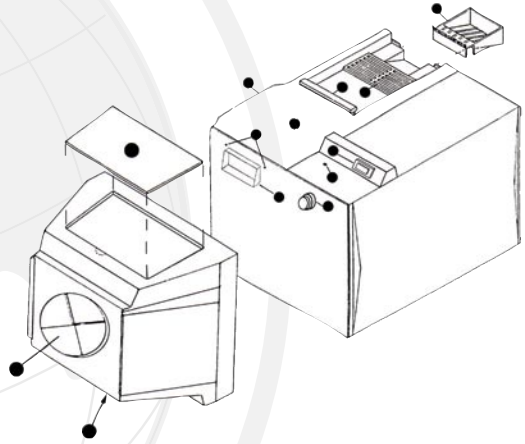


VELOPEX[®]

Automatic X-ray Film Processor

Intra - X

Intra - 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.



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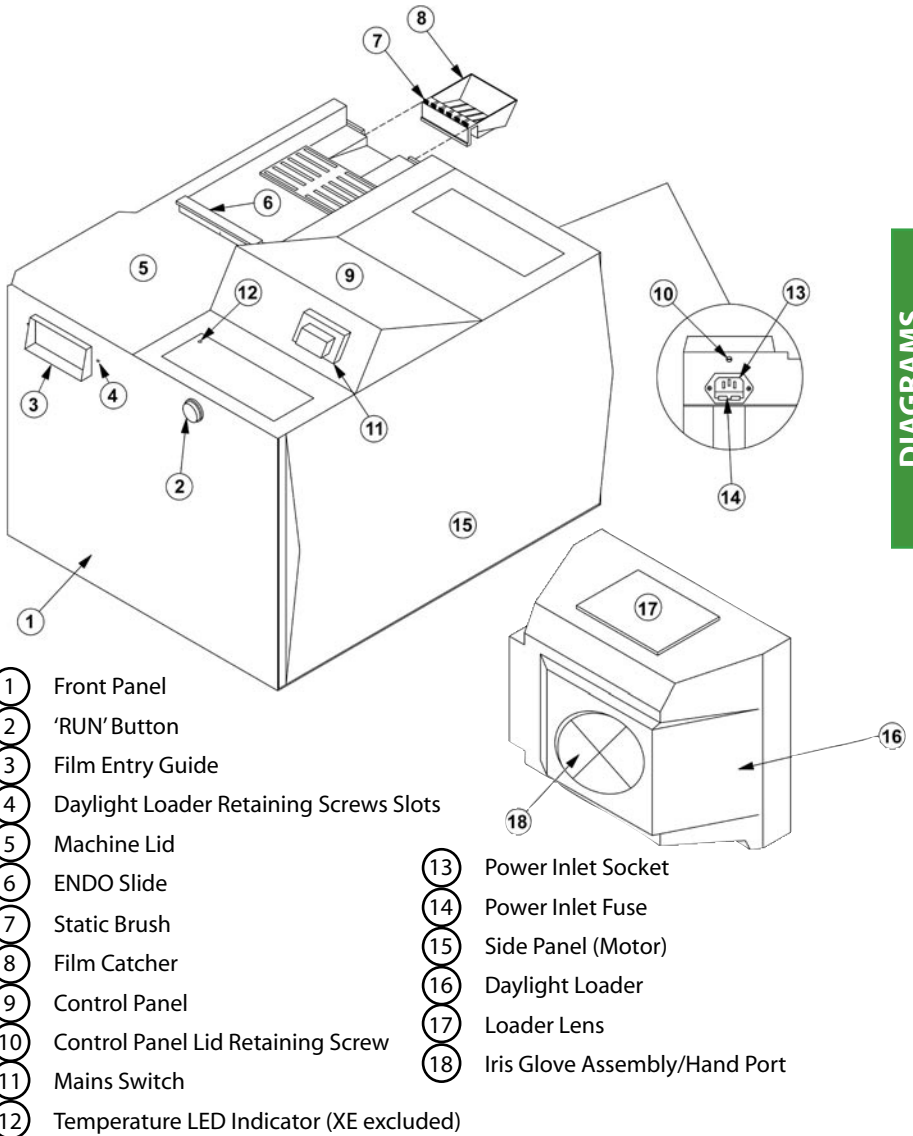
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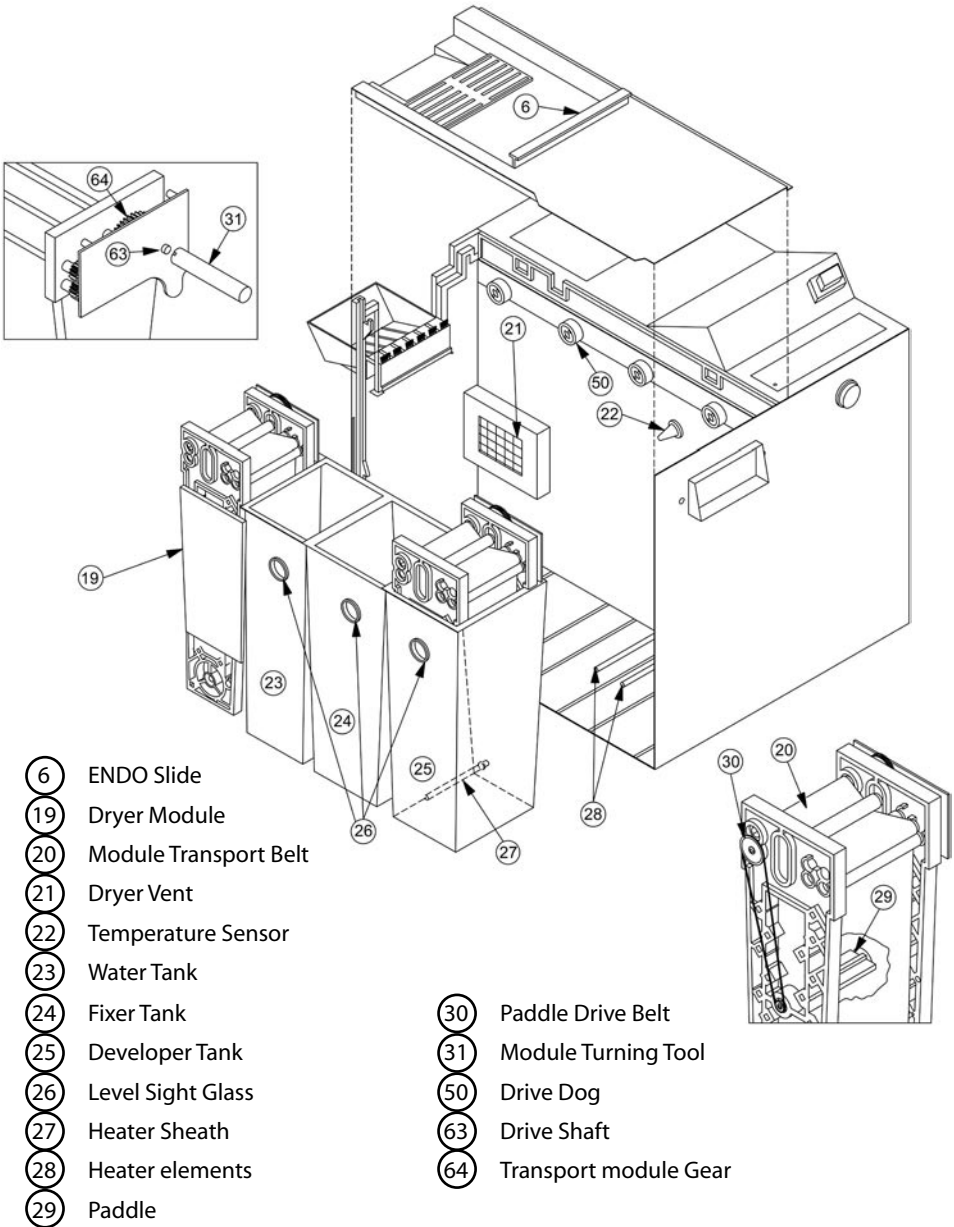
NOTE: All Part Numbers in this manual have been revised. Reference to previous manuals can be found in the Components & Parts section.

