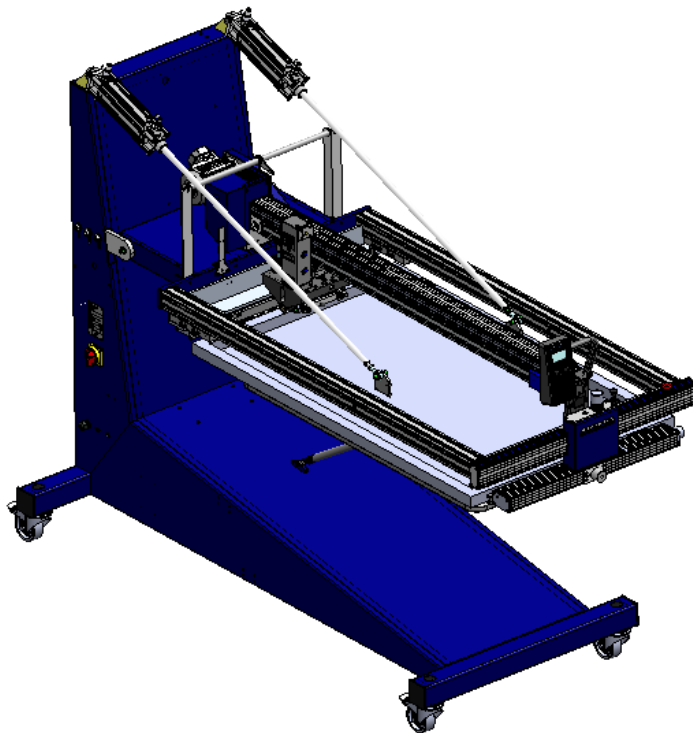


Operating manual

Single Print V5 Inel-Control



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1. Safety Instructions




The machine is built according to the state of the art and in accordance with all appropriate safety regulations. Owing to its complex design, the machine must only be operated and maintained by appropriately skilled staff.

All procedures should only be carried out by properly trained and appropriately qualified personnel. ‘Qualified personnel’ refers to people who are able to carry out the required procedures and to recognize as well as prevent potential risks, as a result of their training, experience and instructions. Such personnel should have a good knowledge of any relevant standards, regulations, rules of accident prevention and internal conditions etc.

1.1. Personal protective equipment


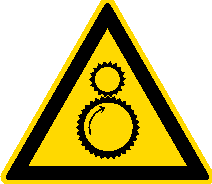



Personal protective equipment must be used at work. This equipment comprises close-fitting working clothes with tight sleeves and high tearing resistance without any protruding parts. These features prevent operators from getting caught by moving machine parts.

1.2. Safety instructions for the operating staff

	<p>All cabinets and covers on the printing machine must always be kept closed. Open cabinets and covers are extremely dangerous as live electrical components are accessible.</p> <p>Mechanical or electrical failures must only be repaired by an MHM authorized/approved technician.</p> <p>On every occasion, the operator should check the correct functioning of the safety devices (Emergency STOP), before commencing use of the printing machine.</p> <p>No modifications to any part of the machine or its assembly system that may adversely affect safety must be carried out without the prior approval of MHM.</p> <p>Program modifications in the control program and changes of settings which may affect the printing machine's operation should only be carried out by an MHM authorized/approved technician.</p>
	<p>All working spaces, passageways, escape and emergency routes and exits must be kept clear.</p> <p>No tools or other objects must be kept or left in the area of the machine.</p> <p>Any modifications or changes to the printing machine's settings should only be carried out by an MHM authorized/approved technician.</p> <p>Always wear protective gloves and safety goggles during cleaning work, in particular when using solvents!</p> <p>Any remains of potentially harmful substances should be disposed of according to the legal requirements of the country or state in which the printing machine is operated.</p>
	<p>All accessories for service and maintenance work (e.g. cleaning agents) must be collected in suitable containers and disposed of according to any relevant regulations.</p>

