INSTRUCTION MANUAL

NDT -FILMPROCESSOR

FNDX 9000

FNDX 9000

AT700 v2.8r14h and up

QUALITY SYSTEM CERTIFICATION

DNV·GL

ISO 9001

INDEX

1. INTRODUCTION

Congratulations upon your decision to buy a

FNDX 9000   NDT - FILMPROCESSOR

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

Some outstanding design features include:

*)   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

FNDX 9000   NDT - FILMPROCESSOR

NOTE:
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are de-signed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.
This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

1.1 EXPLANATION OF THE WARNING SIGNS USED IN THIS MANUAL

Danger: Used to indicate a directly hazardous situation with instructions that must be obeyed to avoid risk of serious or fatal injury.

Warning: Used to indicate a potentially hazardous situation with instructions that must be obeyed to avoid risk of serious or fatal injury.

Caution: Used to indicate a potentially hazardous situation with instructions that must be obeyed to avoid risk of minor or moderate injury.

Note: Signal word that indicates a potentially harmful situation which, if not avoided, may result in damage to the device.

Hazard symbols used in this manual:

Drawing in hazard:

To warn against contact with moving parts that can entrap clothing and body parts causing serious injury.

Crushing hazard:

Possible contact with moving parts leading to crush injuries.

Electrical hazard:

Electrical hazard - possible contact with main voltage.

Thermal hazard:

Thermal hazard - possible contact with parts having high temperature.

Fire hazard:

Fire hazard - possibility of flammable material igniting.

Chemical hazard:

Chemical hazard - chance of chemical burns if chemicals are not handled correctly.

Hazard sticker used on the processor:

Isolate the electrical power-supply before opening. Used on covers where applicable.

Symbols giving orders used in this manual:

Protective clothing:

To always wear protective clothing when working with chemicals, moving parts or electricity.

Working gloves:

To always wear appropriate gloves when working with chemicals, moving parts or electricity.

Safety goggles:

Wear safety goggles when working with chemicals.

Fire extinguisher:

Where there is a potential fire hazard always make sure, that a fire extinguisher is readily available.

Prohibitive signs used in this manual:

No necklaces:

Wearing loose necklaces when working with moving parts can lead to entrapment.

No ties:

Wearing loose necklaces when working with moving parts can lead to trapping or drawing in.

1.2 QUALIFIED STAFF AND SYSTEM OPERATION

> **CAUTION:**
> **Only trained staff to be allowed to unpack or operate the device. Only trained service engineers are allowed to work on the equipment and electrical installation.**

CAUTION

Staff in charge of maintaining the processor (see chapter 11and 12) need to be thoroughly familiar and trained with the equipment. The equipment should not be operated without supervision.

Only the top cover of the film procesor may be removed by the operator (see picture below)

Top cover

Main switch of the film processor

> **CAUTION:**
> **The installation, service, repair as well as the initial operation of the machine must be carried out by qualified and trained service personnel only !**

CAUTION

Carry out the following steps prior to removing the top cover:

1. Give instructions to the operators of the film processor.
2. Switch off the main power switch („0"-position)

The film processor is a complex machine with moving parts such as rotating gears and roller components. It uses photo processing chemicals which are irritating to eyes, lungs and skin. High voltage is used to power the film processor.

> **DANGER:**
> **Do not operate the film processor after consuming alcohol or taking strong medication.**

DANGER

Room temperatures between 18-26 °C (65-80 °F) with a relative humidity between 35% and 75%are ideal for photographic processing and working.

> **WARNING: Electrical and mechanical hazards**
> **Observe all safety warnings to minimize the risk of electrical shock, burns or equipment damage.**
> **Photographic film processors are complex machines with many electrical and mechanical parts as well as with a considerable amount of chemicals.**

WARNING

1.3 MECHANICAL HAZARDS

Observe all safety warnings to minimize the risks of mechanical hazards.

> **WARNING:**
> **Hands or fingers may be pinched or injured by moving parts or when handling heavy parts.**

WARNING

Make sure that clothing or other objects cannot get trapped in gear drives or the roller transport system within the film processor.

> **Do not wear jewellery or loose clothing when operating the processor.**

> **WARNING:**
> **The roller transport system of the processor is a potential hazard - fingers, loose clothing or jewellery can get drawn into rollers or gearwheels.**

WARNING

1.4 ELECTRICAL HAZARDS

> **DANGER:**
> **During installation qualified service personnel must certify that the processor is permanently and reliably grounded according to the standards in the national electrical code.**

DANGER

The film processor must be separated from mains power prior to carrying out any maintenance. This is done by switching the mains power switch of the machine to the „0" position.
Built-in safety devices must not be by-passed or made inoperative. Only use original COLENTA spare parts when replacing failed electrical components.

Main power switch

> **DANGER:**
> **Hazardous voltage can cause electrical shocks, burns or fatal injury !**

DANGER

1.5 FIRE HAZARDS

Fire Prevention

Beware that combustible materials ignite and cause fires.

> **WARNING:**
> **The area around 3 meters of the processor must be kept clean at all times. Keep dust, wood shavings, scrap paper or other inflammable materials out of the dryer compartment.**

WARNING

> **A functional 5kg ABC fire extinguisher must be available in the room where the processor is installed.**

Burn hazard

> **CAUTION:**
> **Dryer compartment produces heat. Dryer parts and covers get hot, therefore do not touch dryer parts or covers when the processor is in operation.**

CAUTION

Fire hazards

> **WARNING:**
> **Dryer compartment produces heat - Paper or other flammable material can ignite.**

WARNING

1.6 CHEMICAL HAZARDS

Corrosive liquids

> **WARNING:**
> **CHEMICALS MAY IRRITATE EYES, LUNGS, SKIN AND DIGESTIVE TRACT**

WARNING

Eyes, skin and lungs may be irritated by photo chemicals.Before using photo processing chemicals always read the Material Safety Data Sheets (**MSDS**s) for information about the hazards of the particular chemicals and how to use them safely contact the chemicals manufacturer or dealer.

> Wear safety goggles,protective gloves and chemical aprons as indicated on Material Safety Data Sheets (**MSDS**s)when handling chemicals.

> **CAUTION:**
> **To avoid hazardous situations, keep floors and floor coverings around the processor and associated drains clean and dry at all times. Any accumulation of fluids outside the film processor should be cleaned/removed immediately.**
> **Ensure proper ventilation in the area where chemicals are prepared, used or stored.**

CAUTION

Drain tanks carefully,avoid splashing. Always drain the system thoroughly before working on any of the external hose systems. Do not allow untrained personnel to handle photo processing chemicals or to operate the film processor.

Chemical disposal

Waste from photographic processing normally contains diluted chemicals. These chemicals should be collected and disposed in accordance with local environmental codes. Dumping chemicals into a drain system could lead to a pollution problem. Contact your local water treatment and sewer district authorities before disposing chemicals.
All plumbing must comply with local and national codes. The DRAIN must be made of chemical resistant and non-corroding material. Use PVC or equivalent.

Exhaust,temperature and humidity

It is necessary to ensure proper ventilation in order to receive good processing results. Make sure that the exhaust hose of the built-in exhaust fan is properly connected to the exhaust air socket (Picture 1).
The built-in exhaust fan exhausts the fumes from the film processor.
These chemical fumes are corrosive. The top cover and the feed cover lid of the film processor should be left slightly open over night (picture2).
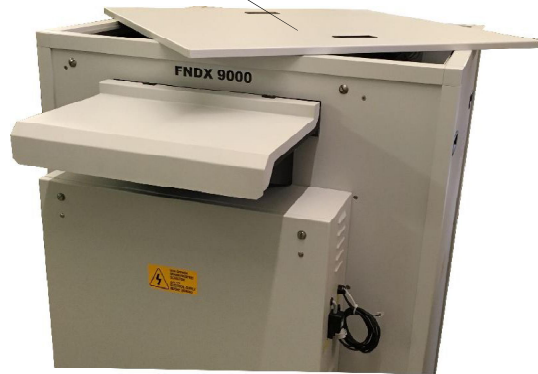
Picture 1

**exhaust ventilation
system**

Picture 2

Top cover

<div style="border: 2px solid black; background: yellow;">

WARNING:
**Take care when draining the processor tanks for cleaning with
running water. ALL racks must be removed from the processor for cleaning.**

</div>

CAUTION

Chemical handling and accident prevention

Misuse of almost any chemical may create a hazard of some type. Generally photo chemicals are not any more dangerous than most of the regular cleaning agents. However, there is always a residual risk. When handling chemicals observe the procedures below.

1).Never smell into a container or open bottle to determine its contents. A cautious sniff of the cap or lid is safer.

2).Label storage containers properly. Avoid storing hazardous chemicals on high shelves or in unprotected glass containers. Keep chemicals away from children. Do not store chemicals in a refrigerator used for food because they may contaminate food or be mistaken for edibles.

3).Observe the manufacturer's recommendations for using and mixing chemicals.

<div style="border: 2px solid black; background: yellow;">

CAUTION:
**Overexposure to photographic chemicals may cause skin irritation
to certain individuals.**

</div>

CAUTION

<div style="border: 1px solid black; background: #ddd;">

**PHOTOGRAPHIC CHEMICAL EMERGENCIES
AND FIRST AID PROCEDURES:**

• **SKIN** - Rinse thoroughly with water.

• **EYES** -Rinse thoroughly with water and consult a physician.

• **BY MOUTH** -Consult a physician immediately.

</div>

1.7 WEEE/ROHS COMPLIANCE STATEMENT

EU Directives WEEE and RoHS

To our valued customers:

We are committed to being a good corporate citizen. As part of that commitment, we strive to maintain environmentally conscious manufacturing operation.

The European Union (EU) has enacted two directives, the first on product recycling (**W**aste **E**lectrical and **E**lectronic **E**quipment, **WEEE**) and the second limit the use of certain substances (**R**estriction **o**n the use of **H**azardous **S**ubstances, **RoHS**). Over time, these directives will be implemented in the national laws of each EU member state.

Once the final national regulations have been put into place, recycling will be offered for our products which are within the scope of the WEEE Directive. Products falling under the scope of the WEEE Directive available for sale after August 13, 2005 will be identified with a "wheelie bin" symbol.

Two categories of products covered by the WEEE Directive are currently exempt from the RoHS Directive – category 8, medical devices (with the exception of implanted or infected products) and category 9, monitoring and control instruments. Most of our products fall into either category 8 or 9 and are currently exempt from the RoHS Directive. We will continue to monitor the application of the RoHS Directive to its products and will comply with any changes as soon as they apply.

