



Operation and Maintenance Manual for the
SODRTEK[®] ST 400
Radiant Pre-Heating System
P/N 5050-0540





TITLE	PAGE
General Information	3
Introduction.....	3
Specifications	3
Physical Parameters	3
Parts Identification.....	4
Safety	5
Safety Guidelines	5
Preheating Basics	5
System Power Up	6
Operation.....	6
LED Operation.....	6
Variable Temperature Control	7
Corrective Maintenance	7
General Maintenance	7
Heater Replacement	7
Power Source.....	12
Packing List.....	12
Spare Parts	12
Service	12
"SODRTEK by PACE" LIMITED WARRANTY STATEMENT	13
Contact Information.....	14



General Information

Introduction

Thank you for purchasing the PACE SODRTEK® model ST 400 Radiant Pre-Heating System. This manual will provide you with the information necessary to properly set up, operate and maintain the ST 400. Please read this manual thoroughly before using the unit.

The ST 400 unit is available in either the 115 VAC or 230 VAC version. The 115 VAC version system bears the FCC Conformity Marking which assures the user that it conforms to all the requirements of FCC Emission Control Standard, Title 47, Subpart B, Class A. The 230 VAC version system bears the CE Conformity Marking which assures the user that it conforms to all the requirements of (EU) directive EMC 89/336/EEC & 73/23/EEC.

Specifications

ST 400 - Operates on 97-127 VAC, 60 Hz (115 VAC version)
405 Watts maximum at 120 VAC, 60 Hz

ST 400E - Operates on 197-264 VAC, 50 Hz (230 VAC version)
405 Watts maximum at 230 VAC, 50 Hz

Heater Type: Radiant, 400 Watt (200 W x 2), closed loop, thermo-couple control

Temperature: 100 °F (37.78 °C) – 400 °F (204.44 °C) Range

Physical Parameters

Dimensions: 7" (17.78 cm) W x 4.1" (10.41 cm) H x 12.5" (31.75 cm) D

Unit Weight: 4.9 pounds (2.2 kg)



Parts Identification



Figure 1



Figure 2



Safety

Safety Guidelines

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

1. **POTENTIAL SHOCK HAZARD** - Repair procedures on PACE products should be performed by Qualified Service Personnel only. Line voltage parts may be exposed when the equipment is disassembled. Service personnel must avoid contact with these parts when troubleshooting the product.
2. To prevent personnel injury, adhere to safety guidelines in accordance with OSHA and other applicable safety standards.
3. Always use PACE systems 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 chemicals (e.g., solder paste). Refer to the Material Safety Data Sheet (MSDS) supplied with each chemical and adhere to all safety precautions recommended by the manufacturer.
5. Do not contact the Heater or its peripheral parts during operation.
6. Once turned off, let the unit cool completely before contacting.
7. After use, verify that the amber indicator lamp is off.
8. When using Fluxes, use fume extraction equipment or use in a well-ventilated area to minimize operator exposure to fumes.

Preheating Basics

Preheating of a printed circuit assembly is normally required in the repair process whenever any one or more of the following situations exist.

1. Epoxy glass substrate with 4 or more layers.
2. Substrate with large ground planes.
3. Substrate of ceramic, polyimide or other high heat dissipative material.
4. Printed circuit assembly with large metal heat sinks.

Preheating of assemblies such as those listed above will accomplish the following objectives.

1. Minimize thermal shock by elevating the assembly temperature to a level closer to solder melt temperature.
2. Minimize the heat cycle reflow time.
3. Overcome the heat dissipation characteristics of the assembly.
4. Minimize adjacent melts on densely populated assemblies.

The assembly undergoing repair must be heated for a length of time sufficient to saturate at the preheat temperature required. The PCB preheat temperature normally used is 100°C (212°F) for epoxy glass substrates and 120°C (248°F) for ceramics and polyimides.

System Power Up

1. Insert the female end of the power cord into the AC Power Receptacle on the rear panel of the power source.
2. Plug the prong end (male end) of the power cord into an appropriate 3 wire grounded AC supply receptacle.

CAUTION: To insure operator and ESD/EOS safety, the AC power supply receptacle must be checked for proper grounding before initial operation.

Operation

The PACE ST 400 unit is easy to operate and can be quickly set up for operation. The following steps provide basic guidelines for rework using the PACE ST 400.

