

OPERATING INSTRUCTIONS

(Translation of the original instruction)



MHM SCREEN PRINTING MACHINE SYNCHROPRINT E-Type

©2005-2016 Machines Highest Mechatronic GmbH, Erl, Austria





Preface

Dear Customer,

Congratulations and thank you for choosing the MHM Synchroprint E-Type Screen Printing Machine. This machine is designed to provide the highest standards of performance and reliability during its guaranteed long operating life. Highly innovative and precise MHM technology provides a combination of the finest built quality along with optimal safety. We trust that these Operating Instructions will assist you in becoming familiar with the safe and efficient operation of the Synchroprint E-Type.

Important Note:

Due to our policy of continuous improvement, we reserve the right to change specifications without prior notice. Therefore, certain individual fittings and components may differ slightly from the model detailed in this document. For any further questions regarding your Synchroprint E-Type, please contact the MHM service team.

Wishing you every success with your future production...

MHM GmbH

Important Advice Regarding These Operating Instructions

These Operating Instructions form an integral part of the Synchroprint E-Type and must be made available to all authorized personnel at all times. No particular sections or pages must be removed from these Operating Instructions, and any missing sections or pages should be replaced immediately, in particular with regard to section *"1. Safety Instructions"*.

These Operating Instructions are subject to international copyright and may not be reproduced and/or revised without our prior written approval.

©2016 MHM GmbH, Erl, Austria. (All rights reserved).

Published by:	Machines Muehlgrab A-6343 Er	Highest Mechatronic GmbH ben 43a 1 / AUSTRIA
Contact details:	Telephone Fax: Mobile: E-mail:	:+43 (0) 5373 - 76080-18 +43 (0) 5373 - 76080-20 +43 (0) 664 - 8151380 service@mhm.at

Erl, July 2016



Contents:

Preface	2
Important Advice Regarding These Operating Instructions	2
1. Safety Instructions	5
 Description of Key Words and Symbols in the Operating Instructions General Information Qualification of Operating and Service Staff Sofety Instructions for the Operating Staff 	5 6 6 7
 1.4. Safety Instructions for the Operating Start	7
 Intended usage of the machine 	10
3. Data	10
 3.1. Serial Number and Year of Manufacture	10 10 11 12
 4.1. General Notes with Regard to Transportation and Danger Warnings	12 12 12 12 12
 5.1. General Assembly Instructions	13 13 14 14
5.4.2. Compressed Air	14
 6. Commissioning the Synchroprint 6.1. Initial Start-up 7. Design and Operation 	15 15 16
 7.1. General Process Description 7.2. Overview Machine Parts 7.3. Main control panel 	16 16 17
 7.4. Safety Devices 7.5. Type Plate 7.6. Pallets	18 18 18 18
 7.8. Print Stations	19 19
7.8.2. Squeegee Drive Motor	20
7.8.4 Off the design of the de	
/.8.4. Off contact screen adjustment	AUSTRIA

PERFECTION IN SCREENPRINTING

		PERFECTION IN SCREENI	PRIN
	7.8.5.	Screen Adjustment/Micro-Registration	20
	7.8.6.	Squeegee Stroke Length Adjustment	20
	7.8.7.	Pressure Controls	20
	7.8.8.	Dryer connector	21
	7.8.9.	Control Keypad	22
	7.8.10.	Squeegee Carriage	24
7.	9. Add 7.9.1.	itional Equipment Flash Cure Units	25 25
8.	Danger	Zones	26
9.	Control	of the Machine	27
9.	1. Stop	pping the Machine in the event of an Emergency	27
9.	2. Stop	pping the Machine in the event of Malfunction	28
9.	3. Putt	ing the Machine into Operation	28
9.4 0	4. Con 5 Mer	figuration of the Control	28 29
9.	6. Mer	nu Design	29
9.	7. Mai	n Menu Images	30
	9.7.1.	Adjust	30
	9.7.2.	Manually	32
	9.7.3.	Automatic	34
	9.7.4.	Memory	36
	9.7.5.	Basic Setup	37
	9.7.6.	Help	38
9.	8. Erro	or display	38
10.	Troub	le shooting	39
10).1. Basi	ic errors (without error message)	39
10).2. Erro	or messages control system	40
11.	Shutti	ng Down the Synchroprint	42
11 11 11	1.1. Swi 1.2. Lon 1.3. Perr	tching the Machine Off After Normal Operation g-term Shutdown nanent Shutdown of the Machine	42 42 42
12.	Mainte	enance of the Synchroprint	43
13.	Pneum	natic diagram	45
14.	Terms	of the Guarantee	46
15.	Limita	tion of liability	46
16.	Suppo	rt, Customer Service and Hotline	46





1. Safety Instructions

This section describes the safety instructions for the correct and safe operation of the Synchroprint E-Type. In addition, this section also contains references to the European rules and regulations concerning the guarantee of industrial safety along with safety at the workplace. These rules and regulations provide the basis for these operating instructions.

These Operating Instructions include:

- 1. General safety instructions.
- 2. Special safety instructions, if they are relevant to a specific section, at the beginning of that respective section.
- 3. Special safety instructions, if they are important for detailed sequences of operation, before the description of that respective sequence of operation.
- 4. Indications to read such instructions included in the respective section.

1.1. Description of Key Words and Symbols in the Operating Instructions

In these operating instructions classified key words and symbols are used to identify dangers and items that require special attention. Particular attention is to be paid to the sections marked in this manner, because they contribute to personal safety as well as the prevention of damage to the Synchroprint.

Symbol	Key word	Meaning
DANGER	DANGER	This symbol indicates possible risk to life.
	CAUTION	This symbol indicates danger of damage to property and/or environment.
1 NOTE	NOTE	This symbol indicates useful additional information and operating suggestions.





1.2. General Information

The Synchroprint E-Type (hereon named Synchroprint) is built in accordance to all appropriate safety regulations. Owing to its complex design, the Synchroprint must only be operated and maintained by suitably skilled staff.

Installation, operation or maintenance of the Synchroprint by persons who have not been suitably trained, introduced or acquainted with the system and informed regarding the possible dangers may result in:

- 1. Failure of essential functions of the Synchroprint.
- 2. Danger to persons through electrical or mechanical actions.
- 3. Material damage to the Synchroprint.

1.3. Qualification of Operating and Service Staff

'Qualified personnel' refers to people who are able to carry out the required procedures and be able to recognize as well as prevent potential risks, as a result of their training and experience. Such personnel should have a good knowledge of any relevant standards, regulations, rules of accident prevention and internal conditions etc.

