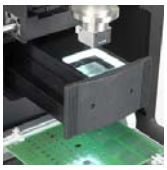
OK INTERNATIONAL™

Precision Systems for the Electronics Bench

APR-5000XL and APR-5000XLS Users Guide



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Preface

Safety And Regulatory Information

WARNING

- TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE SYSTEM TO MOISTURE.

- TO PREVENT FIRE OR SHOCK HAZARD, DO NOT USE FLAMMABLE SOLVENTS NEAR OR ON THE SYSTEM WHILE CONNECTED TO POWER SOURCE.

- TO PREVENT POSSIBILITY OF INJURY OR DAMAGE TO THE SYSTEM, DO NOT OPERATE WITH ANY COVERS OR PANELS REMOVED.

- CHANGES OR MODIFICATIONS MADE TO THIS PRODUCT WITHOUT EXPRESS APPROVAL FROM OK INTERNATIONAL COULD VOID THE USERS AUTHORITY TO OPERATE THE EQUIPMENT.

- Read and understand the entire User's Manual before installation or operation of the APR-5000-XL/XLS. Heed all warnings on the system and in the operating instructions.

  Vor Installation oder Inbetriebnahme des APR-5000 muss die gesamte Bedienungsanleitung gelesen und verstanden worden sein. Beachten Sie alle Warnhinweise am System selbst, sowie die Sicherheitshinweise in diesem Handbuch.

- Use of the APR-5000-XL/XLS is intended only for the removal and placement of electronic components on to printed circuit boards by properly trained personnel. If you are not familiar with the proper and safe operation of the APR-5000-XL/XLS, do not operate until proper training has been obtained.

  Das APR-5000 darf nur zum Entlöten und Platzieren elektronischer Komponenten auf Leiterplatten durch entsprechend geschultes Personal eingesetzt werden. Wenn Sie mit dem ordnungsgemäßen und sicheren Betrieb des Systems nicht vertraut sind, sollten Sie zunächst in die Funktionen eingewiesen worden sein.

- Unit should be operated only from the type of power source indicated on the serial number label.

  Schließen Sie das Gerät nur an die Stromversorgung an, die auf dem Typenschild angegeben ist.

- Use only the supplied power cords. Avoid damage to the power cord. If damage should occur, replace it with the approved OK International replacement power cord.

Verwenden Sie nur die zum Lieferumfang gehörenden Netzkabel, und achten Sie darauf, dass Sie diese nicht beschädigen. Ersetzen Sie beschädigte Kabel durch Originalkabel des Lieferanten.

This CAUTION symbol on the equipment refers the user to the User's Manual for additional information. This symbol appears next to the relevant information in the manual.

Das Symbol "Caution" (Vorsicht) am Gerät verweist auf weitere Informationen im Handbuch. Dieses Symbol erscheint neben den entsprechenden Hinweisen in der Bedienungsanleitung.

This HOT symbol on the equipment warns the user of a hot surface and potential injury if touched. Please refer to the User's Manual for additional information. This symbol appears next to the relevant information in the manual.

Das Symbol "Hot" (Heiß) am Gerät warnt vor heißen Oberflächen und möglichen Personenverletzungen. Weitere Informationen finden Sie in der Bedienungsanleitung, in der die Hinweise entsprechend gekennzeichnet sind.

This HEAVY LIFTING symbol on the packaging warns the user to team lift the APR-5000-XL/XLS during removal from packaging and installation on the workbench. Please refer to the User's Manual for additional information. This symbol appears next to the relevant information in the manual.

Mit dem Symbol "Heavy lifting" (schwer) auf der Verpackung wird der Bediener darauf aufmerksam gemacht, dass das Gerät nur von mehreren Personen aus der Verpackung genommen und an dem Arbeitsplatz installiert werden sollte. Weitere Informationen finden Sie in der Bedienungsanleitung, in der die Hinweise entsprechend gekennzeichnet sind.

Other Safety Tips

- Unplug the unit before cleaning. Clean the exterior of the system with a damp cloth. Do not use solvent-based cleaners.

WARNING: When there is no power to the APR, the reflow head will slowly descend to the down position from its “home position”. This may result in the head assembly coming in contact with the work piece. To avoid potential damage to the workpiece it is highly recommended it be removed before removing power from the APR. Users may also consider the use of an Uninterruptible Power Supply (UPS) in areas where unplanned power outages occur.

- Slots and openings in the system provided for ventilation and to ensure reliable operation and protection from overheating. The openings should never be blocked or covered.

- Do not overload power outlets and extension cords. This can result in a risk of fire or electric shock.

Safety and EMC Information

Declaration of Conformity

TUV Certified

89/336/EEC
EN61326-1: 1997
EN 55011/CISPR 11:1998
FCC CFR Part 15 Subpart B

EMC Standards
Europe

North America

Federal Communications Commission

This equipment has been tested and found to comply with the limits for Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in an industrial installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the system off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio / TV technician for help.

Specifications

Input Voltage	200-240 VAC, 50/60 Hz
Power Consumption	20 AMP, single phase
System Total	3700 W
Pre-Heater (Large Configuration)	2800 W
Pre-Heater (Small Configuration)	1400 W
Reflow Head	550 W
Circuit Breaker	
Pre-Heater	15 AMP
Base	15 AMP
Temperature Control Type	Closed-Loop Control (RTD Sensors)
Maximum Source Temperature	
Reflow Head	400°C (842°F)
Large Pre-Heater source temp	350°c (662°F)
Small Preheater source temp	350°c (662°F)
Airflow	
Control	Preset to 8, 16 & 24 l/min
Supply	Self contained pump
Optional Nitrogen Input	Standard Feature
Nitrogen Operating Spec	Not to exceed 65 PSI(4.7 BAR)
Component Handling	
Maximum Size	55mm x 55mm (2.2" x 2.2")
Minimum Size	1.0mm x 1.0 mm (0.040” x 0.040”)
Maximum Weight	55 g (0.92 oz)
PCB Handling Capability	
Maximum Size	622mm x 622mm (24.5” x 24.5”)
Maximum Thickness	6.0mm (0.240”)
Vision	
Maximum Field of View	55mm x 55mm (2.2” x 2.2”)
Maximum Magnification	10-55X
System Dimensions (Estimate)	
W x D x H	914mm x 914mm x 711mm (36” x 36” x 36”)
Weight	100Kg (220lbs)

Warranty	One-year parts & labor 90 days heaters & lamps

System Part Numbers

Part Number	Item Description
APR-5000-XL	XL Array Package Rework Sys with Standard Vision
APR-5000-XLS	XL Array Package Rework Sys with Split Vision
APR-M17*	APR Monitor, 17" Flat Panel
APR-CNTRL-EN*	APR-Controller, English Version
APR-CNTRL-SP*	APR-Controller, Spanish Version
APR-CNTRL-JP*	APR-Controller, Japanese Version
APR-CNTRL-TC*	APR-Controller, Traditional Chinese Version
APR-CNTRL-SC*	APR-Controller, Simplified Chinese Version
APR-CNTRL-KR*	APR-Controller, Korean Version
APR-CNTRL-FR*	APR-Controller, French Version
APR-CNTRL-GR*	APR-Controller, German Version

* Required for APR-5000-XL and APR-5000-XLS system.

Environmental Conditions (all models)

- Suitable for indoor use only at altitudes not exceeding 6500 ft (2km)
- All systems must be grounded
- Maximum relative humidity of 80% at 88°F (31°C) decreasing linearly to 50% at 104°F (40°C)
- Temperature range of 41°F (5°C) to 104°F (40°C)
- Mains supply voltage fluctuations not to exceed ±10% of 210 VAC
- Pollution degree 2 per IEC 644
- Insulation category II

Vision System

The APR-5000-XLS system provide split field image system to allow corner crossover on large components a maximum four-sided view of 55mm x 55mm (2.2” x 2.2”). The camera magnification has a range of 10X to 55X optical zoom.

Shipping Data

Size	48" W x 48"D x 48" H
Weight	340 lbs. (154 KG.)

1. Introduction and General Overview

Thank you for your purchase of a OK International APR-5000-XL/XLS Array Package Rework System. Each unit has been inspected thoroughly by OK International prior to shipment, and with proper maintenance will give you years of reliable performance.

This Operator's Instruction Manual is a valuable resource. It explains the systems options, features, specifications and the basic operation of your APR-5000-XL/XLS Array Package Rework System. This manual is intended as a guide to the operation of the software. The software itself provides users prompts and, along with training, will guide the operator in use. If any problems should occur during setup or operation of your system, contact OK International's Technical Support Department at experts@okinternational.com or refer to section XVII of this manual for the nearest local OK International Representative.

This OK Internatioal APR-5000-XL/XLS Array Package Rework System provides both accurate component placement and specifically tailored reflow profiles (through OK International's patented single component Micro Oven™) in one user friendly, single platform rework system.

The challenges of Array Package Rework, and the inability to easily inspect placement accuracy (with BGAs in particular), call for a solution that allows for simultaneous viewing of PC board pads and component pads or balls for accurate placement. The APR-5000-XL/XLS fills this need with quick, accurate placement through the use of an optical system employing dual image overlay technology. The image of the BGA solder balls is overlaid with that of the PC board pattern. The image is viewed on the computer monitor then the motorized fine adjustment permits fine X, Y, Z and theta adjustment at up to 50X magnification. Finally, the part is placed and the vacuum is released automatically.

After accurate component placement is achieved, the vacuum pickup tube is automatically retracted and the reflow nozzle is lowered into place. At this point, the component is subjected to a five zone, full convection reflow profile, specifically tailored to the requirements of that particular PCB, device and solder paste. Accurate duplication of original oven reflow parameters is achieved.

During the course of the reflow profile, source temperatures and time intervals can be modified "On the Fly", eliminating the need to wait for the current pro\file to terminate before modifications can be made. Precise solder joint temperatures are measured and displayed on a real time graphical display, thus providing the necessary data to accurately and easily establish the optimum reflow profile for each particular application within minutes.

When operating this equipment, please exercise caution. If this unit is used in a manner, which it is not intended for, serious personal injury may occur. Please read this operators manual thoroughly prior to use.

Seien Sie während des Betriebs des Gerätes vorsichtig. Wird das System für einen anderen Verwendungszweck eingesetzt, kann es zu ernsthaften Personenschäden kommen. Lesen Sie diese Bedienungsanleitung vor der Inbetriebnahme sorgfältig.

The main power cord is a means for disconnecting the APR-5000-XL/XLS from an operating energy source. Equipment must not be positioned in a way that impedes the disconnection of the main power cord in case of an emergency.

Für den Anwender ist die Benutzung eines Erdungsbandes während der Bedienung der APR-5000 XL/XLS zwingend erforderlich.

Mandatory use of a grounding strap is required when operating the APR-5000 XL/XLS.

Für den Anwender ist die Benutzung eines Erdungsbandes während der Bedienung der APR-5000 XL/XLS zwingend erforderlich.

2. System Features and Accessories

APR-5000-XL/XLS ARRAY PACKAGE REOWRK SYSTEM INCLUDES:

1. APR-5000-XL/XLS Series Base Unit
2. Adjustable size board holder
3. APR-5000-XL/XLS Accessory Kit (APR-5XLAK)

APR-5XLAK ACCESSORY KIT INCLUDES:

Lid Storage Organizer 18 1/4 x 13 3/8 x 3 5/8	1
MPVB, Adj. "V" Block for BGA Components	1
Optical Calibration Kit	1
Tape, Kapton	1
Handle, Squeegee	1
CSP-VB, Adj. "V" Block for CSP Components	1
Fine gauge multi-colored thermocouples (5incl.)	1
Wrench, hex key, T-handle, 9/64, 6" blade	1
Wrench, hex key, T-handle, 7/64, 6" blade	1
Screwdriver, slotted, 3/16" width,7"blade	1
Screwdriver, Phillips, #2,7 13/16" long	1
Ball end hex key set	1
Cable, EGA/CGA ser. Monitor ext., db9f/db9m, 6 ft.	1
Cable, video w/ RCA, 2 meter, low loss	1
Nozzle removal pad	1
APR-5XLAK contents checklist	1
O-Ring Kit	1
Vacuum nozzle removal pad	1
PCB spring finger long (pack 2)	2
PCB spring finger short (pack 2)	2
Kit, solder paste/flux prep plate	1
APR Vacuum pick up nozzle 1mm O/D	1
APR Vacuum pick up nozzle 3mm O/D	1
APR Vacuum pick up nozzle 5mm O/D	1
APR Vacuum pick up nozzle 8mm O/D	1
APR Vacuum pick up nozzle 12mm O/D	1
APR Vacuum pick up nozzle 19mm O/D	1

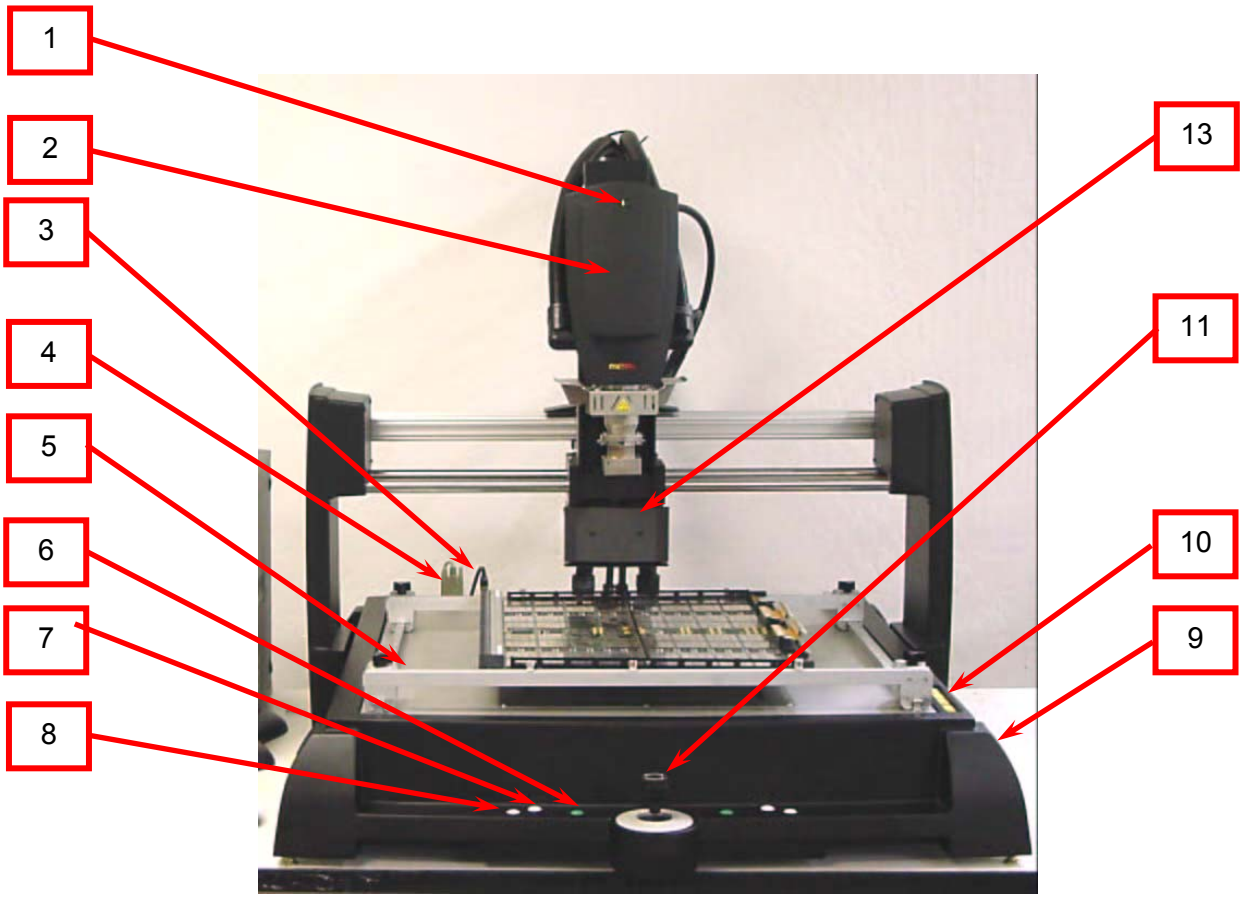


Figure 1

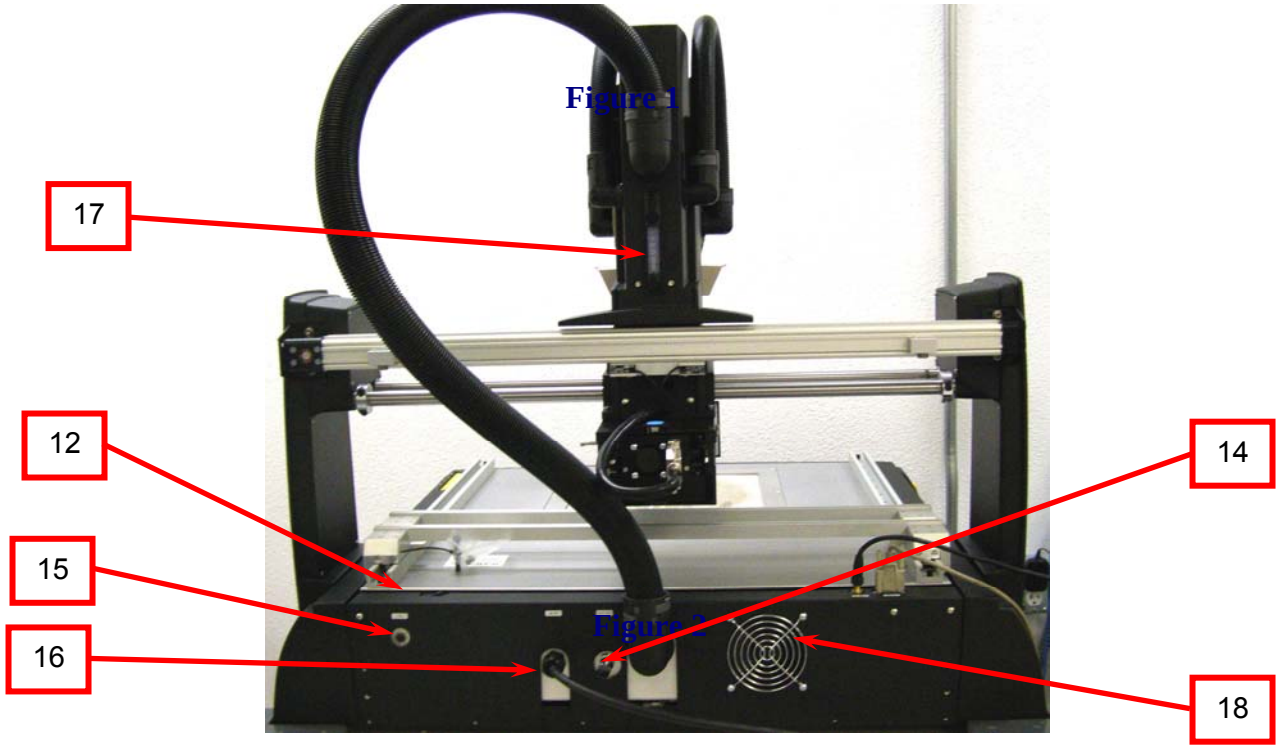


Figure 2

Main Unit Components (Figure 1 and Figure 2)

1. LED Power Indicator
2. Reflow Head
3. Composite video output
4. Computer RS232 cable input
5. Open Frame adjustable printed circuit board holder
6. Next Button (Enter)
7. Reflow Head Up Action Button (2 button operation 1 on each side of casting)
8. Reflow Head Down Action Button (2 button operation 1 on each side of casting)
9. X & Y Axis Enable Button (2 button operation 1 on each side of casting)
10. Type K thermocouple inputs (5)
11. X, Y & Theta Adjustment Control
12. Main Power Switch
13. Camera & Lighting assembly
14. Nitrogen input
15. Circuit breaker
16. Main power cord
17. Flow meter head
18. Cooling fan

3. Set-Up Procedures

The main unit is very heavy. Please uncrate the unit with 2 people.

DO NOT LIFT THE MAIN UNIT BY THE PCBA BOARD HOLDER RAILS.

LIFTING BY THE RAILS WILL DAMAGE THEM!

Das Basisgerät ist sehr schwer. Bitte nur mit 2 Personen auspacken.

HEBEN SIE DAS HAUPTGERÄT NICHT AN DEN SCHIENEN AN.
UB ESCHÄDIGUNGEN ZU VERMEIDEN!

APR-5000-XL/XLS Main System

Prior to performing initial set-up, unpack all accessories from their shipping containers. Ensure that your APR-5000-XL has arrived complete by verifying that all of the accessories listed in Section II of this manual have been included. After all components are located, setup can then begin.

- Remove the APR-5000-XL Main Unit and all accessories from their shipping containers.

When setting up this equipment, be sure to arrange it in a position that allows the user to operate this machine in a comfortable, well-spaced environment.

IMPORTANT: Every APR-5000-XL Rework System has been factory assembled and calibrated. Recalibration is not necessary after initial setup. However verifying Airflow, Calibration and product functionality is strongly recommended prior to initial use. This procedure is thoroughly discussed later in the manual in the section titled “Calibration.”

Controller and Software Setup

System Requirements

To run the APR-5000-XL/XLS you will need the following:

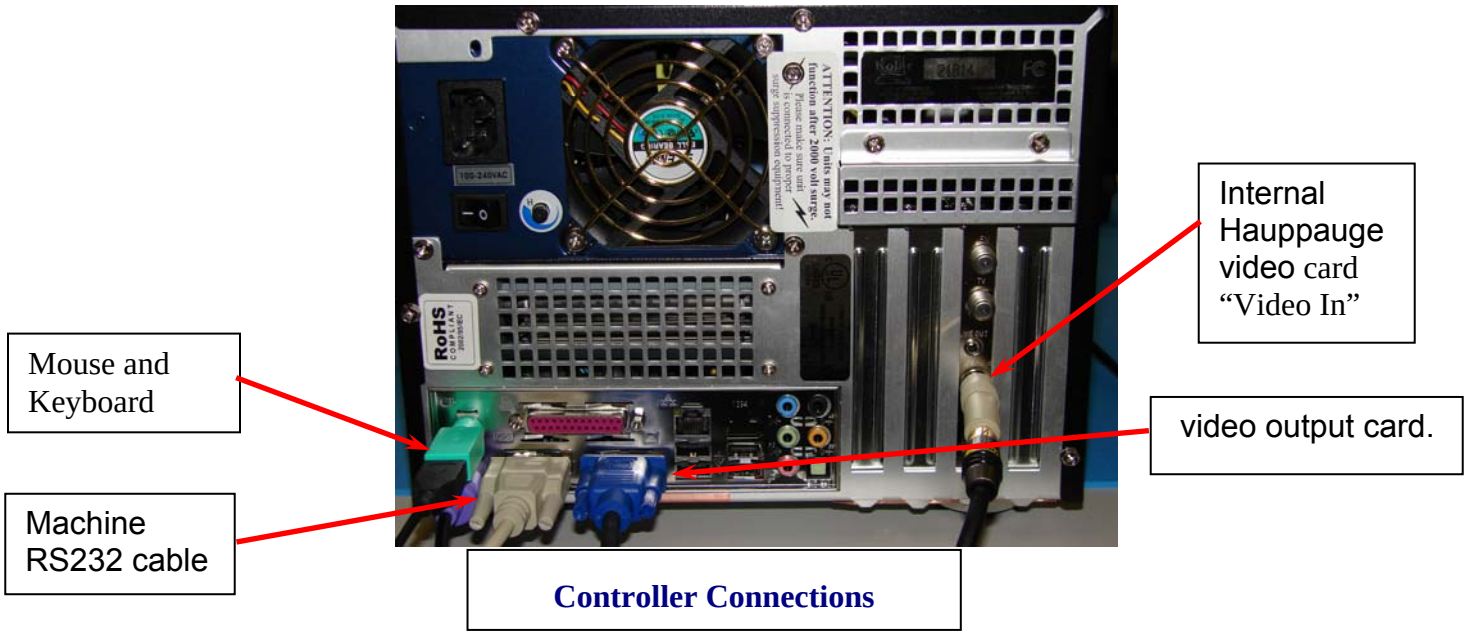
- PC with Pentium III processor (600 MHz or higher recommended)
- 128 MB of (RAM) memory
- 3.5” floppy disk drive
- Hard disk drive with at least 20 Megabytes of free space
- CD-ROM
- 32MB, 4X AGP video card or equivalent
- 17” Monitor (28dpi) 1280 x 1024 optimal resolution *
- Windows® 98, 2000 or Windows® NT operating system
- Internal Hauppauge

* Note – To optimize screen use and vision, resolution must be set at 1280 x 1024.

Computer Set-up

1. Unpack the controller and all its accessories.
2. Using the documentation supplied by the Controller Manufacturer make all the necessary connections.
3. Connect the controller to the APR-5000-XL utilizing the supplied RS-232 cable.
4. Connect the video output from the APR to the video input on the controller utilizing the supplied RCA video cable and S-Video adaptor.
5. When powering the system please use the following startup sequence:
    i. Power on APR
    ii. Power on the Controller
    iii. Initialize the APR Software
6. When powering down the system
    i. Close the APR Software
    ii. Power down the APR
    iii. Power down the Controller
7. This controller is for APR operation ONLY and is not meant to be a network computer. Even though it will operate on a network it is not recommended.
8. This controller MUST NOT be locked while APR software is in use as this will shut down the I/O and causes the controller to lose connection with the APR which may cause damage to your product and or the APR machine.
9. NEVER turn on the screen saver or power management options as this may cause a loss in connection between the controller and the APR machine.

NOTE: If you receive a communication error at anytime; reboot the computer and the APR and reinitialize the startup sequence.



Controller Connections

Final Power-up Sequence

Attach an appropriate power plug to the stripped end of the power cord.

Use recommended power plugs:

- Nema 6-20
- Nema L6-20
- IEC 60309

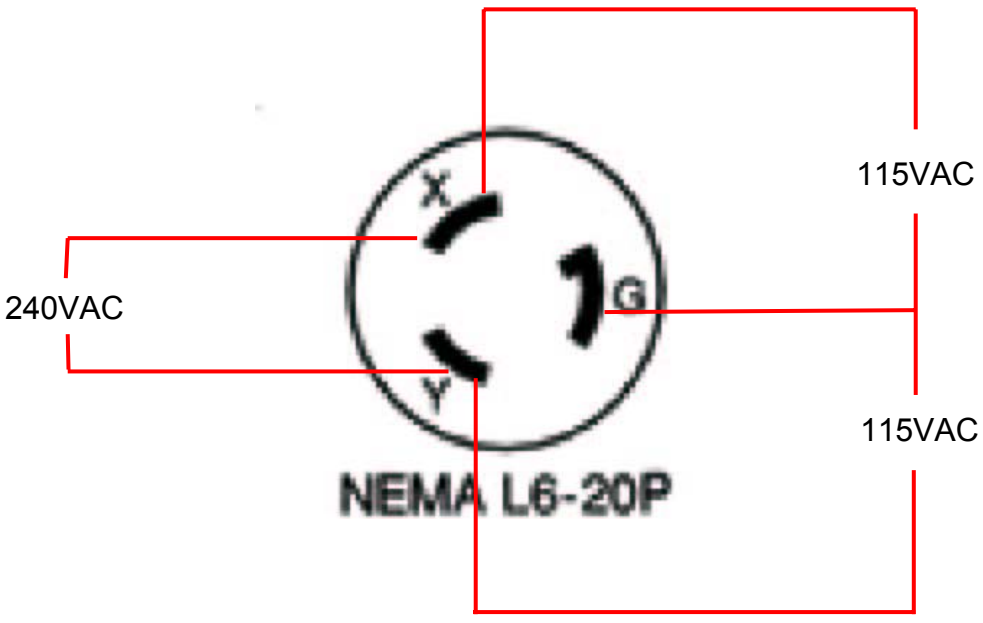
Use the following diagrams together with the manufacturer's recommended procedure for hooking up wires to a power plug:

IMPORTANT

Before connecting the machine to power you will need to determine the voltage at the wall socket. Use a basic AC voltmeter to do this task. Below are three different diagrams showing some basic wire configurations for the US. These are not necessarily showing what configuration you will see. Please have a qualified electrician wire in the machine.

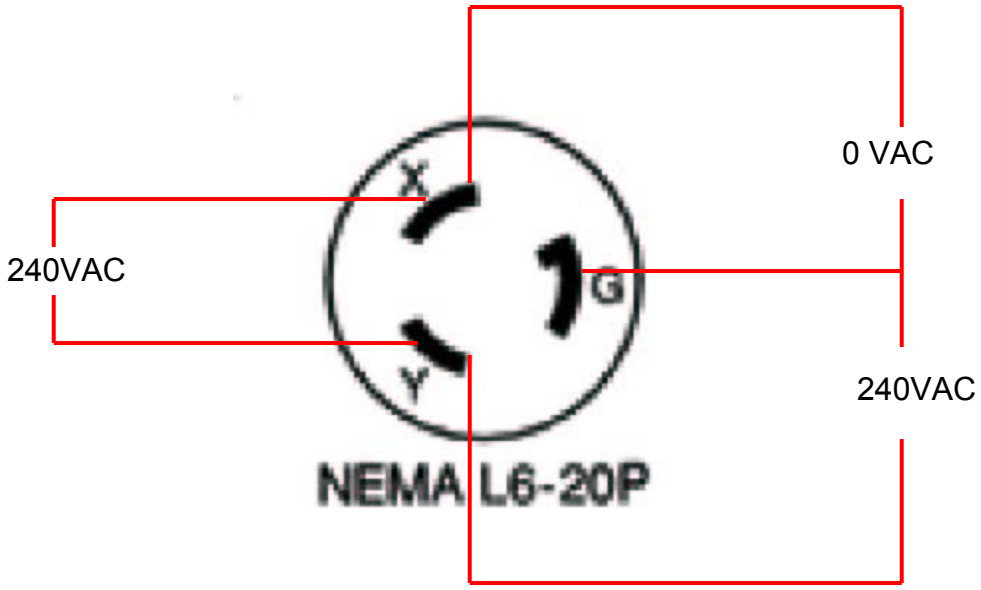
Configuration 1

1. Measure from X to Y. This measurement should always be 208VAC to 240VAC
2. Measure from G to X. This measurement will be 110VAC-125VAC
3. Measure from G to Y. This measurement will be 110VAC-125VAC



Configuration 2

1. Measure from X to Y. This measurement should always be 208VAC to 240VAC
2. Measure from G to X. This measurement will be 0 VAC
3. Measure from G to Y. This measurement will be 208VAC-240VAC



1. Set the APR-5000-XL Main power switch to the “on” position.
2. Turn on controller
3. On the “desktop” Double click the Oki icon.

Your APR-5000-XL Series Rework System is now ready for operation!

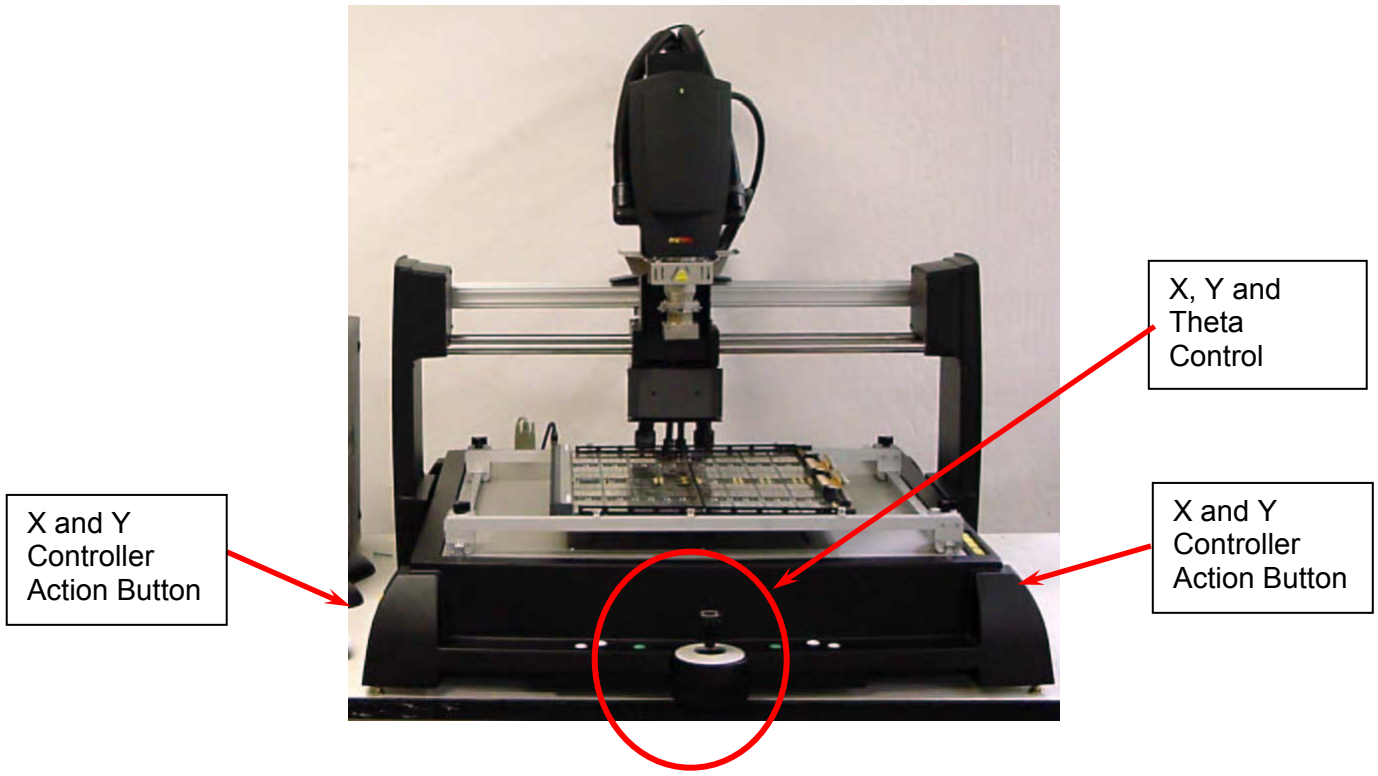
Using the Main X, Y & Theta Controller

All Reflow Head movement is driven and controlled by the base action buttons and control stick. Proper understanding of the Reflow Head movement is necessary. It is recommended that the end user become familiar with the X, Y and Theta controller to optimize use and avoid any movement errors that may occur during a standard process run.

CAUTION

The X, Y & Theta controller is not dependant on the software and is operational when the APR-500-XL base is powered up.

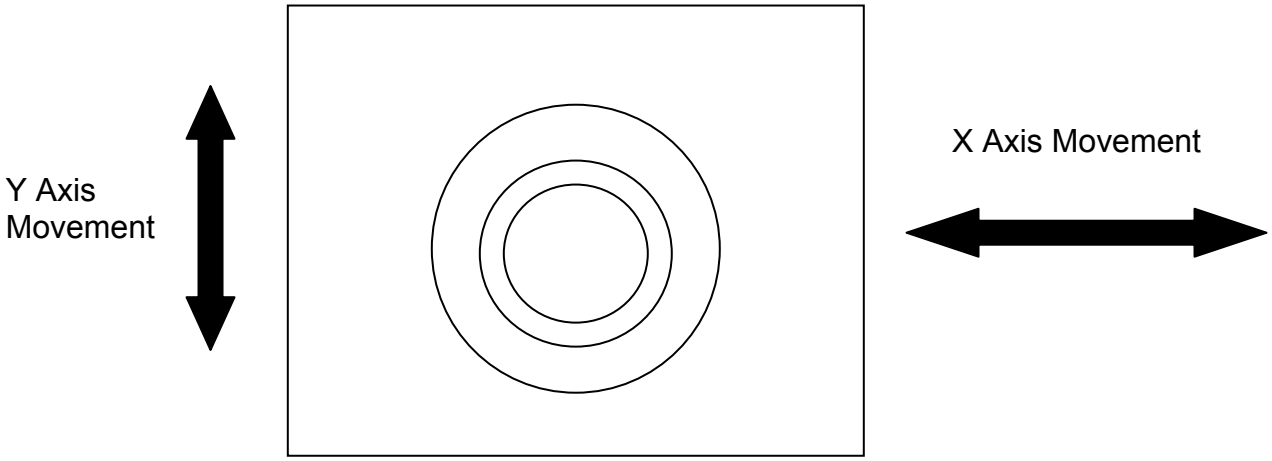
Die X, Y & Theta Steuereinheit ist nicht von der Software abhängig und ist betriebsbereit sobald das APR-5000-XL Basisgerät eingeschaltet ist.



X or Y Axis Head Movement

Depress the yellow Enable button on either side and point the controller in the direction you want the reflow head to go. You need only press one of the two controller Enable buttons. These are located on either side of the APR-5000-XL casting and allow for ambidextrous use. The movement of the head is proportional in direction and pressure. This allows for diagonal movement at any grade and speed.

NOTE: Theta movement is disabled when the yellow enable button is depressed

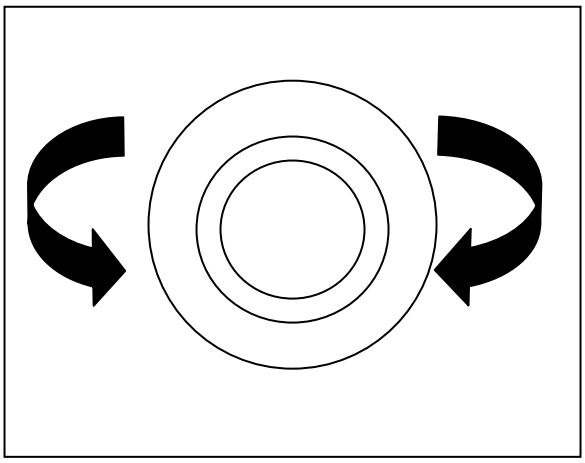


Controller Top View

Fine Theta Adjustment

Fine Theta adjustment is done when the yellow Enable button on either side are NOT depressed. This allows for fine movement with minimal touch. Simply turn the top of the controller in the direction you need the reflow head vacuum tube to turn.

Controller Top View



4. Software Operation

Once your system has been setup and your software has been installed you must follow this sequence for everyday operation of your APR-5000-XL system.

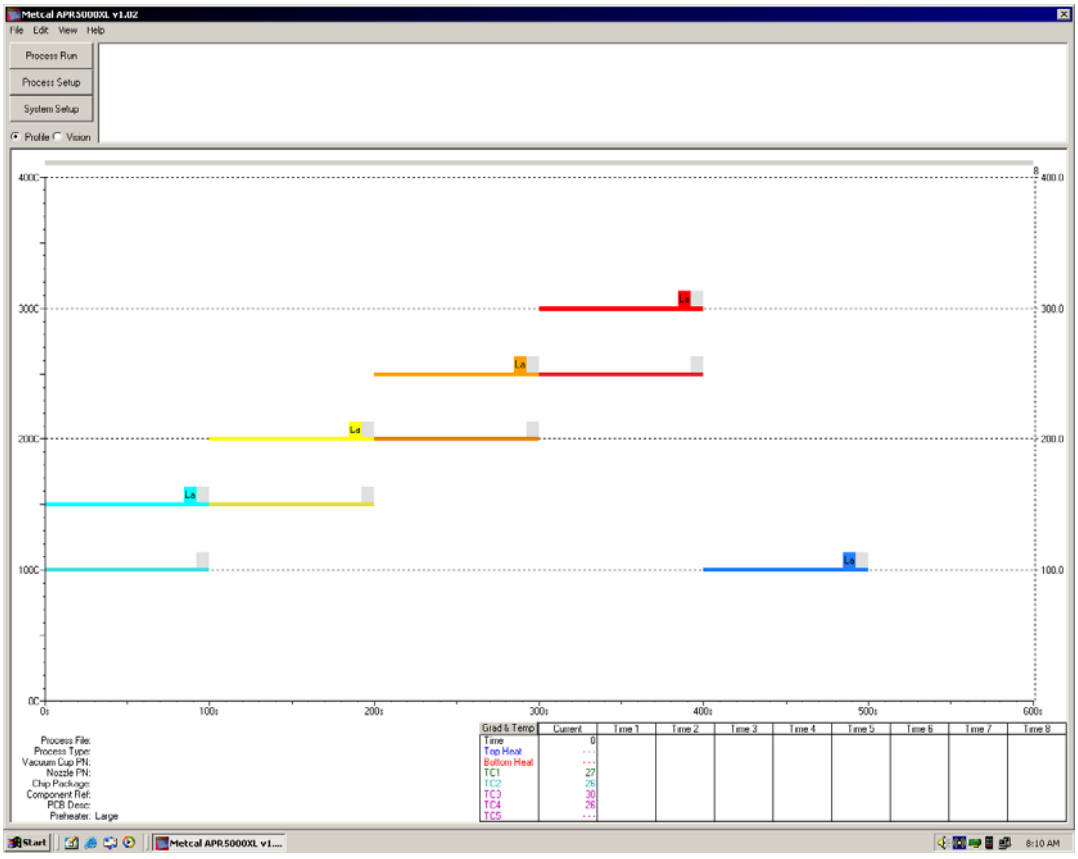
1. Set the APR-5000-XL Main power switch to the “on” position.
Turn on the controller
2. On the “desktop” Double click the Oki icon.

