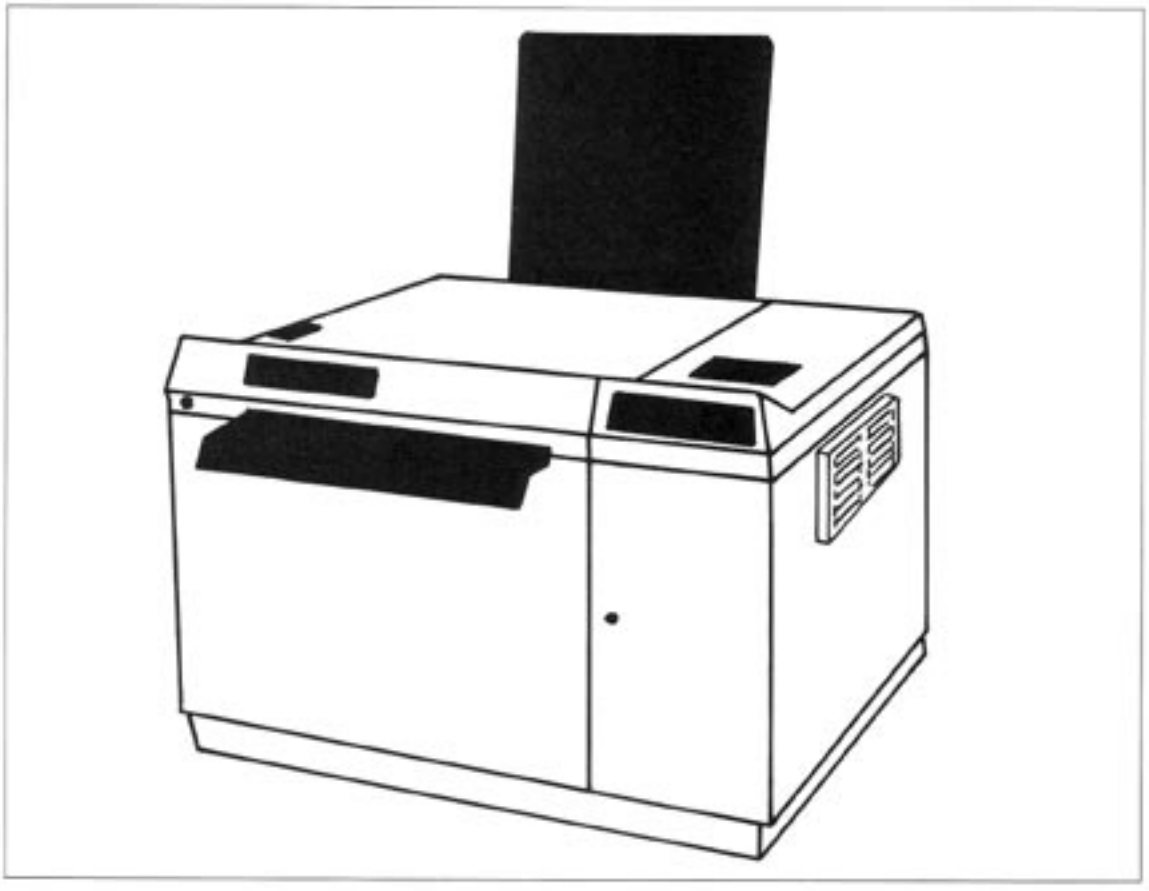
# VELOPEX®

## MD 2000

# AUTOMATIC X-RAY PROCESSORS

# MACHINE MANUAL



**Turning night into day**

MODEL NUMBER

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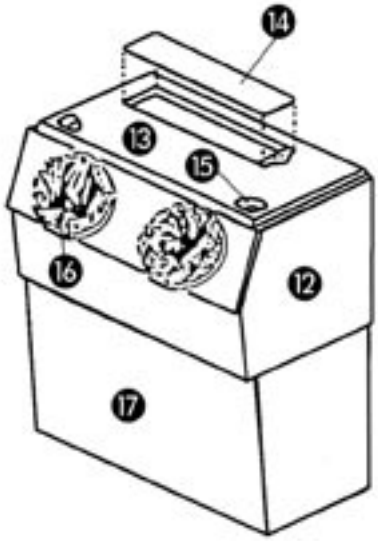
# CONTENTS

# TABLE OF SYMBOLS

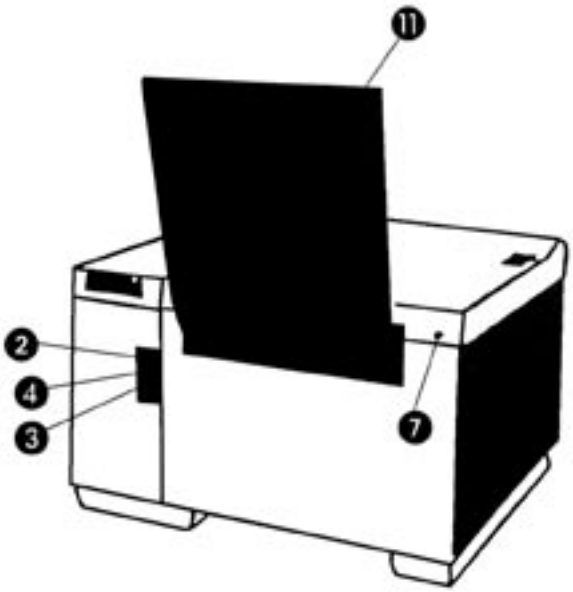
| Symbol | Description |
|---|---|
|  | ALTERNATING CURRENT |
|  | OFF (POWER: DISCONNECTION FROM THE MAINS) |
|  | ON (POWER: CONNECTION TO THE MAINS) |
|  | STAND-BY |
|  | TYPE B EQUIPMENT |
|  | FILM TRANSPORT SWITCH |
|  | INDICATOR ILLUMINATED – CHEMICAL TEMPERATURE LOW<br>INDICATOR OFF – VELOPEX READY FOR USE |
|  | INDICATOR ILLUMINATED – LIQUID LEVEL LOW |
|  | INDICATOR ILLUMINATED – MACHINE SHUTDOWN,<br>LIQUID LEVELS MUST BE RESTORED |