External Components



DIAGRAMS

Internal Features



DIAGRAMS

- (6) ENDO Slide
- (19) Dryer Module
- (20) Module Transport Belt
- (21) Dryer Vent
- (22) Temperature Sensor
- (23) Water Tank
- (24) Fixer Tank
- (25) Developer Tank
- (26) Level Sight Glass
- (27) Heater Sheath
- (28) Heater elements
- (29) Paddle
- (30) Paddle Drive Belt
- (31) Module Turning Tool
- (50) Drive Dog
- (63) Drive Shaft
- (64) Transport module Gear

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 80°F (27°C).

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

- a. Use a stable and level counter that will support a weight of at least 100 lbs. (50 Kg.).
- b. When the machine is filled with chemicals, make sure the stand does not rock or shake. NEVER move the machine with chemicals in the tanks.

2. ELECTRICAL SUPPLY

- a. 115Vac 60Hz, 10A, 1150W (USA)/230Vac 50Hz, 10A, 1150W (World Wide).
- b. The power source must be within three (3) feet (1m) of the machine. It should be easily accessible for operation and maintenance.

• Unpacking the VELOPEX

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

The machine comes in a single carton containing:

Machine, Operator's Manual, Silicone Grease, 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. The transport modules are protected by internal packing pieces: these must be discarded.

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

• Replacing the Mains Input Fuses

Refer to the diagram on page 2. The power inlet socket (item 13) is located on the back of the machine; this contains a drawer section (item 14) which slides out revealing the two fuses.

