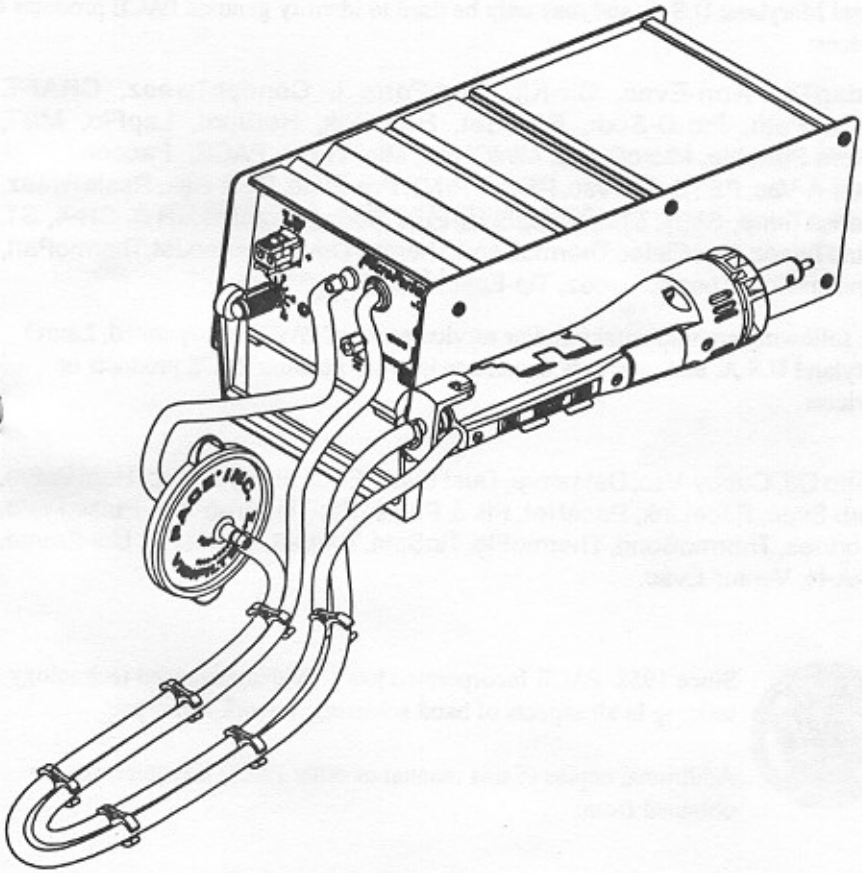
PACE® ISO 9001 CERTIFIED

MP 1 Systems



Operation & Maintenance Manual

Table of Contents

TITLE — PAGE

TABLE — PAGE

Introduction

Thank you for purchasing the PACE model MP 1 MicroPortable Desoldering System. This manual will provide you with the information necessary to properly set up, operate and maintain the MP 1 system. Please read this manual thoroughly before using the system.

The MP 1 system incorporates a highly responsive closed loop temperature control system. This closed loop power is provided to the integral SX-40A Sodr-X-Tractor handpiece which uses a small profile, high capacity heater to perform thru-hole soldering operations. The small profile of the heater assembly also eases access to solder joints on very densely populated assemblies.

Specifications

System Power Requirements:

MP 1	Version operates on 120 VAC, 60Hz or 12 VDC, 85 Watts
MP 1E	Version operates on 230 VAC 50 Hz or 12 VDC, 75 Watts

Temperature Specifications:

Tip Temperature Range:	232°C to 407°C (450°F to 765°F) nominal.
Temperature Stability:	±1.1°C (±2°F) at idle from set tip temp.