# EXTERNAL COMPONENTS OF THE MACHINE

1. Control panel
2. Mains switch
3. Fuse holder
4. 10A Fused electrical socket
5. Air vent
6. Machine lid
7. Lid release buttons
8. Main body
9. Side panel
10. Film loading platform
11. Film collector

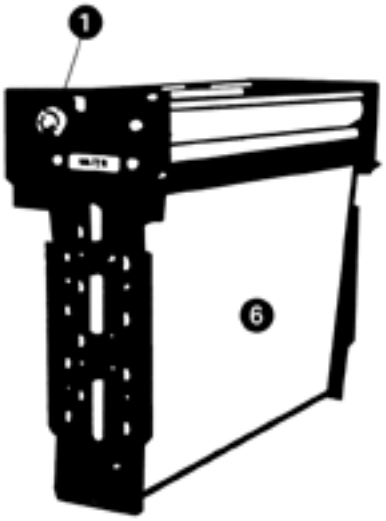



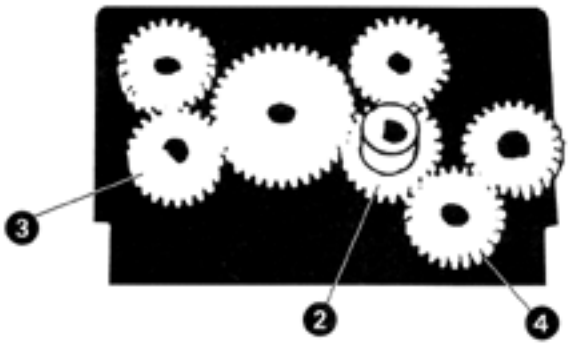

12. Daylight loader
13. Loader lid
14. Viewer cover
15. Daylight loader locks
16. Hand loading gloves
17. Canister



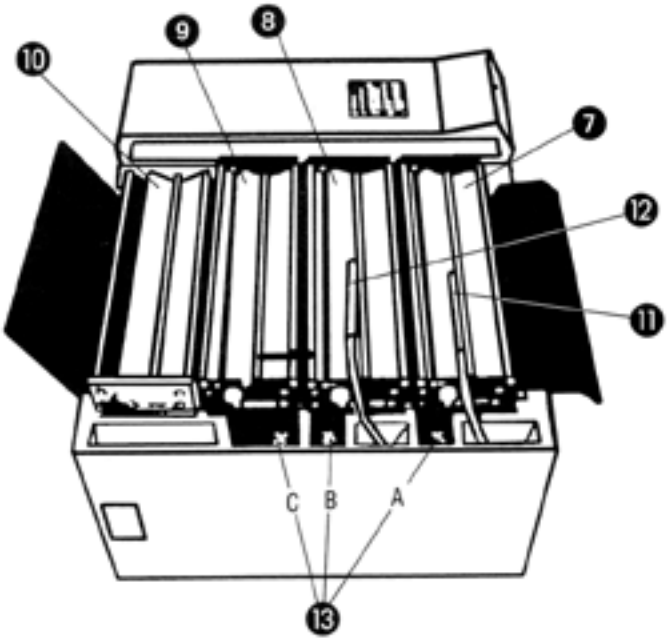
# VIEW SHOWING INTERNAL TANKS AND TRANSPORT SYSTEM

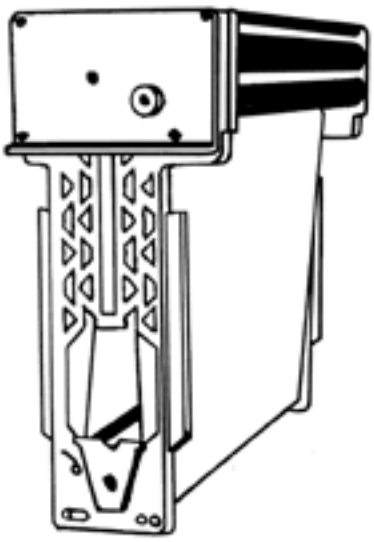
1. Module turning roller
2. Main drive gear
3. 'D' shaped centre hole gears (Total 4)
4. Small idler round hole gear
5. Large idler gear
6. Synthetic film transport belt
7. Developer module
8. Fix module
9. Wash module
10. Dryer module
11. Replenisher tube – dev.
12. Replenisher tube – fixer



