VELOPEX®

Automatic X-ray Film Processor

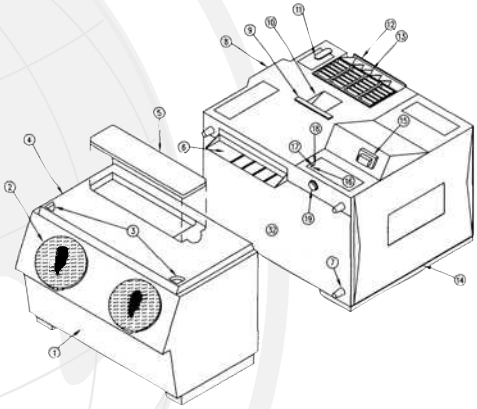
Extra - X

Xtender
(USA only)

Freedom
(UK only)

Lynx

Extra - XE



FOR TRAINED TECHNICAL PERSONNEL

Technical manual

CAUTION:
This Document is for use by a qualified technical representative ONLY.
Any use by unqualified personnel will void the VELOPEX warranty.

VELOPEX® INTERNATIONAL

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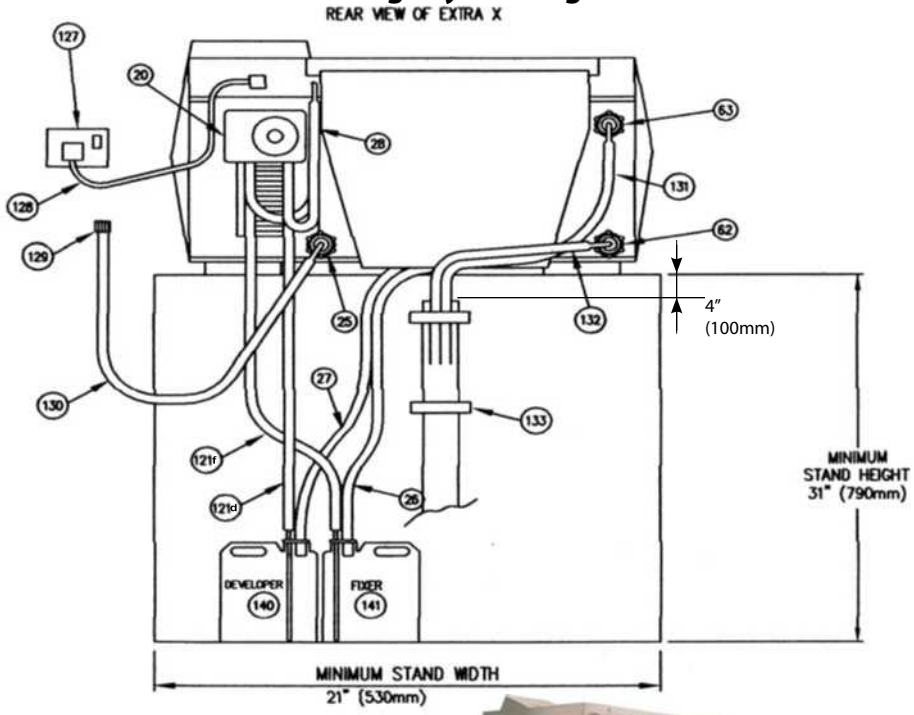
Contents

NOTE: All Part Numbers in this manual have been revised. Reference to previous manuals can be found in the Components & Parts section.

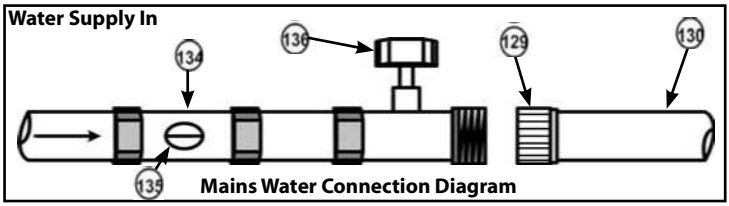
Issue 6 OM14 I/LIT3600M

Plumbing Layout Diagrams



20	Replenisher Pump (Optional)
25	Water Inlet
26	FIXER Waste (Red - Europe/Blue - USA)
27	DEVELOPER Waste (Black - Europe/Red - USA)
28	Chemical Replenisher Inlet Tubes (Optional)
62	Water Waste
63	Water Overflow
121d	Developer Replenishment Supply
121f	Fixer Replenishment Supply
127	Electrical Supply
128	Mains Lead
129	Cold Water Hose Union
130	Flexible Hose - Cold Water Supply
131	Flexible Hose - Water Overflow
132	Flexible Hose - Water Waste
133	Waste Water Drain Pipe
140	DEVELOPER Chemical Container
141	FIXER Chemical Container

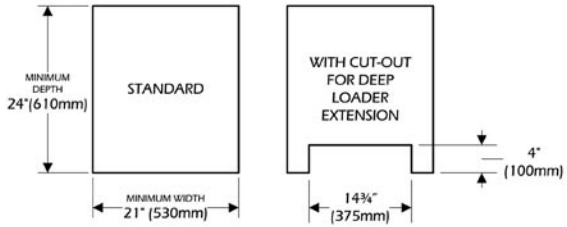
*(Worldwide Plumbing Layout **without** Replenisher / Re-circulation)*



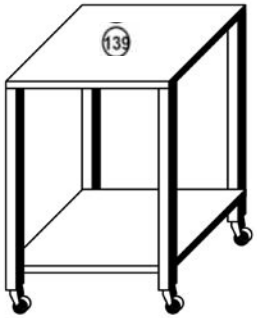
Mains Water Connection Diagram

MACHINE STAND (OPTIONAL) USA

WORKTOP DIMENSIONS



NB: FOR FIXED COUNTER INSTALLATIONS REFER TO PAPER TEMPLATE IL 31.



DEPTH – 15.5" (394 mm)
WIDTH – 23.5" (597 mm)
HEIGHT – 31.0" (787 mm)

129 Cold Water Hose Union
130 Flexible Hose - Cold Water Supply
134 Isolator valve
135 Valve Control
136 Domestic Appliance Service Valve / Faucet
139 Machine Stand (Optional)

MACHINE STAND (OPTIONAL) - WORLDWIDE

DEPTH - 19½" (495mm)
WIDTH - 20⅓" (517mm)
HEIGHT - 31⅞" (810mm)

Pre Installation Instructions

- **Siting of the VELOPEX**

When using the machine in daylight or a darkroom, avoid sources of intense light. Do not mount the unit under a window, fluorescent light or flood lamp.

IMPORTANT NOTE: A well ventilated position is mandatory.

The ambient temperature must be below 82°F (27.7°C), and above 44°F (7°C) to prevent lengthy warm-up times.

Prevent siting the machine above or near other electrical or mechanical equipment. Surfaces susceptible to water or chemical damage should be avoided, such as carpeted areas.

1. COUNTER PLAN (REFER ALSO TO MACHINE LOCATION & DRILLING TEMPLATE IL-31)
   a. Use a Counter that will support a minimum of 200 lbs. (91 Kg.).
   b. With a min. Height of 31 in. (79cm.).
   c. With a min. Width of 21 in. (53cm.).
   d. With a min. Depth of 24 in. (61cm.).

   This will give you a working area of 3.5 sq.ft (0.32 sq. m.) (See page 2).
2. ELECTRICAL SUPPLY
   a. 115Vac 60Hz, 15A, 1150W (USA)/230Vac 50Hz, 15A, 1150W (World Wide).
   b. The power source must be within three (3) feet (1m) of the machine above the counter and well separated from the water supply. It should be easily accessible for operation and maintenance.
   c. If the unit is to stand alone (unplumbed), a second power source will be required for the water pump reservoir.
3. COMMERCIAL WATER SUPPLY

   ATTENTION! Use only the hoses supplied with this machine.

   a. Water temperature no higher than 79°F (26°C).
   b. A Faucet adjusted to a water flow rate of 0.27gal/min (1.0 ltr./min).

Pre Installation Instructions (Cont.)

c. The supply should be fitted with an Isolating Valve just prior to the main On/Off faucet/valve which should be adjusted **before installation** to limit water flow to delivery rate of 0.27gal/min (1.0ltr./min).

d. The output side of the Main On/Off faucet/valve must have a ¾" male thread (see diagram on page 2). The faucet/valve should be situated in such a position that can be easily turned off each day.

IMPORTANT NOTE: The water inlet hose supplied with this machine is not a standard Domestic Appliance Hose. It is fitted with a water flow restrictor valve designed to deliver water at a max. rate of 0.27gal/min (1.0ltr./min). It is suitable for all installations where the mains water supply is rated between 0.2 & 10Bar. However, for installations without mains water supply, e.g.: where a header tank is employed (min. height 6ft. (1.83m) above machine) a standard hose without restrictor must be used and the flow regulated to 0.27gal/min (1.0ltr/min) by a separate Control Valve.

4. DRAIN

a. A corrosion resistant PVC drainpipe 1.5 in. (38mm) diameter with a length of 22-24 inches (56-61 cm).

NOTE: The Drain Pipe should not rise higher than four (4) inches below the bottom of the machine (see page 1).

5. VELOPEX free standing Machine Stand

USA:

a. Shelf dimensions 19.5in. (49.5cm) by 20.3 in. (51.7cm).

b. Shelf height "lower" 9in. (22.9cm) and "upper" 31in. (78.7cm).

