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# User Manual

## Roller Transport Developing Machines

Print Line (50cm – 80cm)



EN ISO 9001



**DNV**

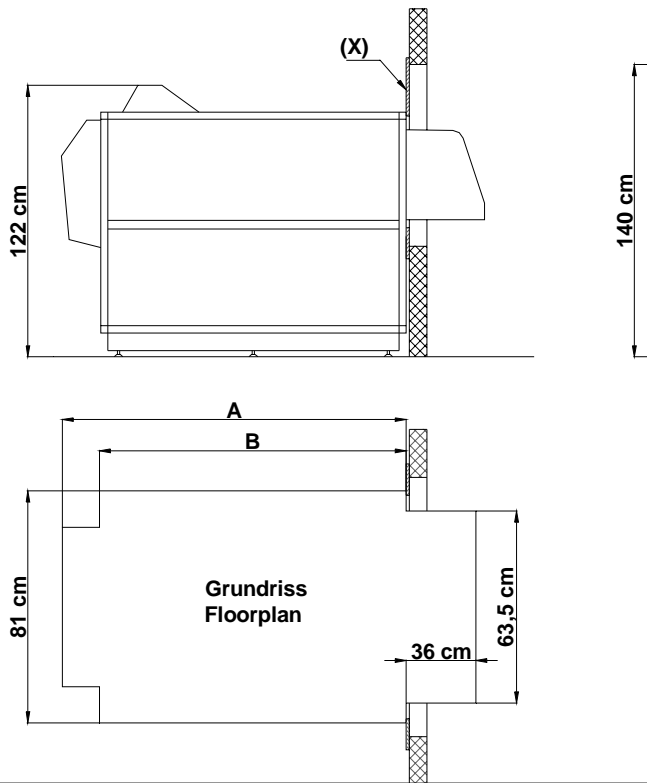
Certified Company

## **Safety Precautions**

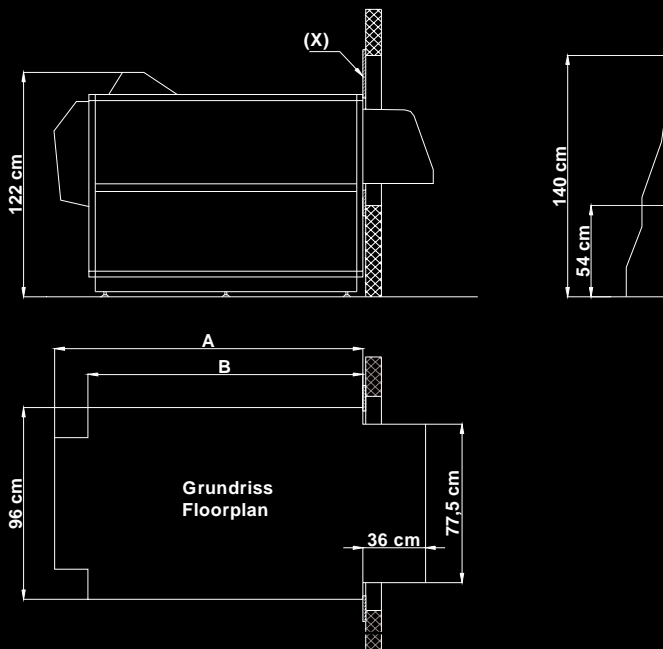
Your photographic equipment is powered by mains electricity, and is designed to comply with international electrical safety standards. However, basic safety precautions must always be followed when operating electrical equipment, including the following:

1. Read and understand all instructions
2. Close supervision is necessary when equipment is being used by inexperienced personnel.
3. Certain parts of the equipment become very hot with continuous use. Take care to avoid burns.
4. Do not operate equipment that has been dropped or damaged, or has damaged electrical leads. Have the equipment examined by qualified personnel.
5. Do not allow any electrical leads to touch hot surfaces.
6. Avoid scuffing any electrical leads that hang over the edge of working surfaces. Ensure the leads are arranged such that they cannot be pulled or tripped over (this also applies to any extension leads).
7. Ensure extension leads are of suitable current rating to prevent the lead overheating.
8. Avoid contact with processing solutions
9. Do not dismantle the equipment unless you are qualified to do so. Incorrect assembly can cause hazards both to yourself and to the equipment.
10. Switch mains power off before connecting or disconnecting any plugs or before opening the electrical panel doors.
11. Always obey local codes of practice, particularly for installation requirements.

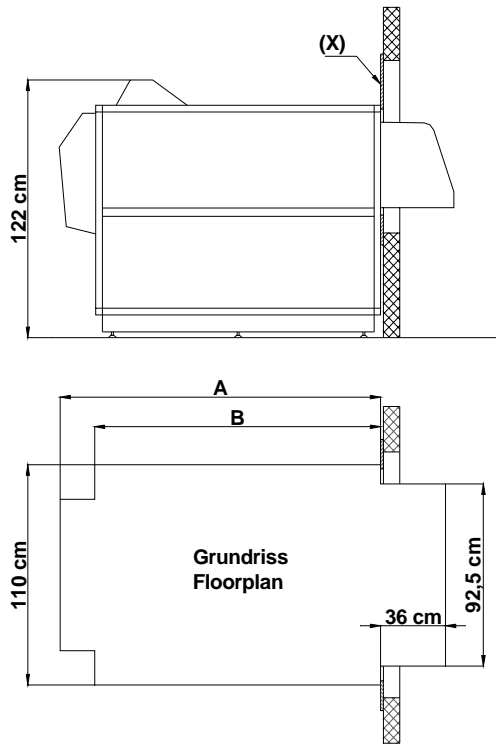
**Do not destroy these instructions**



MODELL	50 RA 70	50 RA 70	50 RA 95	50 RA 95	50 RA 120	50 RA 120
Number of Tanks	4-Tank	5-Tank	4-Tank	5-Tank	4-Tank	5-Tank
Measurement A	143 cm	158 cm	143 cm	158 cm	143 cm	158 cm
Measurement B	125 cm	140 cm	125 cm	140 cm	125 cm	140 cm
Electrical supply	1x230V N	50/60Hz	4,2KW	or 2x110V	if required	
Power loading	3,6 kw	3,6 kw	3,6 kw	3,6 kw	4,7 kw	4,7 kw



	66 RA 95	66 RA 95	66 RA 120	66 RA 120
	4-Tank	5-Tank	4-Tank	5-Tank
Measurement A	143 cm	158 cm	143 cm	158 cm
Measurement B	125 cm	140 cm	125 cm	140 cm
Elektrischer Anschluß	1x230V N	50/60Hz	or 2x110V	if required
Power loading	3,6KW			5,5KW



MODELL	80 RA 70	80 RA 70	80 RA 95	80 RA 95	80 RA 120	80 RA 120
Number of Tank	4-Tank	5-Tank	4-Tank	5-Tank	4-Tank	5-Tank
<b>Measurement A</b>	143 cm	158 cm	143 cm	158 cm	143 cm	158 cm
<b>Measurement B</b>	125 cm	140 cm	125 cm	140 cm	125 cm	140 cm
Electrical supply	3x400V N		50/60Hz or 3x220V		if required	
Power loading	5,5 kw		7,0 kw			

MODELL	<b>80 RA 180</b>					
Number of Tank	<b>5-Tank</b>					
<b>Measurement A</b>	<b>276</b>					
<b>Measurement B</b>	<b>226</b>					
Electrical supply	3x400V N		50/60Hz or 3x220V		if required	
Power loading	10,8 kw					

MODELL	50 RA 70	50 RA 70	50 RA 95	50 RA 95	50 RA 120	50 RA 120
Number of Tanks	4-Tank	5-Tank	4-Tank	5-Tank	4-Tank	5-Tank
Chemical volume developer	9,5 litres	9,5 litres	13 litres	13 litres	18 litres	18 litres
Chemical volume bleachfix	9,5 litres	9,5 litres	13 litres	13 litres	18 litres	18 litres
Volume wash 1	9,5 litres	9,5 litres	13 litres	13 litres	18 litres	18 litres
Volume Wash 2	9,5 litres	9,5 litres	13 litres	13 litres	18 litres	18 litres
Volume Wash3		9,5 litres		13 litres		18 litres

MODELL	66 RA 70	66 RA 70	66 RA 95	66 RA 95	66 RA 120	66 RA 120
Number of Tanks	4-Tank	5-Tank	4-Tank	5-Tank	4-Tank	5-Tank
Chemical volume developer	11 litres	11 litres	15 litres	15 litres	20 litres	20 litres
Chemical volume bleachfix	11 litres	11 litres	15 litres	15 litres	20 litres	20 litres
Volume wash 1	11 litres	11 litres	15 litres	15 litres	20 litres	20 litres
Volume Wash 2	11 litres	11 litres	15 litres	15 litres	20 litres	20 litres
Volume Wash3		11 litres		15 litres		20 litres

MODELL	80 RA 70	80 RA 70	80 RA 95	80 RA 95	80 RA 120	80 RA 120
Number of Tank	4-Tank	5-Tank	4-Tank	5-Tank	4-Tank	5-Tank
Chemical volume developer	14 litres	14 litres	18 litres	18 litres	22 litres	22 litres
Chemical volume bleachfix	14 litres	14 litres	18 litres	18 litres	22 litres	22 litres
Volume wash 1	14 litres	14 litres	18 litres	18 litres	22 litres	22 litres
Volume Wash 2	14 litres	14 litres	18 litres	18 litres	22 litres	22 litres
Volume Wash3		14 litres		18 litres		22 litres

MODELL	80 RA 180
Number of Tank	5-Tank
Chemical volume developer	37 Litres
Chemical volume bleachfix	37 Litres
Volume wash 1	37 Litres
Volume Wash 2	37 Litres
Volume Wash3	

# FACTORY Settings

MODEL

50 RA 70

50 RA 70

50 RA 95

50 RA 95

50 RA 120

50 RA 120

4-Tank

5-Tank

4-Tank

5-Tank

4-Tank

5-Tank

	50 RA 70 4-Tank	50 RA 70 5-Tank	50 RA 95 4-Tank	50 RA 95 5-Tank	50 RA 120 4-Tank	50 RA 120 5-Tank	
Replenishment per / Paper							
Replenishment per / Duratrans							
Replenishment pump starts P							
Replenishment pump starts D							
Replenishment value per cycle							
Paper / DEV							
Paper / BX							
DURA / DEV							
DURA / BX							
Pump adjustment P - DEV							
Pump adjustment P - BX							
Pump adjustment D - DEV							
Pump adjustment D - BX							
Pump running Time P							
Pump running Time D							
Developing time Paper							
Developing time Duratrans							
<b>Programming paper</b>							
TEMP 1							
TEMP2							
DRY							
SPPEED							
REP1							
REP2							
P1 ST							
Water							
<b>Stand-By Program</b>							
DRY							
STB							
BAR							
WON							
WOFF							
WON							
WOFF							
W2							
P1							
<b>Programming Duratrans</b>							
TEMP 1							
TEMP2							
DRY							
SPPEED							
REP1							
REP2							
P1 ST							
Water							
<b>Stand-By Program</b>							
DRY							
STB							
BAR							
WON							
WOFF							
WON							
WOFF							
W2							
P1							
Motor							
Type							

MODEL	66 RA 70 4-Tank	66 RA 70 5-Tank	66 RA 95 4-Tank	66 RA 95 5-Tank	66 RA 120 4-Tank	66 RA 120 5-Tank
Replenishment per / Paper						
Replenishment per / Duratrans						
Replenishment pump starts P						
Replenishment pump starts D						
Replenishment value per cycle						
Paper / DEV						
Paper / BX						
DURA / DEV						
DURA / BX						
Pump adjustment P - DEV						
Pump adjustment P - BX						
Pump adjustment D - DEV						
Pump adjustment D - BX						
Pump running Time P						
Pump running Time D						
Developing time Paper						
Developing time Duratrans						
<b>Programming paper</b>						
TEMP 1						
TEMP2						
DRY						
SPPEED						
REP1						
REP2						
P1 ST						
Water						
<b>Stand-By Program</b>						
DRY						
STB						
BAR						
WON						
WOFF						
WON						
WOFF						
W2						
P1						
<b>Programming Duratrans</b>						
TEMP 1						
TEMP2						
DRY						
SPPEED						
REP1						
REP2						
P1 ST						
Water						
<b>Stand-By Program</b>						
DRY						
STB						
BAR						
WON						
WOFF						
WON						
WOFF						
W2						
P1						
Motor						
Type						



