PACE®

ISO 9001 CERTIFIED

ST 60 Systems

Operation & Maintenance Manual

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General Information

Introduction

Thank you for purchasing the PACE model ST 60 System. This manual will provide you with the information necessary to properly set up, operate and maintain the ST 60 system. Please read this manual thoroughly before using the system.

The ST 60 system utilizes the model PPS 17 power source which incorporates a highly responsive SensaTemp (closed loop) control system providing up to 80 Watts of total power to a single output channel.

NOTE

This system requires a source of compressed air (shop air) which must be connected to the air hose fitting located on the rear of the power source.

The ST 60 system is available in the following three configurations:

ST 60-SX System - System with standard SX-70 Sodr-X-Tractor handpiece provides the high capacity heating necessary to perform thru-hole desoldering operations. The PPS 17 power source incorporates Auto Snap-Vac, with a minimum vacuum on-time of 1.2 seconds, to virtually eliminate re-sweat joints, reduce tip clogging and increase tip life of the SX-70.

ST 60-DTP System - System with standard 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 remove BGAs (Ball Grid Arrays).

ST 60-TJ System - System with standard TJ-70 ThermoJet handpiece provides safe, continuous flow of precision focused hot air for component installation and SMT land preparation.

The ST 60 system configurations are available in either the 115 VAC, 230 VAC or 100 VAC version. The 230 VAC version system bears the CE Conformity Marking which assures the user that it conforms to all the requirements of council directive EMC 89/336/EEC. The system configurations package the power source with a selection of accessories and functional aids.

All available PACE SensaTemp handpieces may be used with the ST 60 system to perform a wide variety of advanced surface mount & thru-hole component removal/ replacement operations. These include:

SP-2A Sodr-Pen	SP-1A Sodr-Pen	SX-70 Sodr-X-Tractor
DTP-80 Dual ThermoPik	TP-65 ThermoPik	TT-65 ThermoTweez
TJ-70 ThermoJet		

Specifications

System Power Source Power Requirements:

PPS 17 Operates on 97-127 VAC, 50/60Hz
90 Watts maximum at 115 VAC, 60Hz

PPS 17E Operates on 197-264 VAC 50/60Hz
80 Watts maximum at 230 VAC, 50Hz

PPS 17J Operates on 90-115 VAC 50/60Hz
80 Watts maximum at 100 VAC, 50/60Hz

Shop Air Input Requirements

Pressure - 5.48 Bar (80 p.s.i.) recommended
6.17 Bar (90 p.s.i.) maximum

Air Flow - 45.3 SLPM (1.6 SCFM) minimum

Temperature Specifications: Tip Temperature Range: 166°C to 482°C (331°F to 900°F) nominal.
Temperature Stability: ±1.1°C (±2°F) at idle from set tip temp.

NOTE

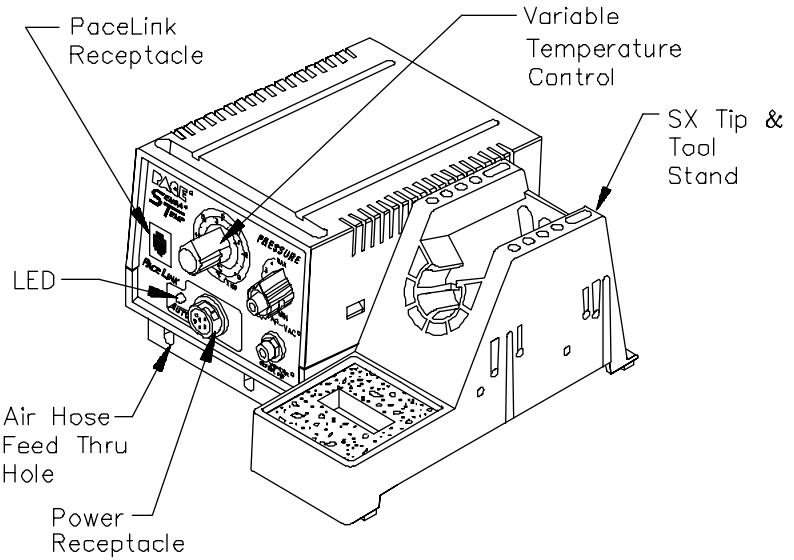
Actual minimum and maximum Operating Tip Temperatures may vary depending on Handpiece, Tip Selection, and application.

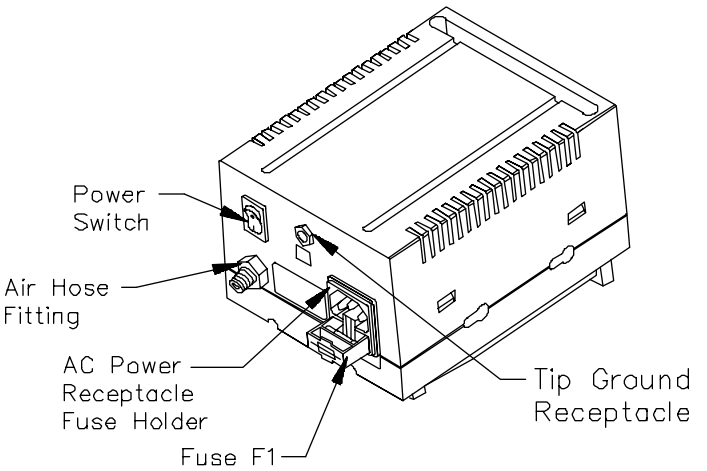
EOS/ESD Specifications: The specifications shown below apply except on "Soft Ground Systems" which have a 1 meg ohm current limiting resistance and a label placed on the power source front panel referring to EN 100015-1.

Tip-To-Ground Resistance: Less than 5 ohms.

AC Leakage: Less than 2 Millivolts RMS from 50Hz to 500Hz.

Parts Identification





The following are safety precautions which personnel must understand and follow when using or servicing this product.

1. SensaTemp handpiece heaters and installed tips are hot when the handpiece is powered on. **DO NOT** touch either the heater or the tip. Severe burns may result.

2. The enclosed Tip & Tool Stand has been designed specifically for use with the included SensaTemp air handpiece (SX-70 Sodr-X-Tractor, TJ-70 Mini ThermoJet or DTP-80 Dual ThermoPik) and houses the handpiece in a manner which protects the user from accidental burns. Always store the handpiece in its Tip & Tool Stand.

3. Always use this system in a well ventilated area. A fume extraction system such as those available from PACE are highly recommended to help protect personnel from solder flux fumes.

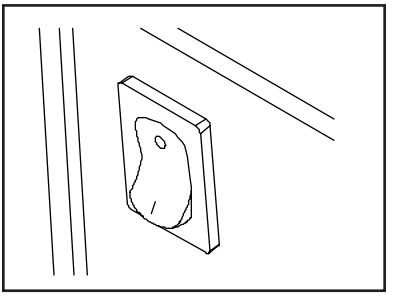
4. Exercise proper precautions when using soldering materials (e.g., fluxes). Refer to the Material Safety Data Sheet (MSDS) supplied with each material and adhere to all safety precautions recommended by the manufacturer.

5. **POTENTIAL SHOCK HAZARD -** Repair procedures on this product should be performed by Qualified Service Personnel only. Line voltage parts will be exposed when the equipment is disassembled. Service personnel must avoid contact with these parts when troubleshooting the power source.

Set-Up

Set up the ST 60 system using the following steps and associated drawings.

1. Store the shipping container(s) in a convenient location. Reuse of these containers will prevent damage if you store or ship the system.
2. Ensure that the Power Switch is in the "OFF" or "0" position.
3. Place 4 of the supplied Rubber Feet on the base of the power source. Remove the paper backing and place in corner indentations. Refer to illustration below.



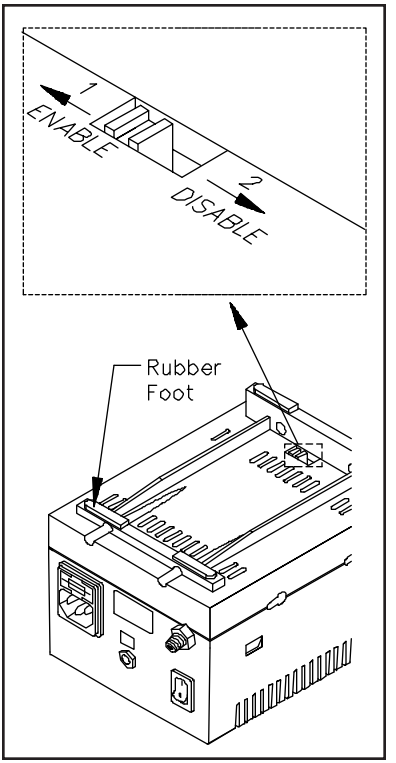
Auto Off Safety System

The Auto Off Safety System removes power from the connected handpiece after 90 minutes of handpiece inactivity. As received from the factory, the feature is Disabled ("2" position). The LED on the front panel will illuminate Yellow in color (with handpiece connected).