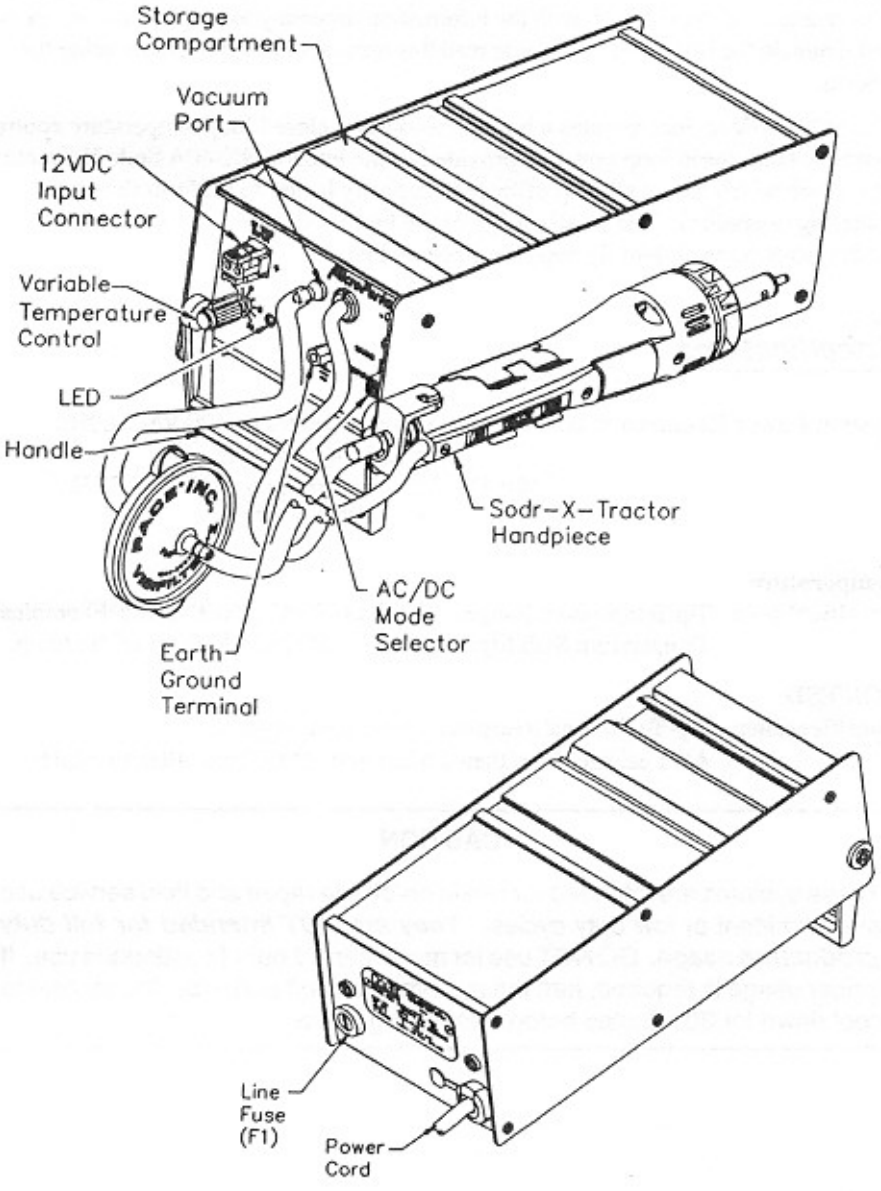
EOS/ESD Specifications:

Tip-To-Ground Resistance: Less than 5 ohms.
AC Leakage: Less than 2 Millivolts RMS from 50Hz to 500Hz.

CAUTION

These systems are intended for use in on/off site repair and field service use at intermittent or low duty cycles. ***They are NOT Intended for full duty production usage.*** DO **NOT** use for more than 1 hour of continuous use. If longer usage is required, turn the system power off and allow the system to cool down for 30 minutes before reapplying power.

Parts Identification



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

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

2. Always store the handpiece in the Handpiece Storage Clip when not in use.

3. Always use this system in a well ventilated area.

4. Exercise proper precautions when using 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.

6. **DO NOT** use for more than 1 hour of continuous use. If longer usage is required, turn the system power off and allow the system to cool down for 30 minutes before reapplying power to the system.

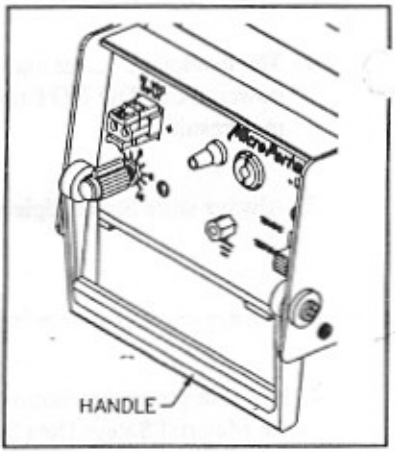
Set-Up

Set up the MP 1 system using the following steps and the 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.

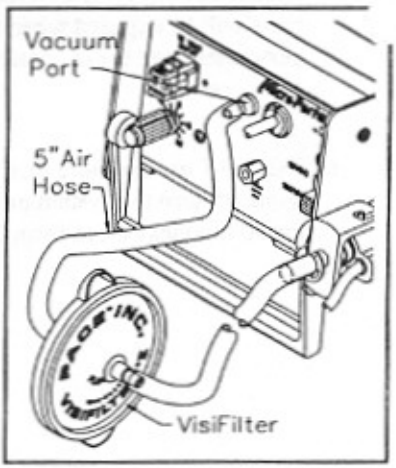
2. Place the system on a convenient work bench or other flat work surface.