To begin operation, first turn the APR-5000-XL on and then launch the software.

After the system has initialized and the head has “homed”, three options will appear on the primary software page:

Process Run – Allows end-user to open and use a current or saved profile.
Process Setup – Allows the end user to design Place and Remove profiles.
System Setup – Allows for verification and calibration of APR-5000-XL.

Primary Software Page

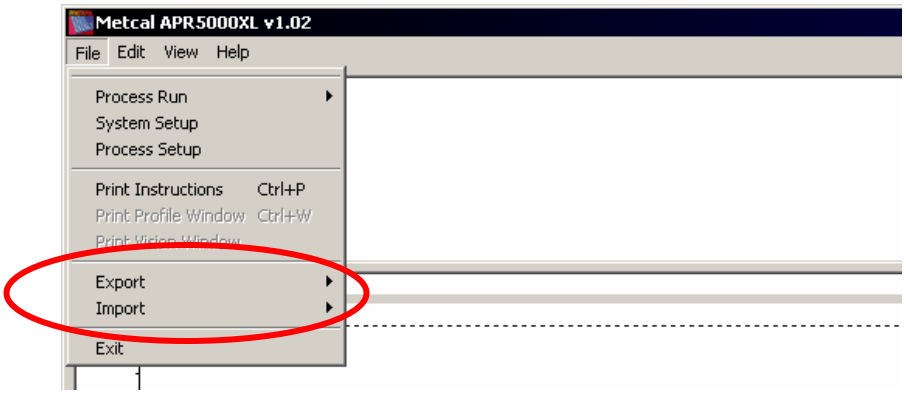


Window Options and Features

The following Window Options and Features are available in all ***Process Setup*** windows.

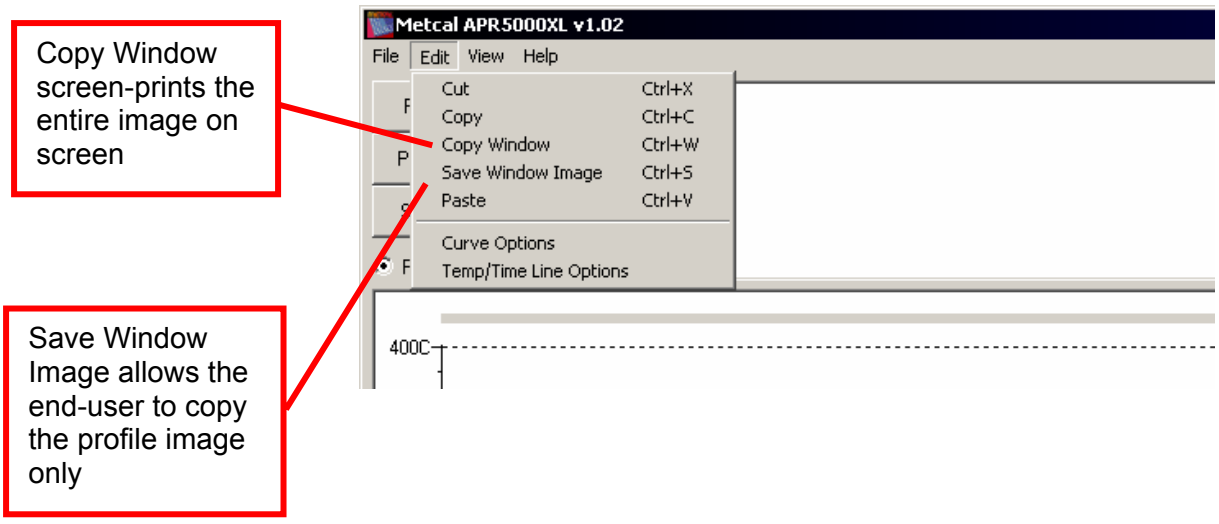
File

Options in ***File*** are limited and are self explanatory with the exception of ***Export*** and ***Import***. The ***Export*** and ***Import*** functions allow the user to export or import thermal profiles from a saved file. This function is the only way thermal plots can be saved and e-mailed from machine to machine.

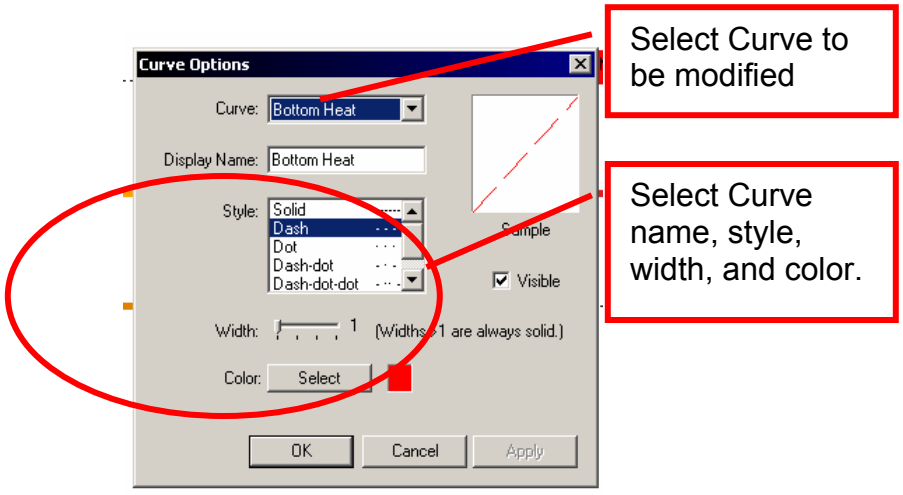


Edit

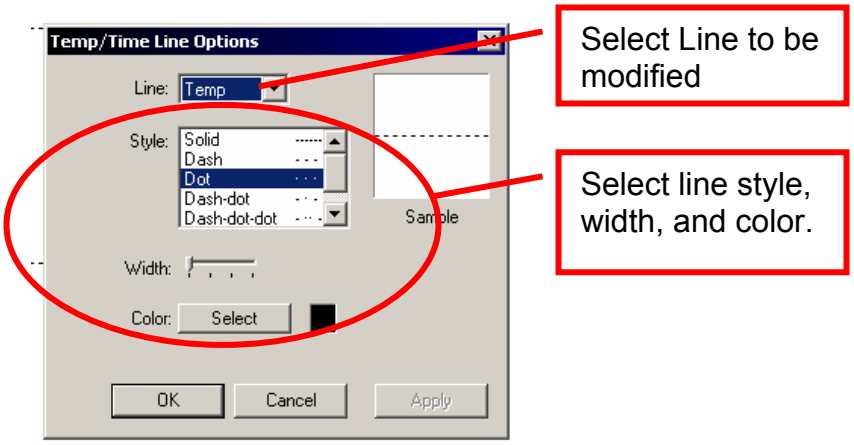
Options in ***Edit*** allow the end-user to copy the actual screen as a screen print or as a profile image only. Also, the end-user can modify the type of curves and Temp/Time lines.



Curve Options

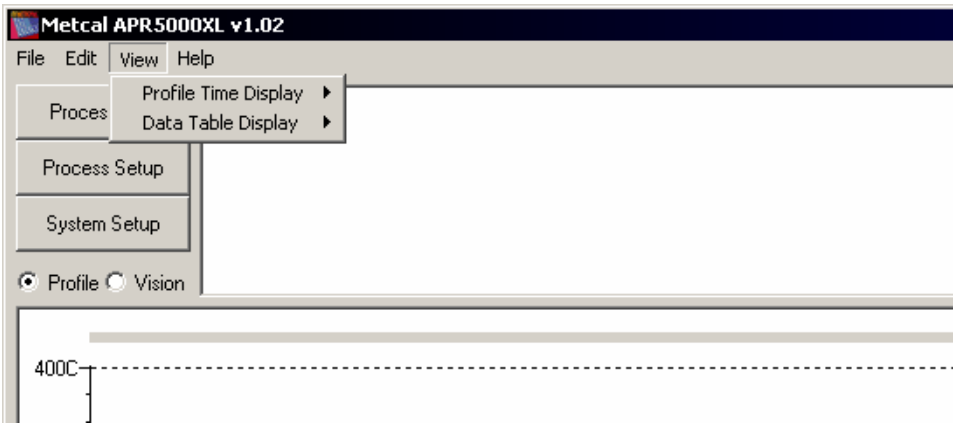


Temp/Line Options

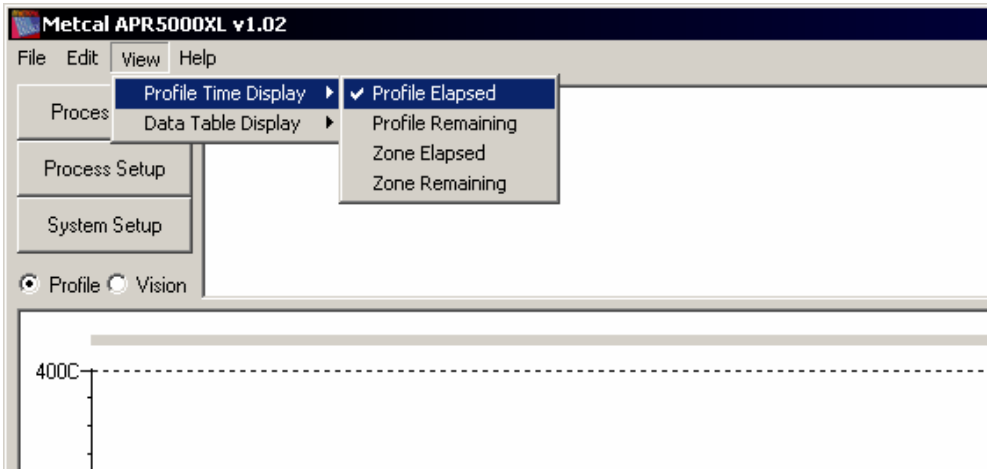


View

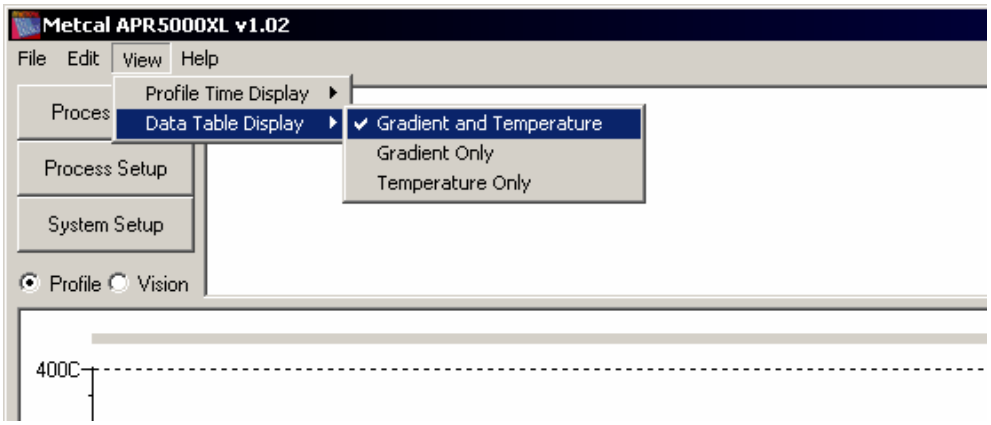
Options in ***View*** allow the end-user to change data viewed during recording or during use. The two modifiable items are ***Profile Time Display*** and ***Data Table Display***.



Profile Time Display – Allows the end-user to change the time as displayed on the graph.

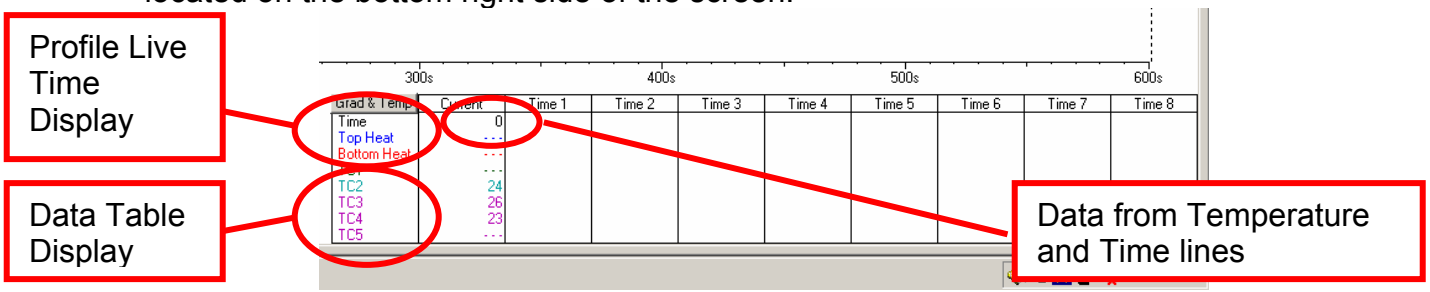


Data Table Display - Allows for end-user to change the data collected.



Where are these changes displayed on the graph?

These change data format. This data is always present during a thermal profile plot and is located on the bottom right side of the screen.



5. Getting Started

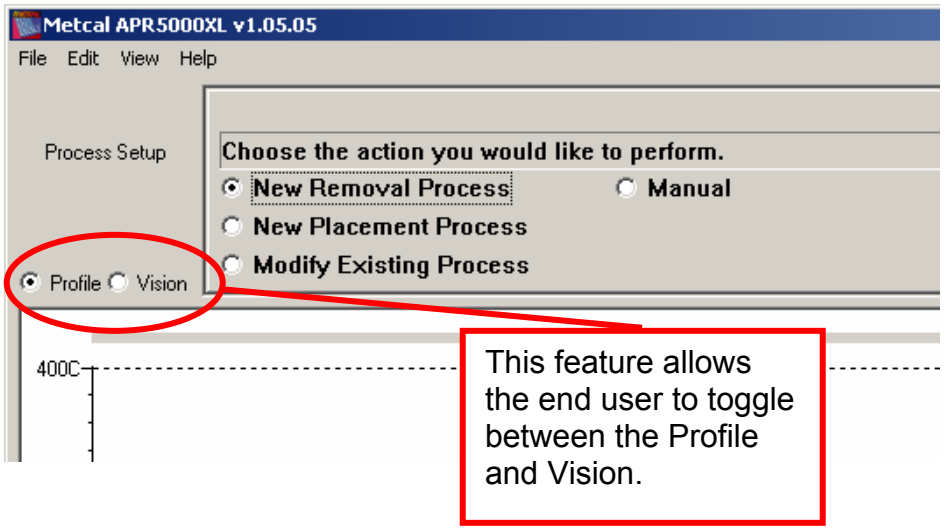
To begin using your APR-5000-XL system, click ***Process Setup*** to begin designing your Removal or Placement process. In this part of the software, information is recorded and saved as a file for use in ***Process Run***.

Note –A saved profile can be opened and used in this mode however, the added steps required to drive part of the program will make your common removal or placement tedious. Remember, this mode is primarily for profile design, and not repeated use.

Process Setup – Guided process development. Not intended for repeated operation.
Process Run –Intended for repeated operation of a developed process. End User can be provided with minor fine adjustment privileges.

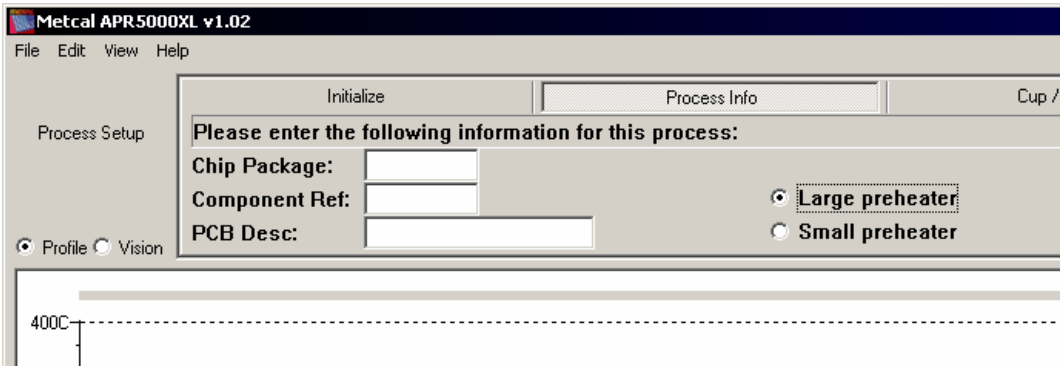
Choose from one of the following options:

- **New Removal Process** – *Setup mode for creating a removal process for shields, BGA, CSP, and micro-SMD components.*
- **New Placement Process** – *Setup mode for creating a placement process for shields, BGA, CSP, and micro-SMD components.*
- **Modify Existing Process** – *Setup mode for modifying an existing placement or removal process for shields, BGA, CSP, and micro-SMD components.*
- **Manual** – *Setup mode that allows the end user to import existing thermal plots (not Processes) and operate the APR-5000-XL manually.*

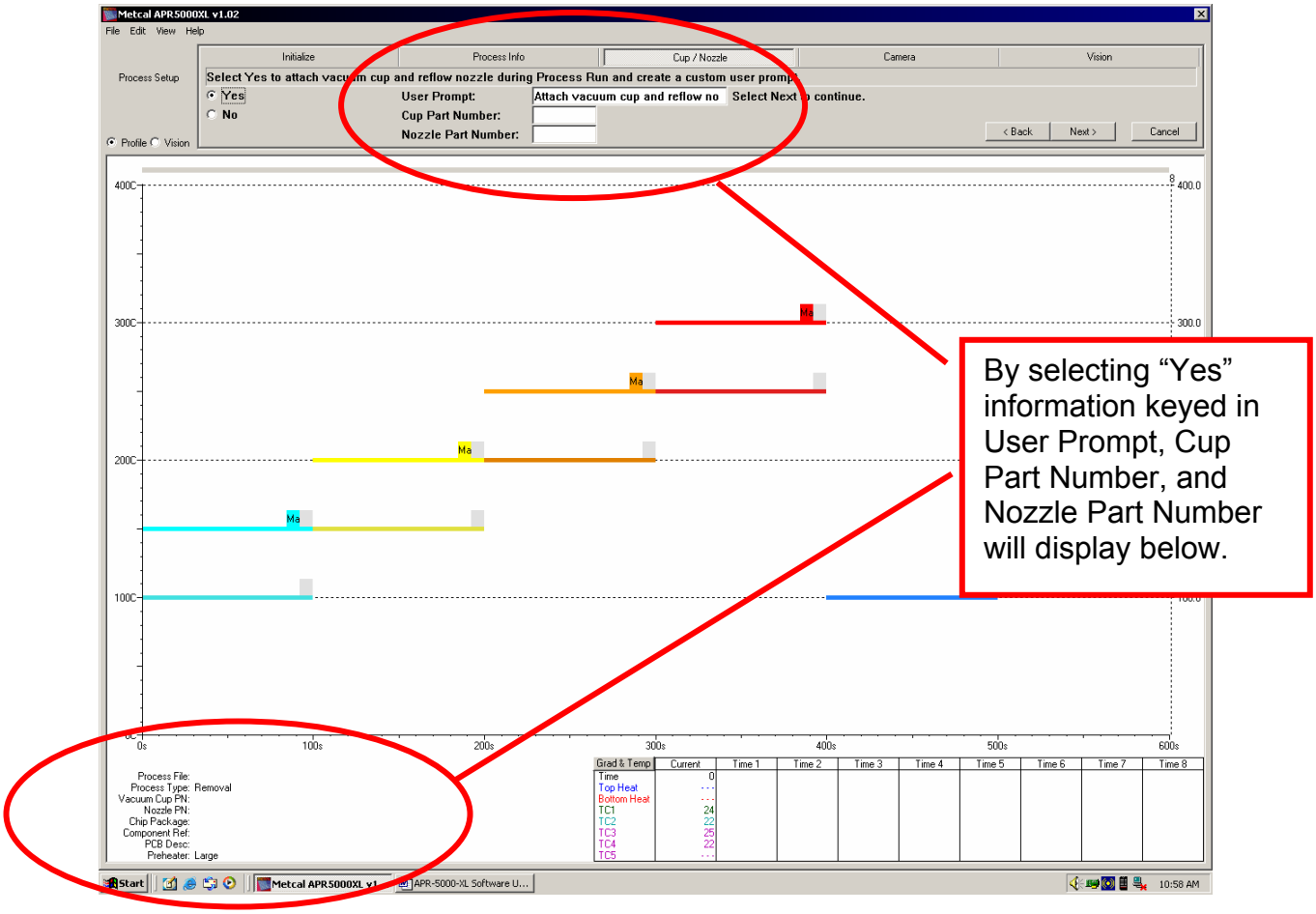


New Removal Process

Type in the necessary information such as ***Chip Package***, ***Component Ref*** (location of component on PCB) and ***PCB Desc*** (PCB description) and choose the amount of heating your PCB needs by either picking ***Large preheater*** or ***Small preheater***.



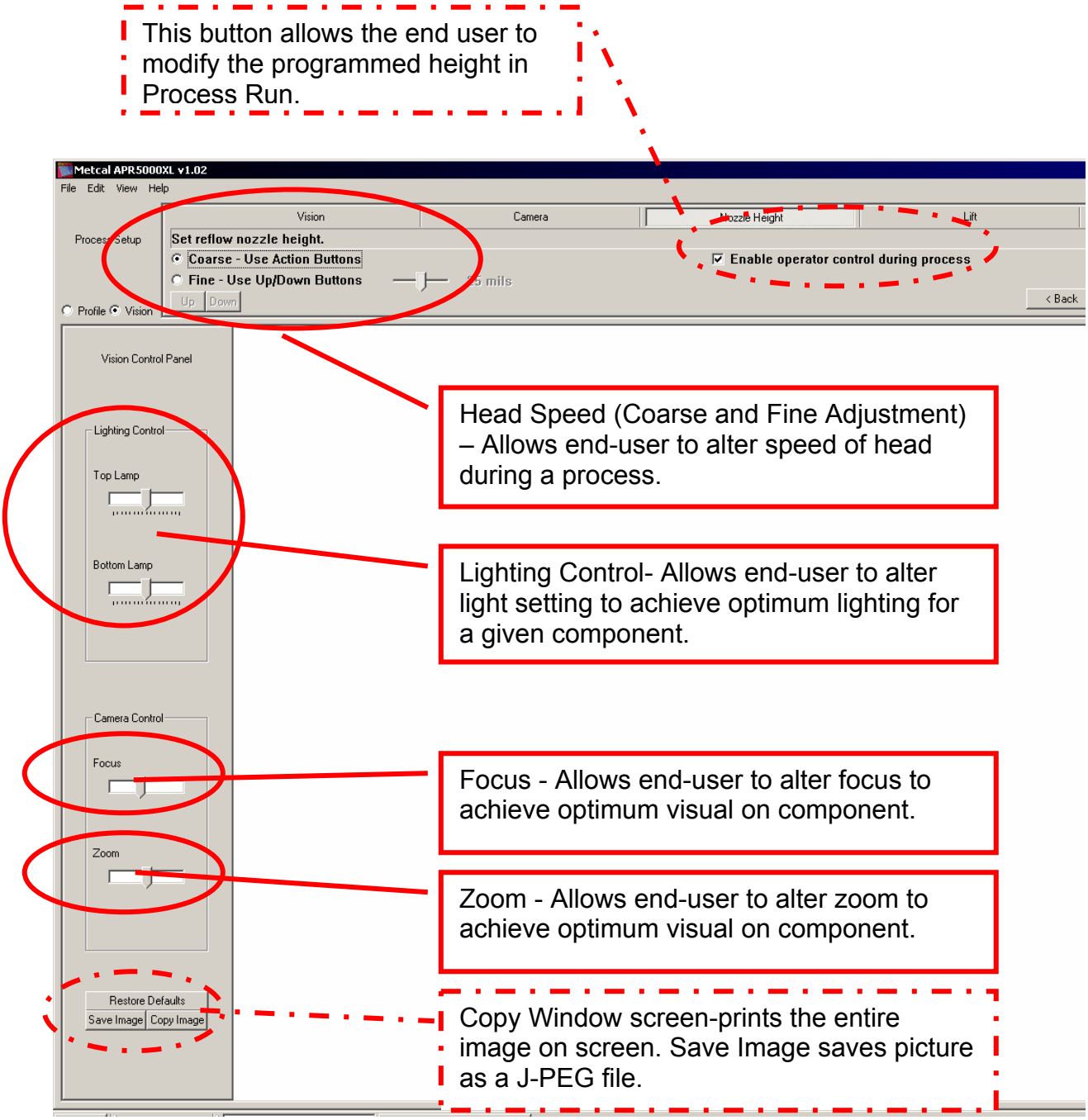
In this window, an option to enter information is prompted. It is highly recommended that the ***Yes*** button be clicked and data be entered in each of the three fields. This information will be viewed in ***Process Run*** when this particular file is opened.



After entering the required data, click ***Next*** and proceed to ***Camera***

The APR-5000-XL software will automatically switch to the ***Vision*** screen. The following information is now available to modify:

- Head Speed (Coarse and Fine Adjustment)
- Lighting Controls (Top & Bottom)
- Camera Focus
- Camera Zoom


This button allows the end user to modify the programmed height in Process Run.
Metcal APR5000XL v1.02
File Edit View Help
Vision
Camera
Nozzle Height
Lift
Process Setup
Set reflow nozzle height.
Coarse - Use Action Buttons
Fine - Use Up/Down Buttons
Enable operator control during process
Up
Down
< Back
Profile
Vision
Vision Control Panel
Lighting Control
Top Lamp
Bottom Lamp
Camera Control
Focus
Zoom
Restore Defaults
Save Image
Copy Image
Head Speed (Coarse and Fine Adjustment) – Allows end-user to alter speed of head during a process.
Lighting Control- Allows end-user to alter light setting to achieve optimum lighting for a given component.
Focus - Allows end-user to alter focus to achieve optimum visual on component.
Zoom - Allows end-user to alter zoom to achieve optimum visual on component.
Copy Window screen-prints the entire image on screen. Save Image saves picture as a J-PEG file.

IMPORTANT

All movements are recorded during ***Process Setup***. As a result, any and all mistakes will appear in the ***Process Run.*** A way to avoid editing Process Setup programs each time an error is discovered is by clicking the ***Enable operator control during process run.*** This will allow the end user to modify the programmed height in ***Process Run***.

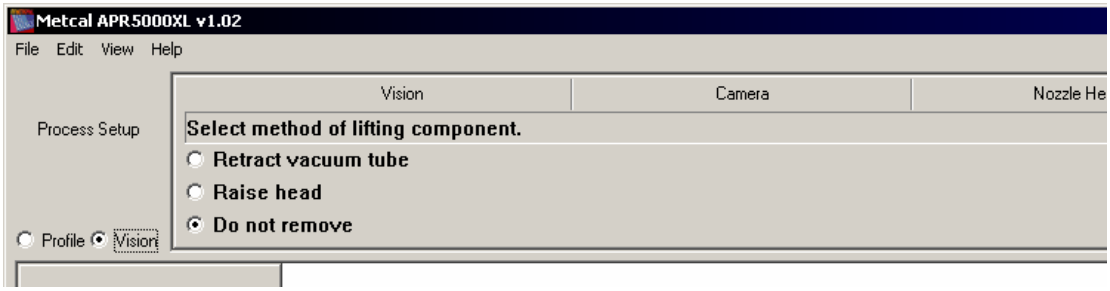
When done with adjustments, press **Next** and proceed to **Lift**.

In **Lift**, the option to lift the component during the removal process is provided. This option was designed to allow for a three distinct processes that are used in rework.

Retract vacuum tube - Designed to minimize adjacent component heating that may occur after removal.

Raise head – Designed for use with high I/O removable such as large BGA components or CBGA.

Do not remove – Designed to self-center components that have slightly skewed but not bridged or reflow cold solder joints.

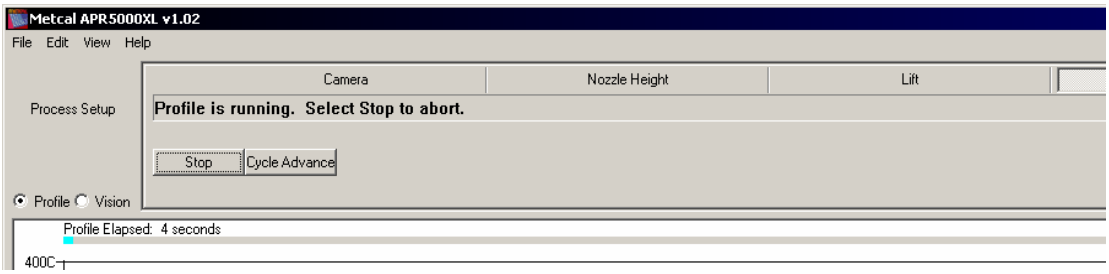


Follow prompt on the screen to ***Create Profile***.

During the **Create Profile** run, two key buttons are visible. One is ***Stop***, and the other is ***Cycle Advance***.

Stop allows the process to be aborted before a profile has been created.

Cycle Advance allows the end user to cycle to the next zone.



When this has been accomplished, proceed to ***Save*** the profile. To save the profile, the end user must press ***Finished.***

The ***New Removal Process*** is now complete.

IMPORTANT

These features allow the end user to create the correct profile for the process movement and makes thermal profiles easier to modify or e-mail. To monitor your profile, attached the five thermocouples to the PCB and component as needed.

Profile Window Options

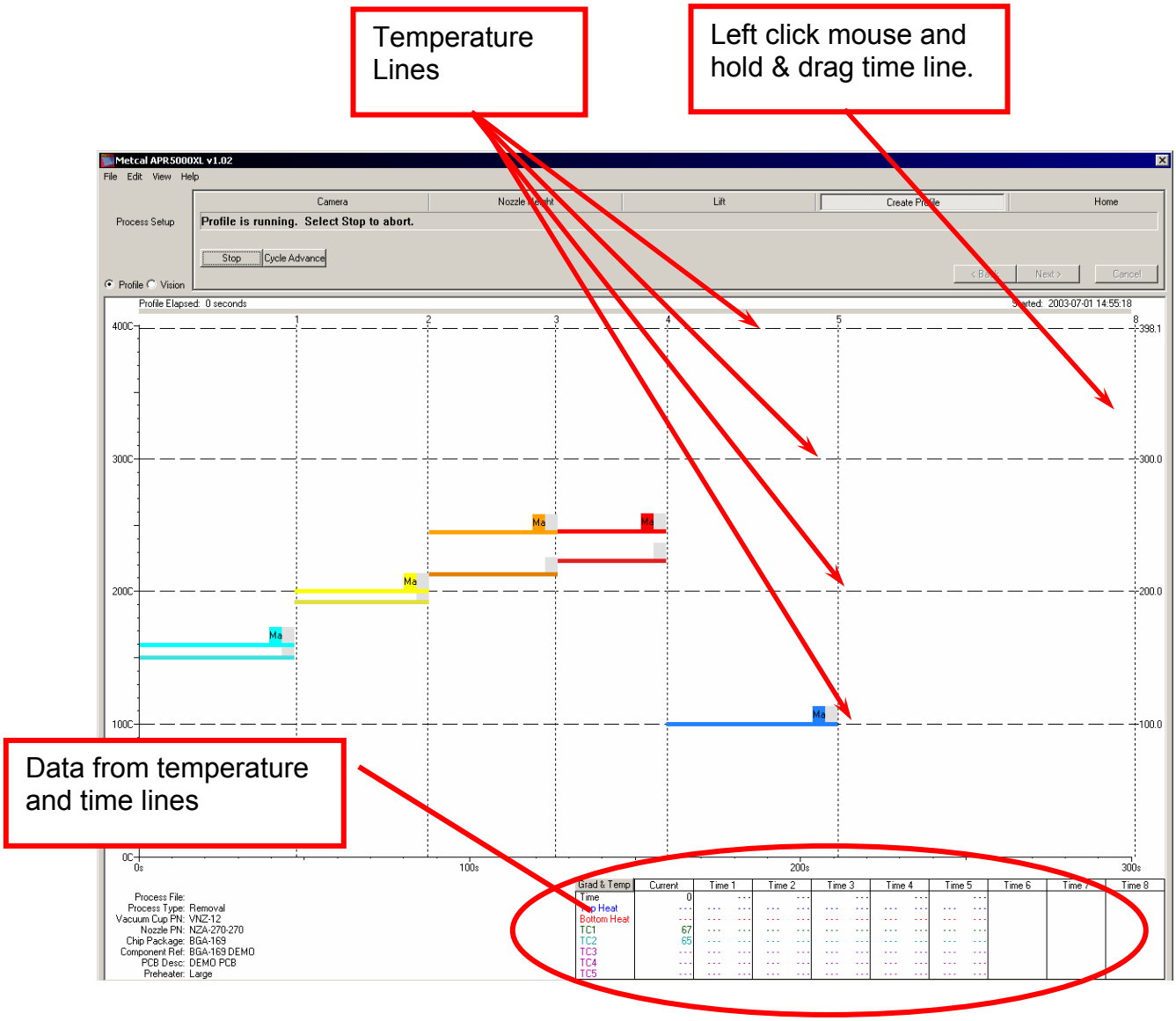
Options in the ***Profile Window*** allow the end user to add eight time lines and modify existing temperature lines while the program is in process. This allows the end user to record eight key data points in the profile. These options can be activated when the using the pointer on the screen. Data within those crossing lines will be monitored as part of the graph data located on the lower middle part of the screen.

How to activate new time lines?

Left click your pointer on a far right of your screen where the dotted time line is. When active, simply hold and drag the new line to any point on the profile you wish to record.

How to modify existing temperature lines?

Left click your pointer to any one of the four available temperature lines and drag the line to vertical position desired.

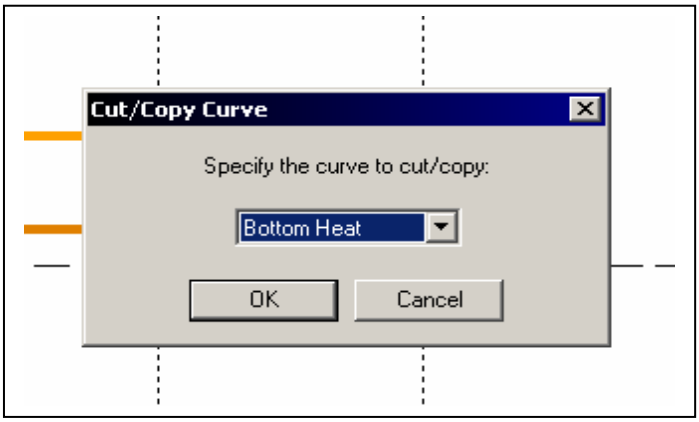


Cut/Copy Curve

The ***Cut/Copy Curve*** option allows the end use to copy a given profile line and superimpose it on another profile. This option allows can be used to verify an existing profile and test the APR-5000 XL performance over time.

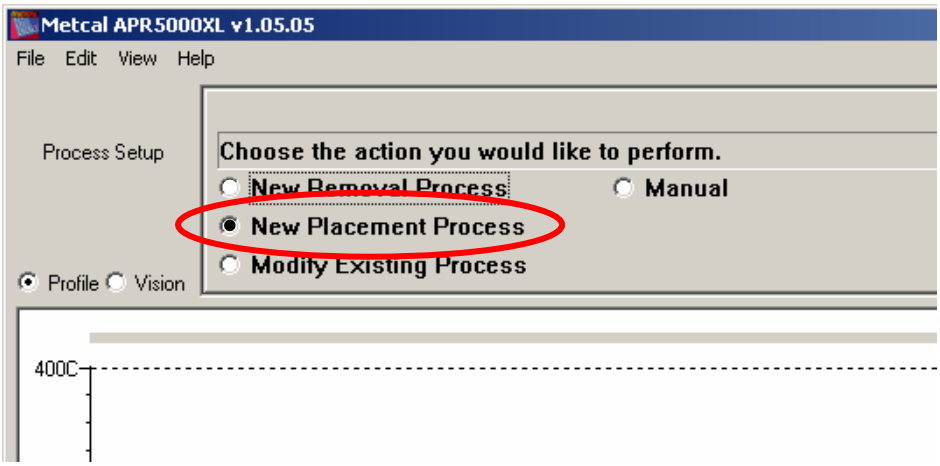
To activate this copy option, right click your mouse pointer on the target line you wish to copy. When activated, an option window will appear in the middle of the monitor screen and prompt the end user to pick from one of the seven curves. They are as follows:

- **Bottom Heat**
- ***TC1***
- ***TC2***
- ***TC3***
- ***TC4***
- ***TC5***
- ***Top Heat***

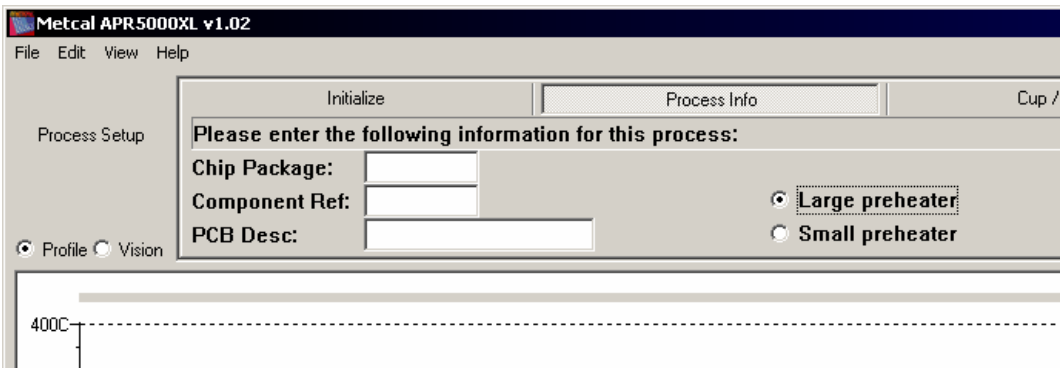


6. New Placement Process

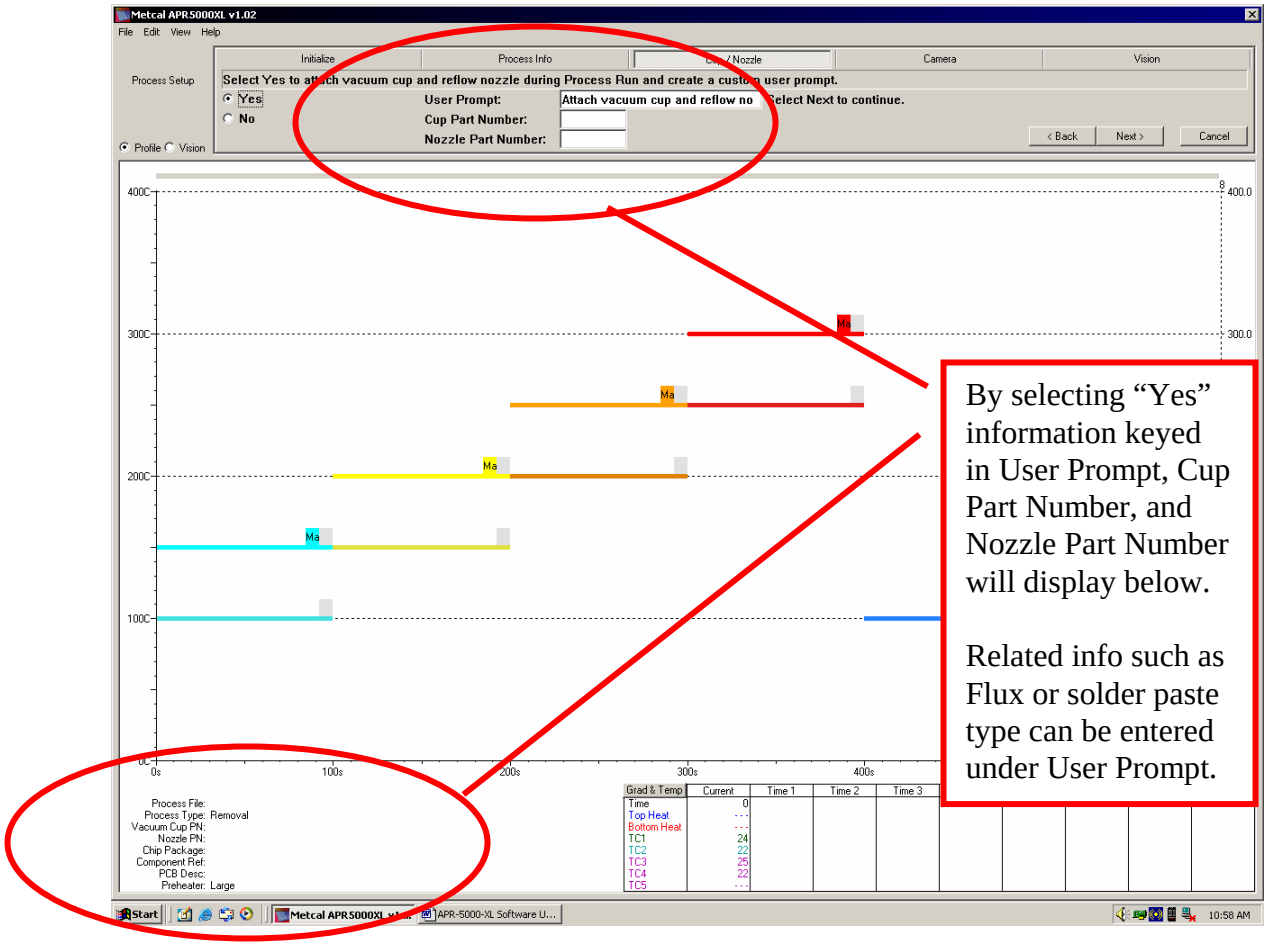
Go to Main Process Setup Window and click New Placement Process.



