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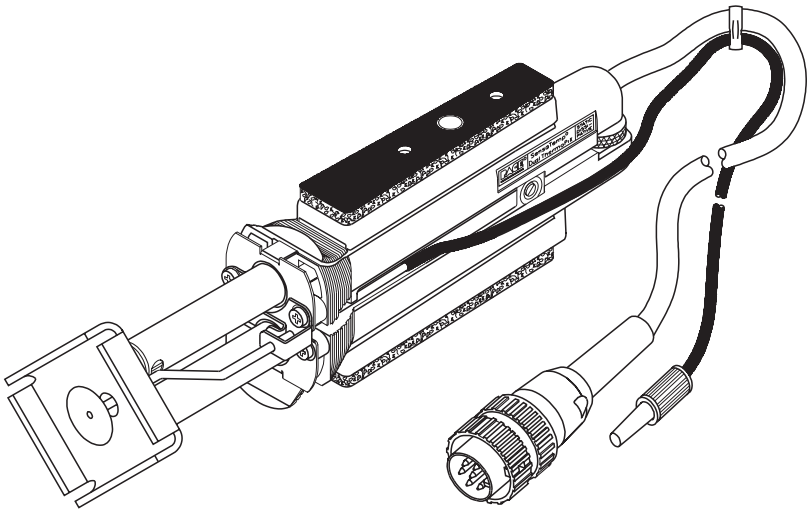
DTP-80



DTP-80 Dual ThermoPik Handpiece

OPERATION & MAINTENANCE MANUAL

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DTP-80
DUAL THERMOPIK HANDPIECE
PACE P/N 7029-0001
OPERATION & MAINTENANCE MANUAL
MANUAL NUMBER 5050-0403
REV. A

For any questions regarding the following instructions, contact your local authorized PACE dealer or contact PACE directly at:

Telephone (301) 490-9860, Fax (301) 604-8782

PACE Incorporated
9893 Brewers Court
Laurel MD 20723-1990

These instructions detail the basic operational guidelines for using the DTP-80 Dual ThermoPik handpiece.

INTRODUCTION

The DTP-80 Dual ThermoPik handpiece provides safe, one-handed removal of a wide variety of Quad FlatPacks (PQFPs) in a matter of seconds and can even remove BGAs (Ball Grid Arrays). The Dual ThermoPik is a member of the PACE SensaTemp family of advanced handpieces.

CAUTION

Always return heated handpieces to the appropriate Tip & Tool Stand when not in use. Failure to do so may cause burns to the operator, equipment or work surfaces and may be a potential ignition source if combustible materials are nearby. Always use this handpiece in a well ventilated area to avoid the inhalation of fumes created by solder flux gases.

HANDPIECE SETUP

HANDPIECE ALIGNMENT

Check the handpiece heaters for proper alignment with each other. Proper handpiece (and tip) alignment is essential for effective operation.

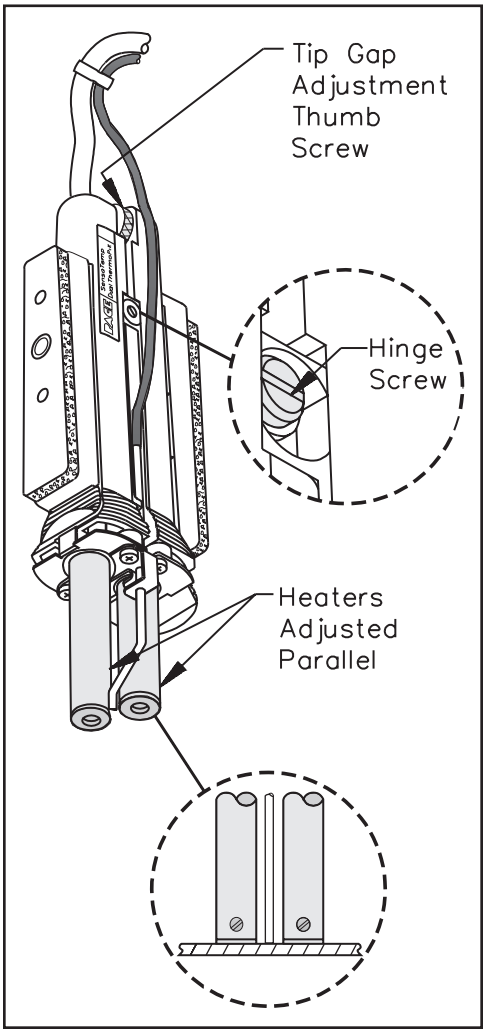
1. Remove any installed tip.