WORLDWIDE:

a. Shelf dimensions 15.5in. (39.4cm) by 23.5 in. (59.7cm).

b. Shelf height "lower" 9in. (22.9cm) and "upper" 31.9in. (81.0cm).

6. STAND ALONE UNIT USING A WATER RECIRCULATION KIT

a. Anko Water Pump (USA).

b. Supplying 1.5 liq.oz./min. (0.051 ml/min.).

c. Supply Tubing.

d. Water Container 2.5 gal. (9.4 ltr.) capacity.

Pre Installation Instructions (Cont.)

WARNING: X-ray radiation can be harmful to patient, technician and dentist. Inadequate lead shielding of the darkroom or film storage area will also cause fogging from exposure of films to stray x-ray radiation. Consult your local codes, Health Department or Dental Equipment Dealer for proper construction of darkroom or placement of film processing equipment in the vicinity of x-ray radiation sources.

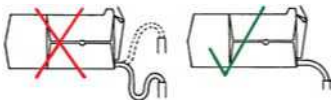
NOTE: For unpacking and lifting the machine into position it is important to have assistance.

The machine comes in a single carton containing:

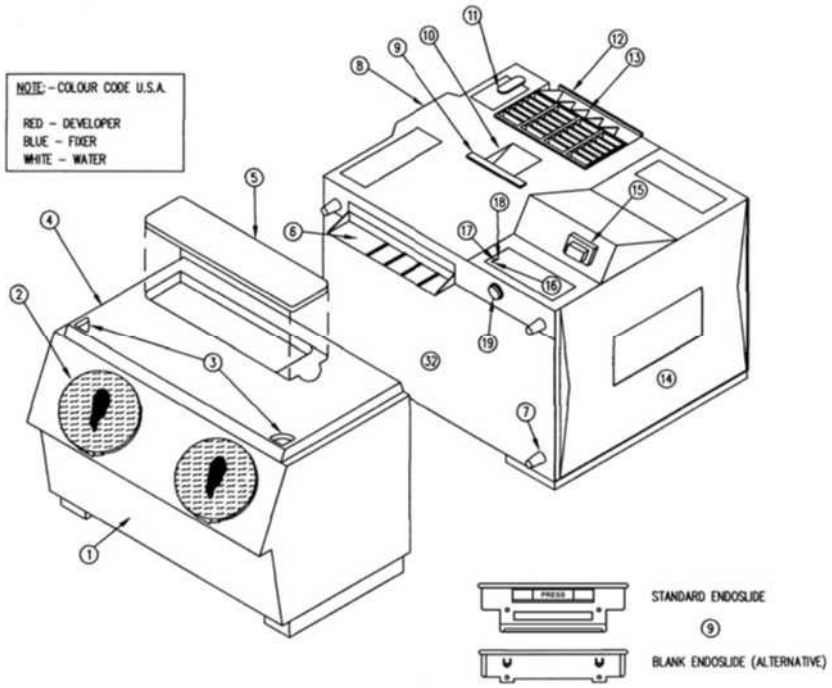
Machine in "darkroom" configuration, Operator's Manual, Hoses, Electrical Cord, Transport Module Turning Tool, Cleaning Brush, Chemical Change Chart and a box of Cleaning Tablets (UK only).

1. Familiarise yourself with the layout of the machine by referring to illustrations at the front of this manual. It is useful to refer to these illustrations as you progress through the manual.
2. Lift the machine from the carton and position on counter top. Remove outer and inner packaging, including carry-straps and tape securing film-catcher. The transport modules are protected by internal packing pieces: these must be discarded.
3. Connect the two Water Waste hoses to the back of the machine (labelled 'water overflow' and 'water drain').
4. Cut hoses to allow 8-12 inches (200–300mm) to be inserted into the waste outlet stand-pipe, ensuring no loops or kinks are left in them. Place hoses in drain, and see diagram – they must not rise higher than the outlet on the back of the machine.

WARNING: Any rise in the height of these pipes above the level of the outlet on the machine will cause incomplete drainage, and could cause the machine to flood.

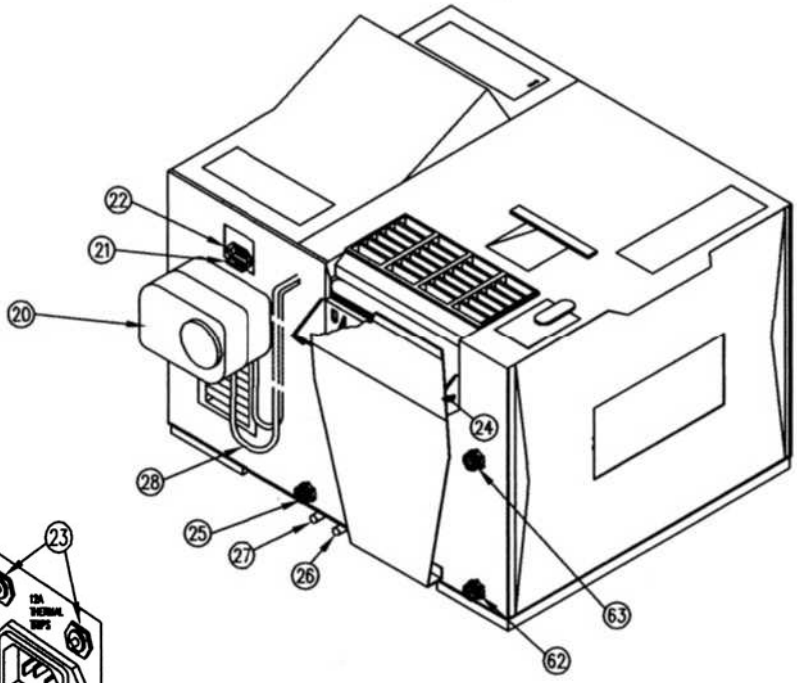


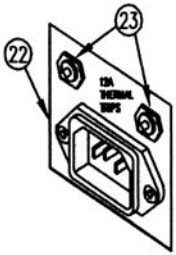
External Components - Front View



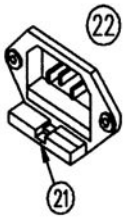
1. Daylight Loader
2. Hand Entry Ports/Gloves
3. Daylight Loader lid locks
4. Daylight Loader Lid
5. Viewer Cover
6. Film Entry Guide
7. Daylight Loader Coupling Points
8. Machine Lid; Protruding grip
9. EndoSlide (See Alternatives)
10. Endo Film collector
11. Machine Lid Lock
12. Film Collector Backplate
13. Film Collector
14. Side Panel
15. On/Off Power Switch/Mains Switch
16. Machine Shutdown Indicator
17. Low Liquid Level Indicator
18. Chemical Temperature Indicator
19. 'RUN' Button

External Components - Back View





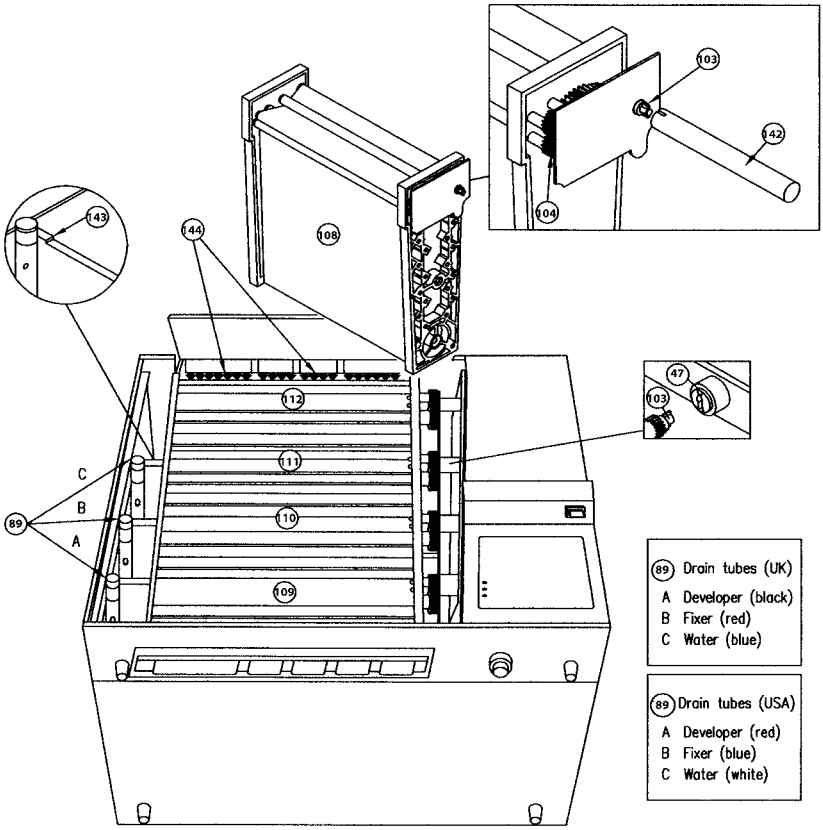
CIRCUIT BREAKERS - USA



FUSE HOLDER - EUROPE

20 Replenisher Pump (Optional)
21 Fuse Holder (Europe)
22 Double Fused Chassis Plug (Europe)
23 Circuit Breakers - USA only
24 Film Collector Backplate Spring
25 Water Inlet
26 FIXER Waste (Red - Europe/Blue - USA)
27 DEVELOPER Waste (Black - Europe/Red - USA)
28 Chemical Replenisher Inlet Tubes (Optional)
62 Water Waste
63 Water Overflow

