



DEN-ON INSTRUMENTS

RD SERIES BGA/SMT REWORK MACHINES FOR STABLE AND SAFE REWORK

Designed for Standard or Lead Free Solders, Large or Small Boards, Large or Small Components

RD-500II



RD-500SII

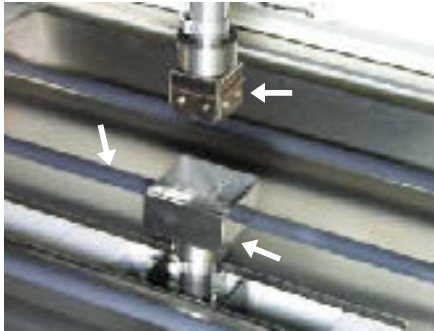


- High Performance 3 Point Heating System
Designed for Lead Free Rework
- IR Area Heater To Prevent PCB Warping
During the Heating Cycle
- 2 Mode Cooling System
- Complete PC Control With Auto-Profiling
- Security Lock-Out System
- 2 Point Profiling To Control Target Component Overheating
- Convenient Profile Inspection System
- 5 Thermocouple Input Capability
- Integrated Component Solder Paste
Preparation System
- Semi-Automatic Placement Control
- Extensive Safety Features

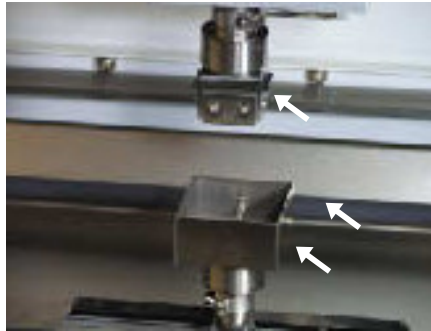
www.denondic.co.jp

■ High Performance 3 Point Heating System For Lead Free Rework

Both the RD-500II and the RD-500SII feature 700 watt upper and lower hot air heaters. By delivering hot air simultaneously from above and below, these units are able to evenly heat the component and solder connections. This results in much safer removal and placement heating profiles. In addition, the RD-500II comes standard with an IR area heater. The RD-500II area heater uses a series of 4 rod type heating elements. Each provides 400 watts of heating power for a combined 1600 watts. This is enough to heat the largest of PCBs evenly in order to prevent the PCB from warping while removing or replacing the component. The RD-500SII has an optional area heater with 2 rod type heaters for a total of 800 watts. This is sufficient for the board that is more common to this unit.



Upper Hot Air Heater (700W),
Lower Hot Air Heater(700W) and Area
Heater(1600W) of RD-500 II



Upper Hot Air Heater (700W),
Lower Hot Air Heater(700W) and Area
Heater(800W) of RD-500S II

■ 2 Point Cooling System

The RD-500II and RD-500SII machines cool the component by two means. The primary method is by turning the heaters off after the heating profile and blowing air through the heating element. The second method is with a cooling fan. After the heating cycle is complete, the heater head raises about 50 millimeters from the board and a fan that is pointed at the reflow point is turned on. Additional cooling such as this has shown to improve lead free solder connections. This second cooling can be turned on by choosing an odd number in the Reflow Time. It is turned off by choosing an even number in the Reflow Time.



■ Software and Set-Up Tabs



Operation - The Operation Tab is where the standard operator will access the profiles that have been developed by the engineer or technician.

Optics - The Optics Tab is where the operator or technician will deploy the Optics Arm. In this mode, the component is picked up from the Optics Arm and then aligned to the PCB.

Development - The Development Tab is where profiles are developed or modified.

Auto-Profile (2 Point) - The Auto-Profile Tab is a function that allows the technician or engineer to take a thermocoupled PCB, enter the desired soak and reflow times and temperatures, and then with the push of a button, easily develop a profile for the PCB and component. The 2 point function is also used to adjust the upper and lower hot air heaters to provide the best reflow conditions without overheating the target component.

Setup - The Setup Tab is where the basic functions of the machine are set. These include Security Password set up, Upper and Lower Indicator Lines, Standby Temperature for the Area Heater, and the Gross Placement Force.

Print/Review - The Print/Review Tab allows the user to pull up existing profiles and print them on a printer that is set up either directly or on a LAN network. A second profile can also be overlaid on the slide.