1.3. Additional risks

Even though the machine has been designed and built according to the most stringent safety criteria, as with all machinery we have to anticipate certain additional risks, which are detailed below:

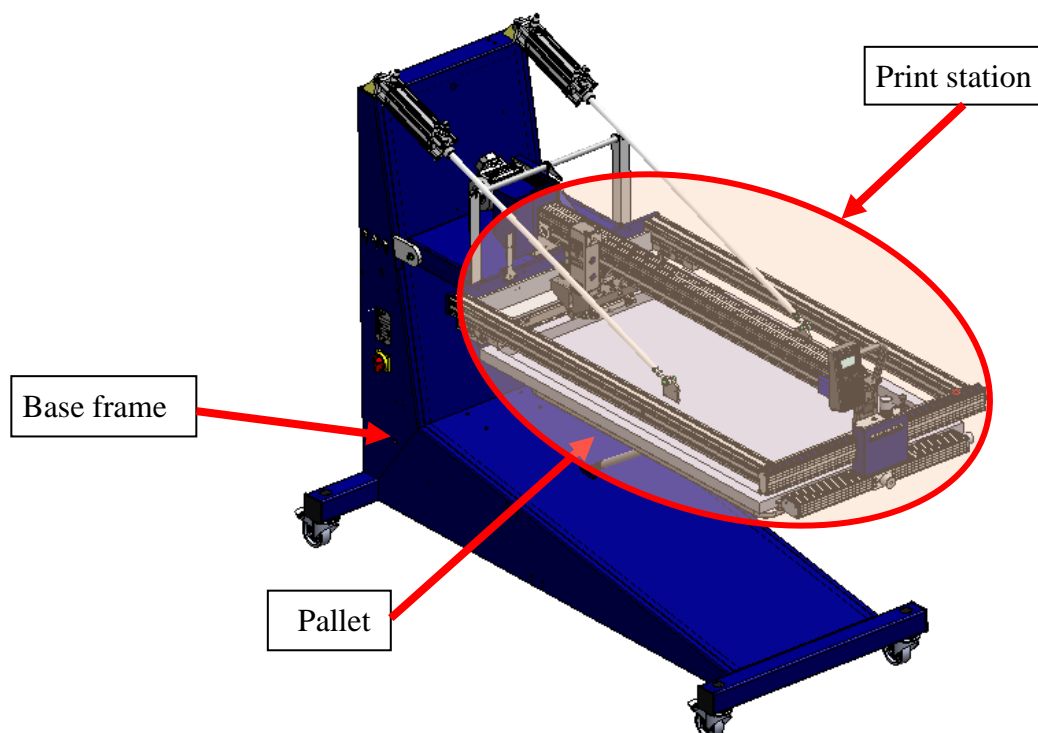
Danger	Description	Behavior/Action
Mechanical threats: Crushing 	Crushing of parts of the body - in particular arms and hands.	Be aware of moving parts whilst operating the machine. Wear protective clothing at all times.
Mechanical threats: Getting caught or trapped 	Danger through moving parts (linear or rotary drive systems).	Danger in reaching into, under or over the machine. Only reach into the machine from the indicated points. Wear appropriately fitting clothes, particularly in the area of the arms.
Mechanical threats: Slipping, stumbling and falling 	Danger of falling (e.g. over obstacles on the floor).	The floor area around the machine must be kept free from any obstacles.
Electrical threats: Indirect contact (in case of defect) 	Danger of life-threatening electrical shock by indirect contact with defective parts carrying voltage (in particular in case of defective insulation).	Unplug machine from power supply! Contact electrician for fault removal.
Danger through contact with or inhaling of substances 	Danger through contact with or inhaling substances or materials with harmful or toxic effects.	Observe the safety instructions for handling such substances.