Internal Components



47 Drive Dog
89 Standpipes
103 Main Drive Gear
104 D' Shaped Centre Gears X5
108 Module Belt
109 DEVELOPER Module
110 FIXER Module
111 WATER Module
112 DRYER Module
142 Module Turning Tool
143 Transport Module Limit Stop
144 Anti-static Strip

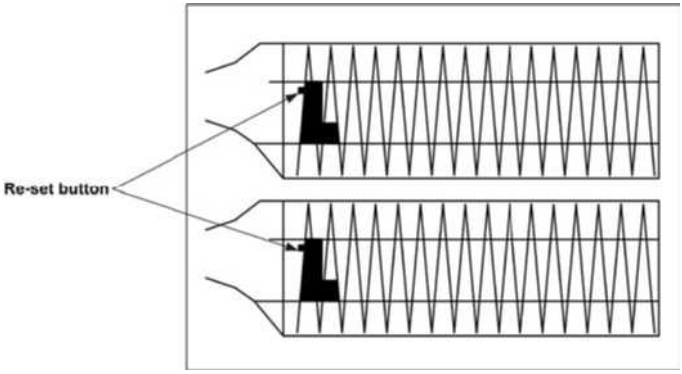
NOTE: *Always Switch off Mains Power and Remove Electricity Plug before beginning any work or inspection procedure.*

- **Access to Internal Components**
  1. To access internal workings of the machine unscrew control Panel retaining screw (item 36).
  2. The control panel may then be hinged upwards.
  3. The side panel may then be removed by releasing one side of the panel at a time by pushing out front and back panel to disengage the barbs.

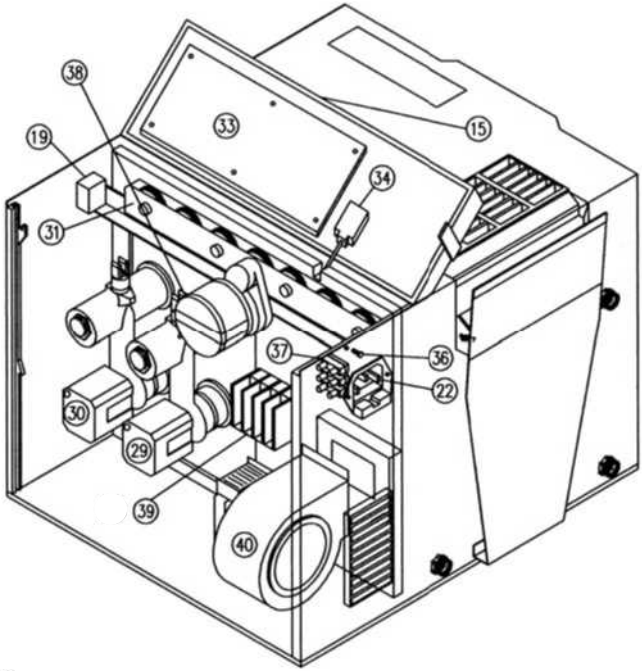
- **Dryer Element Cut-Out Re-set Operation**

Dryer Elements have a small re-set button on the rear of the small black switch inside the Element. If at any time the fan should slow or stop, the Dryer Element will switch off and stay off until re-set button has been operated.

NOTE: Refer to the PCB operating instructions at rear of manual for details of a further over-temperature cut-out now fitted to the PCB.

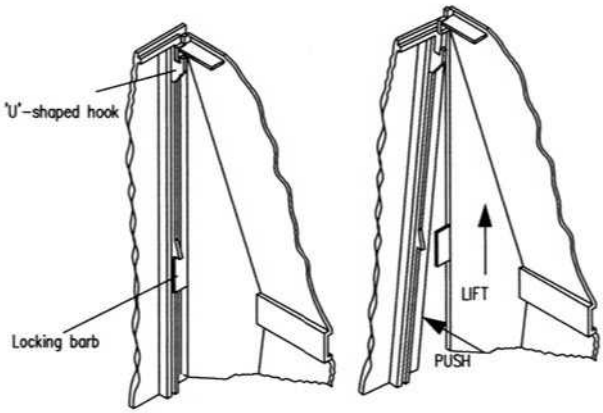


Dryer Elements



19 'RUN' Button
22 Double Fused Chassis Plug (Europe)
29 Circulation Pump FIXER
30 Circulation Pump DEVELOPER
31 Gear Drive Strip
33 Control PCB
34 Safety Switch
36 Control Panel Retaining Screw
37 Dryer Terminal Block
38 Drive Motor
39 Main Terminal Block
40 Dryer Fan

Diagram of side panel lock



- **Fuse**
  1. The power cord socket is located on the back of the machine. This contains a drawer section, which, when slid out, reveals both fuses on UK-Continental machines.
  2. USA: no fuse drawer, but circuit breakers are fitted above socket.
  3. After investigating cause of failure, replace Fuse according to Table:

FUSE TABLE

			230V						115V				
FUSE	SIZE	FUNCTION	INTRA-XE	INTRA-X	EXTRA-XE	EXTRA-X	MD 2000	SPRINT	INTRA-XE	INTRA-X	EXTRA-XE	EXTRA-X	SPRINT
F1	5x20	TANK HEATERS		1A RS416-297 (/ELC2154P) or GDB (S500)	2A RS416-332 (/ELC2158P) or GDB (S500)	→	T50mA RS157-967 (/ELC2156P) or GDC (S504)			2A RS416-332 (/ELC2158P) or GDB (S500)	3.15A RS416-360 (/ELC1013P) or GDB (S500)	→	
F2	5x20	DRYER HEATER	3.15A RS416-360 (/ELC1013P) or GDB (S500)	→	5A RS416-376 (/ELC2155P) or GDB (S500)	→	T1A RS157-9737 (/ELC2169P) or GDC (S506)		5A RS416-376 (/ELC2155P) or GDB (S500)	→	T10A RS419-820 (/ELC2218P) or LF215010	→	
F3	5x20	DRIVE/FAN	T1A RS157-9737 (/ELC2169P) or GDC (S506)	→	→	→			T1A RS157-9737 (/ELC2169P) or GDC (S506)	→	T2A RS1579-9771 (/ELC2219P) or GDC (S505)	→	
F4	5x20	TRANSFORMER		T50mA RS157-9670 (/ELC2156P) or GDC (S504)	→	→				T100mA RS125-4955 (/ELC2157P)	→	→	
F5	5x20	RECTIFIER		T500mA RS157-9709 (/ELC2172P) or GDC (S506)	→	→				T500mA RS157-9709 (/ELC2172P) or GDC (S506)	→	→	
F6	5x20	SOLENOID			FROM F3	T2A RS157-9771 (/ELC2219P) or GDC (S505)					FROM F3	T2A RS157-9771 (/ELC2219P) or GDC (S505)	
INLET	5x20 2 off	MAIN FUSES OR CIRCUIT BREAKERS	T5A RS419-791 (/ELC2217P) or LF215005	→	T8A RS419-814 (/ELC2401P) or LF215008	→	T10A RS419-820 (/ELC2218P) or LF215010	T5A RS419-791 (/ELC2217P) or LF215005	T8A RS419-814 (/ELC2401P) or LF215008	→	12A Schurter T11 211U	→	T5A RS419-791 (/ELC2217P) or LF215005
PLUG (WHERE FITTED)	1"x1/4"	MAINS CABLE	10A RS412-598 (/ELC2153P)	→	→	→	→	→	10A	→	→	15A	10A

RS = RS Components, LF = Littlefuse, GDB or GDC = Bussmann, Schurter = Circuit Breaker

- **Replacing Components on the Gear Strip**

The assembly consists of three strips (items 48, 46 and 31) and the motor board (item 60) which is clamped between gear strips 48 and 46. It is essential to maintain this assembly order.

To replace the main drive gear (item 35, page 16) on the motor shaft, do not dismantle the gear strip assembly. Simply remove the motor (item 38, page 16) by referring to ***Motor Mounting*** section (page 15). Withdraw the main drive gear upwards from the gear strip assembly and replace with the new gear. Finally refer to ***Motor Mounting*** section and replace the motor.

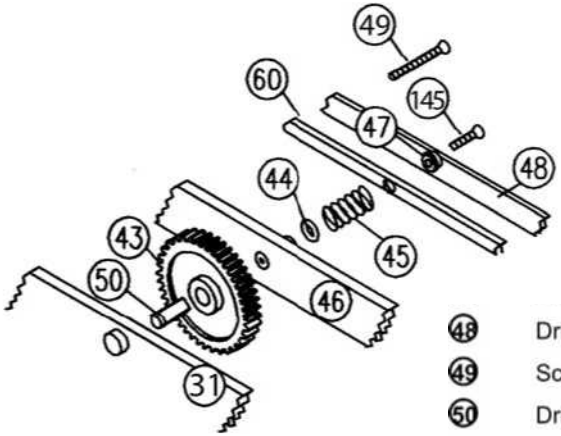
To replace the other gears (items 61, page 16 and item 43) follow the procedure as for replacing the drive dogs (item 47):

- **Replacing the Drive Dogs**

1. Remove the four clamping nuts (item 42, page 16).
2. Remove the motor support strip (item 31) and the gear support strip (item 46) along with the drive dog shaft (item 50).
3. Remove the gears (items 43 and 61, page16), the drive dog springs (item 45) and the thrust washers (item 44).
4. Now dismantle the assembly for cleaning. Be careful not to lose any of the components.
   a. Wipe away the old grease from the springs, thrust washers and the drive dog shafts.
   b. Assemble the module drive gears (item 43) onto the drive dog shafts (item 50).
   c. Feed the shafts through the gear support strip (item 46) and apply a little silicone grease to the shafts before fitting the thrust washers (item 44) and the drive dog springs (item 45). The grease will hold the springs in place during re-assembly.
   d. Fit the idler gears (item 61, page 16) onto their spigots on the gear support strip (item 46) and assemble the motor support strip (item 31) into place.
5. Remove the old drive dogs (item 47) from the motor side of the motor board

(item 60) and wipe clean the holes in the drive dog cover strip (item 48).