Type in the necessary information such as ***Chip Package***, ***Component Ref*** (location of component on PCB) and ***PCB Desc*** (PCB description) and choose the amount of heating your PCB needs by either picking ***Large preheater*** or ***Small preheater***.

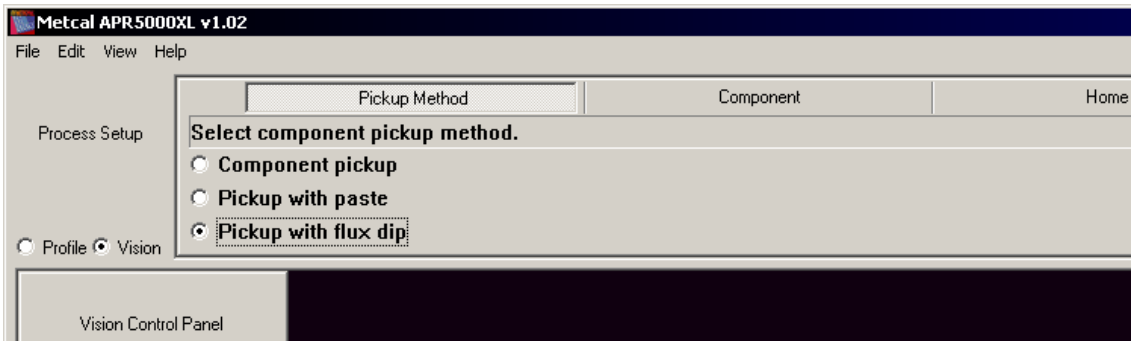


In this window, an option to enter information is prompted. It is highly recommended that the ***Yes*** button be clicked and data be entered each of the three fields. This information will be viewed in ***Process Run*** when this particular file is opened.



After entering the required data, click ***Next*** and proceed to ***Camera***

The next option to appear in the window is “Select component pickup method”. This option is required for the next step.



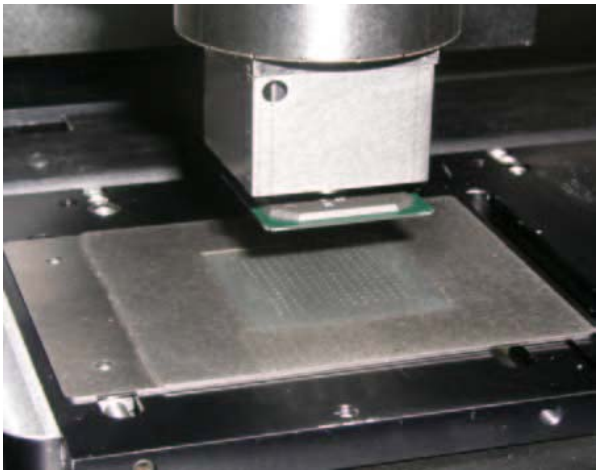
Component pick up - Designed for use with the component pick-up block. Although not preferred, this option also allows the end user to prepare the rework site with liquid flux instead of gel flux or solder paste.

Note-Liquid flux does not evenly distribute the organic material necessary for a sound solder joint. This method can create voids or opens.

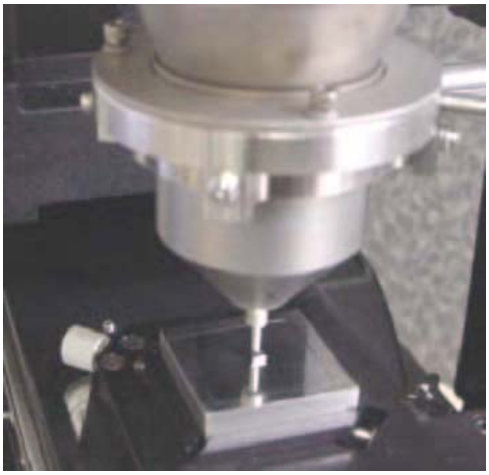
Pickup with paste - Designed for use with OK International component stenciling plate (BST). This method along with the correct stencil allows the end user to recreate OEM stand-off height. This process is preferred to both flux methods.

Pickup with flux dip - Designed for use with OK International Dip Transfer Plates (DTP), this process allows end users to transfer gel flux onto the solder ball only, increasing success rate and minimizing the amount of flux residue.

DTP Plate



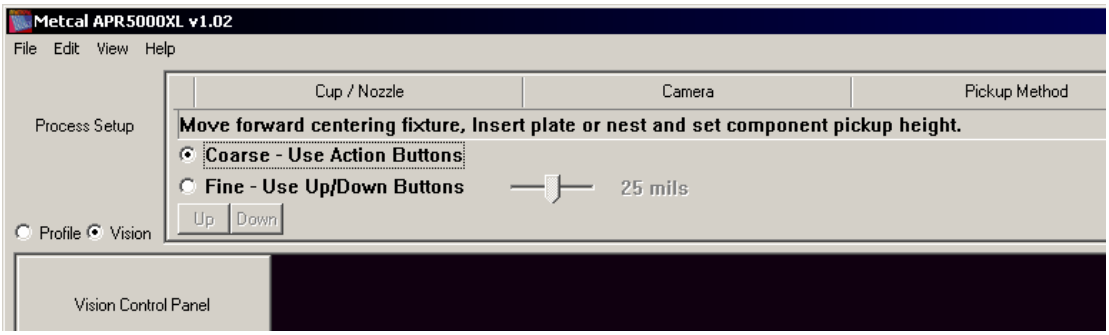
DTB Block



Component pickup Process

Click on Component pickup Process and the “Component” window will appear. Focus on the PCB pads.

When in this window follow the prompts place the centering fixture into position.



When the fixture is in position and component oriented, follow the prompts on the screen. Use both coarse and fine adjustments to place the vacuum cup onto the component.

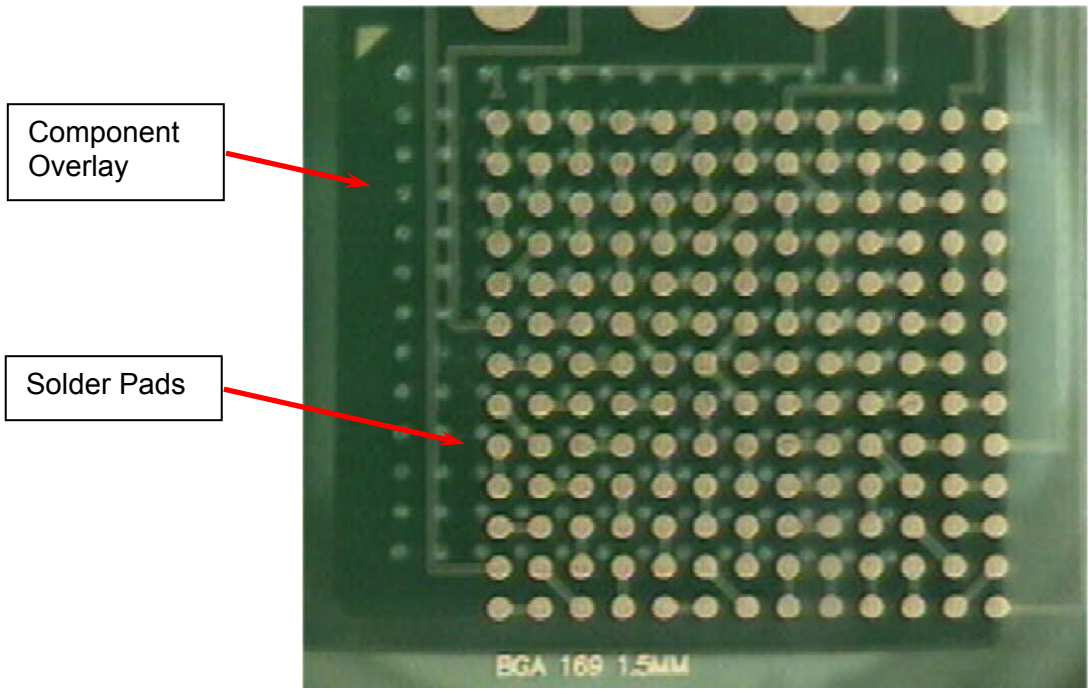
When the component is in position and the head is lifted up from the fixture, remove the centering fixture and click **“Next”.**

Using the up and down keys on the APR-5000-XL system, lower the head until the component has come into view and the over lay image of the component is directly above the solder pads. Focus on the component.

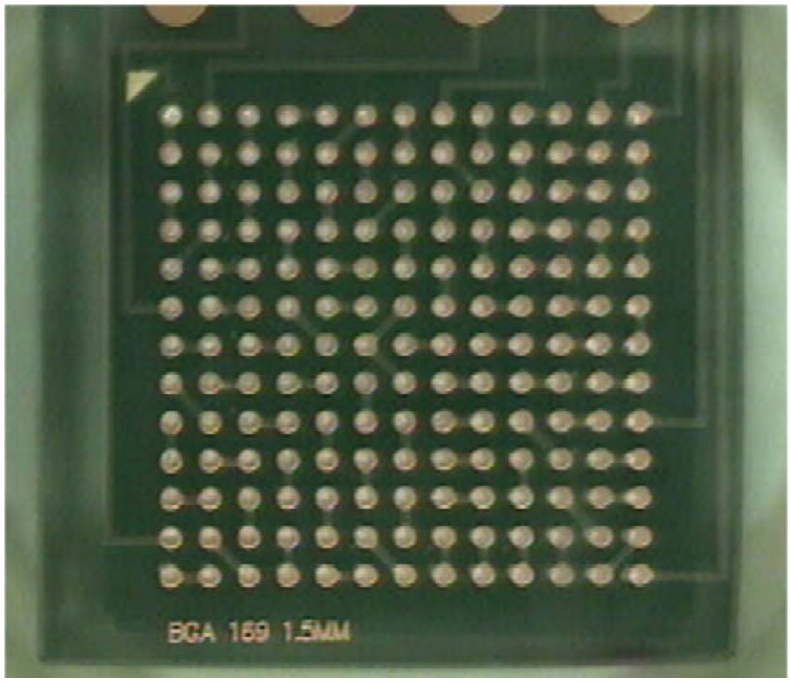
<u>Focusing Process</u>

1. Dim the component lamp (top lamp).
2. Focus directly onto the PCBA and zoom into view.
3. Dim the PCBA lamp (bottom lamp) and increase lighting on component.
4. Using the action buttons, drive the head down until the component comes into full view
5. Do not adjust focus. Focus will be driven by the height of the component.
6. Once bit the component and the PCBA have been set, increase the lighting on the PCBA.

Your view should be in focus now.



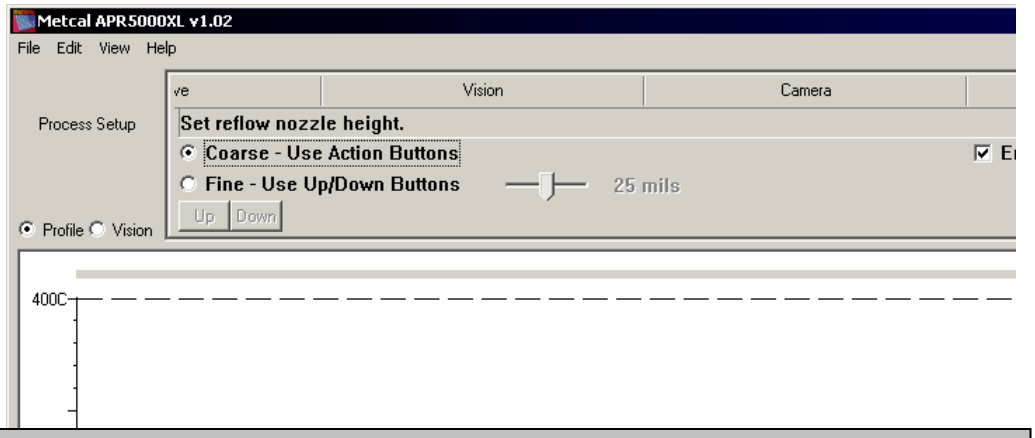
If the image is not over-laid correctly, press one of the yellow buttons located on either side of the APR-5000-XL body and, using the joystick, orient the component into position.



As prompted, focus the PCBA and use the UP/Down keys to place he component in focus.

Using the action buttons, lower the head into position. Use the ***Coarse*** button to lower the component to the PCB. The head will lower to approximately 2 inches form the PCB. At this point, you will need to click ***Fine*** to continue. Proceed until the component has touched the PCBA and the component is in position.

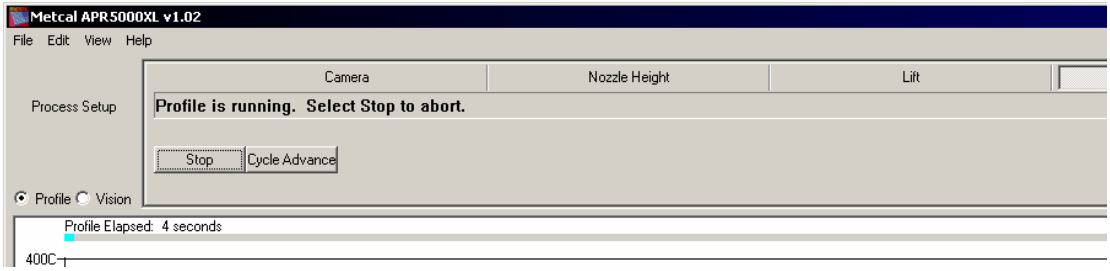
Adjust reflow nozzle height using the same up and down keys.



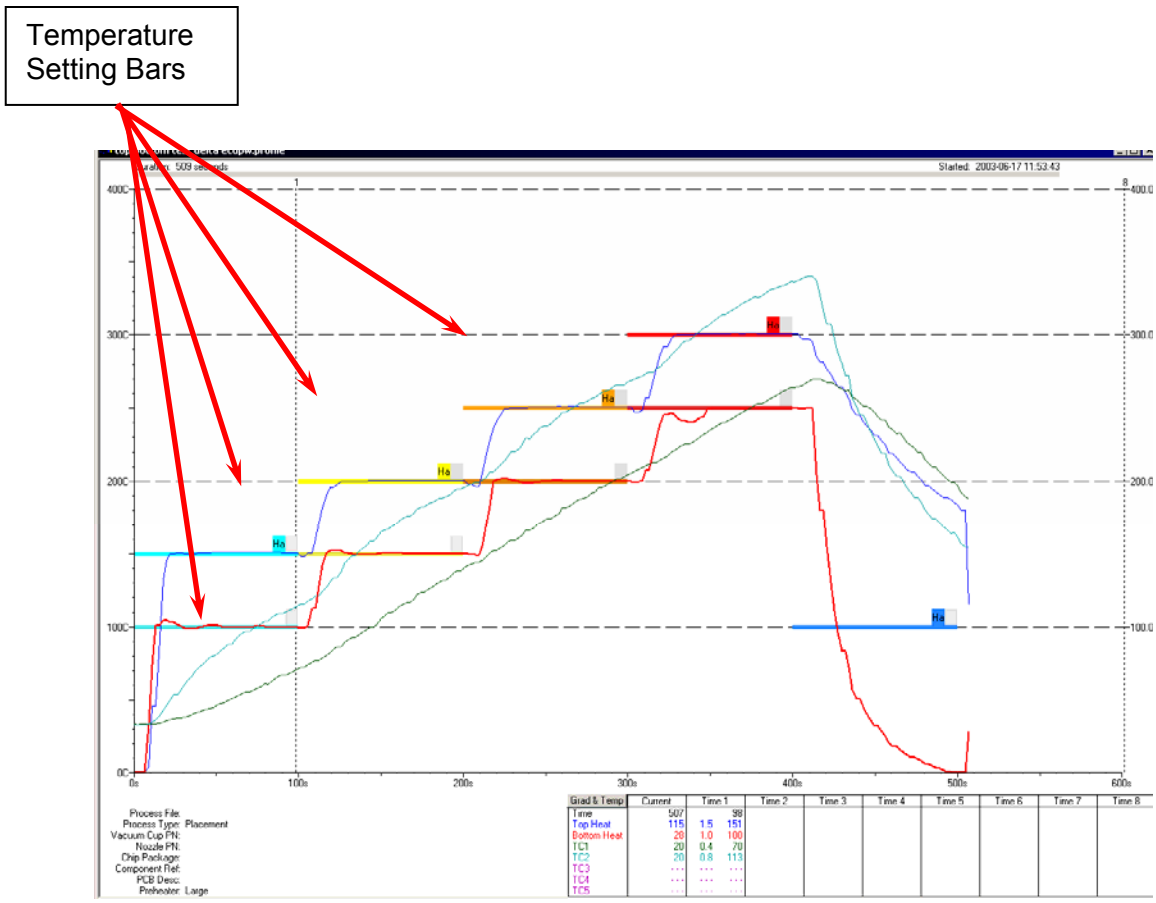
Note- OK International's patented reflow nozzle allows the nozzle to touch the PCBA with minimal clearance from the nozzle body (.010). This increases thermal efficiency and reduces spacing issues that may exist. The reflow nozzle can also reflow components when spaced up to 3mm from the PCBA. This can be very helpful when reworking densely packed PCBAs.

Click ***Next*** to release the component.

Follow prompt on the screen to ***Create Profile***.



Profiling during a process is allowed. This on-the-fly profiling allows the end user to quickly change the profile during the record mode and get the profile right the first time around. To make changes during a process, simply left click your mouse on one of the 10 temperature bars (five for Top Heat and five for Preheater) and drag the bar into the desired position. This feature allows the end user to modify existing processes as well.



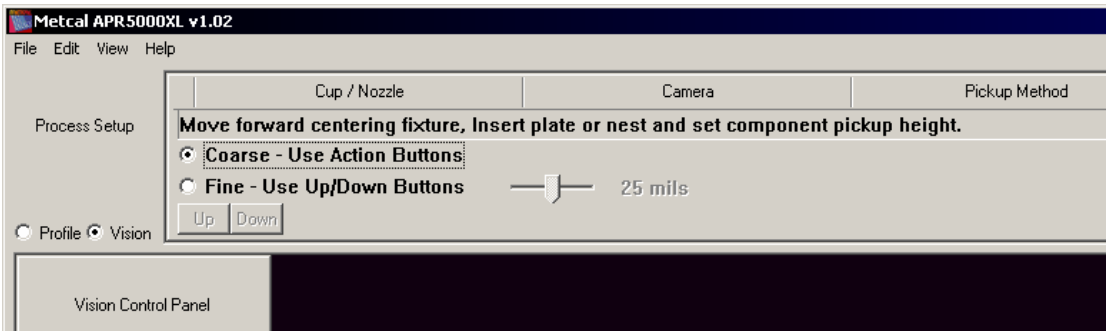
When the profile has been determined, proceed to ***Save*** the profile. To save the profile, the end user must press ***Finished.***

Pickup with paste Process

Click on ***Pickup with paste*** and the "Component" window will appear. Focus on the PCB pads.

When in this window follow the prompts place the centering fixture into position.

Place the BGA Stenciling Template (BST) into position.

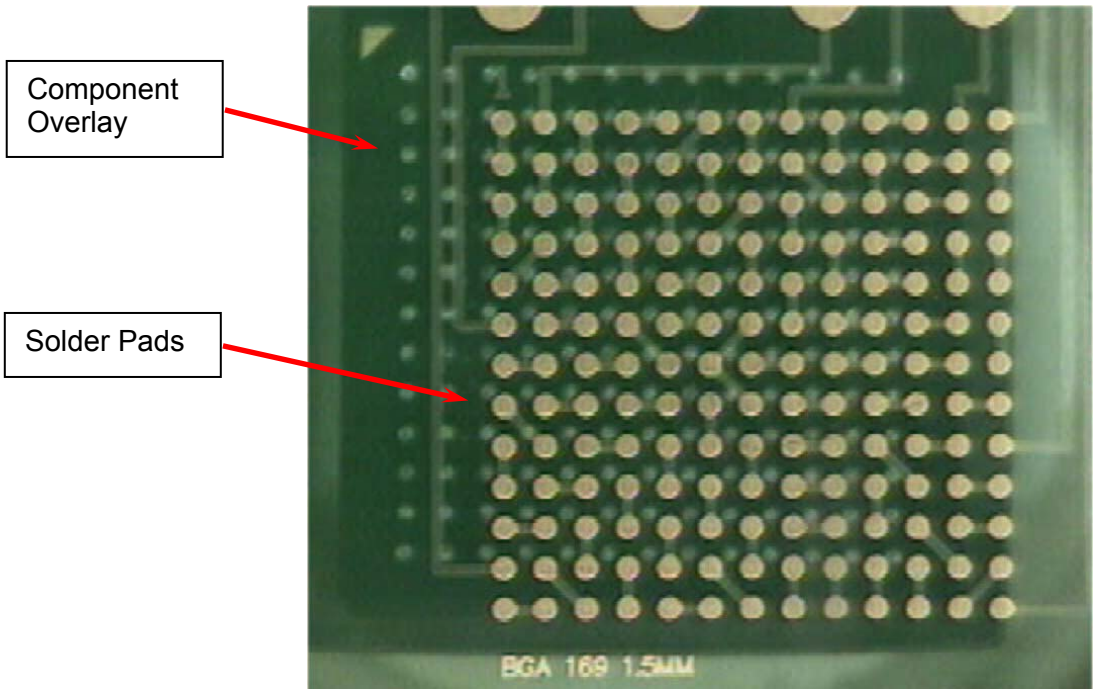


Lower the head into position and pick up the solder pasted component.

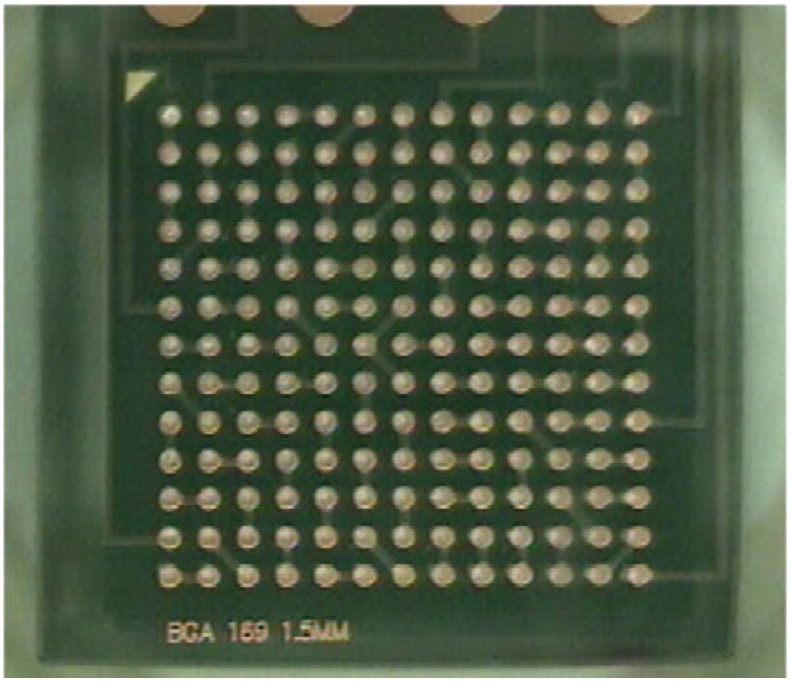
Click ***"Next"*** to turn the vacuum on.

When the component is in position and the head is lifted up from the fixture, remove the centering fixture and click **"Next".**

Using the up and down keys on the APR-5000-XL system, lower the head until the component has come into view and the over lay image of the component is directly above the solder pads. Focus on the component.



If the image is not over-laid correctly, press one of the yellow buttons located on either side of the APR-5000-XL body and, using the joystick, orient the component into position.



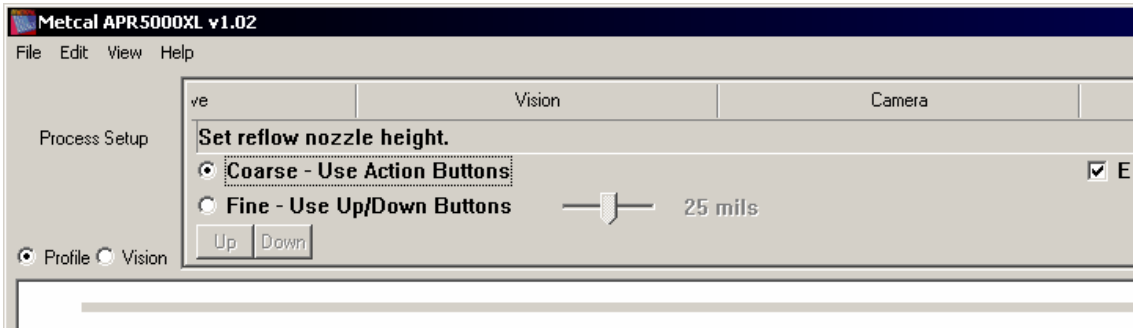
As prompted, focus the PCBA and use the Up/Down keys to focus the component.

Using the action buttons, lower the head into position. Use the ***Coarse*** button to lower the component to the PCB. The head will lower to approximately 2 inches from the PCB. At this point, you will need to click ***Fine*** to continue. Proceed until the component has touched the PCBA and the component is in position.

IMPORTANT

While placing the component onto the PCB, a fine adjustment of 10 mils or less is recommended. This avoids problems with crushed solder paste and minimizes solder bridging.

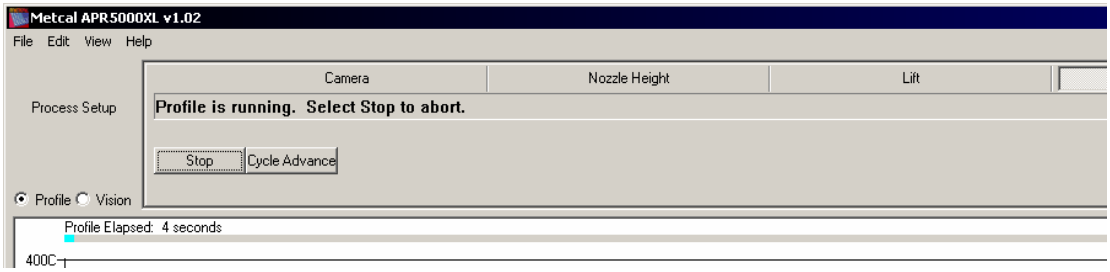
Adjust reflow nozzle height using the same up and down keys.



Note- OK International's patented reflow nozzle allows the nozzle to touch the PCBA with minimal clearance from the nozzle body (.010). This increases thermal efficiency and reduces spacing issues that may exist. The reflow nozzle can also reflow components when spaced up to 3mm from the PCBA. This can be very helpful when reworking densely packed PCBAs.

Click ***Next*** to release the component.

Follow prompt on the screen to ***Create Profile***.

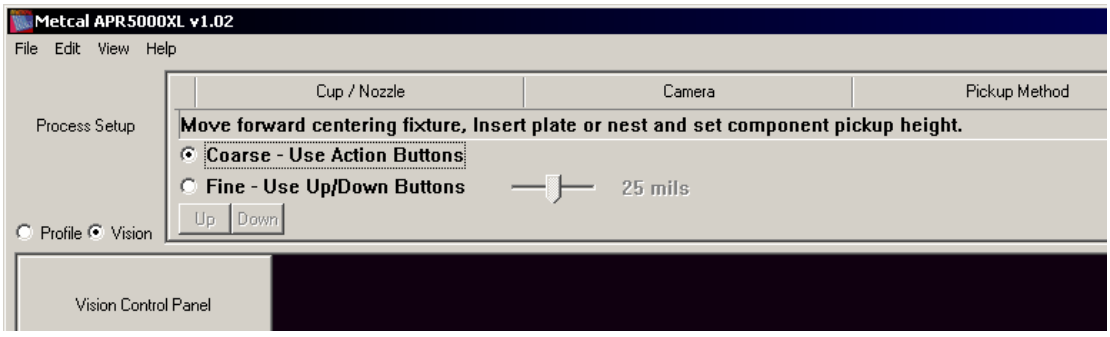


When this has been accomplished, proceed to ***Save*** the profile. To save the profile, the end user must press ***Finished.***

Pickup with flux dip Process

Click on ***Pickup with flux dip*** and the "Component" window will appear. Focus on the PCB pads.

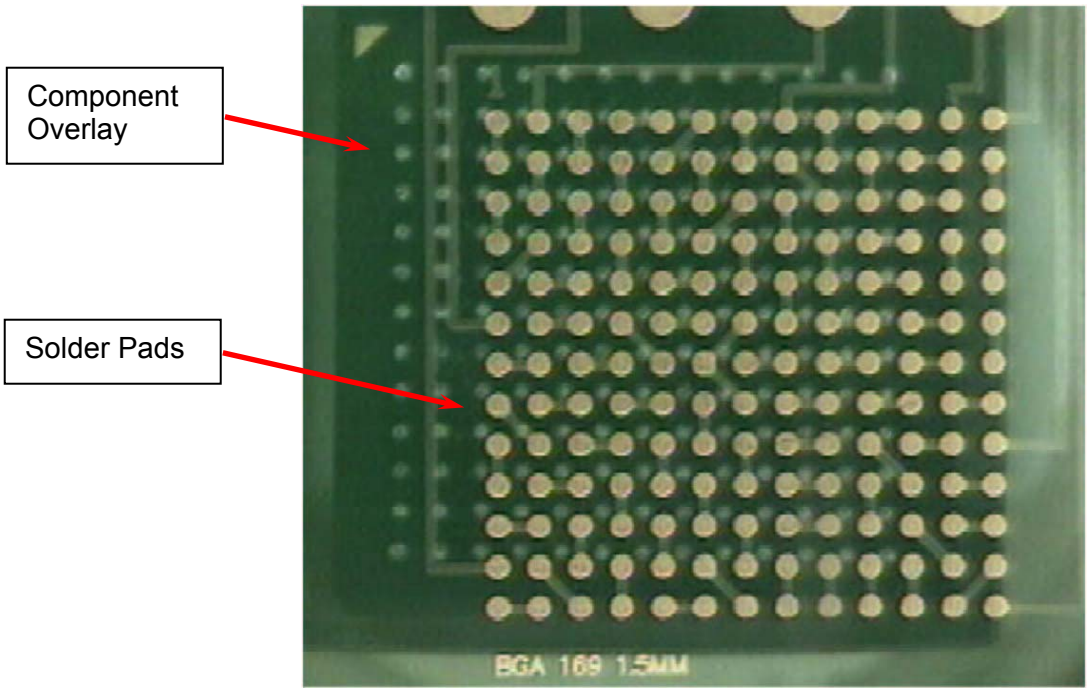
When in this window follow the prompts place the centering fixture into position.



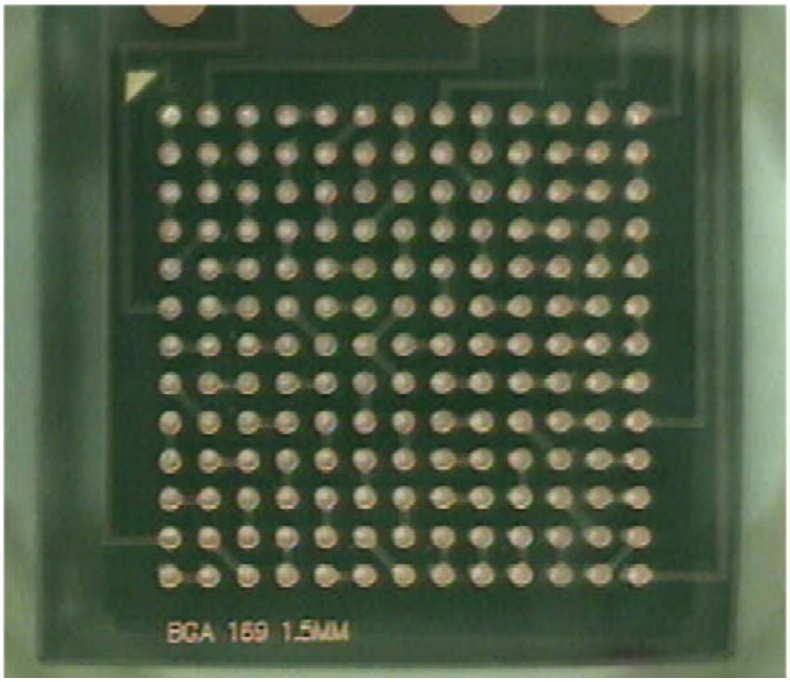
When the fixture is in position and component oriented, follow the prompts on the screen. Use both coarse and fine adjustments to place the vacuum cup onto the component.

When the component is in position and the head is lifted up from the fixture, remove the centering fixture and click **“Next”.**

Using the up and down keys on the APR-5000-XL system, lower the head until the component has come into view and the over lay image of the component is directly above the solder pads. Focus on the component by using the fine up and down control keys and not by using the Focus function.



If the image is not over-laid correctly, press one of the yellow buttons located on either side of the APR-5000-XL body and, using the joystick, orient the component into position.



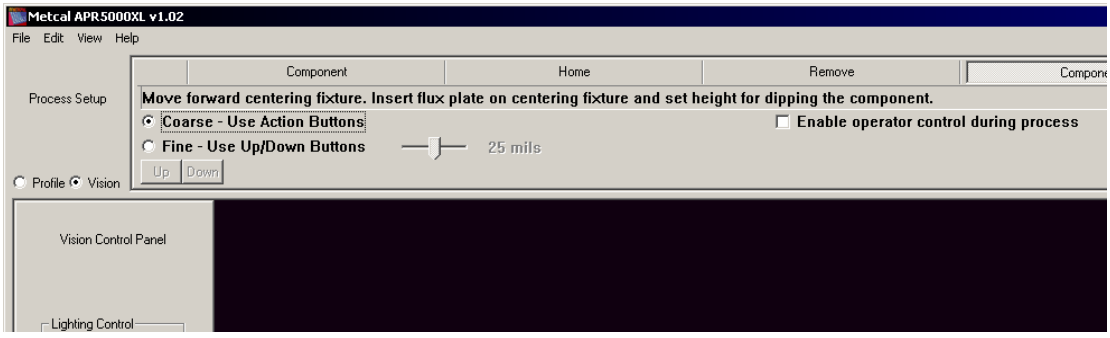
As prompted, focus the PCBA and use the Up/Down keys to place the component in focus.

After the component has been aligned and focused to the PCB pads, click next.

Using the spatula provided with the flux transfer kit spread a controlled bead of gel flux onto the flux transfer plate (DTP).

As prompted, move the centering fixture forward and place the flux transfer plate (DTP) into the centering fixture.

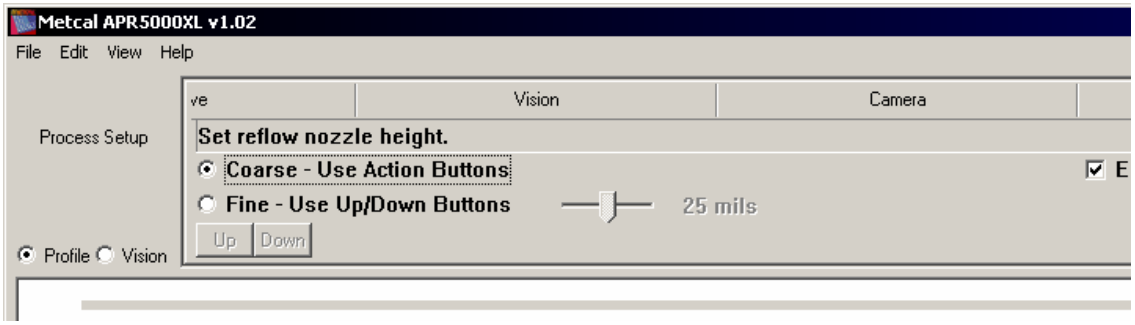
Using the ***down*** keys, lower the component into the flux transfer plate (DTP).



Once the component is immersed in flux, use the ***Up*** keys to raise the head up and away from the flux transfer plate (DTP).

Using the action buttons, lower the head into position. Use the ***Coarse*** button to lower the component to the PCB. The head will lower to approximately 2 inches from the PCB. At this point, you will need to click ***Fine*** to continue. Proceed until the component has touched the PCBA and the component is in position.

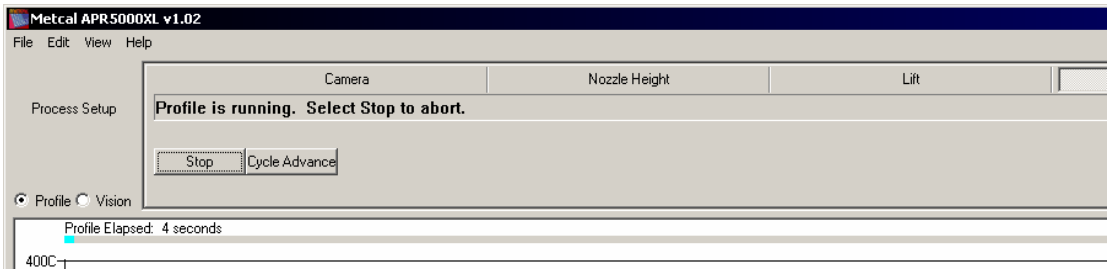
Adjust reflow nozzle height using the same ***Up*** and ***Down*** keys.



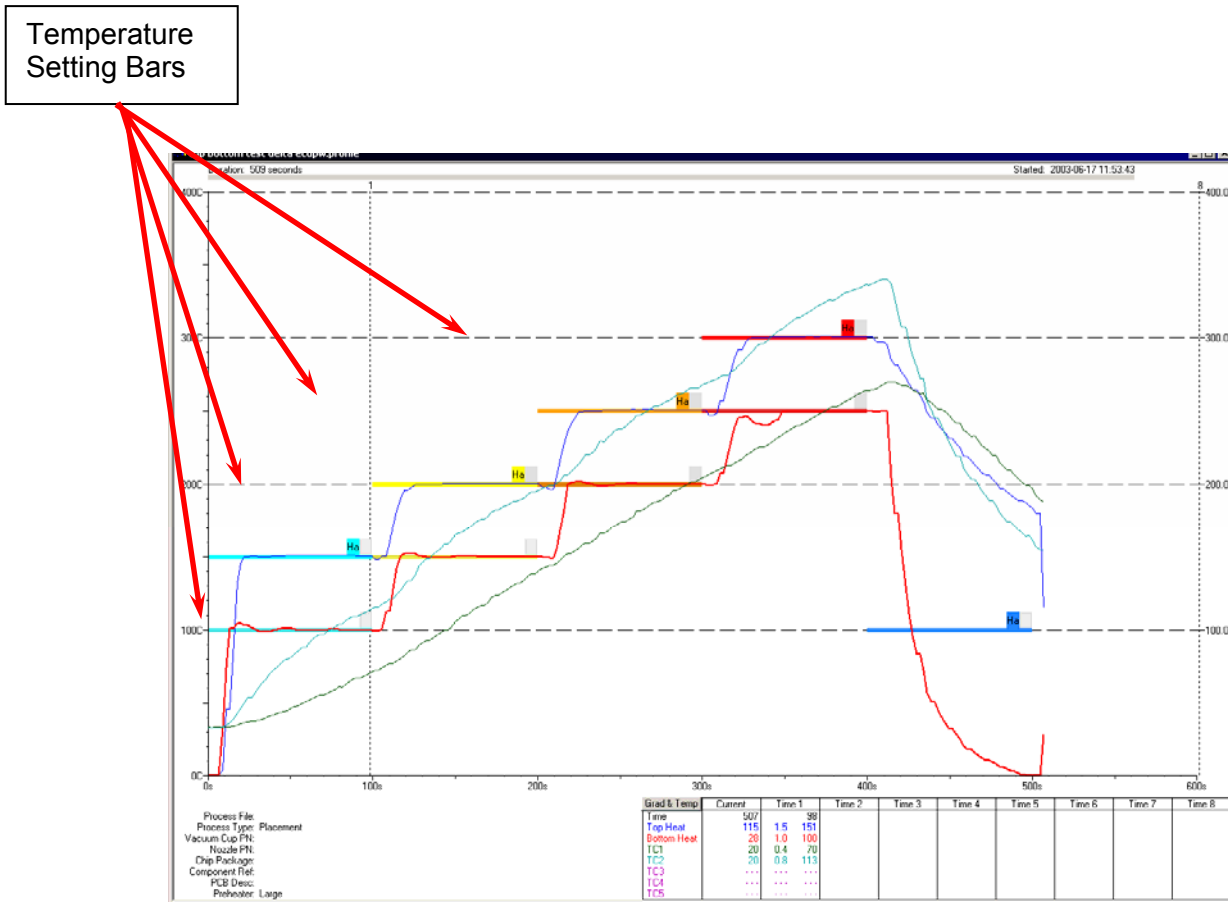
Note- OK International's patented reflow nozzle allows the nozzle to touch the PCBA with minimal clearance from the nozzle body (.010). This increases thermal efficiency and reduces spacing issues that may exist. The reflow nozzle can also reflow components when spaced up to 3mm from the PCBA. This can be very helpful when reworking densely packed PCBAs.