2. **With the handpiece at room temperature**, adjust the heaters parallel to each other (refer to illustration) using the Tip Gap Adjustment Thumb Screw. If the heater ends are even with each other, go to "Power Source Connection". If the ends are not even, go to step 3.

3. Loosen the handpiece Hinge Screw 1/2 turn.

4. Holding the handpiece in a vertical position (heaters facing down), place the ends of the two heaters against a hard flat surface to insure proper alignment. The heater ends should be even with each other and flush against the flat surface. Gently push the rear of the handpiece handles to force both heaters against the flat surface.

5. Tighten Hinge Screw to secure in position.



POWER SOURCE CONNECTION

NOTE

If using your DTP-80 ThermoPik for the first time or if you have just replaced the heater, you must follow the "DTP-80 Heater Burn-in" procedure (red tag on handpiece) to increase the life expectancy of the heater and to minimize any smoke and fumes generated by the heater on its initial power-up.

Connect the handpiece power cable connector to one of the front panel power receptacles on your PACE power source. PACE recommends that air handpieces utilize the power receptacles closest to the **AUTO SNAP-VAC** (or **SNAP-VAC**) Port to minimize cord tangles.

NOTE

To insure optimum performance, use only one Dual ThermoPik handpiece and any other SensaTemp handpiece (except TT-65 ThermoTweez) on 2 channel power sources. On MBT 250A/220A or PRC 2000 systems, use of 2 Dual ThermoPiks or a Dual ThermoPik and a ThermoTweez handpiece may be powered by the same power source with the third channel left vacant (no handpiece connected).

TIP TEMPERATURE

The DTP-80 rapidly transfers heat by contact and typically allows component removal at relatively low temperatures in the 288 - 343°C (550 - 650°F) range. Tip temperature and removal times will vary with each application. PACE recommends the use of a 316°C (600°F) tip temperature setting for initial use in any particular application. With practice, many components can be removed at lower temperatures. Use the lowest possible tip temperature that will provide rapid, yet controlled solder reflow. Lower temperatures extend tip and heater life, allow solder to remain on the lower surfaces of the tip (to improve thermal linkage between the tip and the component during component removal) and help prevent possible board damage.

Refer to the Tip & Temperature Selection System booklet for your particular handpiece/tip combination. For all Dial Display SensaTemp systems, the booklet will indicate the correct Dial Settings for the True Tip Temperature. On systems incorporating a Digital Readout, set the desired operating temperature and Tip Offset Constant for the DTP-80 handpiece/tip combination into the channel powering the DTP-80.

AIR HOSE CONNECTION

Use the following procedure to attach the handpiece air hose to your PACE power source.

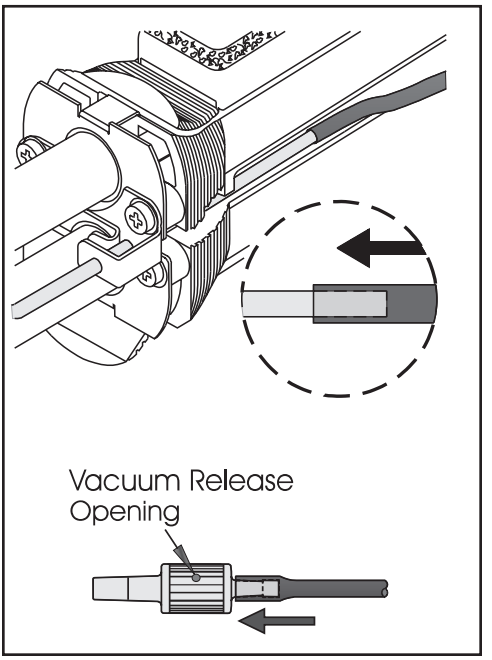
NOTE
Ensure that only one air hose is connected to the **AUTO SNAP-VAC** (or **SNAP-VAC**) or Controllable **PRESSURE** Port at one time. Attachment to both ports simultaneously will cause a deterioration of performance.