2. Technical data

Description	Requirement/Value
Electric supply	1x 230V; 50/60Hz; $\pm 5\%$
Power consumption	500W
Minimum air pressure	6 bar / 87 PSI (filtered, dry air supply only)
Air consumption	100 l/min
Dimensions (W/D/H)	240x112x173cm
Weight of the machine	275kg
Max. print area	70x100 cm

3. Construction

The main components of the machine are the base frame, the pallets and the print station.



3.1. Base frame

The base frame is equipped with rolls for easy transport.



All four rolls must be locked before starting the production. Unlocked rolls may result in danger to persons or material damage to the machine through unexpected movement.

- The print station and the pallet are mounted on the base frame.
- To stop the machine in emergencies or to stop machine movement safely an emergency stop button is mounted on the print station.
- To start a programmed print cycle a start button is mounted on the print station.
- The main power switch is mounted on the left side of the base frame. It disconnects the machine from the main supply voltage immediately. This switch should not be used for the normal shutdown of the machine.
- A signal lamp indicates the actual state of the machine.

The following states are possible:

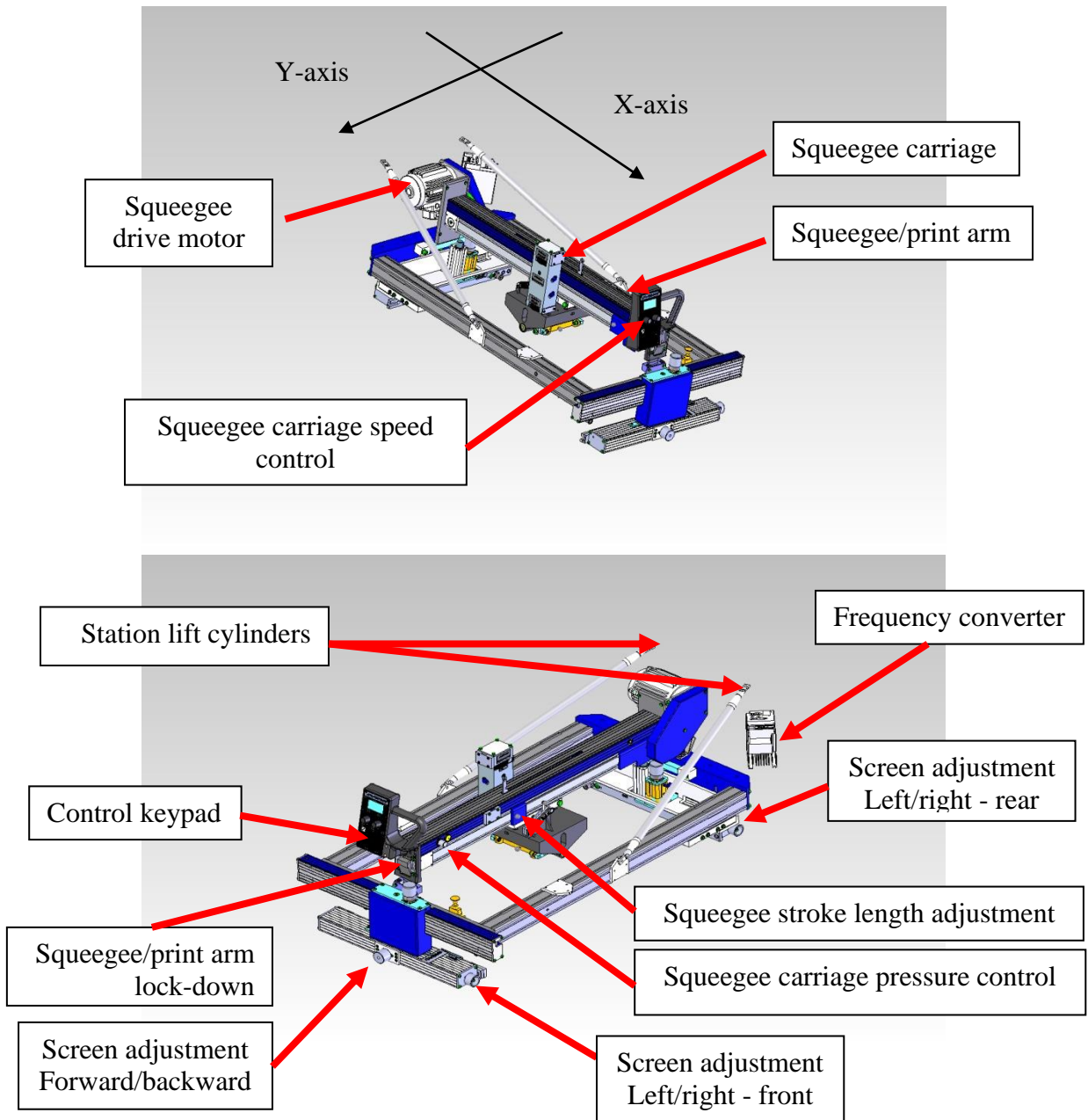
Signal lamp	State
Off	Ready for start.
Flashing	Squeegee carriage is not on start position. Move to position manually.
ON	Error. Emergency stop active or both squeegee position sensors simultaneously.