Click ***Next*** to release the component.

Follow prompt on the screen to ***Create Profile***.



Profiling during a process is allowed. This on-the-fly profiling allows the end user to quickly change the profile during the record mode and get the profile right the first time around. To make changes during a process, simply right click your mouse on one of the 10 temperature bars (five for Top Heat and five for Preheater) and drag the bar into the desired position. This feature allows the end user to modify existing processes as well.



When the profile has been determined, proceed to ***Save*** the profile. To save the profile, the end user must press ***Finished.*** When this has been accomplished, proceed to ***Save*** the profile. To save the profile, the end user must press ***Finished.***

The ***New Placement Process*** is now complete.

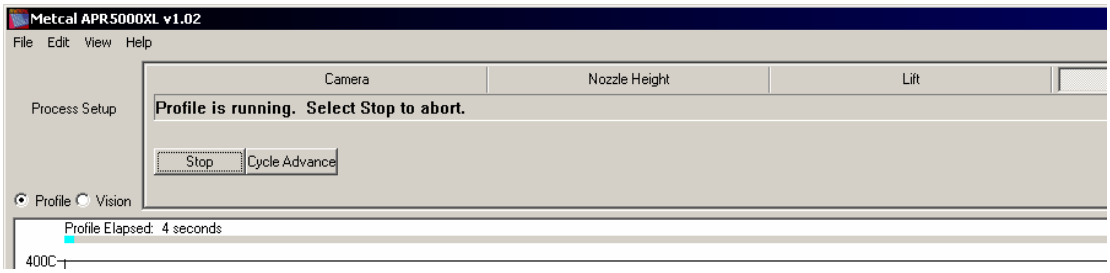
7. Modify Existing Process

Modify Existing Process allows the end user to modify any Removal or Placement process. This simplifies the process and allows multiple component types to be removed from the same PCB.

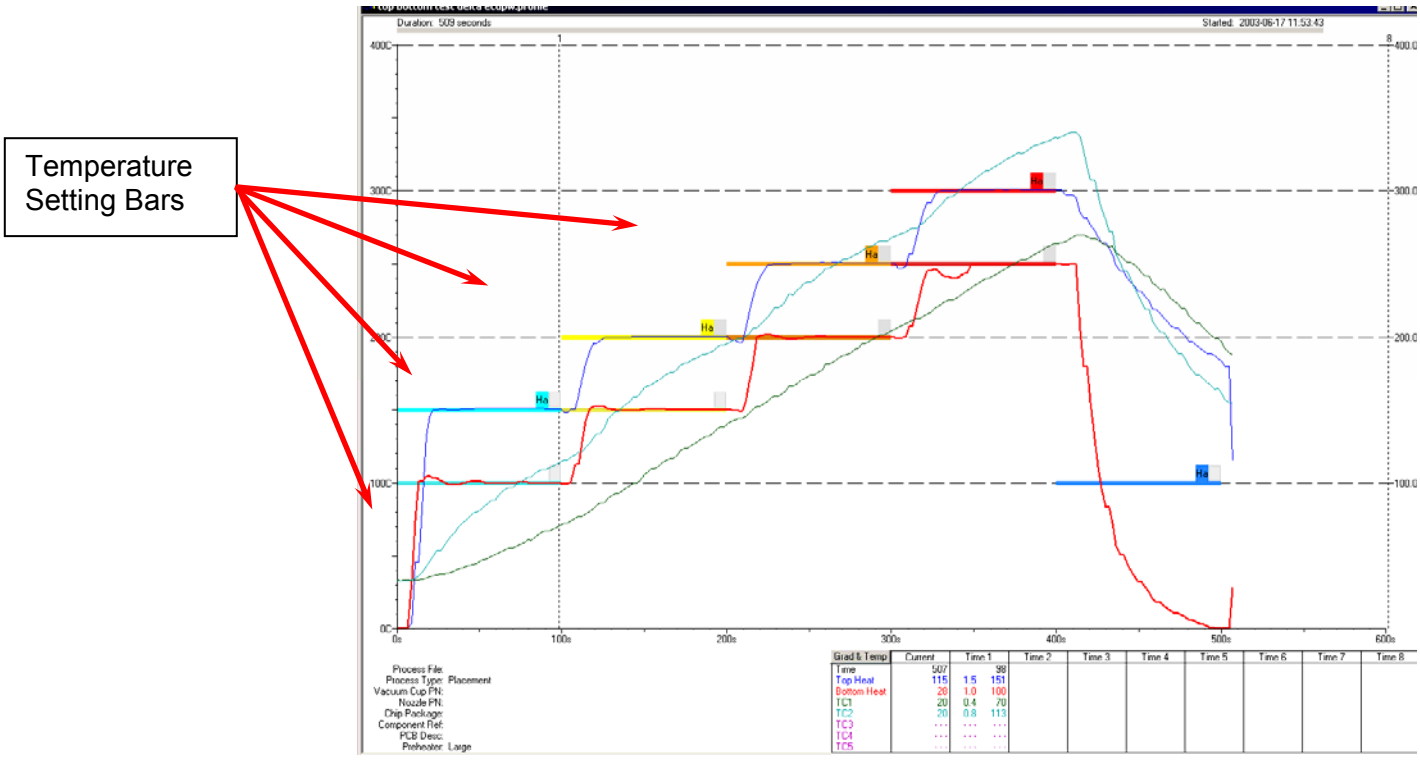
Follow the prompts on the screen and modify the data as needed.

Click ***Next*** to release the component.

Follow prompt on the screen to ***Create Profile***.



Profiling during a process is allowed. This on-the-fly profiling allows the end user to quickly change the profile during the record mode and get the profile right the first time around. To make changes during a process, simply right click your mouse on one of the 10 temperature bars (five for Top Heat and five for Preheater) and drag the bar into the desired position. This feature allows the end user to modify existing processes as well.



When the profile has been determined, proceed to ***Save*** the profile. To save the profile, the end user must press ***Finished.***

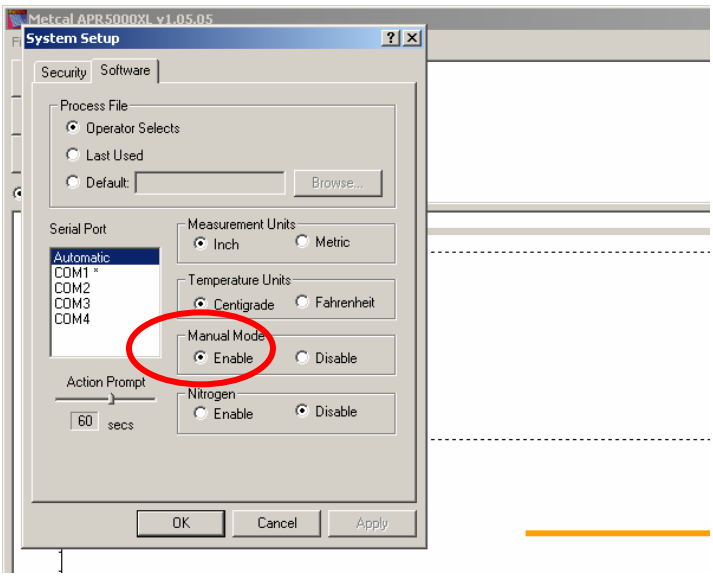
To **Save** T/C plots, you must **EXPORT** the profile.

Notes

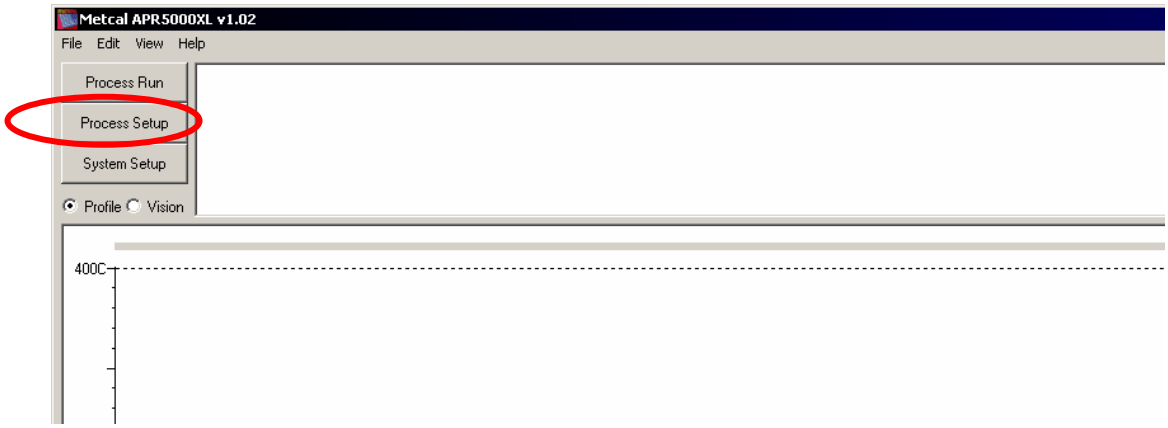
8. Manual Mode

Setup mode that allows the end user to import existing thermal plots (not Processes) and operate the APR-5000-XL manually.

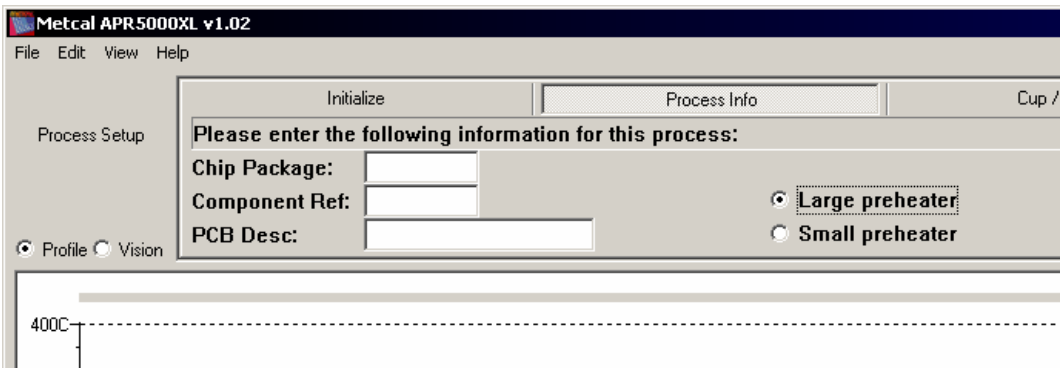
Click on “No Password” button and enter the APR password 1923523. Click Software tab and then "enable" in the Manual Mode option.



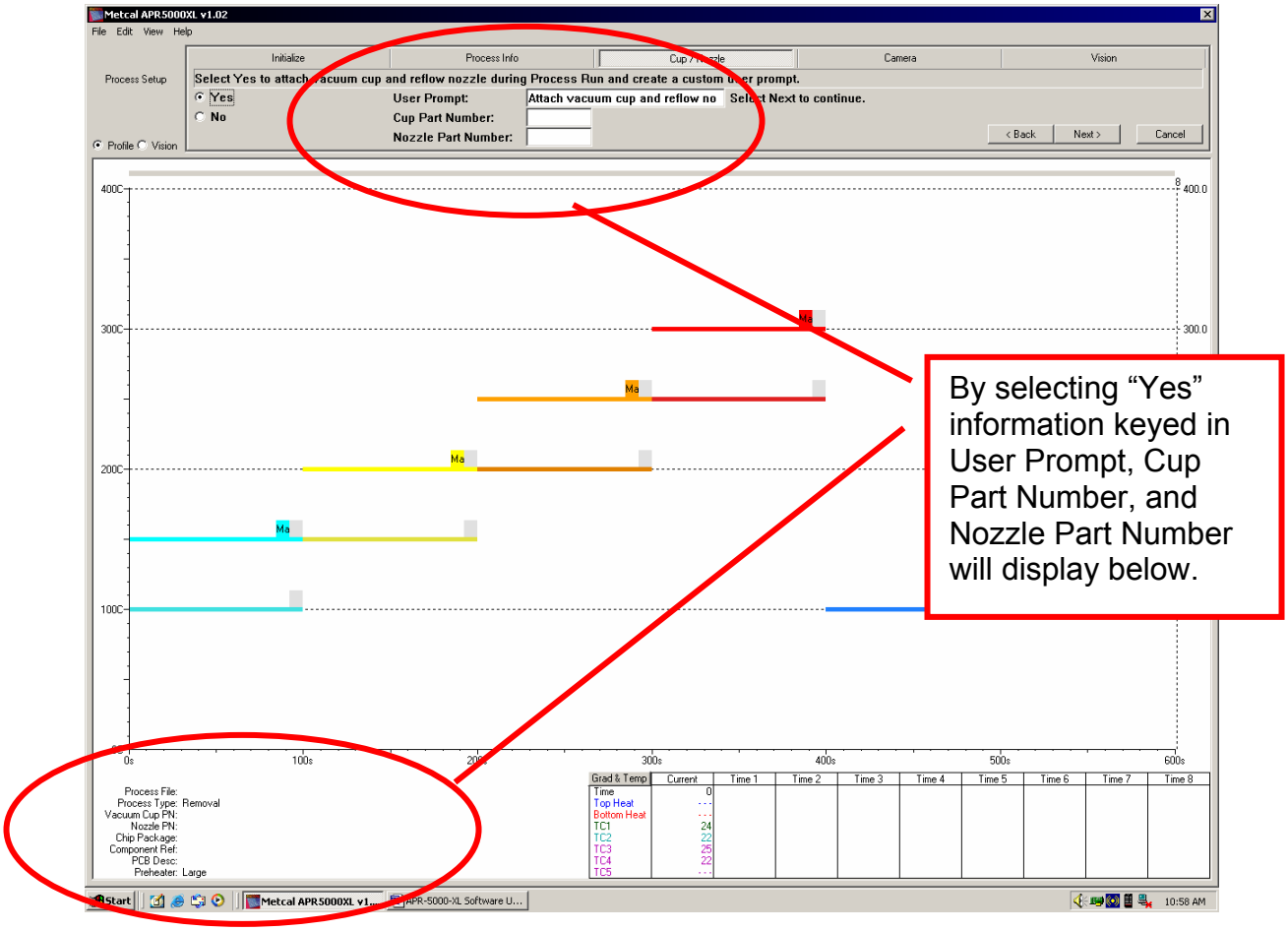
Go to APR-5000-XL Main page and click on ***Process Setup***.



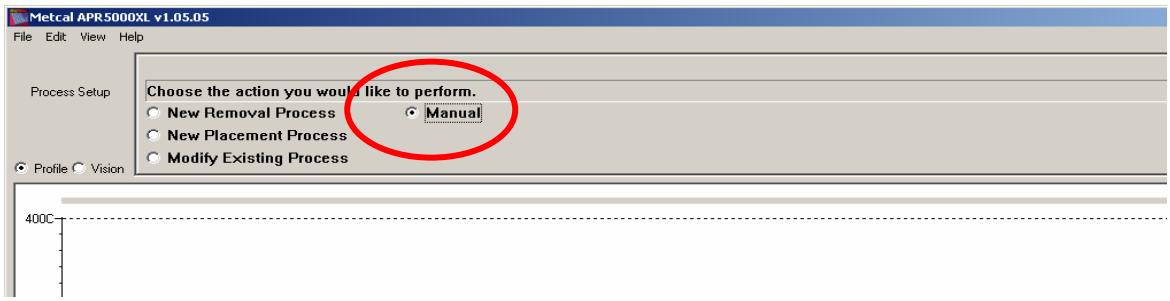
Type in the necessary information such as ***Chip Package***, ***Component Ref*** (location of component on PCB) and ***PCB Desc*** (PCB description) and choose the amount of heating your PCB needs by either picking ***Large preheater*** or ***Small preheater***.



In this window, an option to enter information is prompted. It is highly recommended that the ***Yes*** button be clicked and data be entered each of the three fields. This information will be viewed in ***Manual Window ONLY.***



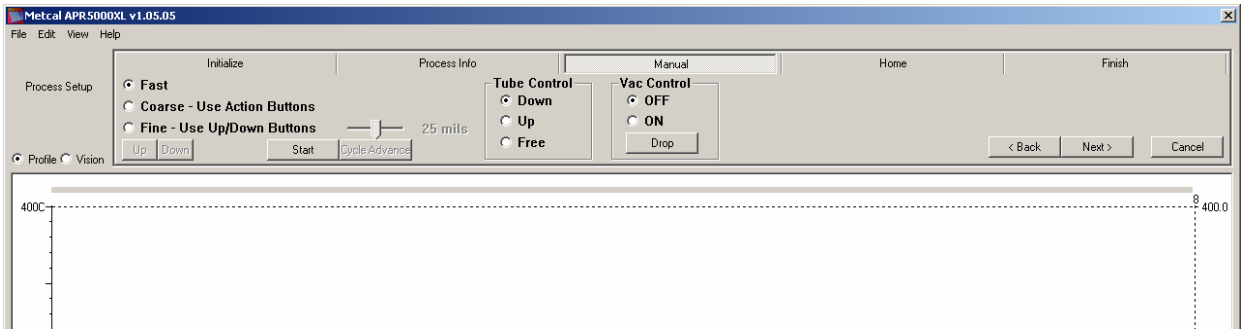
Once the information has been entered, proceed to Next button and click the Manual Mode Option. This will take you to the active **Manual** Mode window.



Manual Mode Window

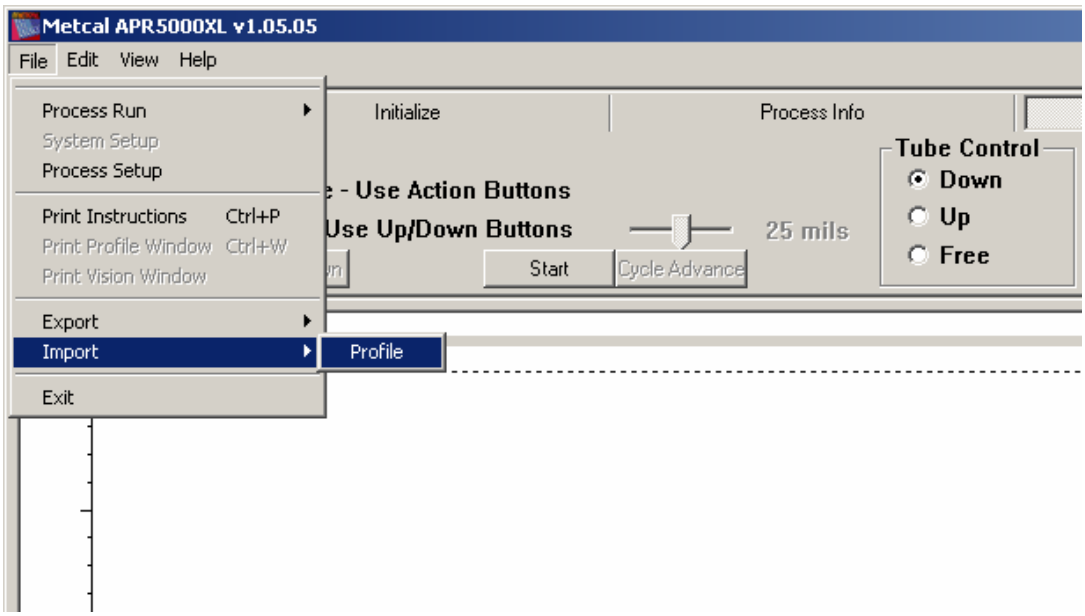
The Manual Mode Window allows the end user to use existing thermal plots while controlling all other mechanical features of the APR-5000-XL. The following functions can be edited at any time during the a profile:

Direction of head movement
Speed of head movement
Vacuum tube movement
Vacuum control: (Puff-off control)

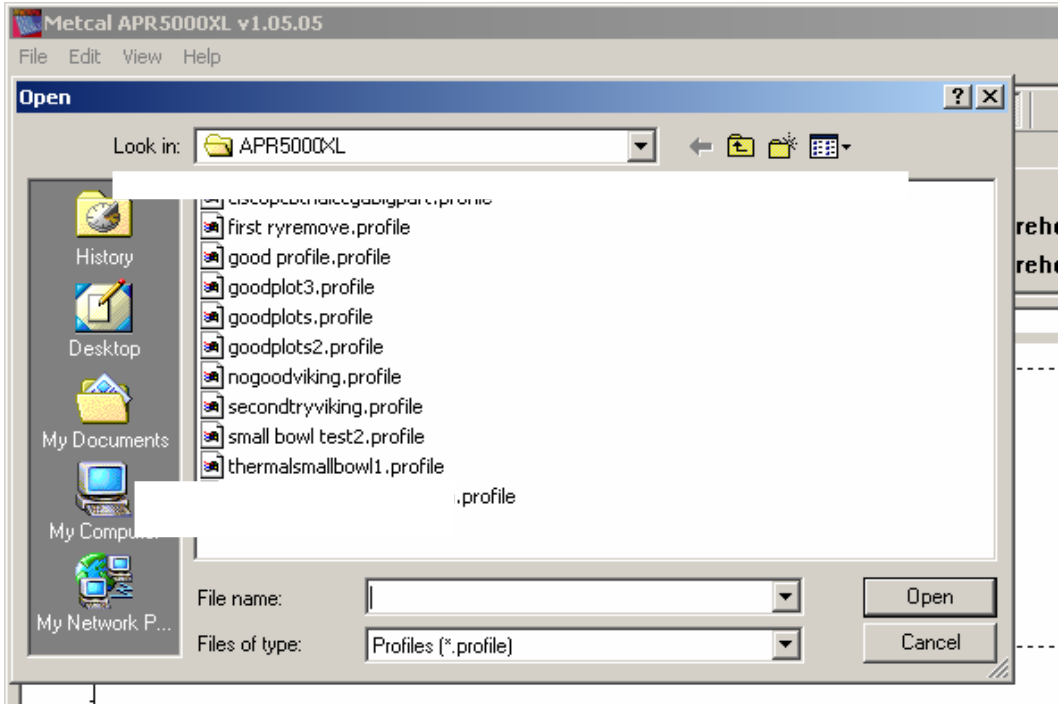


How can I use Manual Mode to remove or place a component?

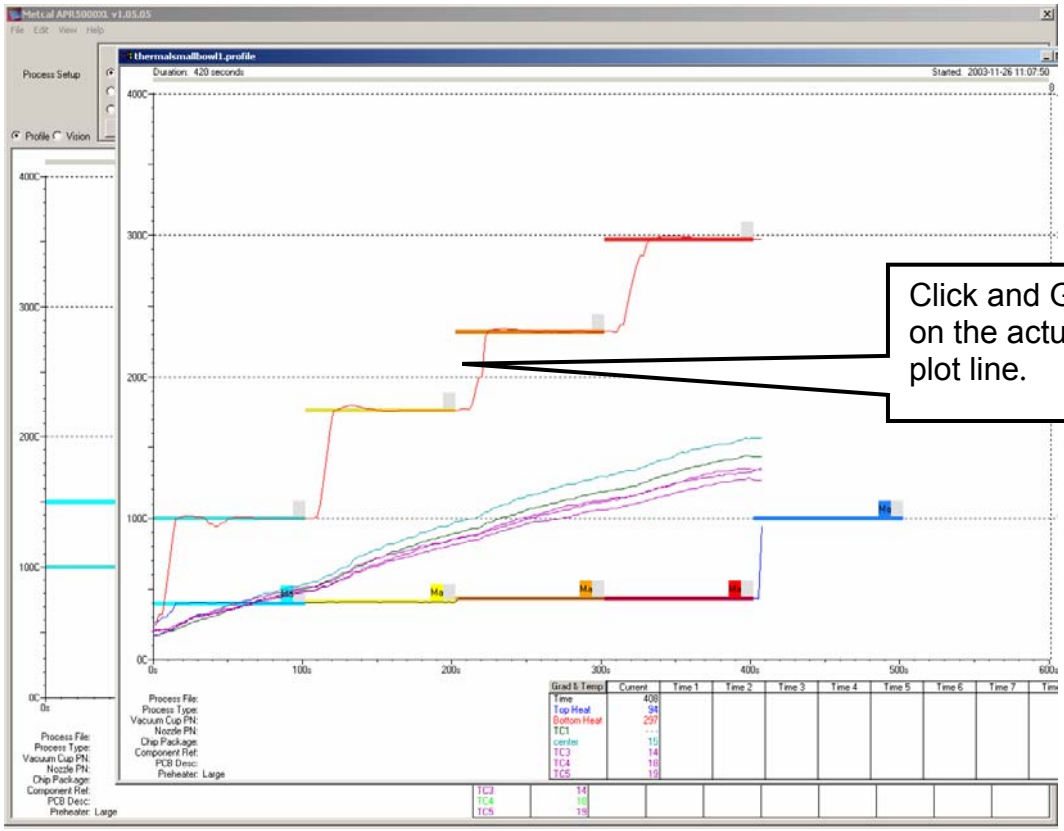
When you have reached this page, you have option to use any saved thermal plots in the library. To start, "Click" of ***File*** as shown below.



Pick the desired thermal plot from your thermal plot library that you have developed.

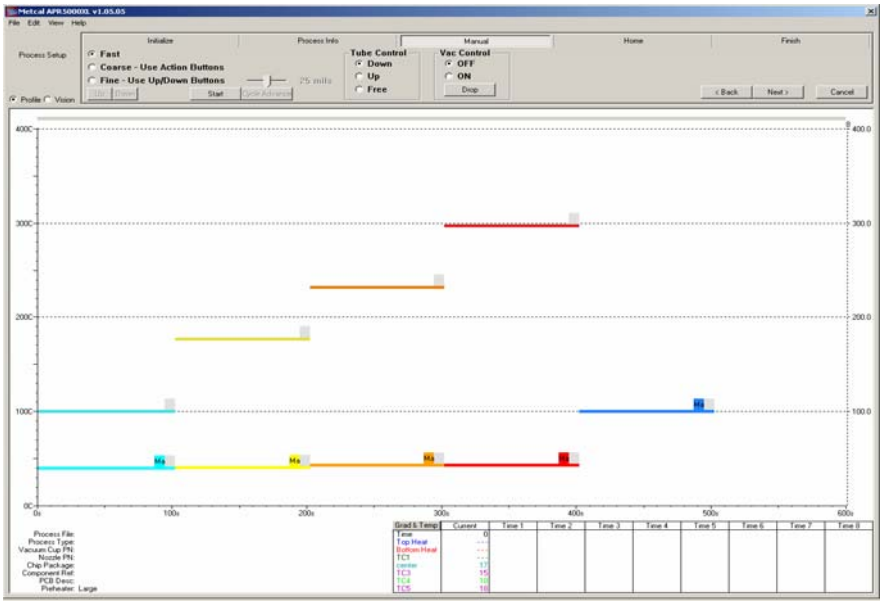


Once the thermal profile has been chosen, the profile will automatically appear in front of the ***Manual Mode Window.***



When the thermal plot is on the screen as shown above, use your left mouse key and "grab" the thermal plot and slide it into the ***Manual Mode Window.*** When the plot is properly "grabbed" from an actual plot bar, a small "Profile" glyph will appear . At this point, slide the "Profile" glyph onto the Manual Mode Window and the profile will copy over.

Transferred Thermal Plot

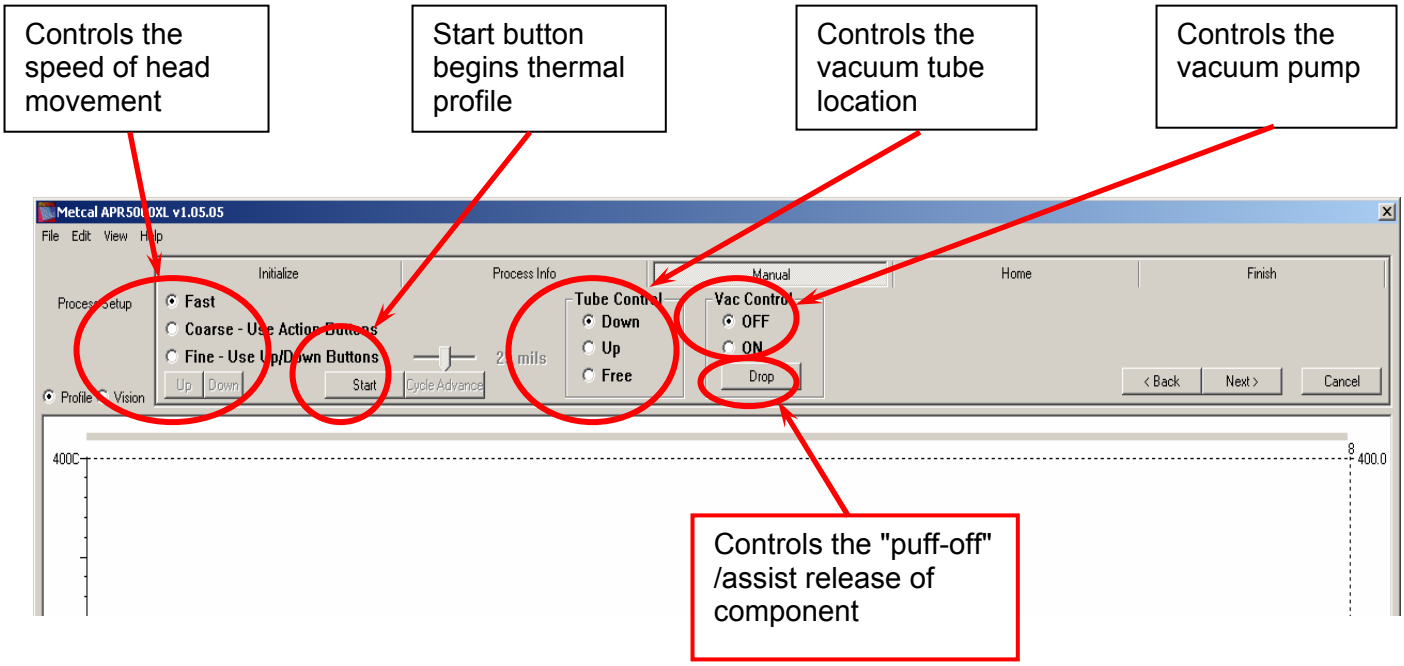


When the plot has been transferred to the ***Manual Mode Window***, proceed to Start the thermal cycle when ever you are ready to begin. Use the functions available to help you manipulate the mechanical functions of the APR-5000-XL.

Note- This is a temporary function that cannot be saved. By clicking on "Next", the ***Manual Mode Window*** will close. To start the thermal profile, press the **Start** button.

Quick reference guide.

- Direction of head movement
- Speed of head movement
- Vacuum tube movement
- Vacuum control
- Puff-off control



CAUTION

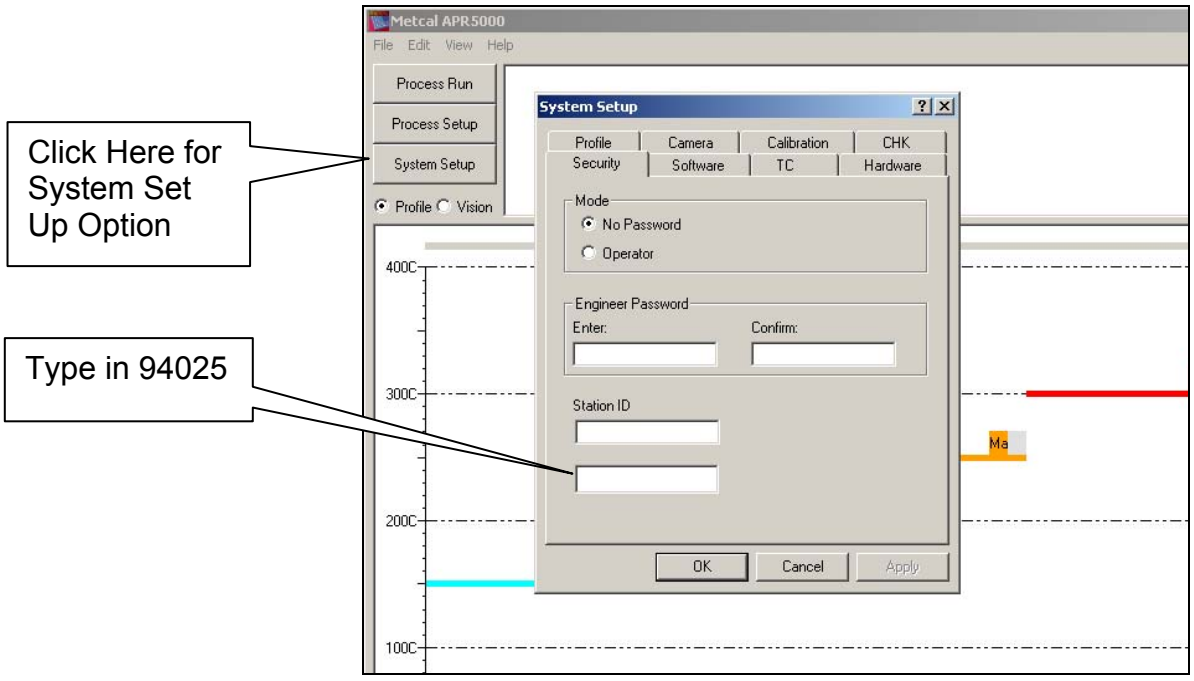
Please do not use your hand to catch the component.
Even after the cooling cycle the component can be extremely hot.

Nehmen Sie das Bauteil nicht mit der Hand auf, da es auch nach der Abkühlphase noch sehr heiß sein kann.

9. APR-5000-XL Test Tab Window

Set Up

1. Turn APR-5000-XL unit on and boot the APR-5000-XL Software.
2. Open System Set-Up by clicking System Set-Up.
3. Click on “No Password” button and enter the APR password 94025.



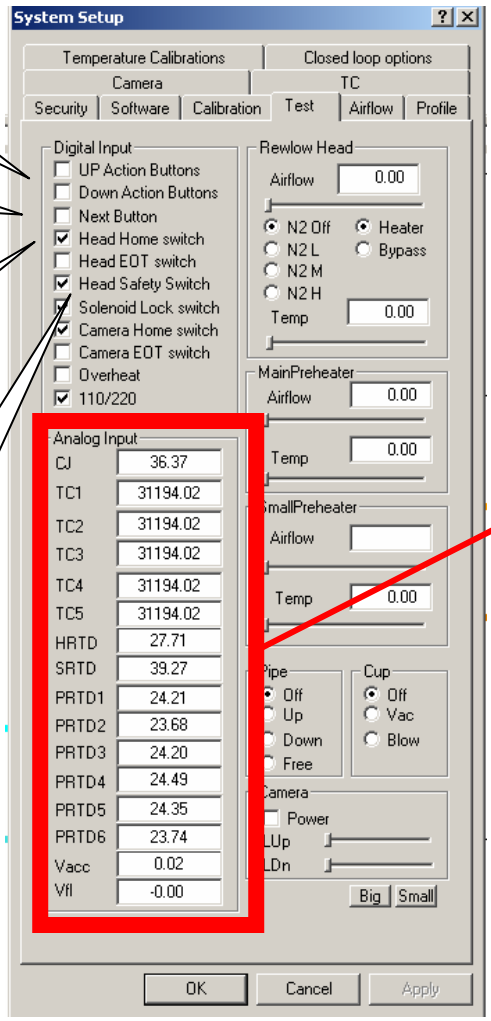
4. Click on the Test tab.
5. This test window must be exited as shown below.

Press Action Buttons as noted. Check mark identifies if buttons are working properly.

Press Next Button as noted. Check mark identifies if button is working properly.

Head Home switch check mark must be checked.

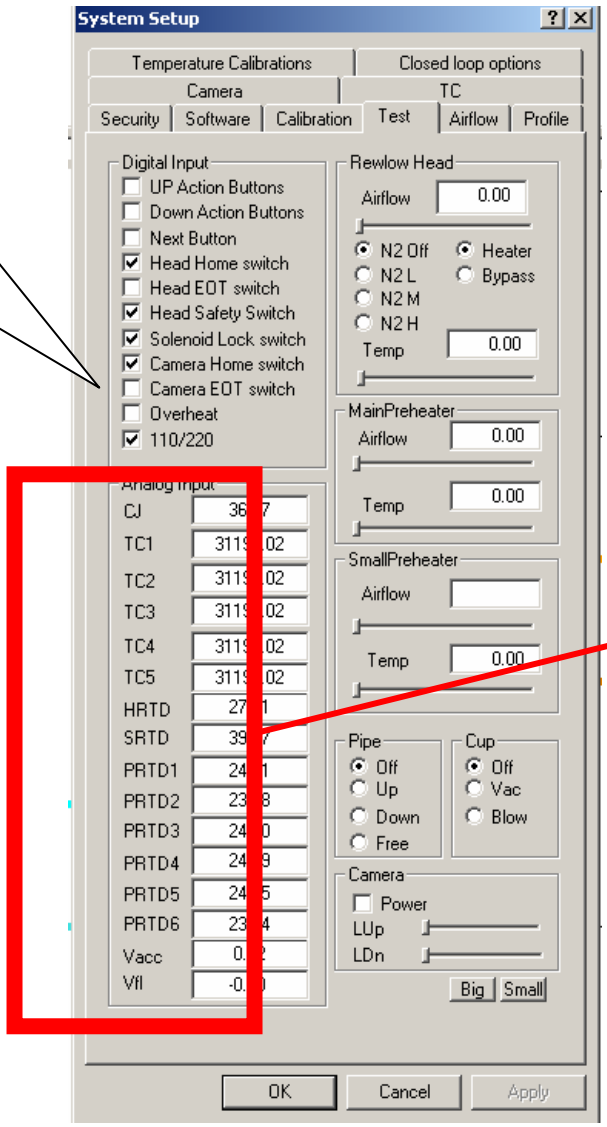
Physically lift head up. Head Switch must go off when head is lifted.



Inputs are not to be altered or tested.

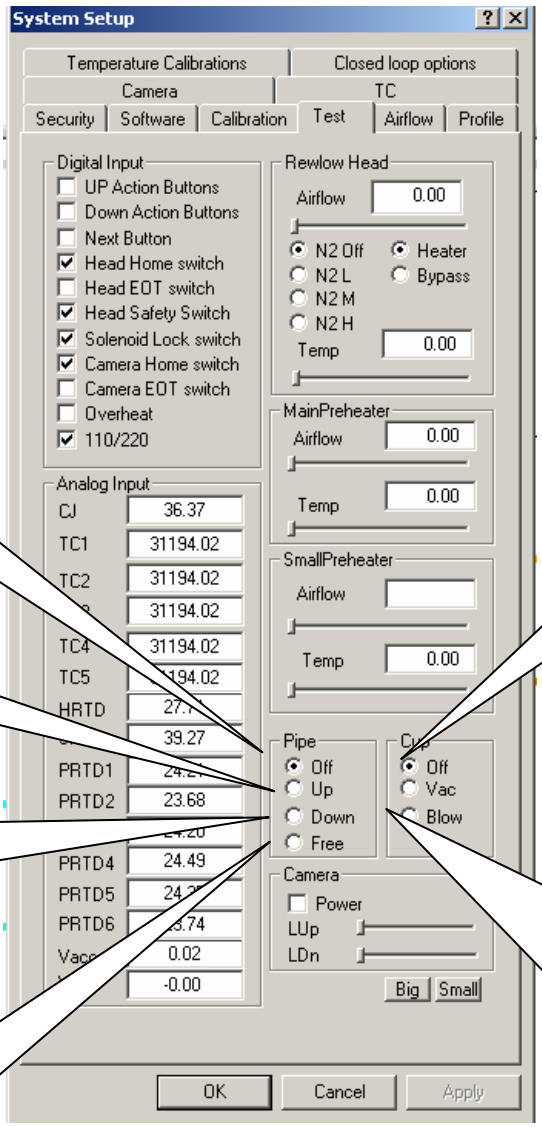
Notes

Physically pull camera out. Check mark toggles from Camera Home switch to Camera EOT switch.