To set up your DTP-80 for operation, perform the following steps:

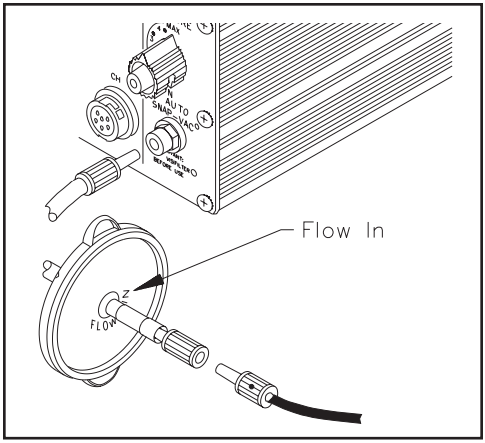
1. Connect the 152 cm (60 inch) length of black silicone air hose to the Vacuum Pick tube (metal tube) in the middle of the handpiece.

2. Attach the male quick connect hose mount fitting (P/N 1259-0102) supplied with the handpiece to the other end of the black silicone air hose. This fitting has a special Vacuum Release Opening to provide a quick component release during component removal operations; **DO NOT** use any other male fitting.

3. Secure the air hose to the handpiece power cable with hose clamps (P/N 1321-0274).



4. Prepare a VisiFilter by connecting a 2.5cm (1 inch) length of clear pvc air hose to each side of the VisiFilter. Connect a female quick connect hose mount fitting (P/N 1259-0086) to one of the air hose ends . Connect the 152cm (60 inch) length of black silicone air hose to this end of the VisiFilter and the DTP-80 handpiece.



5. To the other air hose end (on VisiFilter), attach a male quick connect hose mount fitting (P/N 1259-0087).

6. Attach the male quick connect hose mount fitting (on VisiFilter air hose) to the power source **AUTO SNAP-VAC** (or **SNAP-VAC**) Port.

NOTE
Always use your Dual ThermoPik handpiece with a clean VisiFilter element. Otherwise a deterioration in performance or damage to the unit may occur.

TIP SELECTION

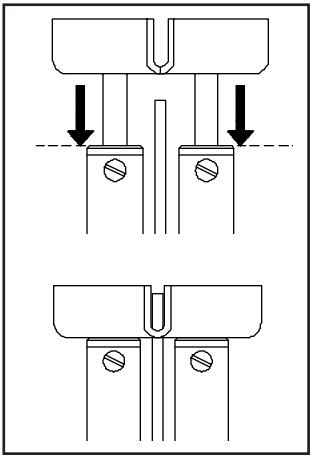
Selection of the proper tip is essential for effective operation. Attempts to use an improperly sized tip will result in unsatisfactory handpiece operation and may result in lifted lands or board damage.

Table I details a partial listing of available tips. Contact your local authorized PACE dealer for the latest Tips & Accessories Catalogue which details all available tips and accessories.

TIP INSTALLATION

The following instructions are for tip installation only. If a tip is currently installed in the handpiece, remove the installed tip (heater hot) and clean both heater bores using the supplied 3/16" diameter wire brush prior to the installation of a new tip.

1. Select the proper tip for your application. Refer to Table 1.

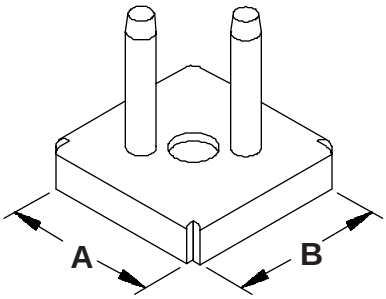
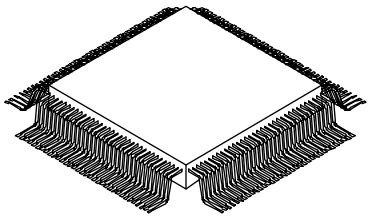
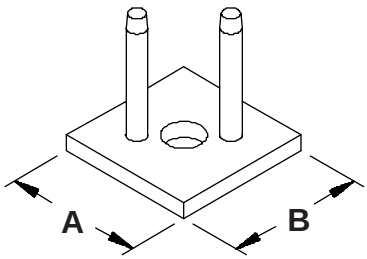
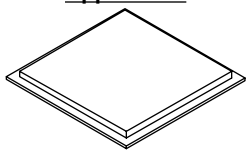


2. Insert the tip shafts fully into the heater bores.

3. Using the supplied Tip & Vacuum Cup Tool (P/N 1100-0239) or small screwdriver, tighten the heater assembly set screws for a snug fit. Do not over tighten.

