller for head displacement (cylinder “Z201”; low pressure)
target value: approx. 2 bar

2 pressure controller for profile clamping (clamping height for bar in longitudinal direction; cylinder “Z17”; high pressure)
target value: approx. 5 bar

3 pressure controller for profile clamping (clamping height for bar in longitudinal direction; cylinder “Z17”; low pressure)
target value: approx. 2 bar

4 pressure controller for profile clamping (clamping width for bar in transverse direction; cylinder “Z16”; high pressure)
target value: approx. 5 bar

5 pressure controller for profile clamping (clamping width for bar in transverse direction; cylinder “Z16”; low pressure)
target value: approx. 2 bar

The pressure controllers are set in such a way that the respective movements are carried out simultaneously at all heads.

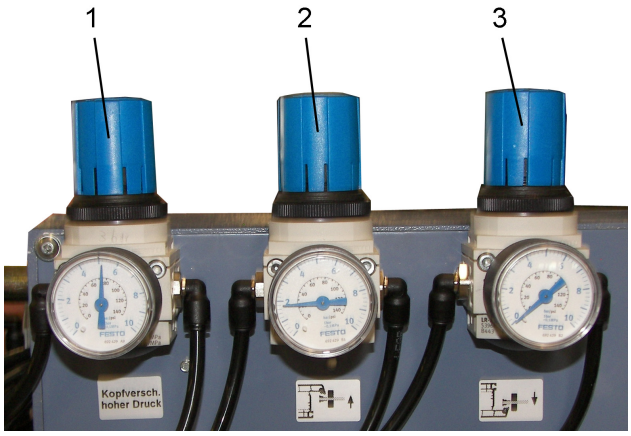

Figure 3.2-3: Pressure controller at each welding head (depending on the machine equipment)

1 pressure controller for head displacement (cylinder “Z201”; high pressure)
target value: approx. 4.8 bar

2 pressure controller for gasket form unit (Option; pulling)
target value: approx. 3 bar (profile-dependent)

3 pressure controller for gasket form unit (Option; pushing)
target value: approx. 3 bar (profile-dependent)

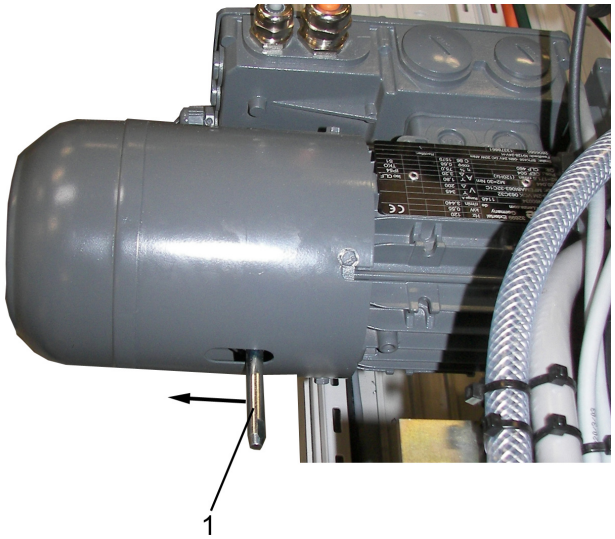

Figure 3.2-4: Brake of the axis motors

1 Lever to release the brake to be able to displace the axis manually.

Pull the lever in the direction of the arrow to release the brake.

After letting the lever go, it moves back into its initial position.

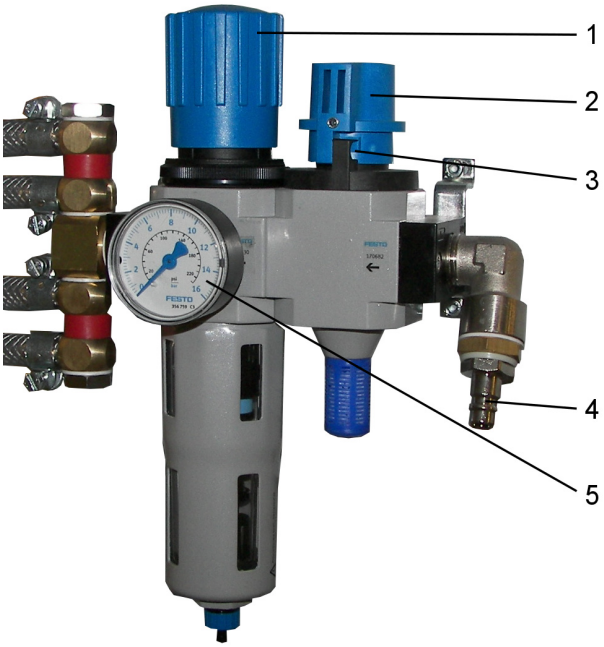

Figure 3.2-5: Service unit capable of being shut off

The machine is equipped with a pneumatic service unit capable of being shut off and locked.

4 Compressed air connection

Opening

Push down the knob (2) and turn it by 90° in clockwise direction.

Shutting off

WARNING	Injury from pneumatic units moving downwards! The pneumatic system of the machine is exhausted by closing the service unit.

Turn the knob (2) by 90° anticlockwise. In this position on the knob can be secured e.g. by passing a padlock through the opening (3) against unauthorised opening.

Pressure setting

The operational pressure of the machine is set by turning the knob (1) and displayed at the pressure gauge (5).

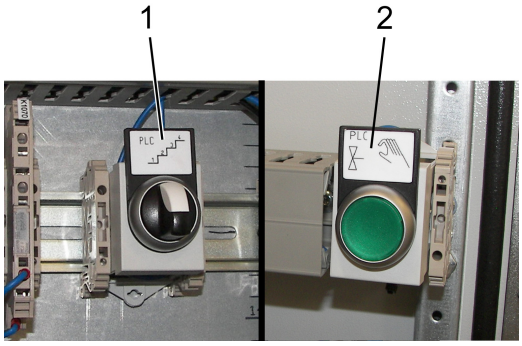

Figure 3.2-6: Service-pushbuttons in the control box

The two pushbuttons in the control box are provided for service functions only.

1 pushbutton for sequence operation

2 pushbutton for manual operations

3.3 Description of the software

Some functions such as e.g. the deletion of folders or modification of the machine settings require special knowledge and thus increased responsibility. Therefore, a user log-in is necessary for these functions.

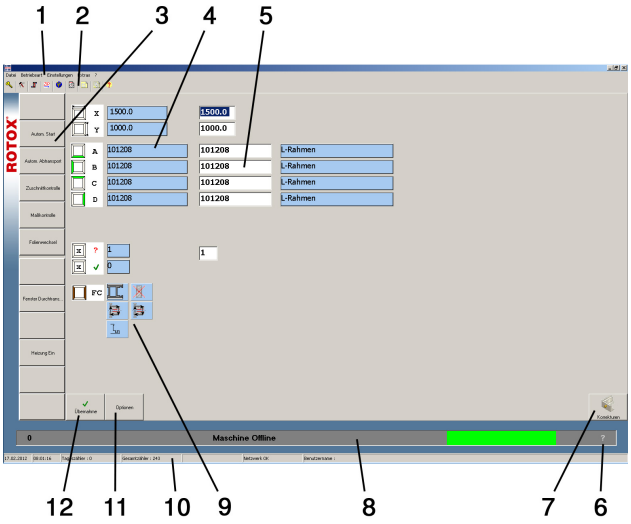

Figure 3.3-1: Individual welding

1 Menu bar including the following functions (the chapter containing the description of the function is indicated in brackets):

File

- User log-in: •to log in or change the user during operation (e.g. change of shift; see Chap. 6.4.3)
- Data backup (see Chap. 6.3.1)
- Update: to update the software
- Close [Alt]+[x]

Operating mode

- Individual welding (see Chap. 6.2.1)
- Welding programme (see Chap. 6.2.2)
- Manual function (individual functions of the machine can be switched manually for service purposes)

Settings

- Profile data (see Chap. 6.4.1)
- Tools (see Chap. 6.4.2)
- Welding data: display of the data and the set values of the currently welded frame. Depending on the system settings, here modifications can be made.
- System (see Chap. 6.4.3)
- Machine (see Chap. 6.4.4)

Extras

- Remote maintenance Web-Control (Option; see Chap. 6.5.1)
- PLC (inputs/outputs: representation of the inputs and outputs for service purposes; PLC editor)
- Malfunctions: listing of all current messages contained in the message bar (8)
- Logbook (recording of the activities carried out and malfunctions occurred at the machine)
- Reset daily counter: The daily counter can be deleted manually. Furthermore the daily counter is automatically deleted every day when switching the machine on for the first time and at midnight.
- Report: recording of the output (job data and profile data of the welded frames)

? (Question mark)

- Help: to indicate e.g. explanations and information regarding error messages
- Documentation: to indicate the following documentation in pdf format:
  Operating instructions
  Electric circuit diagram
  Pneumatic diagram
  General
- Information: information regarding the software versions and the customer service address of ROTOX

2 Symbol bar for direct selection of important menu items

3 Buttons to switch machine functions and special sequences on and off (depending on equipment); when switching on a function, the appropriate button is highlighted in green

Automatic start: After the output transport of the welded frame the machine automatically moves to the insertion position for the next frame. This function can be used for the modes of operation “Individual welding” and “Welding programme”. The next data set must be entered or selected before the output transport of the welded frame is carried out.