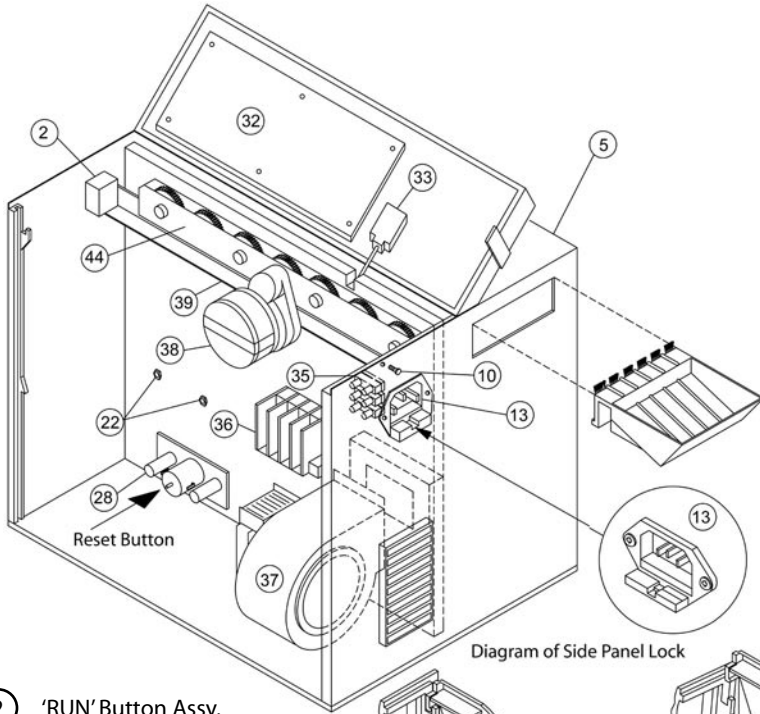
• Access to Internal Components

1. To access internal workings of the machine unscrew control Panel retaining screw (item 10).
2. The control panel may then be hinged upwards and lifted away if needed.
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 (page 6).

• Motor Mounting

1. Disconnect wires from PCB (item 32, page 6) and terminal strip (item 36).
2. Release and withdraw the motor by removing screws (item 40, page 7).
3. To replace, reverse procedure.
4. Ensure ground/earth continuity is maintained by replacing serrated washer between motor body and ground/earth lead termination.

Internal Layout

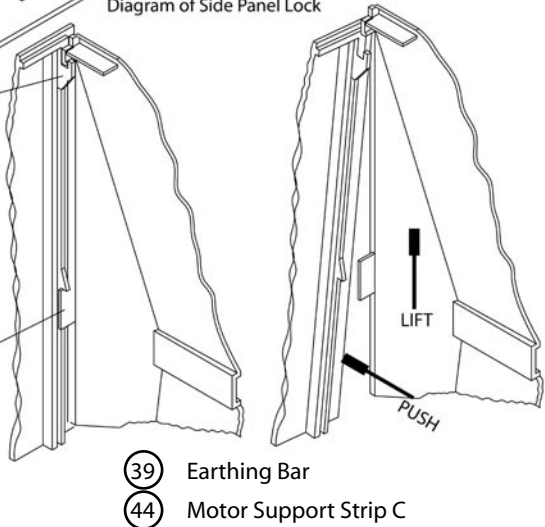


- 2 'RUN' Button Assy.
- 5 Machine Lid
- 10 Control Panel Fixing Screw
- 13 Power Inlet socket
- 22 Temperature Sensors*
- 28 Heater Elements & Thermal Trip*
- 32 PCB
- 33 Safety Switch
- 35 Terminal Block
- 36 Terminal Strip
- 37 Fan Unit
- 38 Drive Motor