MODEL

80 RA 180

5-Tank

Replenishment per / Paper			
Replenishment per / Duratrans			
Replenishment pump starts P			
Replenishment pump starts D			
Replenishment value per cycle			
Paper / DEV			
Paper / BBX			
DURA / DEV			
DURA / BX			
Pump adjustment P - DEV			
Pump adjustment P - BX			
Pump adjustment D - DEV			
Pump adjustment D - BX			
Pump running Time P			
Pump running Time D			
Developing time Paper			
Developing time Duratrans			
<b>Programming paper</b>			
TEMP 1			
TEMP2			
DRY			
SPPEED			
REP1			
REP2			
P1 ST			
Water			
<b>Stand-By Program</b>			
DRY			
STB			
BAR			
WON			
WOFF			
WON			
WOFF			
W2			
P1			
<b>Programming Duratrans</b>			
TEMP 1			
TEMP2			
DRY			
SPPEED			
REP1			
REP2			
P1 ST			
Water			
<b>Stand-By Program</b>			
DRY			
STB			
BAR			
WON			
WOFF			
WON			
WOFF			
W2			
P1			
Motor			
Type			

MODEL	80 RA 70 4-Tank	80 RA 70 5-Tank	80 RA 95 4-Tank	80 RA 95 5-Tank	80 RA 120 4-Tank	80 RA 120 5-Tank	
Replenishment per / Paper							
Replenishment per / Duratrans							
Replenishment pump starts P							
Replenishment pump starts D							
Replenishment value per cycle							
Paper / DEV							
Paper / BX							
DURA / DEV							
DURA / BX							
Pump adjustment P - DEV							
Pump adjustment P - BX							
Pump adjustment D - DEV							
Pump adjustment D - BX							
Pump running Time P							
Pump running Time D							
Developing time Paper							
Developing time Duratrans							
<b>Programming paper</b>							
TEMP 1							
TEMP2							
DRY							
SPPEED							
REP1							
REP2							
P1 ST							
Water							
<b>Stand-By Program</b>							
DRY							
STB							
BAR							
WON							
WOFF							
WON							
WOFF							
W2							
P1							
<b>Programing Duratrans</b>							
TEMP 1							
TEMP2							
DRY							
SPPEED							
REP1							
REP2							
P1 ST							
Water							
<b>Stand-By Program</b>							
DRY							
STB							
BAR							
WON							
WOFF							
WON							
WOFF							
W2							
P1							
Motor							
Type							

# INTRODUCTION

Congratulations upon your decision to buy a  
**COLENTA PROCESSOR.**

Your purchase has been designed to meet the highest technical standards.

Some outstanding design features are:

- \*) compact, space-saving design
- \*) full automatic processing cycle
- \*) smooth roller transport system
- \*) low tank volumes
- \*) electronically controlled temperature system
- \*) automatic replenishment
- \*) low energy consumption

This manual is a guide to installation and routine use of your  
**COLENTA PROCESSOR.**

## **GENERAL SAFETY INSTRUCTIONS**

- \*) Staff responsible for installation and maintenance of the processor must familiarize themselves with with this safety instructions.
- \*) Whilst carrying out service work on the processor safety glasses must be worn.

### **MECHANICAL**

- \*) Take care not to let any unsuitable material enter the processor.

### **ELECTRICAL**

- \*) Prior to servicing, switch off the power at the main circuit switch ensuring it cannot be accidentally switched back on. Observe safety rules if machine has to be switched on during servicing (e.g. fault finding).
- \*) Built in safety devices are not allowed to be bypassed or to be put out of function, failed electrical components must be replaced by original spare parts.
- \*) Repairs to electrical components must meet "safety and test rules for repairs" (VDE 106, part two, VDE 0701, VBG 4, VBG 103).
- \*) Remove any jewellery that may come into contact with electrical components.
- \*) All connections must be grounded according to safety instructions.
- \*) All dampness in the base tray must be eliminated to prevent short circuits.

### **CHEMICAL**

- \*) Follow manufacturer's instructions for chemistry.
- \*) Wear safety glasses and protective gloves whilst working with chemicals.
- \*) Ensure room is adequately ventilated.
- \*) In case of contact with the eyes flush with plenty of cold water for approximately fifteen minutes and seek medical advice.
- \*) Follow environmental instructions when disposing of used chemistry.

## PRE- INSTALLATION

- \*) Site preparation, e.g., water supply, drainage electrical supply must be completed prior installation.

### LOCATION

- \*) Processor can be installed "through-the-wall" or completely in the darkroom. Required measurements can be taken from the processor specification sheet. For "through-the-wall", a purpose built panel is required (optional accessory).

### ELECTRICAL SUPPLY

- \*) All electrical connections must meet national safety requirements. Correct fuses and electrical requirement can be taken from the processor specification sheet.

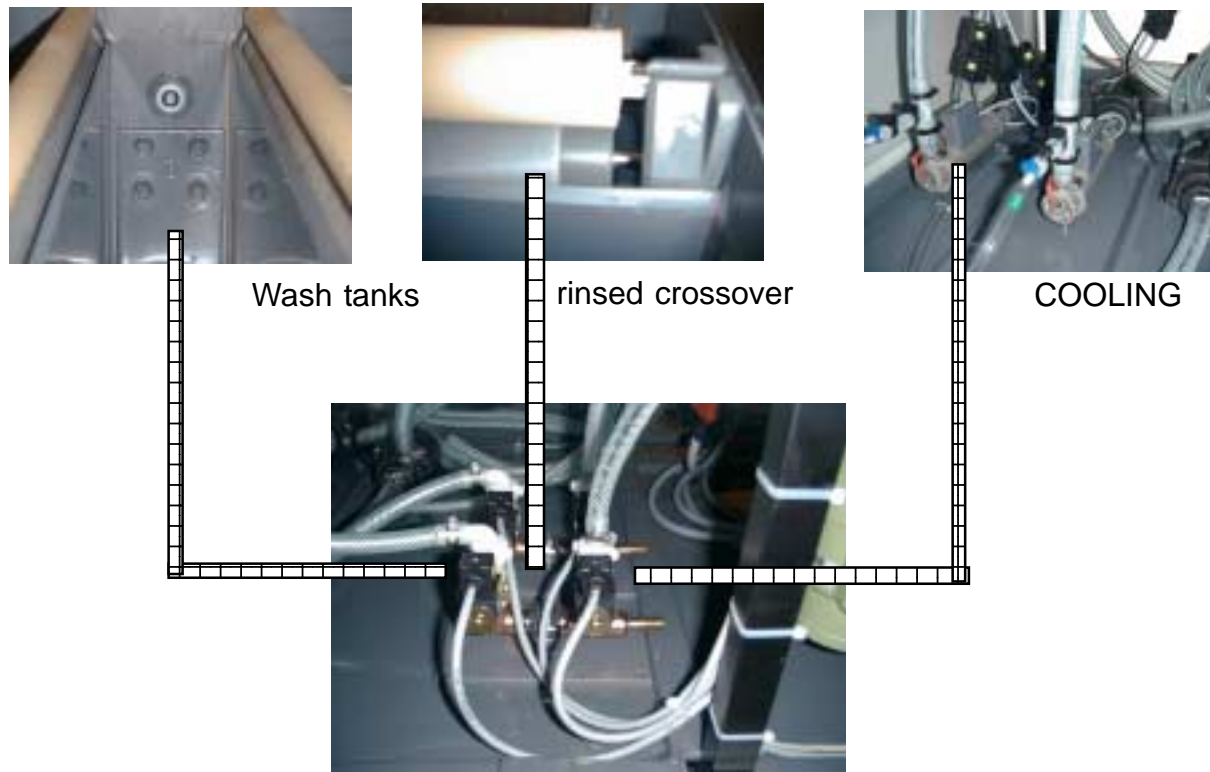


### WATER SUPPLY

- \*) The cold water supply pipe must have a stopcock fitted connection to the processor and should be done by using the 3/4" hose connector, supplied. Easy access to the water tap should be provided as it has to be opened and closed daily.
- \*) A built in magnetic valve reduces water consumption to a maximum of x ltr./minute (see data sheet)



## WATER CIRCUIT

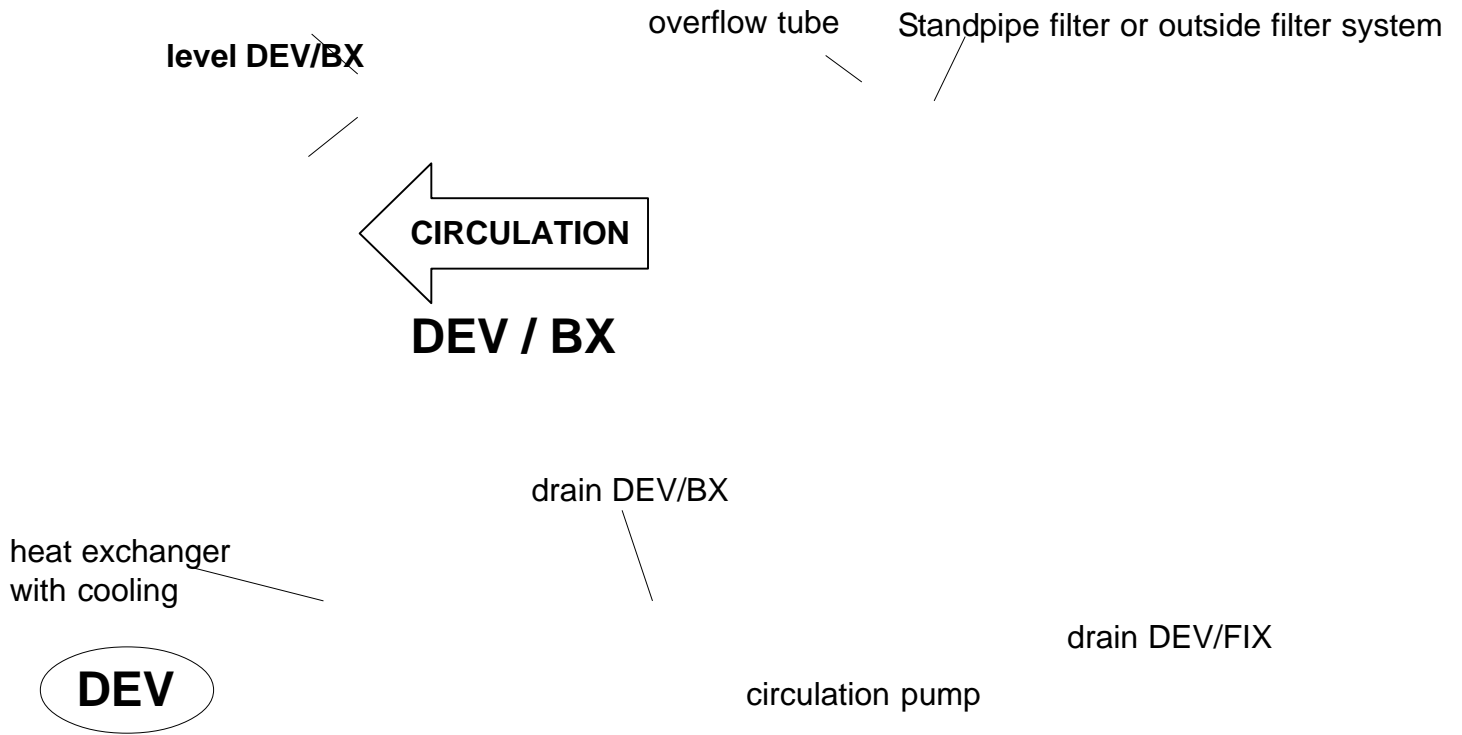


## WATER DRAIN

- \*) The wash water should be drained separately according to local environmental regulations. The processor comes with the suitable hose connections.
- \*) The level of the water drain should be as low as possible with a minimum drainpipe diameter of  $\varnothing$  40 mm.



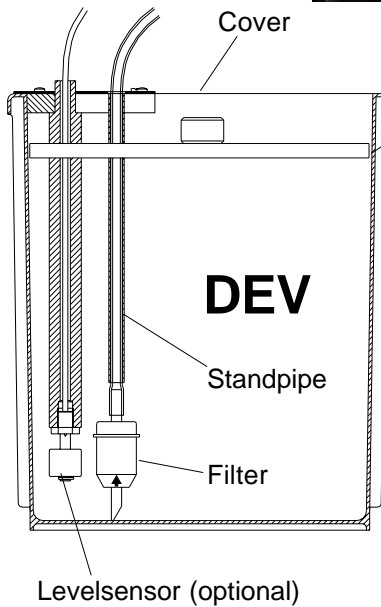
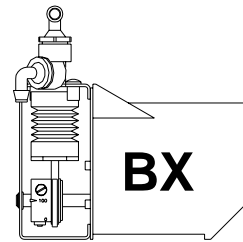
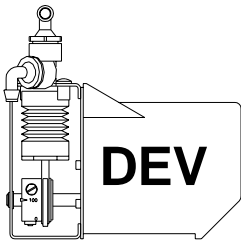
## 1.2.5 CHEMISTRY CIRCUIT / CHEMISTRY DRAINS



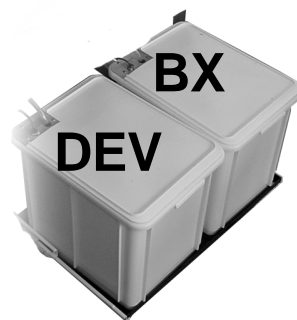
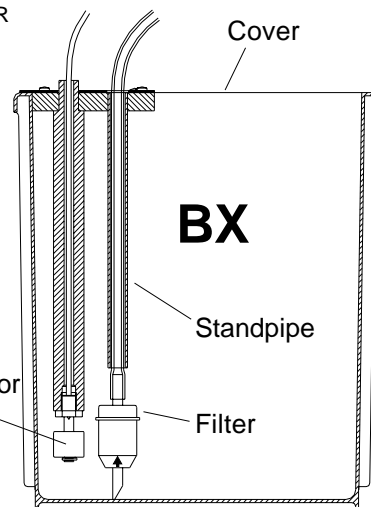
The DEV / BX circuit is equipped with a filtersystem, the filter should be changed from time to time.