Inputs are not to be altered or tested.

Notes



Motor is at idle.

Click The vacuum tube will retract.

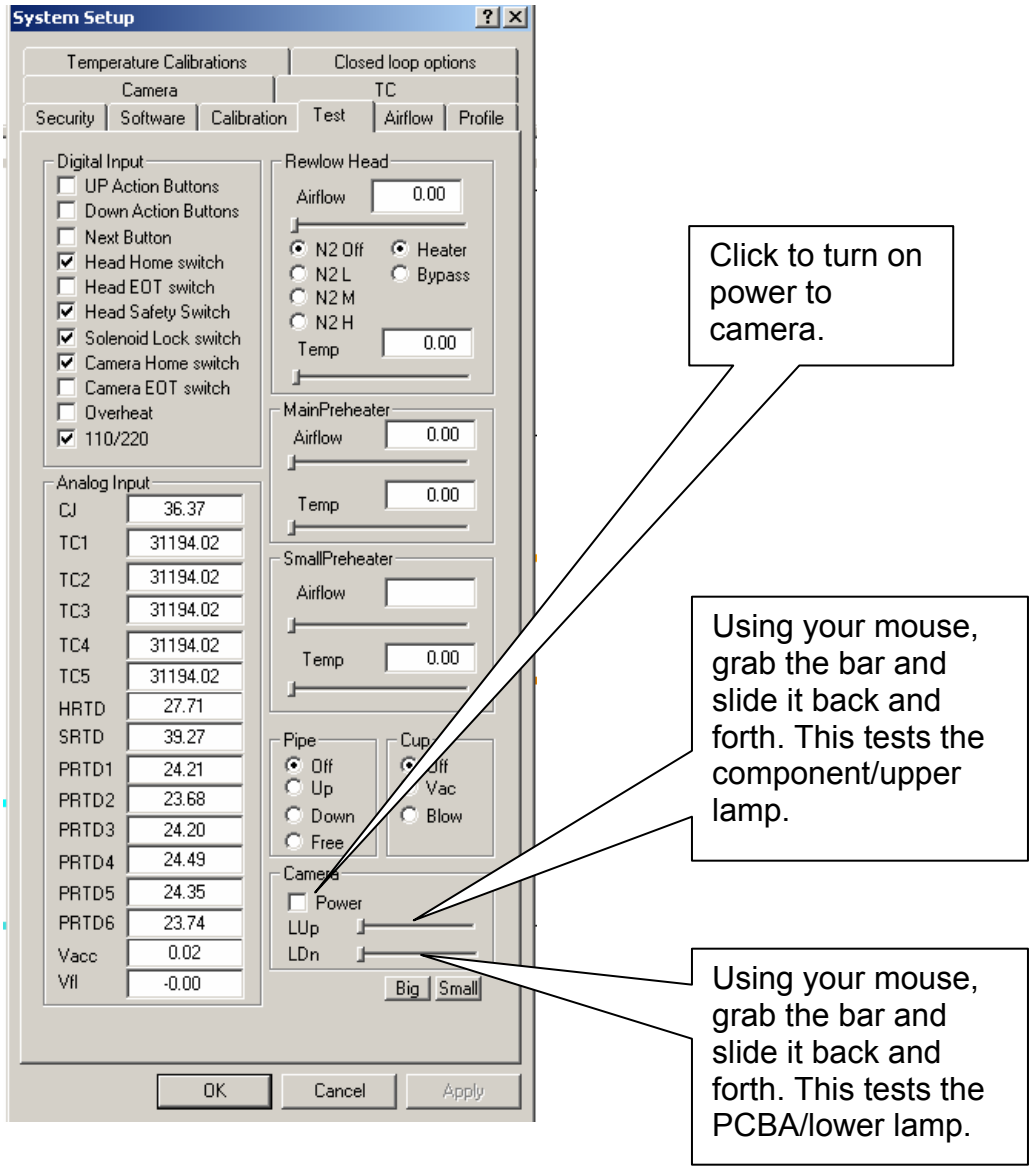
Click. When the button is depressed, the vacuum tube is extended and locked.

Click this button to check the pipette's component pick-up capability. When depressed, the vacuum tube will be free-floating.

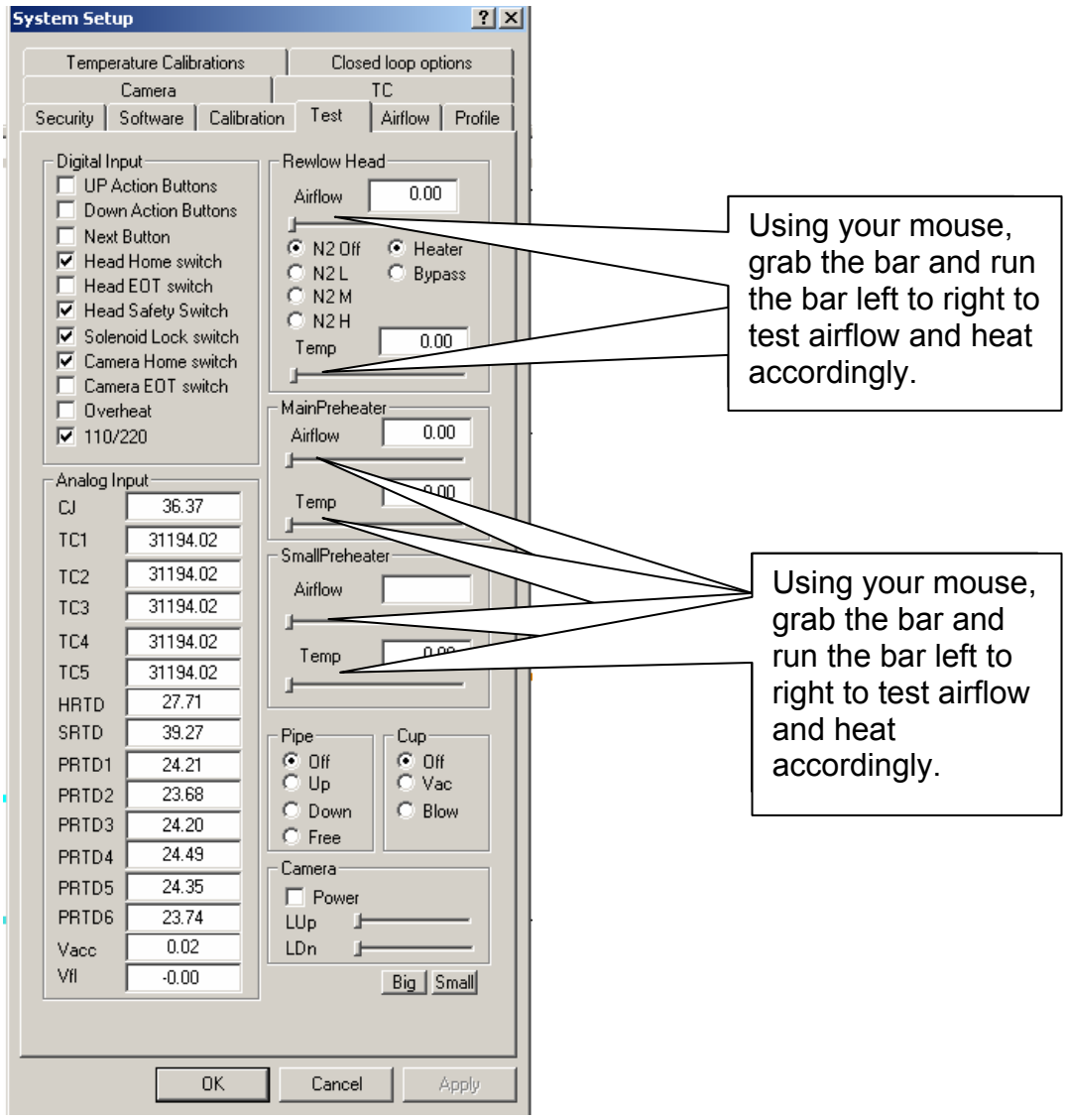
Click this button to check for vacuum pressure at the pipette. If the vacuum pressure is low or cannot lift a component, check the vacuum hoses and vacuum pump.

Click this button to check for component release air pressure. This has no minimum or maximum specification but must be able to release a component instantly from the vacuum pipette.

Notes


System Setup
Temperature Calibrations
Closed loop options
Camera
TC
Security
Software
Calibration
Test
Airflow
Profile
Digital Input
UP Action Buttons
Down Action Buttons
Next Button
Head Home switch
Head EOT switch
Head Safety Switch
Solenoid Lock switch
Camera Home switch
Camera EOT switch
Overheat
110/220
Analog Input
CJ 36.37
TC1 31194.02
TC2 31194.02
TC3 31194.02
TC4 31194.02
TC5 31194.02
HRTD 27.71
SRTD 39.27
PRTD1 24.21
PRTD2 23.68
PRTD3 24.20
PRTD4 24.49
PRTD5 24.35
PRTD6 23.74
Vacc 0.02
Vfl -0.00
Rewlow Head
Airflow 0.00
N2 Off
Heater
N2 L
Bypass
N2 M
N2 H
Temp 0.00
MainPreheater
Airflow 0.00
Temp 0.00
SmallPreheater
Airflow
Temp 0.00
Pipe
Off
Up
Down
Free
Cup
Off
Vac
Blow
Camera
Power
LUp
LDn
Big
Small
OK
Cancel
Apply
Click to turn on power to camera.
Using your mouse, grab the bar and slide it back and forth. This tests the component/upper lamp.
Using your mouse, grab the bar and slide it back and forth. This tests the PCBA/lower lamp.

Notes



Before exiting the troubleshooting window you must ensure all check marks are in their original position. Failure to do so will hinder the performance of your APR-5000-XL and may cause a Process Run failure.

When any tests or adjustments are done and the test window is closed, a grey reset window will appear. This is normal when resting the APR-5000-XL software.

Notes

10. APR-5000-XL Head Alignment Procedure

The Head Alignment procedure details the correct process necessary to center the image and vacuum tube in the center of the monitor. This process consists of two process must be finished before the ***Optical Calibration*** procedure. These steps are ***Vacuum Coplanar Calibration*** and ***Head X-Y Calibration***.

Vacuum Coplanar Calibration

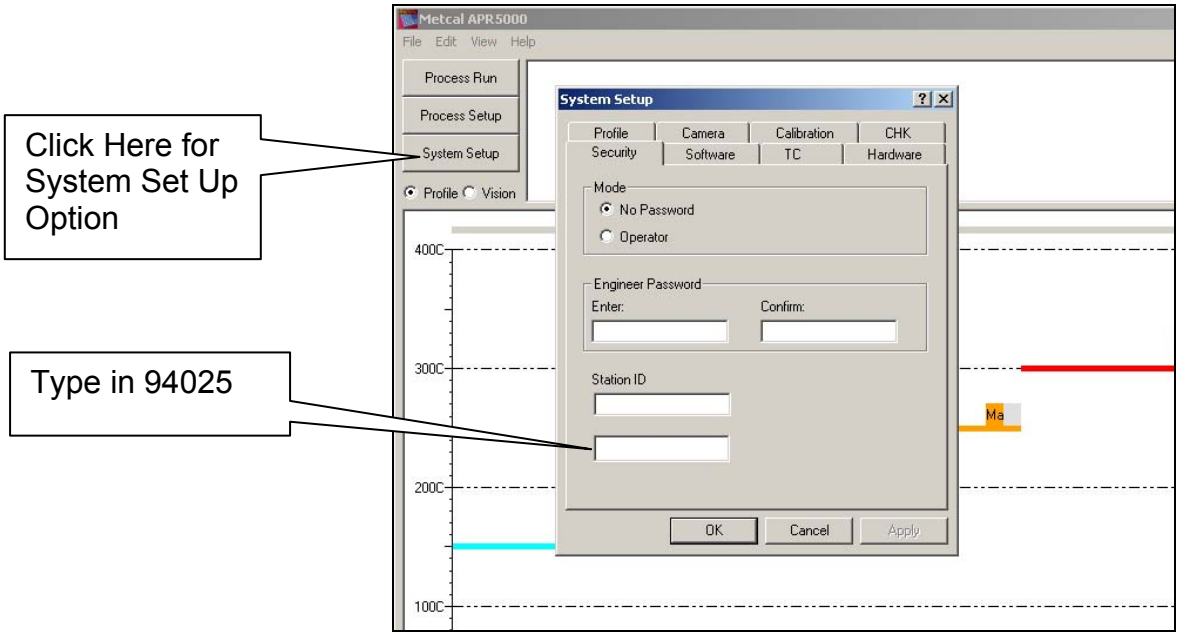
Tools Required

VNZ-12 Vacuum Nozzle
Glass Optical Calibration Tool
Allen Keys

Procedure

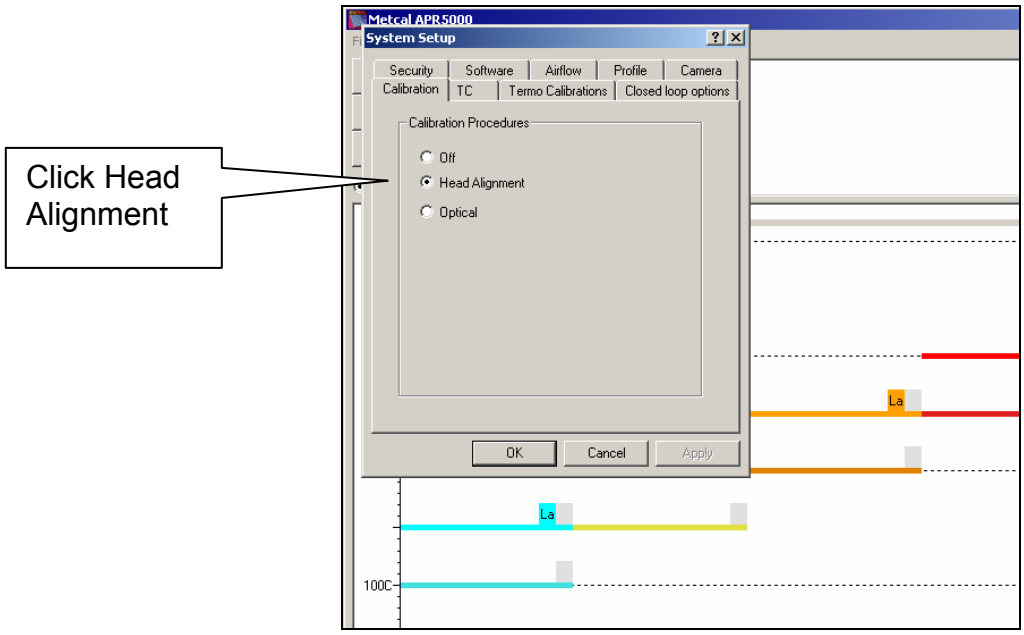
1. Turn APR-5000-XL unit on and boot the APR-5000-XL Software.

2. Open System Set-Up by clicking System Set-Up.

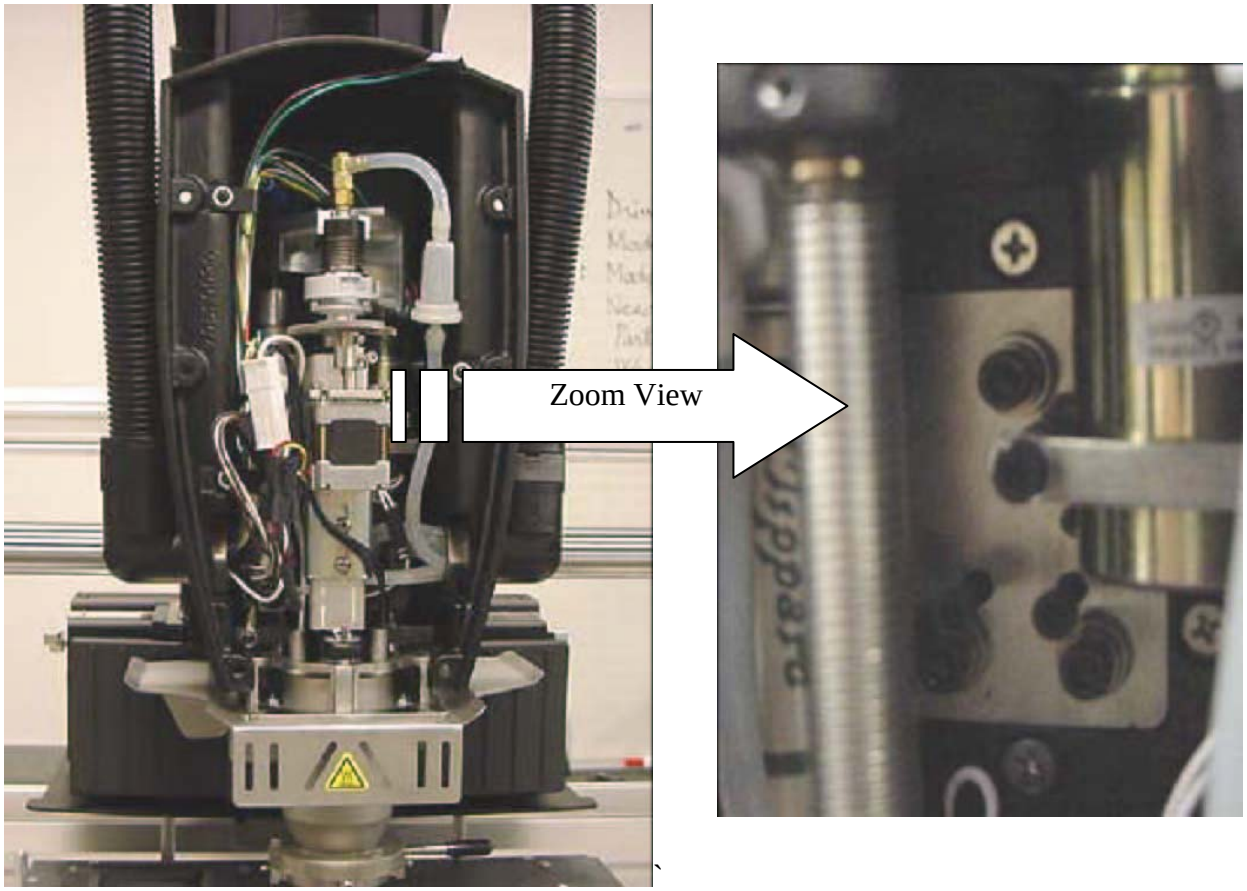


3. Click on “No Password” button and enter the APR password 94025.

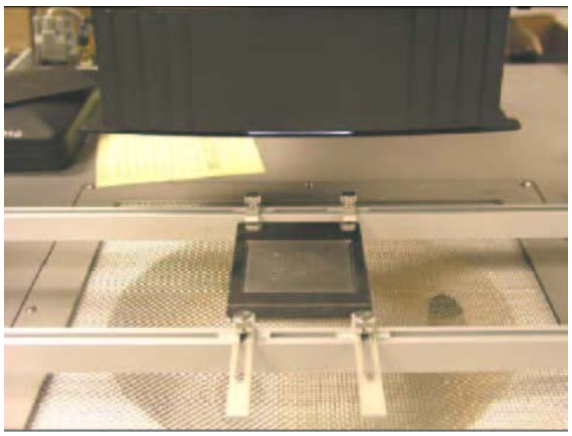
4. Open Calibration Screen and Click on Calibration to set reflow to table co planarity. (See next page). The APR head will be in the “home”/up position.



5. Carefully remove the front cover of the reflow head and hold into place using a using a tie-wrap or equivalent. Note the location of the side-to-side and to-fro adjustment screws on the left side of the vacuum tube. Do not loosen yet.



6. Reverse-mount the Optical Calibration Tool onto the board holder and use glass top on bottom surface of matching plate as shown.

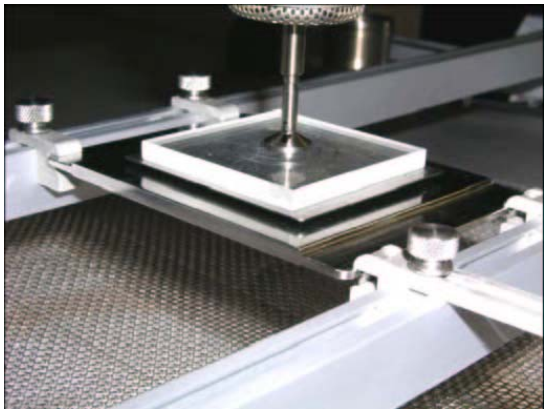


7. Take vacuum nozzle #12, remove rubber o-ring and attach the vacuum nozzle to the APR.

Removing the o-ring allows you to optimize the vacuum pick-up point accuracy.

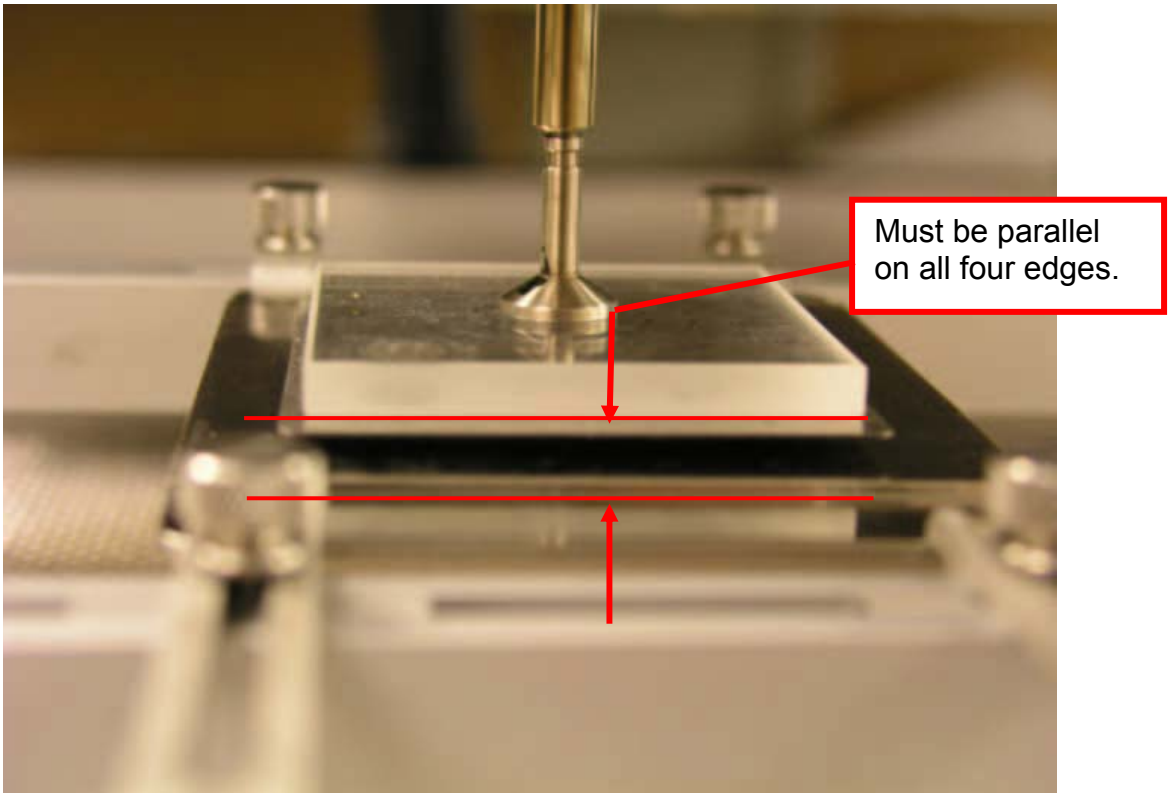
8. Follow prompts past the vision calibration to when the vacuum engages.

9. Next, mount the Glass Calibration plate on vacuum nozzle and, using the down action keys, lower the Calibration Mirror approximately .25” over the reverse-mounted calibration plate.

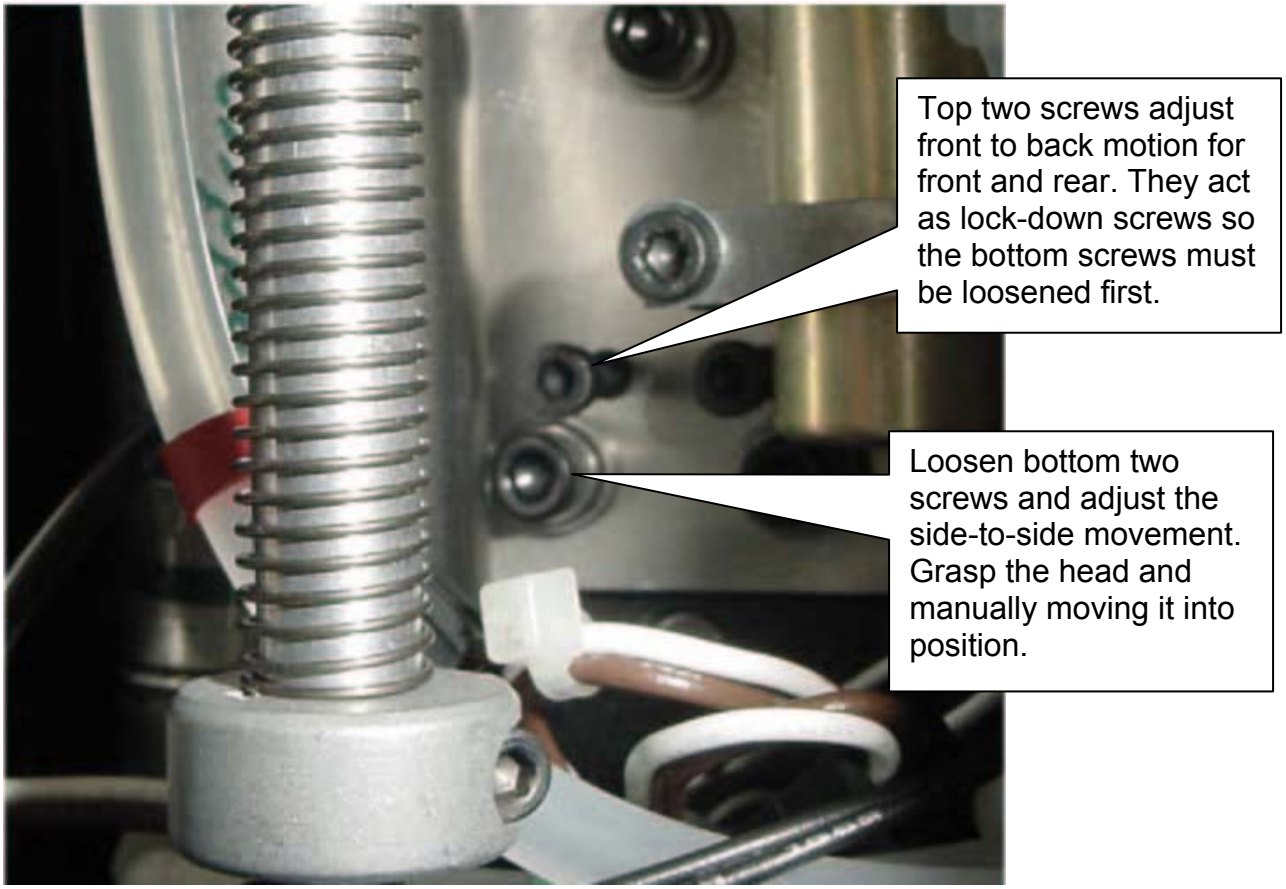


10. Using your software options, fine control reduce the lowering speed to .001”-.010 ″. Reducing speed will increase you field of view.

11. Using the down action keys, lower the glass stencil plate until it nearly touches the reverse-mount the Optical Calibration Tool and check distance to be parallel on all four edges.



12. If the calibration mirror is not parallel to the reverse-mounted metal plate, loosen the adjustment screws as necessary and adjust the head manually until the mirror is parallel to the reverse mounted calibration tool. Top two screws adjust front to back motion for front and rear. They act as lock-down screws so the bottom screws must be loosened first. Loosen bottom two screws and adjust the side-to-side movement. Grasp the head and manually moving it into position. Refer to the picture below.



Note- For a final test, lower the glass stencil plate to the reverse mounted tool, release the glass stencil and attempt to pick-up the plate. If aligned correctly, the steel vacuum pipette will pick up the component. Adjust as needed.

13. When the glass stencil plate is parallel to the reverse mounted Optical Calibration tool, tighten the lock screws and reassemble font cover to APR heater head.

Notes

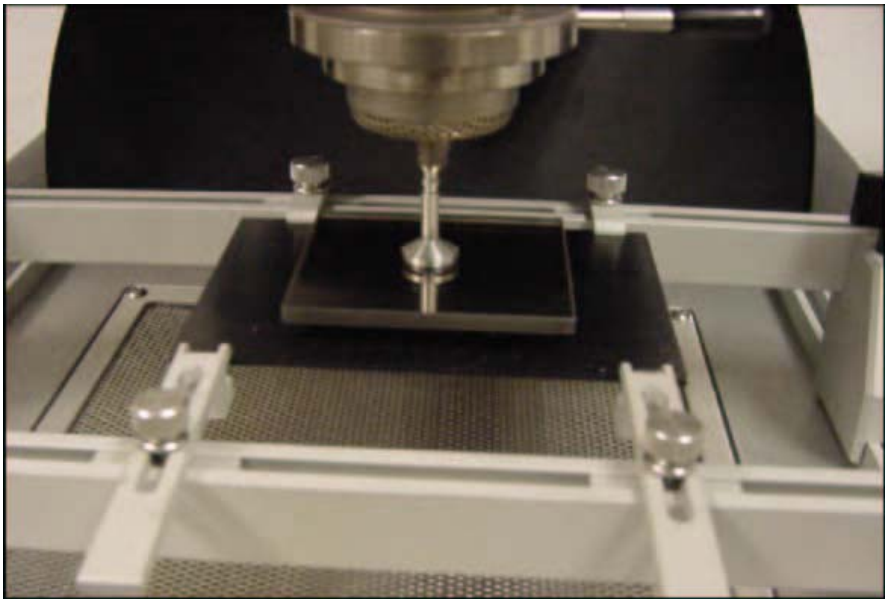
APR-5000-XL Pickup Nest Coplanar Adjustment

The Pickup Nest Coplanar Adjustment is critical for accurate placement of the component as it determines where the component will be picked and where the rotation of the component will occur. If the pickup point is not established before proceeding the calibration routine may not yield the desired results.

Tools Required:

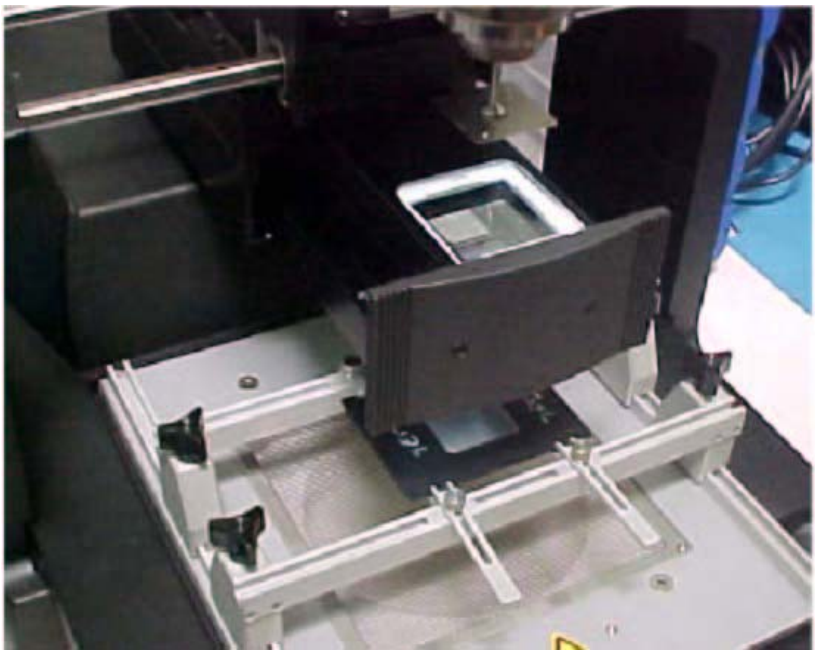
Large Vacuum Nozzle
Calibration Fixture
Allen Keys

1. Drive the motor head down to the PCB pick up point and pick up the centered mirror.



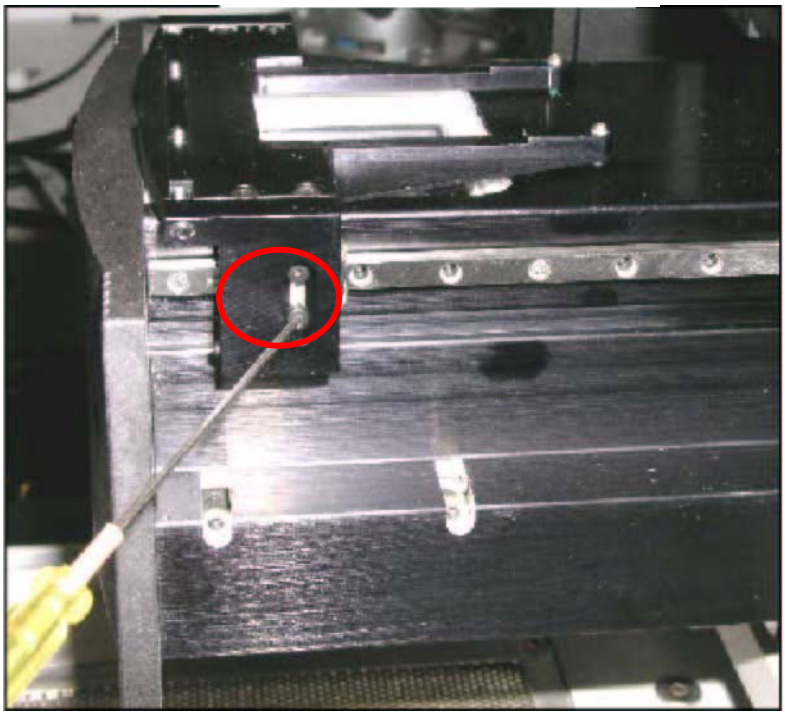
2. Follow the prompts on the screen.

3. Drive motor up until the head is above the centering fixture. Pull out the camera.

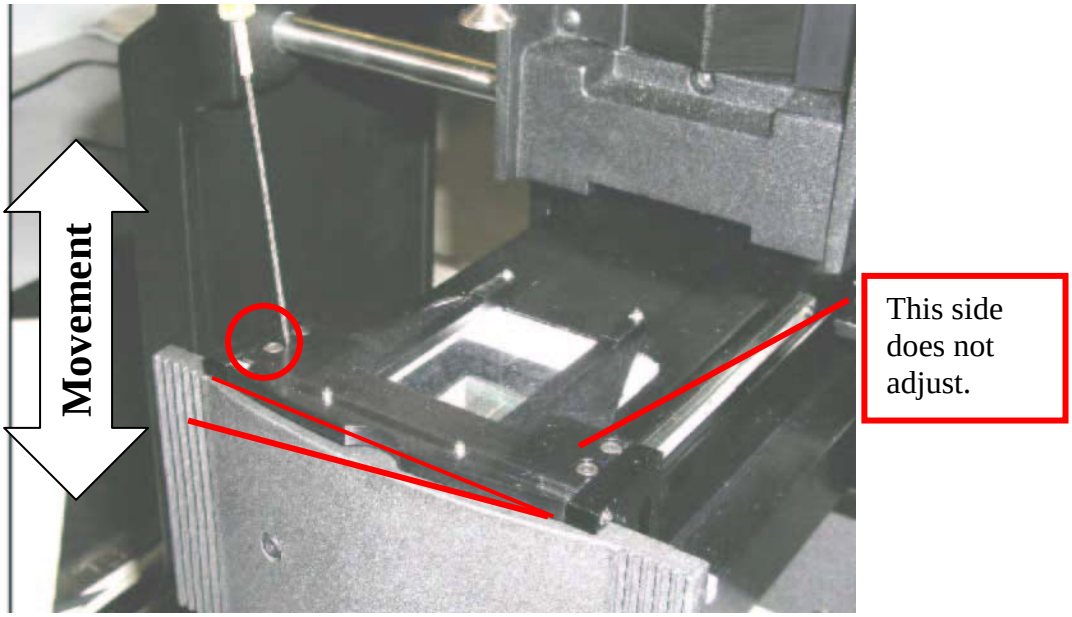


4. Pull out slide and loosen pick-up point lock-down screws. Lock Down Screws are located opposite each other on the camera for optimum adjustment.