'U'-Shaped Hook

Locking Bar

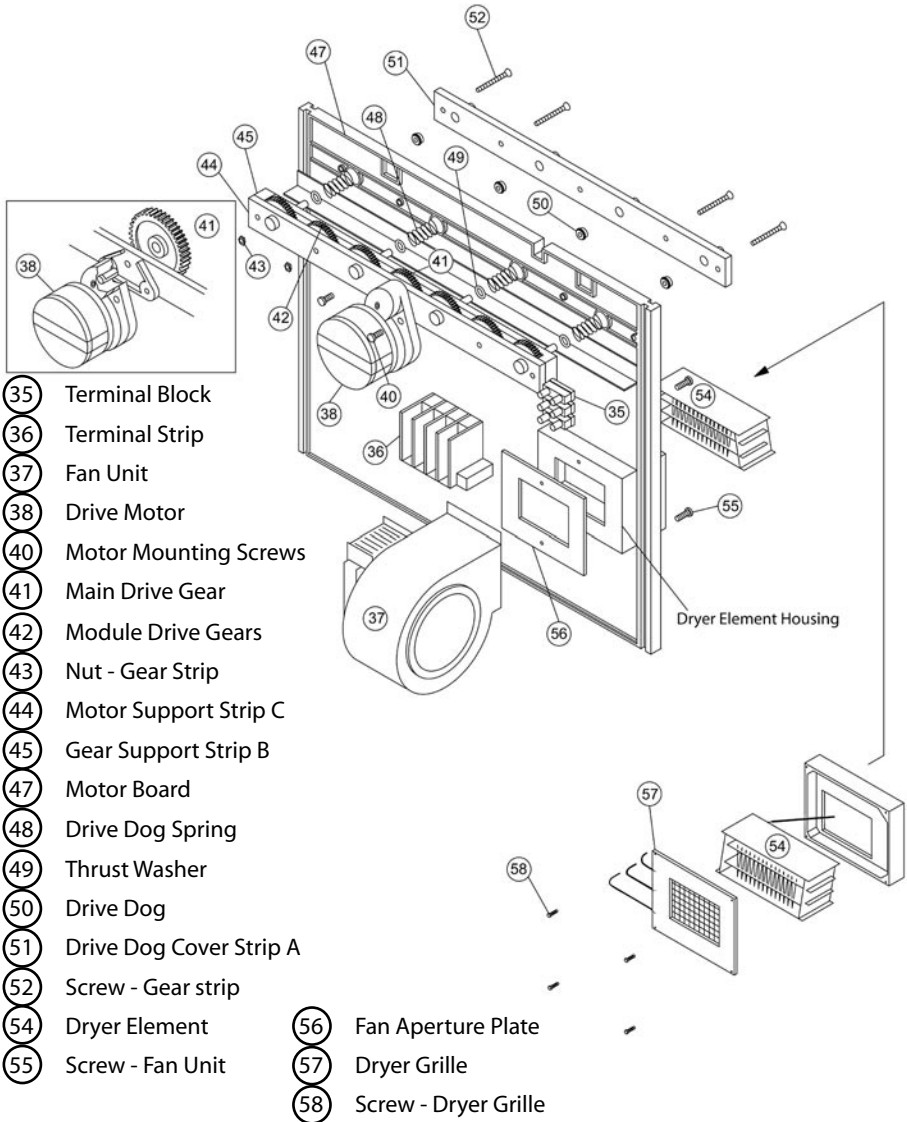
Diagram of Side Panel Lock



- 39 Earthing Bar
- 44 Motor Support Strip C

*Items 22 & 28 are not included in Intra-XE

Motor Board Assembly.



• Replacing Components on the Gear Strip

The assembly consists of three strips (items 44, 45 and 51) and the motor board (item 47) which is clamped between gear strips 45 and 51. It is essential to maintain this assembly order. To replace the main drive gear (item 41, page 7) on the motor shaft, do not dismantle the gear strip assembly. Simply remove the motor (item 38, page 7) by referring to **Motor Mounting** section (page 5). 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.

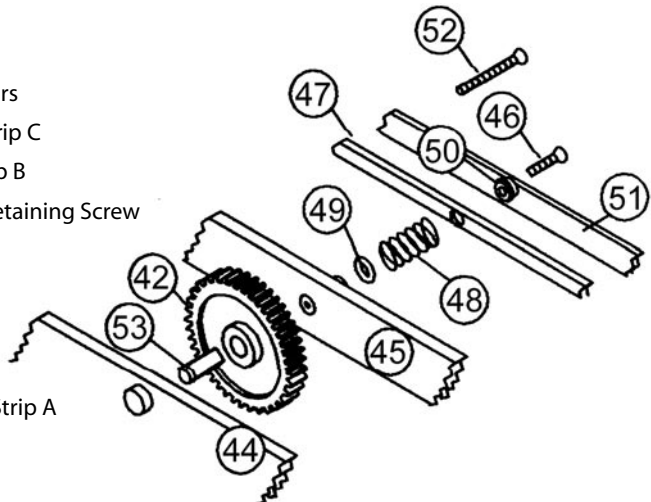
To replace the other gears (items 42, page 7 and item 41) follow the procedure as for replacing the drive dogs (item 50):

• Replacing the Drive Dogs

1. Remove the four clamping nuts (item 43, page 7).
2. Remove the motor support strip (item 44) and the gear support strip (item 45) along with the drive dog shaft (item 53).
3. Remove the gears (items 41 and 42, page 7), the drive dog springs (item 48) and the thrust washers (item 49).
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 42) onto the drive dog shafts (item 53).
 - c. Feed the shafts through the gear support strip (item 45) and apply a little silicone grease to the shafts before fitting the thrust washers (item 49) and the drive dog springs (item 48). The grease will hold the springs in place during re-assembly.
 - d. Fit the module drive gears (item 42) onto their spigots on the gear support strip (item 45) and assemble the motor support strip (item 44) into place.
5. Remove the old drive dogs (item 50) from the motor side of the motor board (item 47) and wipe clean the holes in the drive dog cover strip (item 51).

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 47) taking care that the motor mounting holes are at the bottom of the motor support strip (item 44).
 - a. Starting at one end, align and centre the drive dog shaft (item 53) into the drive dog (item 50).
 - b. Hold the assembly in position and fit the end clamping nut (item 43, page 7) loosely to its gear strip assembly screw (item 46).
 - c. Work along the other three drive dog shafts (item 53) aligning and entering them into their drive dogs (item 50) and fitting the clamping nut (item 43, page 7) loosely to each gear strip assembly screw (item 52), as you go.
 - d. Finally tighten all four clamping nuts (item 43). 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 41, page 7) into place in the centre of the gear train and refit the motor as described in **Motor Mounting** section.

- 42 Module Drive Gears
- 44 Motor Support Strip C
- 45 Gear Support Strip B
- 46 Drive Dog Strip Retaining Screw
- 47 Motor Board
- 48 Drive Dog Spring
- 49 Thrust Washer
- 50 Drive Dog
- 51 Drive Dog Cover Strip A
- 52 Screw - Gear strip
- 53 Drive Dog Shaft



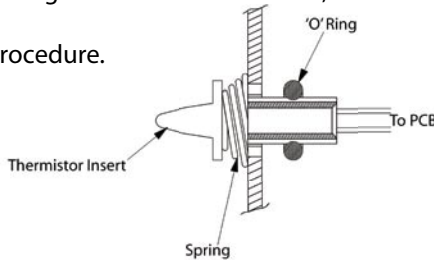
• **Fan and Heater Assembly**

1. To Replace Fan
 - a. Disconnect wires from terminal strip (item 36, page 6), PCB (item 32, page 6) and terminal block (item 35, page 6).
 - b. Remove grille (item 57, page 7) retained by four screws (item 58, page 7).
 - c. Remove heater assembly. Fan unit may then be released by removing two screws (item 55, page 7) located at the back of the dryer element housing.
 - d. To replace, reverse procedure.
2. To Replace Heater Element
 - a. Disconnect wires from terminal block (item 35, page 7).
 - b. Remove grille (item 57, page 7) retained by four screws (item 58' page 7).
 - c. Slide out heater element (item 54, page 7) withdrawing wires through the holes at the back of the element housing .
 - d. To replace, reverse the above procedure.

