



# BENCH TOP BOARD DRYING MACHINE

Part Number: 27-22803

The stainless steel constructed bench top printed circuit board drying machine processes wet circuit boards through a series of squeegee towelling rollers and a heated hot air knife. The unit consists of four pairs of squeegee towelling rollers, the first pair rotate in a shallow water tank with a water level detector, this pair helps to capillary water trapped in the drilled holes, the second and third pair of towel rollers remove excess moisture before the circuit board enters the heat zone where the high output hot air blower removes further moisture from both surfaces of the circuit board and from inside the holes. The board then exits through the last pair of rollers dry.



The electronic control module allows the operator a choice of two heat settings with variable through put rates through the machine thus giving optimum drying rates. The unit also has an automatic over run circuit which operates the wet rollers at maximum speed using a low heat setting for 10 minutes to dry the rollers for future circuit board drying requirements.

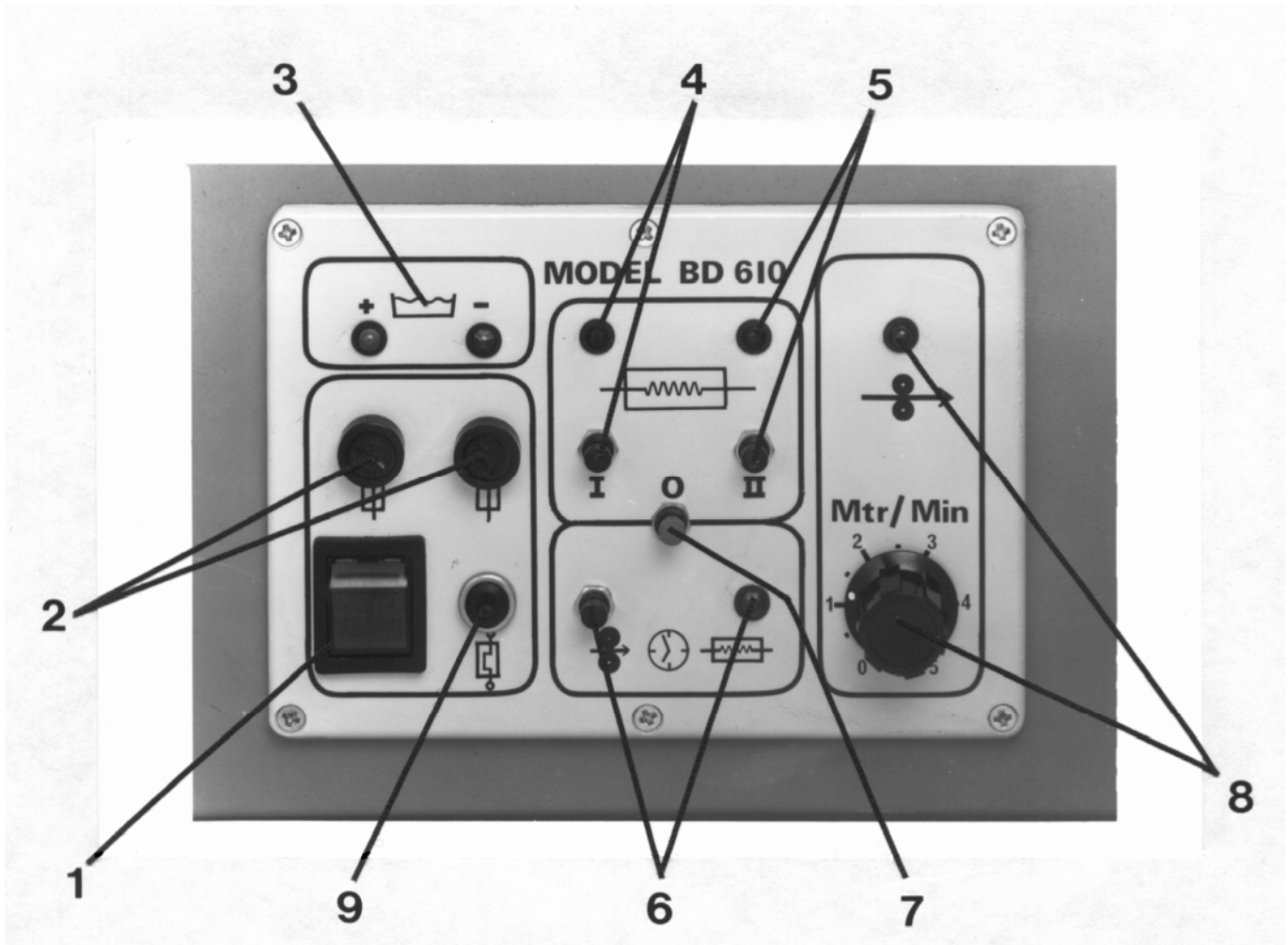
## UNPACKING

Unpack the board drying machine from the transport case and check for any damage. Lift the lid and check for any transport damage or loose items. The machine now requires a single phase supply @ 220/240 volt through a 13 amp fuse. Connections are BROWN wire to live/hot, BLUE to neutral, YELLOW/GREEN to earth/ground.