Automatic removal: The welded frame is removed via the belts. If the frame is removed manually, subsequently the pushbutton “Start” must be actuated.

Cutting check: The bars having been inserted and the machine having moved to the welding position, the automatic welding sequence is stopped. This enables the operator to check the cut profile lengths. After pressing the “Start”-pushbutton the sequence is continued.

Dimensional check: A sequence is started in the course of which the units move to the entered dimension and the working carriages move inwards into upsetting position. The current position of the units can be checked by measuring between the zero tools.

Window throughput transport: An already welded frame can be inserted into the welding machine and be transported without machining to a machine arranged downstream.

Heating on: to switch the plate heating on and off. When changing the welding foil, switch the heating off.

4 Display of the data of the currently welded frame or of the frame having been welded last

5 Input fields for the profile data:
Width and height of the frame, profile, number of frames

6 Button “?” to call advice and instructions

7 Button “Corrections”: to open a window which displays the selected bars as well as possibly required tools and calculated correction values

8 Message bar:
- green = machine ok.
- yellow = messages
- red = error message, emergency-stop

9 Display of the colour code and the corner cleaner machining processes (the data can only be modified in the window “Options” (11))

10 Status bar including the following details:
- Date
- Time
- Overall counter (indicates the total number of sawn profile lengths)
- Daily counter (indicates the number of profile lengths sawn per day; it is automatically deleted every day)
- User name

11 Button “Options”: selection of the machining processes to be carried out at the corner cleaner as well as colour code and profile with or without gasket (only required for equipment with data transfer).

12 Button “Apply”: This button is only required, if a new data set is supposed to be executed without having completely terminated the previous one (target quantity has not been reached). In this case having entered the data this button must be actuated.

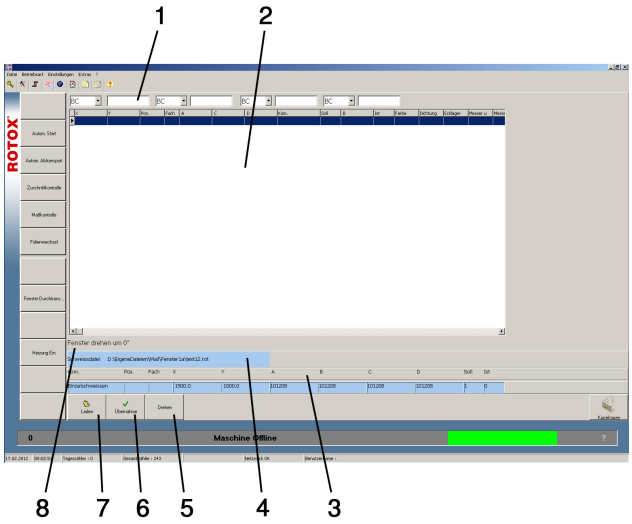

Figure 3.3-2: Welding programme

Here only the differences to the window “Individual welding” are explained:

1 Selection fields to filter the display regarding certain data sets (e.g. frame profiles to avoid frequent tool changing). The meaning of the filters can be seen in the data set description.

2 Table displaying the data of the frames contained in the job file

highlighted in white = still to be welded (status = 0)

highlighted in blue = executed (status = 1)

3 Display of the data of the currently welded frame (production line)

4 Display of path and file name of the job file

5 Button “Rotate”: for certain subsequent machining processes the frame can be welded in a rotated position (deviating from the data set). In this case pay attention to insert the bars appropriately (see display Pos. 3 or display “Corrections”).

6 Button “Apply”: This button is only required, if a new data set is supposed to be executed without having completely terminated the previous one (target quantity has not been reached). In this case having selected the next data set, this button must be actuated.

7 Button “Load” to load the job data

8 Display of the rotation angle (standard is 0°, deviating angles are represented in red)

3.4 Technical Data

Dimensions (without safety fence and light barrier):

Machine width (depending on welding width):
approx. 3600-5500 mm
Machine depth (depending on welding length):
approx. 3300-5300 mm
Machine height: approx. 1800 mm
Weight (depending on size and equipment):
approx. 3000 kg
Welding angle: 90°
Weld bead restriction: 0-2 mm

Workable material:

Hollow profile lengths made of PVC with mitre cut of 45°

Profile width: max. 140 mm without tools
Profile height:
without gasket form unit: min. 30 mm
max. 180 mm
with gasket form unit: min. 35 mm
max. 150 mm
Welding length: max. 2,500 mm or
max. 3,000 mm or
max. 3,500 mm
without gasket form unit: min. 320 mm
with gasket form unit: min. 430 mm
Welding width: max. 1,600 mm or
max. 2,500 mm or
max. 3,000 mm or
max. 3,500 mm
without gasket form unit: min. 430 mm
with gasket form unit: min. 500 mm
Special lengths or widths are possible as an option.

Workpiece clamping:

Pneumatic

Electric installation:

Electric mains: 3/N/PE~ 50 Hz
230/400 V ± 5 %
Power consumption: 8 kW
Fuse protection: I_N = 3x32 A (slow-blow)
Power supply line: H07RN-F 5G6.0 mm²
Earth conductor: 10 mm² Cu

Pneumatic installation:

Operating pressure: 7 bar
Limit pressure: min. 6 bar (also during operation)
max. 8 bar
Air consumption: approx. 150 l/welding process 4 corners
Connection: nominal size Ø 9 mm

Permissible ambient temperature during operation:

min. 15 °C and max. 40 °C

3.5 Sound emission values

The sound values are below 70 dB(A).

3.6 Accessories

The following accessories are included in the scope of delivery of the machine:

Qty.	Designation
2	spanners 10/13 mm
1	hexagon socket screw key 3 mm
1	hexagon socket screw key 4 mm
1	hexagon socket screw key 5 mm
1	hexagon socket screw key 6 mm
1	hexagon 19 mm for installation of the stand
1	control box key
1	lubrication gun
1	grease
1	copy of operating instructions

4. Transport and Storage

4.1 Transport

Danger of serious injury or death from the machine overturning or falling down.
When lifting the machine or during transport make sure by all means that:

» the machine is not suitable for being lifted or transported with a crane!

» transport works are only carried out by qualified and authorised persons taking the present and general safety instructions and accident prevention regulations into consideration.

» load suspension devices are intended and appropriate for this purpose (machine weight see Chap. 3.4 “Technical Data”).

» the machine is equilibrated when being lifted and does not tilt. In particular for any transport without using a pallet the machine is to be secured against overturning!

» no persons or parts of the body are located below the lifted machine or the machine parts

» the transport routes are to be blocked off and marked so that no unauthorised person can enter the danger area!

If the machine is moved to a different location, the transport protections having been removed after installation must be mounted again (see Chap. 5.3 “Removal of the transport protections”). Within the workshop the machine can be transported by means of two elevating trucks without having to be dismantled.

4.2 Storage

In case of incorrect storage important components of the machine may be damaged and destroyed. Therefore the machine may only be stored in dry spaces at an ambient temperature of min. 0°C and max. 50°C.

The machine was protected against corrosion for only 5 days (continental climate) by applying an oil film. In case of extended storage or storage and delayed transport at locations with sea climate additional corrosion protection is to be applied.

5. Erection and putting into operation

Erection and putting into operation may only be carried out by fitters of ROTOX GmbH or by an authorized sales and service office.

5.1 Requirements as to the installation site

With respect to the selection and the size of a suitable installation site the following requirements are to be observed:

» floor space required for the machine taking the alternatives and accessories into account (dimensions of the machine without safeguarding equipment see Chap. 3.4 “Technical Data”). The erection dimensions can be seen in the layout plan, if existing.

» size of the working space additionally required for the handling of the workpieces

» access for the necessary maintenance works

» The floor must be even and dispose of sufficient carrying capability for the machine (machine weight see Chap. 3.4 “Technical Data”).

» The machine must not be operated in the open and may only be run frost-protected (ambient temperature see Chap. 3.4 “Technical Data”).

5.2 Erection

Unpack the machine. Packaging material which is no longer needed is to be disposed of according to the valid regulations for environmental protection.

Danger of tripping in case of unfavourable installation of the electrical and pneumatic connections!
Therefore, install the connection lines and hoses in such a manner that tripping hazards are eliminated (e.g. by using cable ducts or bridges)!

5.3 Removal of transport protection, cleaning of the machine

To protect the machine moving elements were safeguarded by means of a transport protection against uncontrolled movements during transport. These transport protections are identified by labels. Before establishing the connection to the power supply, remove the transport protections.

The machine was protected with an oil film against corrosion. Before putting the machine into operation clean in particular the profile supports, stop plates and profile guides to remove this oil.