Every person instructed to perform any operation on the Synchroprint must:

- 1. Be physically and mentally capable of coping with the respective tasks.
- 2. Be suitably instructed in operating the Synchroprint.
- 3. Be familiar with the Operating Instructions, in particular the general safety instructions in the individual sections, and have read and understood them.
- 4. Be aware of any additional general safety regulations of any local authorities/associations.
- 5. Be aware of the principles of industrial hygiene and be able to demonstrate them.
- 6. Be aware of the contents of suppliers' safety instructions, should they affect his/her area of responsibility.
- 7. Be aware of any relevant safety devices at the workplace and be able to use them.
- 8. Be informed regarding the prevention of environmental damage in respect of his/her area of responsibility.
- 9. Be informed regarding the prevention of material damage in respect of his/her area of responsibility.

If casual workers are employed for assistance work they must be particularly informed regarding existing and potential dangers and instructed accordingly.



1.4. Safety Instructions for the Operating Staff

All cabinets and covers on the Synchroprint must always be kept closed. Open cabinets and covers are extremely dangerous as live electrical components are accessible.DANGERMechanical or electrical failures must only be repaired by an MHM authorized/approved technician. On every occasion, the operator should check the correct functioning of the safety devices (Emergency STOP), before commencing use of the Synchroprint. 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. Program modifications in the control program and changes of settings which may affect the Synchroprint's operation should only be carried out by an MHM authorized/approved technician.All working spaces, passageways, escape and emergency routes and exits must be kept clear. No tools or other objects must be kept or left in the area of the machine. Any modifications or changes to the Synchroprint's settings should only be carried out by an MHM authorized/approved technician.All ways wear protective gloves and safety goggles during cleaning work, in particular when using solvents! Any remains of potentially harmful substances should be disposed of according to the legal requirements of the country or state in which the Synchroprint is operated.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.	ð	
DANGER Image: Non-operation of the electrical failures must only be repaired by an MHM authorized/approved technician. On every occasion, the operator should check the correct functioning of the safety devices (Emergency STOP), before commencing use of the Synchroprint. 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. Program modifications in the control program and changes of settings which may affect the Synchroprint's operation should only be carried out by an MHM authorized/approved technician. All working spaces, passageways, escape and emergency routes and exits must be kept clear. No tools or other objects must be kept or left in the area of the machine. Any modifications or changes to the Synchroprint's settings should only be carried out by an MHM authorized/approved technician. Always wear protective gloves and safety goggles during cleaning work, in particular when using solvents! Any remains of potentially harmful substances should be disposed of according to the legal requirements of the country or state in which the Synchroprint is operated. 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.		All cabinets and covers on the Synchroprint must always be kept closed. Open cabinets and covers are extremely dangerous as live electrical components are accessible
DANGER On every occasion, the operator should check the correct functioning of the safety devices (Emergency STOP), before commencing use of the Synchroprint. 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. Program modifications in the control program and changes of settings which may affect the Synchroprint's operation should only be carried out by an MHM authorized/approved technician. All working spaces, passageways, escape and emergency routes and exits must be kept clear. No tools or other objects must be kept or left in the area of the machine. Any modifications or changes to the Synchroprint's settings should only be carried out by an MHM authorized/approved technician. All working spaces, passageways, escape and emergency routes and exits must be kept clear. No tools or other objects must be kept or left in the area of the machine. Any modifications or changes to the Synchroprint's settings should only be carried out by an MHM authorized/approved technician. Allways wear protective gloves and safety goggles during cleaning work, in particular when using solvents! Any remains of potentially harmful substances should be disposed of according to the legal requirements of the country or state in which the Synchroprint is operated. 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.		Mechanical or electrical failures must only be repaired by an MHM authorized/approved technician.
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.Program modifications in the control program and changes of settings which may affect the Synchroprint's operation should only be carried out by an MHM authorized/approved technician.All working spaces, passageways, escape and emergency routes and exits must be kept clear.No tools or other objects must be kept or left in the area of the machine.Any modifications or changes to the Synchroprint's settings should only be carried out by an MHM authorized/approved technician.Always wear protective gloves and safety goggles during cleaning work, in 	DANGER	On every occasion, the operator should check the correct functioning of the safety devices (Emergency STOP), before commencing use of the Synchroprint.
Program modifications in the control program and changes of settings which may affect the Synchroprint's operation should only be carried out by an MHM authorized/approved technician.All working spaces, passageways, escape and emergency routes and exits must be kept clear.No tools or other objects must be kept or left in the area of the machine.Any modifications or changes to the Synchroprint's settings should only be carried out by an MHM authorized/approved technician.Always wear protective gloves and safety goggles during cleaning work, in particular when using solvents!Any remains of potentially harmful substances should be disposed of according to the legal requirements of the country or state in which the Synchroprint is operated.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.		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.
All working spaces, passageways, escape and emergency routes and exits must be kept clear. No tools or other objects must be kept or left in the area of the machine. Any modifications or changes to the Synchroprint's settings should only be carried out by an MHM authorized/approved technician. Always wear protective gloves and safety goggles during cleaning work, in particular when using solvents! Any remains of potentially harmful substances should be disposed of according to the legal requirements of the country or state in which the Synchroprint is operated. 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.		Program modifications in the control program and changes of settings which may affect the Synchroprint's operation should only be carried out by an MHM authorized/approved technician.
No tools or other objects must be kept or left in the area of the machine.Any modifications or changes to the Synchroprint's settings should only be carried out by an MHM authorized/approved technician.Always wear protective gloves and safety goggles during cleaning work, in particular when using solvents!Any remains of potentially harmful substances should be disposed of according to the legal requirements of the country or state in which the Synchroprint is operated.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.		All working spaces, passageways, escape and emergency routes and exits must be kept clear.
CAUTION Always wear protective gloves and safety goggles during cleaning work, in particular when using solvents! Any remains of potentially harmful substances should be disposed of according to the legal requirements of the country or state in which the Synchroprint is operated. 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.		No tools or other objects must be kept or left in the area of the machine. Any modifications or changes to the Synchroprint's settings should only be carried out by an MHM authorized/approved technician.
Any remains of potentially harmful substances should be disposed of according to the legal requirements of the country or state in which the Synchroprint is operated. 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.	CAUTION	Always wear protective gloves and safety goggles during cleaning work, in particular when using solvents!
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.		Any remains of potentially harmful substances should be disposed of according to the legal requirements of the country or state in which the Synchroprint is operated.
	1 NOTE	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.