NOTE

The DTP-80 tips must be kept properly tinned and free of oxidation to maximize tip life. Use the tip cleaning tools to remove all traces of solder from the heated tip. Carefully inspect for any oxidation buildup. If oxidation is present, re-tin and clean the tip until no oxidation spots remain. Immediately tin the tip surfaces and keep them tinned at all times.

PQFP Removal Tip	Description	Tip Size A X B	Part Number
 **Application** 	PQFP 100	0.83" x 0.83" (21.1mm x 21.1mm)	1121-0549
	PQFP 132	1.03" x 1.03" (26.2mm x 26.2mm)	1121-0551
	PQFP 144	1.15" x 1.15" (29.2mm x 29.2mm)	1121-0553
	PQFP 208	1.17" x 1.17" (29.7mm x 29.7mm)	1121-0557
	PQFP 160/208	1.21" x 1.21" (30.7mm x 30.7mm)	1121-0552
	PQFP 240	1.33" x 1.33" (33.8mm x 33.8mm)	1121-0558
	PQFP 196	1.42" x 1.42" (36.1mm x 36.1mm)	1121-0554
	PQFP 304	1.67" x 1.67" (42.4mm x 42.4mm)	1121-0593
BGA Removal Tips  **Application** 	BGA-169	.88" x .88" (22.4mm x 22.4mm)	1121-0594
	BGA-225	1.10" x 1.10" (27mm x 27mm)	1121-0596

NOTE:
All dimensions are nominal.
Consult your authorized PACE Distributor for sizes not listed.

Table I. Dual ThermoPik Tip Selection Guide

VACUUM CUP INSTALLATION/REMOVAL

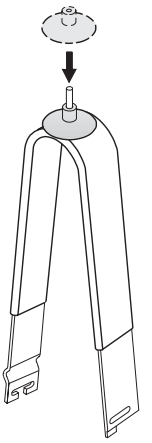
Three vacuum cup sizes are available for use with the DTP-80 handpiece. For optimum performance, select the largest vacuum cup which is smaller than the body of the component being removed. Use the supplied Tip & Vacuum Cup Tool and the following instructions to remove or install the vacuum cup.

WARNING
Do NOT install or remove a Vacuum Cup with bare hands! Always use the Tip & Vacuum Cup Tool! Installation by any other means may cause burns to the operator.

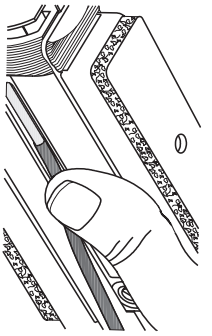
INSTALLATION

1. Ensure that the proper tip is installed in the handpiece.

2. Place the selected Vacuum Cup on the Pin of the Tip & Vacuum Cup Tool as shown.



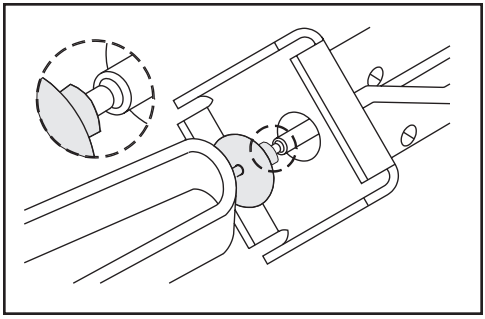
3. Press the vacuum hose against the handpiece handle as shown. This will hold the Vacuum Pick in position.