## 1.2.6 REPLENISHMENT SUPPLY

- \*) 30 litre replenishment tanks are supplied with the processor.  
50 litre and 100 litre tanks are available as optional accessories.  
Used developer can be collected separately.
- \*) Used fixer can be collected separately or passed through a silver recovery system.

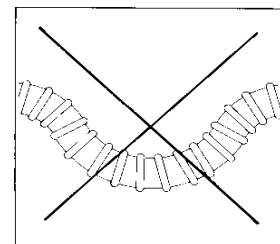


USE FLOADING LID  
TO PROTECT DEVELOPER  
AGAINST OXYDATION



### WARNING

- \*) Do not use brass or copper in the drainage system.
- \*) Chemistry disposal must be in accordance with local environmental regulations.
- \*) To avoid back pressure in the drain, the hoses should be free of bends and with a constant downward gradient.





## Connecting Pumps, Heaters (electrical connections)

Place the group of cables on the floor in front of the wet part of the processor and sort according to length.

Connect the cables in the lower part of the machine, checking reference numbers on the corresponding connectors or colour code; do not forget to connect the bleach spray bar pump (not every machine) and the fan between the feed table and the developer tank.



## Connecting Replenishment Sensors

1. Remove the feed table cover (2 lateral screws)
2. Unscrew the IR-sensors covering plate and pull up to extract it
3. Remove sensor board mounting plate
4. Insert the connecting cable from the light room into the dark room, guiding it between the developer tank and the feed table, then through the appropriate hole in the back panel. Connect the wires according to electrical schematics. Insert the PC-boards holding bar into its seat on the feed table.
5. Insert the ground wire in the same way and attach it to the screw underneath the feed table (metallic part).



## Connecting Magnetic Valves

The magnetic valves are placed in the bottom tank underneath the dryer, on the back side of the machine

Connect each valve, mounting the appropriate magnetic head on top of the valve (check reference numbers); do not forget to insert the seal and to screw the valve head.

### Note

Magnetic valves' heads can easily be removed by pressing and turning them a quarter turn (bayonet mount).



## Connecting The Transport Motor

Connect the transport motor as shown in the schematics.

## Install The Drive Chain

1. Remove top metal covers to provide access to the drive sprockets on both the wet-section and dryer modules.
2. Unscrew and remove the protection on the first driving gear of the developer rack to facilitate chain installation.
3. Loosen chain tensioner
4. Insert the chain on the last driving gear of the dryer (exit side), pass it over the first driving gear of the dryer, then under the racks' driving gears; insert the chain under the transport motor gear. Join the two ends of the chain, passing over the chain tensioner located on the side of the dryer. Use appropriate pliers - or unscrew the motor to loosen the chain - to insert the chain link, the joining piece and the fastening clip.
5. Install the chain tensioner guard



## **Connecting The Processor To The Water Supply**

Use reinforced flexible pipes for the connection between the water panel and the processor; the pipes should be inserted into the processor through one of the holes drilled on the sides of the bottom tank

### **Water Pipes**

Connect all pipes located below the dryer to the magnetic valves, making sure that the reference numbers on the pipes correspond to those on the pumps.

### **Connecting To The Drain**

The main connection to the waste water drain is located underneath the developer tank or last tank, on the front side of the unit. Hard PVC elbows and pipes are delivered with the machine and can be used to build the connection to the drain. As for the water supply pipes, the drain should leave the processor through one of the holes drilled on the sides of the bottom tray.

All chemical solutions overflows must be collected according to local regulations. Flexible pipes connected to the tanks overflows are located in the lower part of the processor. They should also be installed so that they leave the processor through one of the holes drilled on the sides of the bottom tray.

### **Connecting To The Electrical Mains Supply**

All connections to the mains electrical supply should be made by an authorised technician, according to the machine's electrical schematics. The cables should be installed so that they enter the processor through one of the holes drilled on the sides of the bottom tray.

## Installing The Racks

1. Verify that all filters are correctly placed inside the housings.
2. Rinse the tanks thoroughly, **then half fill them with water** to limit damage if the rack inadvertently falls into the tank.
3. Install the racks according to the reference numbers, starting with the developer (first tank) and using the special hooks provided with the processor.

### Note

Always use the special hooks when lifting or transporting the racks. Failure to do so may lead to bent or damaged rollers.

4. Install the lower part of the developer rack at the bottom of the first tank so that it stands against the overflow pipe; take the upper part of the rack with the hooks and lower it into the tank, making sure that it is correctly set onto the lower part.
5. Install the other racks in the same way and in the correct order (numbering starts from tank 1 - developer).
6. Turn on the transport motor and check rotation.
7. Push each rack towards the driving gear so that it is well engaged. Insert the PVC spacing blocks on each side of the racks.



Drive gear



Rack drive roller - Square pin

8. Install the crossover rollers between the tanks, then the corresponding bearings according to the reference numbers.

**Important:**

**Check - and if necessary tighten - all fastening bridles in order to ensure perfect tightness of all seals and pipe connections**

**Dryer Rack**

When the axle face the square hole of the driving gear at the back of the processor, switch on the transport motor and push the dryer rack fully towards the driving mechanism to engage the axle into the gear.

## Connecting To The Replenishment Tanks

The replenishment tanks are delivered with the processor. Each tank has a floating lid (with an indent in a corner for the pump feed tube) and a cover. Be careful not to obstruct the air inlets / outlets with the replenishment tanks.

Use the flexible tube included with the machine to connect the tanks to the replenishment pumps. Start with the developer replenishment system.

1. Heat the end of the plastic tube and insert it onto the pumps input; tighten with a plastic clip
2. Guide the tube along the tank underneath the processor and behind the electrical panel, then pass it through one of the side holes below the dryer.
3. Cut the tube (leaving enough length to reach the replenishment tank) and stretch the last 30cm so that the tube can be inserted into the hard PVC pipe.
4. Insert the PVC pipe through the hole in the cover of the replenishment tank, leaving about 3cm protruding.
5. Unscrew the filter joining ring, insert the fastening clip on the tube and the tube on the filter, then screw back the tube / filter assembly.
6. Place the cover on top of the replenishment tank and adjust the height of the hard PVC tube if necessary.
7. Mark both ends of the plastic tubing and the replenishment tank with the corresponding code, for example „DE“ = developer.
8. Repeat these steps for other replenishment lines.

## Checking The Transport Motor Rotation

1. Switch the transport motor on by pressing the „MAN“ key on the control panel. The motor gear should turn anticlockwise. If this is not the case, change the connections as described in the schematics.
2. With the motor still running, check the speed value on the control panel display. If the value is „0“, invert the black wire and the red wire in the motor connection box.

## Motor Connection Box And Chain Protection

Close the motor connection box and screw the first protection device. Switch on the motor for a final check. Switch off the motor and tighten the driving gear blocking screws. Install the second chain protection device.

## **Final Assembly**

1. Install the crossbars on the vertical posts; remove the plastic protection from upper metal top covers and position them on the posts.
2. Re-check all plumbing connections and pump operation before draining water and filling with chemical solutions.
3. Drain the water from the tanks
4. Install the lateral panels and the access panel below the feed table. Place the covers on top of the processing tanks.

## **Final Checks**

1. Set the machine to programming mode and enter data to meet all required processing parameters in the programme options provided.
2. Set the weekly timer as described.
3. Prepare the chemical solutions and fill the tanks.
4. Check replenishment cycles.
5. Check the processing temperature in the chemical tanks and adjust if necessary. These temperatures are controlled by the software.
6. Check the development time for each program.
7. Complete photographic tests (test strips etc.).



# Weekly Timer

## Operating instructions EM/1 digi 20

504241 3887 02 01.03 2014 15 84 - 001 003 91 - RD 11 08 19 7

### 1. Notes on safety

Installation must be performed and inspected by a specialist or under his supervision.

#### For assembly:

- Suitable for use in ambient conditions with normal contamination.

#### For operation:

- We place very exacting demands on the electromagnetic compatibility (EMC) of the electronics when developing our products. The interference immunity achieved as a result significantly exceeds the current requirements of the corresponding EN standards.
- In individual cases, check whether additional protective measures are still necessary, e.g. installation of appropriate components (varistor, suppresser diodes, RC elements).
- In extreme cases, installation of another subassemblies is recommended, e.g. isolating relay or power contractor, mains suppresser filter.

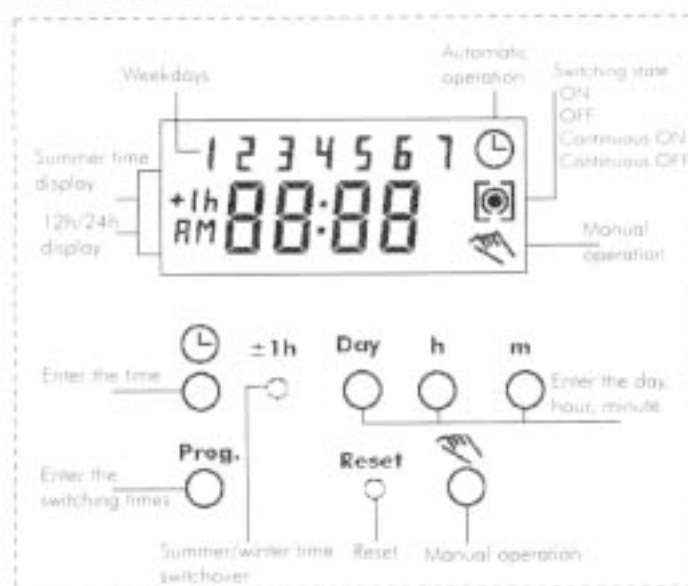
#### For operation:

- No metallic, pointed objects (e.g. needles) may be used on keys which are operated with a tool.

### 2. Connection



### 3. Display/control elements



### 4. Putting into operation



Bring the electronics into a defined state.

Press Reset 1x.  
For approximately 2 seconds you see all display elements, followed by the defined state.

The digits for the weekdays flash.

#### Setting the time and date



Press the key and keep it pressed.

Set the weekday with the Day key.  
1 = Monday, 2 = Thursday... 7 = Sunday



with the h key hours  
with the m key minutes

#### Notes:

If you press the keys h and m for more than 2 seconds, the digits are incremented more quickly.

Release the key.  
The colon now flashes every second.

### 5. Entering switching commands

You define the weekdays, the switching times and the switching state.

Symbol: - ON, - OFF

#### Selecting free memory spaces:

Press the Prog key as often as necessary until the appears. (The digits 1 to 7 are visible).  
Release the key.



#### Setting the weekdays

with the Day key  
1 = Monday, 2 = Thursday... 7 = Sunday



Select the defined combination of the weekdays or single days.  
Example: Monday - Friday

#### Setting the switching times:

with the h key hours  
with the m key minutes



#### Setting the switching state

with the key  
 - ON or - OFF  
Press the Prog key 1x

The input is ended.



Enter the next switching command (see above) or  
Press the key 1x.  
The display shows the current time.

#### Note:

After programming is complete, and you return the timeswitch to the current time display by pressing the key, the timeswitch will not automatically switch to the correct state for the current time. You must select the output required with the key.

= manual mode ON

= manual mode OFF

The timeswitch will correctly follow subsequent switching commands according to the program entered, as they occur in real time.

## 6. Auxiliary functions

- Summer time / winter time switchover
- 12h/24h- display
- Read - Change - Delete



### Summer time / winter time switchover

Press the key +/- 1h once.  
+1h appears in the display.



### 12h/24h display

If you press the keys "+/- 1h" and "h" simultaneously, the display is switched over. AM or PM appears in the display.

### Read - Change - Delete

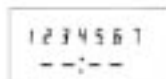
- the switching commands

#### Read

Press the Prog key in steps.  
Each step shows a switching command until the end of the program.

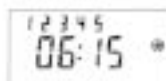
Then:

- a free memory location
- Number of free memory locations



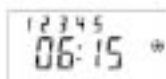
#### Change

Press the Prog key in steps until you come to the switching command you want to change - with the keys Day, h, m.