• **Thermistor/Temperature Sensor Assemblies (XE excluded)**

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.



• **Resetting the Chemical Heater Thermal Cut-Out (XE excluded)**

If the chemicals do not come up to temperature in the normal time and the temperature indicator light stays on, it may be that the thermal cut-out (page 6) has tripped and needs to be re-set.

Refer to the diagram on page 6 and the Instructions on page 5, to gain access to the thermal trip/reset button (Item 28, page 6).

To re-set the trip, simply press the re-set button firmly.

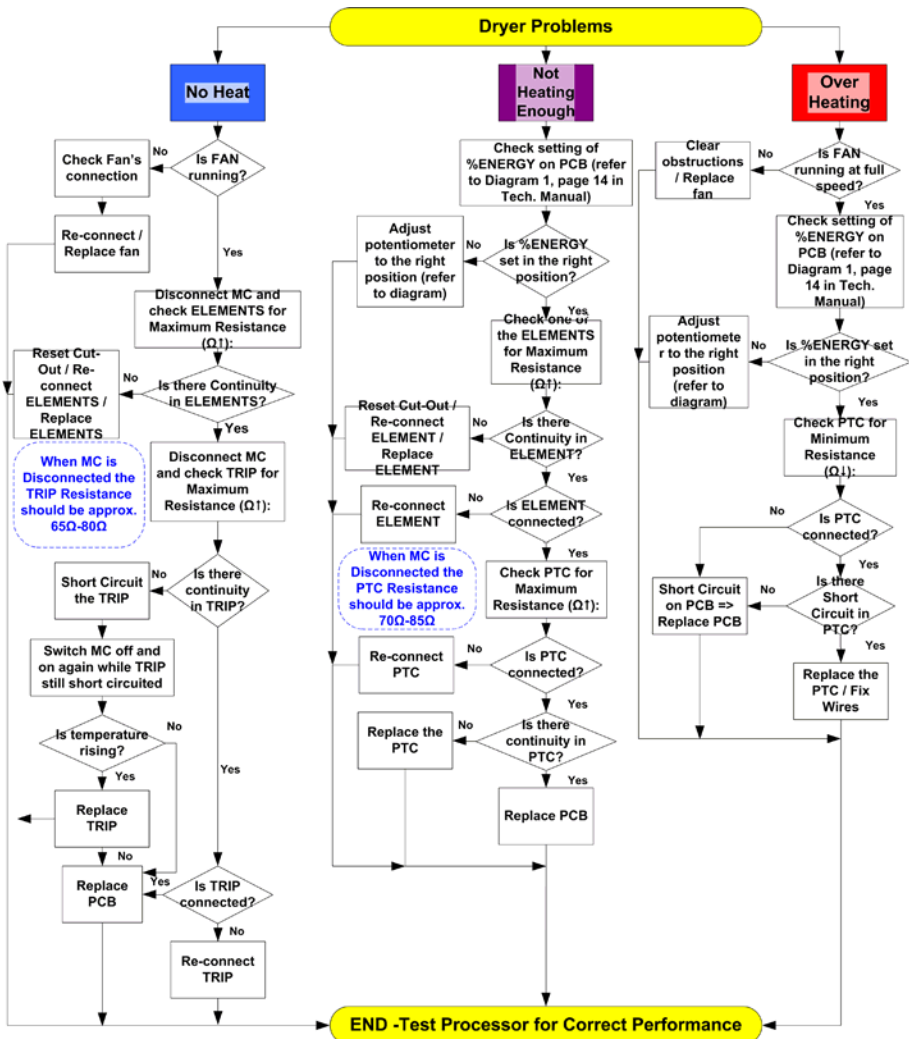
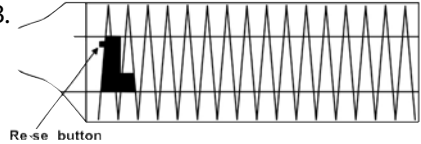
• **Dryer Element Cut-Out Re-set Operation**

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 (page 13) for details of a further over-temperature cut-out now fitted to the PCB.