4. Insert the Tip & Vacuum Cup Tool Pin into the end of the handpiece Vacuum Pick.

5. Gently push the Vacuum Cup onto the Vacuum Pick.

6. Remove the Tip & Vacuum Cup Tool.

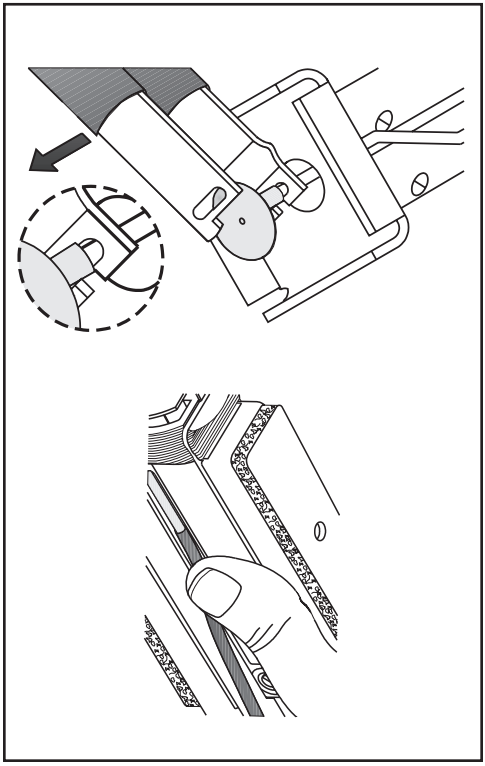


REMOVAL

1. Place the open-slotted end of the Tip & Vacuum Cup Tool around the Vacuum Pick and behind the Vacuum Cup as shown.

2. Press the vacuum hose against the handpiece handle to hold the Vacuum Pick in position.

3. Pull the Vacuum Cup off the end of the Vacuum Pick.



VACUUM PICK ADJUSTMENT

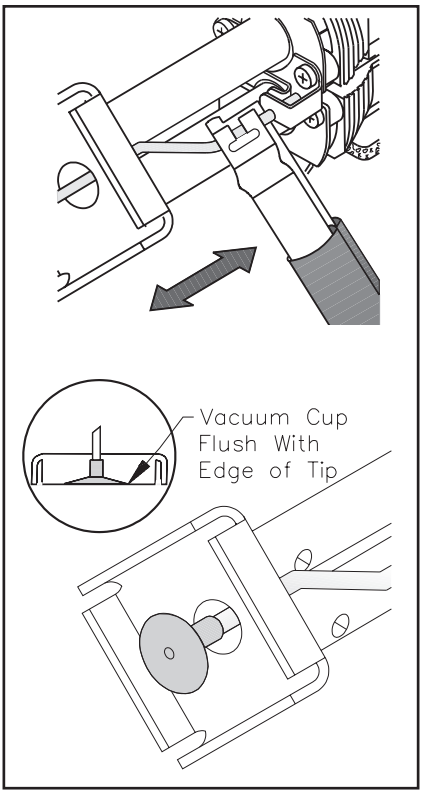
Proper vacuum must be maintained to lift and hold the component during a removal operation. The Vacuum Pick Assembly within the DTP-80 handpiece adjusts quickly and easily to provide an optimum setting where the vacuum cup makes contact with the component body as the tip makes contact with the component leads.

To adjust the Vacuum Pick Assembly, perform the following procedure:

1. Ensure that the proper tip and vacuum cup are installed on the DTP-80.

2. Using the Tip & Vacuum Cup Tool, grasp the Vacuum Pick as shown in the illustration.

3. Adjust the Vacuum Pick position to a point where the end of the Vacuum Cup is flush (even) with the bottom edges of the tip.



IMPORTANT - The Vacuum Pick is now in a proper position for initial operation. During the first component removal operation, the vacuum cup will contact the component body as the tip is lowered over the component. As the tip moves down to contact the component leads, the vacuum pick slides into position. Readjustment will not be required until the component removal application changes (e.g., different component, tip, vacuum cup).

TIP PREPARATION

DTP-80 tips must be kept free of oxidation to ensure that maximum heat transfer will take place at all times.

BGA Removal Tips - are not tinnable; use the tip cleaning tools (provided with the optional Tip Maintenance Station P/N 6993-0138) to remove all traces of oxidation from the heated tip.