#### Delete - Individual switching commands

Press the Prog key in steps until you reach the switching command which you want to delete.



Press the h or m key as often as necessary until --- is displayed.

Press the Prog key and keep it pressed for approx. 3 seconds. The switching command is deleted.

## 7. Manual switch function (key)

This changes the current switching state without affecting the programmed memory. During timed operation, use the key to select settings as described in the table below.

⌚ = Automatic	⌚ = Manual mode	f = Continuous operation
⌚ = OFF	⌚ = ON	⌚ = Continuous ON
⌚ = ON	⌚ = OFF	⌚ = Continuous OFF

The switching state corresponds to the programme entered.

The switching state is overridden, but resets with the next timed instruction in the memory.

The output will remain in the ON or OFF condition permanently, until the key is used to restore the automatic function.

## 8. Technical Data

	1,5 V CMOS	230 V
Dimensions (H x W x D mm)	51 x 64 x 13,5	51 x 64 x 45
Switching panel cut-out (mm)	47 x 60	47 x 60
Installation depth (mm)	14	38
Weight	50 g	95 g
Connection	1,5 V	220-240V
Power consumption (typ.)	15 µA	4,4 VA
Can be approved in accordance with EN60730	yes	yes
Maximum switching capacity	100 mA at 1,5 V AC	10 A at 250 V AC
Minimum switching capacity		100 mA at 20 V AC
Switching output	CMOS	Floating, change-over contact
Ambient temperature	-10 °C ... +55 °C	-10 °C ... +55 °C
Protection class (DIN40050)	User-related	User-related
Running accuracy (typ.)	+/- 2,5 s per day at 20 °C	
Running reserve	none	100 hours
Charging duration	-	140 hours
Shortest switching time	1 minutes	1 minutes
Programmable every	minutes	minutes
Display	LCD	LCD
Channels	1	1
Memory locations	20	20
Manual switch, override	yes	yes
Switching state display	yes	yes
Connection type	3 single litz wires	5 x DIN flat connectors

# Operating Instructions Micro-Control for 2 Temperatures

## Start Up

When the machine is switched on the screen displays the following information:



In the top line you can read the temperature values for Temp 1 and Temp 2.

In the second line you can read the dryer temperature and a programmed speed setting

The third line provides information relating to replenishment pump run times; remaining running time of the pump.

In the fourth line P1 or P2 will indicate which programme has been selected. The machine reverts to programme 1 automatically on start up

**ST.** Provides an elapsed time to stand-by after the last material has left the feed area

**RC.** Indicates the number of replenishment cycles. **NOTE:** Only every second cycle is shown.  
Example: 20 - You have to multiply this number by 2. The processor had 40 replenishment cycles. In case the processor is adjusted to run a replenishment cycle every 0,5 square meter 20 square meter where developed. When the processor is switched off the replenishment counter is set back to 000.

## Function Of Keys

**Key 1** - Manual control of wash water

**Key 2** - Manual control of replenishment pump 1

**Key 3** - Manual control of replenishment pump 2

**Key 4** - In operation without function

**Key 5** - Manual control of transport and dryer

**Key 6** - Programme check; pressing this key will display all pre-set data

**Key 7** - Is used to switch between programs 1 and 2. In order to do this the key must be held down for 5 seconds



## **Normal use**

When the machine is turned on using the main switch or via weekly timer, the processing solutions are heated to their working temperature, the correct temperature values are maintained in the different tanks by the automatic control system (temperature probe, microprocessor) as long as the machine remains on.

## **StandBy Mode**

In standby mode (no material in the processor), the drive motor and circulation pumps are turned on every 5 minutes for approximately 30 seconds; this prevents crystallisation on the top rollers and maintains good temperature homogeneity within the tanks.

## **Processing Cycle**

A processing cycle starts when sensitised material is fed into the machine and covers the infrared sensors at the entrance of the processor; the transport system, the circulation pumps and the crossover rollers' rinsing system are turned on. The dryer is turned on after a pre-set time delay.

## **Replenishment Cycle**

A replenishment cycle is initiated when the number of pre-set replenishment impulses is reached. The replenishment pump(s) will run for a programmed number of seconds; this running time is shown on the display (3rd line), starting from the programmed time and decreasing to zero each time a replenishment cycle occurs.

## **Delay To Standby**

When the last piece of material has left the feed sensors a count down cycle is initiated after which the processor automatically switches to standby; this count down is shown on the display („ST“ value).

## Programming Mode

The programming mode is accessed when the key switch is turned to the right.

The following screen is displayed:



The four keys below the display now have the function described on the last line of the screen

### QUIT

when pressing this key, the message „Turn key switch“ appears on the display; if the key switch is turned back to its original position (left), the machine return to its normal operating mode



### PROC (Processing parameters)

When pressing this key the following message is displayed



In „PROC“ mode, key 3 (CURS) is used to move the cursor within the display and to select the value(s) to be changed; changes are made with key 4 (STEP).

## Processing Temperature

The temperature in the developer and bleach(fix) should be set to the values given by the chemistry manufacturer.

## Speed Value

The speed value for the different programs is set at the factory. Should be checked during final check after installation.

**Example:** To increase the transport speed by 5%, increase the „SPEED“ value by 5%.

## Replenishment - Chemical solutions

The replenishment rates volume are given by the chemistry manufacturer. See data sheets given by them.

The machine is set at the factory to start a replenishment cycle every time ...x m<sup>2</sup> of material is processed (corresponding to the „BAR“ value described later in this section). The volume of replenishment solution added to each solution is adjusted by changing the duration of the pumping action (third line on the display).

## Saving Parameters

Once all values have been entered, they can be memorised by pressing key 5 (SAVE). The display than reverts to:



Press key 2 (QUIT) and turn the key switch to the left to return to operate mode.



## „Stby“

When pressing key 4 while in programming mode, the following screen is displayed:



## DRY

Dryer delay time ( delay until the dryer is switched on from the entrance of sensitised material into the processor). In the example above, „050“ corresponds to 5.0 min.

## STB

Processor and dryer running time from the moment the last piece of sensitised material has passed the infrared detectors. This value should be higher than the dry-to-dry processing time for the relevant program. In the example above, „110“ corresponds to 11.0 min.

## BAR (Sensorbar)

Number of sensor impulses after which the replenishment cycle is initiated. This value depends on the type of processor and on the sensors scanning speed set at the factory. In the example above, „210“ means that a replenishment cycle will start after 210 sensor impulses.

## WON

First wash ON. This is the delay time for initiating a wash cycle. In the example above; „035“ means that a wash cycle will start after 3 min. and 30 sec.

## WOFF

First wash OFF. This is the delay time for ending a wash cycle, calculated from material clearing the feed sensor

## W2

Same procedure for the second wash.

**The values are saved by pressing key 5 (SAVE).**



## „CAL“

When pressing key 5 while in programming mode, the following screen is displayed:



Enter the code number 142 using key 3 (CURS) to select and key 4 (STEP) to enter the digits; press key 5 (SVE) to access the calibration menu.

The following screen is displayed:



Keys 2 to 5 now have the functions described on the last line of the display.

### Quit

To return to programming mode

### Null

To calibrate the temperature sensors (zero value); **this value is adjusted at the factory and should normally not be changed.**

### Fscl

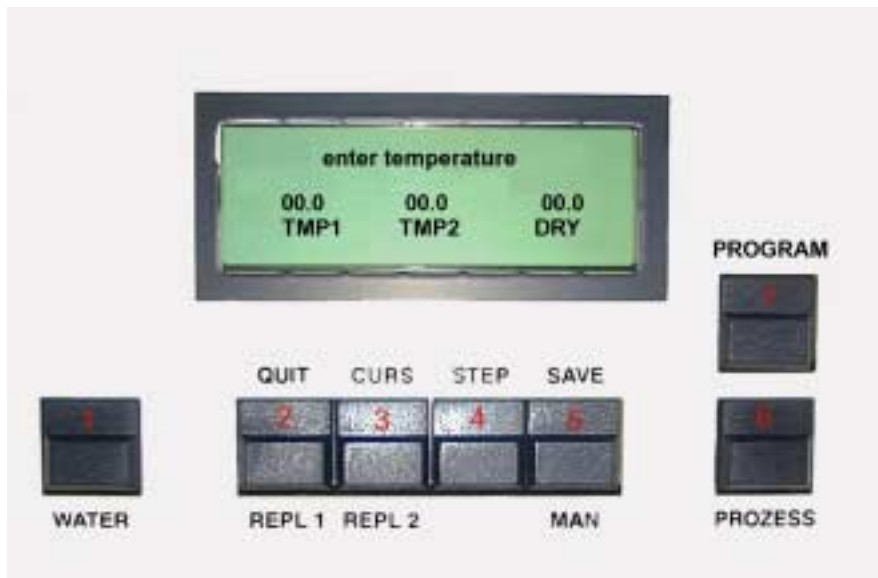
To calibrate the temperature sensors (Full scale“ corresponds to the processing value)

### Tune

To display the effective temperature values

## „Fsc1“ (Full scale)

When pressing key 4 (Fsc1), the following screen is displayed:



## Calibration

The actual temperatures measured in the processing tanks (with solutions at working temperature) and in the dryer can now be entered using key 3 to select and key 4 to adjust the value. The calibration is saved when pressing key 5 and the following screen (example) is displayed.



In order to return to the normal operating mode, press key 2 three times and turn the key switch to the left.

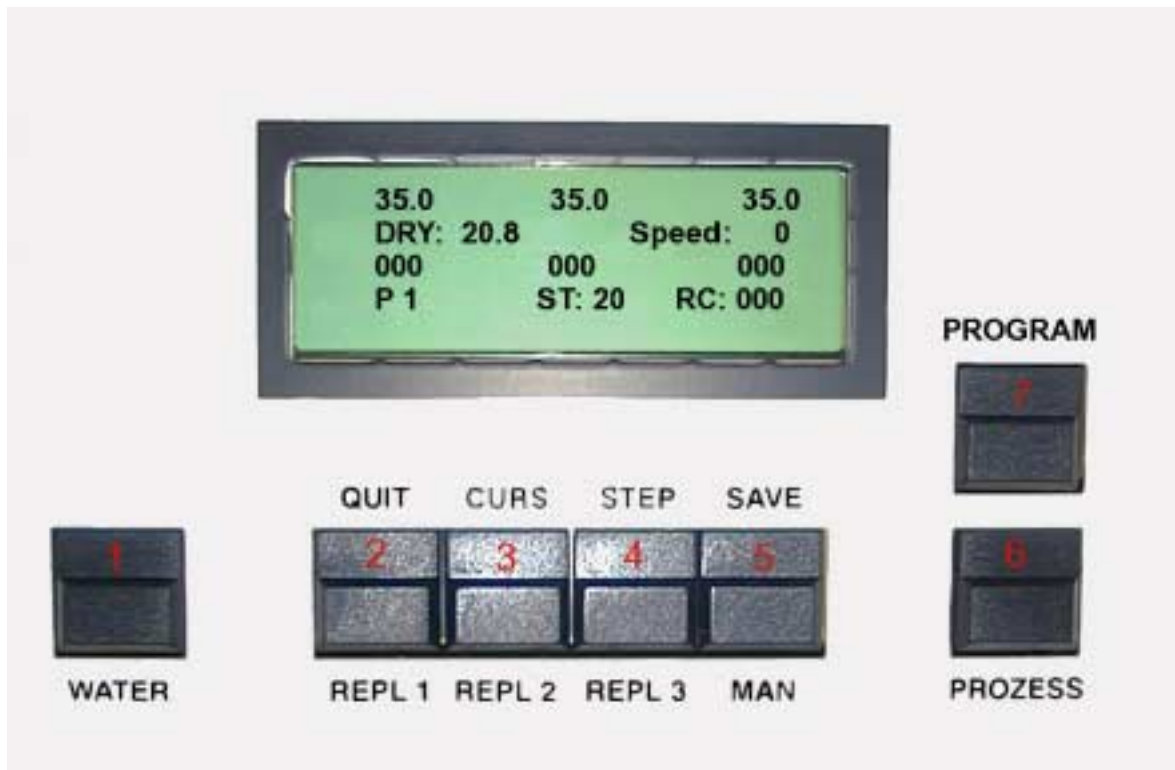
## „Null“

The zero balance of the temperature sensors has to be done at the factory and does not need to be repeated under normal circumstances.

# Operating Instructions Micro-Control for 3 Temperatures

## Start Up

When the machine is switched on the screen displays the following information:



In the top line you can read the temperature values for Temp 1, Temp 2 and Temp 3.

In the second line you can read the dryer temperature and a programmed speed setting

The third line provides information relating to replenishment pump run times; remaining running time of the pump.

