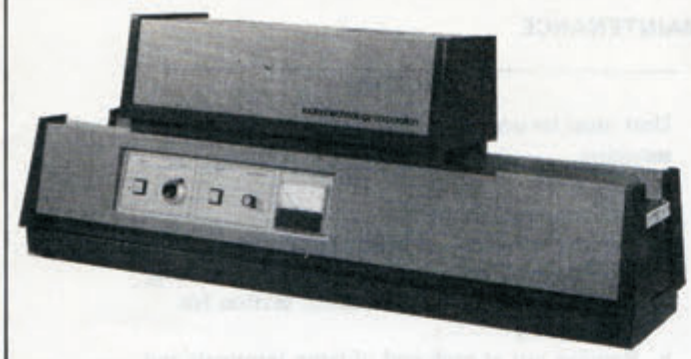

M-100 INFRARED CONVEYOR OVEN

INSTRUCTIONS

May 1975

Uncrate machine carefully and inspect for damage which may have occurred in transit. The system was thoroughly tested and in good working condition upon leaving the R.T.C. factory. If there is evidence of damage, report it immediately to the carrier and to R.T.C.

INSTALLATION

Set the unit on a suitable work surface and connect power cord. Receptacle should be adequate to handle required current. M-100 requires 120 VAC, 2700 watts, 22½ amps.

CHECK-OUT

1. Immediately before starting system unplug unit to avoid shock. Remove top cover of heating chamber. This is secured to the frame by four ball studs and is removed by firmly lifting straight up. (Fig. 1.)
2. Remove back panel by removing the screws located at each end of the oven under the recessed area. Pull out panel, then lift. This will expose the interior of the control area. (Fig. 2.)

Fig. 1. Top Cover Removal

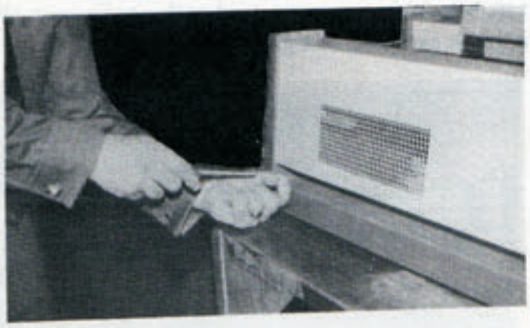

Fig. 2. Back Panel Removal

3. Make a general study of the control area for loose wire connections and loose terminals, especially around the area of the contactor. Check cooling fans to make sure the blades are not bent or out of round.
4. Remove stainless steel end covers located at each end of heating chamber by removing phillips head screws (two per end). Check that lamp terminals are securely connected. (Fig. 3.)

Fig. 3. Cover Removal

5. Inspect the interior of the oven chamber. There are three (3) tubular quartz lamps located at the top of the chamber. They should be visibly checked for breaks or cracks.
6. Reconnect power plug.

CAUTION

While oven is plugged in, do not touch any exposed terminals. Also, care should be taken not to touch the fans nor lay anything on or near the fans.

7. With power connected and while unit is disassembled, start the system by pushing POWER button. (The conveyer will automatically begin to move when POWER button is activated.)
8. Push HEAT button. Turn HEAT RANGE knob full on (fully clockwise). Meter should read 22½ amps. Check quartz lamps; they should be glowing brightly (allow them 3 to 5 minutes to warm-up fully).
9. Check cooling fans; they should be spinning smoothly.
10. Run BELT SPEED knob up and down and see that speed control is operating properly.
11. Turn HEAT RANGE knob up and down; lamps should grow brighter and dimmer.
    After check-out, turn system off by pushing POWER button and re-assemble. Unit is now ready for operation.