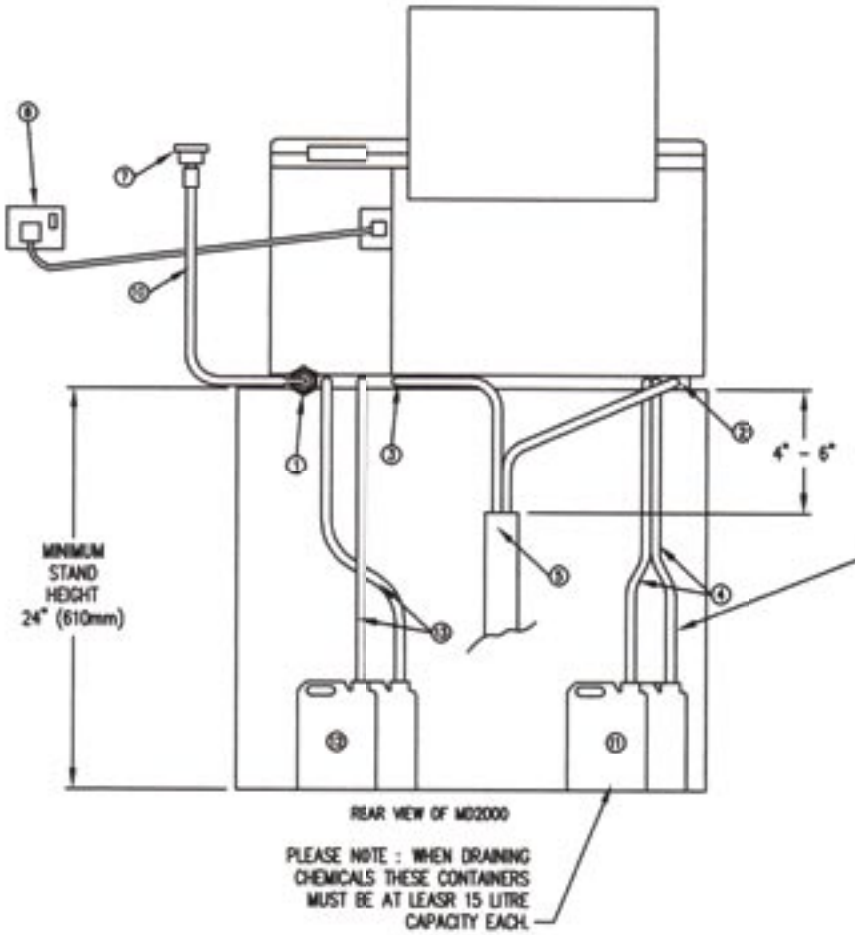

13. Drain tubes
    - A Developer (black)
    - B Fixer (red)
    - C Water (blue)

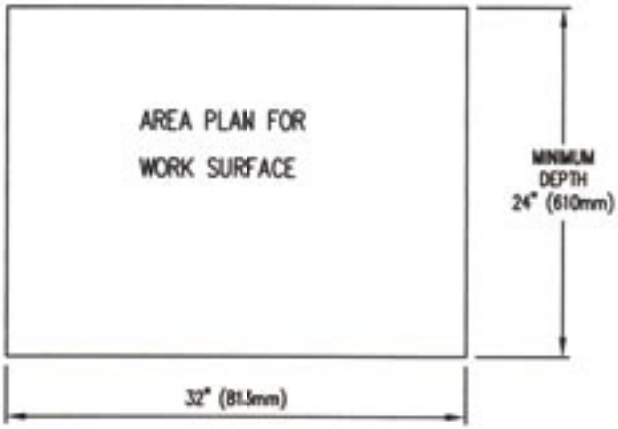


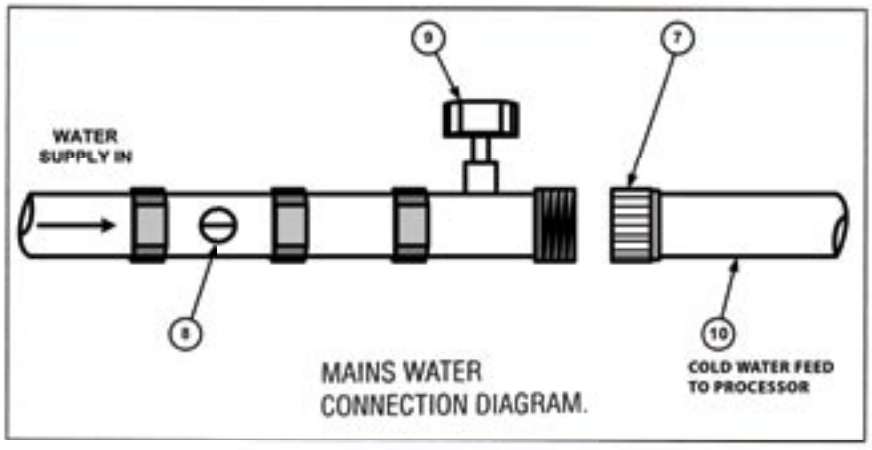
# PLUMBING DIAGRAM

1. Water inlet
2. Water waste
3. Water overflow
4. Fix and developer waste
5. Standpipe waste for waste water only
6. 13A fused electrical supply
7. Cold water hose union with filter and flow restrictor valve
8. Ball-O-Fix restrictor and isolating valve
9. Domestic Appliance service valve
10. Flexible hose
11. Waste chemical containers
12. Chemical containers
13. Chemical syphon tubes




**IMPORTANT NOTICE**
All services need to be within 3-4ft of the stand.



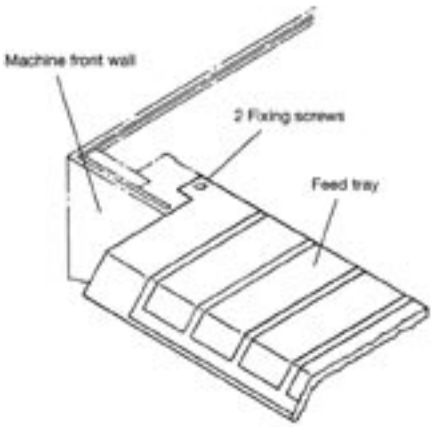

MAINS WATER
CONNECTION DIAGRAM.