1. Turn on the Power Switch.
 - a. The Green Power LED will illuminate
 - b. If the LED does not illuminate, refer to the Corrective Maintenance Section of this manual.
2. Position the ST 400 under your PACE board holding fixture. The ST 400 can be placed under any ST 525 or ST 550 system. Be sure to follow the board installation steps, which are detailed in the ST 500 Series Manual. Figure 3 illustrates a typical usage. Please note that the ST 450 is pictured in Figure 3.



Figure 3

NOTE: For best results, keep the distance between the ST 400 and the board holding fixture to no greater than 2 ¼" (5.72 cm).

3. Set Temperature knob to desired setting. It will take approximately 10 minutes for the radiant heaters to reach their set temperature and stabilize. Use of a thermo-couple is recommended to verify actual PCB temperatures.

LED Operation

The Green colored LED (Temperature Indicator LED) on the power source front panel indicates System Status and Power Receptacle output status (LED OFF, ON or Flashing).

Temperature Indicator LED

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

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



Figure 4

LED Off - No power is being delivered to the heaters. This condition is evident for a short period of time when set temperature is reached and stabilizing or if the Variable Temperature Control setting is decreased. If the LED never illuminates, check for a faulty heater (see Corrective Maintenance section).

Variable Temperature Control

Adjust the Variable Temperature Control Knob to the desired temperature setting. Notice that the control panel has an outer graphic scale denoting temperature in °C (Celsius) and an inner graphic scale denoting temperature in °F (Fahrenheit). These numerical scales denote the set tip temperature times 10 (e.g., "10" on the outer scale is 10 x 10 or 100°C).



Figure 5

Corrective Maintenance

General Maintenance

NOTE: The ST 400 should be kept clean. If flux is spilled on the heaters, the ST 400 should be allowed to cool to room temperature and the heater panels can be wiped off with an appropriate flux cleaner. Always unplug the ST 400 before removing the cover to clean the Heater Panels.

Heater Replacement

Should a heater need to be replaced, please order P/N 3018-0128-P1 for the domestic (115 volt) system or P/N 3018-0129-P1 for the export (230 volt) system from your PACE Distributor. The following steps provide the information as to how to replace the heating panels.

Removal

1. Remove the rear panel by removing the 5 screws.



Figure 6

2. Remove the front panel and bezel by removing the 4 screws.



Figure 7

3. Remove the screws on the sides of the case (one screw on each side).



Figure 8

4. Carefully lift the top from the bottom chassis.

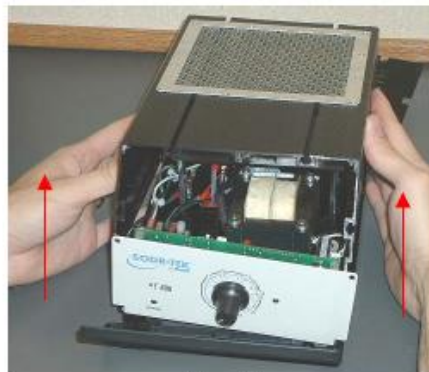


Figure 9

5. Remove the two large heater wires. They are located on the board as shown in figure 10 and 11.



Figure 10



Figure 11

6. Remove the heater sensor connector from the J5 connection on the PC board.



Figure 12

7. Remove the 4 heater mounting plate socket hex head screws. Carefully remove the heater assembly from the chassis.

NOTE: Be careful when removing the heater assembly from the chassis as the heater wires may be caught on other wires or caught on the chassis.

Requires a 9/64"
hex wrench

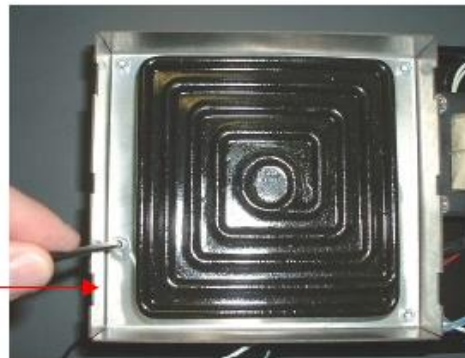


Figure 13

8. Carefully remove the heater retaining clip. Be sure to support the heater during this process.



Figure 14

9. Pull the heater and its wires from the heater mounting plate.

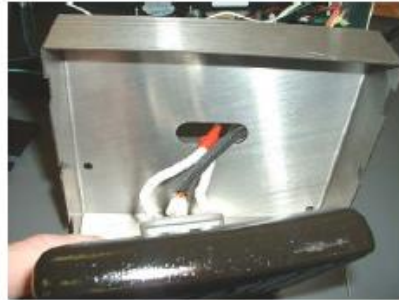


Figure 15

Installation

10. Take the new heater and insert the heater wires through the heater mounting plate and secure the heater as shown in figure 16 and 17 and install the heater retaining clip.