In the fourth line P1 or P2 will indicate which programme has been selected. The machine reverts to programme 1 automatically on start up

**ST.** Provides an elapsed time to stand-by after the last material has left the feed area

**RC.** Indicates the number of replenishment cycles. **NOTE:** Only every second cycle is shown.  
Example: 20 - You have to multiply this number by 2. The processor had 40 replenishment cycles. In case the processor is adjusted to run a replenishment cycle every 0,5 square meter 20 square meter where developed. When the processor is switched off the replenishment counter is set back to 000.

## Function Of Keys

**Key 1** - Manual control of wash water

**Key 2** - Manual control of replenishment pump 1

**Key 3** - Manual control of replenishment pump 2

**Key 4** - Manual control of replenishment pump 3

**Key 5** - Manual control of transport and dryer

**Key 6** - Programme check; pressing this key will display all pre-set data

**Key 7** - Is used to switch between programs 1 and 2. In order to do this the key must be held down for 5 seconds



## **Normal use**

When the machine is turned on using the main switch or via weekly timer, the processing solutions are heated to their working temperature, the correct temperature values are maintained in the different tanks by the automatic control system (temperature probe, microprocessor) as long as the machine remains on.

## **StandBy Mode**

In standby mode (no material in the processor), the drive motor and circulation pumps are turned on every 5 minutes for approximately 30 seconds; this prevents crystallisation on the top rollers and maintains good temperature homogeneity within the tanks.

## **Processing Cycle**

A processing cycle starts when sensitised material is fed into the machine and covers the infrared sensors at the entrance of the processor; the transport system, the circulation pumps and the crossover rollers' rinsing system are turned on. The dryer is turned on after a pre-set time delay.

## **Replenishment Cycle**

A replenishment cycle is initiated when the number of pre-set replenishment impulses is reached. The replenishment pump(s) will run for a programmed number of seconds; this running time is shown on the display (3rd line), starting from the programmed time and decreasing to zero each time a replenishment cycle occurs.

## **Delay To Standby**

When the last piece of material has left the feed sensors a count down cycle is initiated after which the processor automatically switches to standby; this count down is shown on the display („ST“ value).

## Programming Mode

The programming mode is accessed when the key switch is turned to the right.

The following screen is displayed:



The four keys below the display now have the function described on the last line of the screen

### QUIT

when pressing this key, the message „Turn **key switch**“ appears on the display; if the key switch is turned back to its original position (left), the machine return to its normal operating mode



### PROC (Processing parameters)

When pressing this key the following message is displayed



In „PROC“ mode, key 3 (CURS) is used to move the cursor within the display and to select the value(s) to be changed; changes are made with key 4 (STEP).

## Processing Temperature

The temperature in the developer and bleach(fix) should be set to the values given by the chemistry manufacturer.

## Speed Value

The speed value for the different programs is set at the factory. Should be checked during final check after installation.

**Example:** To increase the transport speed by 5%, increase the „SPEED“ value by 5%.

## Replenishment - Chemical solutions

The replenishment rates volume are given by the chemistry manufacturer. See data sheets given by them.

The machine is set at the factory to start a replenishment cycle every time ...x m<sup>2</sup> of material is processed (corresponding to the „BAR“ value described later in this section). The volume of replenishment solution added to each solution is adjusted by changing the duration of the pumping action (third line on the display).

## Saving Parameters

Once all values have been entered, they can be memorised by pressing key 5 (SAVE). The display than reverts to:



Press key 2 (QUIT) and turn the key switch to the left to return to operate mode.



## „Stby“

When pressing key 4 while in programming mode, the following screen is displayed:



### **DRY**

Dryer delay time ( delay until the dryer is switched on from the entrance of sensitised material into the processor). In the example above, „050“ corresponds to 5.0 min.

### **STB**

Processor and dryer running time from the moment the last piece of sensitised material has passed the infrared detectors. This value should be higher than the dry-to-dry processing time for the relevant program. In the example above, „110“ corresponds to 11.0 min.

### **BAR (Sensorbar)**

Number of sensor impulses after which the replenishment cycle is initiated. This value depends on the type of processor and on the sensors scanning speed set at the factory. In the example above, „210“ means that a replenishment cycle will start after 210 sensor impulses.

### **WON**

First wash ON. This is the delay time for initiating a wash cycle. In the example above; „035“ means that a wash cycle will start after 3 min. and 30 sec.

### **WOFF**

First wash OFF. This is the delay time for ending a wash cycle, calculated from material clearing the feed sensor

### **W2**

Same procedure for the second wash.

**The values are saved by pressing key 5 (SAVE).**



## „CAL“

When pressing key 5 while in programming mode, the following screen is displayed:



Enter the code number 142 using key 3 (CURS) to select and key 4 (STEP) to enter the digits; press key 5 (SVE) to access the calibration menu.

The following screen is displayed:



Keys 2 to 5 now have the functions described on the last line of the display.

### Quit

To return to programming mode

### Null

To calibrate the temperature sensors (zero value); this value is adjusted at the factory and should normally not be changed.

### Fscl

To calibrate the temperature sensors (Full scale“ corresponds to the processing value)

### Tune

To display the effective temperature values

## „FscI“ (Full scale)

When pressing key 4 (FscI), the following screen is displayed:



The actual temperatures measured in the processing tanks (with solutions at working temperature) and in the dryer can now be entered using key 3 to select and key 4 to adjust the value. The calibration is saved when pressing key 5 and the following screen (example) is displayed.



In order to return to the normal operating mode, press key 2 three times and turn the key switch to the left.

## „Null“

The zero balance of the temperature sensors has to be done at the factory and does not need to be repeated under normal circumstances.

## Motor adjustment

In case of an exchange of the motor or when you are running the processor at a power supply system with 60 Hz mains frequency it may be necessary to change motor parameters.

Press the buttons QUIT and SAVE and turn the key switch for this simultaneously.



In the first line you will see two four number blocks. The first number is to adjust the starting speed of the motor. The value should be between 3000 and 4000.

The second number serves for the adjustment of the motor type. Different motor types deliver a divergent number of motor impulses per turn. For compensation in the display and for Programming you have to enter a conversion factor. The value should be between 2000 and 4000.

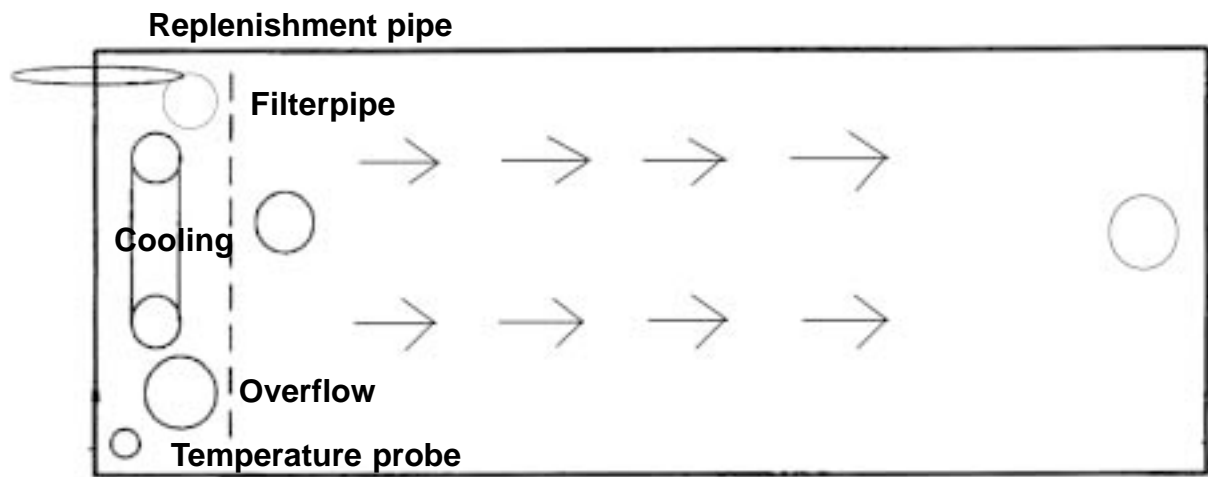


# Schematic for chemistry tank

Filterpipe

Pump

Flowheater



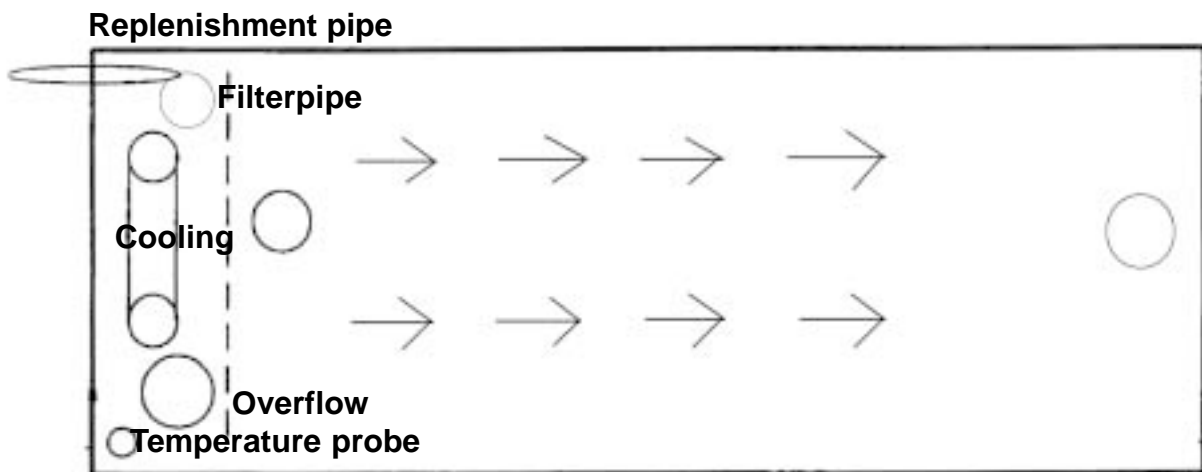
# Schematic for bleach tank (not all processors)



Filterpipe

Pump

Flowheater

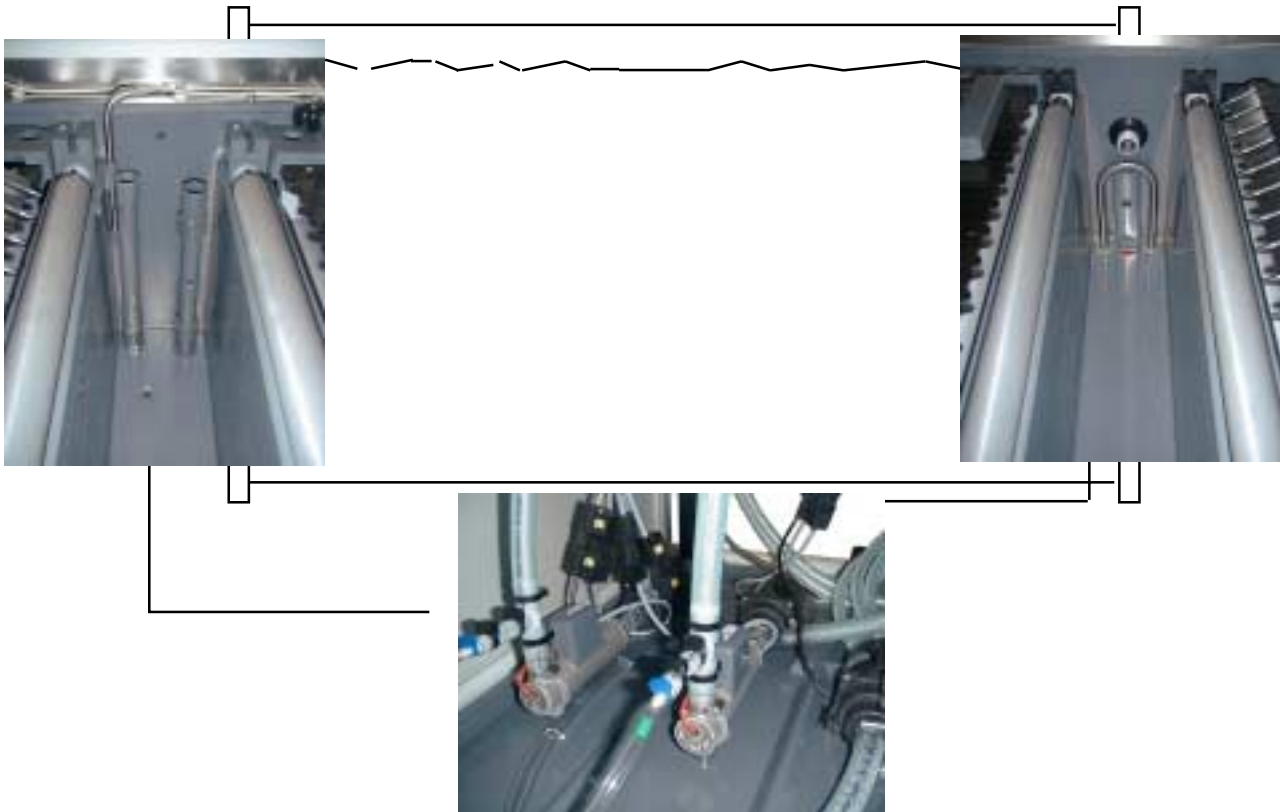


## Tempering System

The processor employs a unique direct tempering system to maintain processing solution temperatures accurately and efficiently. This tempering system is integrated into the recirculation and filter circuit. This system offers more efficiency and energy-saving.