## Film feed tray & catcher

For safety in transport, the film feed tray (10) and the film collector tray (11) as seen in diagram Page 3, are packed separately and must be attached when installing the unit.

## Film feed tray

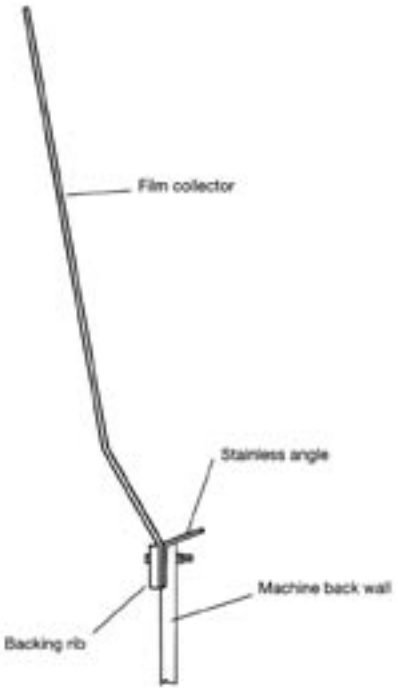
To install feed tray, remove lid from processor, remove the 2 screws from the front wall adjacent to the developer section and fit the film feed tray in its location and secure with the screws just removed.




## Film collector tray

To install film collector, assemble as in illustration. Remove dryer transport. The collector tray screws slot into the locations in the back wall of the dryer section.

To fit, loosen the screws so that the nuts and washers will slide down the internal side of the slots in the unit wall, the stainless angle will sit on the outside of the wall against the tray. Make sure the tray is fully located and tighten nuts to secure.




## Siting your machine for daylight operation

Although the Velopex is designed for use in daylight, care should be taken to avoid sources of intense light. For example do not site directly under a window, fluorescent tube or floodlight.

## Siting your machine for darkroom operation

It is important to ensure that the darkroom has good ventilation and is adequate size. It should be completely light tight and of sufficient size to allow for loading and unloading of cassettes.

***NOTE***

*A site near a sink is ideal as this is a useful position invaluable when changing chemicals and cleaning machine. Avoid carpeted areas.*

*If your machine has not been supplied with the designed stand then ensure the processor is sited on a firm and flat surface of correct height and size, see diagram, page 5.*

*It is important that when the machine is filled with solution that the stand does not rock or shake as this could cause spillage. Never move the machine when chemicals are in the tanks.*

## SERVICES

### Electrical

The machine should be positioned within approximately 3ft of the power supply.
A fused plug should be fitted with a 10A fuse (UK only).

In most instances the machine will have been supplied with a moulded plug mains lead.

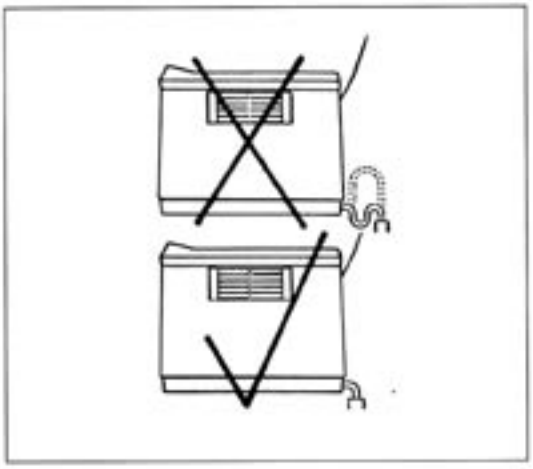
### Plumbing

Study the plumbing diagram, page 5.

### Waste

As you will note from the diagram a standpipe waste should be installed similar to that required on a domestic washing machine. The wastes should not be less than 1½" diameter and should rise between 22" and 24" above floor level immediately behind or within 2ft of the left hand side of the machine.

The outlet hoses for water and chemical wastes are put into the stand pipe as shown.



### Water supply

The machine requires only cold water for film rinsing. This cold water supply should be taken from the buildings water tanks rather than directly off the mains. The water supply should be brought within 3ft of the stand and fitted with a Ball-O-Fix isolating valve and terminated with a Bibcock tap. This can be seen clearly illustrated in diagram, page 5. The tap should be situated in a convenient position so that it can be turned on and off each day with ease.

### Connecting the machine

The machine can then be easily connected with the flexible hose supplied by attaching the hose to the water inlet on the back of the machine and its other end to the Bibcock tap, see diagram, page 5.