3. Position the Carrying Handle in a straight down position .



Air Hose Connection

The system is shipped from the factory with a 29 inch (73.6cm) air hose (and VisiFilter) attached to the handpiece. Attach the free end of the VisiFilter (marked "Flow Out") to the 5 inch (12.7cm) air hose connected to the Vacuum Port.



NOTE

Always use your MP 1 system with a clean PACE VisiFilter replacement element. Otherwise a deterioration in performance or damage to the unit may occur. Refer to the "Corrective Maintenance" section of this manual for instructions on VisiFilter element replacement.

Power Up

The MP 1 system can be connected directly to your house ac supply by the integral .C Power Cord or operated off of a 12 VDC supply. Refer to the applicable use mode following ("AC MODE" or "DC MODE") for power connection instructions.

AC MODE

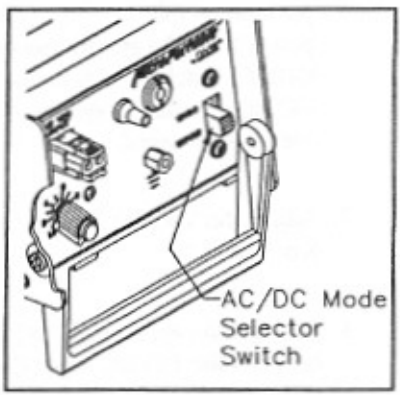
NOTE

Insure that your MP 1 system is compatible with your AC supply. The model MP 1 operates on 120 VAC, 60 HZ. The model MP 1E operates on 230 VAC, 50 HZ.

1. Place the AC/DC Mode Selector switch in the 12VDC position. This removes power from the system (power turned Off) if the AC power cord is connected to the AC supply receptacle.

2. Adjust the Variable Temperature Control to "LO".

3. Plug the AC Power Cord plug into a 3 wire grounded AC Supply receptacle.



CAUTION

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

4. Place the AC/DC Mode Selector switch in the 120VAC position (or 230VAC position on the MP 1E). The system is now ready for operation.

DC MODE

The MP 1 system may be operated using an external 12 VDC supply such as a regulated DC power source, battery pack or automobile battery.

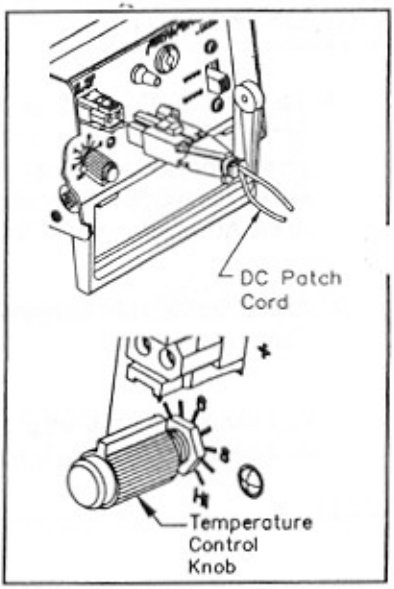
CAUTION

If using an automobile battery as a power source (via cigarette lighter receptacle), check the auto battery connections for a negative ground (-) connection. The majority of automobiles use this type of connection. DO **NOT** use if the automobile battery has a positive ground; use a separate DC power source.

1. Place the AC/DC Mode Selector switch in the 120VAC position (or 230VAC position on the MP 1E). This removes power from the system (power turned Off) if a Patch Cord is connected to a DC supply and the system AC power cord is unplugged.

2. Adjust the Variable Temperature Control Knob to "LO".

3. Connect the appropriate DC Patch Cord between the 12VDC Input Connector and the DC supply. Two Patch Cords are available from PACE.



NOTE

Insure that the PACE Patch Cord Red wire connects to the "+" on the 12VDC Input Connector and the positive (+) side of the DC supply.

4. Place the AC/DC Mode Selector switch in the 12VDC position. The system is now ready for operation.

TIP INSTALLATION

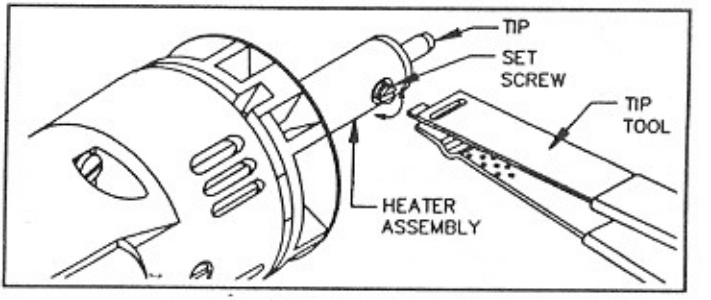
The following instructions are for tip installation only. If a tip is currently installed the handpiece, remove the installed tip and clean the heater bore using the supplied wire brush prior to the installation of a new tip.