6. Insert new Drive Dogs, smear the outside with silicone grease.
7. Offer up the above assembly to its position on the motor board (item 60) taking care that the motor mounting holes are at the bottom of the motor support strip (item 31).
   a. Starting at one end, align and centre the drive dog shaft (item 50) into the drive dog (item 47).
   b. Hold the assembly in position and fit the end clamping nut (item 42, page 16) loosely to its gear strip assembly screw (item 49).
   c. Work along the other three drive dog shafts (item 50) aligning and entering them into their drive dogs (item 47) and fitting the clamping nut (item 42, page 16) loosely to each gear strip assembly screw (item 49), as you go.
   d. Finally tighten all four clamping nuts (item 42). Check that all the gears turn freely and the drive dogs return freely to their outer position after being compressed.
   e. Slip the main drive gear (item 35, page 16) into place in the centre of the gear train and refit the motor as described in ***Motor Mounting*** section.

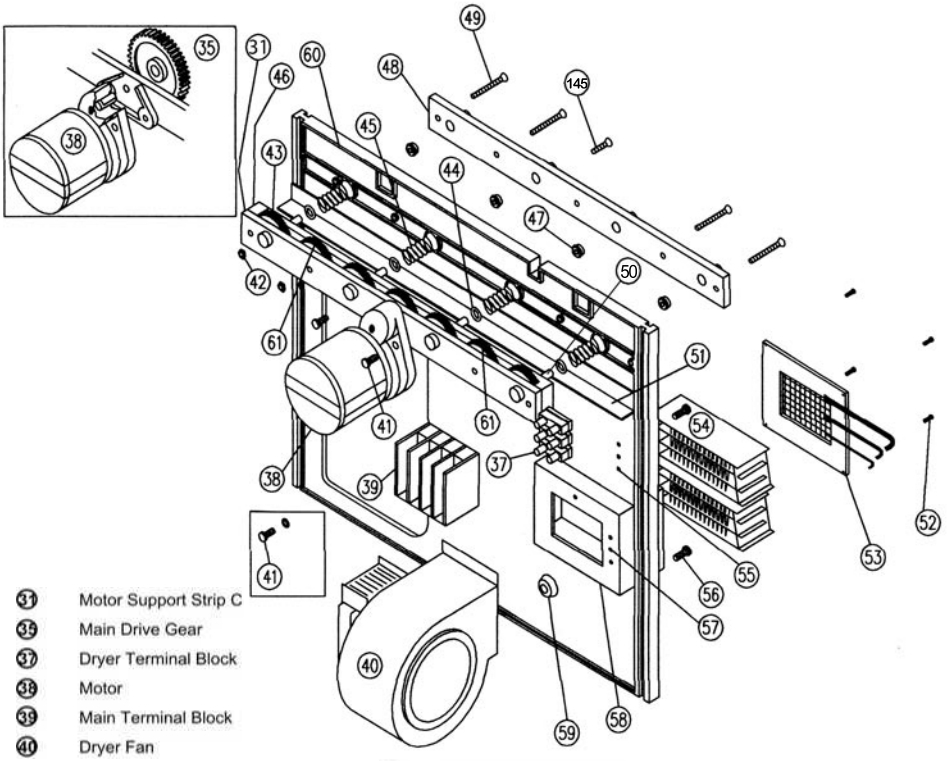


31 Motor Support Strip C
43 Module Drive Gears
44 Thrust Washer
45 Drive Dog Spring
46 Gear Support Strip B
47 Drive Dog
48 Drive Dog Cover Strip A
49 Screw - Gear Strip
50 Drive Dog Shaft
60 Motor Board
145 Drive Dog Strip Retaining Screw

- **Motor Mounting**
  1. Disconnect wires from PCB (item 33, page 10) and terminal block (item 39).
  2. Release and withdraw the motor by removing screws (item 41).
  3. To replace, reverse procedure.
  4. Ensure ground/earth continuity is maintained by replacing serrated washer between motor body and ground/earth lead termination.

- **Fan and Heater Assembly**
  1. To Replace Fan
     a. Disconnect wires from main terminal block (item 39), PCB (item 33) and dryer terminal block (item 37).
     b. Remove grille (item 53) retained by four screws (item 52).
     c. Remove heater assembly. Fan unit may then be released by removing two screws (item 56) located at the back of the dryer element housing (item 58).
     d. To replace, reverse procedure.
  2. To Replace Heater Element
     a. Disconnect wires from terminal block (item 37).
     b. Remove grille (item 53) retained by four screws (item 52).
     c. Slide out heater element withdrawing wires through the holes (item 57) at the back of the element housing (item 58).
     d. To replace, reverse the above procedure.

Detail incorporating – Motor Mounting – General drive strip – Drive dog and spring assembly
Fan and heater assembly – Terminal blocks



31 Motor Support Strip C
35 Main Drive Gear
37 Dryer Terminal Block
38 Motor
39 Main Terminal Block
40 Dryer Fan
41 Motor Mounting Screws and Washers
42 Gear Strip Clamping Nuts X4
43 Module Drive Gears
44 Thrust Washer
45 Drive Dog Spring
46 Gear Support Strip B
47 Drive Dog
48 Drive Dog Cover Strip A
49 Screw - Gear Strip
50 Drive Dog Shaft
51 Motor board Brace & Earth Bar
52 Screws - DRYER Grille
53 DRYER Grille
54 DRYER Elements
55 Holes for DRYER Grille Wires
56 Screw - Fan Unit
57 Holes for Heater Wires
58 DRYER Element Housing
59 Solenoid Wire Grommet/Hole
60 Motor Board
61 Idler Gears
145 Drive Dog Strip Retaining Screw

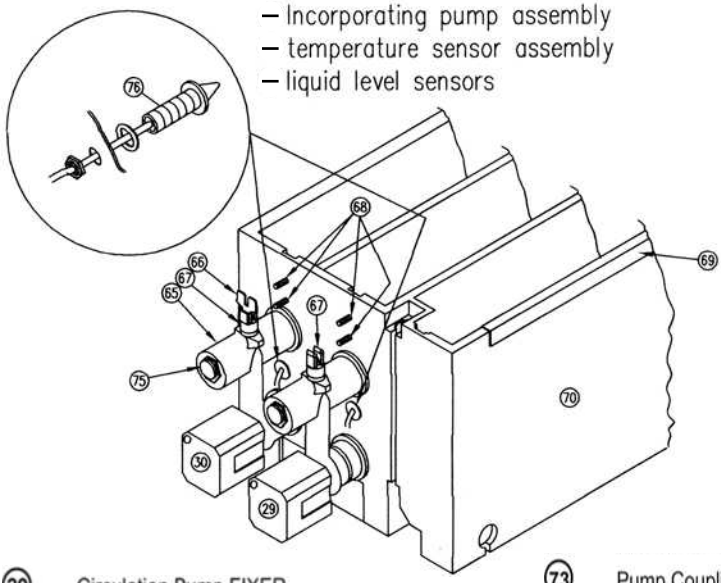
- **Tank Removal and Installation**
  1. To replace tank, drain down fully all three sections.
  2. Remove pump and manifold assemblies from both developer and fixer sections by undoing pump coupling nuts (item 73).
  3. **N.B. Beneath the machine: locate the 'tank retaining screw' found on the base of the machine adjacent to the RIGHT HAND foot and next to the motor board locating slot: this is a 'dome-headed' Philips screw (not flat-headed or counter-sunk).** ***FAILURE TO REMOVE THIS TANK RETAINING SCREW WILL CAUSE SERIOUS DAMAGE TO THE TANK.***
  4. Release lower flexible drain tubes (items 95, 96, page 19), located under foot of machine (item 97, page 19) which is retained by two (counter-sunk) screws (item 98, page 19).
  5. Unscrew connectors (item 94, page 19) from locking nuts (item 93, page 19). Connectors can then be pulled clear of back panel, allowing the removal of all the connecting pipe work including the water waste and overflow drain pipes (items 92 and 91, page 19) and solenoid assembly (item 80, page 19).
  6. Be sure to disconnect Temperature Sensor leads from PCB.
  7. The tank may then be lifted clear of the machine.
  8. To install simply reverse the above procedure.
  9. The water connector has the flow controller inserted and should be replaced in the same position on left rear of machine (water inlet - item 25).