Inspection - The Inspection Tab allows the user to set up the conditions for their ideal or target profile. Then once the profile is developed, they can pull it up in this screen and compare it against these ideal conditions. It provides a quick check to see if any condition is not met anytime during the profile.

■ 2 Point Auto-Profile Function

The 2 Point Auto-Profile function allows the user to create a profile by monitoring the solder ball temperature for the solder melt conditions and by monitoring the top of the component in order to ensure the component does not overheat during the profile. The solder ball thermocouple is plugged into either Sensor Input 1, 2, or 3. The thermocouple on the top of the component is plugged into Sensor 5.

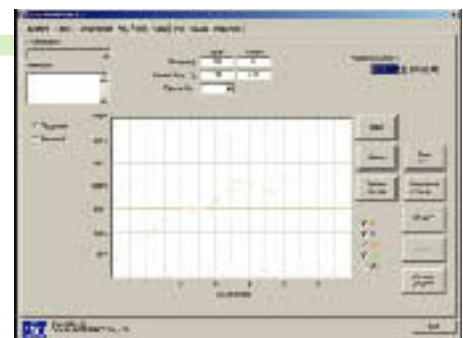
■ Step 1

Place the PCB in the board holder. Take the thermocouple that is attached to one of the solder balls and plug it into to either Sensor 1, 2, or 3. Take the thermocouple that is attached to the top of the component and plug it into Sensor 5



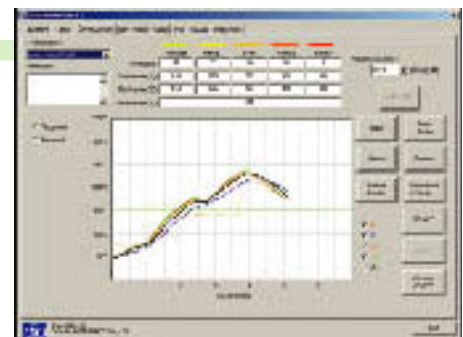
■ Step 2

In the Auto-Profile Tab, Set the desired Soak and Reflow Times and Temperatures. Also enter the nozzle size. This will also effect how the heat is applied to the component.



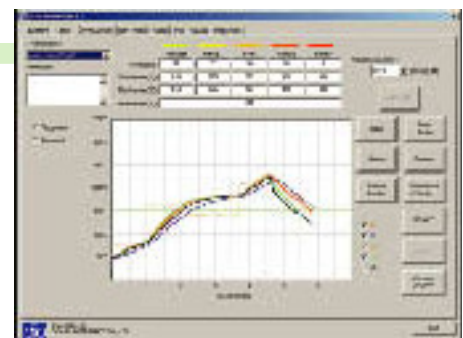
■ Step 3

During this test run, the Auto-Profile will take data about the board. On the graph there will be a slight overshoot and the Soak and Reflow times will be somewhat shortened. This is to save the user time. The data is then given a name and saved.



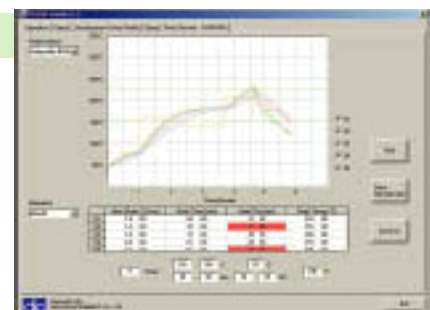
■ Step 4

The data that was saved is called up again in the Development Tab. The profile is run once more to confirm that the profile meets the desired conditions. Any of the times and temperatures can be changed in order to modify the outcome of the profile. But in most cases this is not necessary.



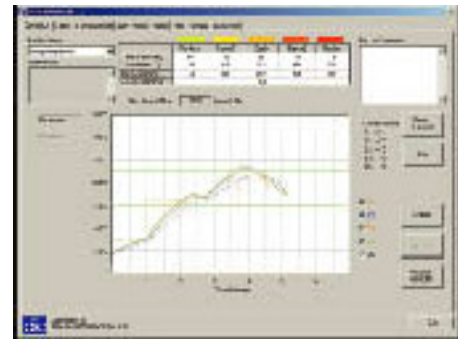
Convenient Inspection Function

Saved data can be easily pulled up from the Inspection Screen. In the Inspection Screen the User can create a standard by which to measure the saved data. The user will enter the desired Max Ramp Rate, the Soak Time and Temperature, the Reflow Peak Time and Temperature, and the absolute Peak Temperature. When the data of a profile is pulled up against this standard, then any variable that is not within the limits of the standard will be marked in Red.