1.5. 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.





1.6. Additional Risks

Even though the Synchroprint 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	Behaviour/Action
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	Switch off the machine with the main switch and EMERGENCY STOP facilities. Isolate the mains supply.
Mechanical threats:	defective insulation).	Be aware of moving parts
Crushing	body -in particular arms and hands.	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 suitably fitting clothing, particularly in the area of the arms.
Mechanical threats: Slipping, stumbling and falling	Danger of falling (e.g. obstacles on the floor).	The floor area around the machine must be kept free from any obstacles.
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.





1.7. Safety Signs on the Machine

The following safety signs are attached to the corresponding points of the machine:

Danger	Description
	Hands off! Don't reach into the machine!
	Warning against squashing of parts of the body, in particular arms or hands.
	Warning of dangerous voltage.

The adhesive labels must be replaced if illegible (due to dirt or damage).

1.8. Other Valid Rules and Regulations

The customer must comply with all regulations applicable in the country where the machine is located.





2. Intended usage of the machine

The machine is intended for the printing of substrates (usually textiles such as T-shirts, but also paper or similar materials) by means of screen printing. The substrates are conveyed by means of the "carrousel system". With the use of optional accessories the substrate can also be dried or treated with other finishing techniques (e.g. flocking).

3. Data

This section details the Synchroprint technical specifications.



NB: As our policy is one of continuous improvement, we reserve the right to change specifications without prior notice.

3.1. Serial Number and Year of Manufacture

Serial number and year of manufacture are indicated on the machine's type plate.

3.2. Dimensions







3.3. Specifications

Type of machine	SPE 8	SPE 10	SPE 12
Number of pallets	8	10	12
Max. number of print stations	6	8	10
Max. print area		40 x 50 cm	
		15,75 x 19,69"	
Height of machine		140 cm	
		55,12"	
Diameter	363 cm	386 cm	423 cm
	142,91"	151,97"	166,54"
Weight of machine	1000 kg	1250 kg	1500 kg
	2203 lbs	2754 lbs	3304 lbs
Max. air consumption	350	400	450
Required air pressure	7 bar / 100 psi		
Main drive system	AC-Drive		
Supply voltage	1~200-240V, 50/60Hz (+/- 5%)		
Kilowatts for indexer main drive	1,6 kW		
Kilowatts per print head	0,4 kW		
Registration		+/- 0,02 mm	
		+/- 0,00079"	
Rec. frame profile		40 x 40 mm	
		1,57 x 1,57"	
Max. frame size		850 x 560 mm	
		33,46 x 22,05"	
Production capacity		1400 pieces / h	





4. Transportation and packaging

This section provides an overview of the proper transportation of the Synchroprint.

4.1. General Notes with Regard to Transportation and Danger Warnings

Danger of falling objects!

The following instructions must be observed

- 1. Never stand or walk under hanging loads!
- 2. Transportation must be carried out by qualified staff observing all safety instructions.
- 3. The Synchroprint must only be lifted at the dedicated lifting points.
- 4. Only the lifting/handling devices and equipment indicated in this document must be used for the movement of the Synchroprint. Non-compliance may lead to serious damage of the Synchroprint and result in cancellation of the warranty.



DANGER

Upon delivery of the Synchroprint the consignment must be examined for external damage immediately. In the case of any damages, they must be documented and reported to MHM GmbH within 24 hours.

4.2. Packaging

The Synchroprint will be packed and delivered in several wooden crates. The crates' exact number, weight and dimensions will vary slightly according to each model/type of machine. Contact customer service for more information about individual orders.

4.3. Unloading of the crates

The Synchroprint is to be unloaded by the customer. A forklift truck with adequate fork length and lifting capacity (see 4.2 Packaging) will be required.



Danger of mechanical damage!

The Synchroprint must be lifted carefully and only at the dedicated lifting points at the middle of the base unit. Lifting the Synchroprint at/by any other point, especially the turntables, may result in serious damage. Be sure to maintain an adequate and safe distance during lifting.

4.4. Packaging material

After unpacking the machine, the packaging material must be disposed of according to local regulations.





5. Assembly

This section describes the external supply/connection ports of the Synchroprint and the points to be observed during assembly.

5.1. General Assembly Instructions



The Synchroprint must only be installed / assembled by an authorized MHM service technician or by an authorized service technician from an official MHM dealer/agent. Any assembly/installation by any third party not listed above will result in immediate cancellation of the warranty.

The customer should have a minimum of two persons available to assist the technician with the installation and assembly of the machine.

5.2. Positioning of the Synchroprint

The machine must be mounted on a bed with sufficient load-bearing capacity. In case of doubt this capacity is to be examined by a structural engineer.

In order to guarantee perfect installation and smooth operation of the Synchroprint, the machine must be installed at a sufficient distance from adjacent elements of the building (walls, columns, etc.) and/or other machines. The distance required in each case depends on the screen size, and must be chosen so as to allow the operator to replace the screens without any problems. The dimensions of the respective machine are indicated in Chapter "*3 Data*".

5.3. Ambient Conditions

For the electrical equipment on the Synchroprint, ambient conditions according to standard IEC 60204 "Electrical Equipment of Industrial Machines" should be observed.

The following points should be observed in order to achieve efficient running and an optimum level of production with the Synchroprint:

- 1. The premises, where the Synchroprint is to be operated, must be kept clean, dry and well-aired.
- 2. The ambient temperature must not fall below $+5^{\circ}$ C or exceed $+45^{\circ}$ C.
- 3. Relative air humidity must not exceed 80 %.
- 4. The mains supply must not exceed or fall below a tolerance of +/- 5 % of the required voltage for the Synchroprint. If this voltage stability cannot be guaranteed, the customer must install a constant-voltage regulator to protect the Synchroprint against such fluctuations.
- 5. The compressed air must be clean, filtered and dry.
- 6. Compressed air supply must be sufficient in terms of pressure, volume and consistency.
- 7. Electricity supply should be sufficient with adequate fuse protection.



5.4. External supply/Connection ports

Connections for compressed air and mains electricity are located on the base unit of the Synchroprint as standard. Overhead supply connections may be ordered optionally but only at time of order, to enable supplies to enter the machine from above, through the centre column.



Danger of tripping over! In case of laying supply lines on the floor, it is necessary to attach step covers.