5.4 Electrical connection

The local operating voltage, frequency and fuse protection must correspond with the technical data of the machine (see Chap. 3.4). In case of deviations the machine must not be connected.

The power supply (min. 5 x 6.0 mm², line type H07RN-F 5G6) is to be connected directly to the electric mains according to the electric circuit diagram.

Due to the leakage current of some electronic components, along its complete routing the protective conductor must have a cross section of a minimum of 10 mm² (EN 50178-1).
The machine is to be connected directly to the mains supply, a residual current device (RCD) should not be arranged upstream of the machine.
It has to be ensured that the EN 60204 Part 1, Section “Protection by automatic disconnection of supply“ is observed.

5.5 Compressed air connection

The machine is equipped with a service unit. The machine must not be operated without this service unit in order to avoid damage of the machine.
Furthermore moisture-free air must be used!

The service unit is connected to the compressed air supply via a pneumatic hose with standard compressed air coupling. The nominal size of the compressed air hose must not fall below Ø 9 mm. The hose length must be shorter than 5 m.

To ensure a faultless operation of the machine, compressed air must be made available, the pressure and volume flow being in compliance with the data contained in Chap. 3.4 “Technical Data”. Having established the connection you can check and, if necessary, set the correct operating pressure at the manometer of the service unit.

5.6 Installation of the safeguarding equipment

To fulfil the basic safety requirements of the EU-Machinery guideline the machine SMH 510 must be safeguarded against any unintended access to the danger spots on all sides (laterally e.g. by means of a safety fence and to the front (access area) with a safety light barrier). The safety light barrier is included in the scope of delivery of the machine, the safety fence can be purchased as accessory.

WARNING

The safeguarding equipment intended to safeguard the danger spots form part of the machine! The machine must NOT be operated without the safeguarding equipment or in case of modifications of the enclosed layout which reduce the safety of the machine!

The following is to be observed during installation:

» The safety light barriers and the safety fences are to be installed according to the layout and to be fixed at the floor.

» The control box including control panel must be arranged in such a way as to prevent a person staying within the danger area from reaching the pushbuttons.

» The passage to any subsequent machine must be prevented.

Prior to putting the machine into operation the safety light barrier is to be checked with respect to its operating ability.

If the machine is supplied without safety fence, the owner is responsible for the correct safeguarding of the danger spots. The distances between safety fence and machine must comply with the regulations of EN ISO 13857. Consider that additional space around the machine might be required to provide access for service works.

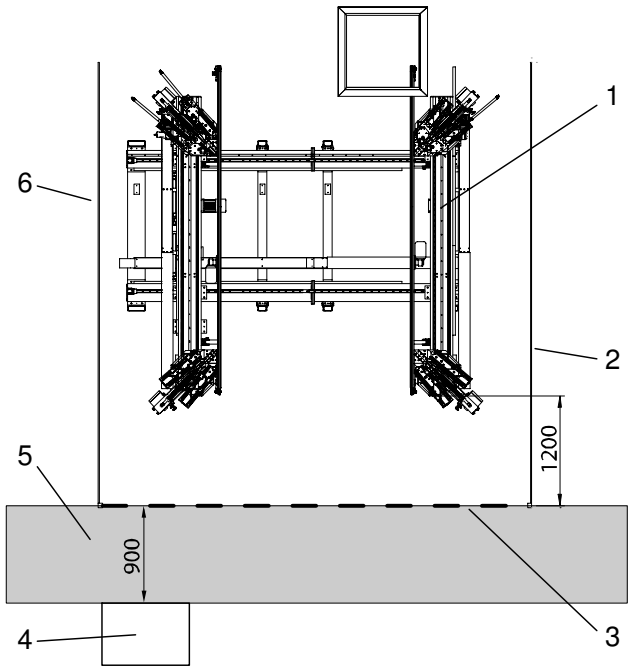

Figure 5.6: Layout

1 welding machine
2 safety fence right side
3 safety light barrier
4 control box including control panel and (light barrier) Reset-pushbutton
5 area in which the control box including control panel must not be installed (distance of min. 0.9 m from the safety light barrier)
6 safety fence left side

6. Machine operation and sequence of work

The machine SMH 510 may only be operated according to its intended use as described in Chap. 2.1 and considering the present operating instructions as well as other safety-relevant regulations.

6.1 Machine operation

6.1.1 Switching the machine on and off

Before switching the machine on check that

» the machine is connected properly to the electric mains and the compressed air supply and that the required air pressure according to Chap. 3.4 “Technical Data” is applied.
» the machine does not show any visible damages.
» the welding foils are correctly mounted and do not show any damage. Any damaged welding foil is to be replaced immediately.
» the safeguarding equipment according to Chap. 3.1 is correctly installed.
» the control box door is closed.
» no workpieces or other objects are placed on the profile support, in the clamping device or in the working range of the welding heads.
» nobody is working at the machine or staying in the danger area of the machine.

Any detected defects are to be notified to the superior immediately. The machine may only be switched on, if all defects have been eliminated.

Switching on

» Turn the main switch into position „I/ON“.
»  Actuate the I-pushbutton.
»  Actuate the Initial position-pushbutton.

If the software is set accordingly it starts automatically when switching the machine on, otherwise it must be started manually.

Before starting work check the emergency-stop switch and the safety light barrier with respect to their operating ability.

The work place must never be left the machine being switched on.

Danger of serious burn injury from the hot welding foils!
Do not come close to the welding foils and do not reach into the machine.

Switching off

Damage of the machine and the workpiece!
Do only switch off the main switch during a machining process, if an emergency is prevailing.

» Wait until the frame has been transported out,
»  actuate the O-pushbutton,
» close the software and shut down the computer with „File“ - „Close“ or [Alt]+[x],
» turn the main switch to position “O/OFF”.

To prevent any unauthorised utilisation of the machine, the electric main switch having been switched off can be secured by means of a padlock.

6.1.2 Putting the machine into operation after an emergency-stop

The behaviour in case of emergency is described in Chap. 2.8 “Behaviour in case of an incorrect operating process and in case of emergency”.

Any malfunction may only be eliminated by persons qualified for this purpose considering the safety instructions contained in Chap 2.

There are two possibilities:

» the welding process has not yet started
» the welding process has already started.

To put the machine into operation follow the instructions displayed on the computer.

Check, whether any components of the machine have been damaged. If components have been damaged, the machine must be switched off at the main switch. The main switch must be secured against restarting. Furthermore the machine is to be separated from the compressed air supply!
Attention: in case of an incident unpressurized pneumatic processing units might make movements unexpectedly due to their own weight or jamming. Such movements may lead to serious injury!

6.2 Sequence of work

6.2.1 Individual welding

Menu bar: Operating mode
Submenu: Individual welding

or button 

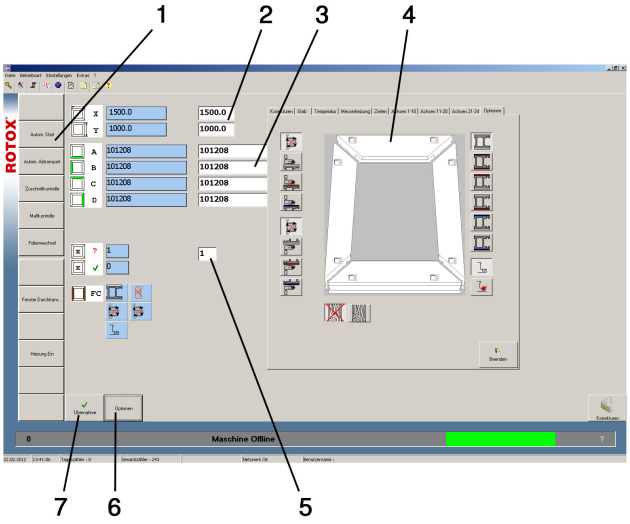

Figure 6.2.1: Individual welding

If necessary, with the buttons (1) select further functions.

In the white fields (2) enter the frame width and frame length.

Enter the profile numbers (3). By double clicking in the fields A-D the profile table is opened. Select the profile and apply it with “OK”. If necessary, previously you can select the profile system.

If you weld four identical profiles, select the profile in a field. Using the [Enter]-key you can apply the profile in all fields.

If equipped with a data transfer function to a corner cleaner: open the option window (4) by using the button „Options“ (6). Select the machining processes to be executed at the corner cleaner as well as the colour code and profile with or without gasket.

Depending on the configuration of the system settings you can modify the welding temperatures or times in the appropriate tabs of the option window.

In field (5) enter the number of the frames which are supposed to be welded applying this data (minimum = 1).

Wait until the frame being placed in the machine is transported out.

 Actuate the pushbutton “Insertion position”.

Danger of serious burn injury from the hot welding foils!
Do not come close to the welding foils and do not reach into the machine.

Insert the profile lengths.

 Actuate the Start-pushbutton.

The profile lengths are welded and the finished frame is automatically transported out (if the function is switched on).