1. Select the proper tip for your application.
2. Ensure that the solder collection chamber is properly installed.
3. Clean the heater bore with a wire brush (1/8").

CAUTION

Hold the handpiece with the heater body pointing up at an angle to prevent injury to personnel when cleaning a hot Sodr-X-Tractor. This will allow dislodged material to fall into the solder collection chamber.

4. Inspect and clean the solder collection chamber as necessary. Refer to the "Cleaning Solder Collection Chamber" section.



5. Holding the handpiece at an angle, the selected tip should be inserted using the Tip Tool (as shown) with the tip extending 9.5 mm (3/8 inch) past the end of the heating element. Use the tip tool to tighten the set screw to secure tip in position. Do not over tighten.

NOTE

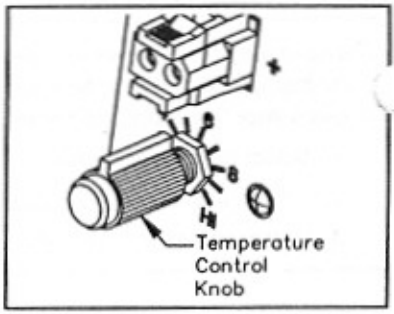
Holding the handpiece tip down may cause the tip to fall out before the set screw has been tightened. Holding the handpiece tip straight up will cause the tip to fall into the heater and solder collection chamber before the set screw has been tightened.

6. Set the desired operating temperature if the handpiece is cold. After a short period (1-2 minutes) recheck the heater set screw to ensure that it remains securely pressed against the tip.

Temperature Selection

Variable Temperature Control

Adjust the Variable Temperature Control to the desired temperature setting. Numbers ont the control are for reference only.



NOTE

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 a temperature control setting of "6" and adjust as necessary.

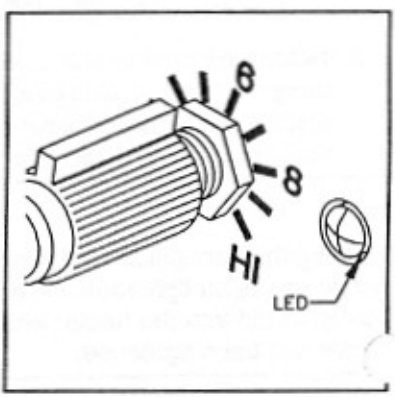
LED Operation

The Red colored LED located on the front panel of the system power source indicates system status. Following is an explanation of these status indicators.

LED Full On - Continuous power is being delivered to the handpiece heater. This condition is evident when the system is first powered up (handpiece heater cold) or when the Variable Temperature Control 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 the set tip temperature.

LED Off - No power is being delivered to the handpiece heater. This condition is evident when the vacuum pump is running (via handpiece Vacuum Control Switch) or if the Variable Temperature Control setting is decreased.

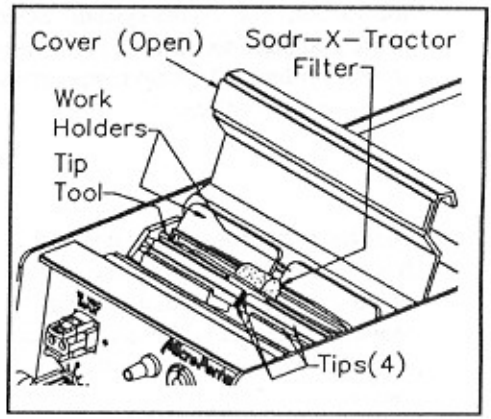


Storage Compartment

The MP 1 system has an integral storage compartment located directly beneath the Cover. To expose the compartment, lift the front of the Cover up and to the rear of the system. The storage compartment serves two purposes as shown below.

Accessory Storage

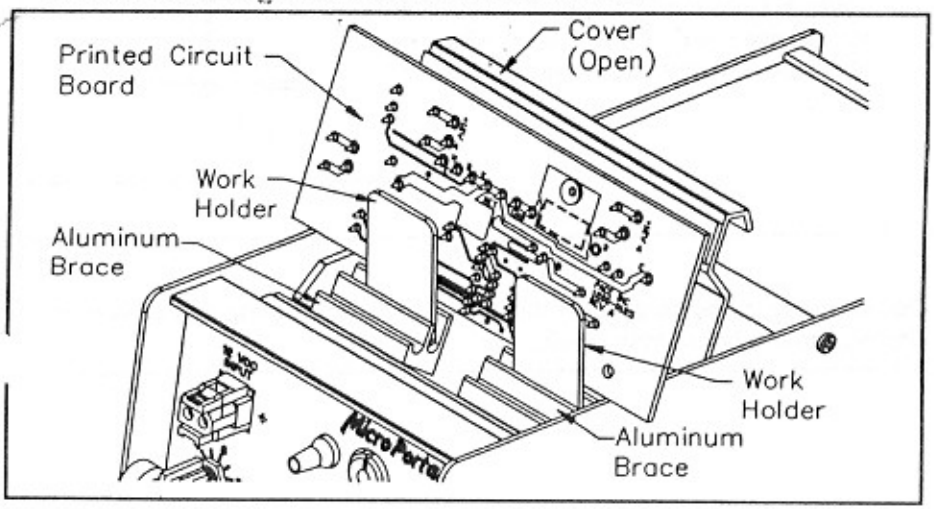
System accessories (e.g., tips, cleaning brush & Tip Tool) may be conveniently stored in the positions indicated.