***IMPORTANT***

*Water supply must be flushed out before connecting to the machine to remove any brick dust, etc. Failure to do so could result in a damaged solenoid valve.*

*The flexible connecting pipe has a rubber sealing washer one end and a filter at the bibcock tap end. Ensure that these are in place, see diagram, page 5. When screwing on the fitting ensure they are firmly tightened by hand. Do not overtighten with molegrips or pliers as this could cause damage.*

### Water flow

The machine is fitted with a solenoid valve which cuts off water supply when the machine is turned off.

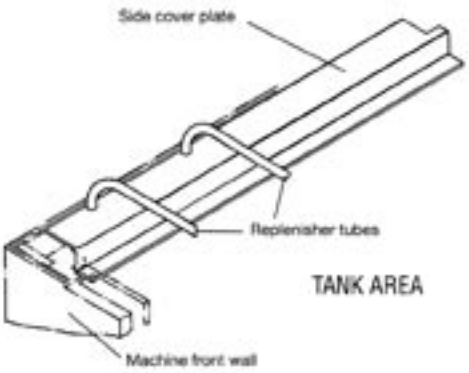
The machine requires a water flow of approximately 1 litre per minute. The flow rate is factory set. Water flow noise can be reduced by adjustment of the Ball-O-Fix valve.

## Filling the machine with chemicals

1. Remove machine lid (6) by pressing in the lid release buttons (7) one at the front and one at the back of the lid, left hand side, see diagram 3. Lift lid clear of machine and place to one side.
2. Remove the four condensation covers marked DEVELOPER, FIXER, WASH and DRY and place to one side.
3. Release the Developer and Fixer replenisher feed tubes from their position on top of their respective modules and hang them over the left hand side of the machine.

   Remove the side cover plate taking special notice in which way it fits and locks the film transports in place. Place to one side.
4. Remove all four film transports. This is done by lifting the left hand side of each module slightly and moving the module to the left to disengage the drive. They can then be lifted clear of their respective tanks.

   **NOTE**: each module is marked for its appropriate position in the machine and they should always be returned to that position.
5. Wipe out any dust from the tanks and check drain tubes are properly screwed in. They should be finger tight.
6. Fill the Developing Tank with 10 litres of working strength developing solution. If Velopex chemicals are not available, ensure to use a good quality machine chemistry and mix as recommended by the manufacturer. (Do not use manual tank chemicals).
7. Fill the Fixer Tank with 10 litres of fixer solution. As with the developer, if no Velopex Fixer available, use a good quality fixer designed for machine use (not manual tanks).
8. Fill the water tank with 6 litres of water. Do not worry about the exact water level as this will be maintained by the machine, if it has been plumbed in according to instructions.
9. Great care should be taken when pouring chemical into the tanks to avoid splashing, as Developer solution is very easily contaminated by Fixer solution, and only a few drops of Fixer into the Developer tank will spoil the chemical.




10. The film transport modules may now be returned to their appropriate tanks. Take care to enter the module into the chemical slowly to avoid splashing, and ensure that it is the correct way round so the module is able to align up with its respective pin on the right hand side of the tank. Once fully lowered into the tank, the module is slid sideways to the right to engage the drive pin. If the module does not engage directly, rotate the module turning knob (1), see diagram, page 4, until drive pin and main drive gear align, push gently to the right until module is fully home.

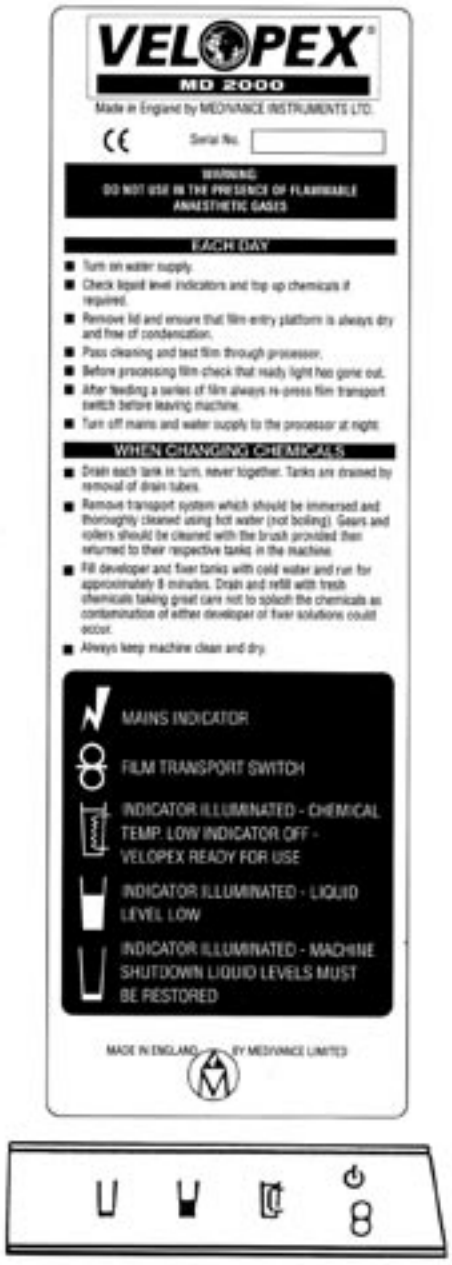
11. Having replaced all the film transport modules, including the wash and dry modules, to their correct positions, replace the tank side cover plate which also serves to hold modules in place. Once the cover plate is in position, replace the developer and fixer replenisher feed tubes back in position over their respective module. Ensure the plastic tube engages into the small slot in the module wall and that the tube end lays neatly behind the stainless steel roller on the top of each of the Developer and Fixer modules (see diagram, page 4, numbers 12 & 13).
12. Return the condensation covers to the top of their respective modules.
13. Replace the machine lid ensuring that it locks down positively.
14. Place the replenisher supply tubes into five litre bottles containing newly mixed Developer and Fixer solutions.