If a different frame is supposed to be welded and the current data set is not yet completely finished (target quantity has not been reached), having entered the data you must actuate the button “Apply” (7).

Insertion or change of welding tools:

If welding tools are required, the message “Change tools” appears. The machine moves into a tool change position.

In the window “Corrections” the number of the tools is displayed.

Insert the required tools.

 Actuate the Start-pushbutton. The machine moves into the insertion position.

Insert the profile lengths.

 Actuate the Start-pushbutton to start the machining process.

The profile lengths are welded and the finished frame is automatically transported out (if the function is switched on).

Automatic start

Switch the function “Autom. Start” on.

After the output transport of the welded frame the machine automatically moves into the next insertion position, if the next data set was entered before the output transport of the welded frame.

6.2.2 Welding programme

Menu bar: Operating mode
Submenu: Welding programme

or button  .

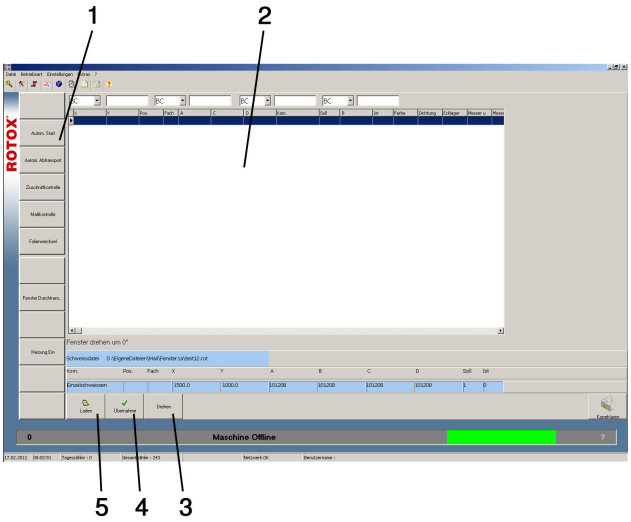

Figure 6.2.2: Welding programme

If necessary, read in the job data (button “Load”  (5)).

From the table (2) select the data set to be machined next.

If necessary, with the buttons (1+3) select further functions.

Wait until the frame being placed in the machine is transported out.

 Actuate the pushbutton „Insertion position“.

Danger of serious burn injury from the hot welding foils!
Do not come close to the welding foils and do not reach into the machine.

Insert the profile lengths.

 Actuate the Start-pushbutton to start the machining process.

The profile lengths are welded and the finished frame is automatically transported out (if the function is switched on).

The next frame or data set is automatically applied in the production.

If an already welded frame must be welded anew, select the appropriate data set from the table.

If a different frame is supposed to be welded and the current data set is not yet completely finished (target quantity has not been reached), having selected the data set, actuate the button “Apply” (7).

Insertion or change of welding tools:

If welding tools are required, the message “Change tools” appears. The machine moves into a tool change position.

In the window “Corrections” the number of the tools is displayed.

Insert the required tools.

 Actuate the Start-pushbutton. The machine moves into the insertion position.

Insert the profile lengths.

 Actuate the Start-pushbutton to start the machining process.

The profile lengths are welded and the finished frame is automatically transported out (if the function is switched on).

Automatic start

Switch the function “Autom. Start” on.

After the output transport of the welded frame the machine automatically moves into the next insertion position.

6.2.3 Operating sequence with a hand scanner (Option)

The scanner can only be used in the mode of operation “Welding programme”.

Depending on the machine equipment there are different possibilities to use the scanner:

1. The first bar (e.g. from a trolley) is scanned, the job data is loaded and machined as described in Chap. 6.2.2 “Welding programme”.
2. The job data must be loaded and then each profile length must be scanned. Thus it is not necessary to select the data set from the table.

Injury to the retina from the laser!
Never look directly into the laser beam. For the operation of the bar code scanner take the safety instructions contained in Chap. 2.5 „Safety instructions“ into account.

Figure 6.2.3: Hand scanner

Hold the hand scanner at a slight angle over the bar code and press the button (1) located in the handle of the scanner.

Make sure that the red line of the laser light crosses the entire bar code (the scanner cannot detect the label correctly, if it is not completely covered and scanned by the light line).

The bar code having been read, a short acoustic signal is given by the hand scanner and the data is applied for production from the data list. In case of a reading error a message is displayed on the screen.

6.2.4 Insertion and change of the welding tools

If welding tools are required, the message “Change tools” appears. The machine moves into a tool change position.

In the window “Corrections” the number of the tools is displayed.

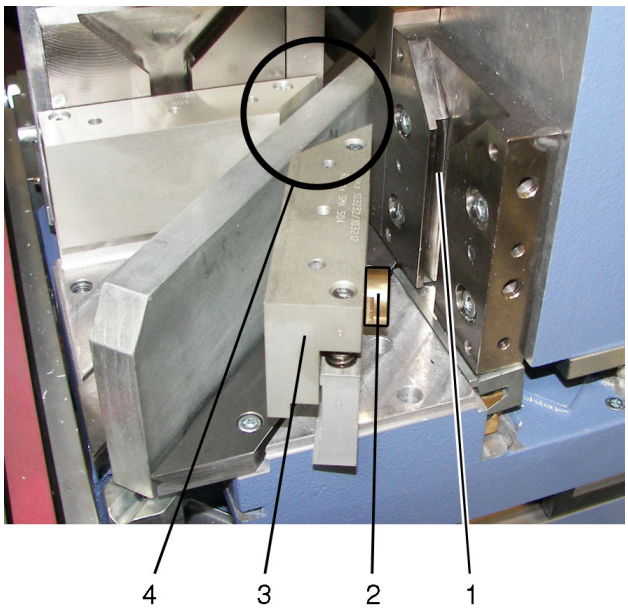

Figure 6.2.4: Tool change

Make sure that the bevelled side of the tools always points in the direction of the heat plate (4).

Push the tools (3) with the clamping pieces (2) from above into the T-grooves (1) of the support elements.

Actuate the Start-pushbutton. The machine moves into the insertion position.

6.3 Menu „File”

6.3.1 Data backup

It is recommended to regularly backup the data so that the software version available in case of emergency is as current as possible (e.g. after modification of machine settings, profile systems).

When backing-up the data the entire directory of the operating software is backed up including software, profile files and machining files (jobs). This directory is located in
D:\ROTOX\SMH510xxxx.

Execute data backup

Menu bar: File
Submenu: Data backup

The data backup creates a record file:

SMH510xxxx_Date-Time.zip in the folder D:\Backup.

Restore data backup

The data backup may only be restored by a computer specialist.

Keep in mind that when restoring a complete data backup, all files contained in the respective directories on the computer, and **also the current jobs are overwritten**.

Open the Windows-Explorer.

Unpack the record file and copy the required files back into the directory of the machine software.

If necessary, after data backup restart the computer.

On the PC (drive D) there is an Image of the system partition (drive C).
In case of a system crash or problems with Windows, the system partition can be restored in as-delivered condition.
In this case please contact the customer service of Rotox GmbH.

6.4 Menu „Settings“

CAUTION

Danger of damaging the machine or the profiles due to wrong settings!
Settings may only be carried out by authorised persons.
Therefore, a user log-in is necessary for some functions.

6.4.1 Profile data

Menu: Settings
Submenu: Profile data
or symbol: 

A table containing the already created profiles appears.

Creating a new profile data set

To create a new data set select the button “New” or copy the data set of an existing similar profile. In this case you can choose the data to be copied.

Modify a data set

You can make modifications directly in the table or select the data set and actuate one of the following buttons:

» Modify: to modify the profile number and designation.
» Tool Offset
  · Settings e.g. for the gasket form unit
» Times temperature
  · Input of the times and temperatures
  · Tool: enter the number of the required welding tool
  · Corner cleaner: number of the machining programme of the corner cleaner (only in case of data transfer).
» Company identification number: control of profile-dependent sequences
» Tool list: list of the existing tools (see Chap. 6.4.2)
» Segment welding: input of the data required for segment welding (Option)

Graphical representation of a profile

A graphical representation can be allocated to each profile (button “New”) or deleted from it by “Delete”.

The drawing must be in file format “DXF”.

Furthermore you can rotate or mirror the view of the profile drawing.

6.4.2 Tool settings

Menu: Settings
Submenu: Tools

Creating a new tool data set

To create a new data set select the button “New”.

Enter the following data:

» Tool number: an unambiguous identification (tool number) which can be used to identify the tool and to allocate it to the various profiles.
» Tool designation
» Correction value: dimension of the zero edge displacement due to the application of the tool (the bar does not fit any longer to the zero edge of the welding machine, but to the support). This dimension is considered in the calculation process of the machine during welding.

Save the new data set.

Modify (edit) a data set

Select the data set and actuate the button “Edit”.

Modify the designation or the correction value.

6.4.3 System

Menu: Settings
Submenu: System

Danger of damaging the machine due to wrong settings!
Settings may only be carried out by authorised persons.
Therefore, a user log-in is necessary for some functions.