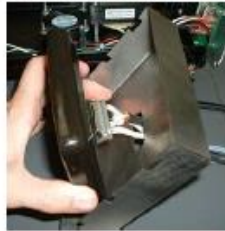


Figure 16



Figure 17

11. Tighten the 4 heater retaining socket hex head screws.



Figure 18

12. Reconnect and route the wires as shown in figures 19 through 22.



Figure 19



Figure 20



Figure 21



Figure 22

NOTE: The heater has been removed in the above pictures to allow proper viewing of wire routing.

13. Reinstall the top half of the case.



Figure 23

14. Reinstall the rear panel.



Figure 24



15. Reinstall the front panel.

NOTE: The front panel screws are longer than the side and rear panel screws.



Figure 25

16. Reconnect power and test the system.

Power Source

Refer to the table below. Most malfunctions are simple and easy to correct.

Symptom	Probable Cause	Solution
No power to system	Blown Fuse	Replace the fuse(s) with one of the same rated value.
	Line cord unplugged	Plug line cord into the appropriate AC outlet
Heater Assembly does not heat.	Blown Fuse	Replace the fuse(s) with one of the same rated value.
	Open Heater	Replace the heater. Refer to the Heater Replacement section on page 7.

The indicated temperature is based on 1 1/2" away from the top of the system.

Packing List

Item #	Description	Part Number	ST 400 Only	ST 400 E Only
1	System Power Supply	8007-0435	1	0
2	System Power Supply (Export)	8007-0436	0	1
3	Power Cord, 115V	1332-0094	1	0
4	Power Cord, 230V	1332-0093	0	1
6	Operations Manual CD	CD5050-0459	1	1

Spare Parts

Item #	Description	PACE Part Number
1	Fuse, 7 Amp, 125 V, Time Lag (ST 400)	1159-0274-P5
	Fuse, 3.15 Amp, 250 V, Time Lag (ST 400E)	1159-0221-P5

Service

Please contact PACE or your local distributor for service and repair.



"SODRTEK by PACE" LIMITED WARRANTY STATEMENT

Limited Warranty

Seller warrants to the first user that products manufactured by it and supplied hereunder are free of defects in materials and workmanship for a period of one (1) year from the date of receipt by such user. Monitors, computers and other brand equipment supplied but not manufactured by PACE are covered under their respective manufacturer's warranty in lieu of this Warranty.

This warranty does not cover wear and tear under normal use, repair or replacement required as a result of misuse, improper application, mishandling or improper storage. Consumable items such as tips, heaters, filters, etc. which wear out under normal use are excluded. Failure to perform recommended routine maintenance, alterations or repairs made other than in accordance with Seller's directions, or removal or alteration of identification markings in any way will void this warranty. This warranty is available only to the first user, but the exclusions and limitations herein apply to all persons and entities. SELLER MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Seller will, at its option, repair or replace any defective products at its facility or other location approved by it at no charge to user, or provide parts without charge for installation by the user in the field at user's expense and risk. User will be responsible for all costs of shipping equipment to Seller or other location for warranty service.

EXCEPT FOR THE REMEDY ABOVE DESCRIBED, UNLESS OTHERWISE REQUIRED BY APPLICABLE LAW, SELLER WILL HAVE NO OTHER OBLIGATION WITH REGARD TO ANY BREACH OF WARRANTY OR OTHER CLAIM WITH RESPECT TO THE PRODUCTS, OR LIABILITY FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, OR INCIDENTAL LOSS OR DAMAGE CAUSED BY OR OCCURRING IN CONNECTION WITH ANY OF THE PRODUCTS.

Warranty service may be obtained by contacting the appropriate PACE Company or local Authorized PACE distributor as set forth below to determine if return of any item is required, or if repairs can be made by the user in the field. Any warranty or other claim with respect to the products must be made with sufficient evidence of purchase and date of receipt, otherwise user's rights under this warranty shall be deemed waived.

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Annapolis Junction, Maryland 20701
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For PACE EUROPE Customers:

PACE EUROPE LIMITED
Sherbourne House, Sherbourne Drive,
Tilbrook, Milton Keynes
MK7 8HX
United Kingdom
Tel. (44) 1908 277666
WARRANTY SERVICE FAX: (44) 1908 277 777

All other Customers:

Local Authorized PACE Distributor



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PACE products meet or exceed all applicable military and civilian EOS/ESD, temperature stability and other specifications including MIL STD 2000, ANSI/JSTD 001, IPC7711, and IPC A-610.



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