***IMPORTANT***

*Take great care to follow the colour code for the machine when fitting the replenisher bottles – that is Black for Developer and Red for Fixer. Failure to do this will cause immediate contamination of the chemical and it will require thorough cleaning down of the machine tanks and modules to remove the contamination and unnecessary loss of the chemicals.*

15. The VELOPEX may now be turned on for processing.

## Control panel




Your Velopex has two switches, the main switch and the film transport switch.

The mains switch is situated at the rear of the machine, and the film transport switch is on the control panel at the front of the machine.

## Starting the machine

The machine having been filled with chemical is now ready for operating, proceed as follows:

Turn on water supply. Turn processor on via the mains switch at the rear of the machine. The standby indicator will illuminate on the control panel and the machine will start to run.

If the chemical in the tanks is below temperature for processing, the temperature indicator light will be on.

When the light is out, it indicates that the chemicals have reached the correct temperature for processing.

The time taken for the indicator light to extinguish will be dependent on the room temperature. From time to time this light will illuminate automatically for short intervals as the machine requires heat throughout the day. Having come to the required temperature, the machine is now ready to accept films.

The machine can now be initiated by pressing the film transport switch on the control panel at the front of the machine.

Film processing time, dry to dry, is 3 minutes.

The machine is fitted with an automatic temperature control. The time taken to achieve the correct temperature for processing depends on the room temperature. Having achieved the required temperature, the machine is now ready to accept films (average warm up time is 15-20 minutes).

The Velopex is equipped with automatic standby. When the machine is turned on, it will run for approximately 8 minutes, after which time the transport mechanism will stop, placing the machine in standby mode. The machine is then initiated by pressing the film transport switch on the front of the machine.

***NOTE***

*When first turned on the machine will operate for approximately 8 minutes after which time it will automatically stop. This is part of the machine's automatic standby operation and is an economy measure. If at this point the 'ready light' has extinguished the machine is ready to process films.*

*The machine should be left in the standby mode all day. This enables you to process films instantly at any point throughout the day. The machine need only be turned off at night.*

## Processing films

Press the film transport switch on the control panel and post film through front entry slot. It is important to post film squarely into the film feed slot. Films that are posted crookedly could be damaged and scratched by incorrect posting.

When processing several films at one time, it is recommended to press the film transport switch again after the last film has been posted. This avoids the possibility of the machine going into standby whilst films are still in the machine.

## Film collector

Films collect in the film collector at the rear of the machine. Keep the collector clean, dry and free from dust.

**IMPORTANT**

When processing film ensure the front film feed tray is dry. This is particularly important to check first thing in the morning as change of temperature at night can cause excessive condensation. This can lead to the film sticking to the entry tray causing film damage and marking. In areas of extreme temperature or humidity, it is a good practice to leave the lid off the machine at night.

## Each day

Before commencing processing feed a clean film through the processor. This will remove dried crystals from the rollers and confirm that the transport is properly engaged and working correctly.

## Liquid level

The machine is fitted with liquid level indicators for the chemical tanks. If the liquid level is low, the indicator light will illuminate on the control panel.

Failure to correct the low level of liquid in the tank will illuminate machine shut down indicator. The machine will not operate until the liquids are restored to correct operating level.

Check that the replenishment bottles are not empty – if necessary replace.

## WARNING

Be very careful not to connect the replenishment bottles incorrectly. BLACK denotes Developing solution and RED Fixer. Even momentary wrong connection will cause contamination of the machine, total loss of chemicals and a major cleaning job.

## Cleaning processor

A clean processor is the key to consistent good results and the following cleaning routine should be carried out at each chemical change, which will vary depending on the use of your machine and the number of x-rays passed through it and the sizes of those films.

> ***Caution***
>
> *Processing chemicals should be handled with care. If spilt they may cause staining or corrosion of surfaces. They can also cause skin or eye irritation. Therefore wipe up any drips or spillage immediately. If chemicals are splashed onto the skin or eyes, flush immediately with copious amounts of plain water. More detailed advice is printed on the containers of developer and fixer.*

A. The machine is fitted with automatic replenishment and when cleaning the machine, it is also necessary to clean the replenishment system. This is simply achieved by removing the replenishment tubes from the chemical bottles and putting them into bottles containing fresh cold water. Run the machine for one processing cycle to clean replenisher pumps and tubes.

B. Unlock the lid of the machine and remove it. Also remove the condensation covers from the transport modules and tank. Drain the tanks by unscrewing the 3 standpipes (Diagram page 4 item (11) A.B.C.). When the tanks have completely drained, flush through the tanks with a little water and replace the standpipes in their correct tanks.