PCB Holding Fixture

When using the system storage compartment as a holding fixture, the pcb (assembly to be repaired) may be positioned in the following manner.

1. Remove any accessory items stored in the compartment.
2. Place the 2 Work Holders upright in the rear slots of the Braces.
3. Place the pcb between the Work Holders and Cover.

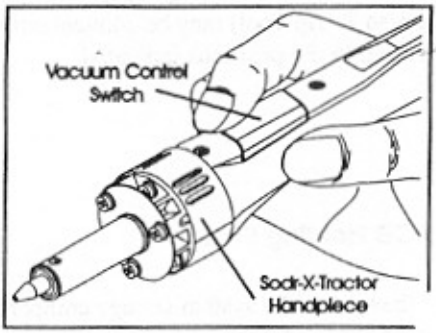


Thru-Hole Solder Extraction

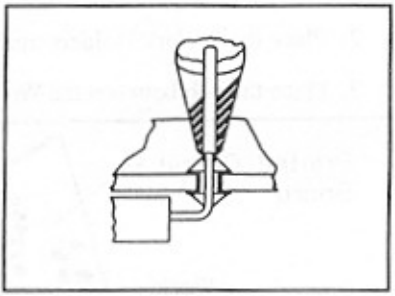
Use the following steps as a guide to obtain the best results in through-hole solder extraction.

1. Ensure that the air hose (with attached PACE VisiFilter) is connected to the Vacuum Port on the system. Select an operating temperature that will cause complete solder melt in 2-3 seconds (somewhat longer on heavy multilayer boards). A tip temperature of 315°C (600°F) is recommended for most applications.

2. Position your index finger just to the front of the Vacuum Control Switch on the handpiece. With a rocking motion, the finger will make contact with the switch and turn on the vacuum.



3. Position the Sodr-X-Tractor tip over the lead and gently onto the solidified solder keeping the tip perpendicular to the pad and board. As the solder melts, allow the tip to fall further into the solder.



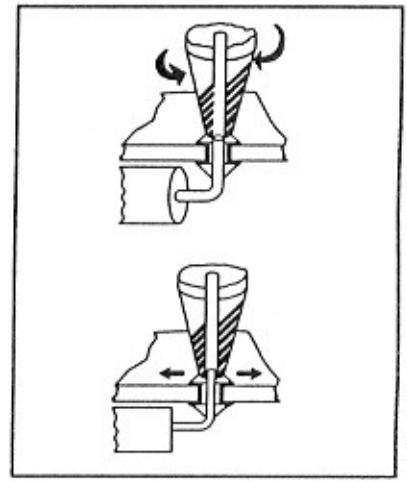
NOTE

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

4. Gently move the lead ...

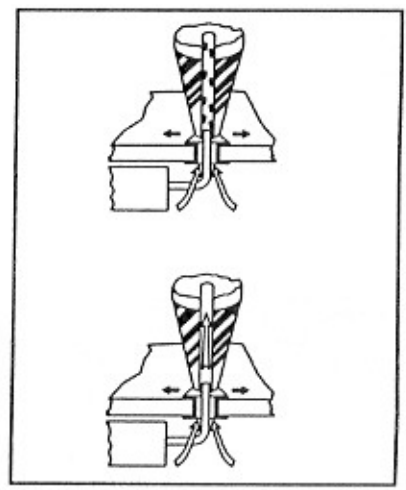
   a. in a circular motion for round leads

   b. in a back and forth motion for flat leads until the lead moves freely.



5. Turn on vacuum with the Vacuum Control Switch while continuing to move the lead. The length of time from when heat is applied until the time vacuum is started should be 2-3 seconds under normal conditions. Heavy multilayer boards may require somewhat longer heating times.

6. After solder is removed, keep the lead moving and continue applying vacuum until the joint has cooled. Remove the tip and release the Vacuum Control Switch to stop the vacuum.