In the European Union, this symbol indicates that when the last user wishes to discard this product, it must be sent to the appropriate facility for recovery and recycling.

Contact your local representative for additional information on the collection and recovery programs available for this product.

• **Do not dispose product with municipal waste**

• **Special collection/disposal required**

Reference:
Original text of the amended EU Battery Directive:
http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_266/l_26620060926en00010014.pdf
EPBA web site:
http://www.epbaeurope.net

2 TECHNICAL SPECIFICATIONS

Processing applications: Rolls/Cut sheets of industrial x-ray films

Film thickness: 0,10mm (4mil) - 0,18mm (7mil)
Material width: min. 7,5 cm max. **43**cm
Material length: min. 10 cm

	Time in Developer	Cycle Time (dry to dry)	Intake speed
Capacity:			
	[sec]	[min]	[cm/min]
	50	3.37	109
	250	16,87	21

additional, see the table on following page.

Tank capacity:	Developer:	20 L	(incl Filter)
	Fixer:	23 L	(incl Filter)
	Wash water:	20 L	

Solution heating (DEV and FIX):   adjustable in a range of 18°C - 43°C via Microcontroller
(separate inline 800W heaters)

Wash Water heating: adjustable in a range of 18°C - 43°C via thermostat
(separate inline 800W heaters)

Dryer: warm air - adjustable in a range of 18°C - 55°C

Replenishment: fully automatic - replenishment is microprocessor controlled and
calculated from information received from sensors measuring the
width and length of material entering the processor.
Replenishment cycles are adjustable.

Water supply: - 1 x single valve (warm or cold water supply) for Wash

Cooling: cold water: 1 x single valve
chiller: Chiller IN and Chiller OUT

required water pressure: 3 - 10 bar

Wash Water supply: filtered at a temperature of 8°C - 12°C
with 3/4" hose connection

Wash Water drain: 32mm (5/4inch) hose or tube

external filter for DEV and FIX

Weight:	Empty	290 kg
	With solution	353 kg

Technical specification subject to change without notice.

2.1 INPUT SPEED / DEV-TIME / CYCLE-TIME

FNDX 9000

NDT - FILMPROCESSOR

Cycle time [min]

Dev. time [s]

Intake speed [cm/min]
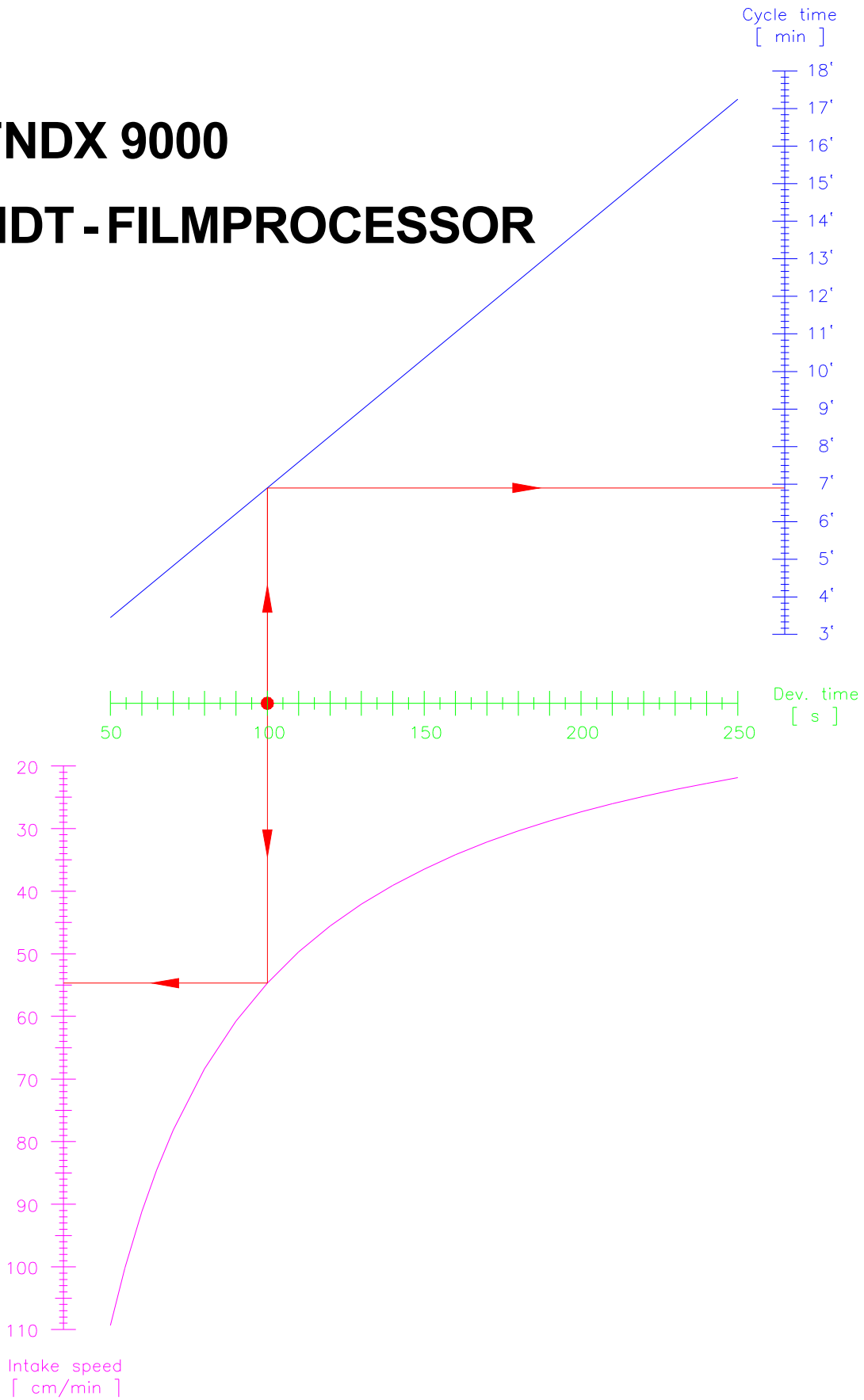
2.2 DIMENSIONS

FNDX 9000   NDT - FILMPROCESSOR
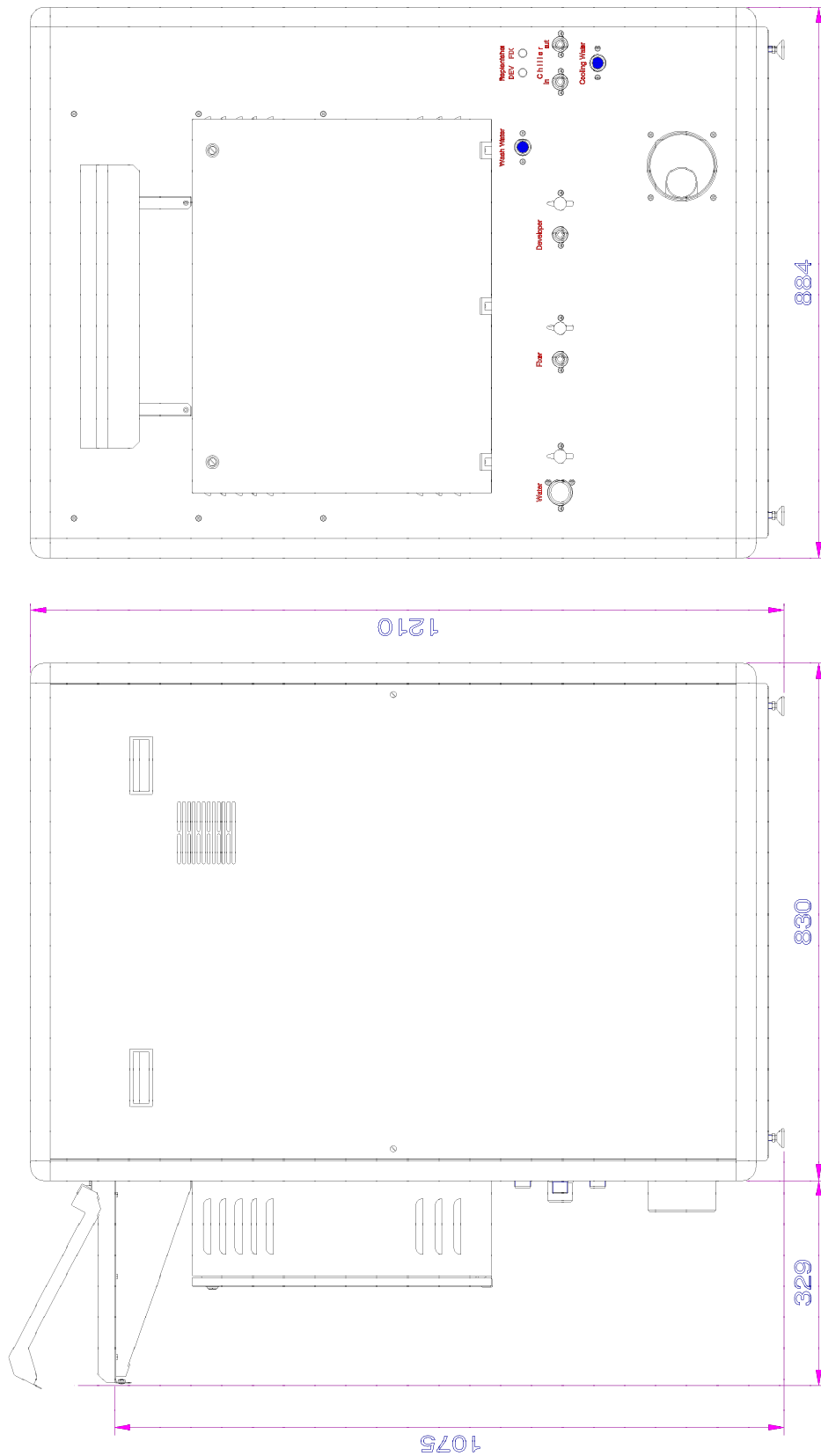
We recommend a minimum walking space of 50 cm around the processor.
Technical specification subject to change without notice.

3 CHEMISTRY DRAINS AND WATER DRAINS

To drain the filmprocessor (Developer, Fixer and the Wash) just open the drain taps according the illustrations below.
Take care that all the mentioned drain taps are close during Refill up.

CAUTION:
Used Developer and used Fixer has to be collected in suitable containers seperately.