'***MPORTANT:*** *After installation check thoroughly for leaks by filling the tanks with water and inspecting.*

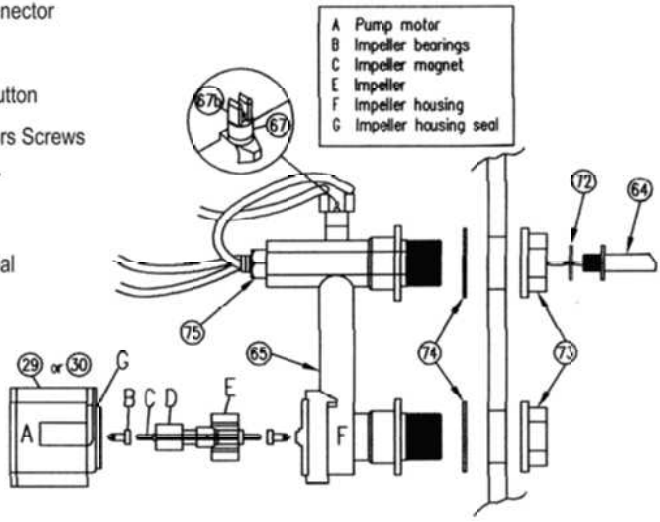
- **Temperature Sensor Assemblies**

NOTE: Before starting to replace the Developer or Fixer temperature sensor, be sure to drain the relevant tank of all liquid.

1. Disconnect sensor leads from the PCB and unscrew the sensor assembly nut.
2. Pass the sensor leads through the nut one at a time, and remove the sensor from the tank.
3. To replace, reverse this procedure.



29 Circulation Pump FIXER
30 Circulation Pump DEVELOPER
64 Heater Element
65 Heater Manifold
66 Double Spade Connector
67 Thermal Cut-out
67B Thermal Cut-out Button
68 Liquid Level Sensors Screws
69 Tank Wall Stiffener
70 Tank - Side Wall
72 Heater Element Seal
73 Pump Coupling Nuts
74 Tank Manifold Seals
75 Heater Coupling Nut
76 Temperature Sensor Assemblies

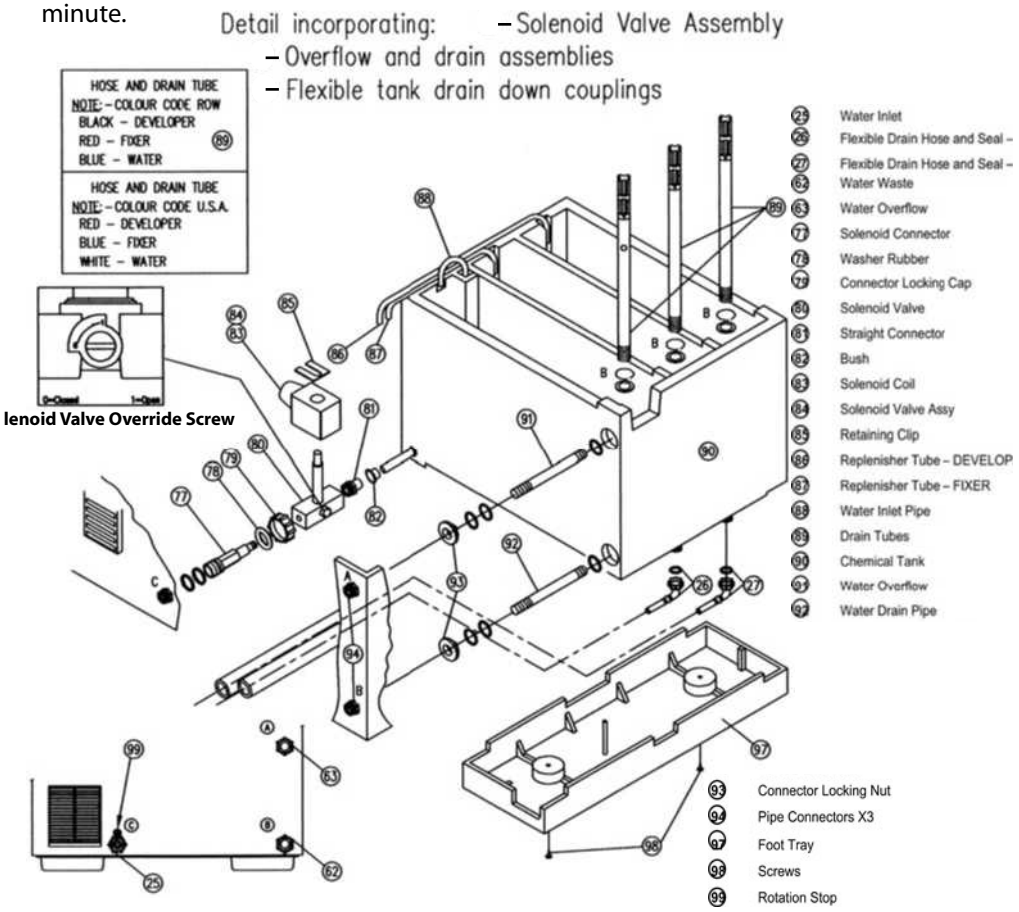


- **Solenoid Valve Assembly**

The solenoid connector (item 77) is screwed into the main valve body (item 80) using PTFE tape to effect water sealing. The male stud coupling (item 81) is screwed into the other end of the main valve body. The stud coupling has its own special seal and does not require the use of PTFE tape.

NOTE: When installing the solenoid ensure that the **valve override screw** faces out into the cabinet of the machine for access.

Current Models are fitted with an on board Flow Controller situated within Component 25. This device controls the water flow to a rate of 1 litre per minute.



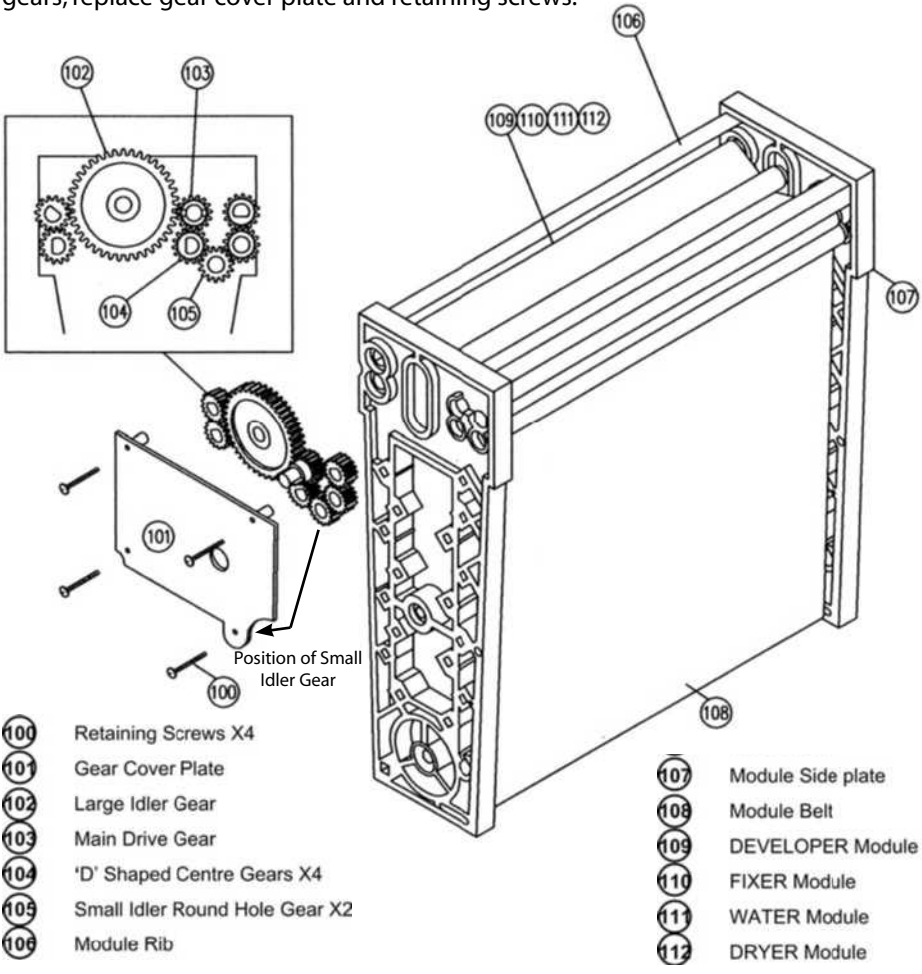
- **Module Gear Replacement**

NOTE: *Only Gears and Tension Springs are replaceable on the Transport Module. For any other fault, replace complete Module.*