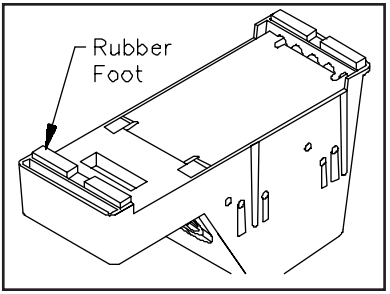
Refer to the description of the Auto Off Safety System detailed in the "Operation" portion of this manual.

To Enable ("1" position) the Auto Off feature, perform steps 4-6.

4. Place the power source on a work surface with the bottom facing up as shown in the illustration.
5. Move the switch to the "1" (Enable) position. During normal use, the LED will now be illuminated Green in color (with handpiece connected).
6. Position the system upright on a convenient bench.



Tip & Tool Stand



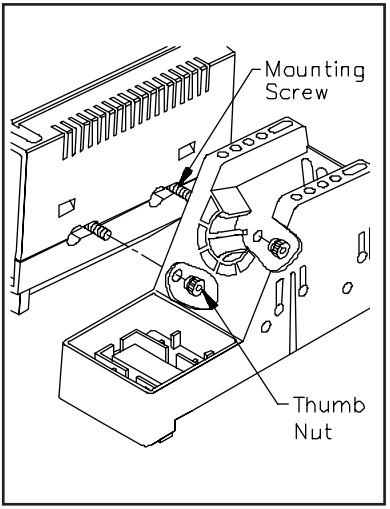
7. Place the 4 remaining Rubber Feet on the bottom corners of the enclosed Tip & Tool Stand.

8. The Tip & Tool Stand may be used as "free standing" or may be attached to either side of the power source. Attach the stand using the following procedure.

   a) Insert the 2 enclosed Mounting Screws (head first) into the power source mounting slots (2) shown. Slide the screws toward the rear of the power source.

   b) Place the Tip & Tool Stand beside the power source, inserting ends of the 2 Mounting Screws into the 2 lower Tip & Tool Stand mounting holes shown.

   c) Install a knurled Thumb Nut onto the end of each Mounting Screw. Tighten Thumb Nuts to secure the stand in position.



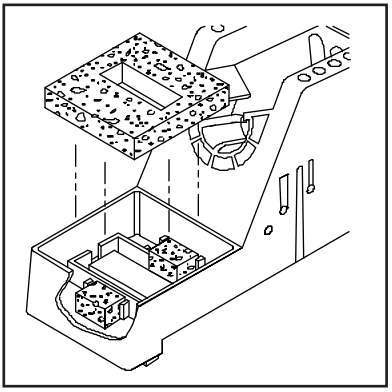
9. Place the supplied sponge in the Tip & Tool Stand using the following procedure.

   a) Remove the 2 small punched out center portions of the sponge & place them into the sponge well of the stand in the position shown.

   b) Place the large sponge section into the sponge well as shown.

   c) Dampen the sponges with water.

10. Place the handpiece into the Tip & Tool Stand.



Air Supply Connection

The ST 60 system utilizes an integral air venturi system to provide air pressure and vacuum for any connected PACE SensaTemp air handpiece. Your in-house air supply (regulated to 5.48 Bar (80 P.S.I.); see "Specifications") must be connected to the system power source.

CAUTION

The system must be connected to a clean, dry, and filtered air supply regulated to 5.48 Bar (80 P.S.I.); see "Specifications". Connection to a contaminated air supply or one with pressure in excess of 6.16 Bar (90 p.s.i. may cause damage to the power source.

11. Attach a length of Small, Flexible Air Hose (not supplied) to the Air Hose Fitting on the rear of the PACE power source using the following procedure.

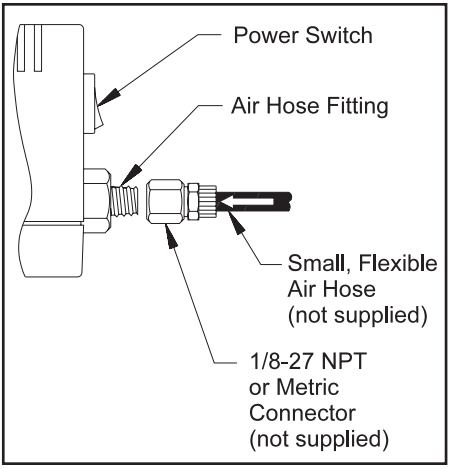
    PACE does not recommend the attachment of quick connect air hose fittings to the power source. The weight of the standard large air hose lines will affect the stability of the system and would require a larger bench space.

    a) **230 VAC Systems only:** A metric adapter fitting (PACE part number 1259-0081) is included for use with 230 VAC systems.
    Install the metric adapter onto the Air Hose Fitting finger tight. Using an appropriate wrench, tighten the adapter an additional 1/4 turn.

NOTE

DO NOT overtighten connections. Damage to the system could occur if excessive torque is applied to the Air Hose Fitting, metric adapter or Connector.

    b) Install the Connector (with Small, Flexible Air Hose) onto the Air Hose Fitting (or metric adapter) finger tight. Using an appropriate wrench, tighten the Connector an additional 1/4 turn. **DO NOT** overtighten.

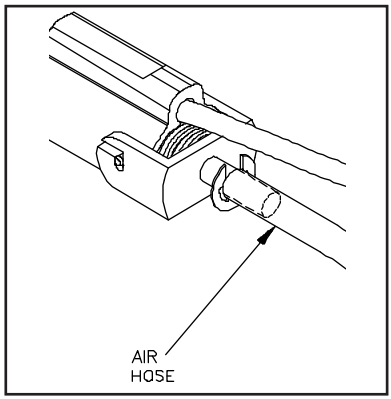


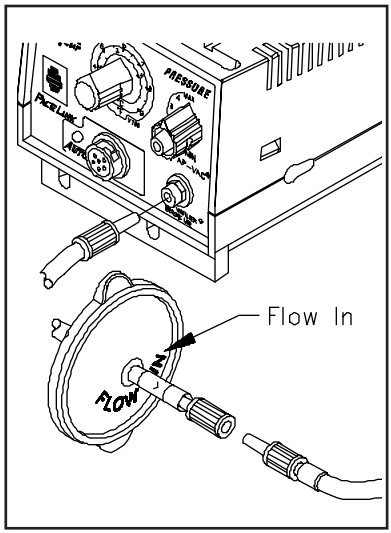
12. Connect the free end of the small, flexible air line hose to your air supply using the appropriate fittings.

Handpiece Vacuum/Pressure

The SX-70, DTP-80 and TP-65 handpieces require the use of the **AUTO SNAP-VAC** Port and the TJ-70 handpiece requires the use of the Controllable **PRESSURE** Port.

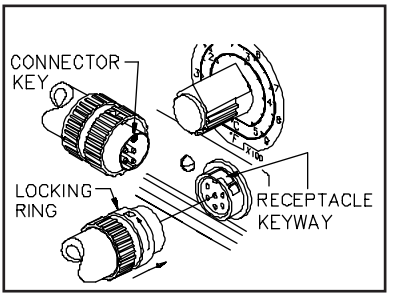
13. Connect the 54 inch (137cm) length of Air Hose to the metal tube in the back of the air handpiece.
14. Insert the ribbed end of a male quick connect hose mount Fitting (P/N 1259-0087) into the free end of the 54 inch (137cm) Air Hose.
15. Secure the Air Hose to the handpiece power cable with the cable clips (P/N 1321-0085-01-P6).
16. Prepare a VisiFilter assembly (not included with TJ systems):
    a) Connect a 1 inch (2.5cm) length of clear pvc air hose to each side of the VisiFilter; push and turn the hose onto the VisiFilter nipple to seat.
    b) Insert the ribbed end of a female quick connect hose mount fitting (P/N 1259-0086) into the free end of the air hose connected to the FLOW IN side of the VisiFilter.
    c) Insert the ribbed end of a male quick connect hose mount fitting (P/N 1259-0087) into the free end of the air hose connected to the FLOW OUT side of the VisiFilter.
    d) Connect the Visifilter air hose with the male quick connect hose mount fitting to the **AUTO SNAP-VAC** Port.
17. For vacuum (SX-70, DTP-80 or TP-65 handpiece), insert the male quick connect hose mount fitting on the handpiece air hose into the female quick connect hose mount fitting on the VisiFilter assembly. For pressure (TJ-70 handpiece), insert the male quick connect hose mount fitting on the end of the handpiece air hose into the Controllable **PRESSURE** Port (VisiFilter assembly remains connected to the **AUTO SNAP-VAC** Port).