## SETTING UP

The machine must now be placed on a suitable bench, this giving suitable exit room for the longest printed circuit board at the rear. Care must be taken that the air intake and exit slots are not blocked or obstructed at the rear and the top lid. The machine must be placed on a level table top. With the lid raised fill the front roller tank via the funnel with between 500ml – 750 ml of water ( about three quarters of the water container 'B' ). Check the water level in the wetting tank to see if the machine is level, and re-level if necessary. Check the funnel top contacts the under side of the rubber seal in the lid ( 'C' ) with the lid shut. If not remove the funnel and pull up the stem tube by the amount required, replace the funnel and close the lid.

The machine can then be switched on and the level LED checked to see if sufficient water is in the machine, if not add more water until the green LED detects that the water level is correct.



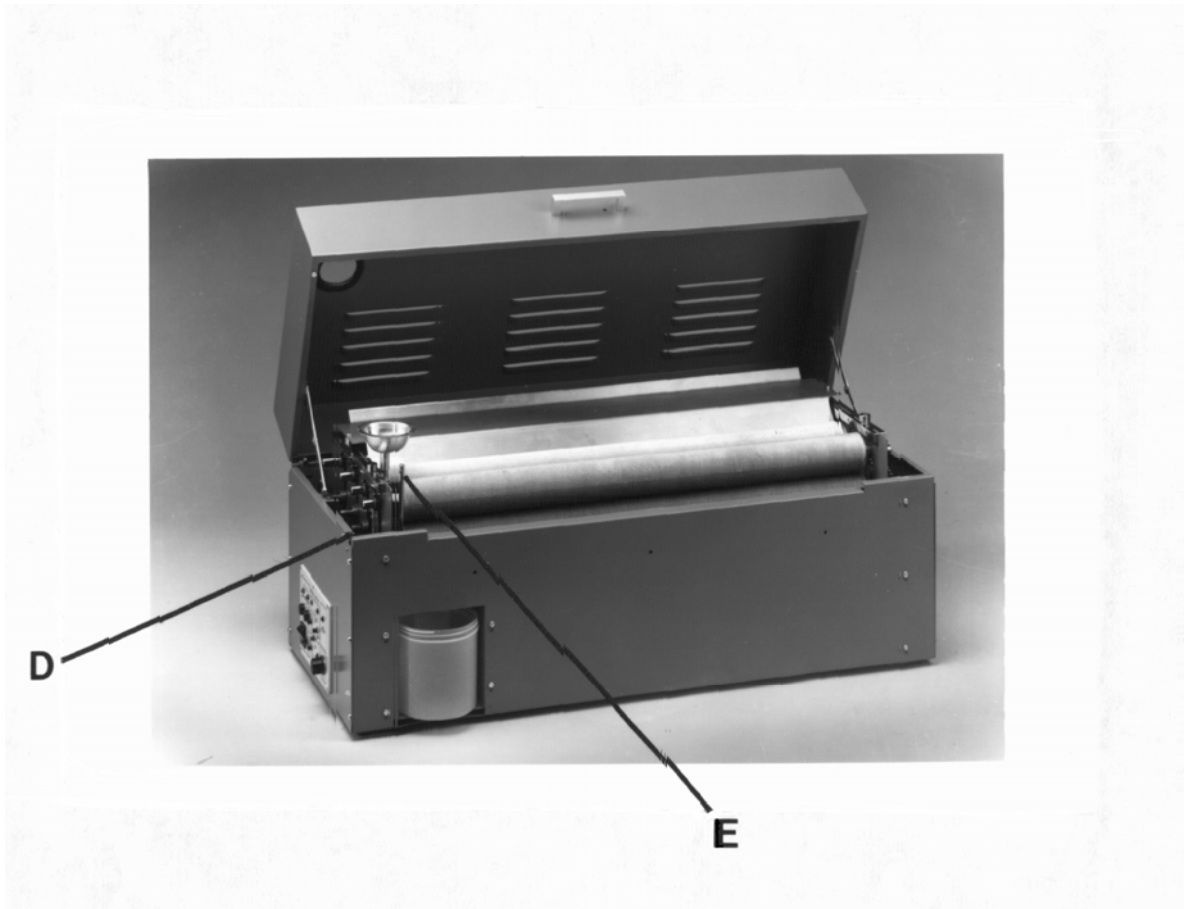
## FRONT PANEL CONTROLS

1. ON/OFF main switch: illuminated
2. Two heater Fuses @ 6.3 amps
3. HIGH/LOW wetting tank water indicators
4. Single 1,500 watt heater switch with indicator
5. Double 1,500 watt + 1,500 watt heater switch with indicator
6. Over-run timer switch to dry rollers after use
7. OFF switch for both heaters and over-run circuit
8. Motor speed control with indication ( motor only runs with heater operation )
9. Motor reset switch

### Note:

Single Heater Setting will give approximately surface temperature 80 – 90 Centigrade  
 Double Heater Setting will give approximately surface temperature 120 – 130 Centigrade

## USING THE MACHINE



The machine is simple to use, the motor speed ( 8 ) and heat settings ( 4 & 5 ) need to be selected relative to panel size, number of holes, amount of copper, etc. i.e.

Small PCBs with large holes - single heater setting and speed 2 – 3 Metres/Min.

Large PCBs with small holes - double heater setting and speed 1 – 2 Metres/Min.

Close attention should be made to the water level detection system via the LED indicators on the front panel ( 3 ) and when required top up with approximately 200 ml of water, 1/5 of water collection container ( B ). One hours use at double heat setting will use approximately 200 ml of water

After long and continuous use:

- The top lid and side panels will be very hot so care should be taken to avoid contact
- The rear cloth rollers may become damp after a long production run and on completion switch to the over-run circuit ( 6 ), the machine will operate at full motor speed with a single heater for approximately 10 minutes and then switch off, thus drying the rollers ready for the next run. Alternatively the lid can be raised to allow the rollers to dry.

It is advisable not to run the machine for any length of time without water in the front wetting tank or place circuit boards on top of the machine lid covering the louvered holes, these both have the effect of over-heating the machine.

# PROBLEM SOLVING

## 1. Motor will not rotate and the heater system will not work:

If mains switch is NOT illuminated then check the power supply (220/240 Volts) and the main input fuse at either the isolator or plug this should be 13 amps.

If mains switch is illuminated then check the overload at (9) and reset if necessary or check the safety switch on the lid (D) and ensure the closed lid contacts the switch.

## 2. Motor rotates either one heater or no heat:

Check the 6.3 amp fuse on front panel at (5)

## 3. Water level LED indicator ( 3 ) remains red:

Either the funnel or funnel support tube is contacting the machine body or water tank, reposition as per the setting up instructions

## 4. Water tank or rollers contaminated:

The wetting tank must be drained via extension plug (E) and if necessary remove wetting rollers from the machine and clean or with the rollers removed clean the tank especially in hard water areas.

## 5. Motor overload trips out at regular intervals:

At time to time dependant on use either the cloth roller bearings, rotating gears, or chain tension assembly may require light lubrication with light oil or grease. Access to the chain drive unit is gained by removal of the right end side panel, care is needed with lubrication so as to not contaminate the cloth rollers.

# FABRIC ROLLER SERVICE & MAINTENANCE

The special cloth covering and the synthetic rubber pads on the aluminium rollers may require replacement from time to time more frequently if heavy board brushing residue or hard water is experienced, a repair kit is available.

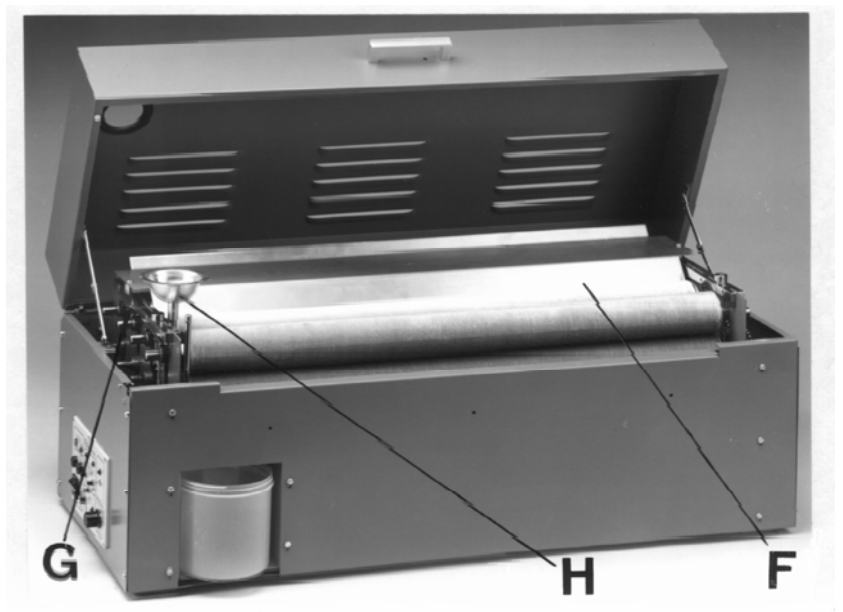
PART NO BD-0610-52 Board drying machine roller service kit, and consists of: -