Operation Screen Confirmation Capability

From the Operations Screen, the user is able to pull up the completed profile. The profile will be visible in the Graph Area so there will be no mistaking which profile has been chosen. For further confirmation, any instruction notes that were entered in the Instructions area will also be visible. These help the user to confirm that the data pulled up is the proper data for the component and PCB.

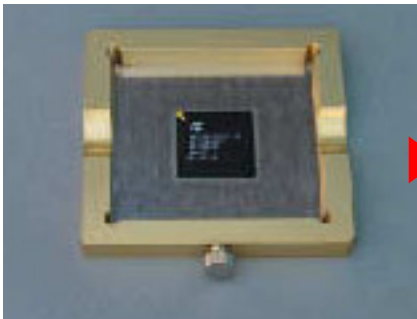


■ Component Preparation, Alignment and Placement

The RD-500II and the RD-500SII both come standard with the BP-500 Solder Paste Preparation kit (stencils are optional). The BP-500 allows the user to apply solder paste directly to the balls of the component. This component is then placed in the Optics Arm where it is picked from the BP-500 and is ready for alignment to the PCB. The Optics

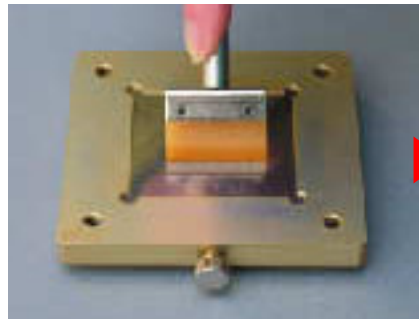
Arm and Alignment software then allow the user to Zoom, Focus (if auto-focus is disabled), and split screen for maximum easy in alignment and placement. Here are the basic steps.

Step 1



Place the component in the appropriate stencil.

Step 2



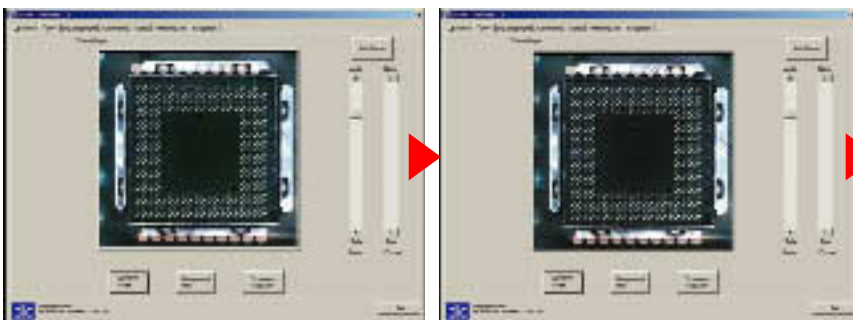
Apply solder or flux paste to the component.

Step 3



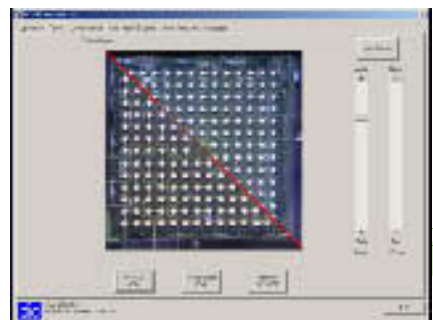
Deploy the Optics Arm and Place the BP-500 with the component against the stop of the Optics Arm.

Step 4



Using the table movement knobs, align the PCB to the component as necessary. If theta adjustment is required, it can be done via the Theta adjustment knob on the front of the heater head.

Step 5 Screen Split



For large components where the balls are difficult to distinguish, the screen split function will enlarge and split the view so that only two smaller corner sections can be viewed.

■ Safety Features

The RD-500II and the RD-500SII share the same set of unique safety features that make operating the machine simple and safe. These include:

Initialization Check – When the unit is initially powered up, the software will check all the major motion sensor and heating functions. If there is any problem such as an open heater sensor, the software will prevent the machine from operating until the problem is fixed and the error is cleared.

Airflow Sensor – There is an airflow sensor on the main input side of the unit that will prevent the machine from running if there is insufficient or no airflow into the machine. Also, if the air flow to the machine is stopped during the cycle it will stop the unit from functioning.