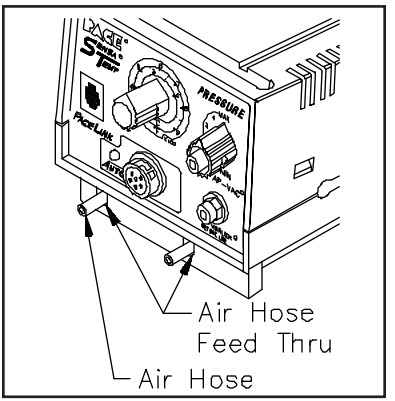
Handpiece Connection

18. Connect the handpiece connector plug into the Power Receptacle in the following manner.
    a) Turn the Locking Ring fully counterclockwise with the Connector Key end facing the power source.
    b) Align the Connector Key with the Receptacle Keyway.
    c) Insert the connector into the power receptacle.
    d) Turn the Locking Ring fully clockwise to secure in place.



Air Hose Routing

When using a Tip-Evac Fume Extraction System, route any associated air hose(s) through the 2 Air Hose Feed Thru holes located on the bottom of the power source.



System Power Up

19. Insert the female end of the power cord into the AC Power Receptacle at the rear panel of the power source.

20. Plug the prong end (male end) of the power cord into a 3 wire grounded AC supply receptacle. The system is now ready for operation.

CAUTION

To insure operator safety, the AC supply receptacle must be checked for proper grounding before initial operation.

21. Read the “Operation” section of this manual thoroughly before operating the system.

PACELINK

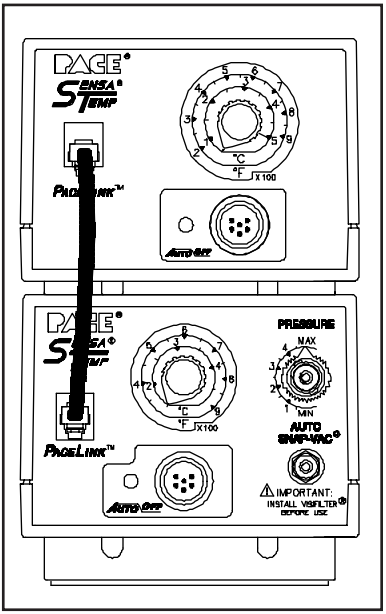
The PaceLink Receptacle on the power source front panel allows the you to link a ST 20A or ST 40A system to your ST 60 system **AUTO SNAP-VAC** and Controllable **PRESSURE** features. If an air handpiece (SX-70, DTP-80, TP-65 or TJ-70) is connected to the ST 20A or ST 40A, actuation of its finger switch will activate air flow through the **AUTO SNAP-VAC** and Controllable **PRESSURE** ports of the ST 60 system. To link a ST 20A or ST 40A to your ST 60 system, perform the following procedure.

1. Place your ST 20A (or ST 40A) & ST 60 systems adjacent to each other (side by side or stacked one on top of the other).

2. Use a PaceLink cable kit (P/N 6993-0182) to connect the systems. Place the plugs ends of the cable into the PaceLink Receptacles on both systems.

3. Ensure that a VisiFilter assembly is connected to the ST 60 **AUTO SNAP-VAC** Port when using a handpiece that requires vacuum (SX-70, DTP-80 or TP-65).

4. Connect the Air Hose of the handpiece currently in use to the VisiFilter assembly or Controllable **PRESSURE** Port.

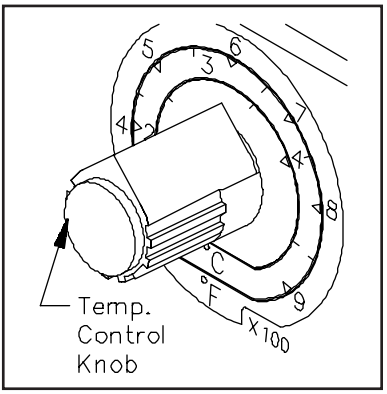


CAUTION

Systems connected together through the PaceLink must be used and controlled by a single operator. Any attempt to operate by more than one individual can create a hazard condition and will cause a deterioration in performance.

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

Temperature Selection



Variable Temperature Control

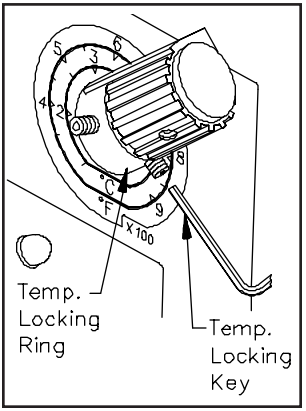
Adjust the Variable Temperature Control Knob to the desired temperature setting. Notice that the control dial has a White graphic scale denoting temperature in °C (Celsius) and a Yellow graphic scale denoting temperature in °F (Fahrenheit). These numerical scales denote the set tip temperature times 100 (e.g., “3” on the White scale is 3 x 100 or 300°C).

Temperature/Dial Lock

The Variable Temperature Control Knob can be locked in position (at one temperature) to avoid accidental or unauthorized changes of the temperature setting. Perform the following procedure to lock the Variable Temperature Control Knob.

1. Adjust the Temp. Control Knob to the desired temperature setting.

2. Using the Temp. Locking Key (hex head wrench) included with the system, tighten the 2 set screws on the Temp. Locking Ring.



NOTE

Temperature will remain at its locked setting, even if the Variable Temperature Control Knob is forced to move. To reposition a knob that has been moved, refer to the "Calibration" section of this manual.

Tip Temperature Setting

To save tip life and reduce the possibility of damage when using tips that come into direct contact with a solder joint, PACE recommends using the lowest possible tip temperature that will provide rapid yet controllable melt of the entire solder joint. Begin with an operating temperature in the range of 316°C (600°F) and adjust as necessary. Tip temperatures in excess of 399°C (750°F) may cause damage.

When using the TJ-70 handpiece, set the temperature to 482°C (900°F).

For safest removal, some components on extra heavy assemblies may require preheating or auxiliary heating.

Tip Temperature Offset

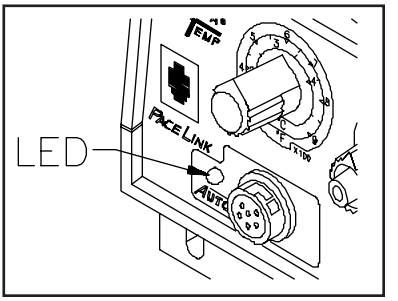
Differences between the temperature settings and true tip temperatures are negligible when using Thru-Hole, single point desoldering tips. With any heating system however, True Tip Temperatures can differ greatly from temperature settings when using SensaTemp handpieces with larger SMT soldering tips installed. This difference is called Tip Temperature Offset.

PACE recommends the use of the Tip & Temperature Selection System booklet (PACE part number 5050-0251) as a guide to accurately set and maintain a true tip temperature for any size and type of SMT tip. The booklet charts will indicate the appropriate Control Dial setting for the listed true operating temperatures of the selected tip. Adjust the Temperature Control Dial accordingly.

NOTE

Entry of a Tip Temperature Offset is not necessary when using Thru-Hole, single point desoldering tips or TJ-70 tips.

LED Operation



The tri-colored (Red, Green and Yellow) LED on the power source front panel indicates System Status (by color illumination) and Power Receptacle output status (LED Off, On or Flashing). Following is an explanation of these status indicators.

Green Illumination - Auto Off Safety System "Enabled".

Yellow Illumination - Auto Off Safety System "Disabled".

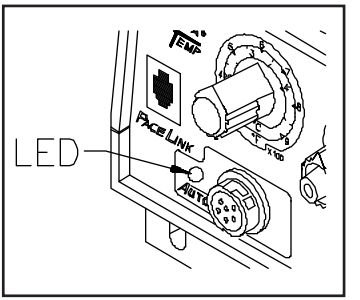
Red Illumination - Auto Off Safety System feature has turned system power off or the connected handpiece is faulty (see Corrective Maintenance section). Turn the system Power Switch off ("0") and then back On ("1") to reset the system.

LED Full On - Continuous power is being delivered to the handpiece (Red or Green illumination). This condition is evident when the system is first powered up (handpiece heater cold) or the Variable Temperature Control setting is increased.