5.4.1. Electrical Connections



Please observe the general safety regulations for electrical connections when connecting the mains supply to the E-Type. Avoid any contact with live components.

The electrical connections must be designed as follows:

Description	Requirement/Value
Supply voltage	1 x 200-240 V
Supply frequency	50/60 Hz ±5 %
Connected load	1.6 kW + (0.4 kW x "number of print heads")
	(= "power for indexer main drive" + "power per print head" x
	"number of print heads")



All flash cure units must be supplied through a separate/independent connection. Please observe the precise technical data from the flash cure unit specification sheet.

5.4.2. Compressed Air

Type of machine	SPE 8	SPE 10	SPE 12
Max. air consumption (I/min.)	350	400	450
Minimum air pressure	7 bar / 100 PSI (filtered, dry air only)		





6. Commissioning the Synchroprint



Initial start-up of the Synchroprint should only be carried out by an authorised MHM service engineer or by an approved technician from an official MHM dealer/agent.

After the initial start-up of the machine, commissioning is to be completed in the presence of the authorized technician along with any persons authorized on the part of the customer. During this initial start-up and commissioning, all tasks carried out by the MHM service engineer or the technicians of an authorized dealer are recorded.



Any defects or complaints must be brought to the attention of the authorized technician, documented in writing and recorded immediately on the service technician's installation/jobsheet.

This installation/job sheet must be clearly signed by both parties, stating the date and location of the Synchroprint and will be legally binding hereon after.

6.1. Initial Start-up

• Before starting the machine, mains connection and compressed-air supply must be checked and, if necessary, established according to the instructions.





7. Design and Operation

This section describes design and operation and indicates the individual assemblies.

7.1. General Process Description

The operator applies a substrate (usually a T-shirt or paper) to the pallets at the locating surface. Textiles will be fixed in position by means of the spray adhesive applied to the pallets beforehand. For paper a special vacuum model is necessary to hold the substrate on the pallet by means of negative pressure. Subsequently, the carrousel moves the substrate to the first print station, where the substrate is printed by means of screen printing or treated with optional accessories. Subsequently, the substrate moves to the second station, where it is treated again, before the process continues with all other stations. Finally, the substrate arrives at the unloading point, where an operator takes it from the machine for further processing.







7.3. Main control panel



The main control panel includes the following features:

Machine feature	Description
Touch screen	The touch screen is used to assign the required parameters of the
	Synchroprint's control program. Touching (tapping on) the
	command buttons displayed on the screen will operate various
	individual functions of the machine. You will find a detailed
	description of all functions in section "9 Control of the Machine".
Main control switch	The main control switch is used to switch the machine on/off.
	When the machine is switched off, a data backup will be carried
	out automatically. This will delay the shut-down by approx. 10
	seconds. During this time, the main power must not be switched
	off; otherwise loss of data can occur.
Safety level key	In operating mode ADJUST an automatic error resetting can be
	activated with the safety level key; this is needed to adjust the
	machine in case of certain adjustment procedures. This can be
	done by switching the safety level key to position 1, in normal
	operation the key must be in position 0. Only properly trained and
	appropriately qualified personnel should use this function. The
	quick stop function of the turn table is active all the time. Print and
	flood strokes can also be made at active error situations, while a
	turntable index is prevented.
USB update port	This port is used to update the software to new releases. This can
	be done by connecting a special update stick and rebooting the
	touch screen. The actual update will be carried out automatically.
	No machine parameters and settings will be changed.
EMERGENCY STOP	The EMERGENCY STOP push button is part of the safety facility.
(push button)	See section 7.4 Safety Devices.





7.4. Safety Devices

The safety devices serve as emergency stop facilities to avoid accidents and to guarantee safe operation of the machine. The Synchroprint has the following safety devices:

Safety device	Description
EMERGENCY STOP	Push button located at the main control panel. In case of
(push button)	emergency, pressing the EMERGENCY STOP will stop all
	movements of the machine. The function of the push button is
	cancelled by unlocking the switch (turning it to the right).
Safety bars	Yellow/black bars located at the right and the left of the
	'load/unload' area. Pressing any one of these bars will result in
	an immediate EMERGENCY STOP of the machine. The location
	of these bars ensures that the EMERGENCY STOP function is
	activated automatically should a person become trapped between
	print station and pallet.
Safety barrier	Yellow/black barriers located between the print stations which
	serve to cordon off the danger zone. As soon as they are opened
	by a person passing through, an immediate EMERGENCY
	STOP is activated.



These safety devices must not be used to switch off the machine under normal operation. Any EMERGENCY STOP presents an exceptional loading to the servo-motor and transmission etc. Excessive use will result in damage to the machine along with subsequent cancellation of the warranty.

7.5. Type Plate

The type plate with type, serial number, year of manufacture, mains voltage, mains frequency, connected load and CE symbol is located on the machine base.

7.6. Pallets

The shirts must be applied on the pallets.

7.7. Main Power Switch

The main power switch is mounted at the machine's basic frame. It disconnects the machine from the main supply voltage immediately. This switch should not be used for the normal shutdown of the machine, which should be carried out with the main control switch.





7.8. Print Stations 7.8.1. Overview Print Stations X-axis **Y**-axis Off contact screen adjustment Squeegee drive motor Frequency converter Squeegee carriage Control keypad Squeegee stroke length adjustment Dryer connector Screen adjustment Left/right - rear Pressure control Screen adjustment Screen adjustment Left/right - front Forward/backward

The print stations are used for printing individual colors onto textiles/garments. The Synchroprint may be ordered with a maximum of up to 10 print stations. The following sections include a detailed description of the individual components.





7.8.2. Squeegee Drive Motor

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

7.8.3. 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.

7.8.4. Off contact screen adjustment

The off contact screen adjustment is used to adjust the height of the screen above the pallets during the printing process. This adjustment is infinitely variable between 0-10mm.

7.8.5. 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.

7.8.6. 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.

7.8.7. Pressure Controls

Adjustment for squeegee pressure (with clear display gauge)







7.8.8. Dryer connector

The dryer connector is used to control external units like intermediate dryers or flock units. The drier is started with a 24-V signal on pin 5. The duration of the drying process can be controlled internally through the control or externally through the drier. In case of external control, a 24-V signal on pin 2 is required as a ready message. The system detects the positive edge of the complete signal, no continuous complete signal is allowed. The following pin assignment is given:

- Pin 2: IN ready signal
- Pin 3: GND
- Pin 5: OUT run/start signal
- Pin 7: +24 V









7.8.9. Control Keypad

The control keypad is used to operate various functions without having to return to the main control panel. Control of the machine through the control keypad is only possible when in the 'ADJUST' mode. The two turning knops are used to adjust the squeegee carriage speed forwards and backwards. Various LED's display the actual state.