Dryer Element Diagram:



MAINTENANCE

When MC is Disconnected the TRIP Resistance should be approx. 65Ω-80Ω

When MC is Disconnected the PTC Resistance should be approx. 70Ω-85Ω

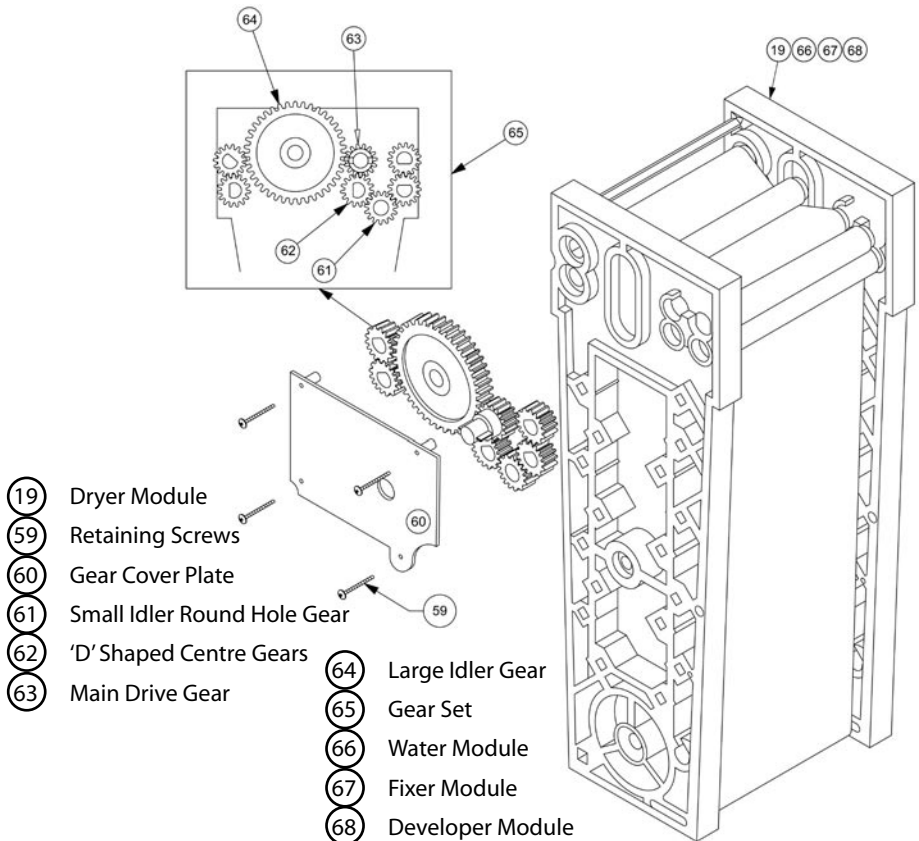
• **Module Gear Replacement**

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 60) 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.



MICRO PROCESSOR PCB OPERATION

The PCB performs the five 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. The dryer is controlled to an output temperature of 147°F/60°C.
3. The Developer and Fixer tank heaters are independently controlled to a pre-set temperature whenever the mains power switch is on (XE excluded).
4. 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 (XE excluded).
5. 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 20% and is adjustable between 20% and 80% by means of the %ENERGY potentiometer (Fig 1, page 13).
2. The safety shutdown of the dryer element is achieved by means of a "Trip" sensor in the heater housing. This is reset by unplugging the processor, and then plugged in 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 thermistor in each tank. These temperatures are set to 82°F/27.5°C (Developer) and 82°F/27.5°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.