Special Applications

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

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

Corrective Maintenance

Your MP 1 system requires no special maintenance other than being kept clean.

1. The solder collection chamber must be cleaned when solder accumulation in the chamber causes a decrease in system performance.
2. The tip should be replaced when wear of the tip end becomes apparent.
3. The VisiFilter element should be changed at regular intervals or when the element becomes clogged or discolored.
4. The heater bore must be kept free of oxidation and debris in order to maintain the proper tip to ground resistance.
5. Periodically inspect the power source and handpiece (especially the air hose and handpiece cable) for evidence of physical damage.

Refer to the following Table for information on correcting most problems.

Symptom	Probable Cause	Solution
INSUFFICIENT VACUUM - Reduction of vacuum will reduce the capability of the extractor. The operator notices that solder joints are not being completely removed on a consistent basis.	Restrictions or leaks	1. Check to ensure that the solder collection chamber is properly seated against the front heater seal. 2. Check for clogged primary filter in chamber. 3. Clean heater bore with wire brush and Replace worn out tip. 4. Check "S" baffle in chamber for proper positioning. See "Cleaning Solder Collection Chamber". 5. Replace VisiFilter element if clogged or discolored.
No vacuum; heating function normal; vacuum pump motor operates.	Clogged chamber	Clean chamber & replace primary filter.
	Clogged Tip	Clean heater bore and replace tip.
	Broken VisiFilter	Replace VisiFilter
	Improper VisiFilter or air hose connections.	Check all connections.
	Hole/kink in air hose.	Replace or unkink air hose.
Heater does not heat; vacuum functions normal.	Defective heater	Replace heater assembly
	Defective control board	Contact PACE Customer Service
LED does not illuminate; no vacuum; no heat.	Blown fuse.	Replace fuse - If fuses blows again, check handpiece & heater for shorts.
	Defective power supply or control circuit.	Contact PACE Customer Service
LED on but does not flash.	Defective control board	Contact PACE Customer Service

Table I. Checkout Procedures

Cleaning Solder Collection Chamber

As the Sodr-X-Tractor is used, solder and flux buildup will begin to impede the air ow and decrease system performance. Regular cleaning of the chamber will keep ne 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 glass 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

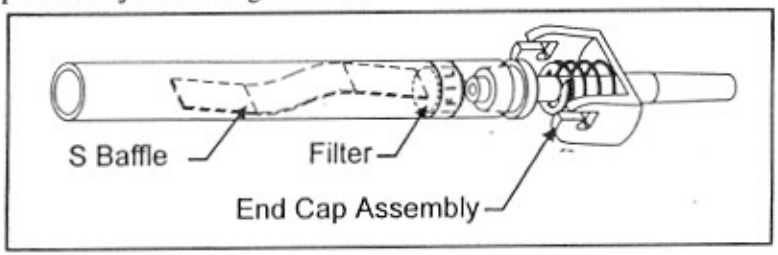
Do not attempt to remove the solder collection chamber (glass or silicone rubber chamber) from the Sodr-X-Tractor using pliers or any like tool. The use of such tools may cause damage to the chamber.

3. To remove the chamber from the End Cap Assembly, grasp the 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.



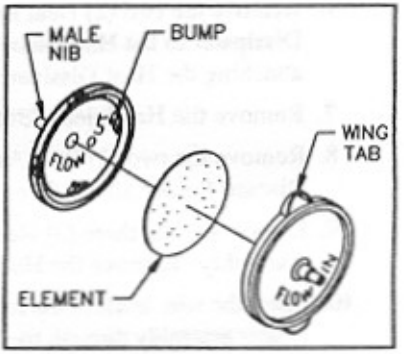
7. To ensure that the chamber will remain attached to the End Cap Assembly, seat the End Cap Assembly in the chamber and twist to secure in place.
8. Hold the Sodr-X-Tractor with the vacuum control switch in the upright position.
9. Insert the chamber into the Sodr-X-Tractor. Slide the chamber into the 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.

VISIFILTER ELEMENT REPLACEMENT

Replace the VisiFilter element when it becomes clogged or discolored.

1. Disconnect the handpiece air hose from the VisiFilter assembly by gently turning and pulling the air hose while holding the VisiFilter.
2. Disconnect the VisiFilter assembly from the Power Source by gently turning and pulling the 5 inch air hose connected to the the Vacuum Port.

3. Disconnect the VisiFilter from the attached 5 inch air hose by gently turning and pulling the VisiFilter while holding the hose.
4. Separate the 2 plastic housing VisiFilter halves in the following manner.
   a) Grasp the VisiFilter in the palm of the hand with the VisiFilter end marked "FLOW IN" facing you.
   b) Pull against one of the Wing Tabs while pulling on the Male Nib with the free hand to open the interconnection of the plastic housings at that Wing Tab.
   c) Pull against the second Wing Tab while pulling on the Male Nib to open the remaining interconnection and separate the plastic housings.