   Pour 400 ml of Velopex Systems Cleaner solution into each tank i.e. Developer, Fixer and Water tanks. Top the tanks up with fresh water to their normal working level. This involves adding 10 litres of water to Developer and Fixer tanks and 8 litres to the Water tank. Replace the lid on the machine. Run the machine through 2 cycles (about 16 minutes), remove the lid and again drain the tanks by removal of the standpipes. If draining the tanks into 5 litre bottles, remember to only let 5 litres out of the tank at a time. Take care to avoid over filling the containers by watching each container fill and then cutting the flow by replacing the standpipe and then replacing the container. Ideally drain into greater than 12 litre containers.

C. Refill the tanks with clean cold water and run the machine for one cycle to rinse out the Systems Cleaner. Then drain and replace with fresh developing and fixing solutions and refill the water tank with fresh water.

D. Replace the water in the replenishment bottles with fresh developer and fixer solutions, taking great care not to mix up the connections and get the bottles the wrong way round (remember BLACK is for Developer and RED is for Fixer solution). It takes only a small amount of fixer to contaminate the developing solution and if the solution should be contaminated, it will involve completely changing of the chemical again and thoroughly re-cleaning the machine.

E. The dryer stage will also need cleaning from time to time and this transport should be cleaned by thoroughly rinsing in warm water in the sink. If a large sink is not available, then cleaning of the module can be done by removing the wash module from the machine and placing the dryer module in the wash tank and then running the machine for one cycle. Remove the module and then allow to drain before replacing into dryer section of the machine.

F. It is recommended that every three months all 4 transports should be completely removed and the tanks of the machine thoroughly cleaned and wiped out with a dry cloth. The transport modules should be cleaned, particular attention being paid to the rollers and gears, and for the bearings of the rollers, use the module turning handle (See page 4 Diagram item 1).

   DO NOT begrudge time spent on cleaning the machine as you will be rewarded by quality results and extended machine life. A thorough cleaning of the machine should take approximately one hour and provide weeks of trouble free service.

## Velopex systems cleaner

Improved cleaning can be achieved by using Velopex Systems Cleaner. Instructions for use are enclosed with the product.

Do not begrudge time spent cleaning the machine as you will be amply rewarded by quality results and extended chemical and machine life.

## Disinfection

Having removed old film wrappers from the daylight loader, clean interior with cold sterilising solution and wipe dry after appropriate period.

# FAULT FINDING

## Thermal safety cutouts

The equipment is fitted with 3 thermally operated over temperature cutouts. One is located on each of the chemical tanks and one on the drying element. These are not user re-settable. Should your chemical tanks not heat or the drying compartment remain cold contact your supplier or manufacturer.

## The processor does not operate

1. Check that the mains supply is switched on at the socket and on at the machine.
2. The machine is fitted with a safety switch, check that the lid has been fitted properly. If the lid is not correctly closed the safety switch will prevent the machine operating. Check by opening and closing again.
3. Check the fuses in the machine. These are to be found at the back of the machine next to the switch panel, see diagram, page 3.
4. Check the fuse in the mains plug.
5. Liquid levels low, machine will not operate.

## Films lost in the machine

1. Check that the transport modules are correctly located in their drive dogs and running correctly. If not relocate.
2. Check that all transport modules have been put through the correct cleaning procedure. A dirty machine can cause loss of film, chemical crystals can gather on the moving parts, causing them to wear or break, and on the webbing, making it sticky enough for the films to slip.
3. Check the spring tensioning of the modules and ensure all springs are in place. Use the module turning roller to rotate the belts to inspect that it is running correctly. Run a dummy film through the module by this method.

   **Should you be unable to rectify the functioning of the module contact the manufacturer for further advice.**
4. Should there be any damage to the belts such as tearing or twisting order a replacement module.
5. Post films accurately and squarely in the machine, this will ensure that they arrive in their correct position on the collector. Incorrect posting could cause the film to slide off the collector and be lost.

## Films will not enter film entry slot

A. Press film process switch as the machine may be in standby mode.

B. Incorrect engagement of the developer transport module, open lid and check for correct running of the transport units. Re-engage where necessary.

C. Liquid levels low, machine will not operate.

## Films come out too dark

Test for light fog by feeding an unexposed film through the machine (either in the darkroom or via the daylight loading section). It should process as a transparent piece of film base and there should be no shadows or blackness on the film. If there is:

A. Check that the top lid is firmly in place.

B. Check that the darkroom is light-tight or that the daylight loading section is firmly on, refer to the previous instructions in this manual. Also check very closely for other possible light leaks. Ensure that, when the daylight loader is used, the machine has not been sited in direct sunlight or under intense lighting conditions.

C. Is the viewer cover on correctly? Extra-oral films are extremely light-sensitive and will fog if the cover is not used.

D. Did you inadvertently take your hands out of the hand entry gloves before the film had fed completely into the machine?

E. Could light have got into the box of film? In both cases D and E above, the fog tends to be to one end of the film or in patches across the films.

F. Check that the Velopex is sited on a flat and level surface. An uneven surface – perhaps caused by an electrical lead being trapped under the machine – could cause distortion of the cabinet and lead to light leaks, and erratic running of the machine.

G. Check that there has been no chemical mix-up leading to cross-contamination.

H. Check temperature of developer and fixer tanks. This is generally set at 27°C. If there is any substantial difference, this could be a reason for the dark film. Turn off and contact supplier or manufacturer.

I. Is the developer temperature light going out? If not, turn off and contact supplier or manufacturer.

J. Check at hand entry ports ensuring there is a good light seal around the wrists if not, contact the manufacturer.

K. Check if films are not out of date, excessive heat can cause premature ageing of the film. Check expiry date on box. Keep films in a cool dry place.