CAUTION

| DRAIN WATER | FIX | WASH WATER supply | DEV | COOLING IN | COOLING OUT |

Drain taps:

CLOSED   **OPEN**
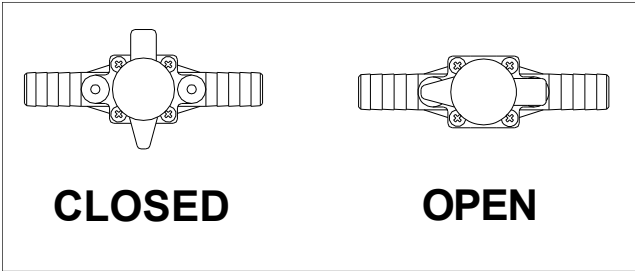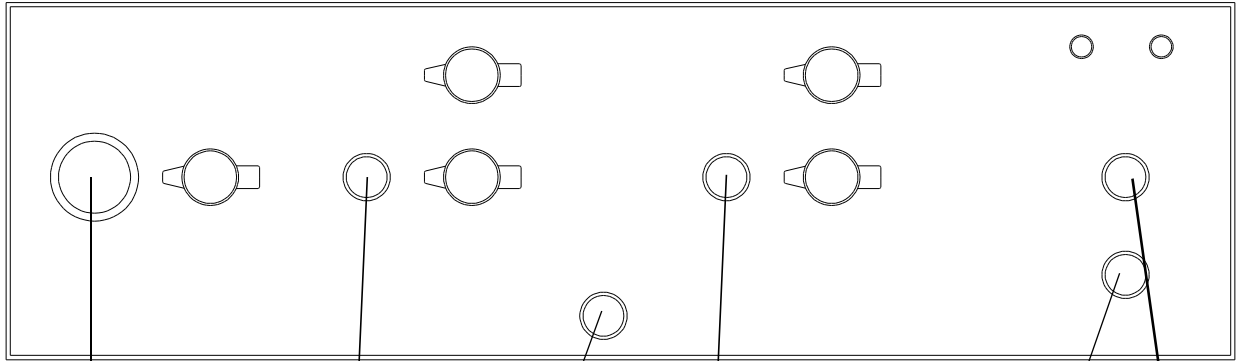
4 INSTALLATION OF THE TRANSPORT ROLLERS

WARNING:
Separate the Film Processor from mains. To do so, switch the main power switch of the Filmprocessor to „0" position. Wear safety goggles, protection gloves and clothing.

DANGER

*)   *Rinse the tanks with water and then fill it to the red marker on the tank wall.*
*)   *Remove all packing materials*
*)   *Rinse the tanks with water and then fill it to the red marker on the tank wall.*

CAUTION:
Take care that all gears are installed as shown.

CAUTION

Rack 1   Rack 2   Rack 3   Dryer
Dev   Fix   Wash
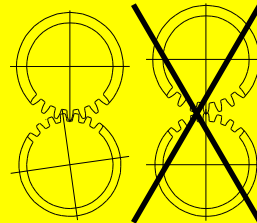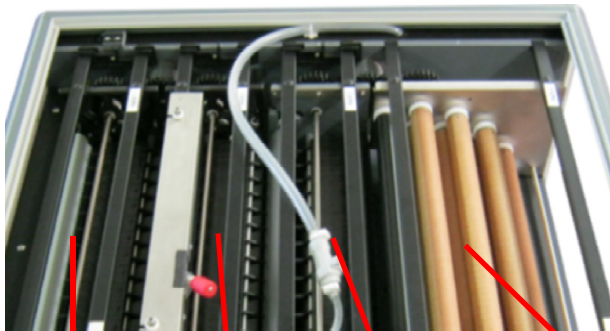
The supporter of the racks have to be completely set into the grooves of the tank.

RACK 1   in the developer tank
RACK 2   in the fixer tank
RACK 3   in the water tank
Dryer   in the dryer
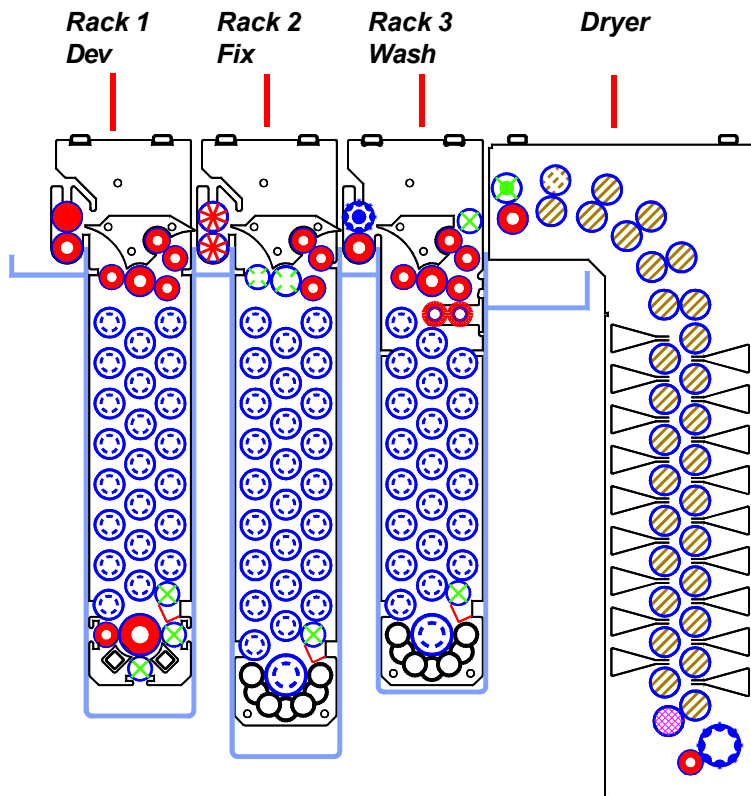
PVC poliert
PVC poliert schwer
PVC geschliffen
PE poliert
PE poliert schwer
PE spezial
Gummi schwer
Gummi leicht
Gummi segmentiert
Schaumstoff
Phenol
Phenol spezial
Stahl
Bürste

5 THE FIRST STEPS

WARNING:
Separate the Film Processor from mains. To do so, switch the main power switch of the Filmprocessor to „0" position. Wear safety goggles, protection gloves and clothing.

DANGER

5.1 USING THE CHEMISTRIES

*)   Only use chemistry suitable for roller transport systems.
*)   Follow instructions of chemistry manufacturers.

FIXER BATH:

*)   Empty fixer tank by opening the fix drain tap.
*)   Remove the Fixer-rack.
*)   Check fixer tank is free of alien material.
*)   Close fix drain tap.
*)   Fill fixer tank with ready-to-use-fixer solution to the red marker on the tank wall.
        Insert the Fixer-rack very carefully and slowly, add hardener solution if advised by the chemistry manufacturer.

DEVELOPER BATH:

*)   Empty developer tank by opening dev drain tap.
*)   Remove the Developer-rack.
*)   Check developer tank is free of alien material.
*)   Close dev drain tap.
*)   Fill developer tank with ready-to-use-developer solution to the red marker on the tank wall.
        Insert the developer-rack very carefully and slowly. Replenishment tanks may be used to mix the chemistry. Any remaining can be used for replenishment.

CAUTION:
Even the smallest quantity of fixer could contaminate the developer solution. Therefore, always fill with fixer first.
When removing the fixer rack, always cover the developer tank.
For removing the fixer rack use rack carrier tray (optional accessory).

CAUTION

6 WORKING WITH THE PROCESSOR

IN THE MORNING:

- Turn on water supply
- Check replenishment tank levels
- Check whether that the water drain tap is closed
- Switch on the Filmprocessor with the Filmprocessor main switch (position "1")
- Wait for the "READY" of the processor

NORMAL WORKING:

- Check level of the replenishment containers (DEV&FIX)
- Check level of the waste containers (DEV&FIX)
- Select programme
- Feed through one or two of cleaning films (optional item)
- During feeding films, always check the free-signal, given form the display
- Ensure first rollers pull material
- Feed large format films in straigh
- Put a leader on roll films
- Fold the leading edge on roll paper
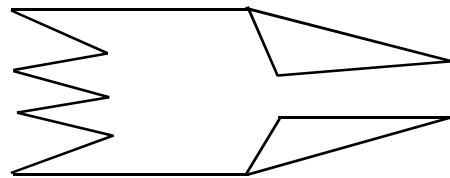
IN THE EVENING:

- Turn off water supply
- Switch off the main power switch of the Filmprocessor (Main switch in position "0")
- Open water drain tap to prevent algae growths in water tank
- ***Lift the top cover to prevent condensation!***

6.1 PROCESSOR FUNCTIONS

Programming:

Automatic processing parameters, e.g., temperature, speed and replenishment rates, can be stored in 7 different programmes.

Warm-Up Time:

Once programmed, temperature settings are accurately controlled. Constant solution temperatures are maintained in the processing tanks. Temperatures tolerances +/- 0.2 °C are achieved by the microprocessor control unit while the solutions are circulated by circulation pumps. When temperature has reached PRE-SET levels, the processor enters STANDBY mode and is ready for use.

Standby:

In case no film is in process - after a fixed period of time and when, after the last plate leaves the dryer, the processor transport, dryer and water supply is switched off automatically. The processor goes to standby mode. During standby, the processor activates two important features:
ANTI-OXIDATION and ANTI-CRYSTALIZATION programmes.

Anti-Oxidation:

During STANDBY mode - and in long periods of no production, a preprogrammable ANTI-OXIDATION cycle (replenishment cycle) is initiated. The additional replenishment compensates the impact of air oxidation of the chemistry during standby mode and maintain chemistry levels in the tanks, in order to compensate evaporation of the water in the solutions.

Anti-Crystalization:

During STANDBY mode - within a programmable cycle period - the transport rollers and the gum pump are activated - this helps to prevent crystalization build-up on the rollers.

Automatic Replenishment:

The processor is equipped with a film area measuring system. Infrared sensors scan the incomming plate area and when the preprogrammed amount of plate (area) enters the processor, a replenishment cycle will be activated.

Automatic (Start-Stop):

Infrared sensors also automatically control the startcycle of the filmprosessor. The filmprocessor changes from STANDBY to RUN once a film has interrupted the light barrier. As the rollers turn, water is supplied to the wash tank and to the intermediate rinse bath system. Once the last film has passed through, the filmprocessor reverts to STANDBY. The film can be taken out of the receivin basket or top cover lid.