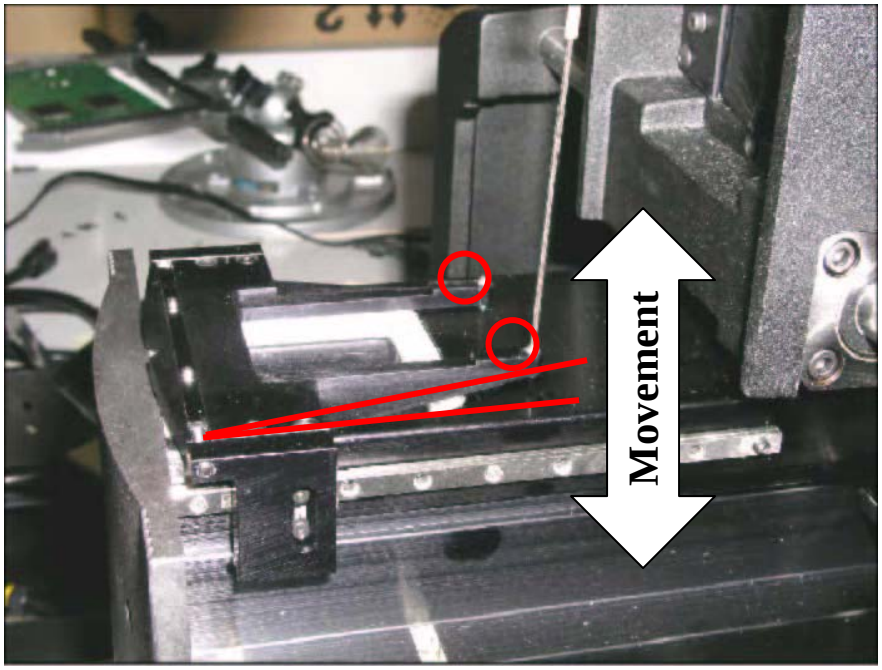
Lock Down Screw



5. Adjust side to side as needed and front to rear as needed with mirror near the pick up point as a gauge.

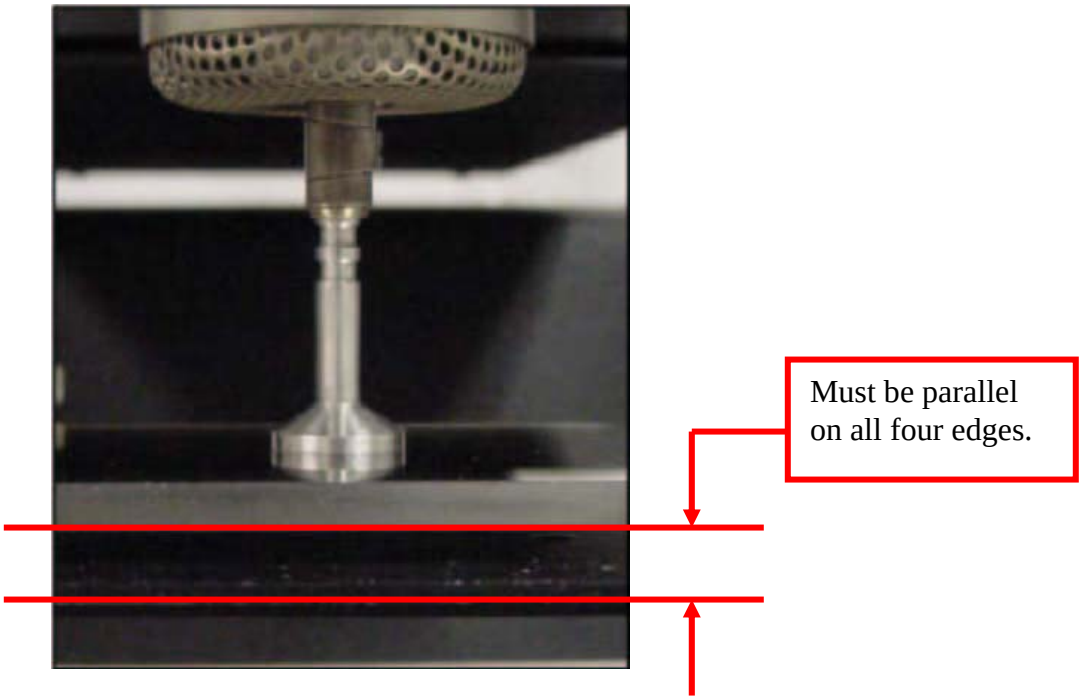


Side to Side Adiustment



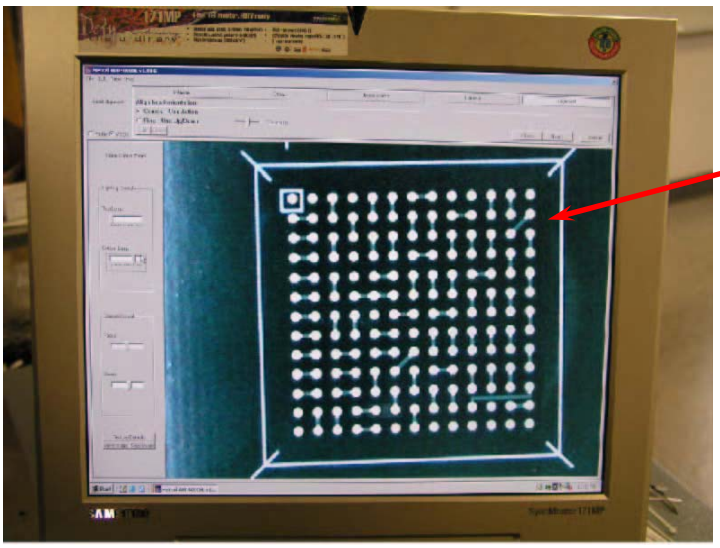
Front to Rear Adjustment

6. Adjust until mirror is parallel to the pick up fixture. When parallel (see below), tighten the lock-down screws.

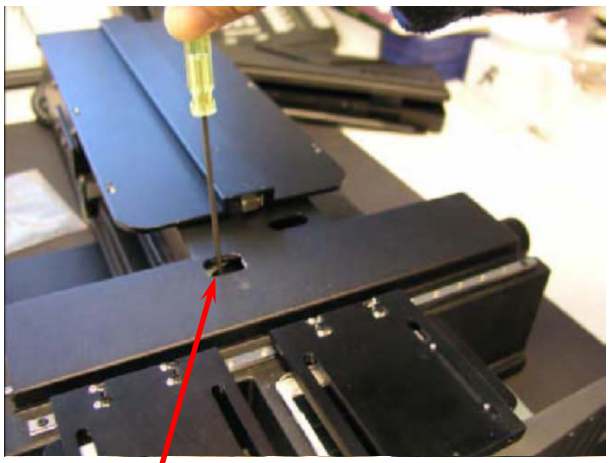


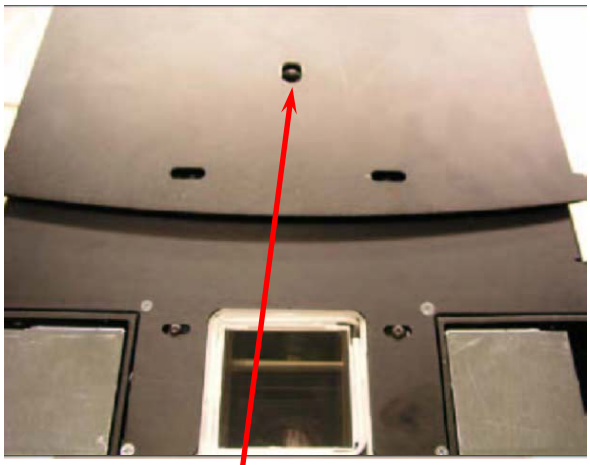
Notes

Rotational Error of Picture in Monitor Adjustments



This can be adjusted by loosening top locking screw. Then making very small adjustments to the leveling screw on the underside of camera box. When picture is square lock top screw up again.





11. APR-5000-XL Optical Calibration Procedure

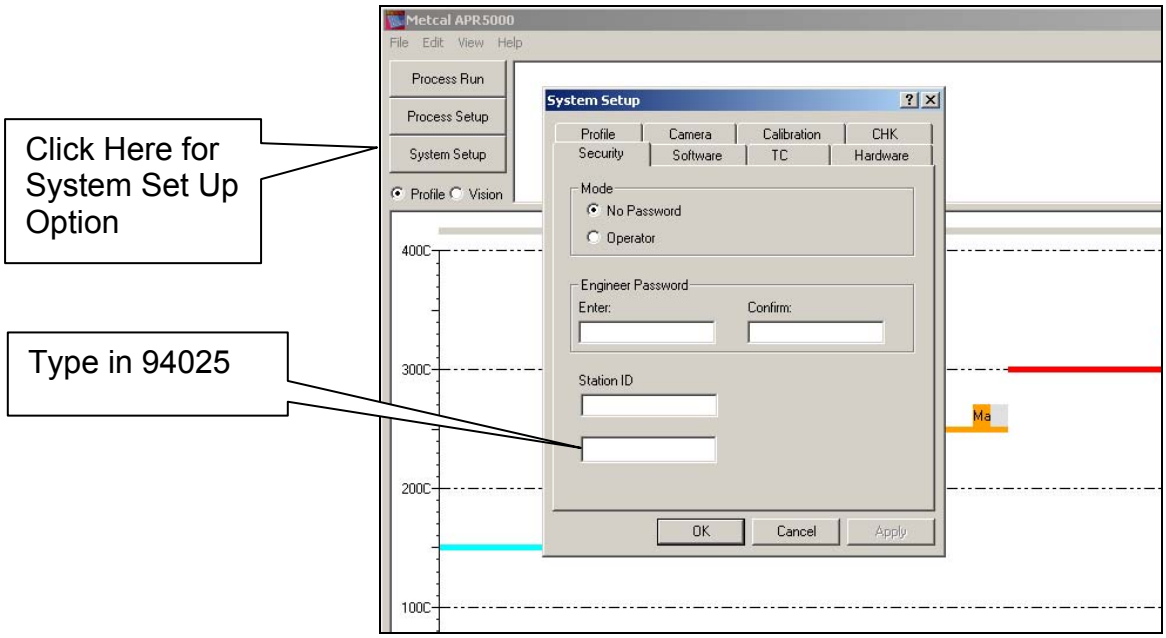
Tools Required:

VNZ-12 Vacuum Nozzle
Vision Calibration Tool
Allen Keys

Procedure

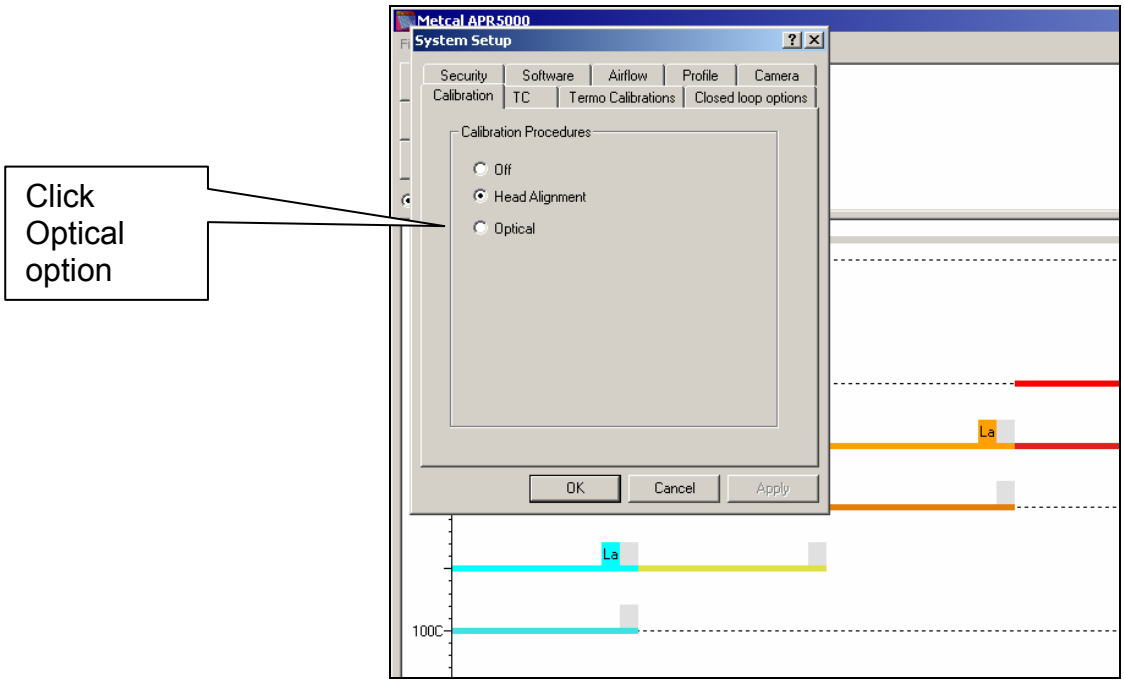
1. Turn APR-5000-XL unit on and boot the APR-5000-XL Software.

2. Open System Set-Up by clicking System Set-Up.



3. Click on “No Password” button and enter the APR password 94025.

4. Open Calibration Screen and Click on Calibration to set reflow to table co planarity. (See next page). The APR head will be in the “home”/up position.



5. Place the optical calibration plate into position as shown below. The calibration fixture must be central to the pre-heater grate.

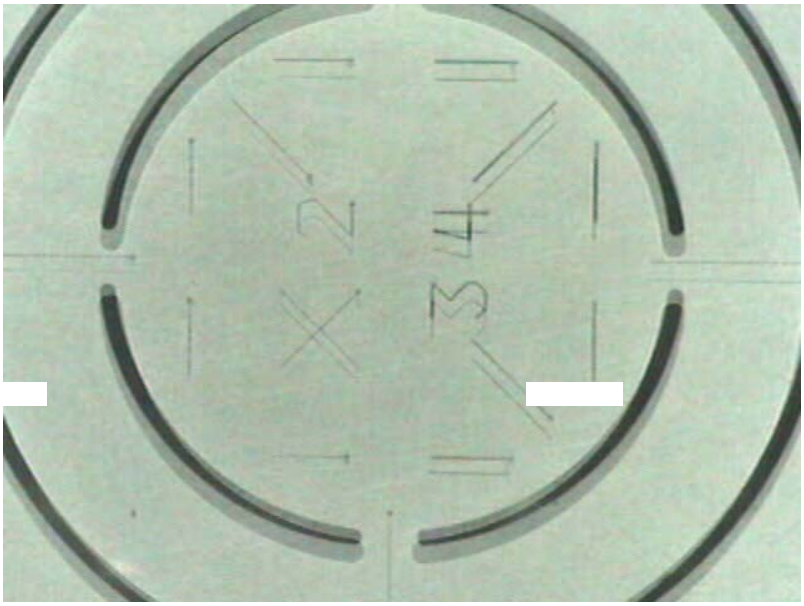
6. Pull camera out and zoom up to see picture below. Focus in on the bottom calibration plate using focus control on software, then drive head down to bring vacuum cup and calibration plate into focus. Do not touch focus control again.

7. Follow software prompts.

8. Pick up top plate.

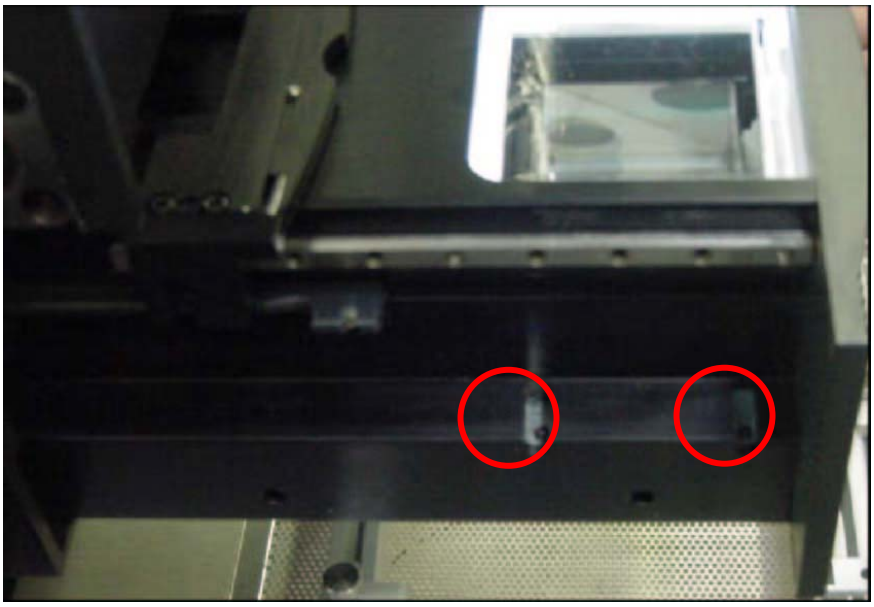
9. Drive above camera and verify focus of bottom to top fixture.

10. Use fine “Z” axis head control to adjust top plate in focus. ***Do not use software focus control***. Only use the focus control to focus on the bottom plate. Use lighting controls to see top then bottom plate clearer.



Example of unit Out of Calibration

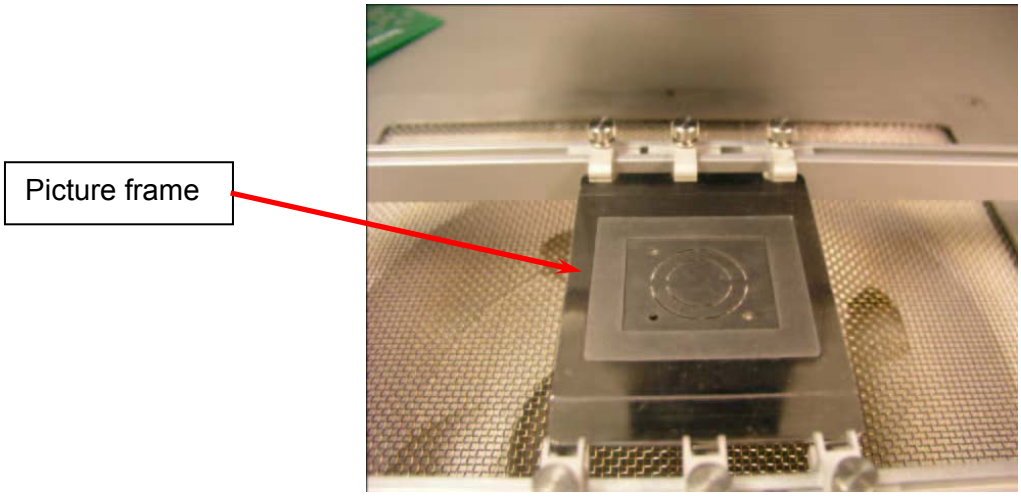
11. Adjust the optical adjustment screws located on the side of the camera until the component image overlays the calibration plate image. The screws should be turned in a clockwise direction to adjust prism if left loose the prism will not be held tight and may result in un-repeatable placement errors as prism may move in camera movement. The three screws are set in a triangle and a combination of the three screws will calibrate the calibration plates perfectly if care is taken.



Optical Adjustment Screws

Note: The prism adjustment screws are adjusted as needed to overlay the top and bottom gun sight images. Each of the three screws can be adjusted as needed to achieve this. (Camera shown is APR-5000-XL version.

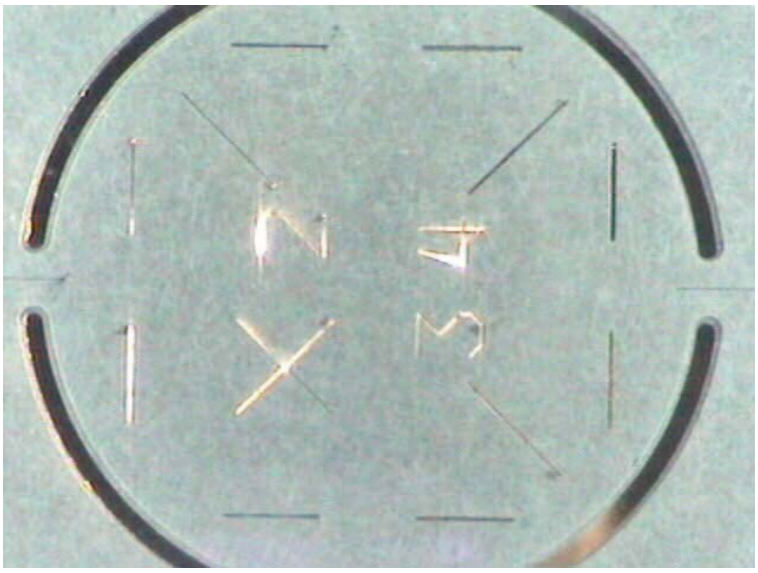
12. Follow the directions on the screen.
13. Once the two plates are optically perfect one on one.
14. Place picture frame into bottom cal fixture to space the top plate from the bottom plate. This is used to stop mechanical alignment of top plate to bottom plate and acts as a spacer. (See below).



15. Before placing bottom plate it is a good idea to now move the head with the joystick and then realign with joystick to exact overlay this will prove 100% placement accuracy.

16. Return camera and follow instructions to place top plate on bottom calibration plate.

17. To verify optical calibration and placement, using the 90º bent light source provided in the kit, light the under side of the numbers. When the calibration is correct, light will pass through the numbering and it will be visible. Letter 2 represents .002″ cut through, letter 3 represents .003″, and 4 represents .004″. The X is a .002″ and shows rotation inaccuracy if light is blocked. If by moving the light underside you can see all the numbers and the x clearly; placement and calibration are complete.



Notes

12. Centralization of Vacuum Nozzle in Software Window

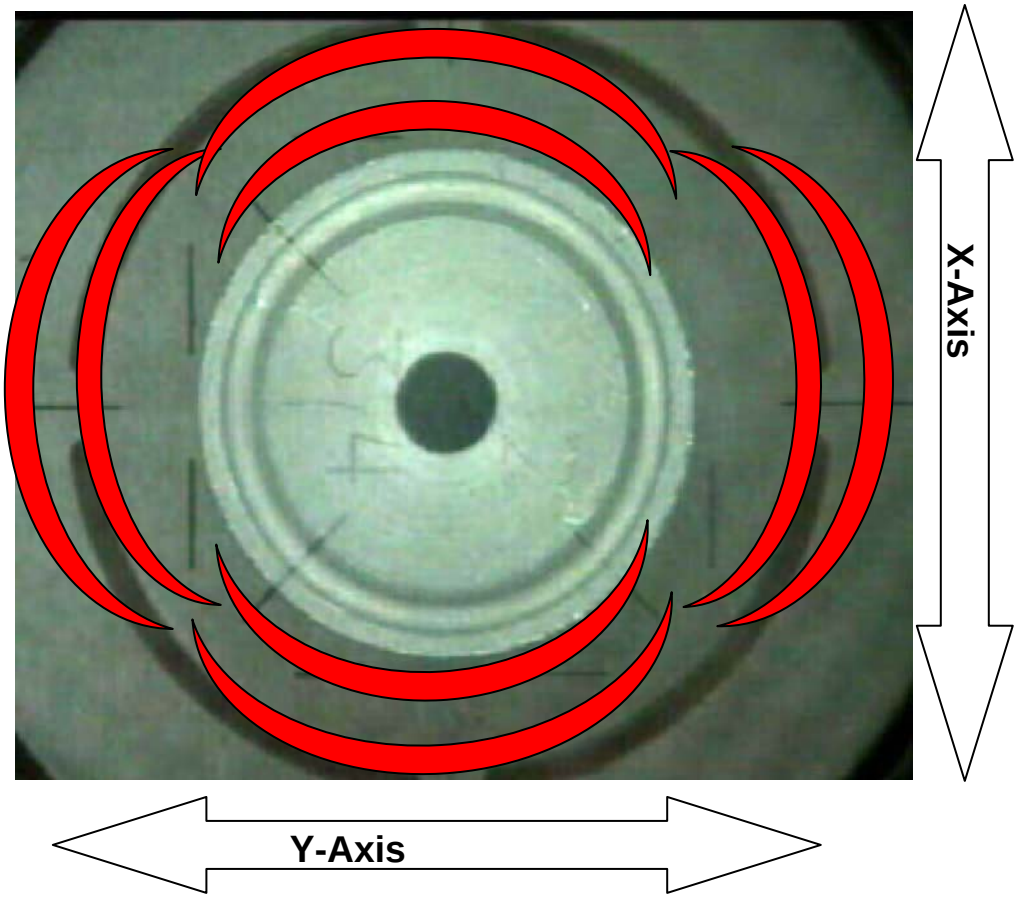
Tools Required:

VNZ-12
Glass Optical Calibration Tool
Ball Allen Keys

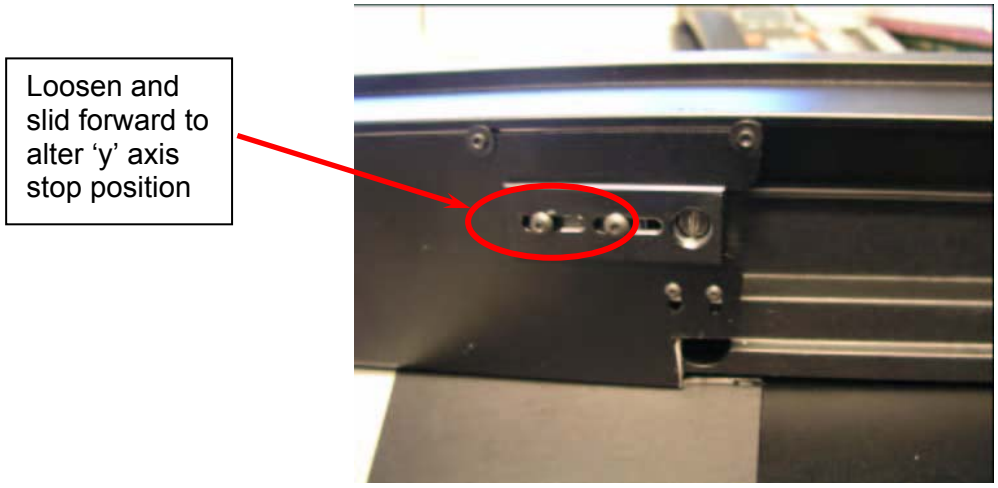
Procedure

1. Place the optical calibration plate into position as shown below. The calibration fixture must be central to the pre-heater grate.

APR-5000-XLS camera featured

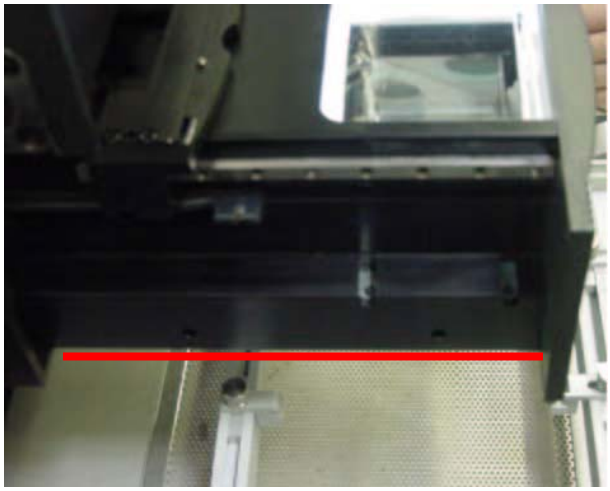


2. If the vacuum nozzle image is not centered in the software window the in Y-axis movement, adjustment the image using the Y-Adjustment screws using the appropriate Allen key.

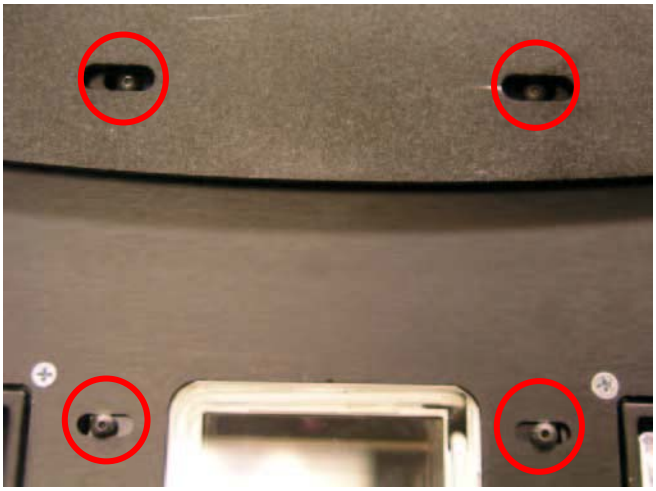


3. If the vacuum nozzle image is not centered in the software window in the X movement, remove the camera heat shield plate and loosen the four camera lock-down screws located underneath the front part of the camera. (Single camera version.)

Camera Heat Shield



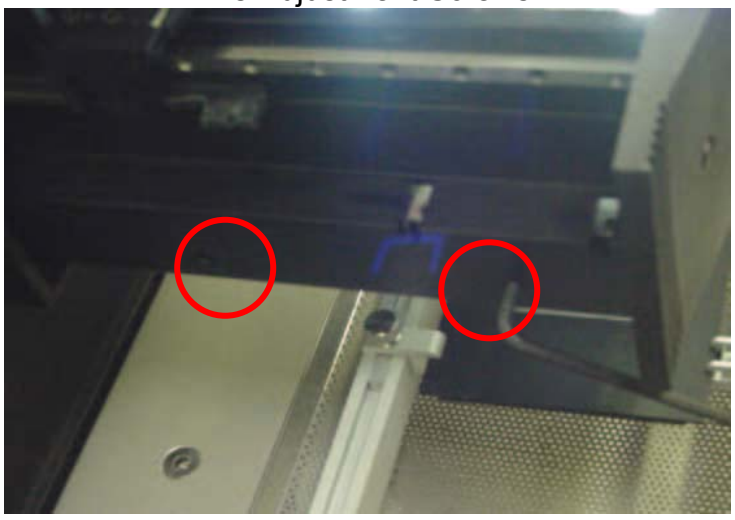
Camera Lock-Down Screws



\

4. When loosened, adjust the X-axis movement as needed to align the vacuum nozzle image to the center of the software image window.

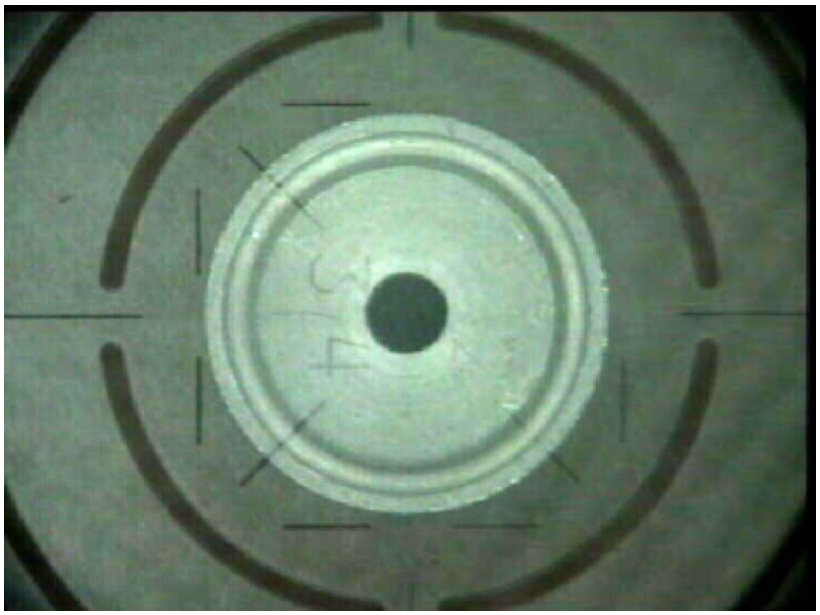
X-Axis Adjustment Screws



Note: When adjusting X-axis make to adjust both screws on each side equally.

5. When the image is centered, tighten the camera lock-down screws located underneath the front part of the camera (screws identified in step 5 above).

6. The final image should have the vacuum cup centered in the software window. Now the vacuum head is central to the camera.



7. Click the “Next” key and follow the prompts on the monitor.

Notes

13. APR-5000-XL Quick Nozzle Co-planarity and Vacuum Nozzle Adjustment

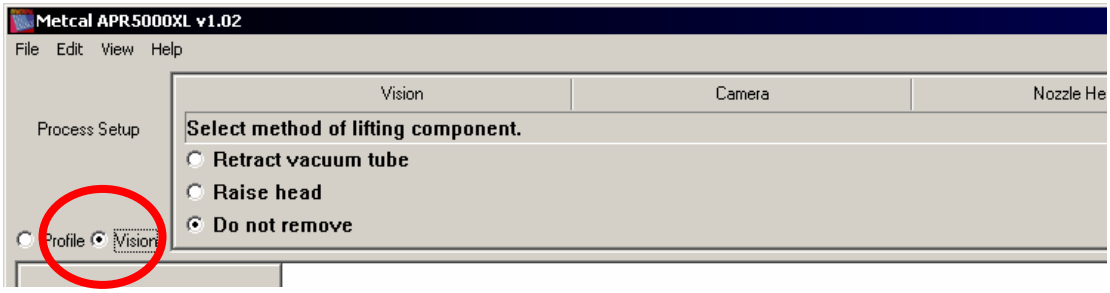
In the rare case that the vacuum nozzle is not central to the box nozzle after the unit has been calibrated the APR-5000-XL does allow for some adjustment

Tools Required:

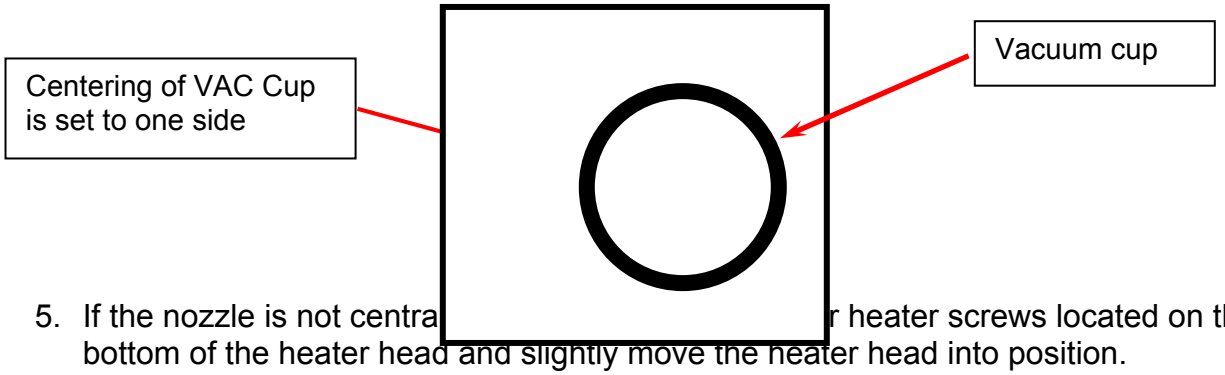
Any Vacuum Nozzle
Vision Calibration Tool
Allen Keys

Procedure

1. Turn APR-5000-XL unit on and boot the APR-5000-XL Software.
2. Open any standard placement or removal process per the instructions in this manual
3. Once a process has been opened, click on ***Vision.***

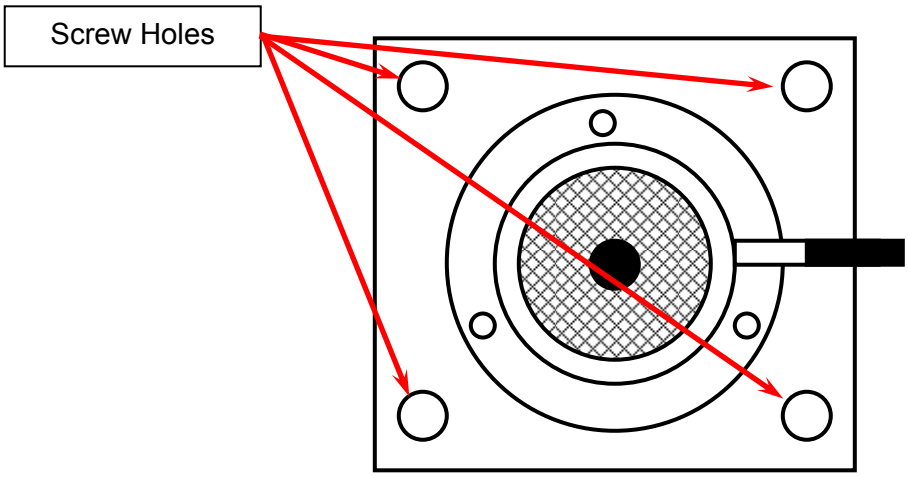


4. View the image on the monitor. If the image of vacuum cup is not central to the nozzle, proceed to the next step.



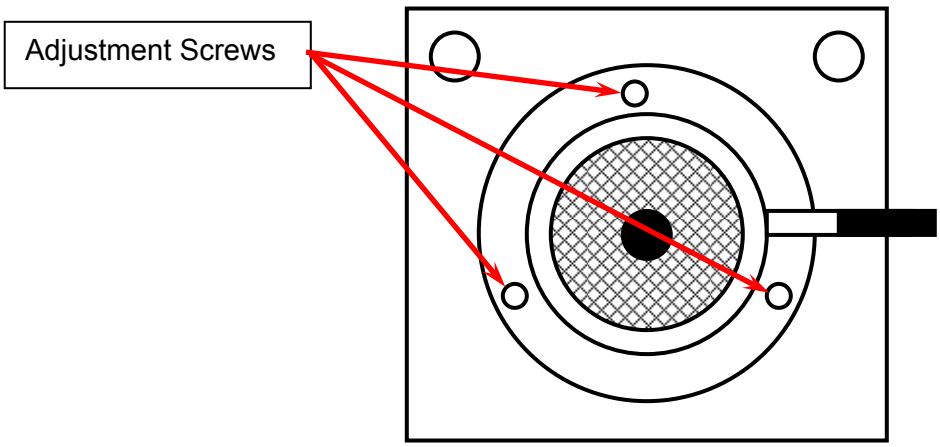
5. If the nozzle is not centra r heater screws located on the bottom of the heater head and slightly move the heater head into position.

Bottom View



6. If the nozzle is not complainer to the PCB insert the small Allen key into one of the three holes located on the inner ring and adjust. This provides the end user with an angular adjustment of nozzle to PCB.

Bottom View



Notes

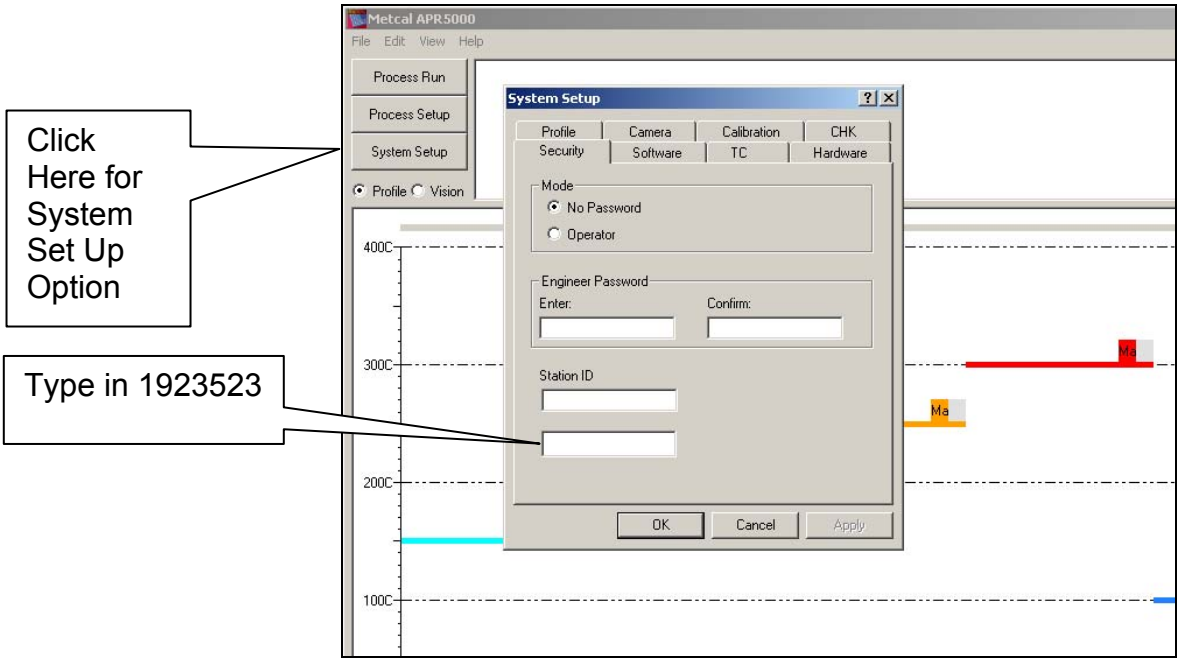
14. APR-5000-XL Thermocouple Calibration

Tools Required:

Thermal Injection Meter
Convection/Thermal Calibration Thermocouple
Thermal Calibration Fixture for XL

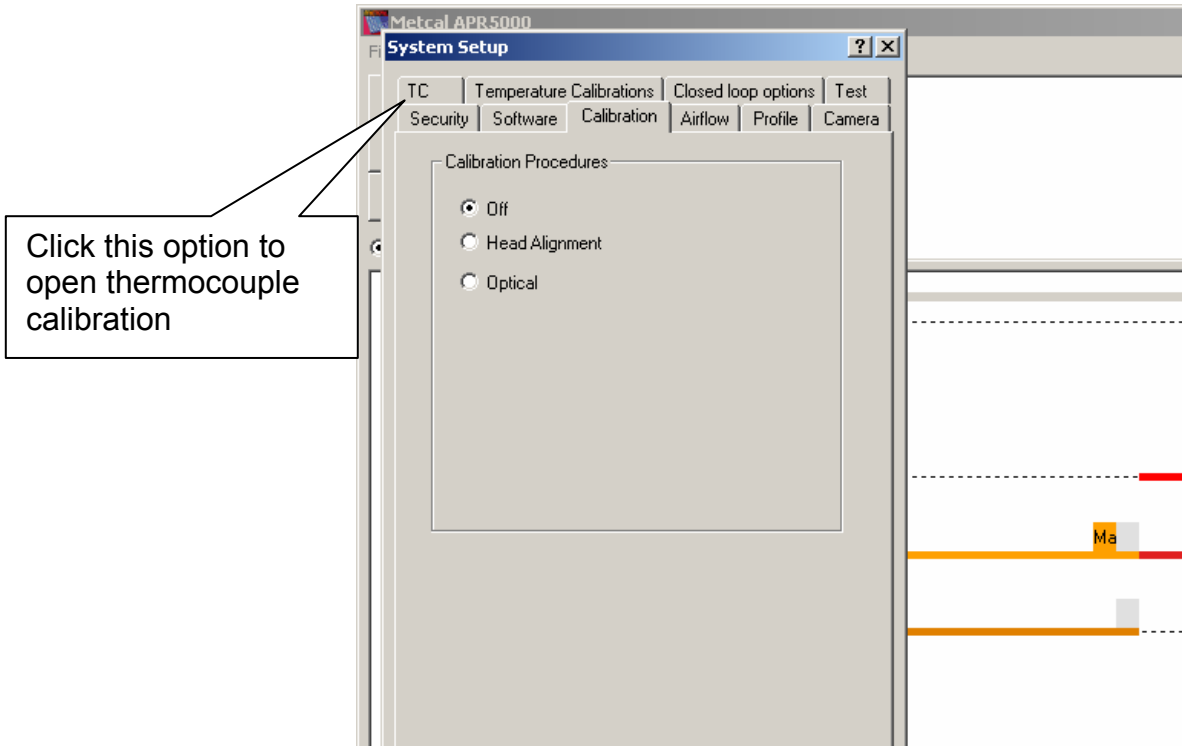
Procedure

1. Turn APR-5000-XL unit on and boot the APR-5000-XL Software.
2. Run a default profile without taking to warm up the machine inside to get repeatable measurements.
3. Open System Set-Up by clicking System Set-Up.
4. Click on “No Password” button and enter the “engineer’s” APR password 1923523 and return.