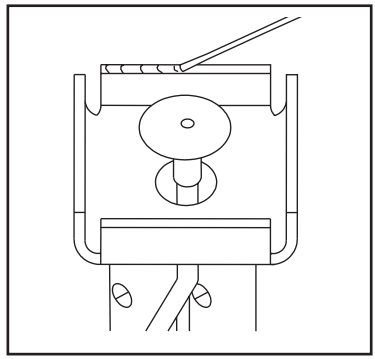
PQFP Removal Tips - must be kept properly cleaned and tinned. Carefully inspect for any oxidation buildup. Use the tip cleaning tools (provided with the optional Tip Maintenance Station P/N 6993-0138) to remove all traces of oxidation and solder from the heated tip. If oxidation is present, clean the tip until no oxidation spots remain. Immediately tin the tip surfaces and keep them tinned at all times.

Prepare the installed tip using the following procedure:

1. Clean all bottom edges of the installed tip using a PACE fiber cleaning tool.

2. Shock the bottom edges of the installed tip using a PACE sponge tool or sponge.

3. When using a PQFP Removal Tip, apply a continuous bead of solder along the bottom edges of the installed tip.



NOTE
The molten solder of a properly tinned PQFP Removal Tip is the medium through which an efficient heat transfer takes place making simultaneous reflow of all solder joints and component removal possible.

BOARD/COMPONENT PREPARATION

Proper preparation is the key to successful component removal. To obtain optimum results, this procedure should be followed.

Once you become familiar with the use of the handpiece, you may find it beneficial to develop procedure variations which comply with your company guidelines.

1. Remove any protective coatings and clean the component leads and land areas using an approved solvent or cleaner.

2. Ensure that the PCB is free of moisture. You may wish to gently dry the area using a heated air tool (i.e., TJ-70 ThermoJet).

3. Preheat the PCB as necessary. PCBs consisting of heat sinking materials (e.g., ceramic, polyamide, etc.) or those with an exceptionally heavy ground or power planes may require the use of a preheating system such as the PACE HotSpot.

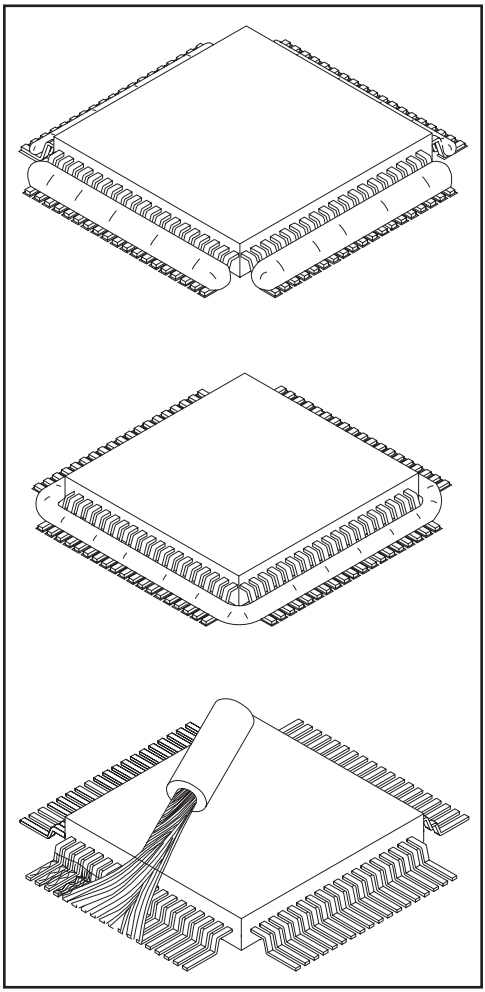
4. In order to maximize heat transfer from the handpiece tip to PQFP component lead/land connections, PACE recommends adding

bridgefill .....

solder wrap .....

or

flux .....



to maximize heat transfer across all connections.

When removing BGA components, the use of flux is an option which can be used to enhance heat transfer.