6.3 THE DISPLAY

Number of programs	9
Temperature range, developer and fixer	18,0 ÷ 43,0°C
Temperature range, dryer	18 ÷ 60°C
Temperature control tolerances	±0.2°C
Temperature measurement resolution	0.03°C
Developing time tolerances at max. speed	±2%

Motor speed is quartz-stabilized and controlled by a separate microprocessor
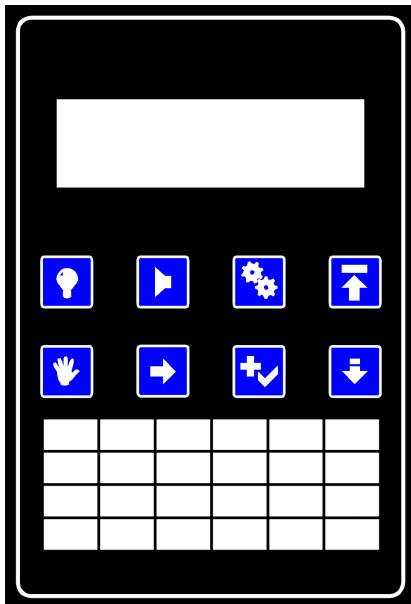
back light ON/OFF
check errors /alarm shutdown
setup mode
back to top menu
manual operation
move cursor
select menu item/change value
scroll page down

6.4 PROGRAMMING PROCEDURES

Switch on the film processor at the main switch (position „1").
By default the processor starts in working mode. Make sure that no media is
being processed, since re-programming is enabled during standby only.

Press ⚙. The programming menu will appear:

With ➡, move the cursor under "Program" and
select it with ⬇.

```
Program  Setup
Options
```
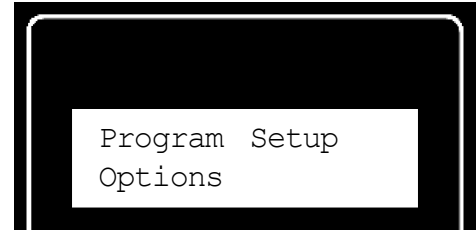
Press ⬇ to change the number of the program
you wish to modify.
With ➡, move the cursor under "Modify" and
select it with ⬇.
The program consists of several pages.

Use ⬇ to scroll through the pages.

```
P1   Modify
set time
```

```
Tank1 time 030 s
T1 26,0°C
```

```
T2 26,0°C
T3 22.0°C
```

T1 Developer
T2 Fixer
T3 Dryer

```
R1 0700 ml/sqm
R2 1400 ml/sqm
```

```
Save   Cancel
```
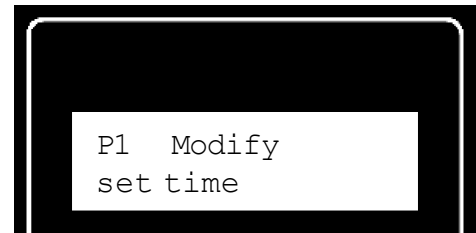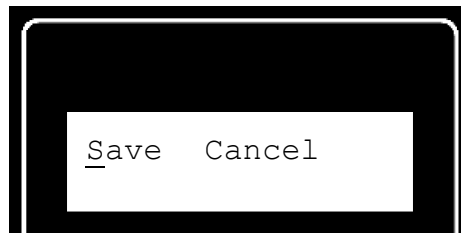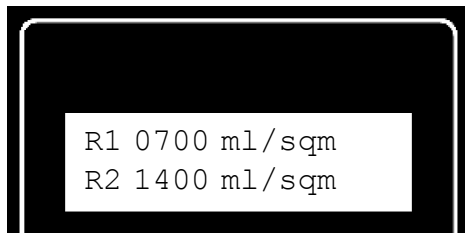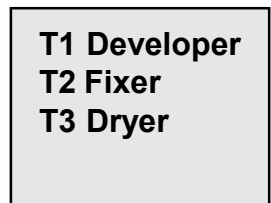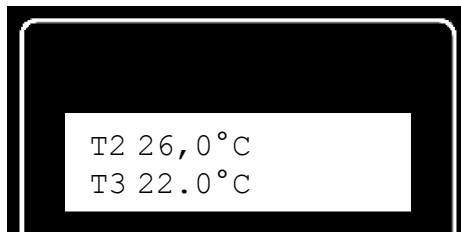
To set the parameters, move the cursor with ➡, then change the value with ✚˅.
Once all digits have been set to the desired value, position the cursor under
"Save" and press ✚˅ to store the values, or select "Cancel" to discard the changes.

If any of the values are set too high or too low, when
trying to save the program you will get.

After 2 seconds the message will disappear
and you will be taken back to re-program the values.

```
Out of range
```
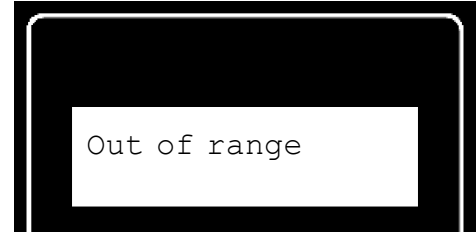
A parameter that was too high will be automatically reset to the maximum
possible value. A parameter that was too low will be reset to the minimum possible value.

This can be used if you want to program extreme values - for instance you want to use
the shortest developing time possible, but you don't remember the value. In this case
just program the "Tank1 time" to 000. After the "Out of range" message, the developing
time will be reset to the minimum. Just select "Save" once again.

To go back to work mode, press ⬆.

NOTE:
The "Setup" menu is for service and factory setup purposes only.
The "Setup" menu sets film processor specific values. This values
should not be changed by the costumer.
Although you can select these menus, scroll through the data
and even change it, saving the changed data is disabled.
Only authorized service technicians are allowed to set these values.

6.4.1 Changing the program

To use another program press ✋. You will see:

If media is being processed, only the "Rep" and "Monitor"
items are selectable. Therefore you must wait until the
processor is empty to switch to another program.
With ➡, move the cursor under P1. Press ✚˅ to change
the program number.

```
Start  P1  Use
Rep    Monitor
```

With ➡, move the cursor to "Use" and select it with ✚˅. Press ⬆ to jump back to main page.
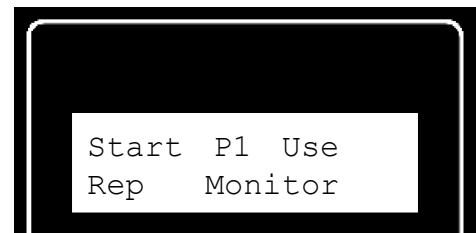
Note:
A cyclic redundancy check is used to verify the data being read from
the non-volatile memory. If some damage occurred to the program
data, or the program was never set up properly, you will get the error
message *"Program invalid"*. **The solution is to enter programming mode**
and re-program the data. This error will occur if the EEPROM chip has
been replaced as well, in which case it contains random data.
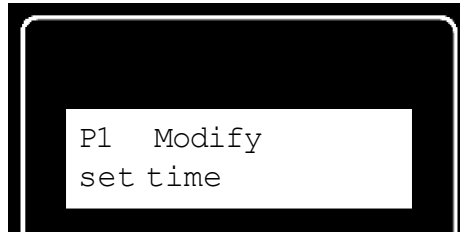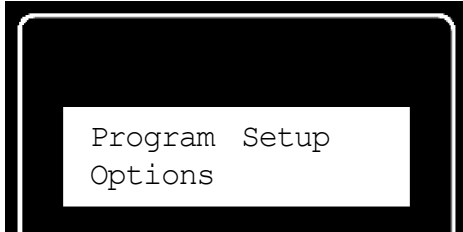
6.4.2 Date & Time

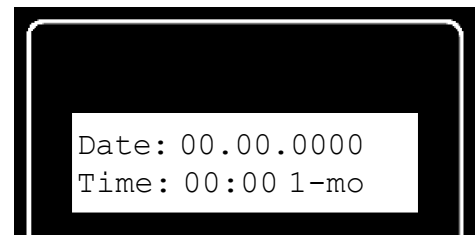The processor allowes to set the actual date and time:

Use ⚙, select "**Program**" and confirm this with ✓.

Select "set time" and confirm this with ✓.

```
Program  Setup
Options
```

```
P1   Modify
set time
```

You are now able to program the date, time and the weekday, this has no impact on the processor functions.

Use save or cancel after doing so.

```
Date: 00.00.0000
Time: 00:00 1-mo
```

6.4.3 Automatic mode

The film processor is designed to work without operator assistance. Under normal circumstances the operator will use the front panel only to check the process parameters and progress.

To scroll through the pages, press ⬇.

Press ⬆ to jump back to main page.

P1 tells you that you are using program 1.
If the film processor was started manually, the indication will be **M1**.

"**55% Done**" is the progress indicator. It means **55%** of the developing process is complete.
After it reaches **100%**, appears **Additional run** and then the machine will switch to standby.

"**T1=32,1ºC**" tells you the actually measured temperature in the tank. The value in the brackets is the programmed temperature.

The same indication is available for tank **2 (T2)**, tank **3 (T3)** and for the dryer **(T4).**

```
P1   Ready
T1=26,1˚C   (26,0)
```

```
55% Done
T1=26,1˚C   (26,0)
```

```
T2=26,1˚C   (26,0)
T3=22,1˚C   (22,0)
```

```
T4=48,8˚C   (50,0)
```
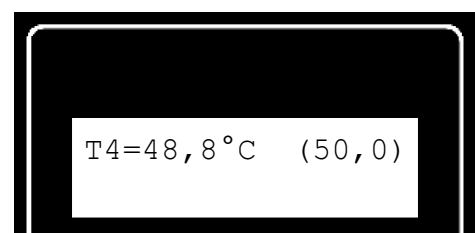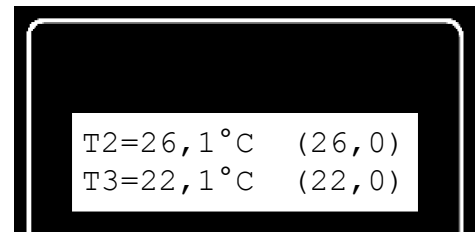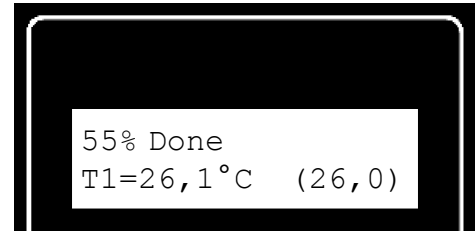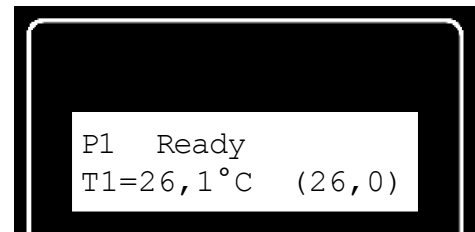
"Rep1" and **"Rep2"** are the replenishment rates for the actual program.

```
Rep1    700ml/sqm
Rep2   1400ml/sqm
```
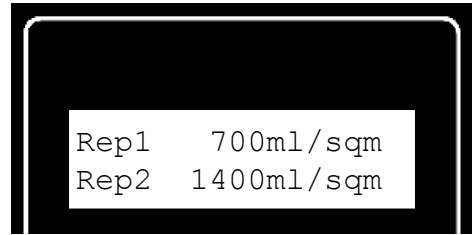
"Tank1 time" is the time the media stays in **tank 1**.
**"Dry to dry"** is the length of the complete processing cycle (leading edge to rearmost edge).

```
Tank1  time  100s
Dry to dry   413s
```
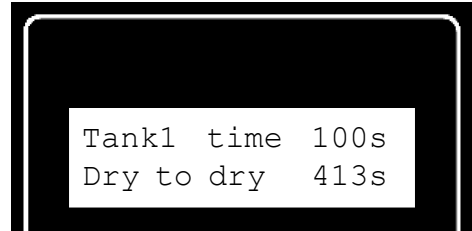
"Film Speed" indicates the linear speed of the media inside the film processor.

```
Speed: xx cm/min
```
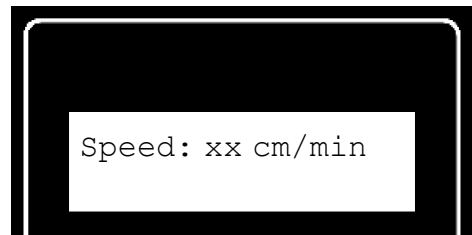
6.4.4 Standby Options