## Temperature Sensing

The temperature probe in the tank senses the temperature change and activates the relevant heater control circuits within the main processor control system so as to maintain accurate solution temperatures.



## Solution Heating

The control panel in turn activates the circulation pumps and the tempering unit. The circulation pumps mix and filter the chemistry to ensure even temperature throughout the entire tank. The drive motor also comes on during this period, to prevent build-up of chemical by-products on the processing rack parts during period of low usage. As protection against overheating most of the processors are equipped with a „cold water“ cooling system.



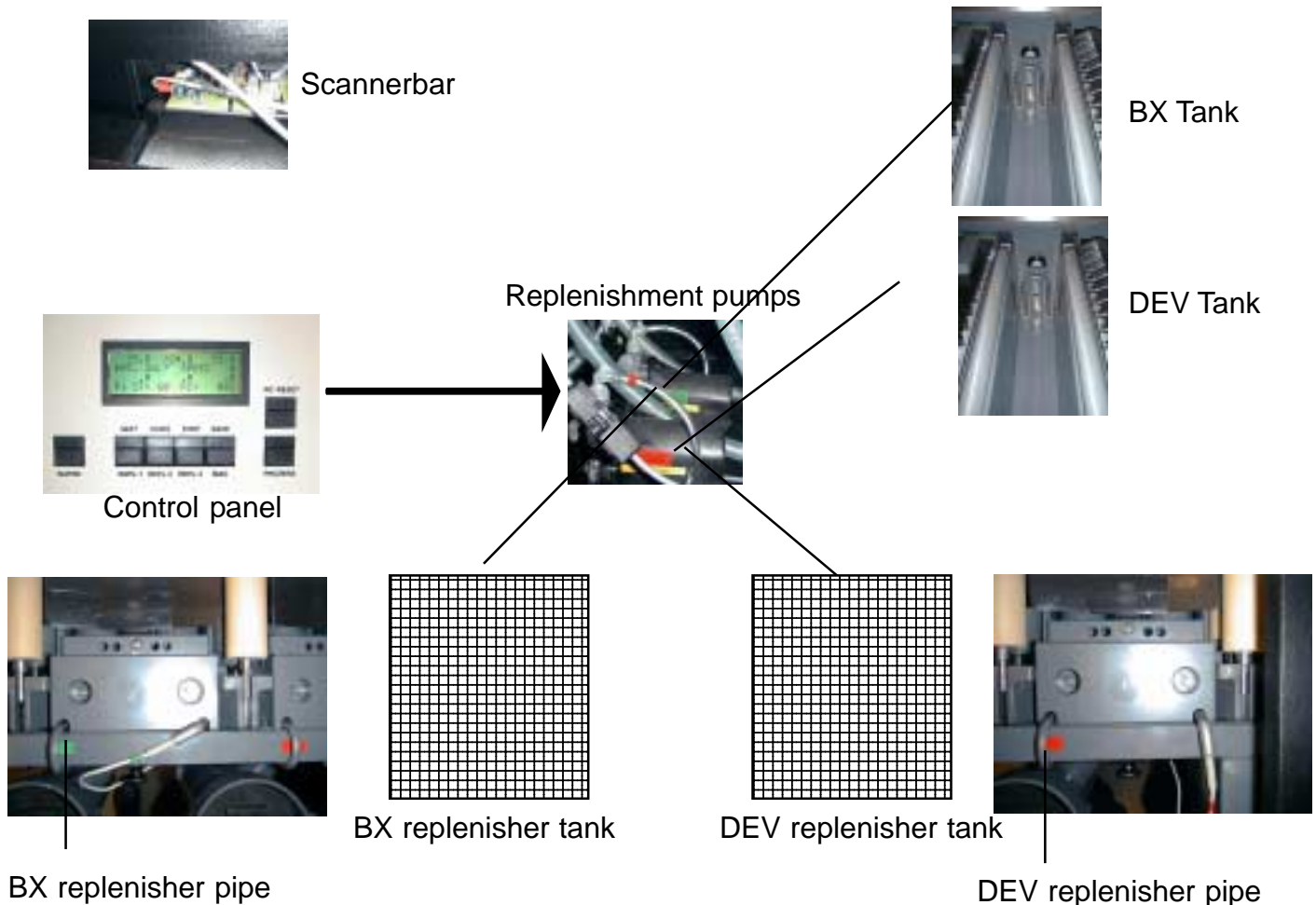
Temperature probe

## Cooling

The cooling system is by way of a cold water connection to the processor which is switched „on demand“ through cooling coils when the in tank temperatures rises above the set processing parameters.

## Chemical Replenishment System

Whenever photographic material is processed, chemical constituents of the developer are used and by-products are left behind in the processing solution. Replenisher solutions are formulated to restore the chemistry to its original activity and to dilute the by-products to a proper level. It is therefore necessary to add the proper amount of replenisher for the amount of material that has been processed.



Performed automatically by the machine by way of infra red sensors installed across the complete feed width of the processor. These sensors emit pulses of infrared light which have no effect on photographic emulsions. When paper is beneath the sensorbar, the pulses are reflected and detected by the sensor. The pulses are transmitted to the control panel where they are „counted“ by the microprocessor. When the number of pulses reaches the amount that has been programmed on the microprocessor, the replenishment timer function starts. The replenishment timer runs the replenishment pump(s) for the number of seconds that have been set on the microprocessor. When the replenishment pumps are activated, the replenisher solutions are pumped through footvalves located at the bottom of the replenisher tanks to the chemistry tank. The footvalves contain a filter and a checkvalve which prevents chemistry from flowing back into the replenisher tanks. The footvalves should be checked monthly and be cleaned or replaced if necessary.

## Calculation Of Replenisher Rate

The following calculation relates to only one model of processor and numbers used will differ for each model and type of processor

### Example: 66 RA 70

Max. process width (66cm) X Speed (0.7) = 0,46 m<sup>2</sup> / min

$$\frac{60 \text{ sec}}{0,46} \times 0,2 \text{ ( rep. cycle per } 0,2 \text{ m}^2) = 26 \text{ sec.}$$

26 secs is the time between replenishment cycles based upon the maximum feed width and with all sensors covered.

Therefore to calibrate a replenishment rate of 240ml per 1m<sup>2</sup>.

$$\frac{240 \text{ ml}}{5 \text{ ( } 1\text{m}^2 : 5 = 0,2\text{m}^2)} = 48 \text{ ml per replenishment cycle}$$

If the output of the pump is calibrated at 200 ml/min. (refer to the data sheet supplied with each machine) calculate as follows:

$$\frac{200 \text{ ml / min}}{60 \text{ sec.}} = 3,3 \text{ ml per second}$$

$$\frac{48 \text{ ml (per replenishment cycle)}}{3,3} = 14,5 \text{ sec. Replenisher pump run time}$$

It must be remembered that replenishment data quoted by chemical manufacturers are recommendations only - Running regular process control tests will verify the replenishment settings and adjustments can be made as and if necessary.

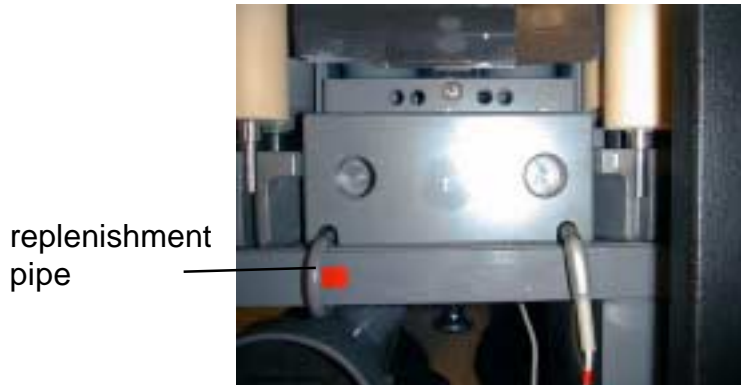
Besides adjustment through the replenishment pumps, the replenishment rate can also be adjusted by changing the running time of the pump.



## Calibration Of The Replenishment Pump

To measure the actual amounts of replenishment solution entering the processor tank it is necessary to use a calibrated container that will provide an accurate and visual display to the user.

Remove the replenishment injector pipe which is located on the left side of the tank.



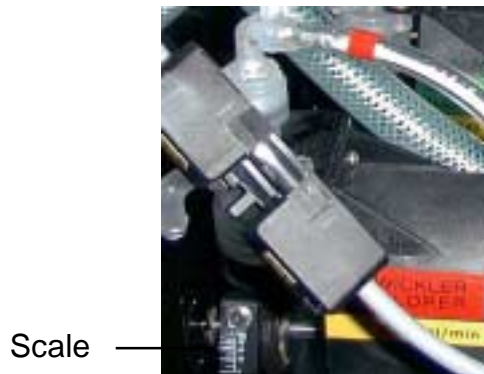
Push and hold the manual over-ride control switch (keys 2 and 3) for a duration of one minute (use stop watch), check the measured output and compare this with the output as listed in the machine data sheet.



## Adjustment Of Flow Rate

**Do not attempt to adjust flow while pump is running**

Clockwise rotation of the adjusting screw increases pump stroke until achieving 100% stroke. Do not attempt forced rotation of the adjusting screw after indicator reaches 100%. Counter-clockwise rotation of adjustment screw decreases stroke. Only eight clockwise revolutions adjust stroke from 0% to 100%. It is not necessary to loosen set screw.



**Note: Do not add lubricants to any pump mechanism.**

## Infrared Replenishment Sensor Bar

The automatic replenishment system uses an infrared-scanner to monitor the area of material entering the processor.

Only when the scanner LED display or the infeed beeper is off is it safe to assume the feed table is clear.

There is the option to choose between visual or acoustic indications of material loading status.



Scannerbar



Scannerbar cover

## **Rack / Transport System**

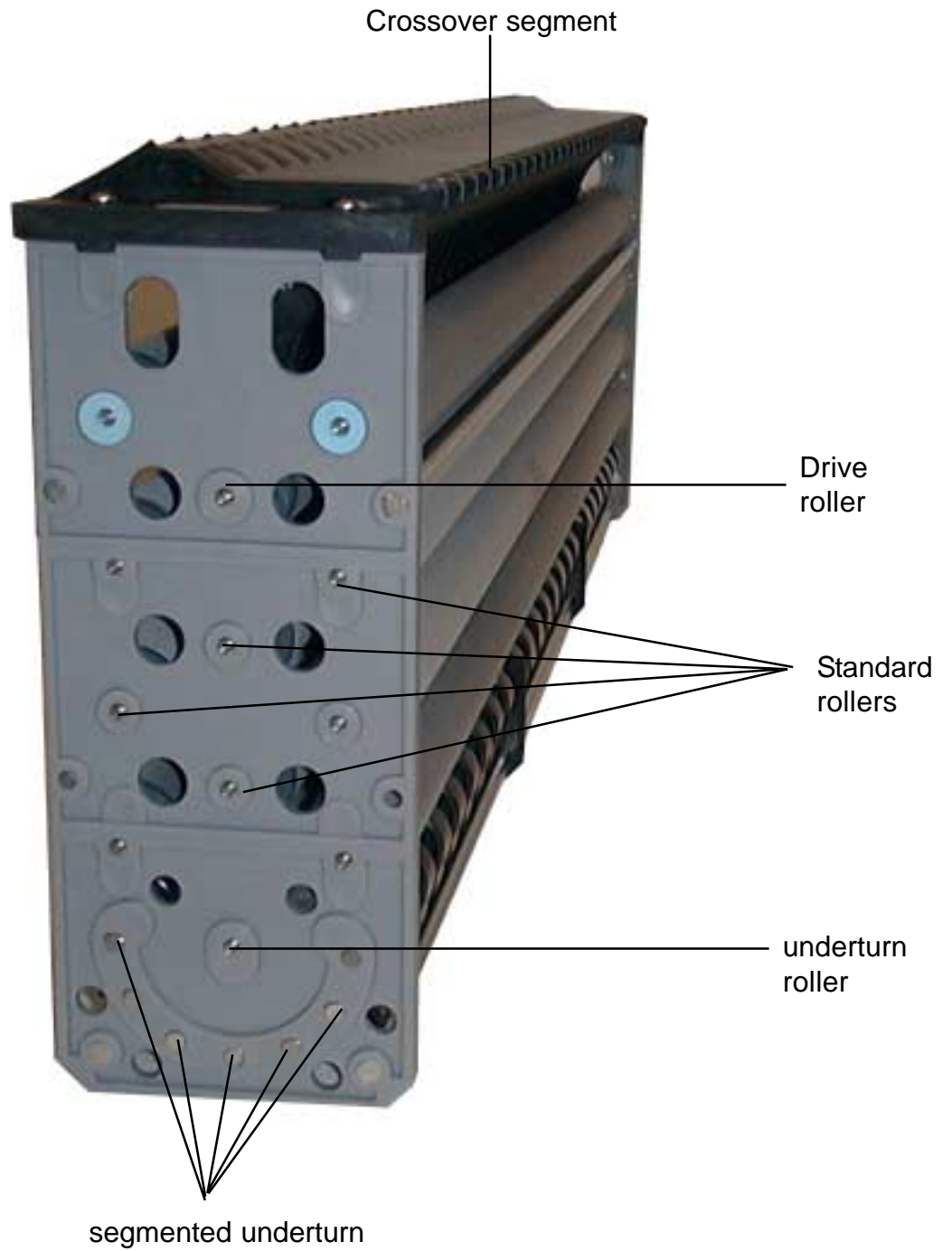
All racks in use in this processor have the same basic design, which simplifies maintenance and greatly reduces the investment in spare part stock

Material entering the rack is directed by the infeed guide down and into the roller path. It is then passed from roller to roller down and into the underturn, up and out through the roller group and then safely guided into the crossover and out into the next rack.