OPERATION

1. To start unit, push POWER button on.
2. Push HEAT button on and set desired heat level by using HEAT RANGE knob. (Heat output is shown on meter in amperes.)
3. Set desired conveyor speed on BELT SPEED potentiometer.
   a. The M-100 has a high range and a low range. When the push button pilot light is lighted, it is in the low range, when unlighted it is in the high range. Numbers on the control potentiometer are direct reading and indicate the time parts will remain in the oven, (2 - 10 would represent 2 and 10/100th minutes, for example). In the high range, simply add ten minutes to the reading, (2 - 10 would represent 12 and 10/100ths minutes).
4. Allow ten minutes for unit to warm up and stabilize before processing parts.

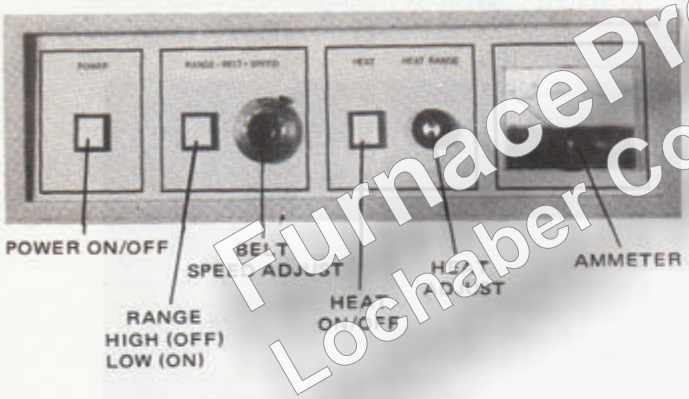

Fig. 4. Control Panel Detail

SUGGESTED SETTINGS

ITEM PROCESSED	AMPS	LENGTH OF TIME IN OVEN
EPOXIES	15	15 min.
MARKING INKS	15	2 min.
SOLDER FUSION Plated Tin lead	22	45 seconds
SOLDER REFLOW Solder Paste	22	2½ min.
SOLDER REFLOW Preforms and pre-tinned	22	2½ min.
THICK FILM PASTES	15	15 min.
CONFORMAL COATINGS	12	2 min.
SHRINK TUBING	15	30 seconds
RESIST, Plating, Etching	14	2 min.
RESIST, Solder	14	3 min.
RESIST, Photo	13	1 min.

NOTE: These are suggested starting points only. Adjustments may be required in heat and time to achieve best settings for your job.

MAINTENANCE

CAUTION

Unit must be unplugged before attempting any servicing.

1. Quartz lamp replacement
   a. Remove top cover of heating chamber and then the stainless steel end cover at each end of heating chamber. (see System Checkout section for procedure.)
   b. Remove nut at each end of lamp terminals and replace lamp.
   c. Reassemble, making certain lamps terminals are connected securely.
2. SCR control unit servicing

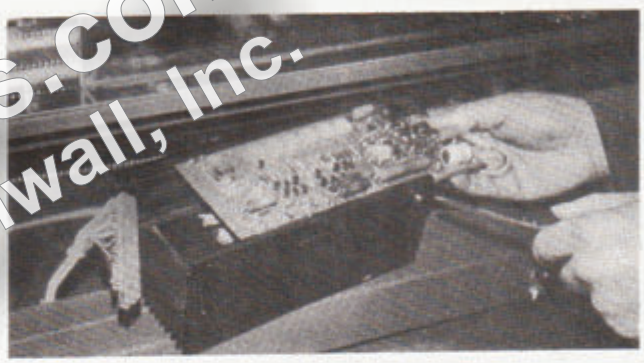

Fig. 5. SCR Control Unit Removal

   a. Remove top cover of heating chamber and then the panel at back of unit to gain access to SCR control unit. (see System Checkout section for procedure.)
   b. Loosen wing nuts on hold-down bracket and gently pull the heat sink assembly to the outside.
   c. To replace PC board only, remove connector; loosen set screw and gently slide board out of track and insert new board and reconnect.
   d. To replace the entire assembly: (1) remove connector from PC board, (2) disconnect the white #12 wire from the load side of the magnetic relay, (3) remove the white #12 wire at the ammeter. (Do not attempt to remove from the heat sink.) Reconnect all wires on new SCR unit and replace into original position.
3. Conveyor Belt Removal or Link Removal
   a. Should it be necessary to remove conveyor belt for cleaning or replacement, or make the belt shorter, proceed as follows.
   b. Lift belt from wear strips and with needle nose pliers unhook each end of a given link. (Fig. 7A)