LED Flashing - Indicates that the set tip temperature (as set on the Variable Temperature Control) has been reached. Power to the handpiece is cycling Off and On to maintain set temperature.

LED Off - No power is being delivered to the handpiece heater. This condition is evident if the Variable Temperature Control setting is decreased. If the LED never illuminates, check for a faulty handpiece (see Corrective Maintenance section).

Auto Off Safety System



The Auto Off Safety System is a feature(see Set-Up section of this manual) which, when Enabled, removes power from the connected handpiece after 90 minutes of handpiece inactivity except when using the largest TT-65, DTP-80 or TP-65 SMT tips.

During normal use with this feature enabled, the LED on the power source will be illuminated Green in color (may be flashing). When the system goes into Auto Off Mode, the LED will illuminate Red in color.

To resume normal operation, the Power Switch (on rear panel) must be turned Off ("0") position and then back On ("1").

These instructions detail the basic operational guidelines for using the SX-70 Sodr-X-Tractor handpiece. Applicable handpiece manuals are included with the ST 60-DTP and ST 60-TJ systems. Refer to those manuals for specific instructions on use of the particular handpiece.

A detailed SX-70 Operation & Maintenance Manual (P/N 5050-0312) and a Video Manual are available from PACE.

Introduction

The SX-70 Sodr-X-Tractor handpiece provides thermally enhanced through-hole desoldering on extra heavy multilayer assemblies, at safer, lower temperatures, even during continuous use and features a large easy-to-clean solder reservoir. The SX-70 also provides safe removal of TQFP (Thin Quad FlatPack) and TSOP (Thin Small Outline Package) surface mount components and continuous removal of old solder from surface mount lands. Its slim-line, pencil grip design and finger actuated vacuum switch facilitates ease of use and manipulation in tight places. The SX-70 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 inhalation of fumes created by solder flux.

NOTES

When using your SX-70 Sodr-X-Tractor handpiece for the first time or if you have just replaced the heater, we recommend that you follow the “SX-70 Heater Burn-in” procedure (Red tag on handpiece) to increase the life expectancy of the heater.

Always use your SX-70 Sodr-X-Tractor with a clean VisiFilter element. Otherwise a deterioration in performance or damage to the unit may occur.

Select and enter your desired true operating temperature on your PACE power source. To save tip life and reduce the possibility of damage, PACE recommends using the lowest possible tip temperature that will provide rapid yet controllable melt of the entire solder joint to be extracted. Begin with an operating temperature in the range of 316°C (600°F) and adjust as necessary.

Tip Selection

Tips for the SX-70 Sodr-X-Tractor come in four basic types.

1. **Desoldering Tips** (3/16" shank) Thermo-Drive, Extended Reach and Long Life versions. These tips are tinnable and provide enhanced thermal performance for thru-hole desoldering on high mass boards.

2. **Micro Tips** (1/8" shank) in straight and angled versions. These tips allow easy access into tight places and unclinching of leads during normal desoldering. The AdapTip (P/N 1360-0083-P1) must be installed in the SX-70 prior to using Micro Tips. Angled Micro Tips also offer convenient cleaning of old or excess solder from individual SMT lands.

3. **Pik-Tips** (3/16" shank) provide safe removal of TQFP (Thin Quad FlatPack) and TSOP (Thin Small Outline Package) surface mount components.

4. **Flo-D-Sodr Tips** (3/16" shank) both standard and Long Life versions. These tips provide rapid, continuous extraction of old or excess solder from SMT lands.

Size selection of tips is important. For thru-hole desoldering, select a tip with an I.D. just large enough to allow the lead to freely pass inside. The tip O.D. should not exceed the diameter of the land to minimize risk of damage to the board substrate. When removing TQFPs or TSOPs, the Pik-Tip should be sized so that the tip blades make proper contact with all the lead/land connections simultaneously.

Available Tips

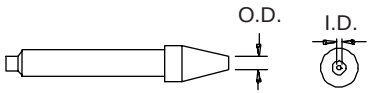
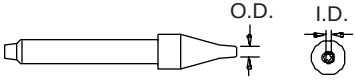
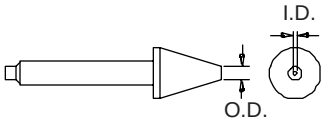
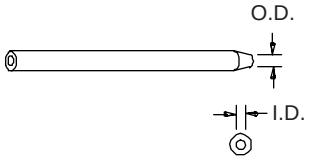
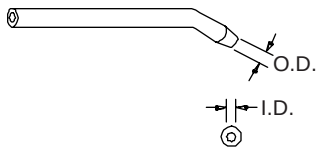
Desoldering Tips		Outside Diameter (O.D.)	Inside Diameter (I.D.)	Part Number
Thermo-Drive 3/16" Shank Desoldering Tips		1.52mm (0.060")	0.76mm (0.030")	1121-0367
		1.91mm (0.075")	1.02mm (0.040")	1121-0342
		2.54mm (0.100")	1.52mm (0.060")	1121-0368
		4.8mm (0.190")	2.29mm (0.090")	1121-0507
Extended Reach Thermo-Drive 3/16" Shank Desoldering Tips		1.65mm (0.065")	0.76mm (0.030")	1121-00505
		2.16mm (0.085")	1.02mm (0.040")	1121-00494
		2.69mm (0.106")	1.52mm (0.060")	1121-00506
Long Life 3/16" Shank Desoldering Tips		1.91mm (0.075")	0.76mm (0.030")	1121-0462
		2.16mm (0.085")	1.02mm (0.040")	1121-0463
		2.69mm (0.106")	1.52mm (0.060")	1121-0464
Micro Tips 1/8" Shank (Must Be Used With AdapTip P/N 1360-0083-P1)		2.03mm (0.080")	0.76mm (0.030")	1121-0253
		1.78mm (0.070")	0.76mm (0.030")	1121-0485
		2.03mm (0.080")	1.02mm (0.040")	1121-0254
		1.78mm (0.070")	1.02mm (0.040")	1121-0486
		2.54mm (0.100")	1.52mm (0.060")	1121-0255
		2.03mm (0.080")	0.76mm (0.030")	1121-0261
		2.03mm (0.080")	1.02mm (0.040")	1121-0262
		2.54mm (0.100")	1.52mm (0.060")	1121-0267

Table I. DesolderingTips

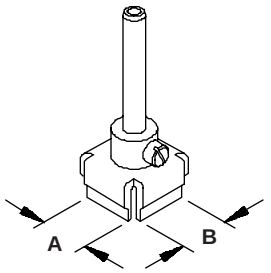
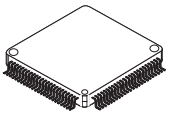
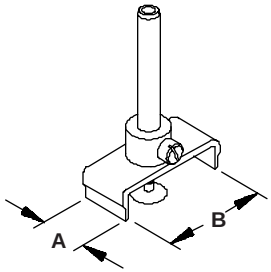
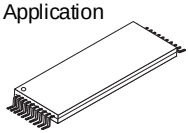
Pik-Tips	Description	Tip Size A x B	Part Number
 Application  TQFP	TQFP-28	8.2mm x 8.2mm (0.322" x 0.322")	1121-0571
	TQFP-32	8.7mm x 8.7mm (0.344" x 0.344")	1121-0572
	TQFP-52	12.0mm x 12.0mm (0.472" x 0.472")	1121-0573
	TQFP-40	12.0mm x 12.0mm (0.472" x 0.472")	1121-0574
	TQFP-80	13.2mm x 13.2mm (0.520" x 0.520")	1121-0575
	TQFP-80/100	15.3mm x 15.3mm (0.604" x 0.604")	1121-0576
	TQFP-144	21.6mm x 21.6mm (0.85" x 0.85")	1121-0604
	TQFP-112	22.1mm x 22.1mm (0.87" x 0.87")	1121-0605
	TQFP-80/100	16.8mm x 22.9mm (0.66" x 0.90")	1121-0603
 Application  TSOP	TSOP-28	8.1mm x 12.7mm (0.320" x 0.500")	1121-0567
	TSOP-32	8.1mm x 19.3mm (0.320" x 0.760")	1121-0566
	TSOP-40	9.9mm x 19.3mm (0.390" x 0.760")	1121-0568
	TSOP-56	14.2mm x 19.3mm (0.560" x 0.760")	1121-0569
	VACUUM CUPS		
	Small	4.4mm (0.175") O.D.	1121-0382-P1
	Medium	7.62mm (0.300") O.D.	1121-0383-P1
	Large	12.7mm (0.500") O.D.	1121-0384-P1
	Kit (w/3 cups)	inc. one of each size	6993-0153-P1