Intra - X PCB Connection

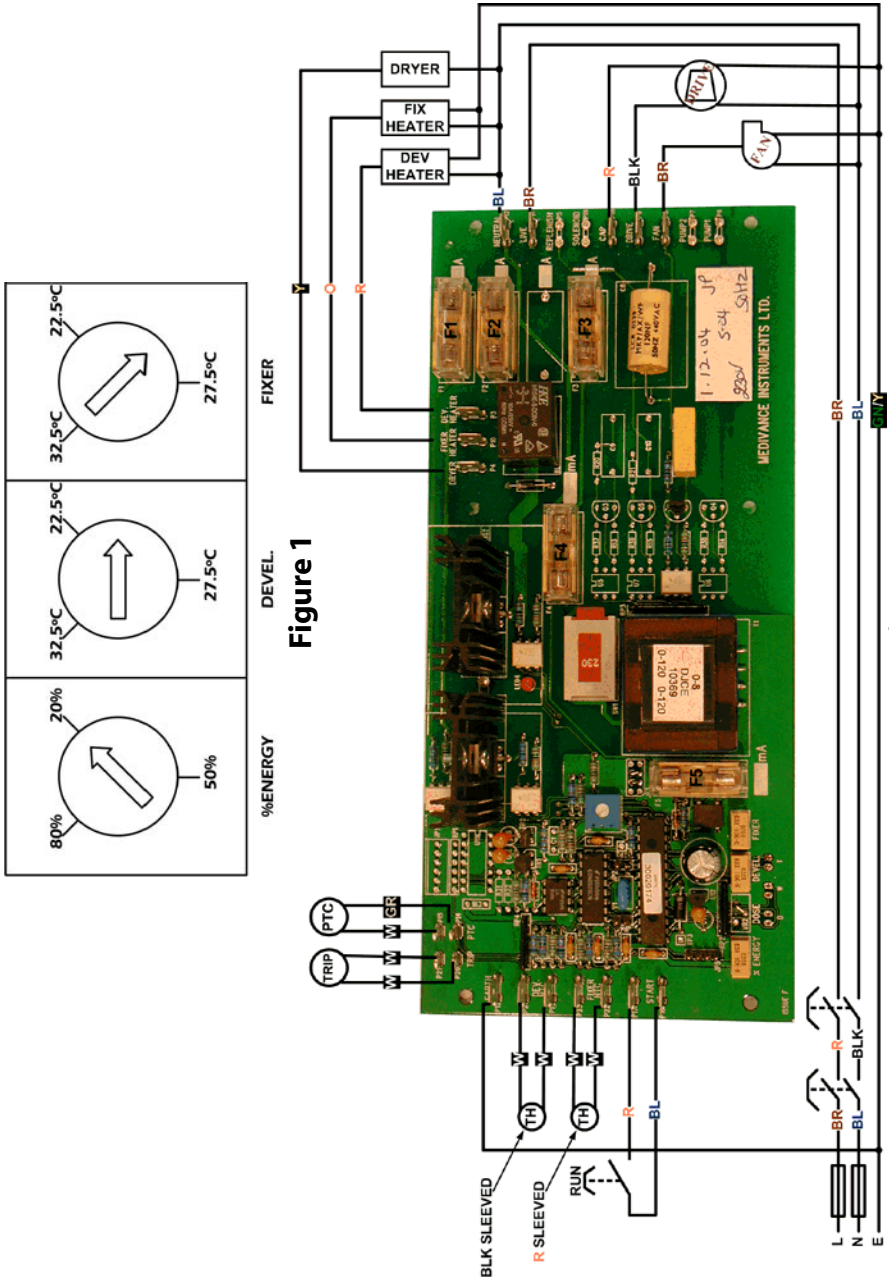


Figure 2

MAINTENANCE

Intra - XE PCB Connection

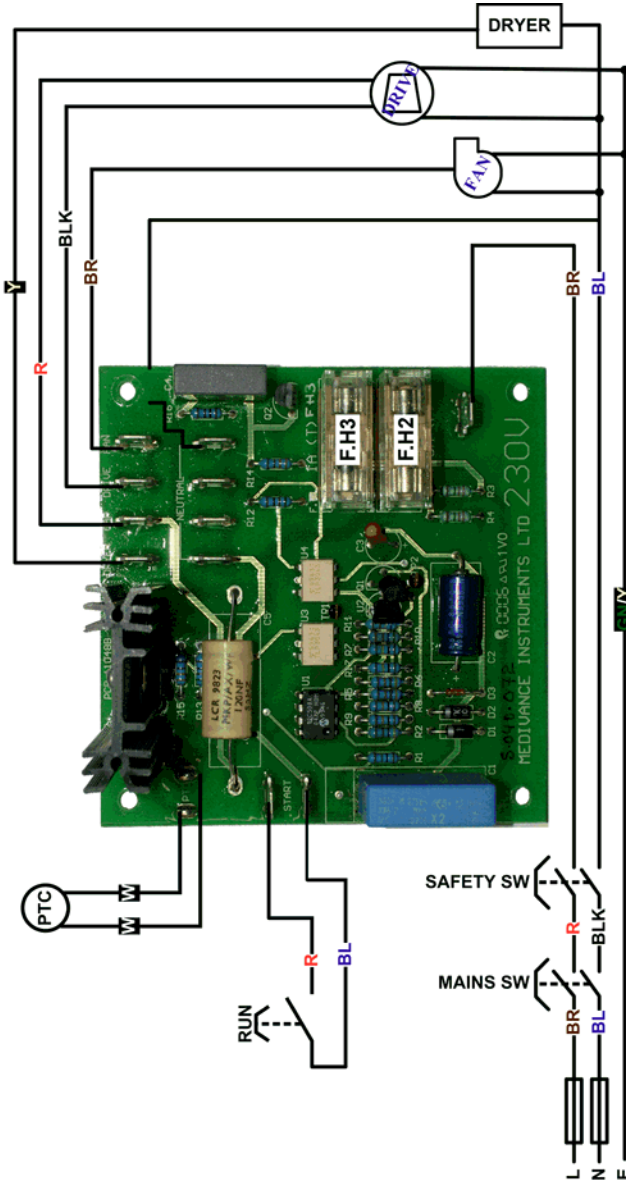


Figure 3

• 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

FUSE	SIZE	FUNCTION	230V			115V						
			INTRA-XE	INTRA-X	EXTRA-XE	MD 2000	SPRINT	INTRA-XE	INTRA-X	EXTRA-XE	EXTRA-X	SPRINT
F1	5x20	TANK HEATERS	/	1A RS416-297 (WELC2154P) or GDB (S500)	2A RS416-332 (WELC2158P) or GDB (S500)	T500mA RS157-907 (WELC2158P) or GDC (S504)	/	/	2A RS416-332 (WELC2158P) or GDB (S500)	3.15A RS416-360 (WELC1013P) or GDB (S500)	/	/
F2	5x20	DRYER HEATER	3.15A RS416-360 (WELC1013P) or GDB (S500)	/	5A RS416-378 (WELC2155P) or GDB (S500)	T1A RS157-9737 (WELC2169P) or GDC (S506)	/	/	5A RS416-378 (WELC2155P) or GDB (S500)	T10A RS419-820 (WELC2218P) or LF215010	/	/
F3	5x20	DRIVE/FAN	T1A RS157-9737 (WELC2169P) or GDC (S506)	/	/	/	/	/	T1A RS157-9737 (WELC2169P) or GDC (S506)	T2A RS1579-9771 (WELC2219P) or GDC (S505)	/	/
F4	5x20	TRANSFORMER	/	T500mA RS157-9670 (WELC2158P) or GDC (S504)	/	/	/	/	/	T100mA RS125-4855 (WELC2157P)	/	/
F5	5x20	RECTIFIER	/	T500mA RS157-9709 (WELC2172P) or GDC (S506)	/	/	/	/	T500mA RS157-9709 (WELC2172P) or GDC (S506)	/	/	/
F6	5x20	SOLENOID	/	/	FROM F3	/	/	/	/	T2A RS157-9771 (WELC2219P) or GDC (S505)	FROM F3	/
INLET	5x20 2 off	MAIN FUSES OR CIRCUIT BREAKERS	T8A RS419-791 (WELC217P) or LF215005	TBA RS419-814 (WELC401P) or LF215008	TBA RS419-814 (WELC401P) or LF215008	T10A RS419-820 (WELC218P) or LF215010	T8A RS419-791 (WELC217P) or LF215005	TBA RS419-814 (WELC401P) or LF215008	TBA RS419-814 (WELC401P) or LF215008	12A Schurter T11 211U	T8A RS419-791 (WELC217P) or LF215005	T8A RS419-791 (WELC217P) or LF215005
PLUG (WHERE FITTED)	1"x1/4"	MAINS CABLE	T10A RS412-598 (WELC2153P)	/	/	/	/	/	10A	10A	15A	10A

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

Component Part Numbers

Balloon Number		Part Description	Part Cat. Number
Issue -6 6/05	Issue -5 1/10/2002 (Page,Part)		
2	(2,10)	'RUN' Button (Initiation Switch + Button + Bezel)	I/ELC2005F
5	(2,3)	Machine Lid	I/MDG2017F
6	(2,4)	ENDO Slide	I/MDG2055F
8	(2,5)	Film Catcher (with Static Strip)	I/MDG2060F