3.2. Pallets

The pallet is located below the print station. The substrates must be applied on the pallets. Depending on the substrate size, different pallets can be used.

3.3. Print Stations

3.3.1. Overview Print Stations



The print station is used for printing ink onto textiles/garments. The following sections include a detailed description of the individual components.

3.3.2. Squeegee Drive Motor

The squeegee/print arm motor is used to drive the squeegee carriage back and forth, precisely controlled by the frequency converter.

3.3.3. Frequency Converter

The frequency converter controls the squeegee drive motor. The motor and the frequency converter have already been adjusted by MHM, and no further adjustment should be necessary.

3.3.4. Squeegee/Print Arm

The squeegee carriage, squeegee stroke length adjustment, control keypad and control knobs for the squeegee carriage speed & pressure are all located on the squeegee arm.

3.3.5. Screen Adjustment/Micro-Registration

The screen adjustment/micro-registration is used for the precise positioning of the screens. Each screen may be positioned forwards/backwards by means of a single handwheel adjuster located at the front of each individual print station. For left/right adjustment there are two handwheel adjusters located at the front and rear of each individual print station. Adjustment is free from play and self-locking, therefore no additional clamping is required.

3.3.6. Squeegee Stroke Length Adjustment

The squeegee stroke length adjustment may be used to adjust the precise travel of the squeegee carriage. There are individual sensors on each print station to adjust the front and rear positions. Minimizing the travel of the squeegee carriage helps to reduce printing times and increase production.

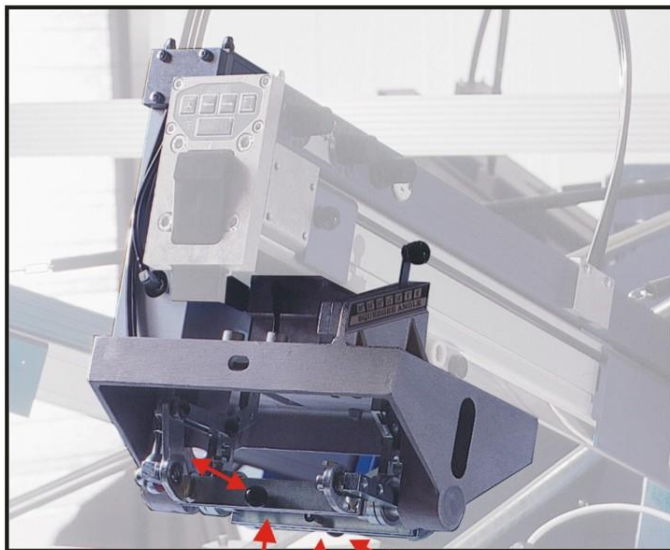
3.3.7. Squeegee/Print Arm Lock

Pressing the squeegee/print arm lock moves the entire squeegee/print arm upwards, providing unobstructed access to the screens.