Heater Overload Sensor – Should either of the upper or lower air flow heaters see a condition where they are getting full power from more than 40 seconds, the unit will stop the cycle.

Thermo-protector Cutoff Switch – These are two heater cut off switches that are mechanically attached to heating elements. These cutoff switches act as breakers in a condition where the heaters become over heated. If they reach a certain temperature, then they will cut off the power to the heater. The only way that they will work again is if they are manually reset by pushing a button on the cutoff switch.

Heater Head Slip Clutch – The heater head moves up and down using a motor driven belt. This belt has a slip clutch on it so that if the motion is obstructed in anyway, the slip clutch will activate and prevent injury or damage to the board.

Low Strength Optics Arm – The optics arm is also deployed using a motor which drives a belt. The power that is used to deploy the arm is at such a low level that even the slightest obstruction will stop the deployment. However, once the obstruction is removed, the arm will continue its movement.

■ NOZZLES



Part #	Size In MM (Inside Dimension)
BNZ-07	7 X 7
BNZ-09	9 X 9
BNZ-13	13 X 13
BNZ-15	15 X 15
BNZ-18	18 X 18
BNZ-20	20 X 20
BNZ-22	22 X 22
BNZ-24	24 X 24
BNZ-26	26 X 26

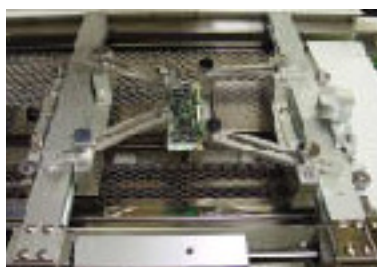
Nozzle without Adjustable Walls for BNZ-07 to BNZ-15



Part #	Size In MM (Inside Dimension)
BNZ-28	28 X 28
BNZ-30	30 X 30
BNZ-32	32 X 32
BNZ-35	35 X 35
BNZ-37	37 X 37
BNZ-39	39 X 39
BNZ-44	44 X 44
BNZ-49	49 X 49
BNZ-52	52 X 52

Nozzle with Adjustable Walls for BNZ-18 to BNZ-52

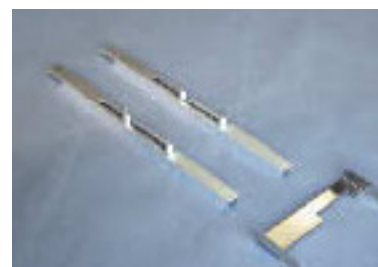
■ OPTIONS



Odd size/shape PCB Holder



Multi Parts Holder



Board Support Bracket



RD-500SII Area Heater



Stencils



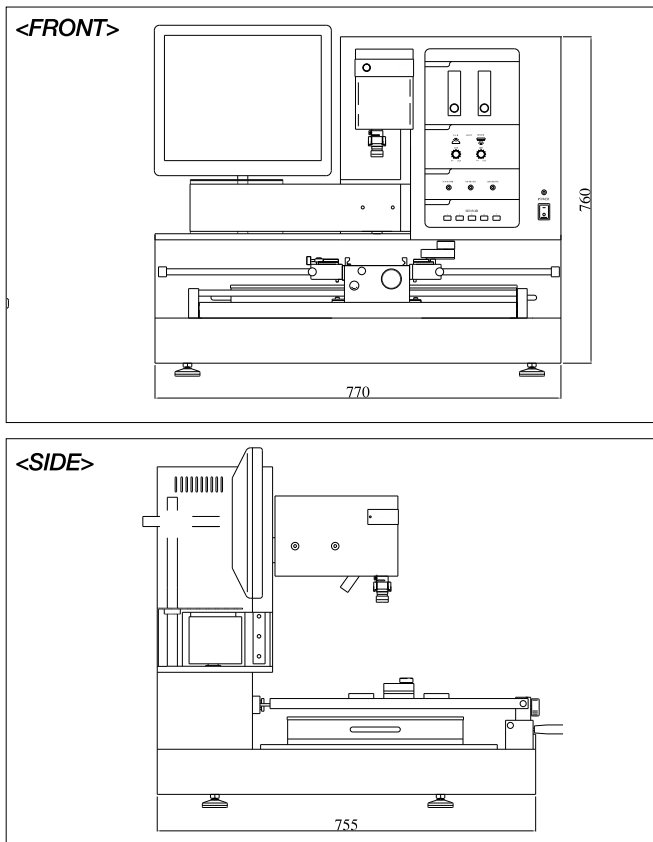
Table with Drawer,
Wheels and Adjustable Leveling Feet