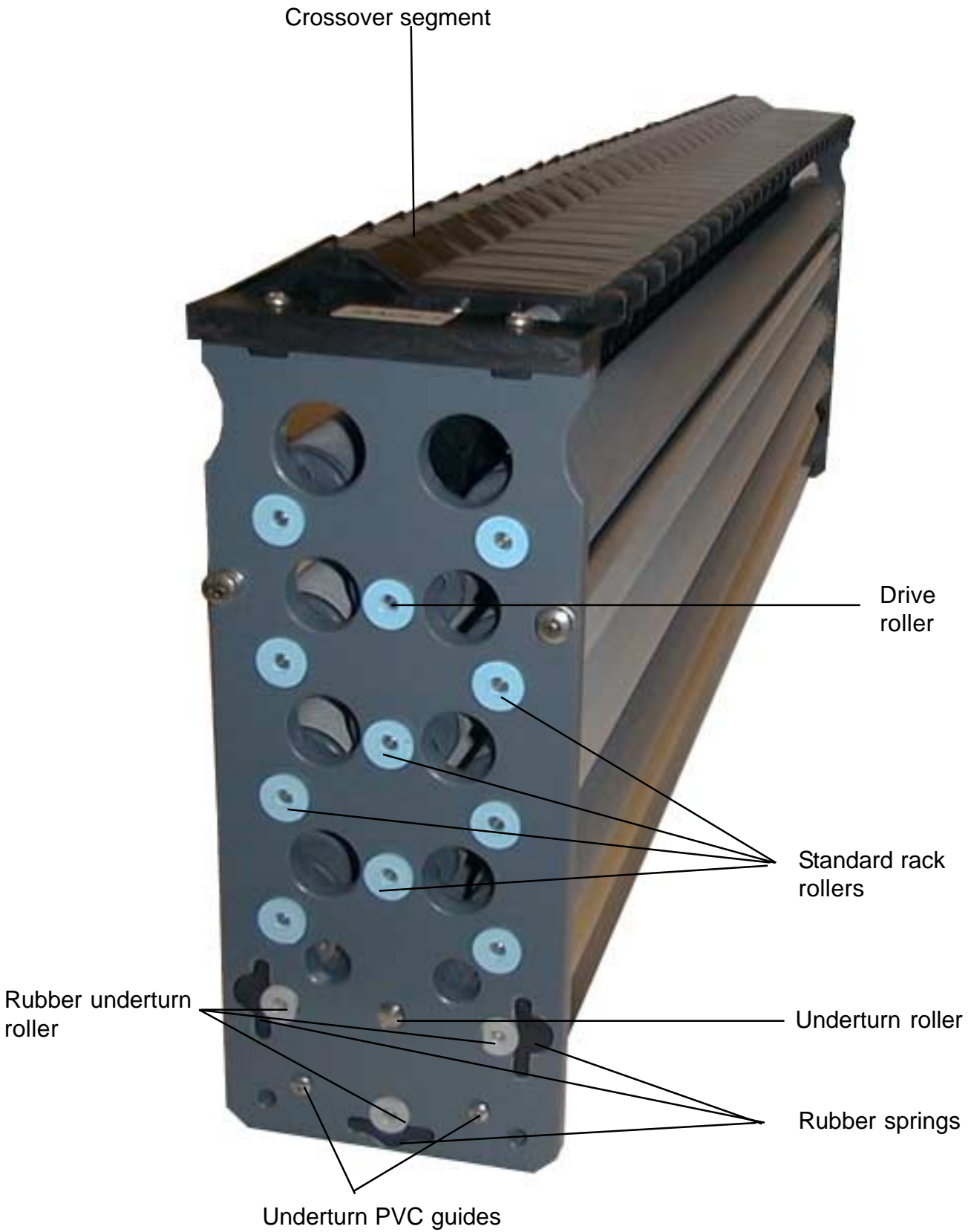
### **Note**

The front and the rear profiles of the crossover segments are not identical.

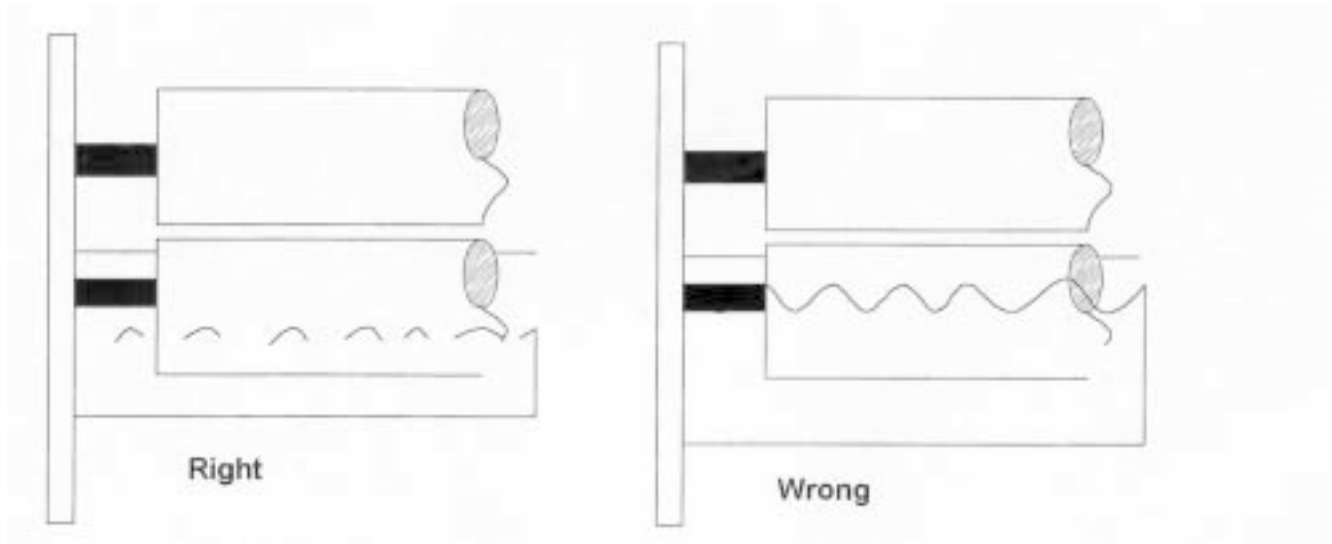
# Standard Rack



# Special Developer - Rack / Rubber (3-point) Underturn



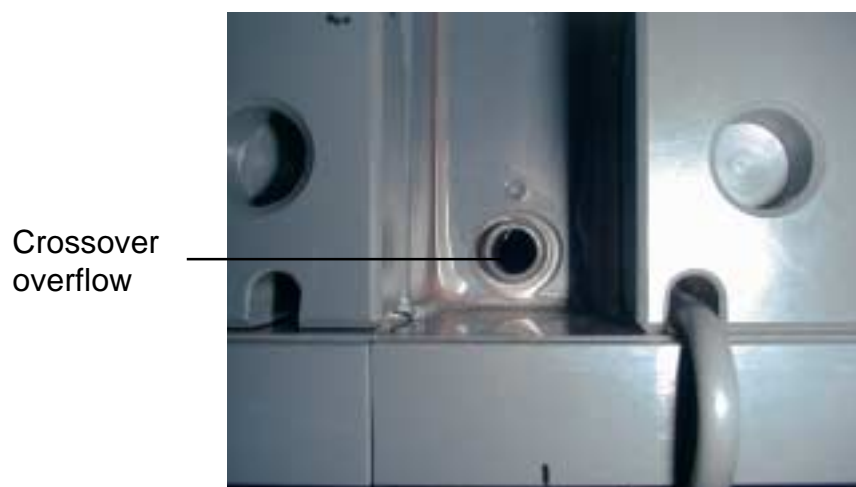
## Rinsed Crossover Rollers



Fine adjustment of the flow rate via a SPAL water tap under the tank on the drive chain side

The crossover rollers are continuously rinsed during a process cycle, by doing, it reduces excessive carryover of chemistry into the next tank. As a result the chemistry within that tank can be used more efficiently and at minimum replenishment rates.

The flow of water into the crossovers is regulated and controlled by a solenoid. There are also inline taps to ensure the correct flow of fresh water reaches each crossover stage.



The overflow from each crossover bath should be inspected monthly so as to ensure the path to drain is clear - failure to do so may result in a blockage and the dilution of chemical baths.



# Dryer

The dryer consists of a ventilator unit with either a radial or an axial ventilator and the dryer transport system. The control unit can be set to select the temperature for each separate material.

The temperature control is divided into two stages.



Air knife system

Dryer transport rack



Fans and heaters

## Stage One



Stage one consists of the blower fans and one „bank“ of heater switching on after the delay time has released and remains on for the duration of the process cycle. This prevents what we call „Hot / Cold“ operation.

## Stage Two



Stage two is the switching of full heat and is regulated by the pre-set dryer temperature. When the dryer temperature reaches the temperature „Set“ in the programme this stage of heating will turn off and on to maintain maximum drying performance. The pre-set temperature should not be higher than the maximum dryer capacity.

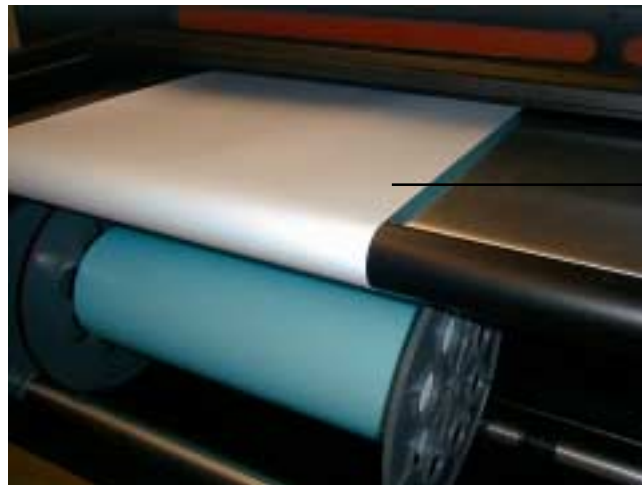
**The temperature set-point is adjusted in the factory. Because of different conditions in the lab or different materials it may be necessary to adjust the temperature to a different value.**

## Feeding paper

When you feed paper always make sure to feed it with emulsion down.

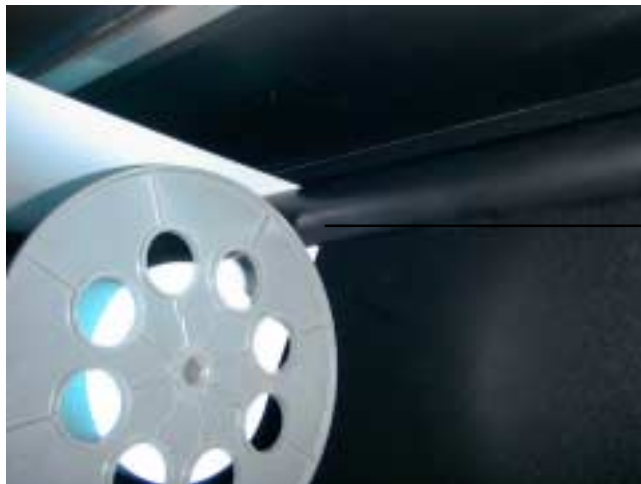
The whole transport and dryer system is designed for this.