Some functions are provided for the Service personnel of ROTOX GmbH only and are thus not described here.

General

Here general basic settings of the machine are made.

» Temperature, melting time and/or cooling time setting: determination, whether the data is applied from the profile data set or if it has to be entered in the window “Temperatures” or “Times”. In case of data input the values remain preserved until the next modification, even after switching the machine off.
» Insertion of all bars at the same time: here you can determine up to which frame size all 4 bars can be inserted at the same time. If the frame is larger, after insertion of the rear bar the welding heads must be moved to their positions.

Start/End

» Auto boot: starting of the software each time the computer is switched on or manual.
» Auto logout: closing of the software with or without query. If the query is switched off, further options to close the software can be determined.

Language

Here the language of the visualisation can be changed.

Welding file

Here the kind of data set is determined as well as the paths where the data set files are located and/or where the terminated files are stored.

Furthermore the file name extension of the data set file can be entered.

Passwords

Some functions such as e.g. deletion of folders or modification of the system settings require special knowledge and thus increased responsibility. Therefore, a user log-in is necessary for these functions.

Without an appropriate user log-in e.g. the system settings can only be viewed.

The user log-in can also be used to change the user during operation (e.g. at change of shift).

The respective user levels should only be allocated to employees disposing of the appropriate qualification and internal responsibility.

In this display window the users and their rights are managed. There are three user levels:

» User: basic level being preset at start of programme. The user can enter and machine dimensions.
» Supervisor: can modify profile data and drive axes manually
» Programmer: can modify all data and has access to the operating system

Any modification as e.g. the password can only be made by the respective user for himself or for users having less rights.

Subsequent to any modification of user settings a new log-in is required.

If you have forgotten your password, in the display window “User log-in” click with the mouse on the ?-symbol next to the password input field. Contact the customer service of ROTOX GmbH and follow the instructions in the appearing window.

Data transfer

In this window the data transfer to a corner cleaner is switched on and off.

Furthermore all data required for the data transfer is entered here.

Data backup

Here a data back-up of the software including the data sets can be carried out.

Any data back-up carried out is displayed in the window.

The execution of the data back-up is described in Chapter 6.3.1.

Bar code reader

In this window the bar code scanner is switched on and off and the parameters for the bar code scanner are entered.

6.4.4 Machine

Menu: Settings
Submenu: Machine

Danger of damaging the machine due to wrong settings!
Settings may only be carried out by authorised persons.
Therefore, a user log-in is necessary for some functions.

Axes

Here the several axes can be driven manually and the axes settings can be corrected.

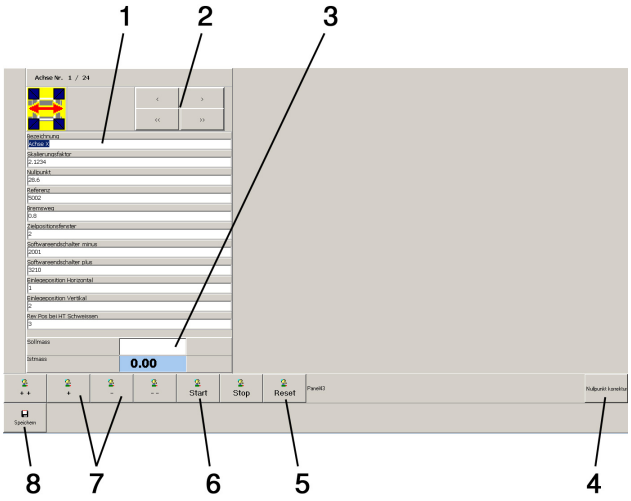

Figure 6.4.4:

5 “Reset” to delete the nominal dimension
8 “Save” to save modifications

With the arrow buttons (2) select the axis. The designation of the axis is indicated in field (1).

In the field “Nominal dimension” (3) enter a nominal dimension. Actuate the button “Start” (6). The axis drives to the preset position.

The axis can also be driven with the arrow buttons (7) in two different velocities without entering a nominal value.

Dimensional check and axis setting

Select the sequence “Individual welding”.

Enter any dimensions (e.g. 1000 mm).

Switch the function “Dimensional check” on.

 Actuate the pushbutton „Insertion position“.

The welding heads move to the entered dimensions into upsetting position.

Check, whether the actual dimensions between the zero tools comply with the entered ones. If necessary, correct the axis settings.

With the arrow buttons (2) select the axis.

Select the button “Zero point correction” (4).

Enter the divergence (difference between actual value and target value) in the field “too large” or “too small”.

Save the modification and check the setting.

 Actuate the pushbutton “Start” to return to the sequence of work.

6.5 Menu „Extras“

6.5.1 Remote maintenance ROTOX-Web-Control (Option)

Menu: Extras
Submenu: Web-Control

Preconditions for the execution of the remote maintenance

As part of the remote maintenance operations concerning hardware diagnosis and software maintenance can be carried out.

For this purpose the following preconditions must be fulfilled:

» The machine PC must be provided with an effective and up-to-date anti-virus software, the operating system must be on an up-to-date safety level (current patches/updates must be installed).
» Internet link-up of the machine.
» a firewall configured to permit an open TCP/IP Port 80 for sending and receiving.
» access to the ROTOX homepage (http://www.rotox.com).
» an additional phone line for an independent voice communication.

Safety instructions

» The remote maintenance connection is only established by the owner of the machine, remote maintenance works may only be started and carried out upon his agreement. The owner is entitled to discontinue the remote maintenance works at any time.
» The remote maintenance may only be carried out under permanent surveillance by the owner who is constantly present and an uninterrupted phone contact being established between the owner and ROTOX GmbH.
» During remote maintenance the operation of the machine is only carried out by the owner, if necessary, certain operating steps are to be carried out upon direction of ROTOX GmbH.
» The responsibility for the safety of machine operation during remote maintenance lies solely with the owner. He must make sure that no person is staying within the danger area of the machine, if necessary, access to the machine has to be blocked off.
» The owner must draw up internal operating instructions for the execution of the remote maintenance.

Execution

Establish a phone connection to the ROTOX-customer service.

Start the remote maintenance:

Menu bar: Remote maintenance
Submenu: Start

WARNING

Serious injury to persons or considerable material damage!
The remote maintenance may only be carried out under permanent surveillance by the owner who is constantly present and an uninterrupted phone contact being established between the owner and ROTOX GmbH.
The responsibility for the safety of machine operation during remote maintenance lies solely with the owner. Nobody must be present in the danger area of the machine, if necessary the access to the machine is to be blocked off.

In the password query enter the password and confirm with „OK“.

The computer establishes the connection to the ROTOX web page from where the software for the remote maintenance is downloaded.

On the web page select the desired language.

Figure 6.5.1-1

In the download query select the button “Open” or “Run” (1).

If a Windows firewall is installed, confirm also the second query with “Run”.

The password query of the remote control software appears. Enter the password you get from the ROTOX employee.

The software having been started the following window intended for the operation of the remote maintenance software appears on your screen:

Figure 6.5.1-2

2 Button or display of the mode (the active mode is highlighted in yellow):
SHOW: The ROTOX employee can read your screen. This function must be switched on by you.
WATCH: Display, if the ROTOX employee has switched on the “SHOW” mode on his computer e.g. to show you something on his computer.

3 Button to close the remote maintenance

4 Buttons ON/OFF to switch the remote control on and off (the active mode is highlighted in yellow):
ON: the remote maintenance is switched on, the ROTOX employee can operate your PC and thus the machine by remote control. This function must be switched on by you.
OFF: the remote maintenance is switched off, the ROTOX employee cannot operate your PC and thus the machine by remote control. Using this button you can interrupt the remote maintenance at any time.
Instead of the buttons you can also switch the remote maintenance on and off with the key [F11].

During remote maintenance you will get further information and instructions by the ROTOX employee.

6.6 Change of welding foils

Required material:

» Teflon welding foil 230x535 mm (ROTOX No. 89710059)

Danger of fumes detrimental to health emerging from inappropriate welding foils during high-temperature welding (Option)!
Do only use the approved welding foils showing the designation „for high-temperature welding“. Any other welding foil must not be used for high-temperature welding.

Change of foil

Actuate the button “Change of foil”. The heat plates move into working position and can be changed.

Danger!
Serious burn injury from the hot welding foils!
Switch the plate heating off and wait until the welding foils have cooled.

Actuate the button „Change of foil“.


Actuate the Start-pushbutton.

The heat plates move into a position in which the welding foils can easily be changed.