The film processor is equipped with an anti-oxidation and a anti-crystallization cycle. That means, when in standby, the processor will start the transport of the rollers and the wash on regular intervals in order to prevent crystallization on the rollers (Anti-crystallization). The anti-oxidation cycle activat, in free programmable time intervals, replenishment cycles. This will prevent oxidation of the the chemicals.

During such a cleaning cycle, the display will look like this.
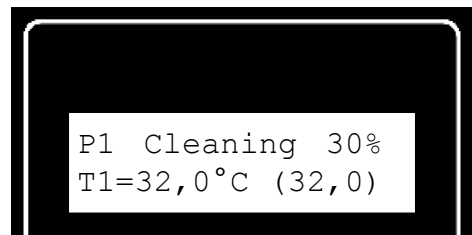
During such a cycle the film processor will accept media. It's not necessary to wait to the end of the cycle.

```
P1 Cleaning 30%
T1=32,0°C (32,0)
```

Press ✸, use ➡ to move the cursor to **"Options"** and press ✚✓, use ✚✓ again to confirm **"Standby".** By using ⬇ you can scroll through the pages:

|	
SB dryer drop **10**	The dryer temp. is 10°C lower than the programmed value.
SB replenishment **200 ml each 2 h**	The film processor will activate a 200ml replenishment cycle each 2 hours.(Anti-oxidation-cycle)
SB self-cleaning **20cm each 10min**	The film processor will activate 2 roller turns (1 roller turn ≅ 10 cm) each 10 min.(Anti-crystallization-cycle)

6.4.5 Manual replenishment cycle

You may need to run the replenishment manually,
for instance during cleaning.
To do this press ✋ . With ➡, move the cursor under
"Rep" and select it with ✚∨.

```
Rep1    0 ml   OFF
Rep2    0 ml   OFF
```
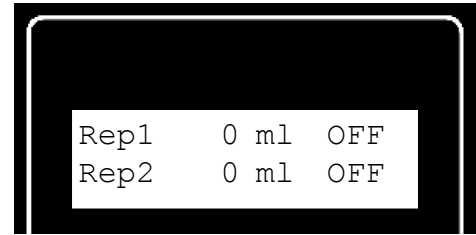
To replenish tank 1
With ➡, move the cursor under "Rep1" and press ✚∨.
This will add 100ml. The OFF indication will change to ON, meaning that the
replenishment pump is working. If you need more replenishment,
 press ✚∨ again to add more replenishment in steps of 100ml. There is no need
 to wait for the replenishment pump to finish.
For tank 2, move the cursor under Rep2 and repeat the procedure.

Press ⬆ to jump back to the main page.

> **NOTE:**
> **Up to 2000 ml of manual replenishment or a maximum of**
> **25min pump working time is allowed (whichever is greater).**

6.4.6 Manual start/stop

The manual start/stop is possible only when no media is being processed. During
processing the corresponding menu items are not selectable - you can't move the cursor
there.

To run the motor manually:
Press ✋ use ➡ to move the cursor under "Start" and select it with ✚∨.
This will run the motor. The menu item "Start" changes to "Stop".
You can stop the motor by selecting "Stop".

When you start the motor manually, this will be indicated on the main page as
M1 instead of P1.

6.4.7 Display illumination ON/OFF

In a dark room, it might be necessary to switch off the display backlight to prevent
exposure. The 💡 button toggles the backlight on/off.
When the backlight is off, all the buttons except 💡 are disabled.
This is done to prevent pressing buttons by accident in a dark room. Switching the
display off is a good idea if the film processor is left unattended. This will reduce the
chances for unauthorized people to operate the film processor.

6.4.8 Automatic start

After switching on, the processor will check all processing parameters (especially the temperatures) and will start to heat up - during this period, (crossover run & heating up) no film can be processed....once the "**Ready**" message is displayed, film can be loaded.

The heat up time, very much depends on the ambient temperature.

```
P1/Er
T1= 14,4°C (26.0°)
```

```
P1 Ready
T1= 26,0°C (26.0°)
```
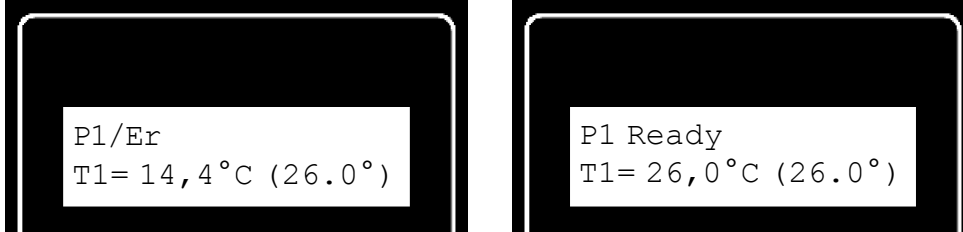
6.4.9 Distance between the films

To prevent film jams, some minimum distance between the films is needed.
After the end of the film, the display will show:

```
P1  Don't feed
T1=26,0°C  (26,0)
```

As long as "Don't feed" is present , it`s not allowed to feed films.
After a while "Don't feed" will disappear and a beep will indicate that the input is free again.

6.4.10 Monitor Mode

The "Monitor Program" is used to check some different parameters of the film processor. Press the button ✋, move the cursor by using ➡ under Monitor and confirm with ✝✓.

```
Start     P1 Use
Rep Monitor
```

The first page looks like this:

This represents the film processor:
The first four DDDD are the developer tank,
FFFF - fixer tank, WWWW - water and
the last DDDD is the dryer.

```
DDDDFFFFWWWWDDDD
 ---          --
```
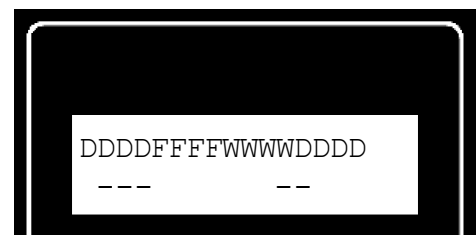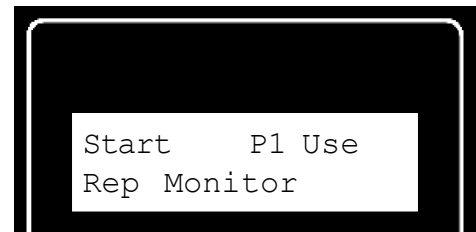
The dashes on the second row indicate where there are pieces of material in the film processor.

The water is turned on only if there is a film in the specified portion of the film processor, that saves water and protects the environment.

Each film is tracked inside the machine. The software can track up to 70 films.
Note that two films running in parallel are considered as one. For the film processor, different films are pieces of material detected by a completely free sensorbar.

Motor Off / On **Speed 31 001**	Motor is **On** or **Off** **31** speed **001** re-impulses from the motor

Normal s-bar **Area=0.0000 sqm.**	A normal 6-sensor sensorbar is recognized Value of the given film aera until to the next replenishment cycle.

|	
S-bar: --------- **-----------**	This feature is used to check each sensor of the sensor-bar. In Your COLENTA processor there are 6 sensors integrated. To check the sensors, follow the instructions underneath: -put a small film under the sensorbar (don't feed into the film processor). -move the film as shown underneath. -at the same time take a look at the display.

S-bar: --------- **---------10**	That means sensor 1 and 0 are occupied
S-bar: --------- **-------32--**	That means sensor 3 and 2 are occupied
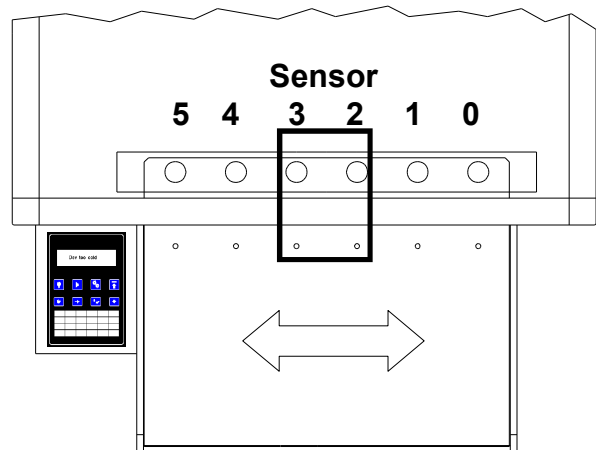
H1=0 H2=0 Hdr1=1 **Hdr2=1 Fan=1**	H1=1 or 0	heater tank1	**On** or **OFF**
	H2=1 or 0	heater tank2	**On** or **OFF**
	Hdr1=1 or 0	heater basic dryer	**On** or **OFF**
	Hdr2=1 or 0	heater additional dryer	**On** or **OFF**
	Fan=1 or 0	dryer fan	**On** or **OFF**

Refill1 0000 **Refill2 0000**	see chapter "Automatic developer and fixer tank fill" on page 28.

|	
Total aera sqm **0000.00**	Displays the total amount of film that was loaded into the processor.

|	
Date: dd.mm.yy **Time: hh:mm:ss**	Displays the date and time.