Carriage LED's: Inactive if carriage is at end position. Squeegee LED'S: Active when squeegee is switched on.

Dryer LED's: Active when start signal is on or ready signal is present.





The following functions are available from the control keypad:

Key	Function
ADJ	Pressing and holding 'ADJUST' on the keypad (approx. 3 sec.) puts the machine in the 'ADJUST' mode.
	The 'LOCK' key is used to lock/unlock the screen pneumatically.
H	Pressing the 'SQUEEGEE CARRIAGE MOVEMENT' key moves the squeegee carriage once, either forwards or backwards depending on its initial position.
II	The 'RAISE/LOWER' key raises or lowers the turn table depending on its initial position.
Ē	Pressing the 'CYCLE' key starts one complete cycle of the respective print station. (e.g. flood/machine lower/print/machine raise)
ADJ +	Pressing the 'ADJUST' and the 'INDEX LEFT' keys simultaneously will move the turntable one position/index to the left.
ADJ	Pressing the 'ADJUST' and the 'INDEX RIGHT' keys simultaneously will move the turntable one position/index to the right.
CLEAN	Pressing the 'CLEAN' key initiates a 'half-index' or cleaning mode, particularly useful for cleaning the screens. In this mode the turntable is rotated backwards in between the print stations, enabling the operator to reach underneath the screens with minimal obstruction. Pressing the two keys again will return the turntable to its original position.



ADJ	?	Pressing 'ADJUST' and 'LOCK' key simultaneously changes the squeegee normal position. In normal position always the print squeegee must be in up position. Wrong squeegee normal position can damage the screen.
		This function is also used to change the squeegees.
		Squeegee replacement is only possible in up position.

7.8.10. Squeegee Carriage



The squeegee carriage is equipped with two squeegees. Pulling the "Quick release knob" 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 "height hand-wheels". The actual values can be read off at the "height index".

Squeegee angle may also be adjusted individually by sliding levers. For adjusting first loose the sliding lever with the "Angle fastener" on the left side and then adjust the angle. Afterwards fix angle again with the "Angle fastener". The actual value is shown at the "Angle index".





7.9. Additional Equipment

7.9.1. Flash Cure Units

Flash cure units may be installed either into an empty station or a print station. The flash cure unit must be powered by a separate supply, which should comply with the electrical data supplied by the manufacturer (*see data sheet for flash cure units*). When installing it into an empty station, the unit is controlled through a data lead which connects to a socket located at the back cover of the station. When installing it into a print station, this socket is located at the rear of the squeegee/print arm.



When connecting the flash cure unit, make absolutely sure to keep all the cables away from any moving parts (especially the turntable/moving pallets, etc.). Failure to do so may result in damage to the cable along with serious electrical damage to the flash cure unit and machinery.

Procedure for the installation of a flash cure unit into a print station



Before inserting a flash cure unit into a print station, the respective print station must be deactivated from the main control panel.

Move the squeegee carriage backward to its back stop position before installing the flash cure unit into the print station. The flash cure can be installed sideways into the print station afterwards. Subsequently, the electrical supply and data lead should be connected. An empty/blank screen frame (without mesh) should be loaded in the position of a normal screen in order to push and hold the screen holders away from the heated area to prevent any damage.



The pallets are only warranted to withstand temperatures of up to a maximum of 150° C. Exceeding this temperature will result in the cancellation of warranty for the pallets.





8. Danger Zones

Danger zones are the areas of the machine which during operation involve a certain risk for people owing to mechanical movement. This comprises all areas of the machine which involve rotary motion, clamping or other movements.

In this connection we indicate the following danger zones:

- Manual Work Area with Locating Surface and Unloading Point The manual work area is located on the left-hand side and the right-hand side of the control panel and is used for applying the substrate to the pallet as well as unloading it from the latter. When applying or unloading substrates, operators must always stand in front of and not between the pallets, in order to prevent getting caught between pallet and print station or control panel in case of a rotary motion of the carrousel (index).
- Area between Two Print Stations Access to the area between two print stations is barred by safety barriers. This area also involves the risk of getting caught between a pallet and a print station.
- Working/Printing Area The working/printing area involves the risk of getting limbs jammed between the squeegee carriage and rigid mechanical parts. Do not reach into these zones during the printing movement.



If any work is to be carried out with or on the machine that requires entering or placing one's hands into any of the danger zones, one of the following conditions must be met:

- 1. The main control switch has been switched OFF.
- 2. The EMERGENCY STOP push button has been pressed.
- 3. One of the respective safety barriers has been pushed and engaged.





9. Control of the Machine

This section explains the control features of the machine from the main touch screen.



This section illustrates the most important of the command screens, not all of which may be illustrated due to the very complex software. The command screens not illustrated in particular are those of a self explanatory nature.

9.1. Stopping the Machine in the event of an Emergency



There is an **EMERGENCY STOP** push button located on the main control panel. The operating staff must be aware of its location in order to stop the machine in the event of an emergency as quickly as possible.

If the operator detects any danger to personnel or the Synchroprint, he can immediately shut down the machine by pressing the **EMERGENCY STOP** push button.

On both the left and right hand side of the load/un-load stations there are two safety bars marked yellow/black, which stop the machine immediately when actuated.

Between each print station there are safety barriers marked yellow/black. If any one of these barriers is opened the machine will stop immediately.



When having dangerous electrical problems the main power switch must be used to disconnect the machine from the main supply voltage immediately.



These safety devices must not be used to switch off the machine under normal operation. Any EMERGENCY STOP presents an exceptional loading to the servo-motor and transmission etc. Excessive use will result in damage to the machine along with subsequent cancellation of the warranty.





9.2. Stopping the Machine in the event of Malfunction

If the main control system detects any electrical or mechanical malfunction, the main drive will be disabled/de-activated automatically for the safety and protection of the operating staff.

9.3. Putting the Machine into Operation

The machine is connected to the supply voltage by means of the machine's master switch. The machine control is started up with the "main control switch", a process that takes approximately 1 minute. Subsequently, the turntable with the pallets must be moved to its reference position (initialization).