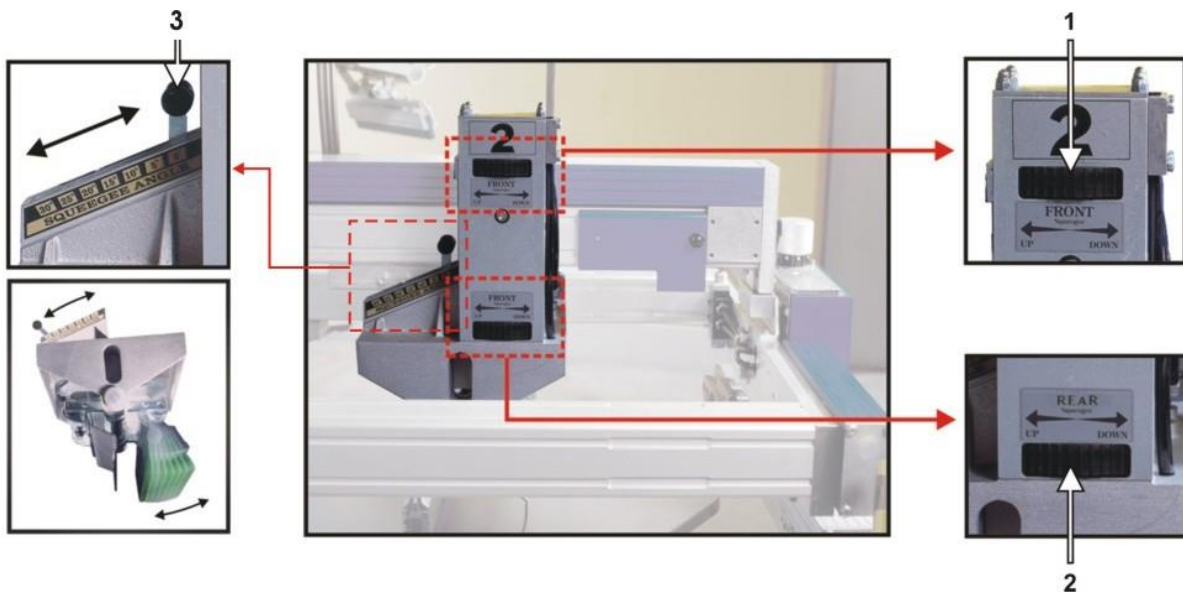
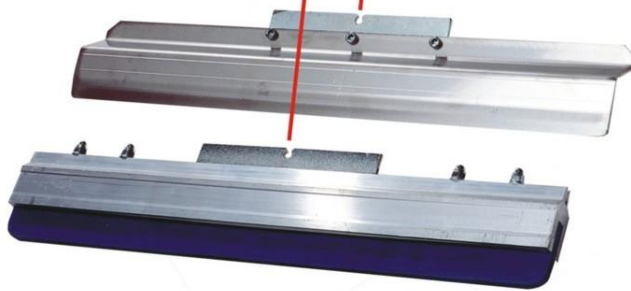
3.3.8. Station lift cylinders

At the far end of the printing station two lifting cylinders are located. These cylinders enable the print station to lift up for easy access to the pallet what is necessary to change the substrates.

3.3.9. Squeegee Carriage



The squeegee carriage is equipped with two squeegees. Pulling the black 'quick release' knob (*pic. opposite*) will release the respective squeegee. Make sure that these locking knobs engage fully when loading the squeegee. The maximum permitted squeegee width must be observed.