6.4.11 Filter control

The software is equipped with a sub-program to control
the filter unit of the developer:
Press the button ⚙, use ➡ to move the cursor
under "Options", press ✚∨ , you will see
"Standby Refill Filter" use ➡ again to move the
cursor to "Filter", press ✚∨ you will see:

```
Area  Log
```
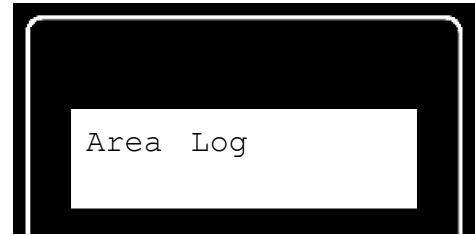
The "Area" menu sets the amount of square meters
before the filter alert. The value is 0000-9999 .
A value of 0000 turns off the filter alert.

```
Filter alert
after xxxx sqm
```
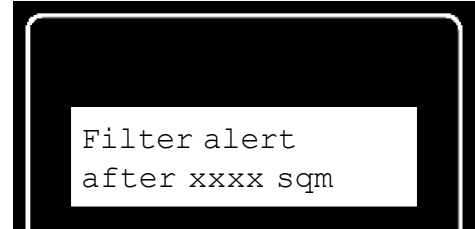
The "Log" menu shows the total area processed
so far. This value is stored in the RAM.
The value is updated each time a replenishment is
initiated. It depends on the „Replenish after" variable
from the setup.
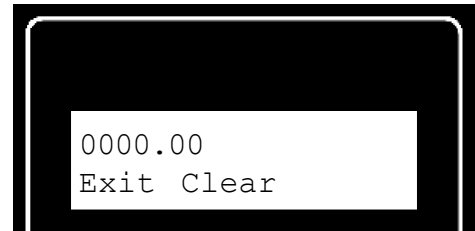
For example if "Replenish after = 0.250sqm",
the total processed area is increased
by 0.250 sq.m. at each replenishment.

```
0000.00
Exit Clear
```

At each replenishment the total processed area is checked for exceeding the alert value.
When the value has been exceeded, an error message appears „Change filter".

WARNING:
Call for qualified service personnel. The filter may
be replaced by qualified service personnel only.

⚠ **WARNING**

NOTE:
After changing the filter, the user must enter the programming
mode menu Options/Filter/Log and clear the processed area,
so that the counter restarts from 0 for the new filter.

ⓘ

### 6.4.12 Additional features - auto fill water / auto fill chemicals (dev & fix)

1 - Automatic wash tank fill / automatic wash tank draining

2 - Automatic developer and fixer tank fill (see next page)

1 - Automatic wash tank filling

 This feature ensures that the water level in the wash tank is at the normal level on „start-up" and then to drain automatically on shut down. This is done by the use of an additional level sensor in the wash tank to inform the film processor controller about the level of water in the tank and the use of an electrically controlled drain valve that will remain „closed" when the film processor is in use and „open" when the film processor is shut down. On morning „start-up" the drain valve is closed and the water „fill" solenoid is opened to allow water to pass into the wash tank until reaching the normal operation level.
If the wash tank does not reach normal level within *20 minutes* (level switch not activated) the electronics will assume that there is a water supply problem and the error message "can't fill water" is displayed.

The following instructions will activate or deactivate this feature:

Press the button ⚙, use ➡ to move the cursor under "Options", press ↴, you will see "Standby Refill"
use ➡ again to move the cursor under "Refill",
press ↴ you will see:

```
Wash auto refill
1  (1-yes,0-no)
```
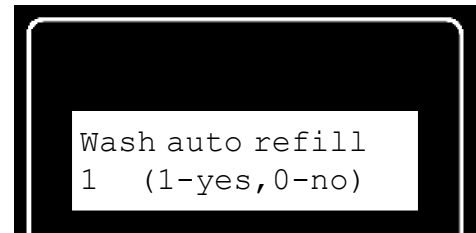
Use ↴ to set 1 or 0. After that procedure, use (3x) ⬇ to leave the menu, the controller will ask you "Save Cancel", choose "Save" by using ↴ .

2) Automatic developer and fixer tank fill.

This feature automatically corrects low level conditions in the developer and fixer chemical tanks with the use of additional level switch monitoring circuits.
If any tank „low level" sensor is activated a replenishment cycle will inject solution (**XXml**) into the chemical tanks until the correct tank level is reached.
** XXml** this amount is programmable and relates to the size of the film processor.
(see the table : factory settings)
In the case of a leak in the tank or the associated circulation system and to avoid the replenishment pumps operating continuously and thereby draining and wasting replenishment chemicals there is a built in fail safe system that will disable the replenishment pumps if the level in the tank can not be reached after 2000ml of replenishment. The pump stops and the message „ Tank - Low Level" is displayed.

Use the following procedure to activate or deactivate the feature:

Press the button ⚙, use ➡ to move the cursor under "Options", press ↴, you will see "Standby Refill" use again ➡ to move the cursor under "Refill" you will see:

```
Wash auto refill
1  (1-yes,0-no)
```
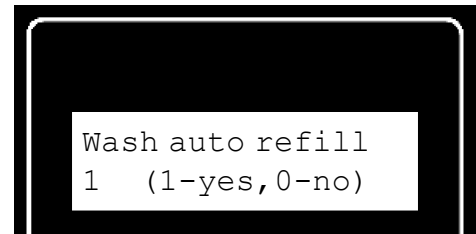
Use ↴ (1x) you will see:
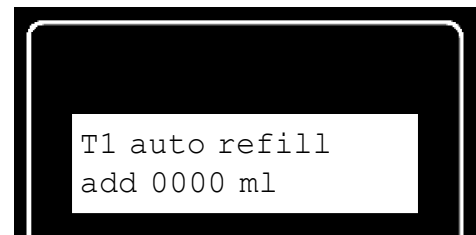
In this case, the automatic chemical tank fill function is deactivated, to activate it, you have to set a value in milliliters. To do so, use the following procedure:
Move the cursor under the "zeros" by using ➡ .
To set a value, use ↴ .

```
T1 auto refill
add 0000 ml
```
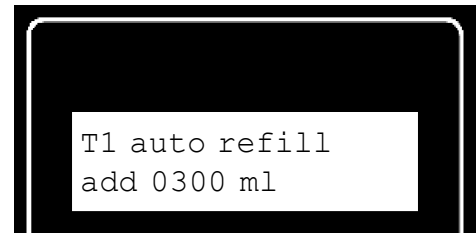
Use the same procedure for tank2 as described for tank1 before.
After you set all that, use ↴ (1x) to leave the menu, the controller will ask you "Save Cancel", choose "Save" by using ↴ .

```
T1 auto refill
add 0300 ml
```

6.4.13 Error codes

If an error occurs, the indication "P1" (or M1) will alternate with "Er". If this happens Press the ▶ button. This will stop the beeper and take you to the error menu, so you can check what kind of error is indicated. If more than one error occurred, press ⬇ to view the rest of them. Press ⬆ to jump back to the main page.

When the film processor switched on at the beginning of the working hours ,it is expected to have low temperatures in the tanks. For this reason, the **"Er"** indication will be shown without alarm. If, however, the temperature drops during normal work, the alarm will be activated.

```
Errors:   1
Tank1 too cold
```

Error Messages:

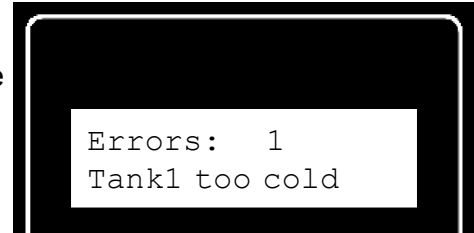| Display	Reason
Tank1 too cold	A:Normal condition during heat-up period. The developer is heated until the set temperature is reached. B:If an error message is displayed: Call for qualified service personnel.
Tank1 too warm	Developer temperature has gone up more than 1°C above SET-temperature.Call for qualified service personnel.
Tank2 too cold	A:Normal condition during heat-up period. The fixer is heated until the set temperature is reached. B:If an error message is displayed: Call for qualified service personnel.
Tank2 too warm	Fixer temperature has gone up more than 5°C above the set temperature. Call for qualified service personnel.
Dryer too warm	Actual temperature in the dryer is more than 5°C above the set temperature. Call for qualified service personnel.
Motor overload	Sluggishly running drive/transportsystem. The drive motor does not reach it´s SET-speed. Call for qualified service personnel.
Emergency stop	A: Top cover of the film processor is open. Close cover. B: Emergency stop is active. Deactivate Emergency stop.
T1: no probe	Temperature probe in tank1 is defect or missing. Call for qualified service personnel.
T2: no probe	Temperature probe in tank2 is defect or missing. Call for qualified service personnel.
T3: no probe	Temperature probe in tank3 is defect or missing. Call for qualified service personnel.
T4: no probe	Temperature probe in the dryer is defect or missing. Call for qualified service personnel.
Change filter	The filter medium has to be replaced. Call for qualified service personnel.
Can't fill water	After *20 (25) minutes*, the watertank should be filled up with water, if the sensor is not reached during this time, the meassage appears. Call for qualified Service personnel.
Tank1 low level	The chemical level in tank1 is too low. Call for qualified Service personnel
Tank2 low level	The chemical level in tank2 is too low. Call for qualified Service personnel.
Water low level	Level of the water tank is too low. Call for qualified Service personnel.
Water overflow	Drain of watertank is blocked. Call for qualified service personnel.
Rep. T1 low level	The replenishment tank for tank 1 is empty. Refill tank.
Rep. T2 low level	The replenishment tank for tank 2 is empty. Refill tank.

3 TEMPERING SYSTEM

The filmprocessor employs a indirect tempering system to maintain processing solution temperatures accurately and efficiently. This tempering system is integrated into the recirculation. This system offers more efficiency and energy-saving.

The control panel in turn activates the circulation pumps and the tempering unit. The circulation pumps mix 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 filmprocessors are equipped with a „cold water" cooling system or a "chiller" cooling.