The following points must be observed:

- Prior to each start-up, any possible defects of the Synchroprint must be rectified by authorized staff.
- The start-up of the machine must only be carried out by qualified and trained personnel knowing and observing all safety instructions.
- It must absolutely be ensured that only authorized persons are permitted in the work area of the machine, and that starting the machine will not endanger anybody.
- The functioning of all safety facilities/devices must be checked.
- All tools and foreign parts must be removed from the machine prior to its start-up.
- The operators must be aware of the function and position of all safety devices/facilities.

9.4. Configuration of the Control

The control of the Synchroprint consists of an IPC (Industrial PC) with touch screen and external inputs and outputs. Operation is carried out through the touch screen, which is attached to the main control panel.





9.5. Menu Structure

After power up, the initial screen is displayed. After pressing the button INITIALIZE the turntable must be moved to sensor position manually, the correct position is displayed on the touch screen. After 2 seconds on sensor position the fixing pin is activated and the display changes to the menu ADJUST automatically. Now it is possible to change directly to other main menus and back again.

The following main menus are existent:

- Adjust
- Manually
- Automatic
- Memory
- Basic Setup
- Help

9.6. Menu Design

The following design is identical at all main menus:

- The main menu buttons are at the head of the display, the active menu is marked red.
- At the bottom on the left side (next to the penguin) the actual control state is displayed. New commands will only be accepted in the "Ready"state.
- An active emergency stop is displayed at the bottom in the center. This can be caused by the emergency stop button, the safety bar or the safety barrier.
- If an error is not confirmed, this is displayed at the bottom on the right side. To confirm change to the LOG menu at BASIC SETUP.





9.7. Main Menu Images

9.7.1. Adjust

The adjust mode is used to enter all parameters required in order to set-up the machine for each particular print job/run. This includes cleaning and adjusting.



The machine setup is displayed in the center of the machine. To change the setup, first choose the affected station by touching on it and then change its configuration. The station can be deselected by touching it again. Using the buttons ALL and NONE quickly selects all stations or no station.

• "Enable Index" activates additional buttons for movement control for a few seconds.

Control Panel COMMON

- < indexes/moves the turntable directly to the next print station on the left.</p>
- > indexes/moves the turntable directly to the next print station on the right.
- CLEAN POSITION moves the turntable into the clean/half index position. On pressing the key ON the turntable will rotate to a mid-position, between the stations. Pressing the key again will return the turntable to its original position.
- PALLETCHANGE allows the operator to lock or release the pallets.



Control Panel SCREEN

- UP raises the turntable.
- DOWN lowers the turntable.
- LOCK/UNLOCK is used to lock and unlock the printing screens (screen clamps). To start a print cycle the screen must be locked, this is symbolized by a padlock.
- TABLELOCK unlocks the turntable.

Station Settings

- ACTIVE enables a station. Further options are displayed.
- INACTIVE disables a station.
- PRINTING STATION defines the station as a print station. Further options are displayed.
- DRYER STATION defines the station as a dryer station. Further options are displayed.
- PRINT CYCLE starts a print cycle or drying cycle with the programmed number of print and flood strokes.

Print Station Options:

- PRINT defines the number of print strokes at a print cycle.
- FLOOD defines the number of flood strokes at a print cycle.
- SQUEEGEE INWARD moves all squeegees to the inner position.
- SQUEEGEE OUTWARD moves all squeegees to the outer position.

Dryer Station Options:

- EXTERNAL chooses the external control of the drying time. A complete signal must be given by the dryer.
- INTERNAL chooses an internal control of the drying time. The time must be set in the field below.
- ON ROTATE starts drying at the beginning of an index.
- AFTER ROTATE starts drying at the end of an index.
- AFTER LIFT UP start drying after the machine has raised the turntable.

The options INTERNAL/EXTERNAL and ON ROTATE/AFTER ROTATE/AFTER LIFT DOWN can be deactivated in the service parameters. In this case, the last adjustment will be used and the buttons are blanked out.





9.7.2. Manually

This screen allows the machine to be operated in manual production mode. Every index can be controlled by the touch screen or an optional foot switch.



The following control buttons are displayed:

- INLET MODE is used for the sequential start of a new print job/run. It activates each selected print station/flash cure unit in sequence when commencing a production run. After the first complete printing cycle with all enabled print stations/flash cure units, the startup mode will be turned off automatically. (Prevents printing onto empty pallets).
- OUTLET MODE deactivates/switches off each selected print station/flash cure unit in sequence upon finish/completion of the production run. (Prevents printing onto empty pallets). A separate command screen will be displayed for choosing if the print job should end with (FLOODING) or without flood stroke (NO FLOODING).
- CLEAN POSITION moves the turntable into the clean/half index position. On pressing the key ON the turntable will rotate to a mid-position, between the stations. Pressing the key again will return the turntable to its original position.
- DRYERTIMES alternates between default display and dryer time adjust screen. Only the displayed functions change, the operating mode is still the same.
- START is used to start an index with print cycle. This can also be done by an optional foot switch. The first start command of a print job must always be given with the start button on the touch screen.





- RESET clears the counters PRODUCED, MISPRINTS and SKIPPED. OPEN AMOUNT is set to the AMOUNT value.
- MISPRINT increases OPEN AMOUNT and MISPRINTS by one.
- AMOUNT sets the desired quantity of the production job. The value can be changed with the up and down arrows or by direct number input after touching the field.
- "WAITTIME [SEC]" is used to delay the production. There are two separate controls for delay after lift down (lower control) or after lift up (upper control). To change the values just move the buttons to the left or to the right.

The following facts are displayed:

- TIME PER PIECE shows the actual cycle time.
- PIECE PER HOUR is the theoretical production amount per hour at constant, actual speed.
- REMAINING TIME calculates the balance time for the actual print job at constant, actual speed.

Screen if button "Dryertimes" is pressed:







9.7.3. Automatic

At automatic mode the index is started cyclical. After a print sequence is finished, the next index and print sequence will be started automatically. An index can be delayed by using the optional foot switch.