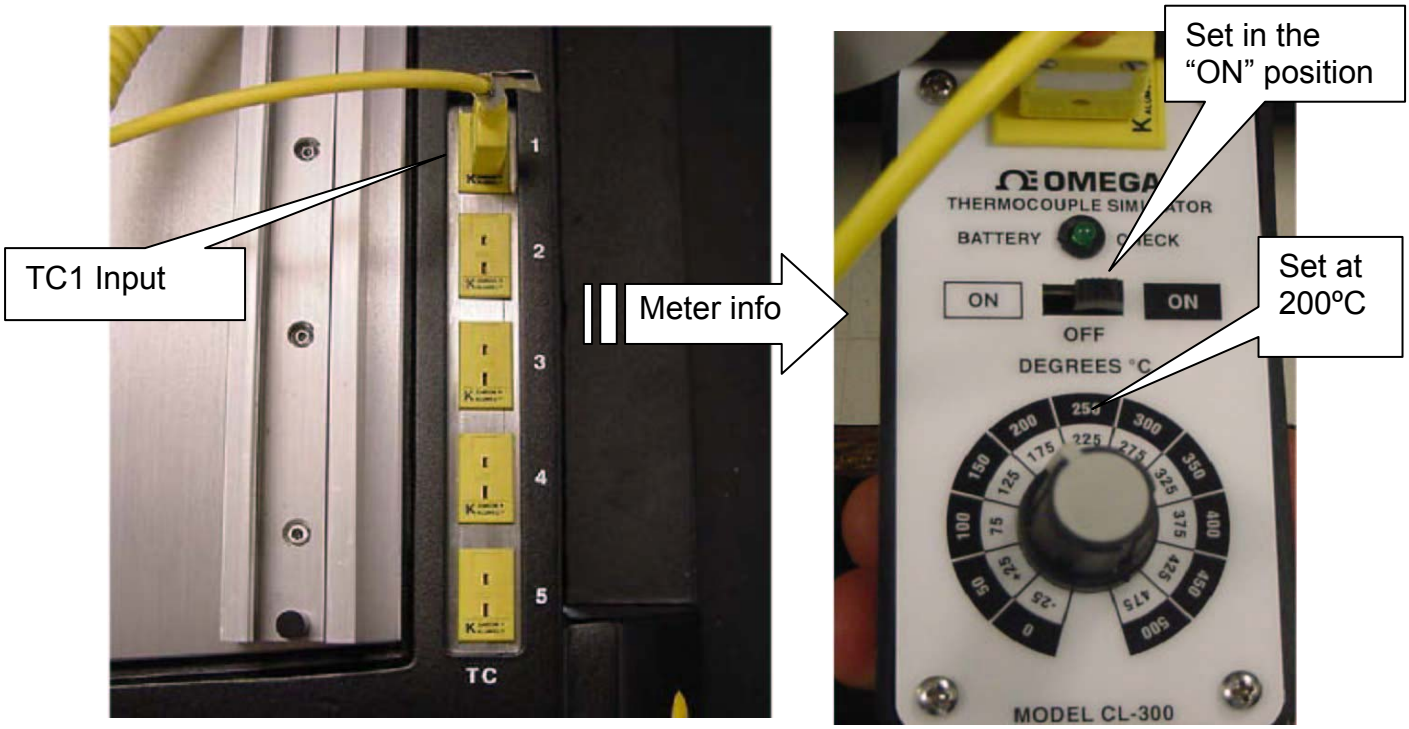
5. This will kick you out to the APR process page again. To begin calibration, open System Set-Up again by clicking "System Set-Up". This will open Calibration Screen.

6. Click TC tab to begin process.

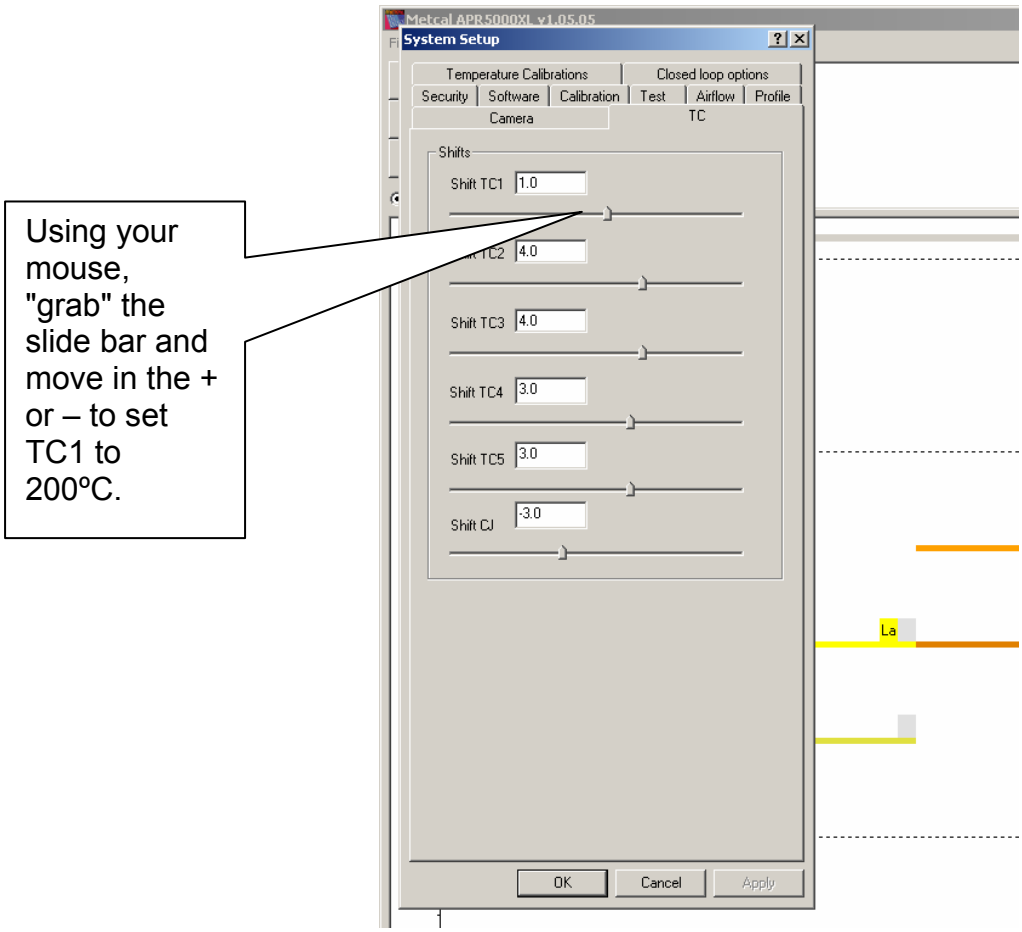


7. The APR-5000-XL software is now in calibration mode. DO NOT ADJUST AT THIS POINT.

8. Connect the Omega Thermal Injection Meter to TC1 (thermocouple input on the top right) and turn the meter on and set the meter at 200ºC.



9. Using the slide bars slide the bars in the + or – to set the monitor and meter to the same temperature (200ºC). When this done, channel 5 is calibrated.



10. Repeat steps 7-9 to calibrate TC2 through TC5.

Note- Offset only updated when “Apply” and “ok” buttons have been pressed.

Notes

15. APR-5000-XL Reflow Head Airflow Calibration

Tools Required:

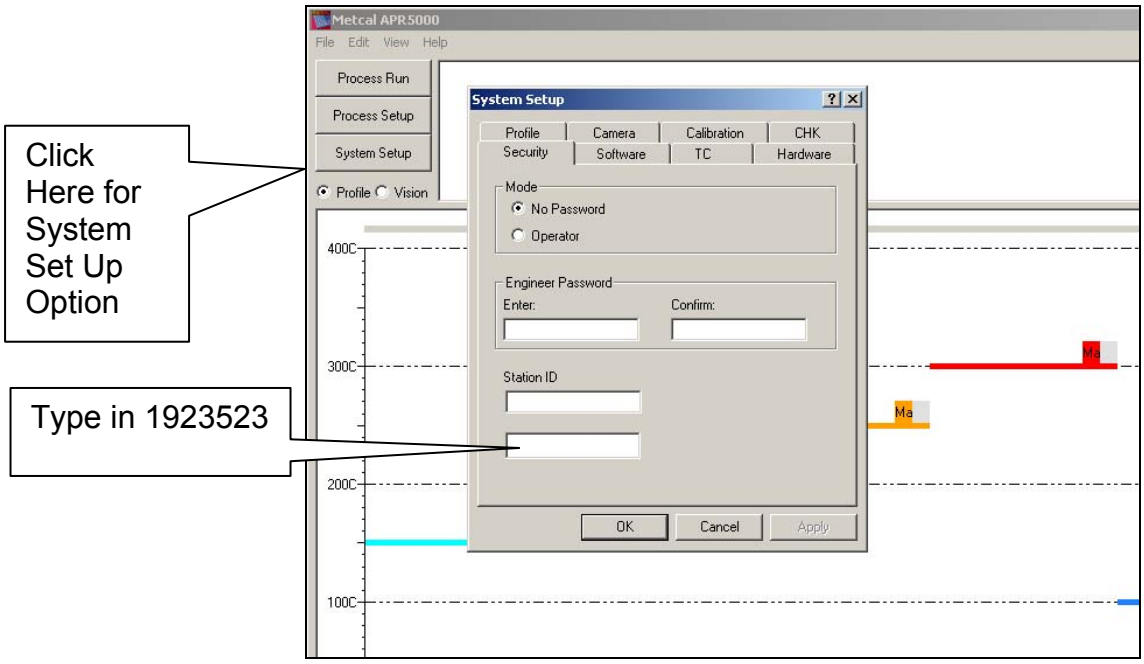
NZA 490-490 Nozzle
In-Line Air Flow Meter

Procedure

1. Turn APR-5000-XL unit on and boot the APR-5000-XL Software.

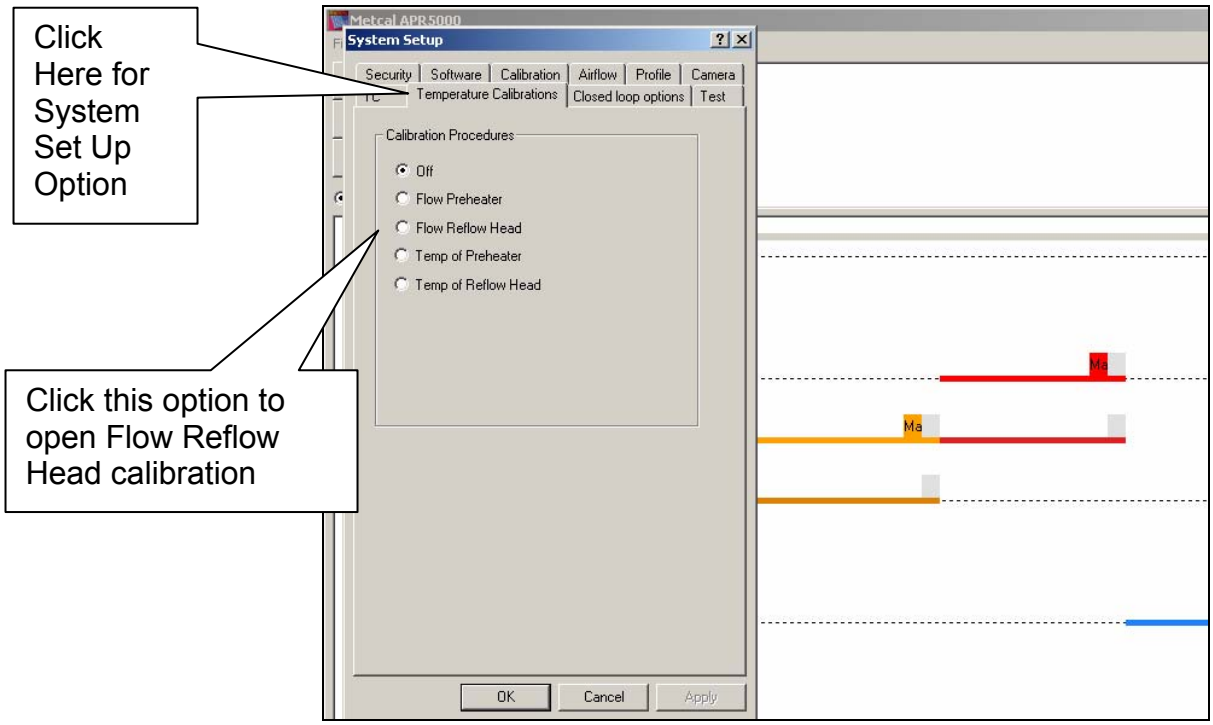
2. Open System Set-Up by clicking System Set-Up.

3. Click on “No Password” button and enter the “engineer’s” APR password 1923523 and return.



4. This will kick you out to the APR process page again. To begin calibration, Open System Set-Up again by clicking System Set-Up. This will open Calibration Screen.

5. Click Temperature Calibration.



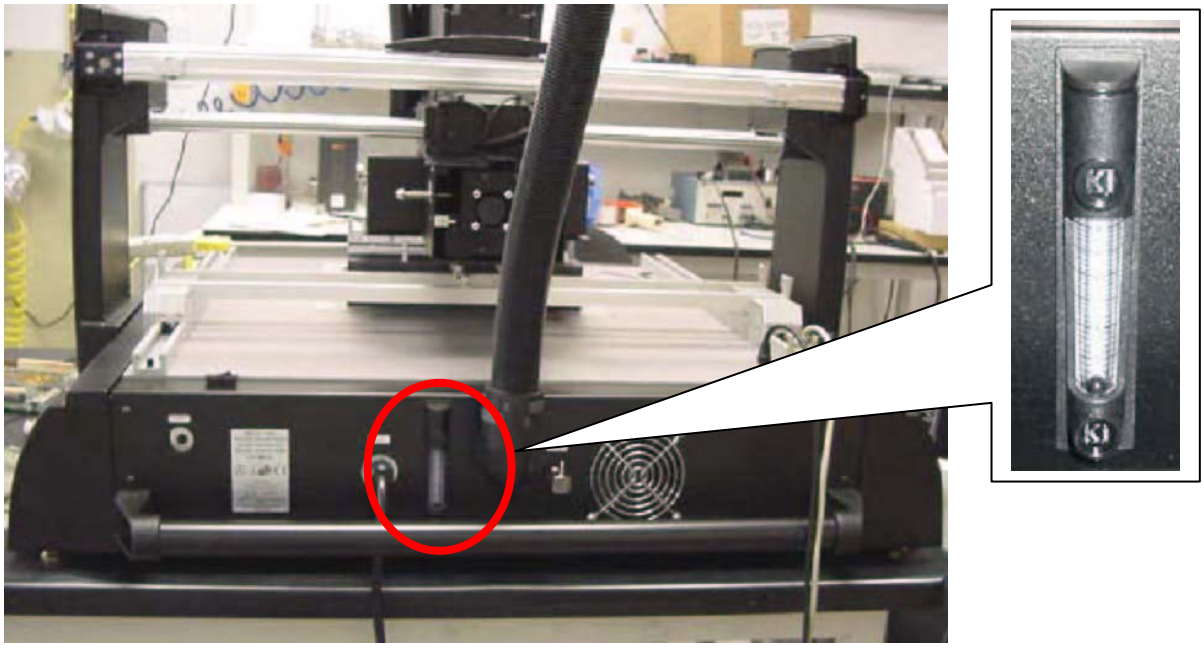
6. Open Calibration Screen and Click on Flow Reflow Head to set reflow head airflow. The APR head will be in the “home”/up position. Click OK to begin calibration.

7. Attach the NZA-490-490 ***without*** vacuum cup to the head assembly.

8. The vacuum calibration gauge is permanently mounted on the rear to APR-5000-XL. Locate this meter before proceeding. (See next page for details).

Notes

Rear View



9. Toggle through the instructions and calibrate air flow meter and the APR-5000-XL software to the following specifications:

APR-5000-XL Software	Factory Setting
Low	8 liters
Medium	16 liters
High	24 liters

10. Follow the APR-5000-XL Software instructions prompts.

11. Flow Reflow Head Airflow Calibration is now complete. Continue to the Pre-heater Calibration Procedure.

Notes

16. APR-5000-XL Preheater Airflow Calibration (Small and Large)

Tools Required:

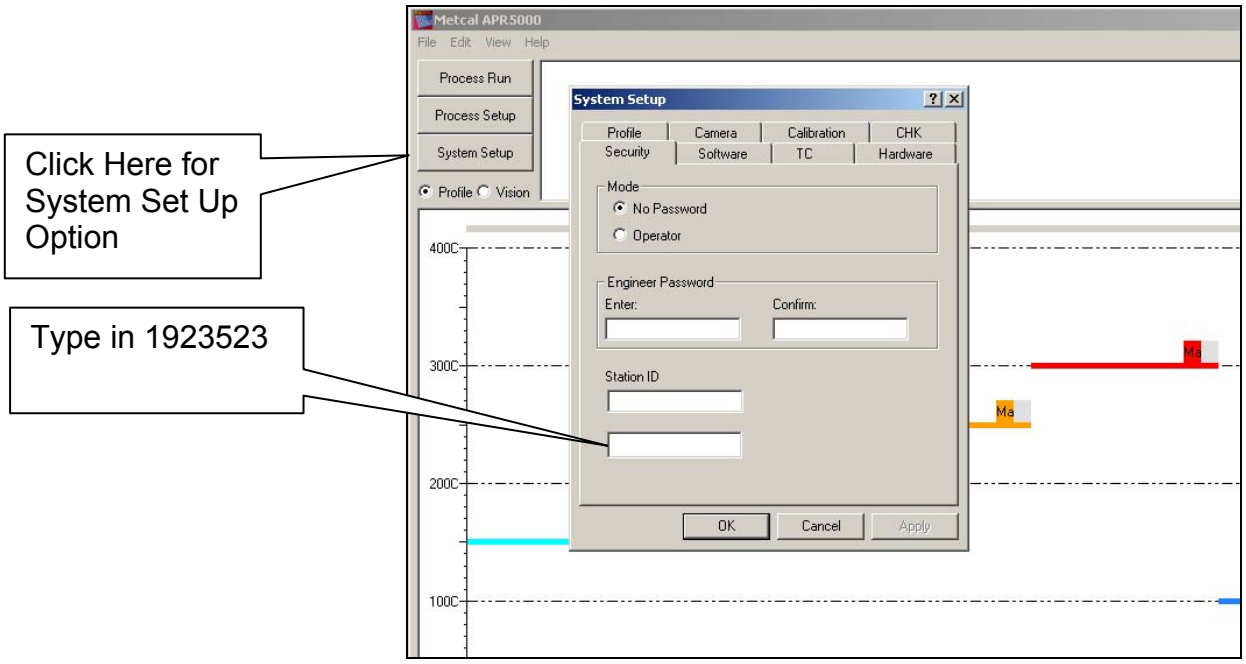
Air Flow Gauge Fixture
Convection/Thermal Calibration Fixture
Turbo Airflow Meter

Procedure

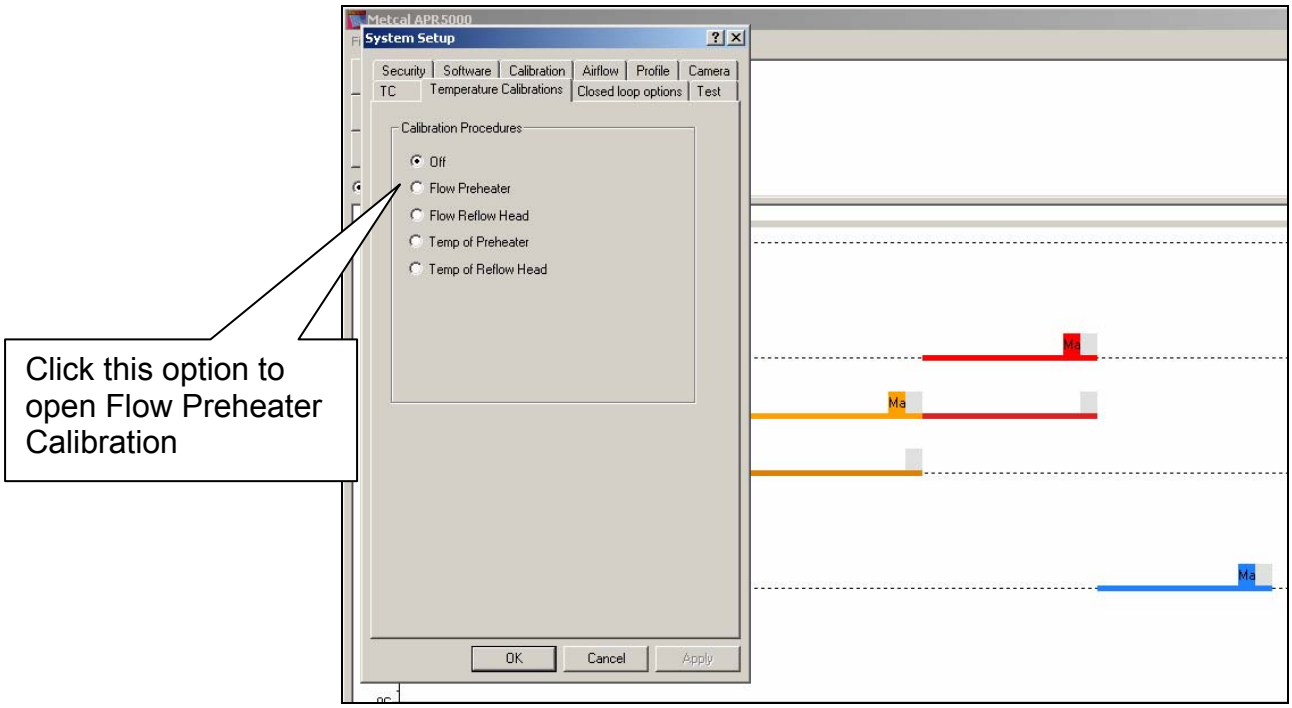
1. Turn APR-5000-XL unit on and boot the APR-5000-XL Software.

2. Open System Set-Up by clicking System Set-Up.

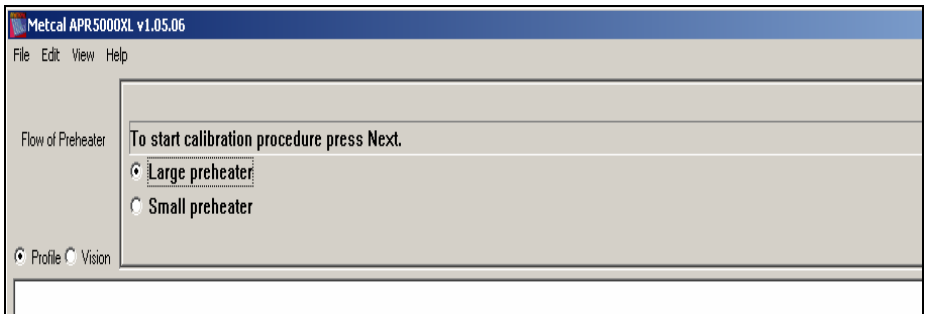
3. Click on “No Password” button and enter the “engineer’s” APR password 1923523 and return.



4. This will open Calibration Screen and Click on Temperature Calibration to set pre-heater airflow.

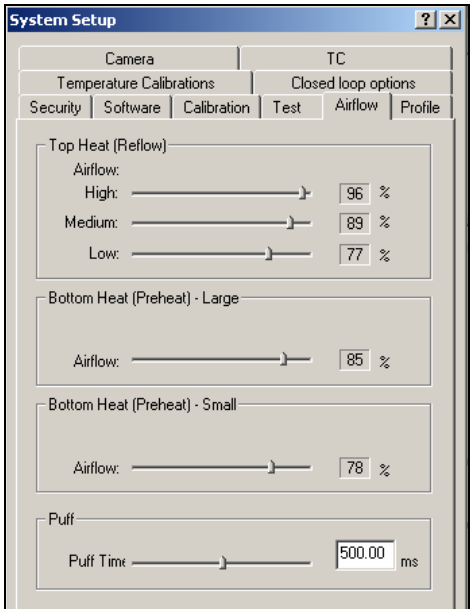


5. Select large or small heater for airflow calibration.



6. Open Calibration Screen and Click on Flow Pre-heater to set pre-heater Airflow. Select either small heater or large heater to set flow calibration. Simultaneous calibration of the small and large preheater is not allowed. The APR-5000-XL software is now in calibration mode.

Airflow Calibration Window



7. Remove top heater grill from machine.

8. Set the Turbo airflow meter to measure knots. A reading of 5 knots should be obtained by sliding airflow slider until 5.0 is measured. If multiply by 100 this measures feet per/minute, thus meeting the OK International APR-5000-XL specification of 500 feet per minute. Depending on voltage/country, the meter should be set between 70% and 80%.

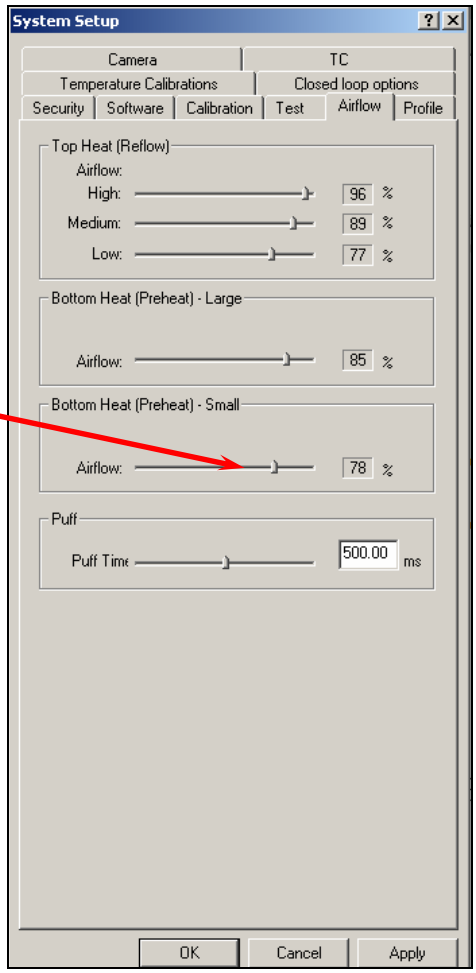
Set meter to middle position for knots measurement of 5.0

9. Once Flow Preheater software Screen is open, place Air Flow Calibration meter into position as shown.

Vary airflow speed until airflow setting reaches 5.0 knots

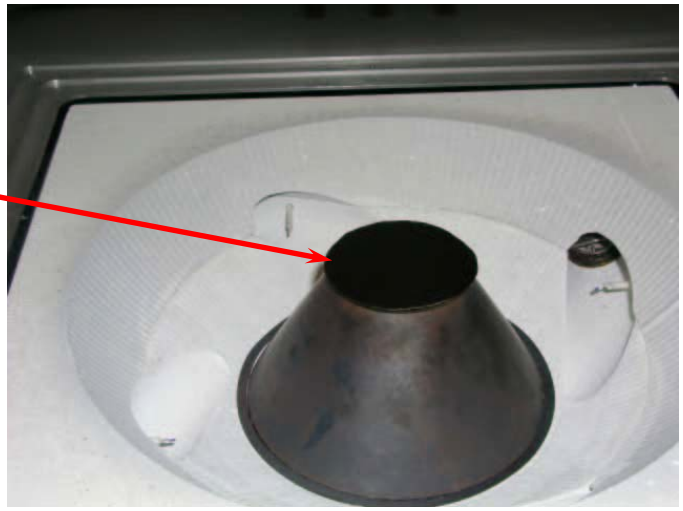
10. Vary the Bottom Heat (Preheater) Small airflow until the airflow setting on the Turbo meter reaches 5.0 knots. See below. When this is done, save settings. This completes small heater flow rate calibration.

To achieve 5 knots speed on Flow Meter, the slide bar must be greater than 80%

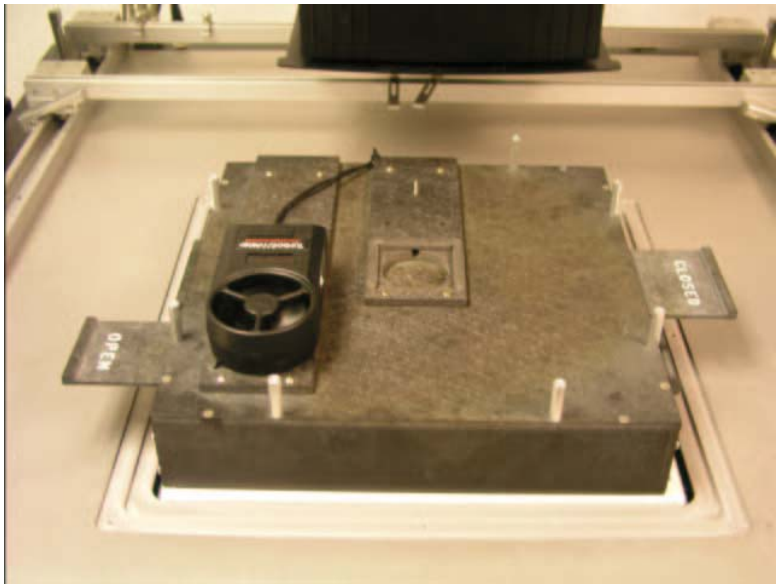


11. Now to set large bowl heater flow rate, cover center cone for small heater to stop airflow going into this chamber with small metal disc supplied.

Cover Disc



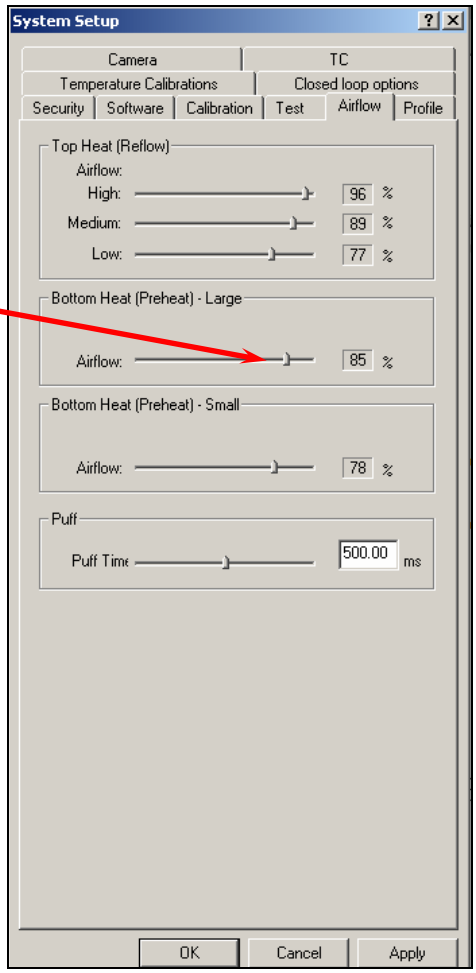
12. Now use calibration fixture with flow meter to the left of the machine as shown. Do not forget to close the center hole and open the hole under the flow meter as shown.



13. Adjust the large heater flow rate to read five knots, the same as small heater. Five knots is 500 feet per/minute.

14. Vary the Bottom Heat (Preheater) Small airflow until the airflow setting on the Turbo meter reaches 5.0 knots. See below. When this is done, save settings. This completes small heater flow rate calibration.

Vary airflow speed until airflow setting reaches 5.0 knots. This will be between 70% -80%



APR Software Reading Small Bowl	Air Flow Gauge Reading
≥ 80%	≥ 500 Ft/min

APR Software Reading Large Bowl	Air Flow Gauge Reading
70% to 80%	≥ 500 Ft/min

15. Apply and save settings follow the APR-5000-XL Software instructions prompts.

16. Remove the Air Flow Gauge and Air Flow Gauge Fixture from the Air Flow/Thermal Calibration Fixture.

Notes

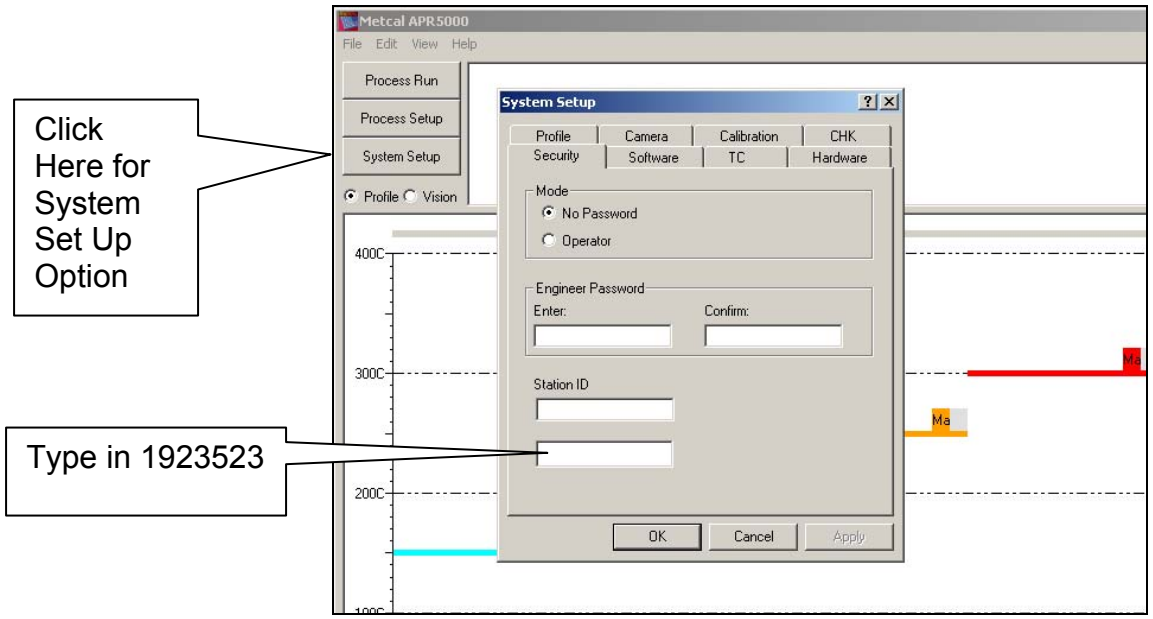
17. APR-5000-XL Head Thermal Calibration

Tools Required:

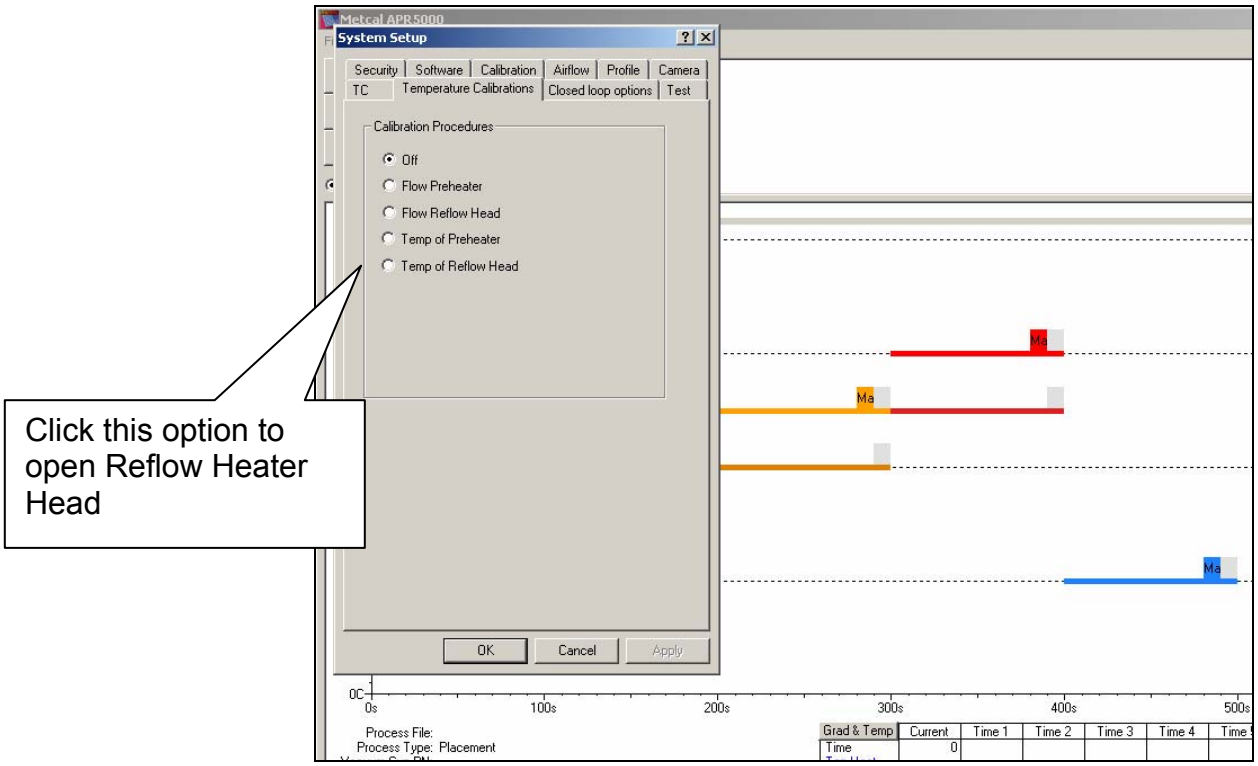
NZA-490-490
Thermocouple Probe
Convection/Thermal Calibration Fixture

Procedure

1. Turn APR-5000-XL unit on and boot the APR-5000-XL Software.
2. Ensure the heaters and thermocouples are at room temperature.
3. Open System Set-Up by clicking System Set-Up.
4. Click on “No Password” button and enter the “engineer’s” APR password 1923523 and return.

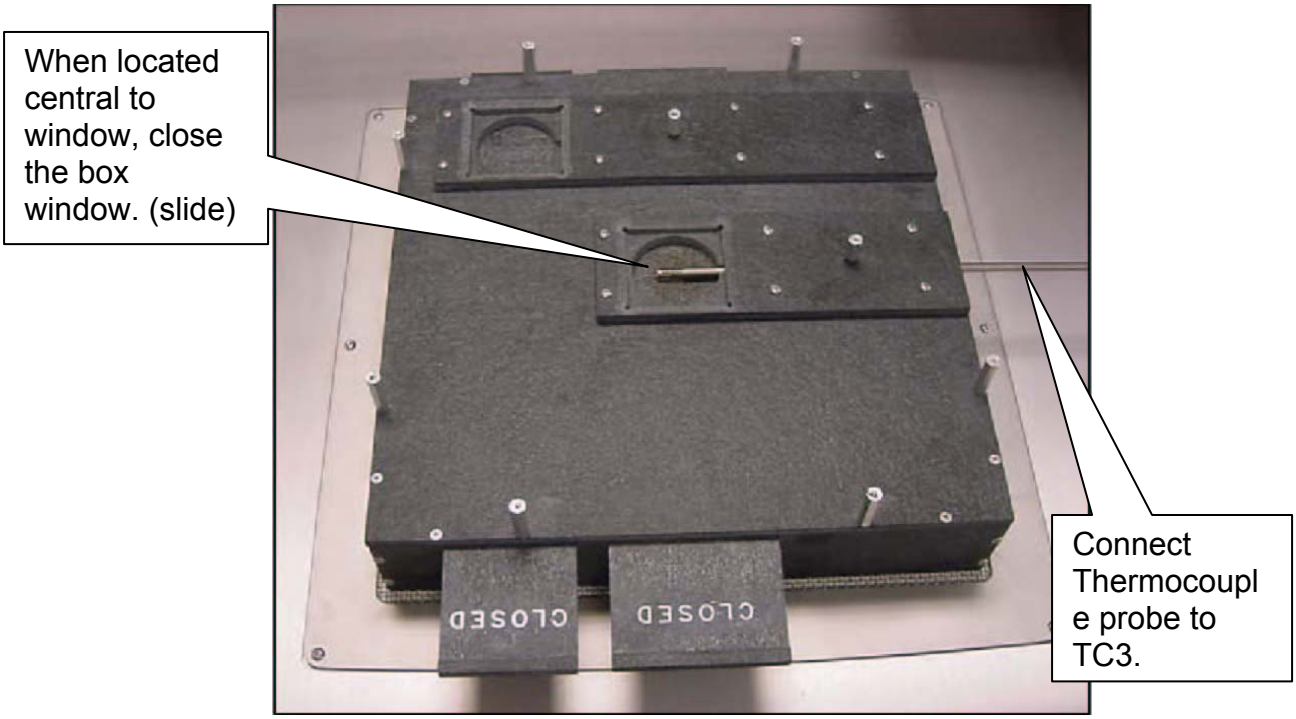


5. This will kick you out to the APR process page again. To begin calibration, open System Set-Up again by clicking System Set-Up. This will open Calibration Screen.
6. Click “Temp of Reflow Head” to begin process.