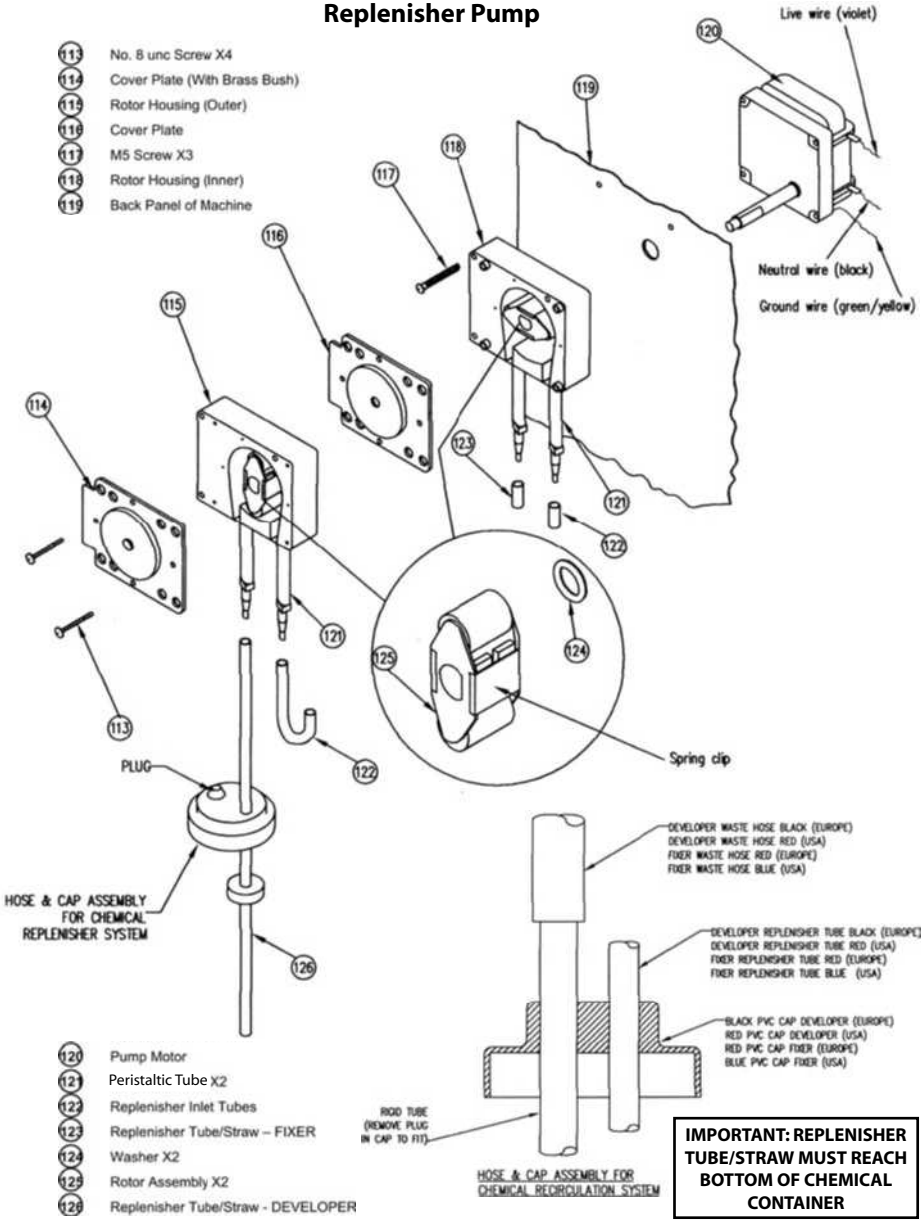
Remove retaining screws on gear cover plate.

The gear cover plate (item 101) can now be gently eased off; remove old gears, and replace with new gears to their correct positions.

To ensure smooth running, ALWAYS replace complete gear set - not individual gears; replace gear cover plate and retaining screws.



Replenisher Pump



IMPORTANT: REPLENISHER TUBE/STRAW MUST REACH BOTTOM OF CHEMICAL CONTAINER

- **Replenisher Pump Mounting Instructions**
  1. With pump motor (item 120) inside, and inner rotor housing (item 118) outside the machine, screw together using three M5 screws (item 117).
  2. Put a washer (item 124) onto the motor shaft.
  3. With the open end of the spring clip facing outwards, push a rotor assembly (item 125) onto the motor shaft along the longest flat of the shaft.
  4. With the rotor assembly in a vertical position, push a hose assembly (item 121), leaving approximately 65mm (2½") hanging outside, into the right hand slot of the rotor housing. Feed the remainder of the hose assembly into the rotor housing by turning the rotor assembly by hand, in a counter-clockwise direction. Finally, press the hose assembly into the left hand slot of the rotor housing where it will be held captive. The two ends should now be of equal length - if not, re-position.
  5. Place cover plate (item 116) in position locating on bosses on the inner rotor housing (item 118).
  6. Place outer rotor housing (item 115) in position, locating on bosses on the inner rotor housing (item 118).
  7. Put the remaining washer (item 124) onto the motor shaft.
  8. With the open end of the spring clip facing outwards push the remaining rotor assembly (item 125) onto the motor shaft along the shortest flat of the shaft i.e. ensure that the two rotor assemblies are at right angles to one another.
  9. Fit the remaining hose assembly (item 121) following note 4 instructions .
  10. Place cover plate (with brass bush) (item 114) in position.
  11. Finally screw completed assembly together using four no. 8 screws (item 113).
- **Hose Connections** (items 86-87, page 19)
  1. Push the end of the red (blue - USA) hose assembly onto the shortest replenisher tube protruding through the back panel of the machine, and fix with two of the hose clips provided. It will be found easier to put the lower of the two clips on first.
  2. Push the end of the black (red - USA) hose assembly onto the longest

replenisher tube protruding through the back panel of the machine, and fix with the two remaining hose clips provided. Again it will be found easier to put the lower of the two clips on first.

- **Electrical Connections**
    1. Connect ground/earth wire (green + yellow) on pump motor to terminal block (item 39).
    2. Connect live wire (grey) on pump motor to PCB (item 33) position REPLENISH (P5).
    3. Connect neutral wire (blue) on pump motor to terminal block (item 39).
- **Finally**
    1. Replace all panels.
    2. Position machine to its final working position, re-connect water and drain tubes.
    3. Remove the fixer bottle cap and replace with the dip tube with the red bung and cap.
    4. Remove the developer bottle cap and replace with the dip tube with the black bung and cap.

REPLENISHER UNIT

Whether supplied as a factory installed unit or as a kit for retro fitting the unit can be used to re-circulate chemicals through the machine utilising an external reservoir:

1. Remove the white bungs from both Red (Blue – USA) and Black (Red – USA) bottle caps.
2. Insert a length of white plastic tubing into each chemical drain hose. Pass the white tubing into each bottle cap. ENSURE THAT BLACK (RED – USA) DRAIN HOSE IS CONNECTED TO BLACK (RED – USA) BOTTLE CAP AND RED (BLUE – USA) DRAIN HOSE IS CONNECTED TO RED (BLUE – USA) BOTTLE CAP
3. Insert the re-circulator suction pipes into fresh containers of chemical - the dip tubes **must** be pushed to the **bottom** of the containers. ENSURE THAT THE BLACK (RED – USA) TUBE IS IN THE DEVELOPER AND THE RED (BLUE – USA) TUBE IS IN THE FIXER

4. Fill the machine tanks with fresh chemicals.
5. Each time the 'RUN' button of the machine is pressed a charge of chemical from the external reservoir will be injected into the machine tanks.

Any overflow is returned to the external reservoir.

VERY IMPORTANT:

When chemicals are exhausted and require replacement, before draining machine chemical tanks:

Remove cap assemblies from both reservoir containers.

Insert cap assembly into empty containers of at least 5 Litre/1 Gal capacity.

Drain Machine tanks by removing the screw-in drain tubes in each tank.

While draining the machine tanks, ensure that the drain containers remain upright.

When machine chemical tanks are completely empty, remove cap assemblies from waste containers and replace screw-in drain tubes in tanks.

Refill machine and replace external reservoir as from 3 above.

- **Temperature and Replenisher**

Temperature and replenisher are located on the PCB (item 33). These are pre-set at time of manufacture and are not customer adjustable. Normal factory settings are: Developer 77°F/25°C; Fixer 81°F/27°C and 2 minutes (replenisher). For XTENDER machines chemical temperature will be set at 82°F/27.5°C in both Dev and Fixer tanks. For LYNX machines chemical temperature will be set at 30°C in both Dev and Fixer tanks.

RE-CIRCULATION PLUMBING DIAGRAM (USA LAYOUT)

MICRO PROCESSOR PCB OPERATION

The PCB performs the 8 functions listed below:

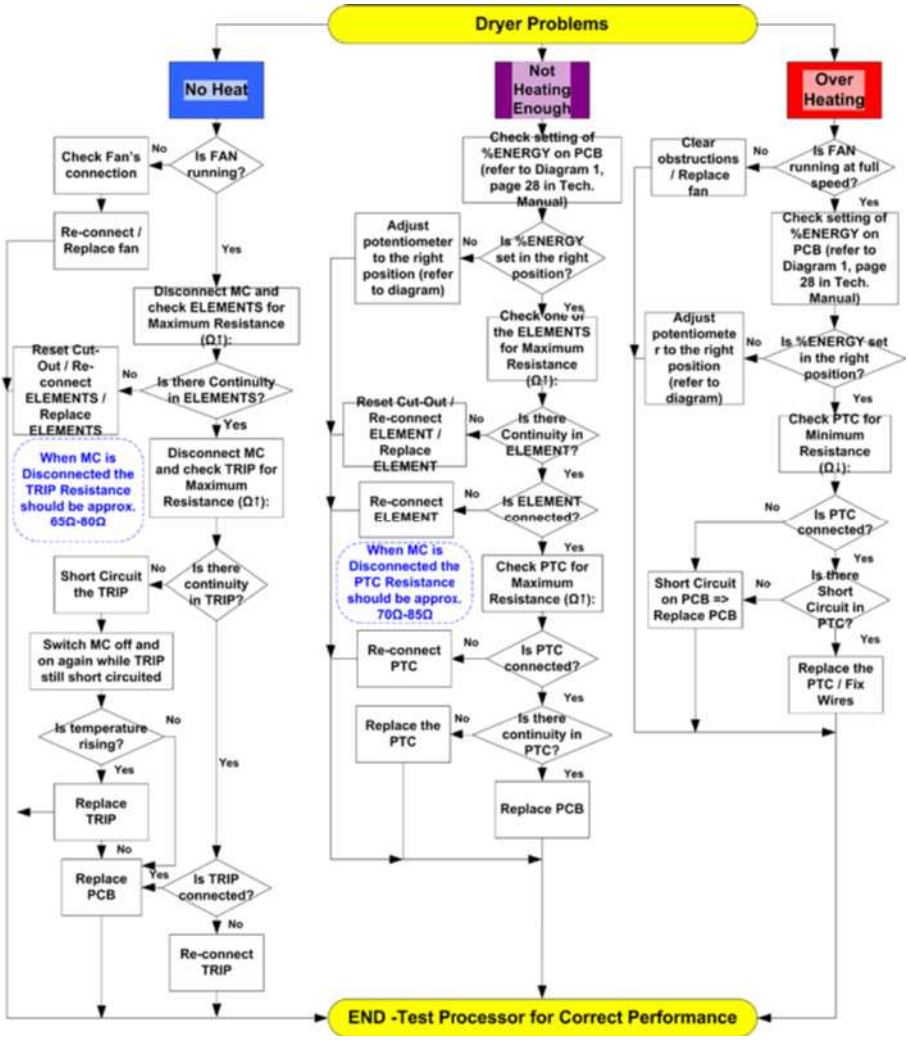
1. At switch on, or whenever the start button is pressed, the drive motor and the dryer run for 8 minutes.
2. At turn on, or whenever the 'RUN' button is pressed, the replenisher runs for two minutes. This is adjustable.
3. The dryer is controlled to an output temperature of 158°F/70°C.
4. The Developer and Fixer tank heaters are independently controlled to a preset temperature whenever the mains power switch is on.
5. The liquid levels in the 2 chemical tanks are monitored to protect the heaters and ensure good film processing by indicating when either is low and then indicating when the developer or fixer is too low to continue processing. At this point the processor will run to the end of its time period and shutdown until the tanks are completely filled again.
6. If either of the temperature sensors controlling the two tank heaters becomes open circuit or short circuit, the ready LED on the PCB will flash once a second.
7. The pumps are switched on whenever the processor is running or the tank heaters are on.
8. If the dryer fan stops or its air inlet grill (on the rear face of the processor) is obstructed, the dryer element will be switched off automatically before it overheats.

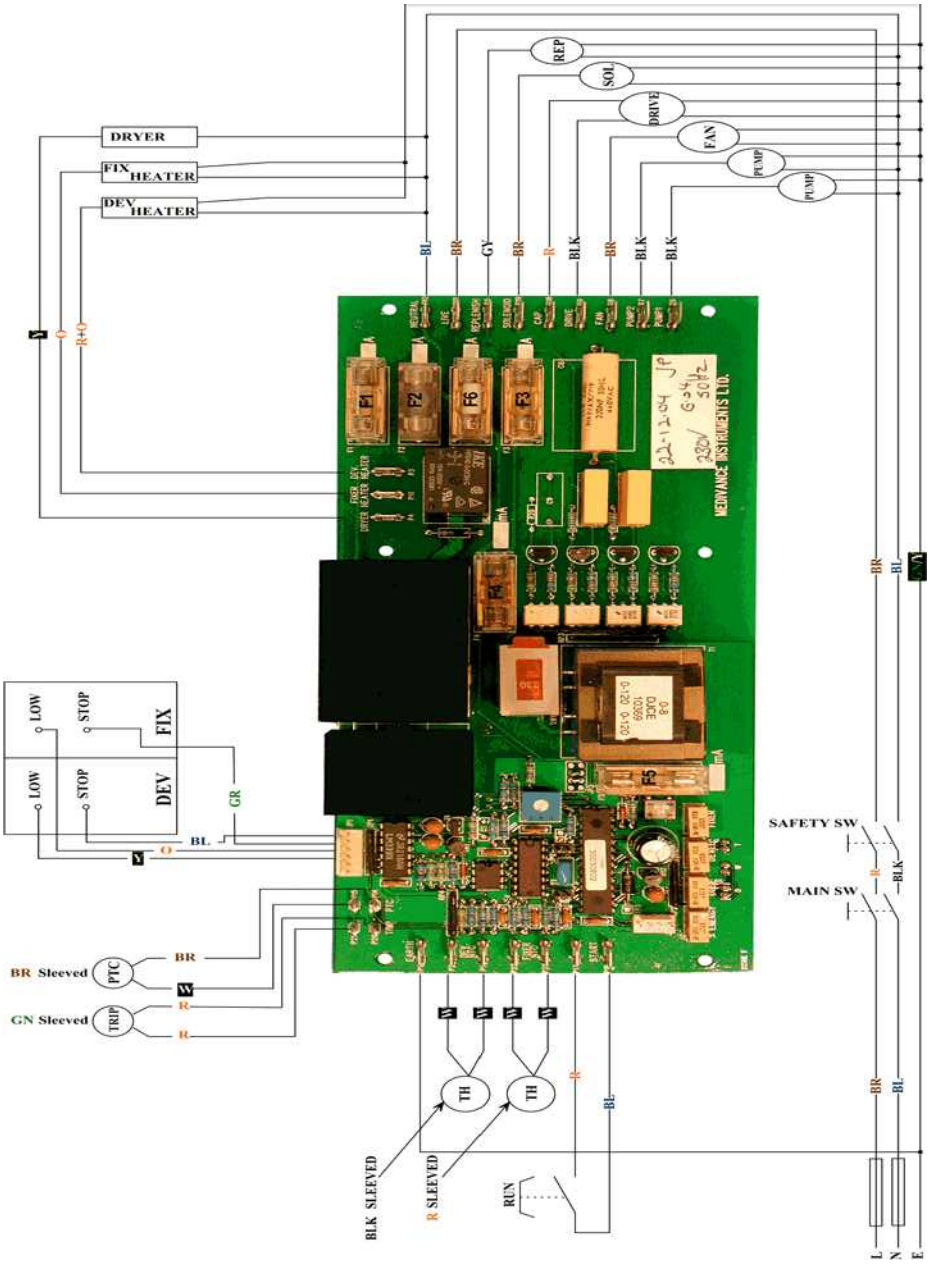
Settings and Adjustments:

1. The dryer is controlled by means of a thermostat in the hot air stream, which switches the dryer element between full power and a reduced power level. This reduced power is achieved by switching the element on and off 60 times a minute for a proportion of the time. This proportion is set to 50% and is adjustable between 20% and 80% by means of the %ENERGY potentiometer (Figure 1, page 28).
2. The safety shutdown of the dryer element is achieved by means of a "Trip" sensor in the heater housing. This is automatically reset by switching the

processor off then on again after a 10 second pause.

3. The chemicals in the Dev. and Fix. tanks are kept at a set temperature by means of a thermostat in each tank. These temperatures are set to 77°F/25°C (Developer) and 81°F/27°C (Fixer) and are adjustable by means of the DEVELOPER and FIXER potentiometers between 72.5°F/22.5°C and 90.5°F/32.5°C (see **Temperature and Replenisher** section on page 24).

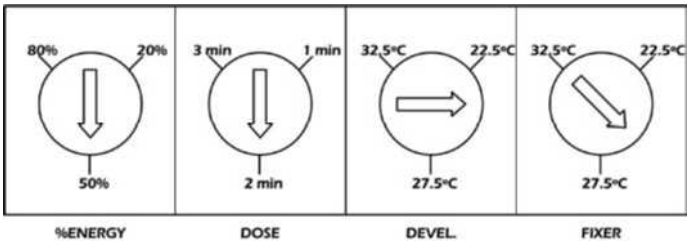




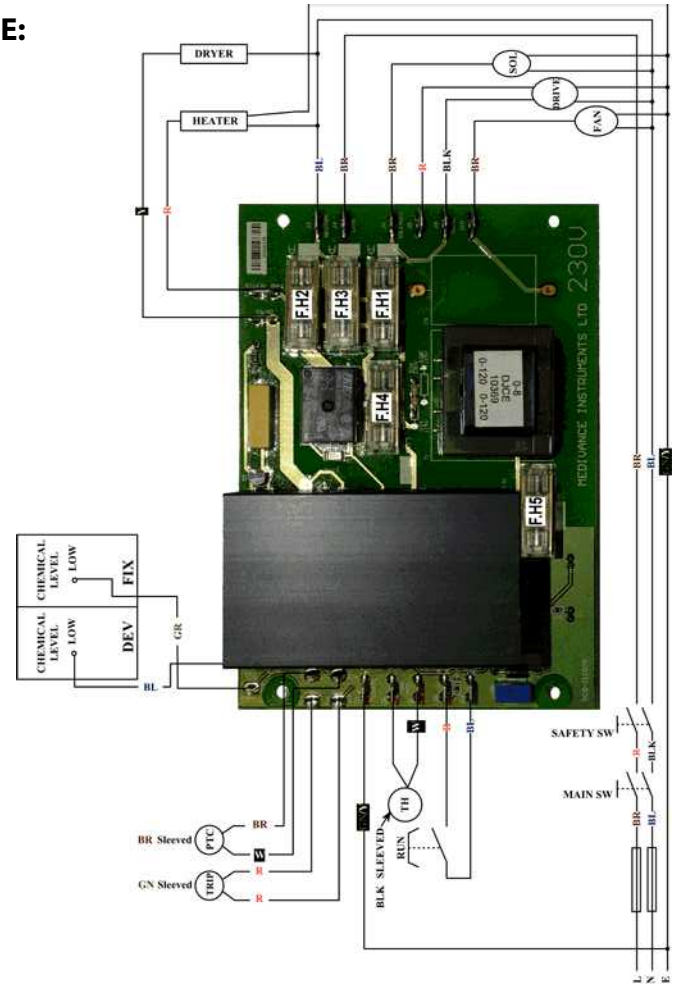
MAINTENANCE

PCB Connection Diagram(Cont.)