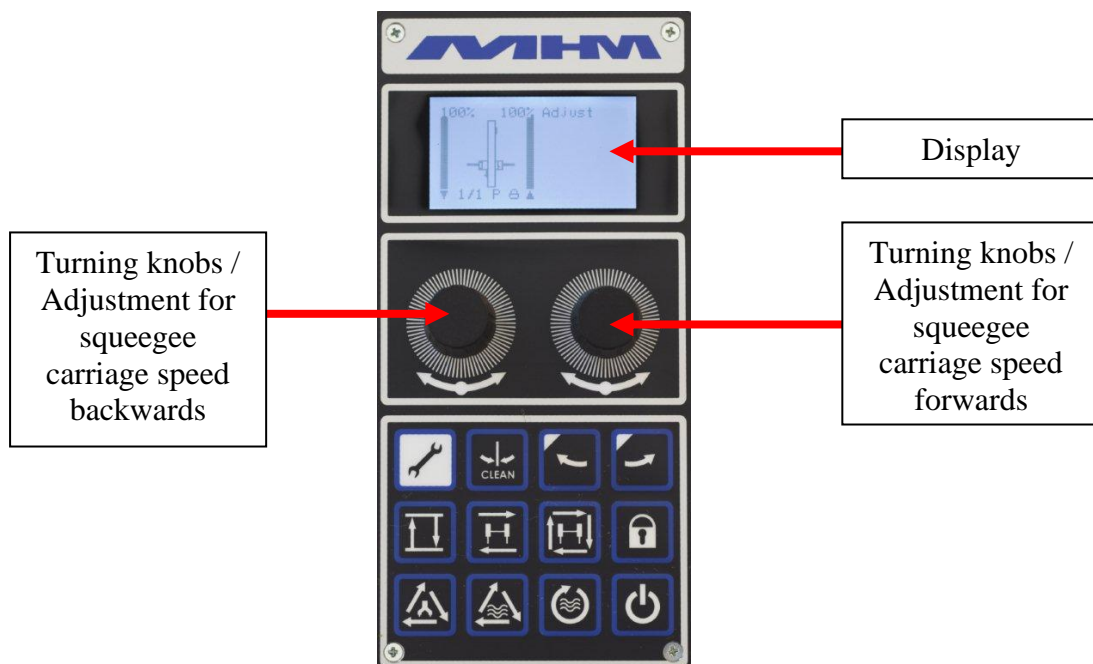
Squeegee height may be adjusted individually with the handwheels (*pic. 1 + 2*). Squeegee angle may also be adjusted individually by the sliding levers (*pic. 3*). Squeegee pressure may be adjusted with an adjusting knob located on the squeegee arm.

3.3.10. Squeegee carriage pressure control

Adjustment for squeegee pressure (with clear display gauge)

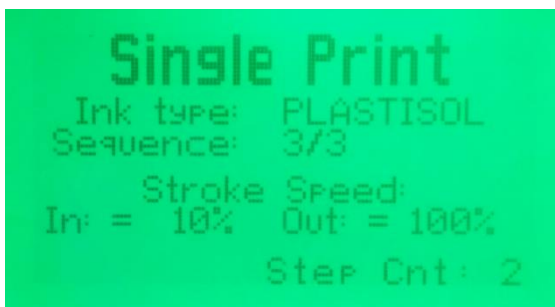


3.3.11. Control Keypad




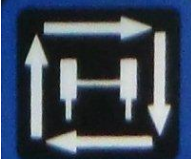






The control keypad is used to operate the machine.

On the display the adjusted ink type, the print sequence and the squeegee stroke speed for inward and outward can be seen. “Step Cnt” shows actual position in software for debugging.