- i) Eight cloth sleeves/tubes  
circumference 170 mm
- ii) Eight adhesive backed  
synthetic rubber pads
- iii) One Knife

Repairs can be done simply by following the instructions:

1. Remove the left and right spring assembly bars with the attached baffle plate (F) by slackening the eight socket screws at position (G)

2. Remove the top drying rollers with the bearings, and the bottom rollers with the gears and bearings. Remove the gears from the bottom rollers by the split pin, bearings can be removed from the steel end shafts on both sets of rollers, note the position of the thin spacer washers where fitted.



G

H

F

- 3.** Remove both end lock nuts and clamp washers, lift up both ends of the old cloth to remove special serrated clamp washer. At this point make a note of how the cloth at the ends are cut into " vees " under the clamp washer so to enable the cloth to lay flat, this is most useful on re-assembly.
- 4.** Cut off with the knife provided the old cloth, and where necessary remove the old rubber pads from the roller with a scrapper. (Application of hot air with say a hair dryer helps with removal and petrol or other solvents can help to remove the adhesive).
- 5.** To help with the fitting of the adhesive rubber pads, a straight pencil line can be drawn along the length of the roller, peel away approximately 25 mm of backing paper along the length of the rubber pad and stick along the pencil line. Lay the roller down on a flat surface on the edge of the rubber pad where fixed to the roller and as the backing paper is removed roll the roller to fix the rubber pad around the circumference. If the pad is too wide to fit then trim along the edge with scissors or sharp knife.
- 6.** The cloth tubes/sleeves need to be pulled over the rubber covered roller, (care should be taken at the starting end as not to roll the edge of the rubber pad away from the aluminium roller, this will cause a lump under the cloth at the end) excess cloth overlapping both ends need to be made equal lengths as when wet the cloth shrinks in both directions.
- 7.** Supported by the steel bearing ends and from the middle working outwards wet the cloth with water at approximately 40 – 50 degrees centigrade over all the cloth ensuring all parts are wet. Shrinkage will take place immediately and continue for approximately 30 minutes, further small shrinkage will take place until the cloth is dry. Natural drying is preferable but force drying can be done evenly to the cloth but a temperature not higher than 50 degrees must be maintained
- 8.** Only after the rollers are totally dry then trim the excess end lengths of cloth to within.16 mm overlap from the end of the aluminium and then cut about 6 " vees " in the overlap around the circumference as noted in previous section (3), this will allow the cloth at the ends to lay flat when clamped.
- 9.** Under the overlapped cloth place the serrated washer in the recess in the aluminium roller end, over the overlapped cloth place the clamp washer and then with the lock nut fix into place, before tightening the nut excess cloth can be forced behind the clamp washer by means of a thin blunt knife.
- 10.** A film of light grease or oil can be placed onto the inside of the impregnated oil bearing prior to assemble onto the roller bearing shaft, care must be taken at this point to ensure which rollers have the thin spacer washer and that no grease or oil contaminates the cloth. On the bottom set of rollers fix the chain sprocket with the split pin.
- 11.** At this point it may be worth inspecting the chain and the small gears for lubrication and a light oil may be necessary if the system looks dry.
- 12.** Re-assemble all the rollers back into the machine, checking that the bottom roller chain sprockets locate into the chain and the top rollers have free movement.
- 13.** Fix the spring bar assembly with the attached baffle plate (**F**) into its original position. (The lower front edge of the baffle plate should be 3 mm from the rear of the second top input roller), check all leaf springs are in contact with the oil bearings and still have 3mm movement upwards.
- 14.** Replace the water funnel (**H**) and close the lid checking that the funnel is contacting the rubber ring in the lid.



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