Adjust Manu	ally	Memory	Basic Setup
Inlet Mode	Produced		Amount
	Time per Piece	0	
Preheat Pallets	Piece per Hour	0	
Sample Mode	Remaining Time	0	Produced
			0
			Missprints
			0
Clean Position			Skipped
Dryertimes			0
			Open Amount
			0
	Waittime [sec]		Reset
	\bullet	0.0	
Start			Missprint
		0.0	
🔔 Ready		EMERGENCY	STOP Unverified Logentry

The following control buttons are available:

- INLET MODE is used for the sequential start of a new print job/run. It activates each selected print station/flash cure unit in sequence when commencing a production run. After the first complete printing cycle with all enabled print stations/flash cure units, the startup mode will be turned off automatically. (Prevents printing onto empty pallets).
- OUTLET MODE deactivates/switches off each selected print station/flash cure unit in sequence upon finish/completion of the production run. (Prevents printing onto empty pallets). A separate command screen will be displayed for choosing if the print job should end with (FLOODING) or without flood stroke (NO FLOODING).
- PREHEAT PALLETS is used to 'warm-up' the pallets. The machine will begin to cycle with only the flash cure units active. Button is only visible if dryers are active.
- SAMPLE MODE is used to print sample shirts. The number can be set at AMOUNT field (setting 0 or 1 prints one shirt). This function starts inlet and outlet mode automatically, no further adjustment is needed.
- CLEAN POSITION moves the turntable into the clean/half index position. On pressing the key ON the turntable will rotate to a mid-position, between the stations. Pressing the key again will return the turntable to its original position.



MADE IN AUSTRIA



- DRYERTIMES alternates between default display and dryer time adjust screen. Only the displayed functions change, the operating mode is still the same.
- START initiates the print job. The machine starts with an index followed by a print sequence and so on. An index can be delayed by using the optional foot switch.
- STOP interrupts the actual print job and displays a submenu with the following options available:
 - Outlet Mode Flooding: Outlet mode is started with flood stroke at the end.
 - Outlet Mode No Flooding: Outlet mode is started with print stroke at the end.
 - Stop:

- Ends production immediately without outlet mode.
- Continue: Continuous production.
- RESET clears the counters PRODUCED, MISPRINTS and SKIPPED. OPEN AMOUNT is set to the AMOUNT value.
- MISPRINT increases OPEN AMOUNT and MISPRINTS by one.
- AMOUNT sets the desired quantity of the production job. The value can be changed by the up and down arrows or by direct number input after touching the field.
- "WAITTIME [SEC]" is used to delay the production. There are two separate controls for delay after lift down (lower control) or after lift up (upper control). To change the values just move the buttons to the left or to the right.

The following facts are displayed:

- TIME PER PIECE shows the actual cycle time.
- PIECE PER HOUR is the theoretical production amount per hour at constant, actual speed.
- REMAINING TIME calculates the balance time for the actual print job at constant, actual speed.

Screen if button "Dryertimes" is pressed:



MADE IN AUSTRIA



9.7.4. Memory

In the screen menu "MEMORY" all parameters which belong to the print job can be saved and loaded again at a later date.

Х		Form1			_ ×
Adjust Manually	Automatic		Memory	Basic Setup	(?) Help
Actual Job: GFF					
Jobs					
1					
23665 BNM					
BNM					
GFF					
HJL					
JK 222					
ККООО					
MJJIOL					
NJKIH					
TEST					
Search		Save		Load	
Rename		Delete		Create	
🔔 Ready			EMERGEN	ICY STOP Und	onfirmed Log

The following control buttons are available:

- SEARCH searches all stored dataset for the terms to be entered.
- SAVE stores all actual parameters.
- LOAD reloads the selected job.
- RENAME changes the name of the selected job.
- DELETE deletes the selected job.
- CREATE creates a new job. The desired name must be entered.



9.7.5. Basic Setup

X MHMGui <2>		_ ×
Adjust Manually	Memory Basic Setup	(?) Help
Index Right Left Double Index		
Log Station Setup Language		
Ok		
🚴 Ready	EMERGENCY STOP Unconfirm	ned logentry.

BASIC SETUP is used to change fundamental parameters of the machine.

The following control buttons are available:

- INDEX RIGHT/LEFT defines the direction of the turntable at production.
- SINGLE/DOUBLE INDEX changes from single (normal) to double index mode. At double index the turntable moves two stations in one go. This can be used to work with 4 persons at the working area.
- LOG changes to the error display and history. All errors must be cleared before the machine can be started again.
- STATION SETUP displays the following station parameters:
 - Relay time for squeegee center position front and back.
 - Delay time before print and flood stroke

- Stroke speed for in and out movement (only at automatic version, at manual version the speed can be adjusted at the print arm). At automatic stations the speed can also be changed with the keypad.

• LANGUAGE changes the display language.



9.7.6. Help

At HELP you can find information about touch screen handling, additional explanations with regard to error messages and a software version history.

9.8. Error display

Error messages are displayed the following way:

The message is divided into the following parts:

- Error location (in this case: Printingstation 1).
 Shows where the error was detected on the machine. The following messages are possible:
 - Controlunit (= system PCB).
 - Printingstation X (printing station PCB at station number X).
 - Dryer X (drying station PCB at station number X).
 - Screen X (Screen positioning unit at station number X).
- Error message (in this case: squeegee is not on start position). Explanation of the respective error.
- Internal error variable.

An error message can be handled the following ways:

- Confirm: Clears an error if possible (error reason is no longer present).
- Log: Changes to error history.
- Help: Shows further information if available.

MADE IN AUSTRIA



10. Trouble shooting



Before trying to locate any fault, it must be made sure that the machine may not move unintentionally. Before entering the danger zones, one of the machine's safety facilities/devices must be actuated; in case of required work on current-carrying parts, the machine must be cut off from the supply voltage (using the main power switch).

Error description	Possible reason	Fault clearance
Touch screen does not boot up	Main power switch switched off.	Switch on main power switch!
	Power supply of machine is missing.	Is frequency converter display active? YES: Power supply existent. NO: Reestablish power supply!
	No 12V power supply at touch screen.	Remove front cover of machine! Is LED at 12V power supply unit lightning? YES: Power supply existent. NO: Fuse or power supply unit defective.
	Touch screen not connected to connection PCB	Check wiring connection PCB to touch screen (see wiring diagram)!
	Wrong wiring of main control switch at touch screen housing.	Put touch screen out of housing and check wiring of ON/OFF switch (see wiring diagram)!
	Connection PCB not connected with system PCB.	Check ribbon cable from connection PCB to system PCB (see wiring diagram)!
Safety level can not be adjusted.	Safety key is not connected to connection PCB.	Check wiring connection PCB to safety key (see wiring diagram)!
	Wrong wiring of safety key at touch screen housing.	Put touch screen out of housing and check wiring of safety key (see wiring diagram)!
Squeegee does not toggle at squeegee	Squeegee pressure too low.	Adjust pressure control at print station!
carriage movement.	Valve not actuated.	Check wiring POT PCB to squeegee valve (see wiring diagram)!
Unlock screens does not work.	Wrong low pressure adjustment.	Check regulator adjustment of left pressure regulator (0,3MPa)!
	Valve not actuated.	Check wiring connection PCB to squeegee valve (see wiring diagram)!