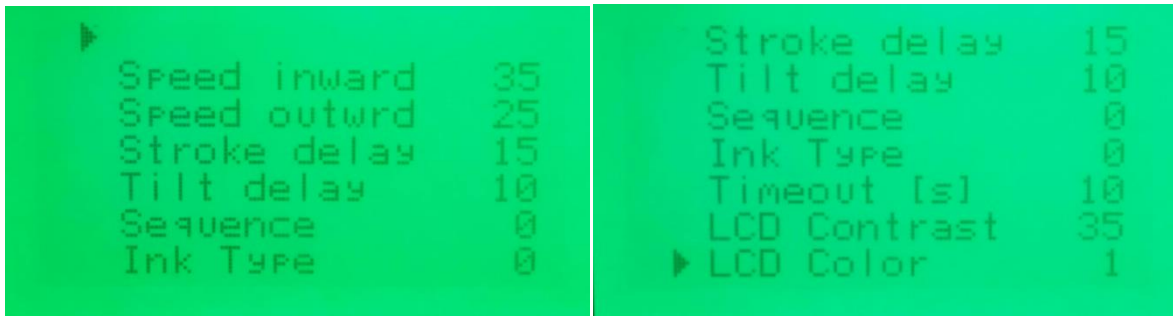
The following functions are available from the control keypad:

Key	Function
	<p>Use 'ADJUST' button to exit the Submenu.</p>
	<p>The 'RAISE/LOWER' key raises or lowers the screen depending on its initial position.</p>
	<p>Pressing the 'SQUEEGEE CARRIAGE MOVEMENT' key moves the squeegee carriage once, either forwards or backwards depending on its initial position.</p>
	<p>Pressing the 'SQUEEGEE CARRIAGE CYCLE' key starts the automatic print cycle. The function is identical to a start signal from the start button or foot switch.</p>
	<p>The 'LOCK' key is used to lock/unlock the screen pneumatically.</p>
	<p>Pressing the 'PRINTSTATIONADJUST' button changes between five different printing modes. The following modes are possible: 1/1...One print and one flood stroke 2/2...Two print and two flood strokes 3/3...Three print and three flood strokes 2/0...Two print and no flood strokes 4/0...Four print and no flood strokes</p>
	<p>Pressing the 'DRYERADJUST' button will change between waterbased and plastisol inc.</p>
	<p>The 'ON/OFF' button lowers or lifts up the print station depending on its initial position.</p>

3.3.12. Submenu:

To activate the sub-menu the right turning knob has to be held and the left turning knob has to be pushed. After power on the parameters from the submenu are loaded automatically. The following parameters can be edited in the sub-menu:

- Speed inward
Adjust stroke speed for moving inwards. Enter in percentage (10 to 100%).
Default: 35%
- Speed outwrđ
Adjust stroke speed for moving outwards. Enter in percentage (10 to 100%).
Default: 35%
- Stroke delay
Adjust time for squeegee start. During that time the screen must be lowered or lifted.
Enter in 1/100 of a second.
Default: 20 (0,2s)
- Tilt delay
Adjust time for squeegee center position. Enter in 1/100 of a second.
Default: 10 (0,1s)
- Sequence
Adjust default print sequence.
0...1/1 (One print and one flood stroke)
1...2/2 (Two print and two flood strokes)
2...3/3 (Three print and three flood strokes)
3...2/0 (Two print and no flood strokes)
4...4/0 (Four print and no flood strokes)
- Ink Type
Adjust default ink type.
0...plastisol ink
1...waterbased ink
Default: 0 (plastisol)
- Timeout [s]
Adjust maximum print cycle time. After this time the single print machine will stop.
Enter in seconds.
Default: 35 seconds
- LCD Contrast
Adjust LCD Contrast.
Default: 35
- LCD Color
Adjust LCD Color.
Default: 3