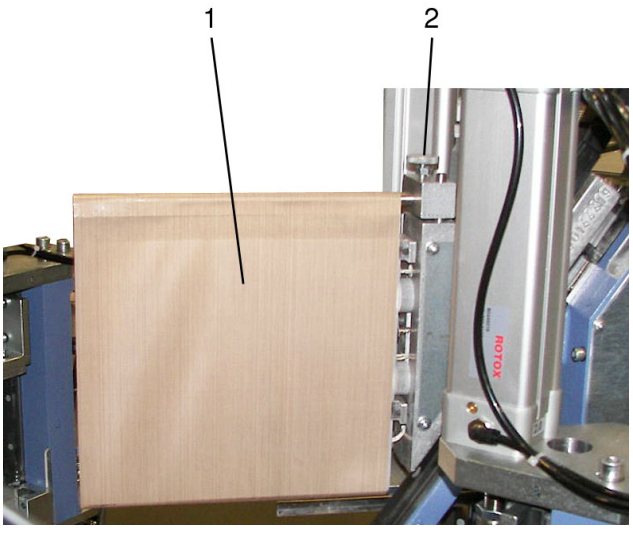

Figure 6.6

Loosen the clamp bolt (2, knurled thumb screw) and remove the welding foil (1) from the heat plate by pulling.

Slip the new welding foil over the heat plate.

Tension the welding foil using the clamp bolt (2).

6.7 Change of gasket punch and gasket knife (only gasket form unit, Option)

The gasket punch and the gasket knife are profile system related.

Required tools:

» hexagon socket screw key 4 mm
» hexagon socket screw key 3 mm

Serious injury from the hot welding foils and moving machine parts!
Switch the plate heating off and wait until the welding foils have cooled.
Actuate the emergency-stop switch and separate the machine from the compressed air supply.

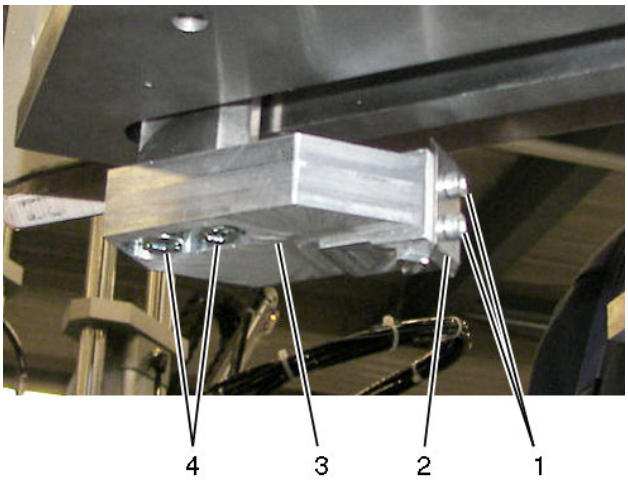

Figure 6.7

Change of gasket punch

Loosen the two hexagon socket-head screws (4) and remove the gasket punch (3). Screw a different gasket punch on.

Change of gasket knife

Remove the gasket punch.

Loosen the two hexagon socket-head screws (1) and remove the gasket knife (2). Screw a new gasket knife on.

Screw the gasket punch back on.

7. Maintenance

Regular, correctly executed maintenance represents an essential precondition for

» the operational reliability,
» trouble-free operation,
» a long working life of the machine and,
» the quality of the products produced by you.

Therefore observe the service and lubrication intervals provided in the present operating instructions.

In order to avoid the loss of warranty, only original ROTOX spare parts may be used in case of any replacement of parts occurring.

In case of inexpert intervention in the machine by the customer our warranty will expire!

7.1 Service

Serious injury from the hot welding foils and moving machine parts!
Switch the machine at the main switch off and separate it from the compressed air supply.
Wait until the welding foils have cooled.

Secure the machine against any unauthorized restarting and put up an information sign indicating the works at the machine!

The machine must not be cleaned with steam or chemical diluting agents.

Works at the electrical equipment of the machine may only be carried out by a skilled electrical fitter!

Danger from electric shock!
After switching the main switch off, the connection terminals L1, L2 and L3, the conductors of the power supply line at the main switch as well as the socket in the control box are still current-carrying!

Always keep the control box door closed! Access is only permitted for authorized persons.

Repair works at the pneumatic equipment of the machine may only be carried out by a specialist skilled in pneumatics! Before starting works at pneumatic units or elements, these must be unpressurised to prevent the dangers of injury, explosion or fire. When venting components at the cylinder or valve, pay attention, for these components may make a sudden, unexpected movement!

Having terminated the service works make sure that

» loosened screwed connections are checked on tight fit,
» all materials and tools having been needed to execute the service works have been removed from the working area of the machine,
» liquids which might have escaped have been removed,
» any damaged or removed information and warning signs are replaced.

Serious injury from the hot welding foils and moving machine parts!
The works having been terminated any removed covering or safeguarding equipment must be installed again and checked with respect to its operating ability.

Overview Service works

Interval	Equipment	Activity / Check	Note
daily	Emergency-stop switch	Functional test by actuation	Test after switching the machine on; immediately replace any defective emergency-stop switch (electrical fitter).
	Safety light barrier	Functional test by interruption	Test after switching the machine on; immediately replace any defective light barrier (electrical fitter).
	Welding foil	Check regarding impurities, if necessary clean.	see Chap. 7.1.1; unclean welding foils lead to bad welding results.
		Check regarding wear or damages, if necessary replace foil.	see Chap. 6.6
	Service unit	Discharge water trap.	Push the stud below the sight glass upwardly or turn the black turning knob below the sight glass to the left, push it upwardly and then turn it back into the initial position.
	Profile support	Clean from chips (sweep, exhaust, wipe).	Danger of blindness from flying splinters! Do not use compressed air.
	Spring-mounted tools	Clean spaces from chips (sweep, exhaust, wipe).	Danger of blindness from flying splinters! Do not use compressed air.
	Guiding system	Cleaning, wiping	
weekly	Electric installation	Check the connection line regarding damage.	Replace any damaged connection lines (only electrical fitter!).
		Check the lines on tight fit.	Attach loose connections.
	Pneumatic installation	Check components, hoses and connections with respect to leakage and damages.	Replace any damaged hoses or components.
	Heat plate	Check regarding impurities, if necessary clean.	Scrape or grind with sandpaper.
	Laser of the scanner (Option)	Clean optical window.	Clean with a cotton tip stick and spirit; do not use any acid cleaning agent.
	Safety light barrier	Dedust the optical component with a soft brush, then clean with a damp cloth.	Cleaning agent: AJAX glass cleaner, anti-static plastic cleaner; do not use any alcoholic cleaning agents or solvents.
every six months	Control box: dust filter of ventilation and ventilation motor	Clean with compressed air, if necessary replace it.	Open the cover from below (recess) with a small screw driver and remove it; the smoother filter side must point into the direction of the control box.
	Output transport belt	Check and if necessary adjust the belt tension.	see Chap. 7.2
	Drive belt of gasket form unit	Check and if necessary adjust the belt tension.	see Chap. 7.3

7.1.1 Cleaning of the welding foils

Required material:

» welding foil cleaner
» safety gloves

Cleaning

The cleaning of the welding foils can only be carried out the machine being switched on.

Actuate the button “Change of foil”.

Actuate the Start-pushbutton.

The heat plates move into a position in which the welding foils can easily be changed.

WARNING

Serious injury from the hot welding foils!
Keep your hands off the welding foils and wear safety gloves.

Clean the welding foils using a special welding foil cleaner.

Leave the danger area.

7.2 Adjusting the belt tension of the output transport belt

Required material:

» spanner 13 mm
» hexagon socket screw key 4 mm
» hexagon socket screw key 6 mm

Adjustment of the belt tension

WARNING

Entanglement hazard between belt and belt pulleys!
Actuate the emergency-stop switch and separate the machine from the compressed air supply.
Wait until all moving parts have come to standstill.

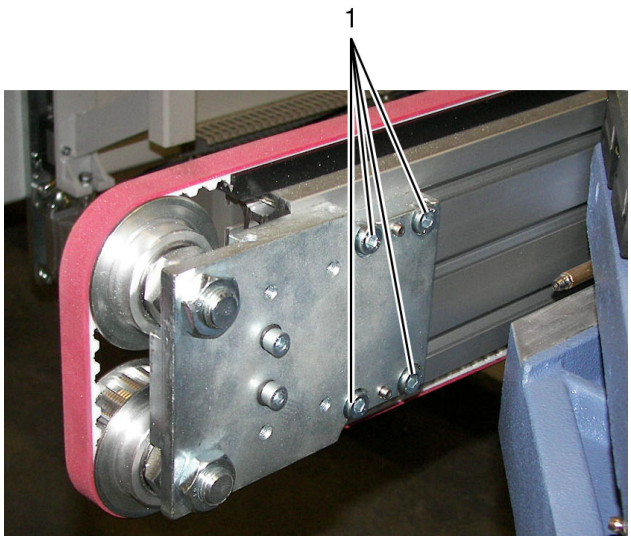

Figure 7.2-1

Loosen the four locking screws (1) using a hexagon socket screw key 6 mm.