COMPONENT REMOVAL

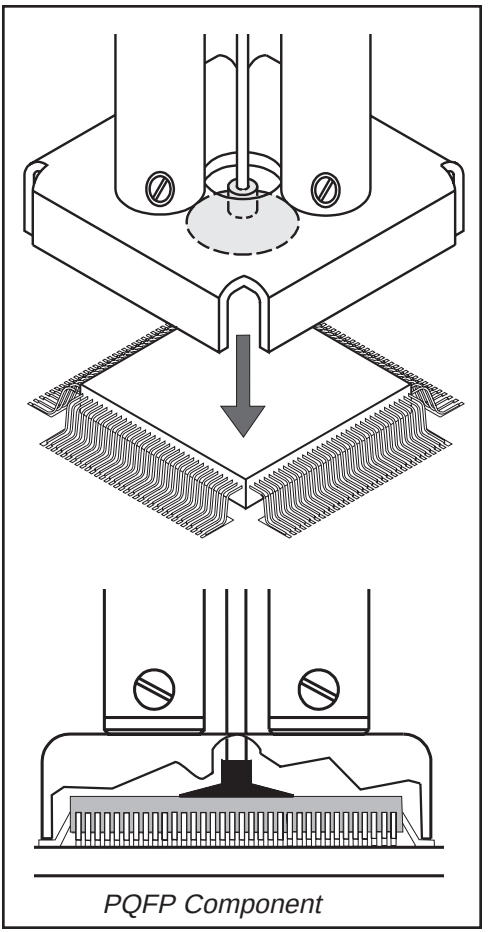
Use the following procedure to remove the component. Ensure that the component and board have been properly prepared (see "Board/Component Preparation") before removing component.

1. Set the PCB Assembly so that the component side to be worked on is flat and steady.

2. Clean the tip and apply a fresh bead of solder to its bottom edges.

3. Position the handpiece directly over the component to be removed.

4. Bring the handpiece down over the component. The vacuum cup should make contact with the component body before the tip makes contact with the leads. If the vacuum cup does not make contact, then the vacuum pick assembly is not properly adjusted. Remove the handpiece and readjust the pick before proceeding.



PQFP Component

NOTE
If the Vacuum Pick adjustment is incorrect (the vacuum cup not resting on the component body correctly), refer to the "Vacuum Pick Adjustment" portion of this manual.

6. The installed tip, when used to remove . . .

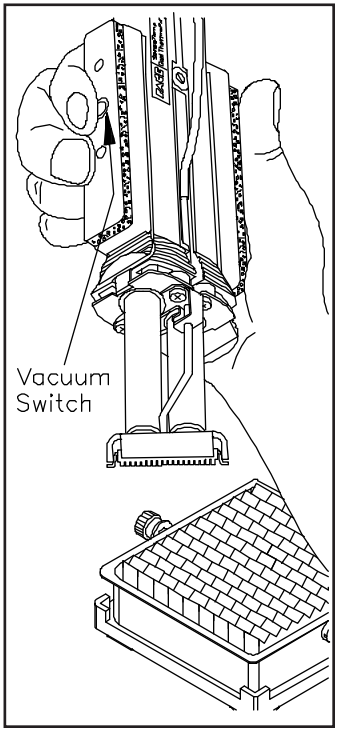
   a) **PQFP components -** should make contact with all the leads/solder joints simultaneously. After 1-5 seconds, all the leads should have reflowed.

      Activate **and hold** the Vacuum Switch to apply vacuum. If any adhesive is located beneath the component, gently slide the component to break adhesive loose.

      NOTE - Total time for the operation from tip placement to component lifting should take no longer than 6-8 seconds. If complete solder melt has not been achieved, remove the tool and allow the board and component to cool before a second attempt.

   b) **BGA components -** should make contact with the package. Dwell times may be longer than one minute & will vary depending on your particular component and PCB.

      After reflow of all connections, activate **and hold** the Vacuum Switch to apply vacuum.



7. Lift the handpiece straight up with the vacuum still running. Release the Vacuum Switch to deposit the component on an insulated surface.

8. Clean the tip; re-tin if using a PQFP Removal Tip (BGA Removal Tips are not tinnable). Return the handpiece to its Tip & Tool Stand.

You may wish to alter your procedure for best results in your application.

Use the SX-70 Sodr-X-Tractor handpiece to remove the old solder from the PCB and to prepare the lands for installation of a new part. Refer to one of the SX-70 Sodr-X-Tractor manuals for suggested solder removal techniques.