Table II. Surface Mount Removal Tips

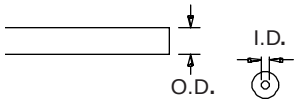
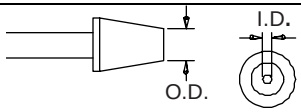
Flo-D-Sodr Tips (3/16" shank diameter)		Outside Diameter (O.D.)	Inside Diameter (I.D.)	Part Number
Flo-D-Sodr Tip		4.77mm 0.188"	1.52mm 0.060"	1121-0369
Long Life Flo-D-Sodr Tip		4.98mm 0.196"	1.52mm 0.060"	1121-0465

Table III. Flo-D-Sodr Tips

Tip Installation

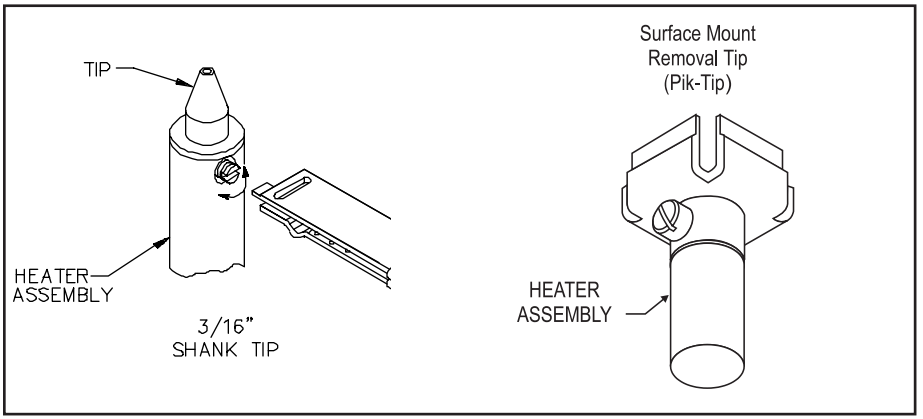
The following instructions are for tip installation only. If a tip is currently installed in the handpiece, remove the installed tip (heater hot) and clean the heater bore using the supplied wire brushes prior to the installation of a new tip.

1. Select the proper tip for your application. Refer to "Available Tips" tables.

2. Apply power to the handpiece and set the desired operating temperature if the handpiece is cold. Refer to the "Temperature Setting" portion of this manual.

3. Install the selected tip in the following manner.

   a) To install 3/16" shank Desoldering tips, Flo-D-Sodr tips or Surface Mount Removal tips, hold handpiece with the heater end up (heater hot), insert tip all the way and *GENTLY* tighten heater set screw.



   b) To install Micro Tips, first insert AdapTip into heater (heater hot) all the way and *GENTLY* tighten heater set screw. While holding handpiece horizontally, insert selected tip into AdapTip opening using the Tip Tool as a gauge, leaving 3/8" (1 cm) of tip extending out of the AdapTip, and *GENTLY* tighten AdapTip set screw.

4. After a short period (1-2 minutes) recheck the tip set screw to ensure that it remains snug.

Tip Preparation

Proper tip preparation will insure optimum results and increase tip life. Follow this procedure before each component removal or land preparation operation and prior to storage of the handpiece in its Tip & Tool Stand.

NOTE

The use of a PACE Tip Maintenance Station (PACE part number 6993-0138) is recommended for the proper preparation and maintenance of all SX-70 tips. If this item has not been purchased (standard on MBT 250 & PRC 2000 systems), contact your local authorized PACE dealer for assistance.

1. Insure that the installed tip is at set tip temperature.

2. Using a moistened sponge, remove all solder dross and flux residue from the tip.

NOTE

Insure that the sponge material is moist and free of debris. Add water if necessary. Wiping the heated tip on a dry sponge will only contaminate the tip and ultimately the board. It will also significantly shorten the life of the sponge itself.

3. Surface Mount Removal, Thermo-Drive and Thermo-Drive Long Life 3/16" shank tips are tinnable. Using a large gauge, flux cored wire solder, tin the end of these tips. Proper tinning enhances heat transfer to lands and extends tip life. All Micro Tips (1/8" shank) are not tinnable and must be used with the AdapTip.

4. During Flo desoldering or Thru-hole desoldering, on heavily fluxed or contaminated boards, debris may collect inside the tip bore. If this occurs, clean the tip bore with the Sodr-X-Tractor Tip Cleaning Kit (PACE part number 6993-0151).

5. The SX-70 handpiece is now ready for use. If not immediately using the handpiece, store in its Tip & Tool Stand.

Thru-Hole Solder Extraction

Use the following procedure to obtain the best results in through-hole solder extraction.

1. Ensure that the air hose is connected to a VisiFilter and the **AUTO SNAP-VAC** (or **SNAP-VAC**) Port on the power source. Select an operating temperature that will cause complete solder melt in 2-5 seconds (somewhat longer on heavy multilayer boards). A tip temperature of 316°C (600°F) is recommended for most applications.
2. Position your index finger on the vacuum control switch found on the handpiece. Alternatively, vacuum can be actuated by an optional foot pedal.
3. Gently position the extractor tip over the lead contacting the solidified solder keeping tip perpendicular to the pad and board.

NOTE

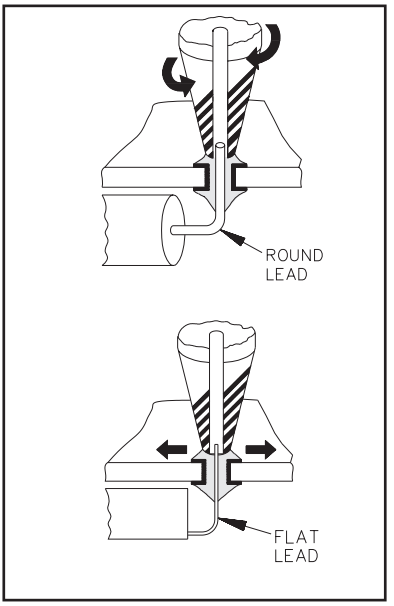
Do not apply pressure against the pad at any time during this operation. Damage to the board may result.

4. Gently move the lead ...

   a) in a circular motion for round leads

   b) in a back and forth motion for flat leads

   until the lead moves freely. Free lead movement indicates that complete solder melt has been obtained.



5. While continuing to move lead, actuate vacuum with the finger switch and keep on for at least 2 seconds to cool joint and prevent resweating. The length of time from when heat is applied until the time vacuum is started (i.e., complete solder melt) should be 2-5 seconds under normal conditions. Heavy multilayer boards may require somewhat longer heating times. In extreme cases, preheating or auxiliary heating is recommended to achieve the safest results.

NOTE

Premature actuation of the vacuum may result in incomplete removal of solder from the joint being desoldered. Free movement of the lead is the workpiece indicator that proper solder melt has been achieved. In the event that all the solder has not been removed from the hole, the recommended procedure is to resolder the hole and try again after the board has been allowed to cool.

6. Remove tip from pad and continue vacuum application for an additional 2 seconds to insure that all residual solder is drawn into the solder collection chamber.

7. Retin tip using large gauge flux cored solder and return SX-70 to its Tip & Tool Stand.

8. After all leads are desoldered, the component is easily removed. If any solder should remain in the plated thru-hole after extraction, resolder the connection and perform this procedure again.

Surface Mount Component Removal

Component Preparation

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

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.

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 Heat Wave.

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

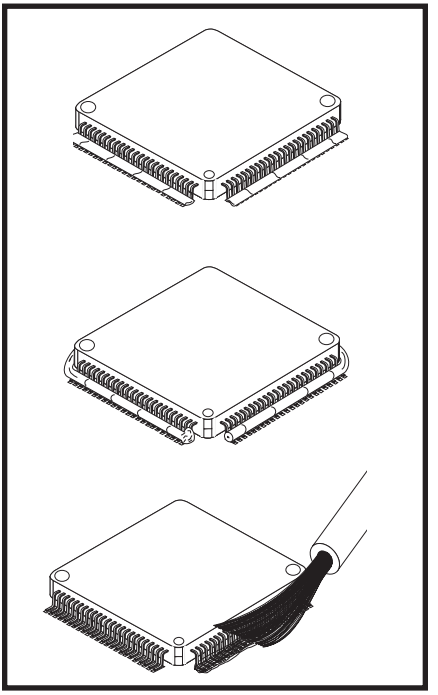
bridgefill .....

solder wrap .....

or

flux .....

to maximize heat transfer across all connections.