## Films come out too light

A. Chemicals may need replacing.

B. The chemicals may be contaminated.

C. The level of chemical in the tanks may be too low.

D. The temperature of the chemicals may be too low. If the temperature indicator light does not go out, check with a thermometer. If the temperature is much less than 27°C, consult supplier or manufacturer.

E. Check that films are correct for the type of intensifying screen used with the x-ray machine.

F Check films have been exposed correctly.

## Films come out grubby or marked

A. The water tank may not be cleaned sufficiently, leading to build up of algae.

B. Check that the transport modules are being cleaned correctly.

C. The transport modules may have been replaced in the wrong positions, leading to cross-contamination.

D. Stray light may be getting into the machine, check for leaks. Watch out for sources of strong light such as sunlight, spot lights and strip lights sited too close to machine. Check darkroom for stray light particularly doorseals.

E. Check films are not out of date, excessive heat can cause premature ageing of the film. Check expiry date on box. Keep films in a cool dry place.

## Contamination

When changing chemicals, make sure that the tanks are drained down fully and rinsed out, as fresh chemical could be spoiled by contamination, leading to poor results.

Should your tanks fail to drain down fully when the drain tubes are removed, it will probably be because the waste outlet pipe is not lying flat but rising before entering the waste pipe. The tank will then take its level from this point. Correct this by ensuring that the waste exit pipe does not rise above bench level.

If the unit should emit abnormal odour, become overheated in some parts or produce unusual noises, immediately switch machine off at machine and mains and contact your supplier or manufacturer.

**A clean, well-maintained machine makes for good, clear x-rays.**

**A dirty machine just makes problems.**

**Do not struggle with film processing problems. We, through experience, probably have the answer. If you are having problems, give us a ring or write, enclosing a sample of the film and we will do our best to resolve them for you.**

# USER SERVICEABLE ITEMS

## Fuses

The fuses are to be found in the drawer section of the mains lead socket situated on the back of the machine, see diagram on page 3, Item 3.

For continued protection against fire or electric shock, replace fuses only with same type and rating.

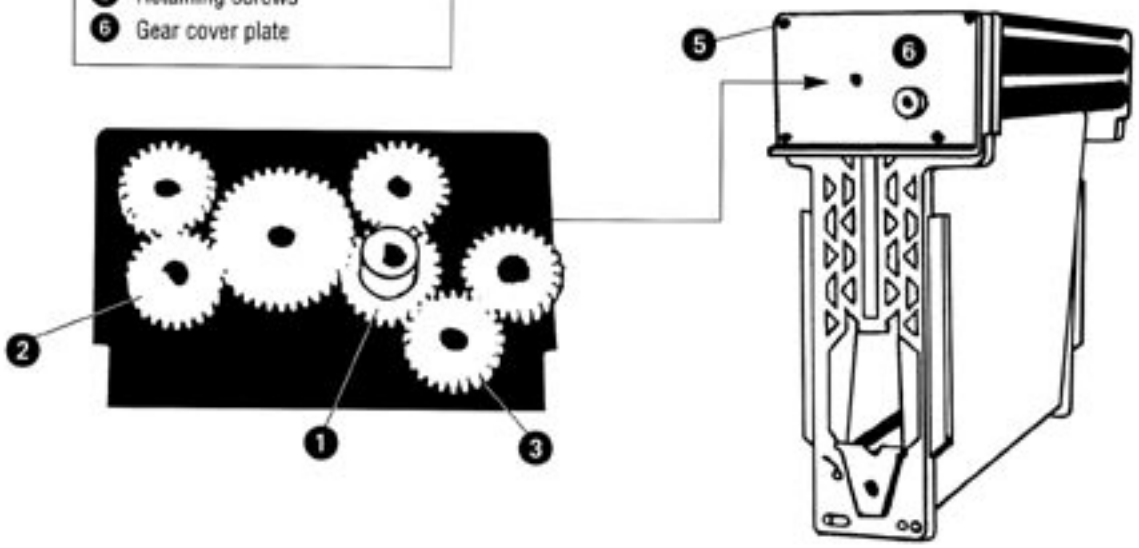
## Module gears

If problems are experienced with the transport module it should be considered for replacement.

However, changing of the gears is an extremely simple operation and can be carried out on site. To replace gears proceed as follows:

Remove gear cover place retaining screws, see diagram, item 5. The gear cover plate, item 6, can now be removed. Remove old gears and replace with new gears to their correct positions. Replace gear cover plate and retaining screw.

1. Main drive gear
2. 'D' shaped centre hole gears (Total 4)
3. Small idler round hole gear
4. Large idler gear
5. Retaining screws
6. Gear cover plate




## NON USER SERVICEABLE ITEMS

Medivance Instruments will make available on request circuit diagrams, component part lists, descriptions, calibration instructions, or other information which will assist the USER'S appropriately qualified technical personnel to repair those parts of EQUIPMENT which are designated by Medivance Instruments as repairable.

Application should be made to:

Medivance Instruments Limited
Service Department
Barretts Green Road
Harlesden
London NW10 7AP

**MEDIVANCE INSTRUMENTS LIMITED**
BARRETTS GREEN ROAD, HARLESDEN,
LONDON NW10 7AP
TELEPHONE: 020 8965 2913
FAX: 020 8963 1270
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