11	(2,2)	Mains Switch	I/ELC2027F(230V) I/ELC2049F(115V)
13	(2,18)	Power Inlet Socket	I/ELC2072F(WW) I/ELC2071F(USA)
14	(2,19)	Power Inlet Fuse	I/ELC2217F(WW)
15	(2,7)	Side Panel (Motor)	I/MDG2045F
16	(2,11)	Daylight Loader	I/MAC6100F
18	(2,61)	Iris Glove Assembly/Hand Port	I/ASS0010F
19	(4,10)	Dryer Module	I/MOD0076F
22	(4,15)	Temperature Sensors	I/ASS5017F(DEV.) I/ASS5019F(FIX.)
23	(4,9)	Water Tank	I/ASS2178F
24	(4,8)	Fixer Tank	I/ASS2177F
25	(4,7)	Developer Tank	I/ASS2176F
28	(4,11)	Heater Elements	I/ELC2097F(230V) I/ELC2098F(115V)
30	(4,1)	Paddle Drive Belt (supplied in a set of 6)	I/FIT0005F
31	(4,1)	Module Turning Tool	I/MDG5145F
32	(7,54)	PCB	I/ASS2500F(230V) I/ASS2501F(115V) XE: I/ELC2103F(230V) I/ELC2104F(115V)
33	(7,55)	Safety Switch	I/ELC2037F
37	(7,38)	Fan Unit	I/ELC2090F(230V) I/ELC2091F(115V)

Component Part Numbers (cont.)

Balloon Number		Part Description	Part Cat. Number
Issue -6 6/05	Issue -5 1/10/2002 (Page,Part)		
38	(7,35)	Drive Motor	I/ELC2123F(230V) I/ELC2189F(115V) XE: I/ELC2101F(230V) I/ELC2102F(115V)
41	(8,32)	Main Drive Gear (1 supplied)	
42	(8,30)	Module Drive Gears (4 supplied)	
61	(8,31)	Idler Gears (2 Supplied)	
		Drive Gear train (only supplied complete)	I/ASS5206F
48	(8,27)	Drive Dog Spring	
49	(8,28)	Thrust Washer	
50	(8,29)	Drive Dog	
53	(8,26)	Drive Dog Shaft	
		Drive Dog Kit (only supplied complete)	I/ASS5205F
51	(8,22)	Drive Dog Cover Strip A	I/MDG2135F
54	(8,41)	Dryer Element	I/ELC2117F(230V) I/ELC2118F(115V)
57	(8,42)	Dryer Grille	I/ASS0051F
59	(9,E)	Retaining Screws	
60	(9,F)	Gear Cover Plate	
61	(9,C)	Small Idler Round Hole Gear	
62	(9,B)	'D' Shaped Centre Gears X5	
63	(9,A)	Main Drive Gear	
64	(9,D)	Large Idler Gear	
65	(9,74)	Module Gear Set (only supplied complete)	I/MOD0100F
66	(9,-)	Water Module	I/MOD0071F
67	(9,-)	Fixer Module	I/MOD0068F
68	(9,-)	Developer Module	I/MOD0067F

Service Log:

Date	Service Description	Serviced By
/ /	<i>Machine Installation</i>	
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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: Installation, Engineer- Servicing, Parts replaced by user, etc.

Keep this log for reference and use at any time you contact your supplier.