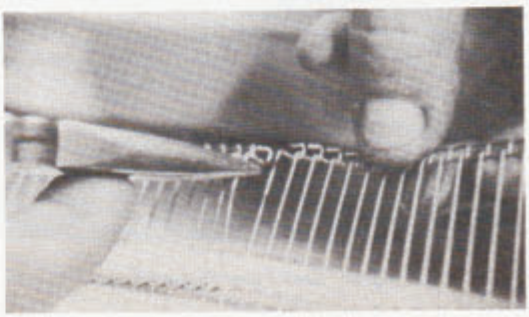

Fig. 7A

c. Now unhook the ends of the immediate next link. (Fig. 7B)

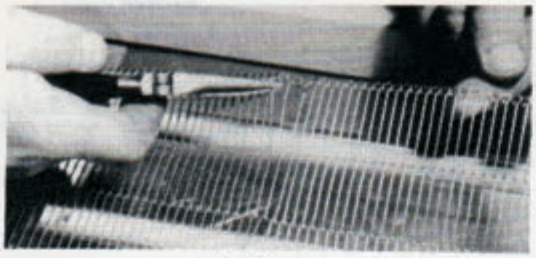

Fig. 7B

d. Bend the loose link with forefinger and slip it through the center of belt. (Fig. 7C) (Fig. 7D)

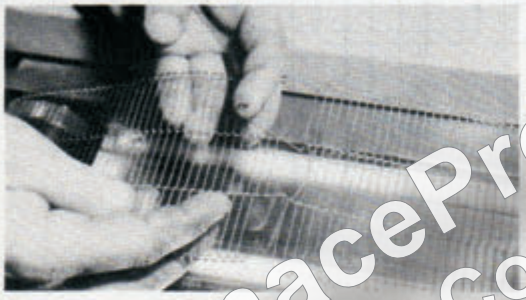

Fig. 7C

Fig. 7D

e. To reconnect, reverse the procedure.

TROUBLE SHOOTING

1. Complete Shut Down
   a. See that power cord is properly connected.
   b. Check fuse holders at rear of unit for blown or missing fuses.
2. Conveyor Belt Stops or Speed is Erratic
   a. See that there is nothing obstructing belt.
   b. See that belt is engaging properly on gear drives.
   c. Check that motor speed control circuit is not malfunctioning.
   d. Check fuses at rear of unit.
   e. The openings (or windows) on the black plastic photo disc connected to conveyor motor may be plugged or dirty. If these holes are plugged or dirty, speed of conveyor may become erratic.
3. Improper Increase or Decrease in Heater Output
   a. Check fuses. No output would indicate a blown fuse.
   b. Check for burned out heater lamp.
   c. Check for malfunction in heater control circuit.
   d. Needle on meter may be sticking. Tap meter to free needle.