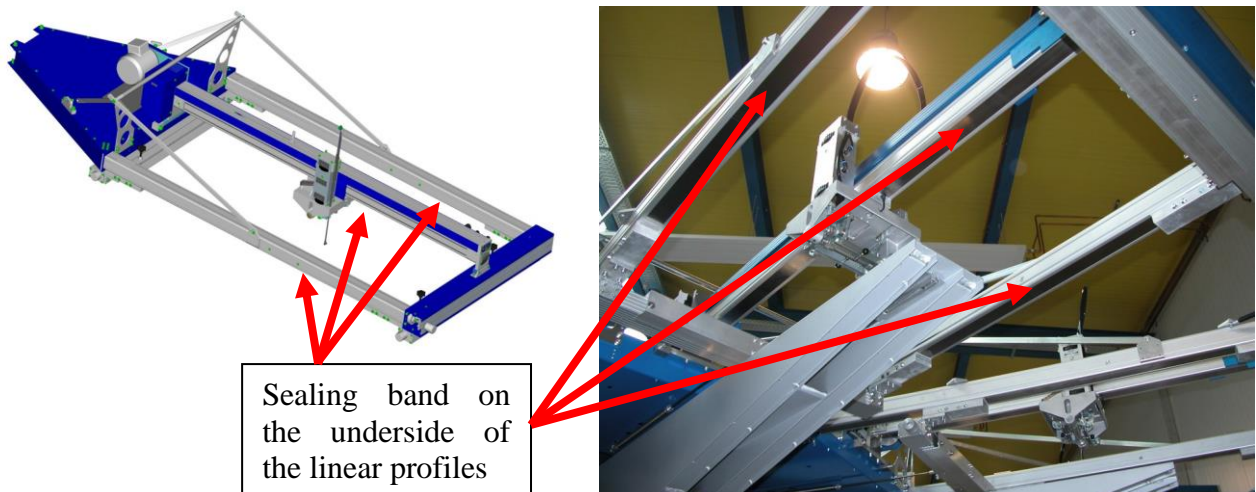


To change a parameter value, first scroll to the respective parameter with the left turning knob and select it by pressing the left turning knob. Turn the right knob to change the value, to save the value press the right turning knob. Use the ADJUST key to exit the parameter menu.

4. Maintenance of the printing machine

The printing machine has been designed to operate ‘maintenance-free’ as far as possible. Only a few important service measures are necessary by the operator.

Task	Frequency	Comment/Action
Daily cleaning	Daily	Remove all residues from the printing machine remaining from production materials such as inks and adhesives etc. Clean, tidy and sweep the printshop area.
Check inspection glass on water separator/trap	Daily	The inspection glass of the water separator/trap must be checked for condensed water. The level must not exceed the red mark; otherwise the automatic relief aperture may become clogged or defective.
Clean automatic relief aperture	Monthly	The entire water separator/trap is attached to the pressure regulator with a bayonet lock. Take off the water separator/trap and clean the automatic relief aperture.
Wipe clean the sealing band on the underside of all the linear profiles	Weekly	The sealing band on the underside of the linear profiles must be wiped clean thoroughly and lubricated with an oil-soaked cloth.



5. Terms of the Guarantee

The terms of the guarantee are detailed in the General Terms and Conditions of Machines Highest Mechatronic GmbH.

6. Limitation of liability

Warranty and liability claims for personal injury and material damage are **excluded** if they can be attributed to or are a result of one or several of the following:

- Improper use of the printing machine.
- Incorrect assembly, operation or maintenance of the printing machine by the operator.
- Operation of the machine with defective safety devices and/or safety devices which are missing / removed or not in correct working order.
- Failure to comply with the safety instructions in this document with regard to transportation, assembly, start-up, installation, operation, control and maintenance of the printing machine.
- Failure to comply with the Operating Instructions.
- Unauthorized modifications to the printing machine (e.g. disassembly of original MHM components and/or use of any non-original MHM components)
- Unauthorized modifications to any part of the drive or control systems (e.g. change of control components or frequency converters).
- Lack of monitoring and maintenance of machine parts/components subject to wear and tear.
- Repair measures, maintenance or service work carried out by unauthorized persons.
- Use of lubricants other than those recommended by MHM.
- Operation of the machine under technical conditions other than those specified by MHM (e.g. excessive power supply voltage and/or excessive air pressure).
- Damage by any foreign object and/or force majeure.
- Omission of specified maintenance, service measures and procedures.
- Operation of the printing machine by untrained personnel.

7. Support, Customer Service and Hotline

In case of any problems or additional questions please turn to your appropriate service partner.