10.1.Basic errors (without error message)





10.2. Error messages control system

Error message	Error description	Action
can't move taker, taker	Incorrect signal from proximity	Check cabling. Replace the affected
is locked	switch transport pin.	component.
Command Timeout	'Time out' limit for turn table	Check parameter (default: 4s). Is
rotate command	movement exceeded.	the rotary drive blocked or is the
		main drive unit (frequency
		converter, motor, transport pin)
		working correctly?
air pressure too low	Failure signal from main air	Check air supply. Test Function of
(minimum 5 bars)	pressure sensor.	sensor.
taker isn't on start	Main drive didn't reach the left or	Check main drive position and the
position (totally left or	right end position.	position sensors. Change if
right)		defective.
tables aren't locked (fix	Incorrect signal from proximity	Check sensor and function of fixing
pin isn't down)	switch fixing pin.	pin.





Error message	Error description	Action
both squeegee initiators	The signals for front and rear	Check squeegee stroke length
are active at the same	position of the squeegee carriage	adjustment! Sensor or wiring
time	are active at the same time.	defective.
squeegee is not on start	Squeegee carriage is not on front	Move squeegee carriage to position
position	or rear position.	manually!
timeout waiting for	Sensor for front or rear position of	Check squeegee stroke length
squeegee initiator signal	squeegee carriage is not active	adjustment! Maybe squeegee
	within the time limit.	carriage is blocked. Is the metal
		strip of the squeegee stroke length
		adjustment in place? Check
		distance between sensor and metal
		strip! Sensor or wiring defective.
timeout waiting for	The complete signal of the dryer	Check parameters of dryer unit
dryer finish signal	unit is not active within the time	(internal for controller timing,
	limit.	external for complete signal of
		dryer)! Is the dryer programmed
		appropriately (positive edge for
		complete)? Check wiring between
		machine and dryer!
palettes unlocked	Wrong position of pallet release.	Check connection of pallet cylinder
	Signal of the pallet switch does	sensor! Is air at pallet release
	not coincide with cylinder signal.	cylinder connected correctly? Is
		pallet release valve connected
		correctly? Maybe cylinder is
		blocked. Sensor or wiring
		defective.
emergency stop	Safety circuit has been interrupted.	Check if safety barrier has been
		emergency stop button has been
		pressed! Check switches and wiring! Is
		safety device connected correctly?
		Safety device defective.
emergency stop active	Some has tried to operate the	Check the emergency stop conditions,
	machine with the EMERGENCY STOP activated.	eliminate cause of fault and reset!
device not initialized	Parameters for system PCB are	Turn machine off and on again with
	missing. This can happen at system	main power switch.
	PCB reset without IPC reset.	
protocol queue full,	Problems with data transfer.	Change wiring or circuit boards at the
transmission error		respective station!





11.Shutting Down the Synchroprint

11.1.Switching the Machine Off After Normal Operation

The following order of operations must be observed when switching off the Synchroprint after normal operation:

- Clean all print stations.
- Shutdown control unit with main control switch and wait until touch screen switches off automatically.
- Switch off the Synchroprint with the main power switch.

11.2.Long-term Shutdown

This refers to a scheduled long-term shutdown of the Synchroprint. The following steps must be carried out:

- Remove all the printing screens along with the pallets.
- Clean all print stations.
- Shutdown control unit with main control switch and wait until touch screen switches off automatically.
- Switch off the Synchroprint with the main power switch.
- Switch off the compressed air supply.
- Disconnect the power supply.
- Carry out a thorough cleaning of the machine.
- Carry out any necessary maintenance work.

11.3.Permanent Shutdown of the Machine

If the Synchroprint is to be shut down permanently or decommissioned (e.g. disposed of/scrapped), upon disassembly all individual parts must be disposed of according to their class of substance, in accordance with all respective regulations in effect at that time in the machine's particular location/country, through a licensed waste-disposal company.





12. Maintenance of the Synchroprint



Before doing maintenance work the machine must be cut off from the supply voltage using the main power switch).

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

Task	Frequency	Comment/Action
Daily cleaning	Daily	Remove all residues remaining from production materials
		such as inks and adhesives etc. from the Synchroprint.
		Clean, tidy and sweep the print shop area.
Check water	Daily	The water separator/trap must be checked for condensed
separator/trap		water. If the glass is completely full of water the automatic
		relief aperture may become clogged or defective. In this
		case twist off the water separator and clean or change it.







Task	Frequency	Comment/Action
Weekly cleaning	Weekly	Wash off all anodized parts of the Synchroprint with an appropriate cleaner. Clean all inspection glasses and displays. Clean or replace the protective foil on the touch screen.
Wipe the sealing bands clean on the underside of all linear profiles	Weekly	The sealing bands on the underside of the linear profiles must be wiped clean thoroughly and lubricated with an oil-soaked cloth.



Task	Frequency	Comment/Action
Lubrication	Every 2 weeks	The machine must be lubricated via the grease nipple
center shaft	for the first 6	located on the centre shaft.
	months, then	
	quarterly	
	thereafter	
Lubrication	Every 6 months	The fixing pin and the transport pin must be lubricated
pins		every 6 months through the lubrication nipples.

MHM recommends "Berner Heavy-Duty Multi-Purpose Grease" or comparable grease with the following technical specifications:

- Water-repellent, lithium grease
- Minimum melting point of approx. +195° C

Effective lubrication range from -20° C to +120° C



Clogged valve silencers cause lowered speed of pneumatic functions. In that case the silencers must be changed.







13. Pneumatic diagram





14. Terms of the Guarantee

The terms of the guarantee are detailed in the General Terms and Conditions of MHM GmbH.

15. Limitation of liability

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

- Improper use of the Synchroprint.
- Incorrect assembly, operation or maintenance of the Synchroprint 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 Synchroprint.
- Failure to comply with the Operating Instructions.
- Unauthorised modifications to the Synchroprint (e.g. disassembly of original MHM components and/or use of any non-original MHM components)
- Unauthorised 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 unauthorised 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 Synchroprint by untrained personnel.

16. Support, Customer Service and Hotline

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