3.1 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.
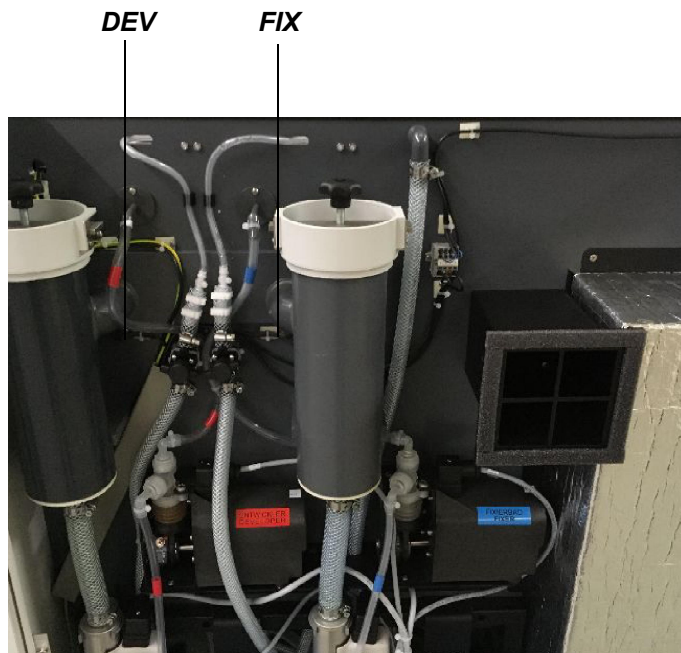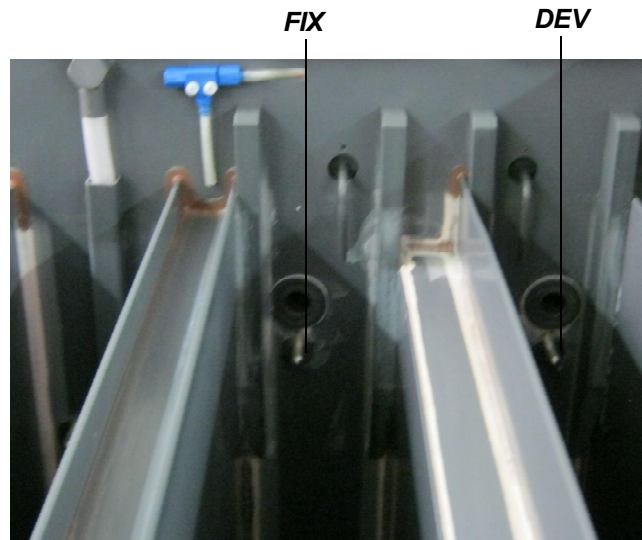
4 I2C - BUS SYSTEM

Probes positioned under solution levels precisely monitor all solution tank temperatures.
These temperature probes are continuously supplying information to the microprocessor on actual solution temperatures within the tanks.

The microprocessor then compares these actual temperatures to the required programmed "set" temperatures and controls the relevant heaters/cooling systems accordingly.

Bus-System	Measurement	Action
Temperature probe	Developer Temp.	Heating/Cooling
	Fix Temp.	Heating/Cooling
	Wash Temp.	Heating
	Dry Temp.	Heating
Sensorbar	Incomming film-area	Start/Replenishment/Stop

NOTE:
To transfer this information, a I2C - Bus System is installed.

4.1 OVERVIEW: I2C-DISTRIBUTION BOARD
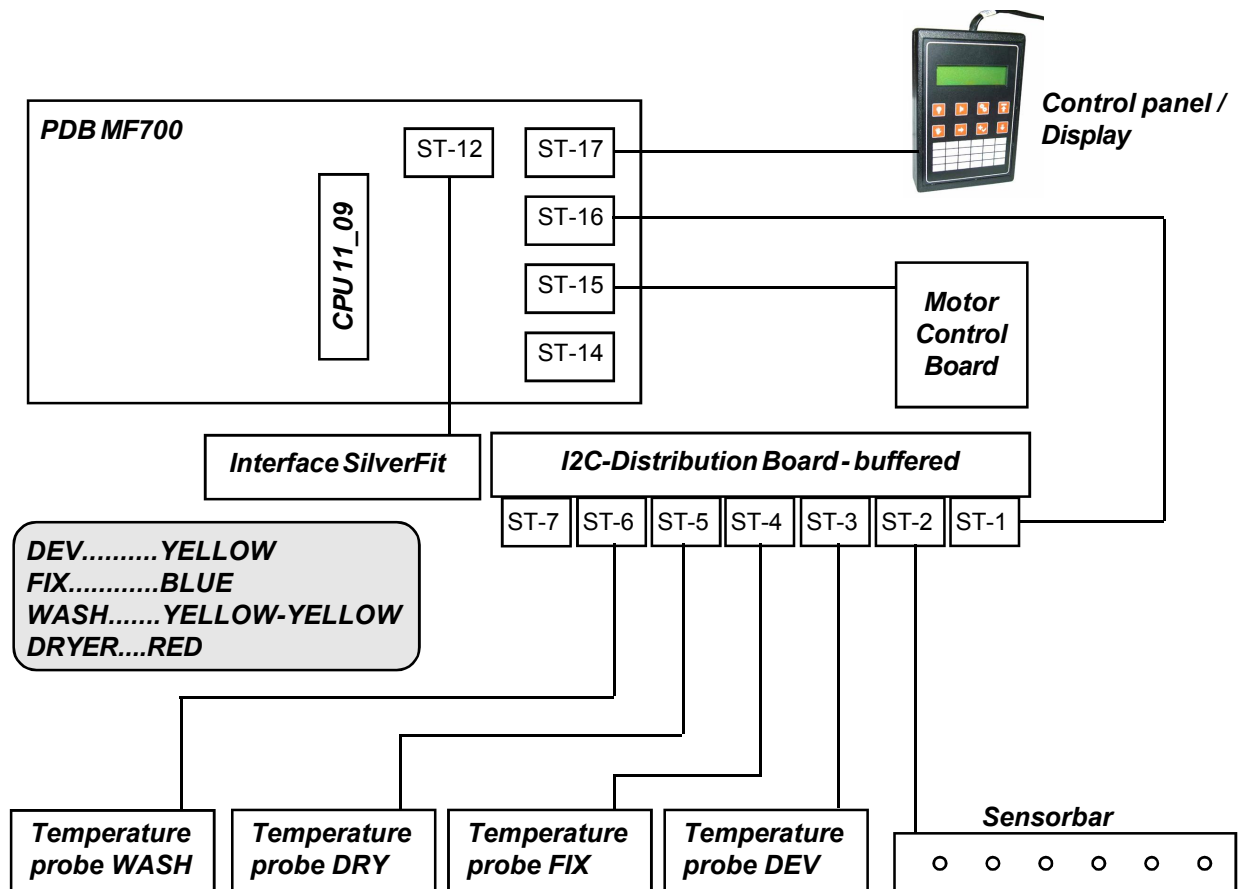
5 VENTILATION

To prevent cristalization and humidity inside the filmprocessor a ventilation divice is fitted to processor.

It is recommended to connect the below mentioned tube to an external exhaust device to prevent any possible problems.

WARNING:
To install such a external exhaust device, is allowed for qualified Service personnel only.
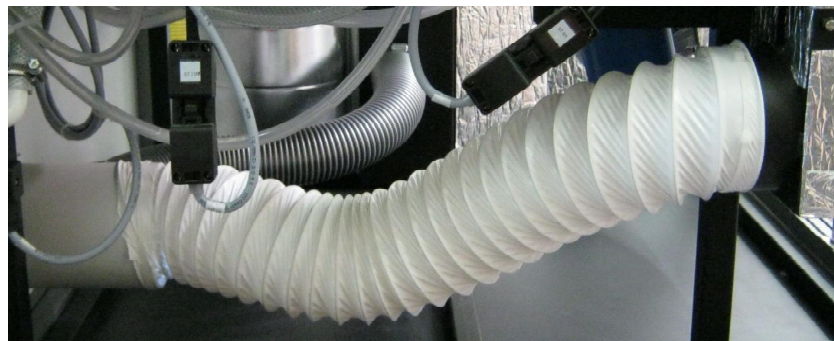
WARNING

Tube

6 CHEMICAL REPLENISHMENT SYSTEM

Whenever photographic material is processed, chemical components of the processing solutions are used and by-products are left behind in the processing solutions.

Replenisher solutions are formulated to restore the chemistry to its original activity and to dilute the by products to a correct 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 filmprocessor by way of infrared sensors installed across the complete feed width of the filmprocessor.
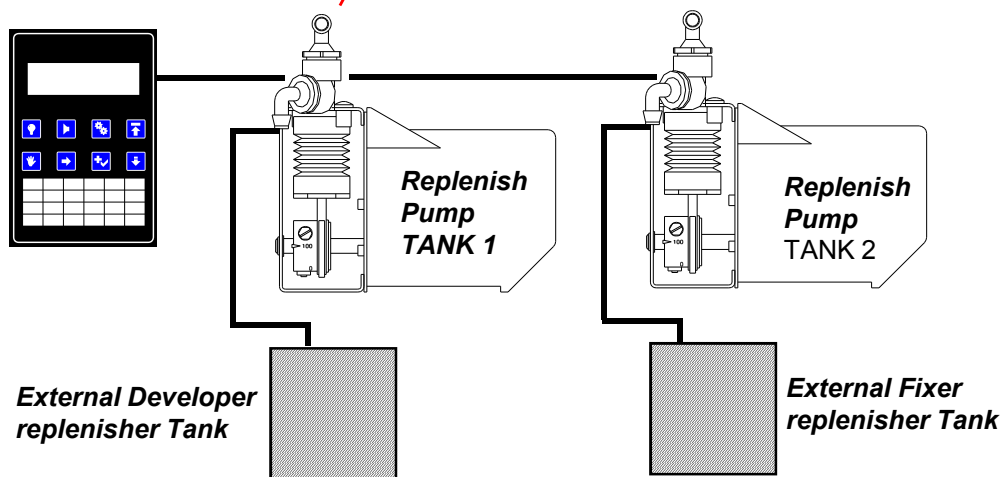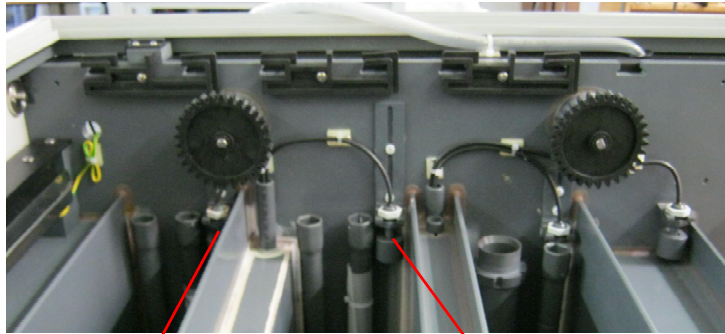
These sensors emit pulses of infrared light which has no effect on photographic emulsions. When media is beneath the sensorbar, the pulses are reflected and detected by the sensor. The pulses are transmitted to the control panel where they are "counted" by the microprocessor. When the number of pulses 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 filters located at the bottom of the external replenisher tanks to the chemistry tank. The replenisher tanks are outside of the film processor.
The filters should be checked monthly and be cleaned or replaced if necessary.
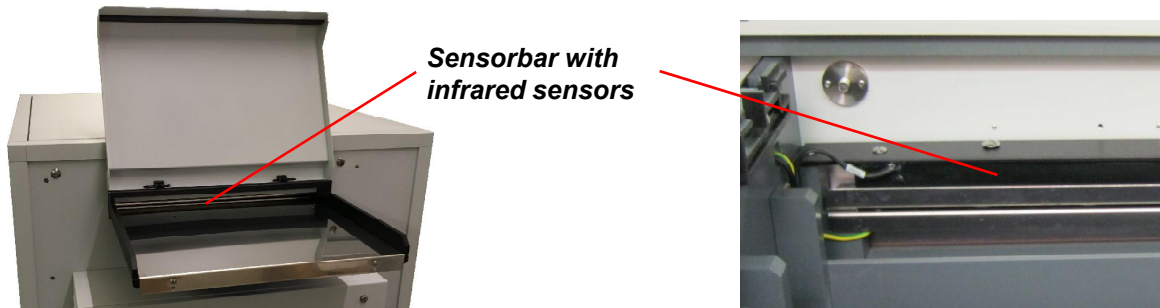
WARNING:
Separate the Film Processor from mains. To do so, switch the main power switch of the Filmprocessor to „0" position. Wear safety goggles, protection gloves and clothing.