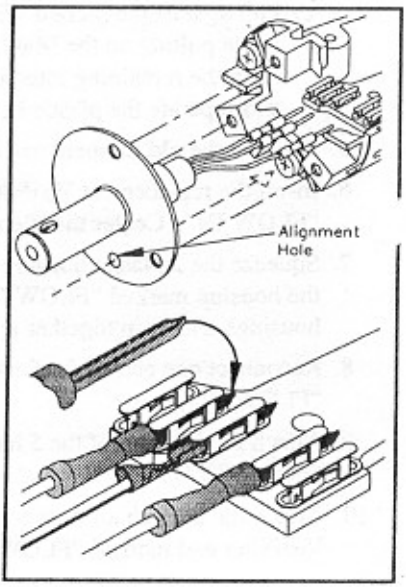
5. Remove the old Element and discard.
6. Insert the replacement VisiFilter Element into the housing marked "FLOW IN". Center the Element in the housing well.
7. Squeeze the 2 plastic housing halves together using 4 plastic Bumps on the housing marked "FLOW OUT" as pressure points. The 2 plastic housings will snap together and lock the Element in position.
8. Reconnect one end of the 5 inch air hose to the VisiFilter end marked "FLOW OUT".
9. Attach the free end of the 5 inch air hose (connected to the VisiFilter end marked "FLOW OUT") to the Vacuum Port on the power source.
10. Attach the 29 inch air hose (connected to Sodr-X-Tractor) to the VisiFilter end marked "FLOW IN".

Heater Replacement

To replace the MP-1 Heater, perform the following procedure using the illustrations as a guide

1. Remove and set aside any installed tip from the handpiece & disconnect the power source from the AC (or DC) supply.
2. Remove the end cap assembly & solder collection chamber from handpiece.
3. Remove the two (2) C Clips located at the rear of the handpiece. Refer to illustration on page 19.

4. Remove the two (2) Handpiece Mounting Screws which secure the top and bottom halves of the handpiece together.
5. Remove the three (3) Heater Assembly Screws. Allow the Heater to hang loose. **DO NOT** pull the Heater from the handpiece at this time.
6. 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).
7. Remove the Handpiece (Bottom).
8. Remove the two (2) PCB Assembly Screws. Set the PCB Cover aside. Discard Solder Shield (if present).
9. Disconnect the three (3) Heater leads plugged into the Cord and Switch Assembly. Remove the Heater from the handpiece.
10. 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.
11. Using needle nose pliers, carefully plug the five (3) 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 bare metal lead into the center jack (#3) (see PCB Cover markings on illustration). Plug the two (2) Yellow leads into jacks #2 and #4 on either side of jack #3. The 2 jacks along the edges of the pcb (#1 and #5) are not used.