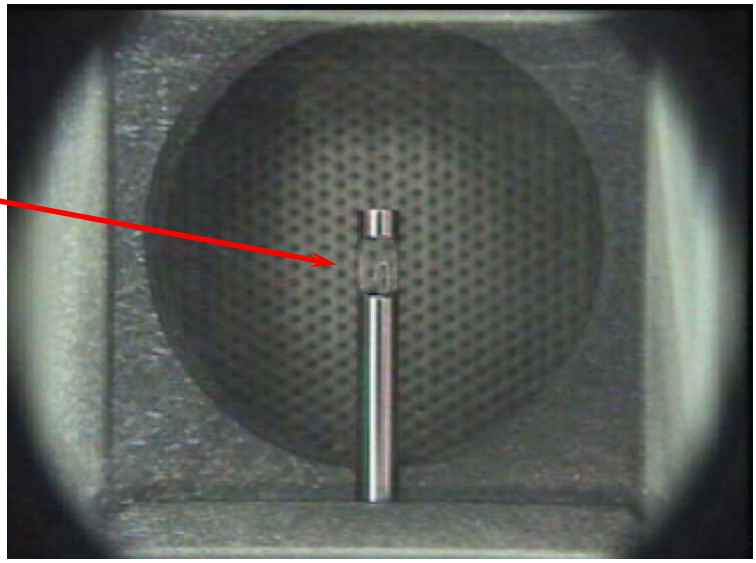
7. Attach NZA-490-490 nozzle to APR Reflow Head.

8. Place Convection/Thermal Calibration Fixture and thermocouple probe in place, connect thermocouple probe to input three as shown below.



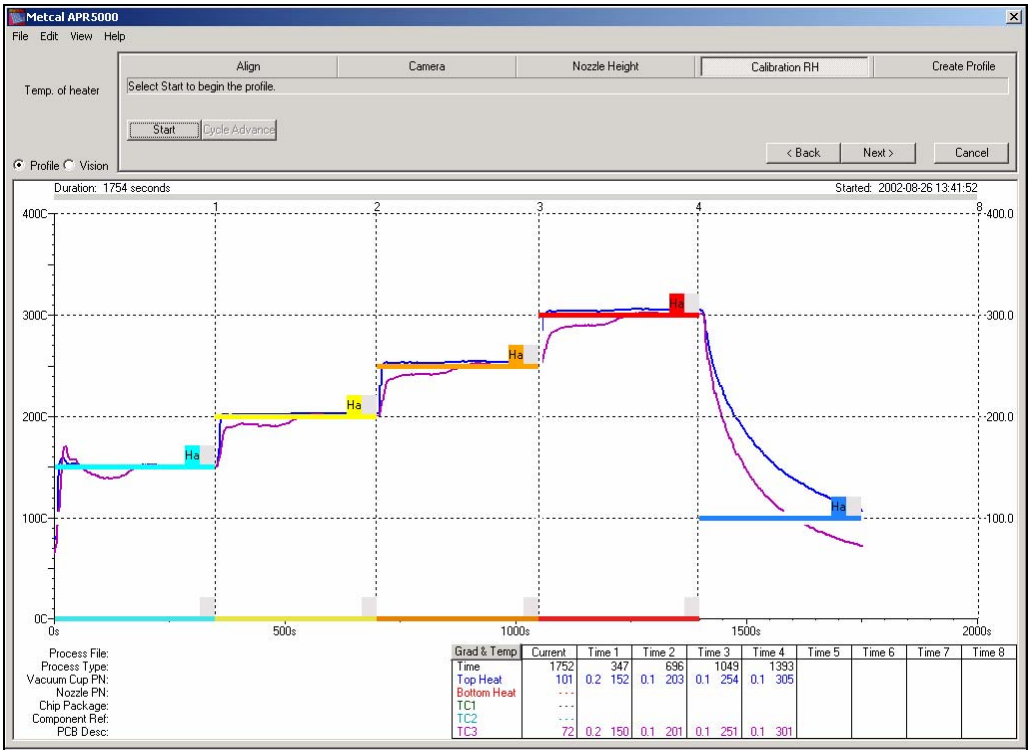
9. Follow the prompts and center the thermocouple as shown below. This must be done to ensure accurate temperature reading. Make sure t/c is in the center of the calibration window as shown this should be marked for repeatability with the mechanical stop.

Locate thermocouple in exactly the center. Also vertically open as in photo.



10. Follow the prompts on the monitor through the auto-calibration process.

11. Thermal graph should look similar to this for reflow nozzle



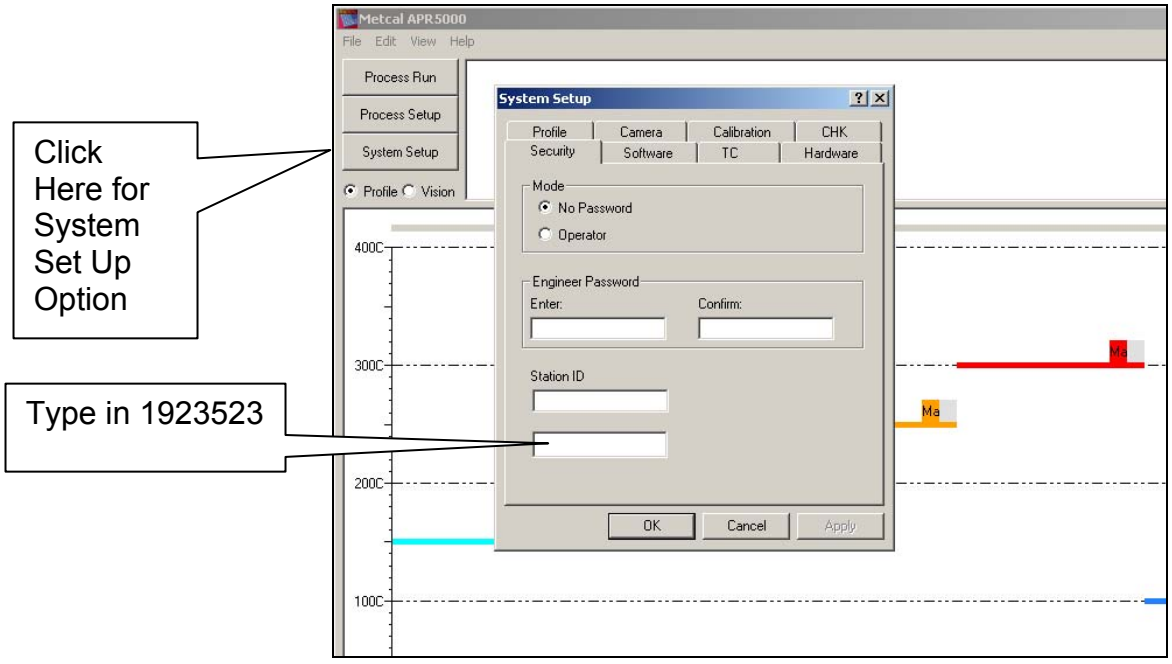
18. APR-5000-XL Large Preheater Thermal Calibration

Tools Required:

NZA-490-490
Thermocouple Probe
Convection/Thermal Calibration Fixture

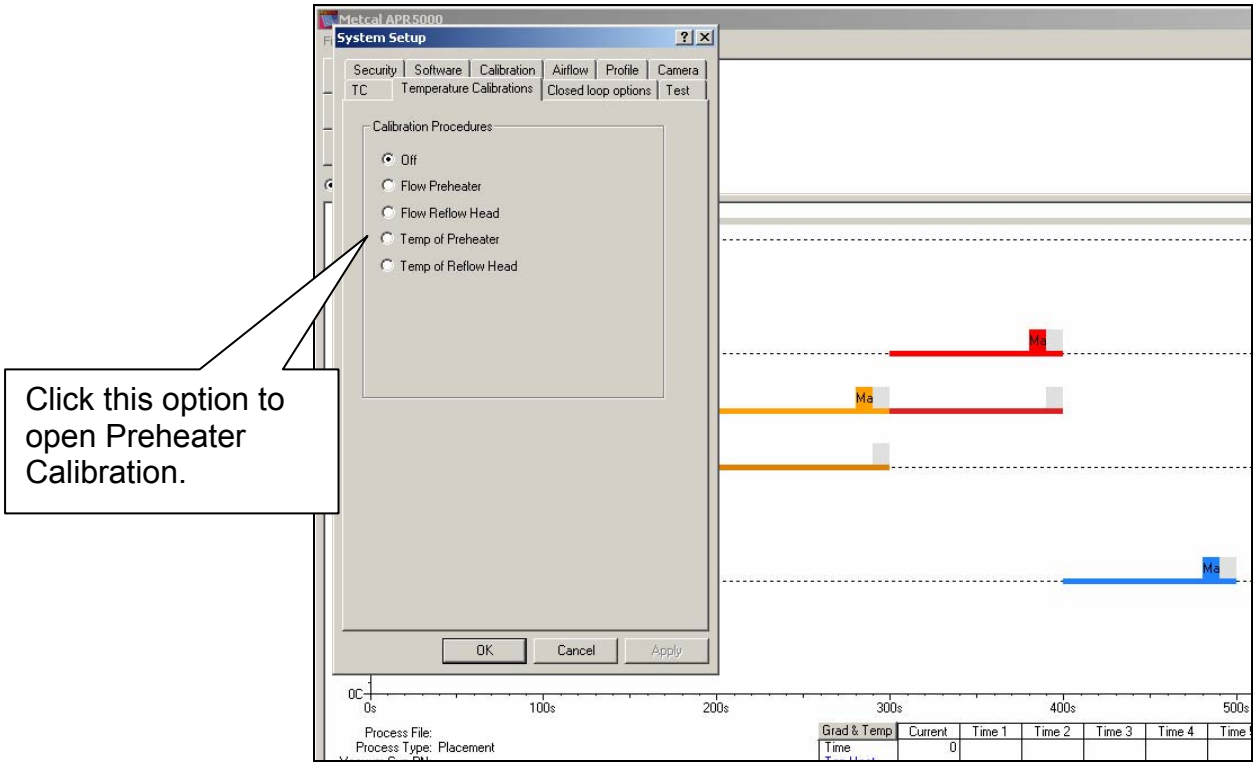
Procedure

1. Turn APR-5000-XL unit on and boot the APR-5000-XL Software.
2. Ensure the heaters and thermocouples are at room temperature.
3. Open System Set-Up by clicking System Set-Up.
4. Click on “No Password” button and enter the “engineer’s” APR password 1923523 and return.

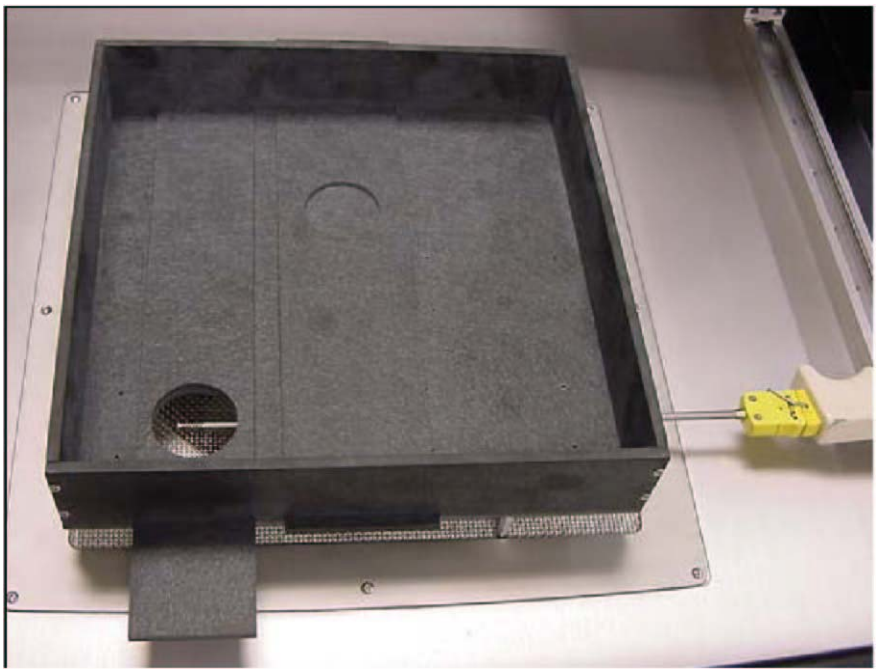


5. This will kick you out to the APR process page again. To begin calibration, open System Set-Up again by clicking System Set-Up. This will open Calibration Screen.

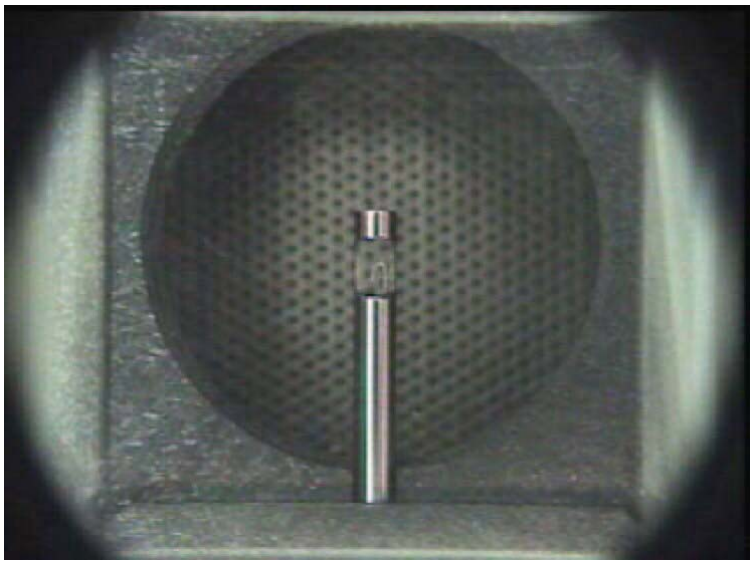
6. Click “Temp of Preheater” to begin process.



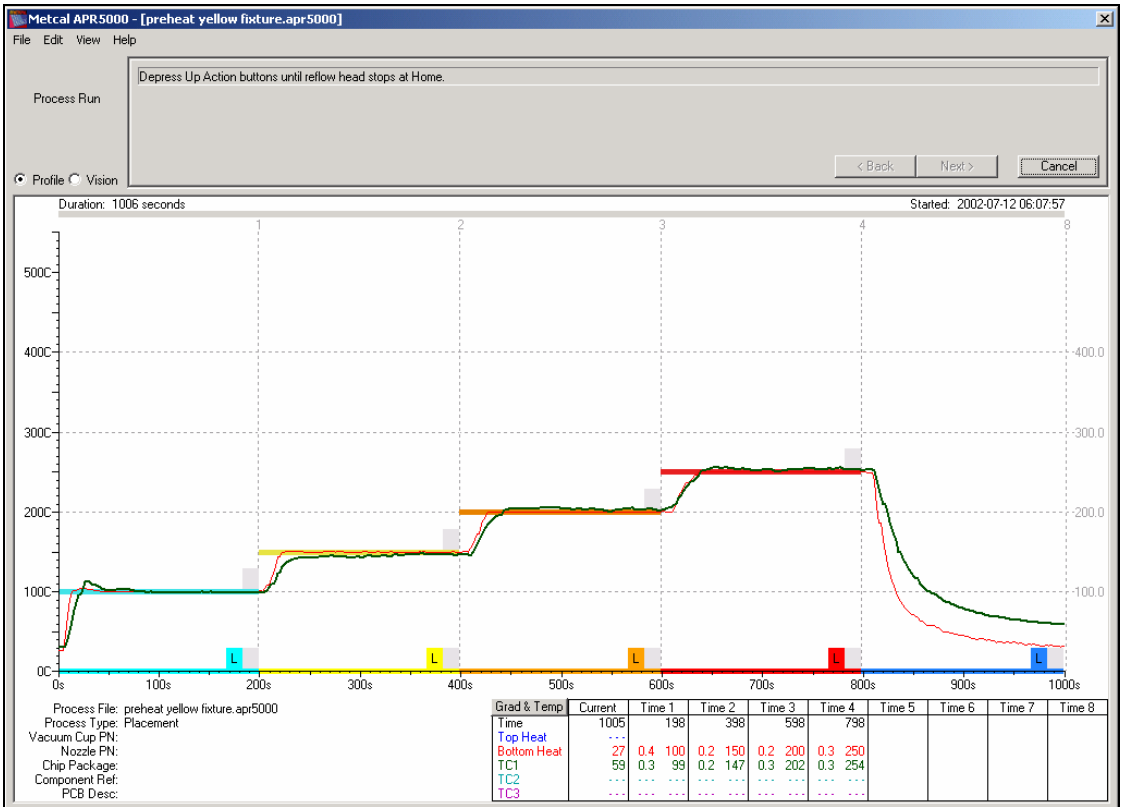
7. Select large heater for calibration and place Convection/Thermal Calibration Fixture and thermocouple probe in place. Connect thermocouple probe to input five (TC5). Position of calibration hole must be left front. See below.



8. Follow the prompts and center the thermocouple as shown below. This must be done to ensure accurate temperature reading. Thermocouple must be in center as before.



9. Follow the prompts on the monitor through the auto-calibration process. Graph should be similar to graph below



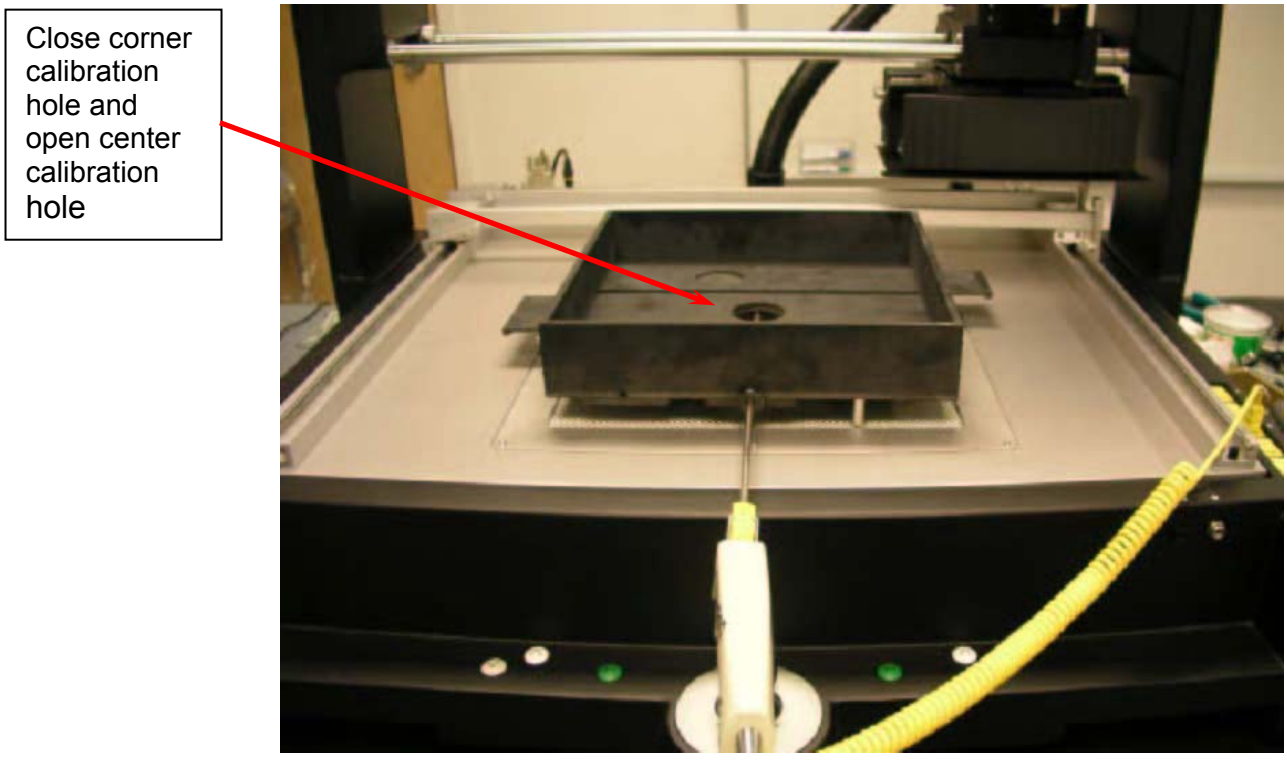
19. APR-5000-XL Thermal Calibration of Small Preheater

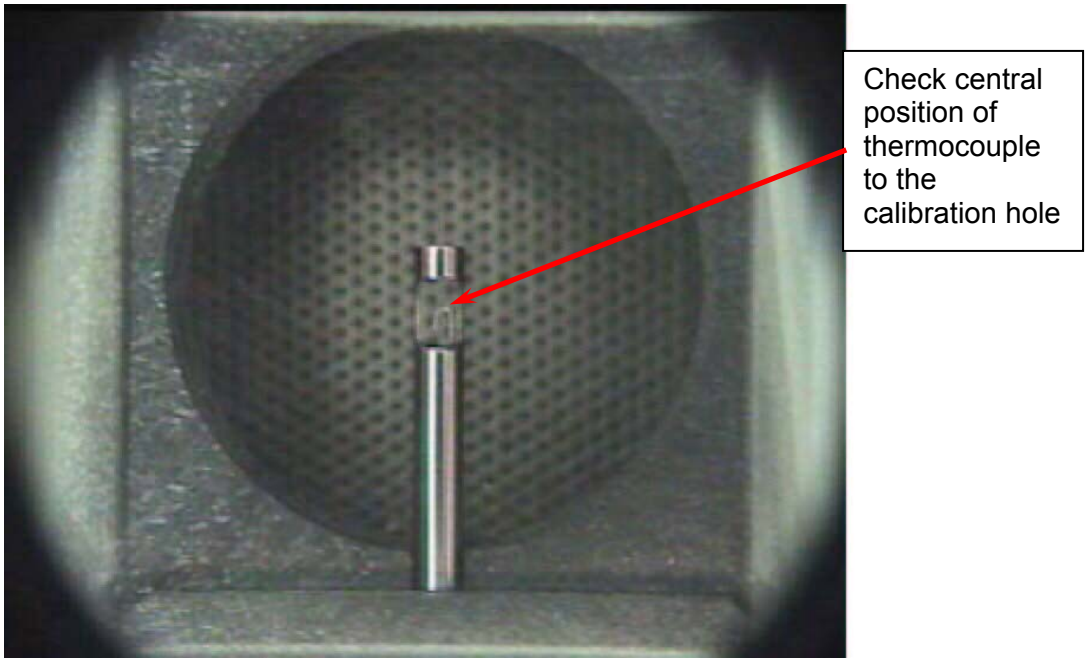
Tools Required:

NZA-490-490
Thermocouple Probe
Convection/Thermal Calibration Fixture

Procedure

1. Position the thermal calibration fixture as in photograph below.





2. Run thermal calibration for small heater and save setting by clicking "Finish" in software window. During all calibration of heaters control air changes in room due to door or air condition changes in temperature.

This now completes the thermal calibration of the machine.

Note- All offsets are saved into the machine and not the PC so a record should be kept of the offsets in profile window and can be save by print screen or copy and paste.
If new calibrations are done the old readings should be checked against the new and if any major differences occur this should be looked into as heaters may be getting old or reflow pumps. These offsets are your calibration data for ISO9000 references.

20. Trouble Shooting Grid & Error Messages

Troubleshooting

Fault	Reason	Solution
No video picture	Hauppauge Disconnected	Connected Video Cable into back of computer integrated Hauppauge card.
No monitor picture	VGA cable connected to incorrect out put	Connect to horizontal video card. See computer connection procedures in this manual.

Reflow Head Airflow is incorrect	Check calibration on site.	See Airflow calibration in procedure in this manual.
Thermocouple plot is erratic (noisy)	Intermittent connection in yellow plug	Check connection at thermocouple
	Damaged thermocouple	Replace thermocouple
	Thermocouple is not attached to the PCBA or component	Attach to PCBA using Kapton tape
	Reflow Head is shorting thermocouple wires	Raise head off wires.
Preheater plot not reaching set point (large preheater)	Fan or heating element failed	Check all four heaters and blowers for large bowl. See the software test tab window
	Blower speed is set too low	Using airflow calibration procedure, check blower speed. See the software test tab window
Preheater plot not reaching set point (small preheater)	Fan or heating element failed	Check both heaters and blowers for large bowl. See the software test tab window
	Blower speed is set too low	Using airflow calibration procedure, check blower speed. See the software test tab window
Component moves on placement	Excessive air set point in Puff Off	Adjust “Puff-Off” in Process Setup to achieve placement without removing component. Range is from 1 MS to 1 thousand MS.
Unsuccessful component removal	Check solder reflow temperature. Eutectic or PD-free	Check Reflow at removal point
	Co planarity of vacuum head	Calibrate per vacuum head calibration procedure.
	Lack of vacuum	Check 15 hg of vacuum is available at vacuum cup. If not, check for air leaks or vacuum pump failure. Use test tab to check
Unsuccessful component pick-up on camera	Pick-up plate is not co planar to vacuum cup	See calibration procedure for flatness calibration procedure
	Faulty o-ring	Replace o-ring

Unsuccessful component pick-up on camera	Stencil is not co planar to vacuum cup	Damaged stencil. Replace
Component pick up not central to nozzle.	Component slide in X/Y is out of adjustment	Check centralization pick up plate to vacuum cup. See procedure in this manual.
Component is not central in vision window.	Camera is out of adjustment.	Adjust X Y and rotation. See manual.
Vision window is too small.	PC resolution is not optimized or monitor is wrong size	Use 17 inch monitor, check resolution as per manual specification.
Erratic top or bottom heater plots (not from thermocouples)	Possible RTD failure	Use test tab in software window to view RTD is approximately 100 ohms at 25ºC

Error Codes

Message	Corrective Action
Critical System Error (X)- Contact OK International Technical Service.	1. Check administrator rights for PC. 2. Reinstall software Contact OK International Technical Service for help in resolving your system malfunction.
Communications Failure (X) – See Troubleshooting Section of the Operator's Manual.	1. Ensure the serial cable is properly connected to the communications port on your computer. 2. Ensure the serial cable is properly connected to the APR 5000 hardware. 3. Ensure the APR 5000 hardware power is on. 4. If you still experience problems, please contact Technical Service.
APR Hardware Error (X) – Please contact Technical Service..	1. Ensure the serial cable is properly connected to the communications port on your computer. 2. Ensure the serial cable is properly connected to the APR 5000 hardware. 3. Ensure the APR 5000 hardware power is on. 4. If you still experience problems, please contact Technical Support. 5. Messages 7-12. 6. Hardware problem. Please contact Technical Service. 7. Message 13, 15. 8. Cool down the APR5000. Rerun process. If

	you still experience problems, please contact Technical Support. 9. Message 14. 10. Check camera position. Rerun process. If you still experience problems, please contact Technical Service.
Motor Malfunction (X) – See Troubleshooting Section of the Operator's Manual.	1. Ensure there is nothing physically impeding the movement of the reflow head. 2. If the reflow head was completely lowered before starting the software, try closing the software and starting the program again. 3. Ensure the serial cable is properly connected to the communications port on your computer. 4. Ensure the serial cable is properly connected to the APR 5000 hardware. 5. Ensure the APR 5000 hardware power is on. 6. If you still experience problems, please contact Technical Service.
Camera Malfunction (X) – See Troubleshooting Section of the Operator's Manual.	1. Ensure there is nothing physically impeding the movement of the camera. 2. Ensure the serial cable is properly connected to the communications port on your computer. 3. Ensure the serial cable is properly connected to the APR 5000 hardware. 4. Ensure the Camera Box cable is properly connected. 5. Ensure the APR 5000 hardware power is on. 6. If you still experience problems, please contact Technical Service.
Printer Error (X) - See Troubleshooting Section of the Operator's Manual.	1. Ensure the printer is properly connected to the computer. 2. Ensure the printer power is turned on. 3. Ensure there is an adequate supply of paper in the printer. 4. Ensure the printer has adequate printing material (ribbon, toner, etc.) 5. If you still experience problems, please contact Technical Service.
File Error - See Troubleshooting Section of the Operator's Manual.	File Error - See Troubleshooting Section of the Operator's Manual.
System Error (X)- Contact OK International Technical Service.	Contact OK International Technical Service for help in resolving your system malfunction.

21. Nozzles, Vacuum Pickup Nozzle And Accessories

Nozzle

NZA-USMD	3 mm Round Nozzle
NZA-060-060	APR Reflow Nozzle 6mm x 6mm
NZA-080-080	APR Reflow Nozzle 8mm x 8mm
NZA-080-095	APR Reflow Nozzle 8mm x 9.5mm
NZA-100-100	APR Reflow Nozzle 10mm x 10mm
NZA-130-130	APR Reflow Nozzle 13mm x 13mm
NZA-150-150	APR Reflow Nozzle 15mm x 15mm
NZA-180-180	APR Reflow Nozzle 18mm x 18mm
NZA-200-200	APR Reflow Nozzle 20mm x 20mm
NZA-230-230	APR Reflow Nozzle 23mm x 23mm
NZA-250-290	APR Reflow Nozzle 25mm x 29mm
NZA-270-270	APR Reflow Nozzle 27mm x 27mm
NZA-300-300	APR Reflow Nozzle 30mm x 30mm
NZA-350-350	APR Reflow Nozzle 35mm x 35mm
NZA-350-350-CGA	APR Reflow Nozzle 35mm x 35mm Column Grid Array
NZA-355-455-CGA	APR Reflow Nozzle 35.5mm x 45.5mm Column Grid Array
NZA-400-400	APR Reflow Nozzle 40mm x 40mm
NZA-450-450	APR Reflow Nozzle 45mm x 45mm
NZA-470-470-CGA	APR Reflow Nozzle 47 mm x 47 mm Column Grid Array
NZA-490-490	APR Reflow Nozzle 49mm x 49mm
NZA-555-555-CGA	APR Reflow Nozzle 55.5 mm x 55.5 mm Column Grid Array
Vacuum Pick-Up Nozzle	
VNZ-005	APR Vacuum pick up nozzle .5 mm O/D
VNZ-01	APR Vacuum pick up nozzle 1mm O/D
VNZ-03	APR Vacuum pick up nozzle 3mm O/D
VNZ-05	APR Vacuum pick up nozzle 5mm O/D
VNZ-08	APR Vacuum pick up nozzle 8mm O/D
VNZ-12	APR Vacuum pick up nozzle 12mm O/D
VNZ-19	APR Vacuum pick up nozzle 19mm O/D
Accessories	
AC-RP	Nozzle Removal Pad
APR-NK	APR 5000 Nozzle Kit
APR-NK-CSP	APR 5000 CSP and Micro SMD Nozzle Kit
APR-VRT	Vacuum Nozzle Removal Tool
APR-CNTRL-EN	APR-Controller, English Version
VPI-M17	VPI Monitor, 17" Flat Panel
APR-DK1	Demonstration PCB with BGA & CSP Component Kit
FL-APR-2	PCB Finger Long (Pack 2)
FLL-APR-2	Thick PCB Finger Long (Pack 2)
FLS-APR-2	Thick PCB Finger Short (Pack 2)
FLSL-APR-2	Thick PCB Spring Finger Long (Pack 2)
FLSS-APR-2	Thick PCB Spring Finger Short (Pack 2)

FS-APR-2	PCB Finger Short (Pack 2)
FSL-APR-2	PCB Spring Finger Long (Pack 2)
FSS-APR-2	PCB Spring Finger Short (Pack 2)
PF-1	KIT, Solder Paste/Flux Prep Plate
PICK-APR	Component Pick Up Plate
TF-1T	Tape Feeder, Micro SMD with Thumb Wheel
TF-2T	Tape Feeder, 0603-0402 with Thumb Wheel
TF-3T	Tape Feeder, 0201 with Thumb Wheel
UBS-APR-XL	APR-5000-XL Underboard Support
VNZ-ORINGK-XL	APR-5000-XL/XLS VNZ Pipette O-Ring Kit
VNZ12-ORING	VNZ-12 O-ring replacement kit (Qty 50)
VNZ19-ORING	VNZ-19 O-ring replacement kit (Qty 50)
APR-5XLAK	APR-5000-XL Accessory Kit
VAC-P100	Vacuum Assist Plate (double sided Kapton plate) (Qty 100)

22. Calibration Kit & Spare Parts

Listed below are the calibration kit and spare parts that are available for your APR-5000-XL Rework System.

APR-XLVPUK	APR-5000-XL Vacuum Pick Up Kit
APR-TRM	APR-5000-XL Theta Rotation Motor
APR-PAC	APR-5000-XL Pneumatic Cylinder, Head
APR-ZAM	APR-5000-XL Z-Axis Motor
APR-XLRP	APR-5000-XL Reflow Pump
APR-TCP	APR-5000-XL Thermocouple Panel
APR-JS	APR-5000-XL Joy Stick
APR-XAM	APR-5000-XL X-Axis Motor
APR-YAM	APR-5000-XL Y Axis Motor
APR-DCPS	APR-5000-XL Dc Power Supply
APR-XLPHK	APR-5000-XL Preheater Kit
APR-XLPHB	APR-5000-XL Preheater Blower (Set Of 2)
APR-XLPHRTD	APR-5000-XL Preheater Rtd (Set Of 2)
APR-XLMC	APR-5000-XL Motor Control
APR-SSR	APR-5000-XL Solid State Relay (Set Of 2)
APR-EMIPCB	APR-5000-XL Emi Circuit Board
APR-SVCA	APR-5000-XL Split View Camera
APR-XLABK	APR-5000-XL Action Button Kit
APR-EBK	APR-5000-XL Enable Button Kit
APR-CALKITXL	APR-5000-XL Calibration Kit

23. Site Preparation

Solder Removal:

Prepare the site to receive a new component by removing all of the residual solder. This can be accomplished by using an OK International MX-500 Series Rework System with blade cartridge assembly. Employing OK International Smart Heat™ Technology into your rework process will virtually eliminate the potential of accidentally removing any pads when removing residual solder. This is because OK International's patented Smart Heat™ Technology ensures that tip temperature is constantly maintained, regardless of the thermal demand of the assembly that is being reworked. For more information on OK International Smart Heat™ Technology, please contact your local OK International representative or visit
www.OK International.com for more information.

The following blade style tips are available for the OK International MX-500 Series Rework System:

SMTC-x60 (.410" length)
SMTC-x61 (.620" length)
SMTC-x62 (.870" length)
SMTC-x110 (1.55" length)

Please note that "x" denotes tip temperature. All cartridges are available in 500, 600 and 700 series styles. (5 = 500°F, 0=600°F and 1=700°F).

As an option you can utilize a vacuum desoldering system such as the OK International SP-440 Self-Contained Desoldering System or MX-500DS Shop-Air Desolder / Solder Rework System to vacuum residual solder from the PCB.

NOTE ON CLEANING:
Although isopropyl rubbing alcohol and cotton swab work satisfactory for removing flux residue, it is strongly recommended you contact your solder paste manufacturer for recommendations for cleaning the residue left by their products.

Solder Paste Deposition And Flux Application

Component Stenciling Templates
The application of new solder paste or flux directly to the component's solder balls can be accomplished with OK International's Component Stenciling Templates. The templates allow the precise application of solder paste without concern for surrounding parts on your PCB. Since the component is pasted rather than the board, operators find this to be a much faster and simpler solution. Please contact your local OK International representative for information and availability. Custom sizes and styles are available.

Solder Paste Application using the Component Stenciling Templates:

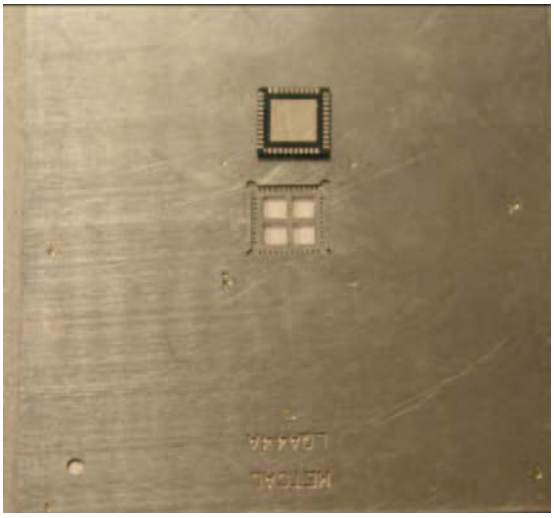
1. Select the correct solder paste plate for your component and application.
2. Position the component onto the component side of the plate (the side with the smaller cut out or etched component corners.)
3. Secure the component with the supplied clamp assembly. Please be careful not to over-tighten the clamp as this can cause the plate to bend, which will affect print quality.
4. Apply solder paste to the solder balls using the supplied spatula. When printing, make sure the stencil face remains clean after your print, this ensures correct solder paste volume.
5. Carefully remove the component clamp assembly and position the solder paste plate onto the component pick up plate aligning it with the two tooling pins.
6. Using the vacuum pipette lift the component from the solder paste plate and continue with your alignment process.

Two types of paste deposition plates exist

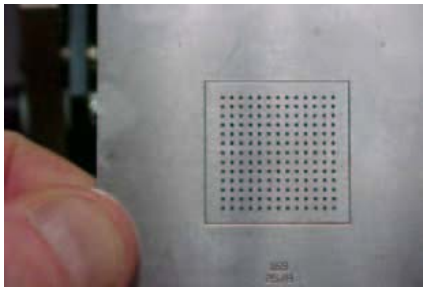
1. To print on balled devices these are called BST plates **Balled stencil template.**
2. To print on flat components such as LLP or LGA (Land Grid Array) this is the only recommended way to rework these type of parts as different volumes of solder paste need to be applied to the component pads, this is done with this plate called BRP Plates.

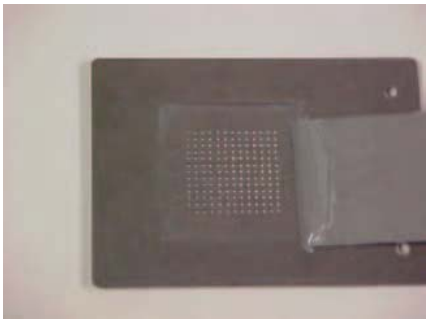
Body recognition plate.

Type 2 Body Recognition Plate



Type 1 Balled Stencil Plate





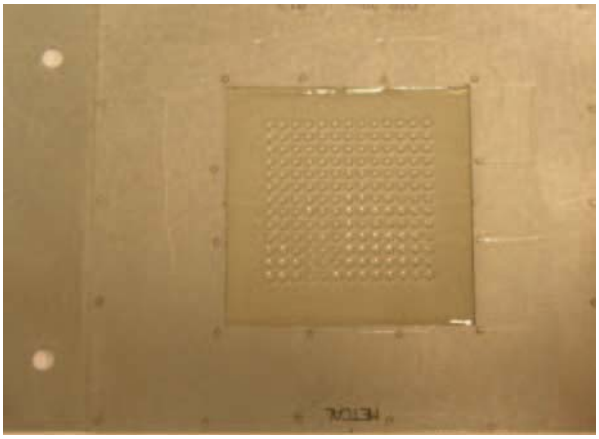
Dip Transfer Plates

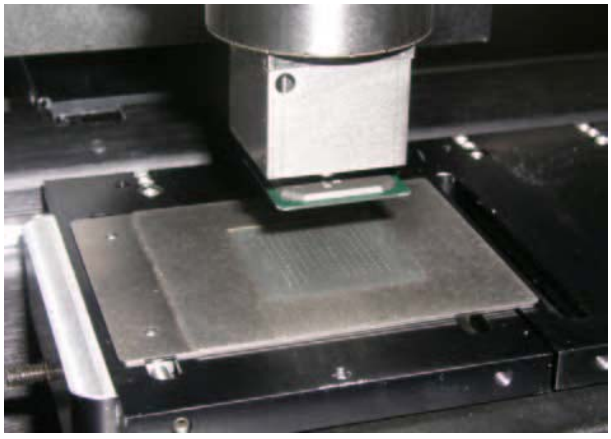
The application of high viscosity paste flux can be accomplished with OK International's Dip Transfer Plates. These plates allow for a simple, controlled application of paste flux to the solder balls of your BGA or CSP component. They are available in many sizes and depths. Please contact your local OK International representative for information and availability. Custom sizes and configurations are available.

OK International has pioneered the application of high viscosity paste flux using specialized fixtures to ensure consistent repeatable results.

1. Select the Dip Transfer Plate that meets your components requirements for size and depth.
2. Using the supplied spatula fill the cavity with paste flux. Use the spatula to smooth the flux level with the sides of the transfer plate. This ensures a repeatable deposit.
3. Place your component into the component pick up plate and pick it up with the vacuum pipette.
4. Using the joystick, align the component in the X, Y and Theta axes.
5. Remove the adjustable component fixture and replace it with the flux transfer plate.
6. Follow the screen prompts to lower the component into the flux transfer plate so the solder balls contact the bottom plate of the flux transfer plate. Depress the "Z" axis "UP" buttons to return the component to the focus position.
7. Remove the component pick up plate and inspect the impression left in the flux to ensure all the solder balls have been coated.
8. Check component alignment and adjust as required.
9. Follow the screen prompts, push in the camera and click next.
10. Place the component as directed by the screen prompts, and continue with the placement process that you have selected.

Flux Dip plates BGA and CSP





24. Warranty And Service

Contact your local authorized Ok International Representative or Distributor for details.

25. Technical Support Contact

OK International offers Hot Line service. Please contact your nearest OK International office for technical support:

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