Figure 1:



Extra - XE:



MAINTENANCE

PCB Connection Diagram(Cont.)

Balloon Number		Part Description	Part Cat. Number
Issue -5 12/04	Issue -4 5/1/2001 (Page,Part)		
1	(2,16)	Daylight Loader	I/MAC6000F
2	(2,18)	Hand Entry Ports/Gloves	I/FIT3002F
4	(2,20)	Daylight Loader Lid (incl. locks' hinge' covers)	I/MDG3009F
6	(2,30)	Film Entry Guide	I/MDG2080F
8	(2,9&11)	Machine Lid	I/MDG2040F
9	(2,35)	EndoSlide (See Alternatives)	I/MDG2056F
11	(2,10)	Machine Lid Lock (2 supplied)	I/MDG2155F
12	(2,13)	Film Collector Stainless Steel Backplate	I/FIT5015F
13	(2,12)	Film Collector	I/MDG2152F
14	(2,32)	Side Panel	I/MDG2045F
15	(2,2)	On/Off Power Switch/Mains Switch	I/ELC2027F/ I/ELC2049F(USA)
19	(2,6)	'RUN' Button (Initiation Switch + Button + Bezel)	I/ELC2005F
22	(2,7)	Double Fused Chassis Plug (Europe)	I/ELC2071F
23	(2,7)	Socket Non Fused (Circuit Breakers) USA only	I/ELC2069F
24	(2,14)	Film Collector Backplate Spring (6 supplied)	I/SPR0001F
25	(2,23)	Water Inlet Connector (+ item 99)	I/MDG2085F
26	(2,27)	FIXER Waste (Red - Europe/Blue - USA)	I/FIT2025F(BL)/ I/FIT2030F(RD)/ I/FIT2031F(BLK)
27	(2,26)	DEVELOPER Waste (Black - Europe/Red- USA)	Use Description
28	(2,22)	Chemical Replenisher Inlet Tubes	I/FIT4042F
29	(17,14)	Circulation Pump FIXER (with Impeler)	I/ELC2150F / IELC2051F(USA)
30	(17,13)	Circulation Pump DEVELOPER (with Impeler)	I/ELC2150F / IELC2051F(USA)

Component Part Numbers (cont.)

Balloon Number		Part Description	Part Cat. Number
Issue -5 12/04	Issue -4 5/1/2001 (Page,Part)		
33	(17,9)	Control PCB	I/ELC2400F)230v)/ I/ELC2401F(115v) XE: I/ELC2410F(230v)/ I/ELC2420F(115v)
34	(17,8)	Safety Switch	I/ELC2037F
35	(18,7)	Main Drive Gear (1 supplied)	
43	(18,5)	Module Drive Gears (4 supplied)	
61	(18,6)	Idler Gears (2 supplied)	
		Drive Gear train (only supplied complete)	I/ASS5206F
38	(17,2)	Motor Drive	I/ELC2124F / I/ELC2188F(USA)
40	(17,4)	Dryer Fan	I/ELC2090F / I/ELC2091F(USA)
44	(18,8)	Thrust Washer	
45	(18,9)	Drive Dog Spring	
47	(18,10)	Drive Dog	
50	(18,13)	Drive Dog Shaft	
		Drive Dog Kit (only supplied complete)	I/ASS5205F
48	(18,2)	Drive Dog Cover Strip A	I/MDG2135F
53	(18,19)	DRYER Grille	I/ASS0050F
54	(18,17)	DRYER Elements	I/ASS2117F / I/ASS2118F(USA)
62	(2,24)	Water Waste (Incl. Connector, Nuts, Rings)	I/MDG2085F
63	(2,25)	Water Overflow (Incl. Connector, Nuts, Rings)	I/MDG2085F
64	(20,12)	Heater Element	I/ELC2096F (USA) / I/ELC2095F(UK)

Component Part Numbers (cont.)

Balloon Number		Part Description	Part Cat. Number
Issue -5 12/04	Issue -4 5/1/2001 (Page,Part)		
65	(20,4)	**Heater Manifold**	**I/ASS5011F(230v)**
67	(20,5)	Thermal Cut-out	**I/ASS5018F(115v)**
72	(20,11)	Heater Element Seal	
73	(20,10)	Pump Coupling Nuts	
74	(20,9)	Tank Manifold Seals	
75	(20,13)	Heater Clamping Nut	
69	(20,14)	Tank Wall Stiffener	I/FIT2045F
70	(20,1)	Tank (supplied with manifold assy.)	I/ASS0009F(230v) / I/ASS5006F(115v)
70	(20,1)	Tank (supplied without manifold assy.)	I/ASS0005F(230v) / I/ASS5008F(115v)
70	(20,1)	Tank (supplied with manifold but no Pump)	I/ASS0007F(230v) / I/ASS5004F(115v)
76	(20,7)	Temperature Sensor Assemblies	I/ASS5016F
84	**(--,--)**	**Solenoid Valve Kit**	**I/ASS2111F(115v)**
77	(21,8)	Solenoid Connector	**I/ASS2105F(230v)**
78	(21,13)	Washer Rubber	
79	(21,14)	Connector Locking Cap	
80	(21,7)	Solenoid Valve	
81	(21,15)	Straight Connector	
83	(--,--)	Solenoid Coil	
86	(21,11)	Replenisher Tube - DEVELOPER (Stainless Steal)	I/FIT4045F
87	(21,12)	Replenisher Tube - FIXER (Stainless Steal)	I/FIT4050F
88	(21,3)	Water Inlet Pipe	I/FIT2145F
89	**(21,2)**	**Drain Tubes (Supplied as a set of 3)**	**I/ASS5210F(230v)**
		Developer Drain Tube	**I/ASS5211F(115v)**
		Fixer Drain Tube	
		Water Drain Tube	

Component Part Numbers (cont.)

Balloon Number		Part Description	Part Cat. Number
Issue -5 12/04	Issue -4 5/1/2001 (Page,Part)		
93	(21,9)	Connector Locking Nut	I/MDG3075F
94	(21,10)	Pipe Connectors X3	I/MDG2085F
97	(21,19)	Foot Tray	I/MDG2047F
99	(21,--)	Rotation Stop (Retainer)	See Item 25
		Module Gear Set (only supplied complete)	**I/MOD0100F**
101	(19,6)	Gear Cover Plate	
102	(19,4)	Large Idler Gear	
103	(19,1)	Main Drive Gear	
104	(19,2)	'D' Shaped Centre Gears X4	
105	(19,3)	Small Idler Round Hole Gear X2	
109	(19,--)	DEVELOPER Module	I/MOD007F
110	(19,--)	FIXER Module	I/MOD008F
111	(19,--)	WATER Module	I/MOD0012F
112	(19,--)	DRYER Module	I/MOD0017F
20		**Replenisher Pump Set (supplied complete)**	**I/REP0002F)230v)**
113	(11,10)	No. 8 unc Screw X4	**I/REP0001F(115v)**
114	(11,7)	Cover Plate (With Brass Bush)	
115	(11,6)	Rotor Housing (Outer)	
116	(11,5)	Cover Plate	
117	(11,9)	M5 Screw X3	
118	(11,2)	Rotor Housing (Inner)	
119	(11,11)	Back Panel	
120	(11,1)	Pump Motor	

Component Part Numbers (cont.)

Balloon Number		Part Description	Part Cat. Number
Issue -5 12/04	Issue -4 5/1/2001 (Page,Part)		
		Hose Assembly (supplied as a pair)	**I/ASS2141F(230v)**
121	(11,8)	Peristaltic Tube	**I/ASS2142F(115v)**
122	(11,8)	Replenisher Inlet Tubes	
123	(11,8)	Replenisher Tube/Straw - FIXER	
126	(11,8)	Replenisher Tube/Straw - DEVELOPER	
125	(11,3)	Rotor Assembly X2	I/FIT2153F
128	(22,--)	Mains Lead	I/ELC2148F(UK) / I/ELC2149F(USA) / I/ELC2147F(CONT)
130	(22,--)	Flexible Hose - Cold Water Supply	I/FIT2026F(USA)/ I/FIT2027F(WW)
131	(22,--)	Flexible Hose - Water Overflow	I/FIT2034F(USA)/ I/FIT2027F(WW)
132	(22,--)	Flexible Hose - Water Waste	I/FIT2034F(USA)/ I/FIT2027F(WW)
138	(22,18)	Deep Loader for Large Cassettes (Optional)	Use Description
139	(22,--)	Machine Stand (Optional)	I/MAC9104F
142	(--,--)	Module Turning Tool	I/MDG5145M
144	(--,--)	Anti-static Strip	I/FIT2010F

Service Log:

Date	Service Description	Serviced By
/ /	*Machine Installation*	
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MC = Monthly Cleaning ; WIA = When In Area ; SC = Service Call

TIP: ***Service Log Table***

Use this table to record any service/maintenance done, including: Installations, Chemical Change, Engineer- Servicing, Cleaning, etc. Keep this log for reference and use at any time you contact your supplier.