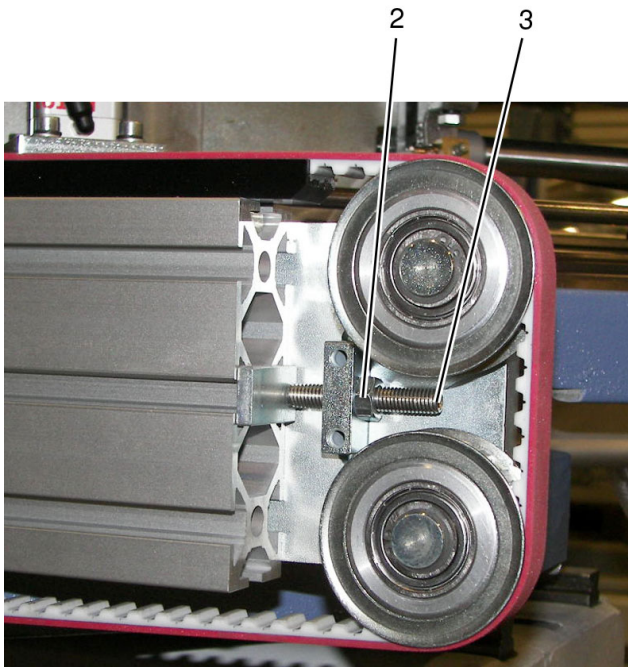

Figure 7.2-2

Loosen the locknut (2) using a spanner 13 mm.

At the set screw (3) adjust the belt tension (hexagon socket screw key 4 mm).

Tighten the locknut again.

Tighten the four locking screws (1).

7.3 Adjusting the belt tension of the gasket form unit

Required material:

» hexagon socket screw key 5 mm

Adjustment of the belt tension

WARNING

Serious injury from the hot welding foils and moving machine parts!
Switch the plate heating off and wait until the welding foils have cooled.
Actuate the emergency-stop switch and separate the machine from the compressed air supply.

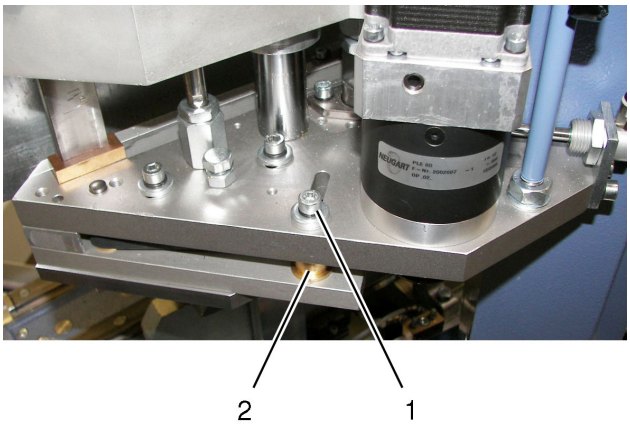

Figure 7.3

Loosen the locking screw (1) with the hexagon socket screw key.

Push the belt pulley (2) inwards until the belt is tensioned.

Tighten the locking screw.

7.4 Lubrication

Observe the environment requirements for the disposal of used lubricants or dirty rags. Remove excess lubricant by wiping with a rag.

WARNING

Serious injury from the hot welding foils and moving machine parts!
Switch the plate heating off and wait until the welding foils have cooled.
Actuate the emergency-stop switch and separate the machine from the compressed air supply.

Required material:

» lubrication gun
» grease Fuchs Lagermeister EP2 (ROTOX-no. 89260310)
» MoS2 multi-purpose high performance grease (ROTOX-no. 89260306)
» machine oil of viscosity 20-40 cSt

Lubrication plan

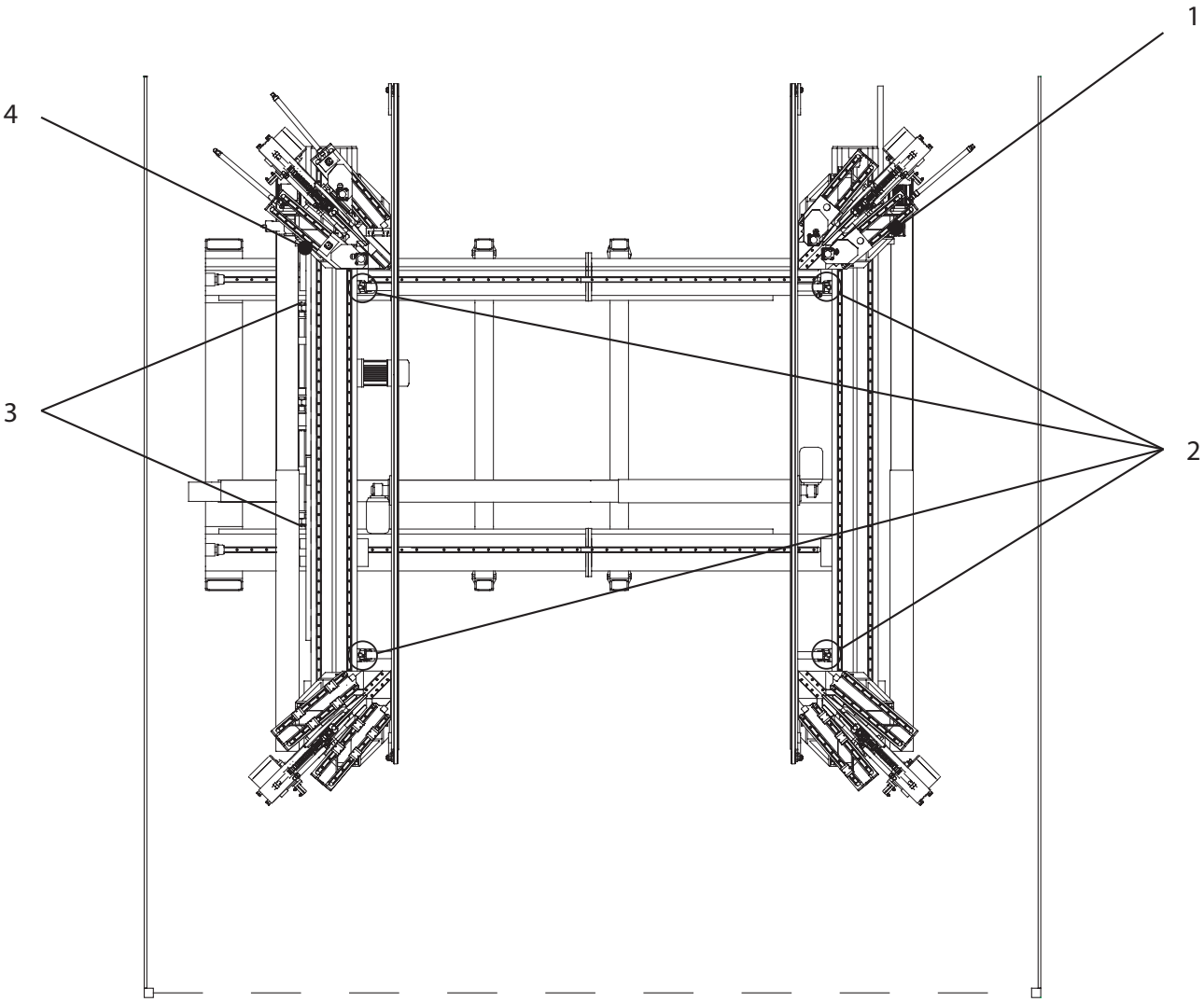

Figure 7.4-1: Lubrication plan (representation of the machine without control panel)

