Title:

Soldering Using Air Vac, Set-up and Operation

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1.0 PURPOSE

1.1 This procedure defines the methods to set-up and operate the Air Vac Printed Circuit Board Reflow System Model PCBRM-10. This machine is used for removal / re-soldering of leaded components from / to PCBs.

2.0 SCOPE

2.1 This procedure applies to Air Vac PCBRM-10.

3.0 REFERENCES

3.1 Air Vac Printed Circuit Board Reflow System Model PCBRM-10 Operation Manual

3.2 MSDS for Bar Solder

3.3 MSDS for water soluble flux: Alpha 857

4.0 DEFINITIONS

4.1 PCB - Printed Circuit Board.

4.2 Solder Wave - Standing wave of solder created by the molten solder flowing through the flow well.

4.3 Flow Well - The nozzle through which the solder flows.

4.4 Cleaning Hood nozzle - Rubber hood used for blowing solder from component holes with low pressure compressed air

4.5 Solder Duration - The length of time solder flows in one cycle. This can be programmed or controlled manually.

5.0 RESPONSIBILITIES

5.1 Production operators will understand and follow this procedure.

5.2 Maintenance will provide technical support for the equipment.

5.3 Engineering will provide support as required by production and maintenance.

5.4 Production supervisor will train operators to this procedure and ensure that it is followed.

6.0 EQUIPMENT

6.1 Air Vac Printed Circuit Board Reflow System Model PCBRM-10, various Flow Wells and Cleaning Hoods.

6.2 Pliers, IC remover, and other component extractor tools.

6.3 Safety glasses

6.4 Dust mask

6.5 Heat resistant gloves

6.6 T-handle Allen wrenches

6.7 Metal spatula

6.8 Dross Can

7.0 MATERIALS

7.1 Disposable wipes or clean rags

7.2 Glass cleaner

7.3 Water soluble flux: Alpha 857

7.4 Bar Solder (Kester 63/37 Ultra pure)

8.0 RECORDS

8.1 N/A

9.0 PROCEDURE

9.1 Machine Set-up

9.1.1 Set the solder pot temperature on the digital display to 495^{o} F. Ensure the Process switch is set to Process and not Stand-by.

9.1.2 Set air pressure to 17 psi. This can be set to operator's preference.

9.1.3 Set Duration knob to 7. This setting determines how long the solder will flow while the unit is in Automatic mode. Most applications will use settings between 4 and 8. This can be set to operator's preference.

9.1.4 Set Flow Rate knob to 7. This setting adjusts the pumping speed and height of the solder wave through the flow well. Most applications will use settings between 4 and 8. This can be set to operator's preference.

9.1.5 Turn on the machine by switching the Main Power switches to right side. The RED light illuminates when power is on.

It is recommended to wait for the unit to come up to operating temperature (about 1 hour and half). When the hand in temperature gauge reached 495 F indicate the unit has reached operating temperature and may be operated.

9.1.6 Select and install the best Flow Well to the pump housing. Ensure the Flow Well is pushed all the way down.

9.1.7 Select and install the best fitting rubber Cleaning Hood nozzle to the PCB Hole Cleaning System Arm. The Hood must be positioned exactly over the Flow Well with faces of the Hood and Well parallel to one another.

9.2 Automatic Operation

9.2.1 Set the Timer switch to Auto to put the unit into Automatic mode. In this mode the flow of solder begins when the left foot switch is depressed or the Continuous switch activated. Solder will flow for up to 60 seconds; the duration is set by the Duration Control knob.

9.2.2 Flow of solder can be stopped by depressing the right foot switch or pressing the emergency stop.

9.3 Continuous Operation

9.3.1 Set Timer switch to Continuous to put the unit into Continuous Operation mode. In this mode the unit will start the flow of solder when the left foot switch is depressed or the Continuous switch activated and will stop only when the right side foot switch is depressed. Solder flow will not resume until the right side pedal is released. Continuous mode is operator controlled.

9.4 Component Removal From PCB

9.4.1 Safety - Be sure to wear safety glasses and if necessary heat resistant gloves.

9.4.2 When the unit is up to operating temperature, cycle the unit to preheat the Flow Well so that the solder does not solidify in the Well during the removal process.

9.4.3 Set Flow Rate Control to the setting that produces a level solder wave. Adjust Leveling Legs of the machine if the wave is not level.

9.4.4 Set the machine to Automatic or Continuous as described above. If Auto is selected, set Duration Control knob for the time desired.

9.4.5 Using the flux brush or dispensing bottle, flux the entire lead pattern. Position the component over the flow Well using the Hood as a locator. Secure the PCB with the Locking Screws on the X-Y-Z Carrier Arm.

9.4.6 With the PCB in the Carrier Arm, use the Carrier Height Adjustment Wheel to adjust to the proper height.

If desired, the machine can be used without the PCB Carrier Arm supporting the PCB. In this case, move the Carrier Arm out of the way and support the PCB manually; wear gloves and be careful.

9.4.7 Start the solder flow with the left Foot Switch or the Continuous Switch on the front panel.

9.4.8 Observe the component leads and when all the joints are molten. Lift the component from the PCB using an Extractor Tool that firmly grasps the component body. Sometimes the component must be lifted out manually without a special tool (e.g. edge connector); wear gloves and be careful.

If the solder is still flowing, interrupt the cycle by depressing the right Foot Switch.

The end of the solder flow is indicated by an audible signal. Do not attempt to remove the component after the signal. The PCB must remain rigid and horizontal during the removal process.

9.4.9 Turn on the fume hood if required.

9.5 PCB Hole Cleaning Procedure

9.5.1 The hole cleaning operation starts immediately at the end of the component removal procedure. Upon hearing the audible signal, lower the Hood to the surface of the PCB making a tight seal.

9.5.2 Low pressure air comes on automatically 1.5 seconds after solder stops flowing forcing the molten solder to drop from the holes into the empty Flow Well.

9.5.3 Use a vacuum desoldering tool if necessary to remove solder from trouble spots.

9.6 Soldering Replacement Component

9.6.1 After the holes have been cleaned, flux the leads of the replacement component and insert into the PCB. Flux the leads of the component on the bottom side of the board. Actuate the Cycle Switch to start the solder flow which will solder the component to the PCB.

9.6.2 Turn on the fume hood if required.

9.7 PCB Cleaning

9.7.1 After all desoldering and component replacement operations have been completed, wash the PCB assembly in the in-line cleaners according to MEP004.

9.8 Daily Maintenance

9.8.1 At the end of the shift, remove the Well and top plate from the solder pot. Turn on the fume hood. Scrape dross from the top of the solder pot with a spatula and discard the dross into a dross can.

9.8.2 Clean the workstation and machine with Glass cleaner and a clean rag or wipe.

9.9 Precautions

9.9.1 Solder contains lead, a poisonous element. Thoroughly wash hands before eating or smoking and after handling lead, components, or PCBs.

9.9.2 Molten solder is very hot! Be careful and be sure to wear eye protection at all times. Wear thermal protective gloves when necessary.