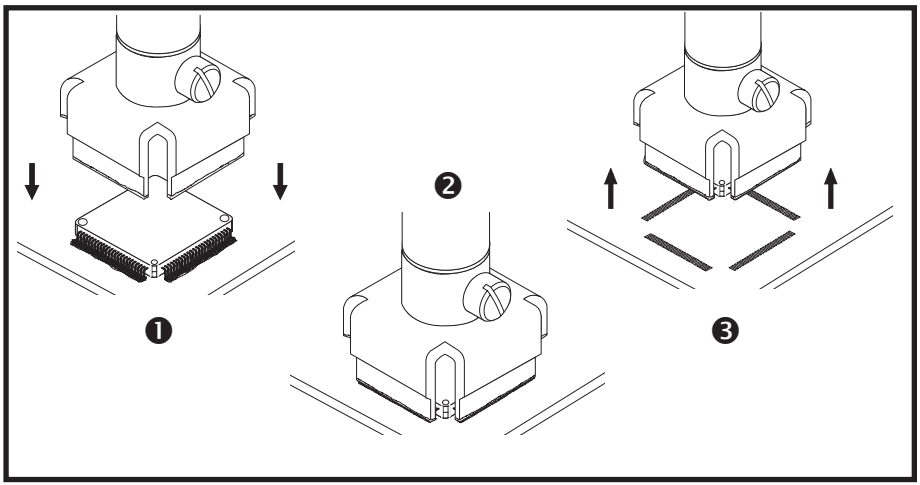


TQFP/TSOP Component Removal

TQFP and TSOP surface mount components can be removed using the SX-70 handpiece and the appropriate Pik-Tip. Use the following procedure to obtain optimum results. The illustrations accompanying the procedure depict a TQFP removal; removal of TSOP components are accomplished using the same procedure.

Procedure

1. Ensure that all Board/Component Preparation has been performed.
2. Start with a tip temperature of 315°C (600°F) and adjust as necessary.
3. Enter Tip Offset for the selected tip.
4. Install vacuum cup to Pik-Tip tube using Tip Tool.
5. Install TQFP (or TSOP) Removal Tip into Sodr-X-Tractor using Tip Tool.
6. Remove old solder from tip with sponge. Tin inside and bottom edges of tip with solder.



7. Lower tip over component contacting **ALL** leads with tip (see ❶&❷).
8. Confirm solder melt of **ALL** joints, apply vacuum and lift component from PCB (see ❷&❸).
9. Release component onto a heat resistant surface.
10. Re-tin tip with solder and return Sodr-X-Tractor to its Tip & Tool Stand.
11. Prepare lands for component replacement.

SMT Land Preparation

Proper land preparation is the key to successful assembly, rework and repair. To obtain optimum results, follow these steps.

1. After component removal, clean the land area of old flux residue using an approved solvent or cleaner.

2. Ensure that the PCB is free of moisture. You may wish to gently dry the land pattern area using a PACE ThermoJet handpiece or Heat Wave preheating or auxiliary heating.

3. Some circuit boards such as ceramic and polyamide as well as those incorporating large ground planes or multilayer technology may require the use of preheating to prevent thermal shock and reduce heat sinking from the component mounting site. The PACE Heat Wave should be used for this purpose as necessary.

4. Apply a thin coat of an approved liquid flux to the lands (optional step).

5. Ensure that the air hose is connected to a VisiFilter and the **AUTO SNAP-VAC** (or **SNAP-VAC**) Port on the power source. Select a tip operating temperature that will cause complete solder melt immediately upon tip contact without causing heat damage to the lands.

6. Install the proper tip for your application.

   a) Install a Flo-D-Sodr tip. The Flo-D-Sodr tip is used for continuous land cleaning.

   b) Install the AdapTip (P/N 1360-0083-P1) and a Micro Tip to individually clean lands.

7. Hold the SX-70 handpiece (with Flo-D-Sodr or Micro tip installed) in a vertical position (tip down) directly over the land where solder is to be removed.

8. Lower the handpiece tip for contact with the solder.

NOTE

Contact between the tip and land must be maintained to obtain maximum thermal linkage. Downward pressure should be minimized to avoid damaging of lands.

9. Complete solder melt should be immediate. Actuate vacuum using the handpiece vacuum control switch or the optional foot pedal.

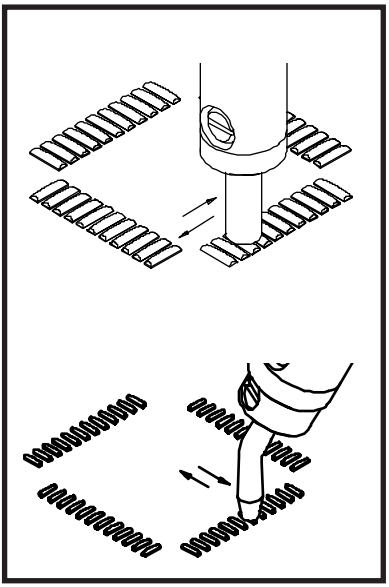
NOTE

If solder melt is not immediate, remove the handpiece and tip. Continued heating without allowing the board to cool to the ambient temperature may cause board damage. Preheating or a higher tip temperature may be required.

10. Sweep the tip (Flo-D-Sodr or angled Micro tip) along the length of each land or row of lands until all solder is removed using the appropriate procedure shown below.

    a) Using a Flo-D-Sodr tip, gently contact the solder, activate vacuum and sweep along the length of each row of lands while maintaining vacuum until all solder is removed. After all lands are cleared, continue vacuum for an additional 5 seconds to clear all molten solder from the heater chamber.

    b) Using a Micro tip, gently contact the solder. When the solder melts, activate vacuum and sweep along the length of the land until all solder is cleared. Deactivate vacuum and proceed to the next land.



Cleaning Solder Collection Chamber

As the Sodr-X-Tractor is used, solder and flux buildup will begin to impede the air flow and decrease system performance. Regular cleaning of the chamber will keep the Sodr-X-Tractor operating at peak performance.

1. Remove any installed tip using the Tip Tool.

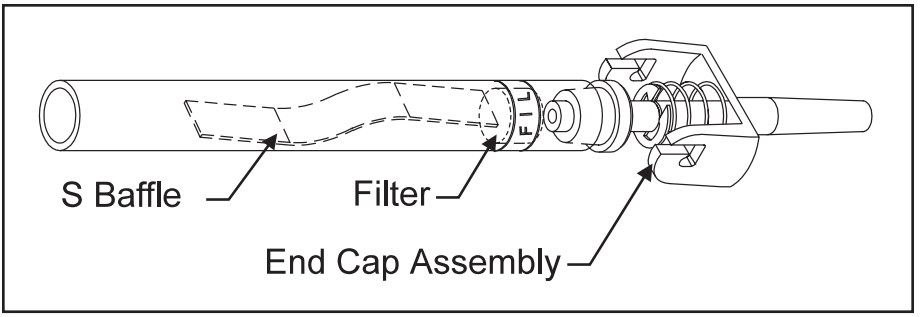
2. While holding the Sodr-X-Tractor tip up, remove the End Cap Assembly from the rear of the handpiece. This action is accomplished by pushing the End Cap Assembly toward the front of the handpiece and turning counterclockwise to disengage.

   The chamber can be easily removed if it remains in the handpiece when the end cap assembly is removed. Insert a small flat blade screwdriver into the handpiece and gently push the front end of the glass chamber off the front seal.

NOTE

Do not attempt to remove the solder collection chamber (glass or silicone rubber chamber) from the Sodr-X-Tractor using pliers or any like tool. The use of such tools may cause damage to the chamber.

3. To remove the chamber from the End Cap Assembly, grasp the chamber by the end closest to the End Cap Assembly. On a heated extractor this end may be warm to the touch. DO NOT touch the other end as it initially may be too hot to touch. If dropped, a glass chamber is likely to break.



4. Clean and inspect the solder collection chamber in the following manner:
   a) **Glass Chambers** - Push the S Baffle and Filter from the chamber. A bristle brush may be used for this purpose. Check for breaks or cracks in the glass and for broken or rough edges on the ends of the chamber. Replace if any damage is evident.