When material is fed with emulsion up we take no responsibility for any damages either to the processor nor to the material.



**Emulsion down**

When you feed roll paper please handle it the way as shown on the picture.



guide paper around  
the back roller

Feeding sheet paper - cut from a roll, please take care to counter curl the paper



## Cleaning Of Machine Prior To Filling With New Chemistry

Prior to filling machine with fresh chemicals it should be cleaned thoroughly.

Please observe the following steps:

1. Turn main switch into OFF position - left turn
2. Remove all covers
3. Retract the rack locking pins and remove all locating plates and covers
4. Remove the top crossover rollers, the driven crossover rollers are removed by lifting the roller bearing blocks
5. Wash the rinse rollers thoroughly with tempered water

**Note:**

**When reassembling the machine observe roller sequence.**

## Drain Chemical Tanks

There are two possibilities to drain the tanks:

Un-screw the tank standpipe using the tool provided. This will result in the chemistry flowing into the drain or collection facility.



**Note:**

**Observe national and local laws.**

By removing the PVC hoses located on the left side and opening the tap the chemical can be drained into collection tanks.



PVC drain / collecting hose

Unscrew filters or open filter housings, remove and clean filters, replace when needed.

## Drain Water Tanks

The water tanks are drained through the stand pipes or by opening the drain tap located under the tank - you must always check that this tap is returned to the „close position“.



Spal water tap

## Cleaning Of Racks

Remove racks out of the tanks by pulling the rack horizontally out of their bearing blocks and lifting straight up and place on rack carrier tray. Wash and rinse the racks thoroughly with tempered water.

## Cleaning Tanks And Circulation Pumps

Insert stand pipes, remove filters and fill tanks with tempered water-  
Set main switch to ON, push AUTO switch and let machine run in this mode for 10 to 15 minutes.  
Drain tanks as described and wipe clean.

## Reassembly Of Machine After Cleaning

The reassembly of the machine after cleaning procedure is done in reverse steps as shown in the disassembly

## Filling Machine With Fresh Chemistry

The filling of tanks with fresh chemistry must be done very carefully, to prevent the cross contamination of the chemicals. The filling should best be done with a funnel. The tanks are filled when the chemistry level has reached the top of the stand pipe. The rack rollers are then below the chemistry or water level.

Top level



## **Maintenance**

### **Daily Start-Up Maintenance**

1. Check chemical levels and „top-up“ if necessary (water will compensate for any evaporation loss). Very low chemical levels would suggest a leak or fault with the replenishment system and must be investigated before using the machine.
2. Check levels in replenisher tanks
3. Check temperature readings
4. Check circulation in each bath
5. Check transport gear operation
6. Clean feed table and infrared sensors
7. Fill up wash tanks
8. Process a control strip and make density measurements to obtain control values for plotting and process monitoring

### **Daily Shut-Down Maintenance**

1. Rinse top rollers with water
2. Rinse any spills and splashes
3. Check crossovers, clean residues
4. Add biocide to the wash tanks

### **Weekly Maintenance**

1. Clean crossover rollers
2. Clean all wash tanks
3. Check and clean/replace chemical filters

### **Monthly Maintenance**

1. Measure effective processor speed
2. Check accuracy of temperature display
3. Check replenishment system
4. Inspect and clean racks
5. Clean the bleach spray bar holes (not all machines)

### **Quarterly Maintenance**

1. Lubricate chain and gears
2. Inspect and clean dryer section
3. Check pumps and electrical system

## Fault Finding Guide

### Chemistry not heating

Main power switch off	Turn switch on
Fuse blown in control panel	Check and replace
Power cable to heater disconnected	Turn main power off, reconnect cable, turn on main power switch
Heater defective	Replace
Thermostat set too low or defective	Reset or replace
Temperature on control set too low	Reset
Triac or optocoupler defective	Replace
Filter(s) in recirculation system dirty / obstructed	Clean or change filter(s), check agitation
Recirculation pump defective	Replace
Pipe bent	Check pipes
Heater over temp. circuit activated	Where applicable press to re-set chevron on display
Chevron on display? YES	Check the LED of the referring temperature on the motherboard; check fine wire fuse; change triac board
Chevron in display? NO	Check desired temperature, adjust if necessary

### Chemical temperature too high

Temperature in control panel set too high	Reset ( calibrate temperature with separate thermometer)
No water flow through cooling coils	Check water supply valves
Temperature of cooling coil too high	Check
Probe seal broken or capillary line crimped	Replace
Temperature of inlet water too high	Adjust
Triac or optocoupler defective	Replace
Chevron on display? YES	Check the status of the LED on the corresponding triac control board connecting into the mother board; change triac board

Chevron in display? NO

Check desired temperature, adjust if necessary

## **No transport**

Drive motor defective

Replace

Commutator / brushes carbonised

Clean

Motor brushes worn

Replace

Fuse blown

Replace

Do other functions operate when in-feed sensors activated? YES

Check motor triac board; check/change fine-wire fuse, replace optocoupler/triac board

Do other parts work when they receive a sensor impulse? NO

Check scanner-bar; switch on manual

## **No transport in manual mode**

Motor PC-board defective

Replace

Main power switch off

Turn on main power switch

Fuse on motor PC-board blown

Replace fuse

Transport motor cable(s) disconnected

Reconnect cable(s)

Speed adjustment set too low

Adjust, recalibrate for correct development time if necessary

## **No auto start**

Scanner bar cable disconnected

Reconnect

Sensor defective

Replace

Sensor sensitivity set too low

Adjust trim pot on sensor board

## **Motor running Continuously**

Triac or optocoupler defective

Replace

Sensor sensitivity too low

Adjust

Dust or paper under the scanner bar

Clean or remove

## **Transport problem within a rack motor and chaindrive operational**

Rack not fully engaged into drive fitting	Re-engage rack, reset hold down block
Rack main drive roller pin or gear loose	Repair or replace
Crossover guides misaligned or fitted incorrectly	Re-position
Material fed into machine emulsion up	Clear material
Algae or dirt in crossover area or in wash tanks material slips	Clean (use manual or auto biocide injection)
Material fed is too short (min. 17,8 cm)	Use longer sheets
Material fed too close or overlapped	Clear material
Chain tensioner not set	Reset

## **No drive**

Main drive gear loose or broken from motor drive shaft	Tighten set screw on sprocket or repair with roll or spring pin
Steel drive chain broken	Repair chain with half or master link
Gear broken	Replace

## **Drive chain jumps**

Chain tensioner locked, chain not engaged sprocket	Lubricate tensioner arm pivot, reset chain onto sprocket
Direct drive „bulkhead“ fitting frozen	Lubricate „bulkhead“ fitting or replace
Material lodged in racks	Isolate rack, remove material, re-engage

## **Insufficient chain tension**

Chain too long

Shorten

Chain tensioner loose

Fasten and adjust tensioner

## **Rack does not turn**

Rack not fully engaged into direct drive

Slide rack towards bulkhead fitting, hold-down block out of drive side, engage, reset rack hold-down block

Square drive pin or gear end cap loose in main drive rack roller

Replace drive roller

Material jam in rack or squeegee section

Clear material, check squeegee rollers

## **LED display fails to illuminate when material is fed**

Sensor sensitivity misadjusted

Adjust

Sensor defective

Replace

## **LED display is on continually with no material feeding**

Sensitivity adjustment set too high

Set lower

Sensors dirty

Remove dirt or chemical deposits

## **No replenishment in auto-mode with feed sensor LED on**

Triac or optocoupler defective

Replace

Fuse blown

Replace

Power cable to replenisher pump disconnected or bad contact

Reconnect

Replenisher pump defective

Repair or replace

Running time for replenisher pump too short

Adjust

Pulse count „trigger point“ set too high

Adjust to a lower value



Indication on the display? YES                      Check LED on main PC-board; change fine-wire fuse or triac board

Indication on the display? NO                      Check desired and scanner-bar values.  
Adjust

## **Constant replenishment**

Triac or optocoupler defective                      Replace

Sensor defective                                      Replace

Running time for replenishment pumps set too high                      Adjust

Indication on the display? YES                      Check LED on main PC-board; change fine-wire fuse or triac board

Indication on the display? NO                      Check desired and scanner-bar values.  
Adjust

## **Over replenishment**

Running time for replenishment pump set too long                      Adjust

Replenisher pump volume too high                      Adjust

Interval between replenishments too short                      Adjust

## **Under replenishment**

Running time for replenishment pump set too short                      Adjust

Replenisher pump volume too low or back pressure valve obstruct                      Adjust, clean or replace back pressure valve

Interval between replenishments too long                      Adjust

Crossover drains obstructed or contaminated, water overflowing into processing tanks and diluting the chemicals                      Clean crossover drains

Chemical storage tanks empty                      Prepare new solutions and fill storage tanks

## **Replenisher pump(s) do not pump chemistry**

Chemical storage tanks empty	Prepare new solutions and fill storage tanks
Air bubbles in pump lines	Prime lines, manually pump and fill
Blown fuse	Replace fuse
Pump cable disconnected	Reconnect
Pump bellow defective	Repair or replace
Hoses obstructed or crimped	Clear lines
Pump check valves blocked	Clear or clean valves
Pulse count set too high	Check programme data and adjust if necessary
Triac or optocoupler defective	Replace

## **Recirculation pumps do not work**

Blown fuse	Replace
Pump motor defective	Replace
Triac or optocoupler defective	Replace
Power cable disconnected or bad contact	Reconnect
Broken pump impeller	Replace
Air bubbles in pump or hoses	Prime lines
Clogged chemical filters	Clean or replace
Fuse on triac board defective	Replace

## **Dryer fans and heaters do not work**

Dryer time delay incorrectly set	Adjust
Automatic cut-out released	Switch on
Power cable disconnected	Reconnect

Triac or opto-coupler defective	Replace
Pre-rated temperature (in control unit) too high	Adjust to 45-50°C
Triac board for TR1 and TR1 defective	Replace
Faulty dryer contactor (relay)	Replace

### **Dryer heat does not increase with panel control**

Defective temperature probe	Replace
Temperature probe cable disconnected	Reconnect cable
Defective heater	Replace
Defective overheating protection	Replace
Temperature on control unit set too high	Adjust

### **Uneven drying**

Defective heater	Replace
Defective overheating protection	Replace
Contaminated heater	Clean heater
Air exhaust port obstructed	Check port clearance

### **Fans run at low speed**

Defective fan motor	Replace
Defective triac or opto-coupler	Replace

### **Fans do not run**

Defective fan	Replace
Open / faulty plug connection	Check connections

## **No indication on the display**

Defective power supply fuse (mother board)

Replace

26-pin cable disconnected

Reconnect cable

No power to processor

Check incoming power

## **Outputs do not switch ON or OFF**

Drive IC's defective (IC1 + IC2 74HC373)  
defective

Replace

## **Blue or cyan cast/stain**

Developer over-replenished; not enough  
starter additive

Starter additive repeated

## **Blue or magenta horizontal lines on the print**

Bleach and developer tanks level too low

Check tank level, replenishment,  
overflow pipe

## **Magenta marks on the print**

Fingerprints, paper touched with wet hands

Handle paper at the edges or wear gloves

First rollers wet

Dry rollers

## **Stained or irregular development, blue or cyan marks**

Feed rollers wet, water or developer

Clean and dry rollers

No water in crossover area between  
developer and bleach

Check main water supply, check crossover valve

## **Black or brown smudges or spots on paper**

Algae in wash tank

Rinse and wipe rack and tanks; flush with warm water

Algae in crossover

Rinse and wipe clean, check water flow; adjust if necessary

## **Over development**

Temperature set too high

Adjust, calibrate with separate thermometer

Defective flow heater thermostat

Replace

Transport speed set too slow

Adjust

## **Under development**

Temperature set too low

Adjust, calibrate with separate thermometer

Defective flow heater thermostat

Replace

Transport speed set too fast

Adjust

## **Uneven development**

Insufficient circulation

Check recirculation pumps and filters, clean or replace

Recirculation pump defective

Replace

## **Insufficient colour density (see under development)**

Developer diluted

Check and adjust crossover water flow

Too much starter additive

Re-mix developer or add replenisher

## Water spots on prints

Dryer temperature too low

Adjust

Insufficient squeegee

Check squeegee rollers

## Magenta stripes on the print

Rollers in crossover area between developer and bleach without sufficient contact

Check rollers for clearance; check pins, straighten or replace if bent

Insufficient water in crossover between developer and bleach

Adjust valve, open reduction tap

Bleach deluted with water caused by under-replenishment or water inflow from crossover

Check control strip or sample print

Developer oxidised or over-replenished

Add or reapply starter, adjust replenishment rate

## Squeegee crossover rollers do not run

Bottom crossover roller square drive pin loose

Replace roller

Top crossover roller not set into bearing block

Position correctly

Bottom crossover roller not held into direct drive fitting

Position correctly