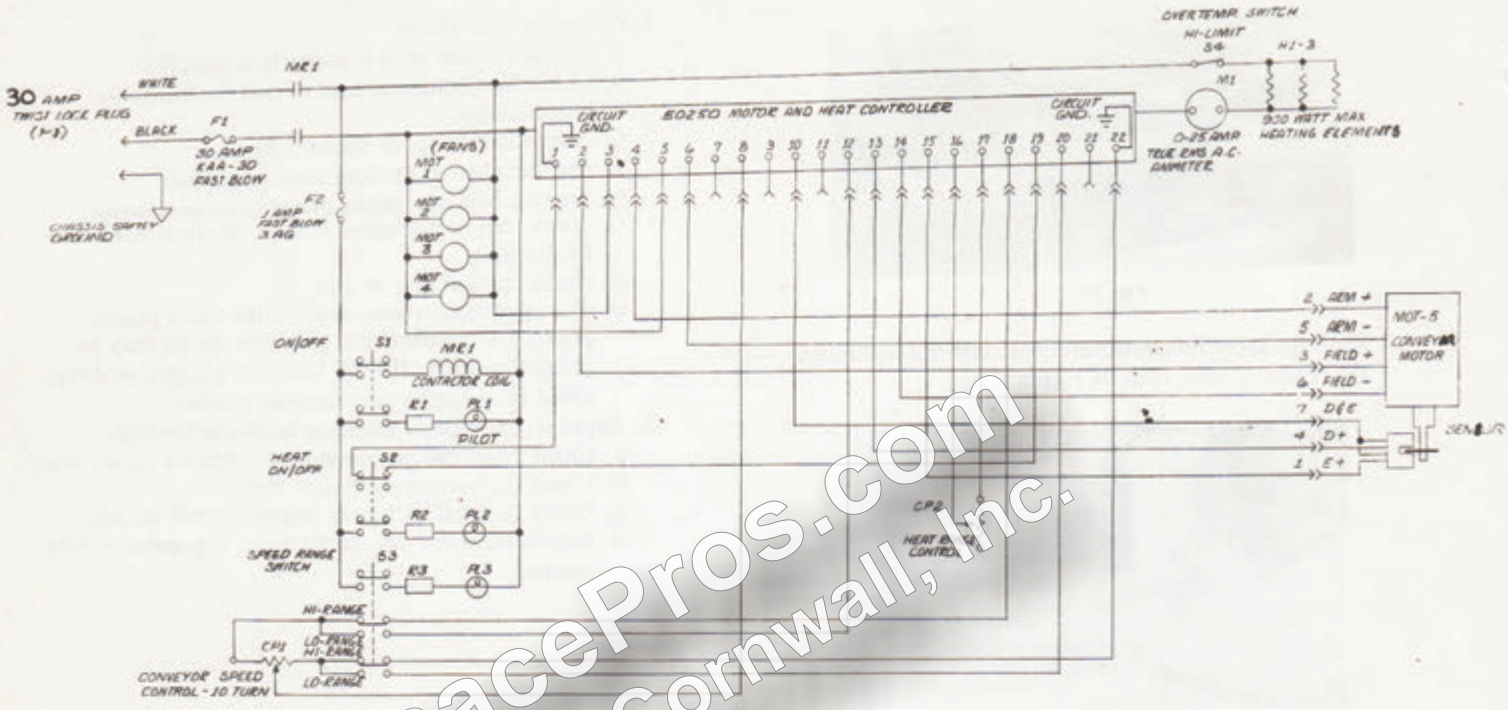

Fig. 6. Schematic Diagram – M-100

Each system is assigned a parts ordering number. This number is on the aluminum information and name tag located at back of system near the power cord. The parts' ordering number must be used when ordering parts. The serial number must also be used.

EXAMPLE

Parts ordering number — 02-1516 – H1 – 1001
RTC reference no. (See Spare Parts List)
Serial No. of your system

SPARE PARTS LIST

RTC REFERENCE NO.	DESCRIPTION	RECOMMENDED SPARES
HI–3	ELEMENT, HEATING	2
MOT–5	MOTOR, CONVEYOR W/SENSOR	0
MOT1–4	FAN, COOLING	0
SCR–1	CONTROL, SCR	1
RL–1	CONTACTOR, MAIN	0
S1–2	SWITCH	0
S–3	SWITCH	0
M–1	AMMETER, 0-25 AMPS	0
PL1–3	PILOT LIGHT, SWITCH	0
F–1	FUSE, 30 AMPS	1
F2–3	FUSE, 1 AMP	3
P–1	POT, CONVEYOR	0
P–2	POT, HEAT	0
CB–1	BELT, CONVEYOR	0

RTC

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