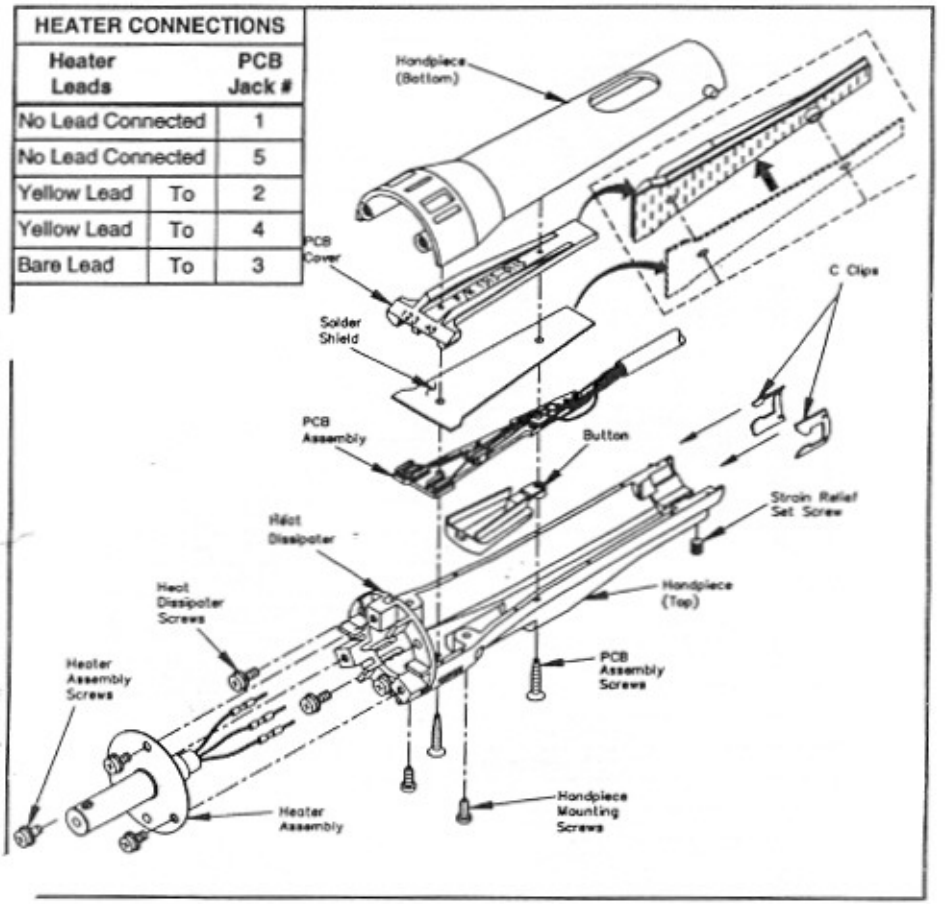


12. Place the replacement Solder Shield on the bottom of the PCB Cover, aligning the 2 holes in the Shield with the 2 holes on the cover. Press the hole at the rear (small end) of the Solder Shield over the shoulder (with hole) at the rear of the PCB Cover. This will hold the shield in position on the cover.
13. Place the PCB Cover (with Solder Shield) back over the PCB Assembly. Attach to the handpiece using the two (2) screws removed in step #8.
14. Reassemble the handpiece in the following order.
    a) Replace the Handpiece (Bottom) removed in step #7.

b) Replace the two (2) Heat Dissipater Screws removed in step #6.
c) Replace the three (3) Heater assembly Screws removed in step # 5.
d) Replace the two (2) Handpiece Mounting Screws removed in step #4.
e) Replace the two (2) C Clips removed in step #3.
f) Replace the solder collection chamber and the end cap assembly removed in step #2. Replace the tip.

15. Connect the handpiece to the power source and follow the "Heater Burn-in" procedure (Red tag on handpiece) to increase the life expectancy of the heater.

HEATER CONNECTIONS		
Heater Leads		PCB Jack #
No Lead Connected		1
No Lead Connected		5
Yellow Lead	To	2
Yellow Lead	To	4
Bare Lead	To	3



Replacement Parts

Listed below is a Packing List of accessories shipped with the system, a partial listing of Other Available Accessories and a list of Replacement Parts which may be ordered through your local authorized PACE distributor. To obtain a complete list of available accessories, contact your local authorized PACE distributor. To obtain ar... replacement parts other than those listed below, contact PACE Customer Service directly at Tel. #(301) 490-9860 or FAX #(301) 483-7030.

ITEM #	DESCRIPTION	PART NUMBER
	PACKING LIST	
1	Tip Tool	1100-0206
2	Nylon Brush	1127-0002
3	Wire Brush, 1/8" dia.	1127-0006
4	Work Holder (2 supplied)	1321-0089
5	Fuse 0.80 amp S.B. (MP 1)	1159-0215
	0.63 amp S.B. (MP 1E)	1159-0214
6	Extractor Tip, .030" Dia.	1121-0253
7	Extractor Tip, .040" Dia.	1121-0254
8	Extractor Tip, .060" Dia.	1121-0255
9	Soldering Tip, 1/16" chisel	1121-0131
10	Primary Filter (for solder collection chamber)	1309-0018
11	VisiFilter	1309-0028
	OTHER AVAILABLE ACCESSORY ITEMS	
12	Extractor Tip, .030" Dia., thin wall	1121-0485
13	Extractor Tip, .040" Dia., thin wall	1121-0486
14	Extractor Tip, .030" Dia., angled	1121-0261
15	Extractor Tip, .040" Dia., angled	1121-0262
16	Extractor Tip, .060" Dia., angled	1121-0267
17	VisiFilter Elements	1309-0027
	REPLACEMENT PARTS (Power Source & Handpiece)	
18	SX-40 Sodr-X-Tractor Handpiece)	6010-0068-P1
19	Heater Assembly	6010-0069-P1
20	Heater Set Screw	1348-0547
21	Glass Chamber	1265-0009-P1
22	Cord & Switch Assembly	6993-0135
23	Air Hose, 29" lg.	1342-0001-09
24	Holder, Tube To Wire	1321-0085-01
25	Motor Pump Assembly	6008-0104
26	Control Board Assembly	6020-0067
27	Power Supply Board Assembly	6020-0050
28	Fuse (internal), 7.5 amp, 32V	1159-0245

Table II. Replacement Parts And Accessories