DANGER

6.1 INFRARED REPLENISHMENT SENSORBAR

The automatic replenishment system is using an infrared-sensor-bar to detect the incoming film area. With that information the CPU of the filmprocessor will calculate the replenishment rate which will be need.

Sensorbar with infrared sensors

WARNING:
Special care must be taken to ensure that the processor entrance rollers are always clean and dry – any spillage of chemical or water onto the feed tray / feed rollers or sensor bar must be avoided. Any spillage must be cleaned immediately.

WARNING

The "holes" in the film input guide show you the position of the sensors.

RACK Developer

Sensorbar with 6 infrared sensors

main frame of the filmprocessor

Input-guide with "holes"
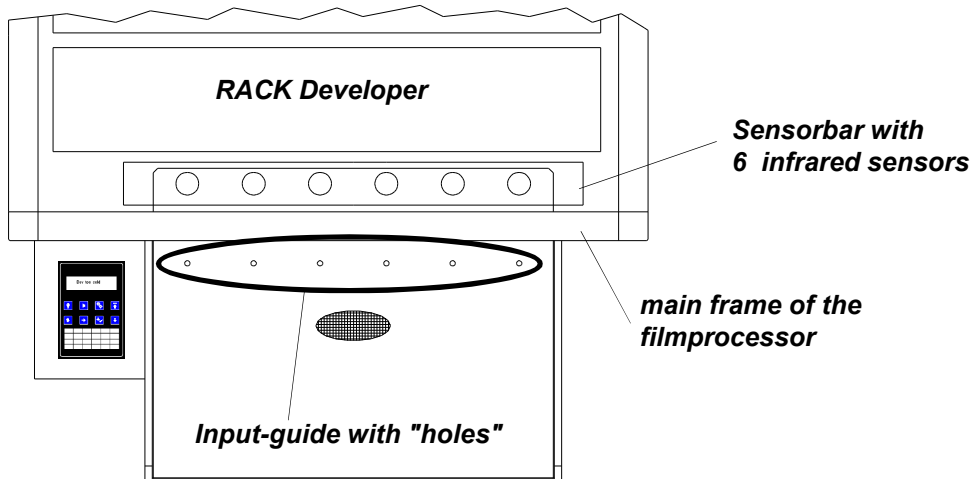
To process rollfims, take care to the following points:

- use a leader
- take care that the film will be detect by minimum 1 sensor

leader

fixing

roll-film
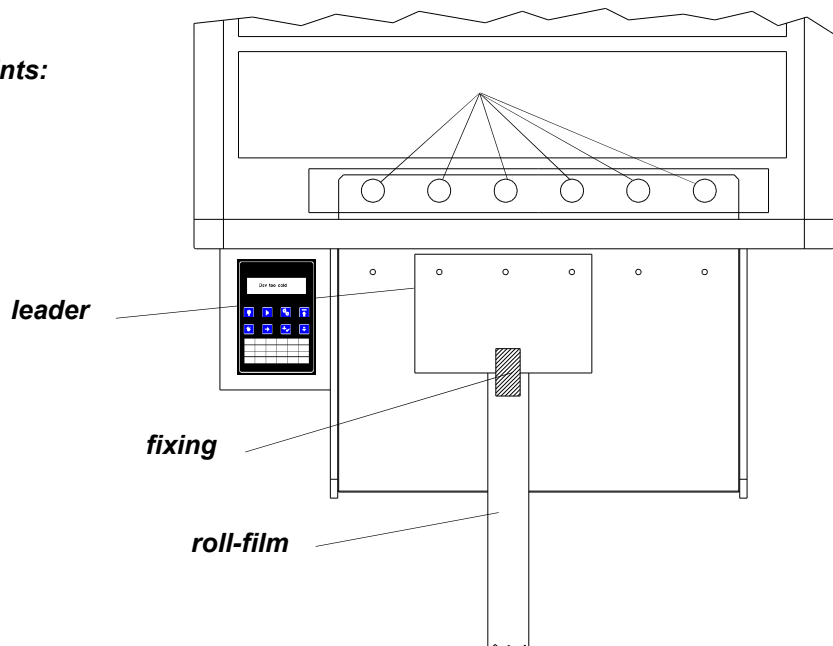
7 MAINTENANCE

The filmprocessor is designed to produce consistent high quality production with the minimum of maintenance. Regular maintenance minimizes the chances for equipment failure and loss of processing quality.
A well trained person has to be responsible for performing the maintenance of the filmprocessor and must be familiar with the operation and function of the processor as well.

7.1 DAILY MAINTENANCE

*)   Check levels of the external replenishment tanks -
      If necessary mix fresh solution.
*)   Cleaning feed tray.
*)   Cleaning spray-bar-guide for the fixer
*)   Before starting production we advise to feed some
      cleaning films to remove any overnight residue.
*)   Use the supplied "spray-bottle" to remove any deposits
      from the drive gears:
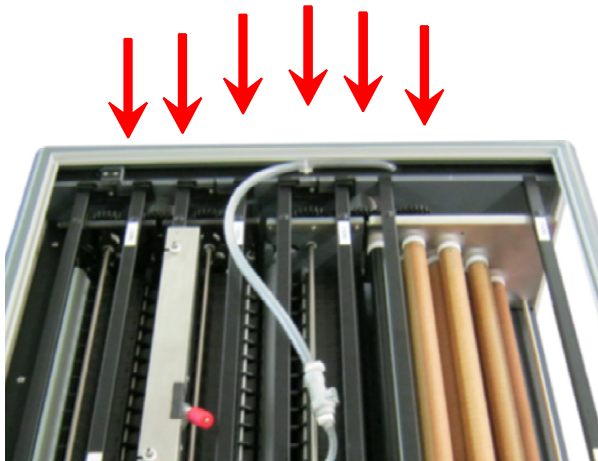
Spray-bottle

7.2 WEEKLY MAINTENANCE

*)   Wipe external surfaces of film processor / enclosures / panels
      with a wet cloth to remove any chemical / dirt deposits.
*)   Inspect and clean the wash tank and
      intermediate water rins drains. If algaes
      present then the should be removed,
      in such a case we suggest to use a proven
      algae control system
*)   Check the shown drain pipes and overflow
      tubes - remove any deposits to prevent blocked of the drain.

7.3 RECOMMENDED MAINTENANCE EVERY 3-6 MONTHS

(Period is subject to filmprocessor useage.)

Good processing quality and the reliable operation of a filmprocessor is dependent upon regular and careful cleaning. Every 3-6 months, the chemicals in the tanks should be drained.
A chemical cleaning of the processing tanks and wash tank is recommended. Always follow safety warnings as described in section 1 when cleaning the filmprocessor.

> **WARNING:**
> **Separate the Film Processor from mains. To do so, switch the main power switch of the Filmprocessor to „0" position. Wear safety goggles, protection gloves and clothing.**

DANGER

*)   Switch off the main power switch of the film processor first (position "0").
*)   Remove the top cover of the filmprocessor.
*)   Drain individual tanks by open the draintaps in front of the filmprocessor.
*)   Remove rack assemblies (water / DEV / FIX, see chapter 5) and put them aside.
*)   Close taps and fill all tanks with water or better with suitable cleaning solution until the red mark inside the tanks are reached.
*)   Put the racks back into the tanks of the filmprocessor and close the top cover.
*)   Switch on the filmprocessor and start some replenishment cycles. The hoses will be cleaned with water as well. Also start the transport of the filmprocessor, the racks has to be in. Let the filmprocessor run for 10 to 15 minutes.
*)   Switch off ("0" position) the main power switch of the filmprocessor and drain the filmprocessor tanks again.
*)   NOTE: Use cleaning solution according to the manufacturer´s instructions.
*)   After tank cleaning, the developer- and wash-tank should be filled twice with fresh water (eventually use neutralizer recommended by manufacturer). Let the filmprocessor run for approximately 10 minutes again. Check all external (outside of the filmprocessor) hose connectors (outside of filmprocessor) and fittings for leaks.
*)   Drain all tanks.
*)   Remove the water / DEV / FIX Racks and check for:
> -worn gears
> -damaged or worn bearings
> -loose screws
> -scratched or bent film guides
> -plastic flat springs in developer bottom underturn.

*)   All repairs must be carried out by qualified service personnel.
*)   Check the inside of the tank for contamination and alien substances.
*)   Clean the rollers well.
*)   Close the drain taps of all 3 tanks.
*)   Fill developer and fixer tanks with fresh chemicals to the required level (1st fixer, 2nd developer)
*)   Fill wash tank.
*)   Re-install the racks carefully. Take care of correct sequence of the racks is followed and make sure the gears are in the right position. Secure the racks.
*)   Insert the respective suction pipe to the correct external replenisher tank. Re-install the top cover and switch on the filmprocessor.
*)   Process test films.

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