Standard Accessories

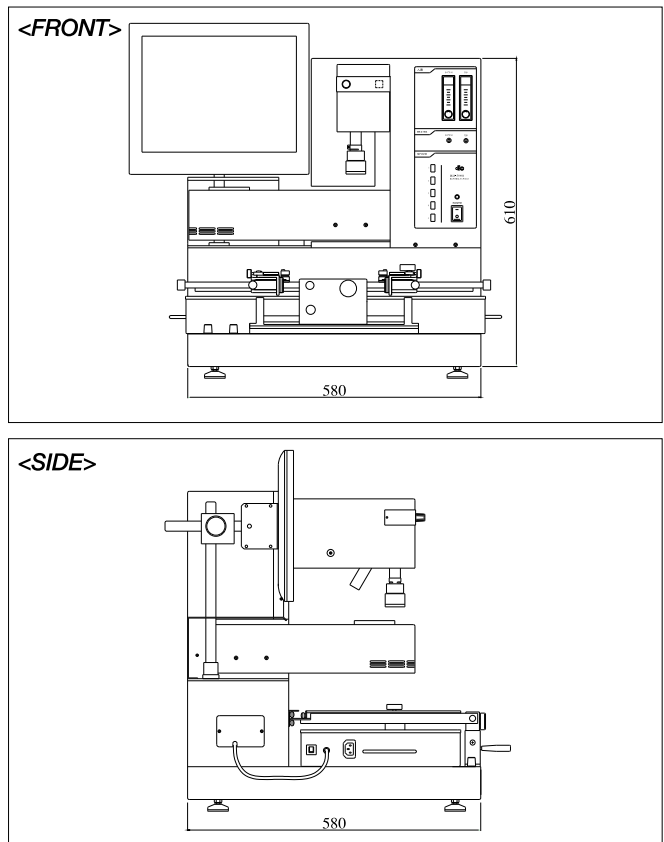
- PC with Video Card
- Flat Panel Display
- Regulator
- Small Board Holder for Small Size PCB
- Board Support Bracket (Optional for RD-500SII)
- Top Heater Nozzle (Selectable from 18 kinds)
- Bottom Heater Nozzle 2 each
- Vacuum Pad, Medium and Large 3 each
- K-Type Thermocouples 5 each
- Stenciling Kit BP-500(less Stencil)
- Squeegee

Overviews and Specifications

RD-500II



RD-500SII



RD-500II	Specifications	RD-500SII
500mm x 600mm	Maximum PCB Size	400mm x 420mm
2mm - 50mm	Device Size Range	2mm - 50mm
+/- 0.025mm	Placement Accuracy	+/- 0.025mm
700 Watt Hot Air	Upper Hot Air Heater	700 Watt Hot Air
700 Watt Hot Air	Lower Hot Air Heater	700 Watt Hot Air
400 W × 4 (IR) 1600 Watt Total	Area Heater	400 W x 2 (IR) 800 Watt Total ※Optional
100 ~ 500°C	Temperature Setting Range Upper & Lower Hot Air Heater	100 ~ 500°C
0 ~ 500°C	Temperature Setting Range Area Heater	0 ~ 500°C
Windows	PC Operating System	Windows
15 Inch Flat Panel	Monitor Size	15 Inch Flat Panel
770W x 755D x 760H	Overall Size Less PC	580W x 580D x 610H
Approximately 78kgs	Overall Weight	Approximately 50kg
60 L/min 1-10kgf/cm ² (0.1 - 1.0MPa)	Air Requirements	60L/min 1-10kgf/cm ² (0.1 - 1.0MPa)
AC100-120V or AC200-230V 3.0kw	Electrical Requirements	AC100-120V or AC200-230V 2.2kw (1.4kw for Main Body, 800w for Area Heater)

DEN-ON INSTRUMENTS CO., LTD.

1-26-10 Sekimachi-Higashi Nerima-ku, Tokyo 177-0052 JAPAN
 TEL:81(Japan)-3-3929-6000 FAX:81(Japan)-3-3929-7441
<http://www.denondic.co.jp>