      Clean the chamber and S Baffle with the large nylon bristle brush which has been wetted with an approved solvent. Run the brush through the chamber several times to remove solder and flux residues which have built-up. If desired, apply mineral oil to the brush and lightly coat the inside of the chamber and the S Baffle.

   b) **Silicone Rubber Chambers** - Remove the Filter and S Baffle from the chamber. Tap the side of the chamber against the side of a waste container to release residual solder. Check for any breaks or deformation of the chamber. After extended use, the ends of the chamber may deform and cause air leaks at the rubber seals (front and rear of handpiece). Replace if any damage is evident.
5. Assemble the solder collection chamber by installing the S Baffle and a new Filter into the chamber. The S Baffle should have enough tension to maintain a constant position within the chamber. Bending of the baffle slightly at the center will readjust the tension. Do not attempt to bend the baffle while installed in the chamber. The Filter must line up with the markings on a glass chamber (just clear of the End Cap Assembly in a silicone rubber chamber) and the rear of the S Baffle should be positioned just touching the Filter.
7. To ensure that the chamber will remain attached to the End Cap Assembly, seat the End Cap Assembly in the chamber and twist to secure in place.
8. Hold the Sodr-X-Tractor with the vacuum control switch in the upright position.
9. Insert the chamber into the Sodr-X-Tractor. Slide the chamber into the handpiece and onto the front heater seal.
10. Inspect for proper seating of the chamber on the front seal.
11. Attach the End Cap Assembly to the Sodr-X-Tractor by pushing forward and turning clockwise to lock into place.
12. Check all air hose fittings. Actuate the vacuum and ensure that proper vacuum flow is present at the tip.

Tip Cleaning

During heavy, continuous desoldering, on boards with flux residues or other contamination, the tip may occasionally become clogged with such material. If this should occur, clean the tip with the Tip Cleaning Kit (PACE part number 6993-0151) by inserting the wire tool into the tip end.

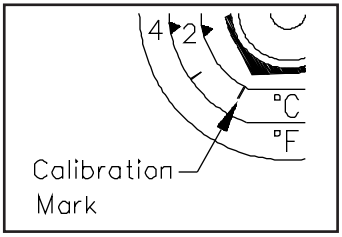
Special Applications

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

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

The ST 60 system power supply is designed to produce tip temperatures that accurately match the Set Temperature indicated on the Dial/Display. Perform the following procedure to verify temperature accuracy of the system or to reposition a dial that has been forced out of position while locking the Temperature/Dial setting.

NOTE - When set fully counterclockwise, the pointer of the Variable Temperature Control knob will align to the Calibration Mark as shown.

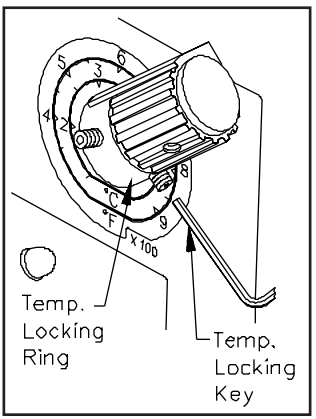


1. Install a tip with an attached thermocouple wire into the handpiece connected to the system. Tips with K type thermocouples are available from PACE; use part number 7021-0004-P1 when ordering.
2. Connect the thermocouple assembly to a PACE Process Monitor (part number 8001-0077 or 8001-0078) or appropriate temperature meter.
3. With the system turned on, adjust the Variable Temperature Control to 350°C (652°F) on the Dial/Display.

   Compare the temperature displayed on the Process Monitor (or temperature meter) to the 350°C (652°F) setting. If necessary, reposition the Variable Temperature Control knob by performing steps 4-7.

NOTE - Recheck temperature accuracy using a second handpiece before performing steps 4-7.

4. Set the control knob to obtain a 350°C (652°F) temperature reading on the Process Monitor (or temperature meter).
5. Carefully lock the temperature by tightening the 2 inner set screws on the Temp. Locking Ring.
6. Loosen the outer set screw on the Variable Temperature Control knob. Position the knob with the pointer aligned to match the temperature indicated on the Process Monitor (or temperature meter). Secure the knob in position by tightening the outer set screw.
7. Loosen the 2 inner set screws (on Temp. Locking Ring) to unlock the Variable Temperature control. The operating temperature can now be adjusted.



Power Source

Most malfunctions are simple and easy to correct. Refer to Table IV below to clear these malfunctions.

Symptom	Probable Cause	Solution
No power to system.	Blown Fuse	Check handpiece using Table V . Replace the fuse (located in the AC Receptacle/Fuse Holder) with one of the same value (see Table VI).
No heat on handpiece.	Defective Heater	See Table V. Heater Assembly Checkout Procedures or refer to the handpiece Manual.
No vacuum or air pressure at handpiece.	House air supply not connected to power source.	Check house air supply connection at power source rear panel.
	Kinks in handpiece air hose.	Remove kinks or replace air hose.

Table IV. Power Source Corrective Maintenance

Handpieces

The following procedures are applicable to all PACE SensaTemp handpieces except for the DTP-80 & TT-65. Refer to the applicable manuals (5050-0403 & 5050-0300) for troubleshooting procedures pertinent to that handpiece. Disconnect the handpiece from the power source and perform the procedures with the handpiece (and heater) at room temperature. If the handpiece is warm, resistance readings will be different from those shown. Use a meter to check resistance across the handpiece connector plug pins as outlined in the "Checkout Procedure" column.

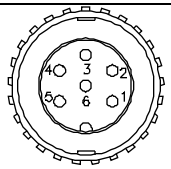
Symptom	Checkout Procedure	Cause	Solution	Heater Specifications
No heat on handpiece.	Check resistance - Pin 2 to Pin 5. Refer to "Heater Specifications" column. If resistance is high - -	Open Heater.	Replace Heater Assembly.	SP-1A = 10-12 ohms SP-2A = 8-10 ohms
	Check resistance - Pin 3 to Pin 6. If circuit reads open - -	Open Sensor.	Replace Heater Assembly.	SX-70 = 8-10 ohms
Handpiece overheating LED is Red.	Check resistance - Pin 3 to Pin 6. Resistance should be 110 ohms. If resistance is less than 105 ohms - -	Shorted Sensor.	Replace Heater Assembly.	TP-65 = 9-11 ohms TJ-70 = 6-8 ohms
Fuse blows when unit is turned on.	Check resistance - Pin 2 to Pin 5. Refer to "Heater Specifications" column. If resistance is low - -	Solder short in Handpiece.	Remove Short. Replace Heater Assembly & Fuse.	 Connector Plug Pinouts
		Shorted Heater.	Replace Heater Assembly & Fuse.	
No Ground on Tip.	Check resistance - Pin 4 to a NEW Tip. Resistance should be less than 2 ohms. If not - -	Oxidation in Heater Bore.	Clean Heater Bore using appropriate wire brush.	
		Defective Heater.	Replace Heater Assembly.	

Table V. Heater Assembly Checkout Procedures

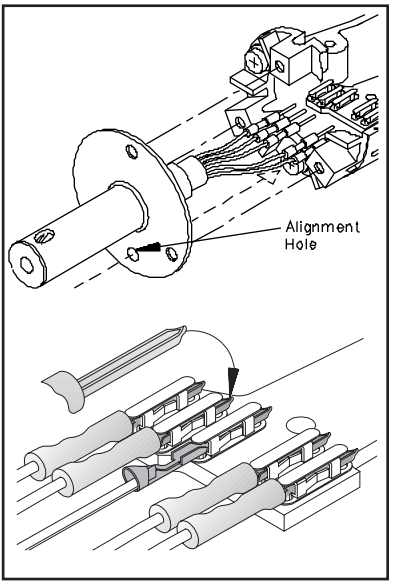
SX-70 Heater Replacement

Ensure that the heater assembly of your handpiece is defective by referring to the Corrective Maintenance section of this manual. To replace the SX-70 Heater, perform the following procedure using the illustrations as a guide

1. Remove and set aside any installed tip from the handpiece.
2. Disconnect the SX-70 handpiece from the power receptacle of the power source.
3. Remove the end cap assembly & solder collection chamber from handpiece.