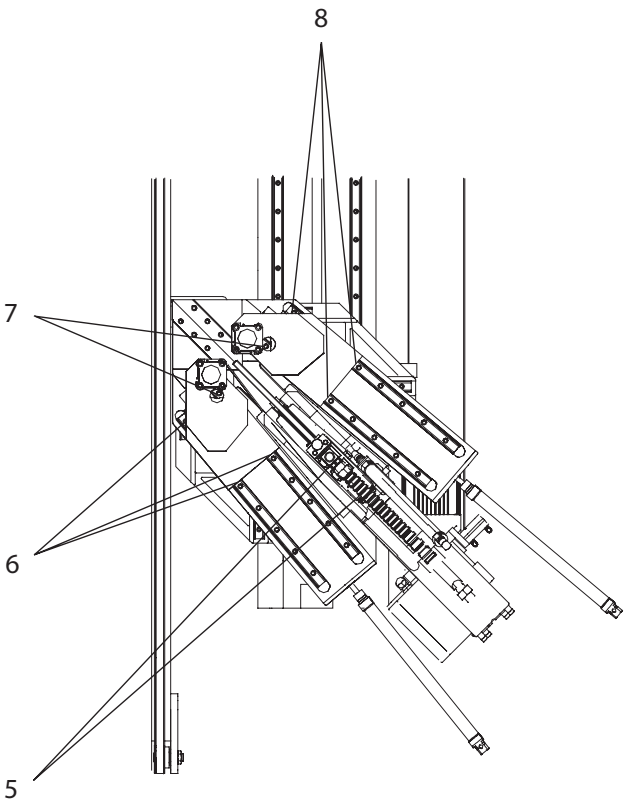

Figure 7.4-2: Lubricating points at profile clamping and heat plate

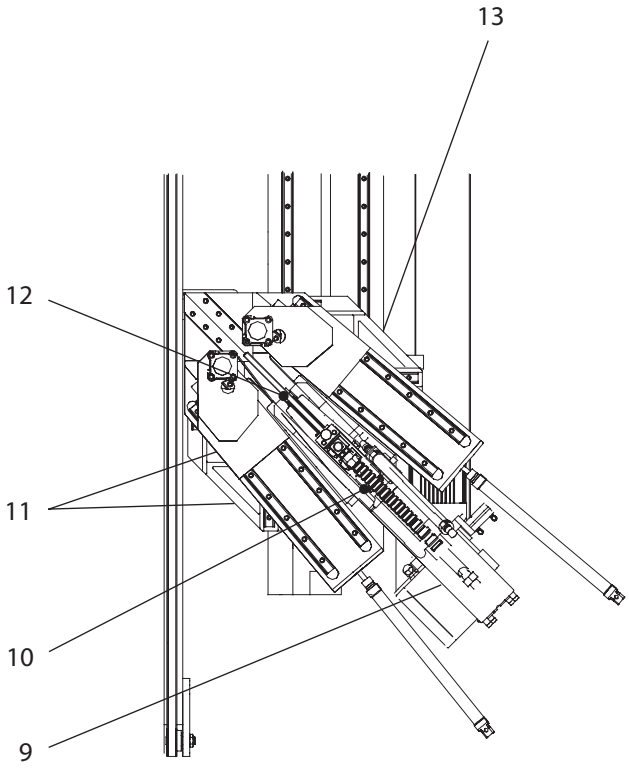

Figure 7.4-3: Lubricating points at welding heads

Lubrication instruction

Pos.	Lubricating point	Lubricating agent	Interval	Execution
1 3 4	**Toothed racks** movable welding heads and movable side	MoS2 multi-purpose high performance grease	weekly	Clean and lubricate.
7	**Guiding system** profile clamping	machine oil spray oil	weekly	Clean and lubricate.
3 9	**Centralized lubrication** movable side and movable welding heads	Lagermeister EP2	500 hours of operation	Press grease once or twice into each lubricator nipple. Then displace the components slightly (approx. 3x the carriage length) and lubricate again once.
5 6 8	**Linear guiding** heat plate (2x) and profile clamping (4x each)	Lagermeister EP2	800 hours of operation	Lubricate until grease emerges at the front sealing of the carriage. Then displace the components slightly (approx. 3x the carriage length) and lubricate again once.
10 11 12 13	**Centralized lubrication** welding heads	Lagermeister EP2	800 hours of operation	Press grease once or twice into each lubricator nipple. Then displace the component (approx. 3x the carriage length) and lubricate again once.
2	**Linear guiding** lifting equipment, output transport belt	Lagermeister EP2	annually	Lubricate until grease emerges at the front sealing of the carriage. Then displace the components slightly (approx. 3x the carriage length) and lubricate again once.

7.5 Repair works

Repair works may only be carried out by specially skilled experts.

Please contact our customer service or your service office. For the address of our customer service refer to Chap. 9.

8. Waste disposal

At the end of its working life the machine is to be dismounted workmanlike.

Even if the machine is separated from the compressed air supply, cylinders may be pressurised and can make movements when the system is exhausted. Such movements may lead to serious injury!

The various materials of the machine as e.g.

» metals
» plastics
» electric components, computers
» lubricants

are to be disposed of according to the valid regulations for environmental protection or to be supplied to a professional recycling system.

Recommendation: Contact a professional company specialised on disposal.

9. Warranty, Customer service

The liability for defects of quality and in title stated in our Terms of Delivery and Sale is applicable. These can be consulted or printed in the Internet under “www.rotox.com”.

For technical questions please contact the address mentioned below and hold the following information at your disposal:

» machine type and machine number (see nameplate)
» kind and extent of the malfunction
» time and circumstances of the malfunction
» assumed cause.

ROTOX GmbH
Am Sportplatz 2
56858 Grenderich
Germany
Phone: +49-2673/98 1-0
Switchboard Service: - 200
Head of Service - 201
Staff Service - 202 or - 203
Fax:+49-2673/98 1-209
E-mail: service@rotox.com
Internet: www.rotox.com

10. Spare parts list

Serious injury from hot welding foils, electric shock, high pressure and moving machine parts!
Defective components may only be replaced by skilled specialists.

X-axis / Y-axis

Designation	ROTOX-No.
magnetic tape MB500-0104 (length depending on the machine stand size)	82270607

Output transport

Designation	ROTOX-No.
cylinder NXD-050-15-210-R	80415017
ball bearing 6003-2Z	84126003
ball bearing 6004-2Z	84126004
needle bearing NKI 10/20	84231020
motor SN3F / 0.25 kW / 7:1	82725003
output transport 2500: toothed belt 16T10/8330	84701683
output transport 3000: toothed belt 16T10/9330	84701693
output transport 3500: toothed belt 16T10/10330	84701611
output transport 1600: toothed belt 16T10/6740	84701667

Welding unit

Designation	ROTOX-No.
cylinder NXD-020-025-210-R	80412026
cylinder NXD-032-020-210-R	80413221
cylinder NXD-032-030-210-R	80413231
cylinder NXD-050-020-610-R	80415022
cylinder HMP-25-320-R	80412532
buffer 20x15 A M6x15 68S	83682015
compression spring 1.25x9.25x17 D-196A	83950021
magnetic tape MB500-0104 (0.3 m)	82270607

Profile clamping 145 mm

Designation	ROTOX-No.
cylinder XL-050-160-050-R	80445016
cylinder XL-050-200-050-R	80445020
multiphase motor ST5918M2008-A (gasket form unit)	82680012
planetary gearing PLE 60-12/OP2 i=12:1 (gasket form unit)	84970000
HTD-toothed belt 600-5M-09 CXP (gasket form unit)	84745008
warning sign “Hot surface”	89523044

Electrical installation, Computer desk

Designation	ROTOX-No.
power unit CP SNT 500W 24V 20A	82006238
RIO 16 I / KE I/O-module	82002853
RIO 16 O / KE I/O-module	82002854
bus coupler RIO EC X2	82002873
module XP-SRC4	82002877
control unit XCN 540	82002879
USB disk drive external	82003024
screen TFT 19"	82003046
industrial computer 1.0 GHz	82003115
keyboard USB / German	82003300
optical USB mouse Logitech	82035090
fan filter LG 12K	82019002
filter fan LS 1(K)	82019003
light barrier M 4000	82280038
deflection mirror M4000	82280039
program memory SP-Memory	82310015

Auxiliary agents and consumables

Designation	ROTOX-No.
grease Fuchs Lagermeister EP2	89260310
MoS2-multi-purpose high performance grease	89260306

Tool

Designation	ROTOX-No.
Teflon welding foil 230x535 mm	89710059

11. Circuit diagrams

Serious injury from electric shock or high pressure!
Any works carried out at the electric or pneumatic equipment of the machine may only be carried out by experts in electrics or pneumatics! The electrical and pneumatic diagrams are provided for specialists only!

The circuit diagrams will be provided in the control box of the machine upon delivery.

12. Elimination of malfunctions

Serious injury from the welding foils and moving machine parts!
Switch the machine at the main switch off and separate it from the compressed air supply.
Wait until all moving parts have come to standstill.
Some malfunctions may only be eliminated by skilled specialists.

Press the „?“-button on the right side of the status bar. A display appears showing the designation of the error and a possible solution for its elimination.

13. Welding defects and causes

Perfect welding results are achieved by the correct coordination of the factors welding temperature, restriction jaw temperature, melting time, reheat time, melting distance and upsetting distance.

The following table shows the consequences of possible setting errors.

Error	Cause	Note
Welding seam has a yellowish colour.	Heat plate temperature too high	
Loss of solidity; the structure of the Teflon foil can be seen in the fracture	Heat plate temperature too high and reheat time too long	The profile is molten too much and during upsetting the remaining weld material is not sufficient.
	Reheat time too long	
	Melting time too long	
	Melting way too long, upset way too short	
During upsetting the profile is pushed away from under the profile clamping.	Heat plate temperature too low	During upsetting non-plastic material gets in contact with each other.
	Melting time too short	
	Melting way too short, upset way too long	
Loss of solidity; crack formation is visible after corner cleaning	Heat plate temperature too low	During upsetting non-plastic material gets in contact with each other.
	Melting time too short	
	Melting way too short, upset way too long	
Jaw form is visible on the profile surface.	Restriction jaw temperature too high	
Sunken spots in the area of the welding seam		
Loss of solidity	Restriction jaw temperature too low	Heat loss at the surface of the weld material is too high.
Weld material sticks to the heat plate and burns.	Reheat time too short	
Loss of solidity		During upsetting too cold material gets in contact with each other.
Irregular weld bead	Profile stops are not accurately adjusted.	