SPECIAL APPLICATIONS

If you require assistance in the use of this handpiece or require assistance with a special application, contact PACE Applications Engineering at:

Telephone:	(301) 490 - 9860
Fax:	(301) 604 - 8782

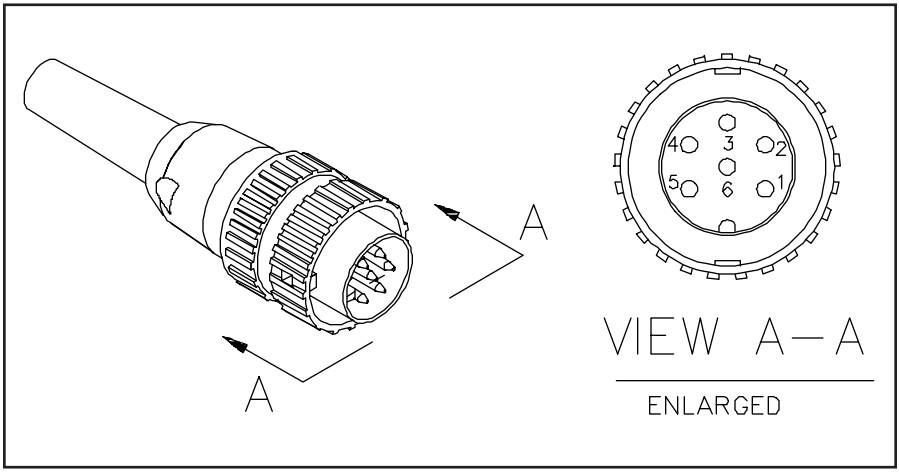
CORRECTIVE MAINTENANCE

Your DTP-80 requires no special maintenance other than being kept clean. The heater bore must be kept free of oxidation and debris in order to maintain the proper tip-to-ground resistance. Periodically inspect the power cable, connector and handpiece itself for evidence of physical damage. Do not use a handpiece with a damaged power cable. Refer to Table II and the illustration following for information on troubleshooting most handpiece problems. Table III lists the common handpiece parts.

Use Table II and the Connector Plug illustration to troubleshoot your DTP-80 Dual ThermoPik handpiece. Disconnect the handpiece from the PACE power source. Use a voltmeter to check the resistance across the handpiece Connector Plug pins as outlined in the “Checkout Procedure” column.

NOTE

The handpiece Heater Assembly must be at room temperature (22° C or 72°F) before performing "Heater Assembly Checkout Procedures".



SYMPTOM	CHECKOUT PROCEDURE	CAUSE	SOLUTION
No heat on either heater.	Check resistance - Pin 3 to Pin 6. Resistance should be 110 ohms. If circuit reads open - -	Open Sensor	Replace Heater Assembly "A".
	Check resistance - Pin 2 to Pin 5. Resistance should be 6 ohms. If circuit reads open - -	Open Heater	Replace both Heater Assemblies.
Handpiece overheating.	Check resistance - Pin 3 to Pin 6. Resistance should be 110 ohms. If circuit reads less than 105 ohms - -	Shorted Sensor	Replace Heater Assembly "A".
Heat on only 1 heater.	Check resistance - Pin 2 to Pin 5. If resistance equals 12 ohms - -	Open Heater	Replace cold Heater Assembly.
Fuse blows when unit is turned on.	Check resistance - Pin 4 to Pin 5 and Pin 4 to Pin 2. Circuit should read open. If not - -	Shorted Heater	Remove handpiece side cover "B". Disconnect wire connections to Heater "B". Check resistance again. If circuit reads open, replace Heater "B". If circuit is not open, replace Heater "A".

Table II. Heater Assembly Checkout Procedures

REPLACEMENT PARTS

Description	Part Number
Heater Assembly "A" (with sensor)	6010-0082-P1
Heater Assembly "B" (without sensor)	6010-0083-P1
Heater Set Screw	1348-0547-P10
Tip (and Vacuum Cup) Tool	1100-0239
Vacuum Tubing	1342-0027
Holder, Tube to Wire (hose clamps)	1321-0274-P6
Vacuum Cup Kit	6993-0153-P1
DTP Tip & Tool Stand	6019-0047
Replacement Pads For Cushion Grips	1317-0029-P2
Tip Redi-Rak	6021-0007-P1
Tip & Tool Stand Tip Redi-Rak	6021-0008-P1
3/16 inch O.D. Wire Brush For Cleaning	1127-0014-P5
Tip Maintenance Station	6993-0138

Table III. DTP-80 Replacement Parts