(continued on next page)

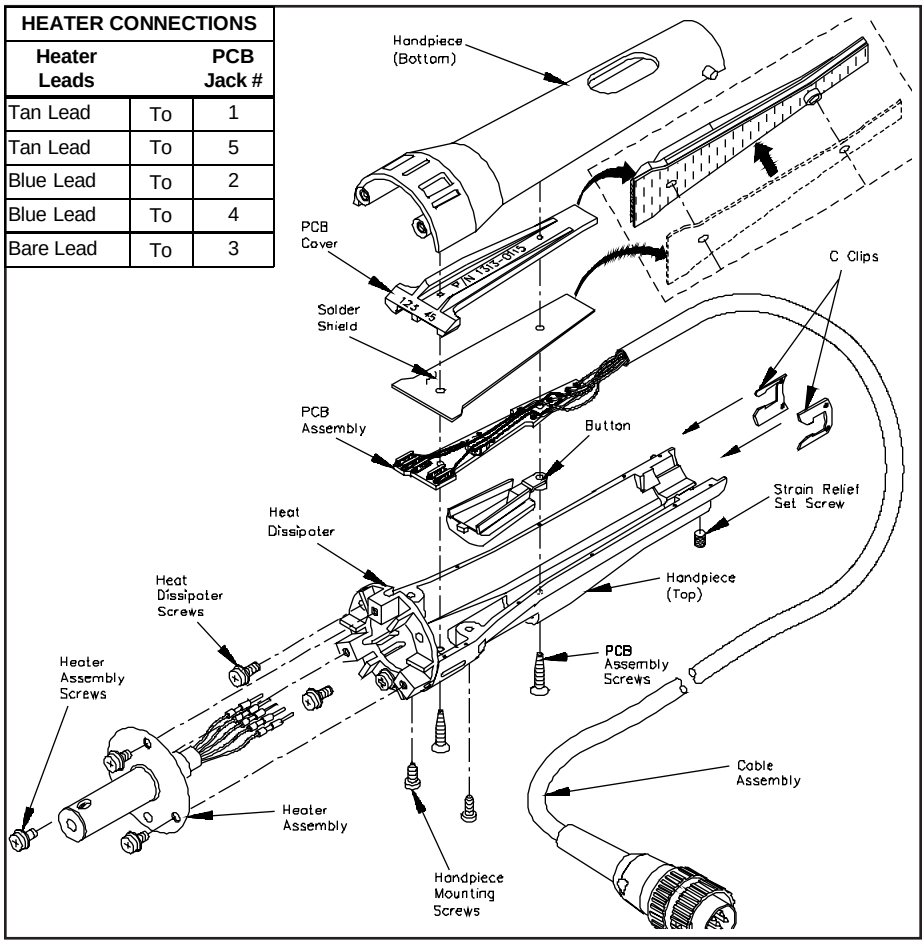
4. Remove the two (2) C Clips located at the rear of the handpiece. Refer to illustration on page 37.
5. Remove the two (2) Handpiece Mounting Screws which secure the top and bottom halves of the handpiece together.
6. Remove the three (3) Heater Assembly Screws. Allow the Heater to hang loose. **DO NOT** pull the Heater from the handpiece at this time.
7. Remove the two (2) Heat Dissipater Screws which attach the Heat Dissipater to the Handpiece (Bottom). **DO NOT** remove the third screw attaching the Heat Dissipater to the Handpiece (Top).
8. Remove the Handpiece (Bottom).
9. Remove the two (2) PCB Assembly Screws. Set the PCB Cover aside. Discard Solder Shield (if present).
10. Disconnect the five (5) Heater leads plugged into the Cord and Switch Assembly. Remove the Heater from the handpiece.
11. Insert the wire leads of the replacement Heater assembly through the Heat Dissipater. Align heater assembly with the Alignment Hole (on heater flange) directly over the Heat Dissipater Screw.
12. Using needle nose pliers, carefully plug the five (5) color coded wire leads of the replacement Heater assembly into the receptacles of the PCB Assembly. Ensure that the leads are are inserted as shown with the flat surface of the metal pins down against the PCB. Plug the Tan leads into the jacks along either edge of the pcb (#1 and #5; see PCB Cover markings on illustration). Plug the bare metal lead into the center jack (#3). Plug the two (2) Blue leads into the two (2) remaining jacks (#2 and #4).



13. Place the replacement Solder Shield on the bottom of the PCB Cover, aligning the holes in the Solder Shield with the 2 holes on the cover. Press the hole at the rear (small end) of the Solder Shield over the shoulder (with hole) at the rear of the PCB Cover. This will hold the Solder Shield in position on the cover.
14. Place the PCB Cover (with Solder Shield) back over the PCB Assembly. Attach to the handpiece using the two (2) screws removed in step #9.

15. Reassemble the handpiece in the following order.
    a) Replace the Handpiece (Bottom) removed in step #8.
    b) Replace the two (2) Heat Dissipater Screws removed in step #7.
    c) Replace the three (3) Heater assembly Screws removed in step # 6.
    d) Replace the two (2) Handpiece Mounting Screws removed in step #5.
    e) Replace the two (2) C Clips removed in step #4.
    f) Replace the solder collection chamber and the end cap assembly removed in step #3. Replace the tip.
16. Connect the handpiece to the power source and follow the "SX-70 Heater Burn-in" procedure (Red tag on handpiece) to increase the life expectancy of the heater.

HEATER CONNECTIONS		
Heater Leads		**PCB Jack #**
Tan Lead	To	1
Tan Lead	To	5
Blue Lead	To	2
Blue Lead	To	4
Bare Lead	To	3



Packing List

Listed below is a packing list of the items shipped with the system. This list was current at the time of publication of this manual.

ITEM NO.	DESCRIPTION	PART NUMBER	QTY. SUPPLIED		
			ST60 -SX	ST60-DTP	ST60 -TJ
ACCESSORY TRAY ITEMS (Packing List)					
1	SX-70 Sodr-X-Tractor Handpiece	6010-0077	1		
2	DTP-80 Dual ThermoPik Handpiece	7029-0001		1	
3	TJ-70 ThermoJet Handpiece	7023-0002			1
4	Power Cord, 115/110 VAC Systems	1332-0094	1	1	1
	230 VAC Systems	1332-0093			
5	SX Tip & Tool Stand	6019-0044	1		1
6	DTP Tip & Tool Stand	6019-0047		1	
7	Wire Brush, 3/16 inch diameter	1127-0014	1	1	
8	Wire Brush, 1/8 inch diameter	1127-0006	1		
9	Bristle Brush	1127-0002	1		
10	VisiFilter	1309-0028	1	1	
11	Tip Cleaner Kit	6993-0151	1		
12	Metric Adapter Fitting (230VAC sys.)	1259-0081	1	1	1
13	Tip Tool	1100-0206	1		1
14	Tool, Tip & Vacuum Cup	1100-0239		1	
15	Vacuum Cup Kit	6993-0153		1	
16	Tip Holder	1500-0012		1	
17	Fiber Cleaning Tool	1100-0232		1	
18	Sponge Cleaning Tool	1100-0233		1	
19	Tip & Tool Stand Redi-Rak	6021-0008			1
20	PACE Screwdriver	1100-0230		1	
21	Miscellaneous Parts, Tips & Hardware				
REPLACEMENT PARTS					
22	Fuse, 1.0 Amp Time Lag (PPS 17)	1159-0246			
	0.5 Amp Time Lag (PPS 17E)	1159-0213			
	1.25 Amp Time Lag (PPS 17J)	1159-0217			
Refer to the current issue of the PACE catalogue for a complete listing of available handpieces and accessories.					

Table VI. Packing List

SX-70 Parts

DESCRIPTION	PART NUMBER
Handle Assembly Kit	6993-0140
Heater Assembly	6010-0080-P1
Heater Set Screw	1348-0547-P10
Front (heater) Seal	1213-0033
Cord/Switch Assembly	4010-0098
Rear Seal Assembly	4010-0101
Glass Chamber	1265-0009-P1
Tubing, Silicone, Static Dissipative, 54 Inches Long	1342-0015-08
Holder, Tube To Wire (pkg. of 6)	1321-0085-01
"S" Baffle	4010-0033
Filter (glass chamber)	1309-0018-P50
VisiFilter	1309-0028
VisiFilter Replacement Elements	1309-0027-P50
Tip Tool	1100-0206
Wire Brush, 3/16" Diameter	1127-0014-P5
Bristle Brush	1127-0002-P5
Sodr-X-Tractor Tip Cleaning Kit	6993-0151
PACE Screwdriver	1100-0230
Handpiece tips listed under "Available Tips"	- - - - - - - -

Table VII. SX-70 Parts

MANUAL IMPROVEMENT & COMMENT FORM

Instructions

1. Duplicate this form and submit comments on the copy. Keep the original to make future comments.
2. Complete all requested information.
3. Submit completed form to:

PACE Incorporated
Applications Engineering Fax: (301) 604-8782
9893 Brewers Court
Laurel, MD 20723-1990 U.S.A.

Document #	**5050-0376**	**Rev. E**	Date of Submission:

Nature of Change (Identify page and paragraph and include proposed rewrite, if possible.)

Reason for Recommendation

Name of Submitter:	Company or Organization:
Mailing Address:	Telephone: ( )
	Voice:
	Fax:
	e-Mail:

Thank you for your comments; they are greatly appreciated!