



SPECIALTY COATING SYSTEMS™

G3 Spin Coater Series Model G3P-8 Operator's Manual

System Serial Number: 145700

Prepared for: _____

**Make certain that everyone associated with this machine
becomes knowledgeable about the material contained in this manual
before using the equipment.**

7645 Woodland Drive, Indianapolis, IN 46278-2707

Customer Service: P 317.244.1200 F 317.240.2073
E SCScustomerservice@SCScoatings.com

COPYRIGHT SPECIALTY COATING SYSTEMS

Specialty Coating Systems



DECLARATION OF CONFORMITY

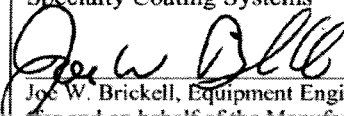
Manufacturer:	Specialty Coating Systems 7645 Woodland Drive, Indianapolis IN 46278, USA
Authorized Representative: (regulatory inquiries only)	Alura Group BV P.O. Box 18626 2502 EP The Hague The Netherlands
Product:	G3-XX, G3P-XX, 68XX & 68XXP Series Spincoaters
Start of Manufacturing:	March 1, 2003
Directives & Standards	
Machinery Directive & Standards:	
Low Voltage Directive & Standards	<p>DIRECTIVE 2006/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (codified version)</p> <p>BS EN 61010-1:2001 IEC 61010-1:2001 - Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements</p>
Electromagnetic Compatibility Directive & Standards:	<p>DIRECTIVE 2004/108/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC</p> <p>EN 61326-1:2006 Electrical equipment for measurement, control and laboratory use — EMC requirements — Part 1: General requirements (IEC 61326-1:2005)</p>
Signature:	<p>Specialty Coating Systems</p>  <p>Joe W. Brickell, Equipment Engineering Manager (for and on behalf of the Manufacturer)</p>
Date:	05/27/10

TABLE OF CONTENTS

SECTION 1 SAFETY..... 1

1.1 STANDARDS STATEMENT..... 1

1.2 GENERAL HAZARDS..... 1

 1.2.1 Hazard Icons..... 2

1.3 POWER CORD (SHOCK) SAFETY 2

1.4 SERVICING..... 2

SECTION 2 OVERVIEW 3

2.1 DESCRIPTION 3

SECTION 3 SPECIFICATIONS..... 5

SECTION 4 INSTALLATION 7

SECTION 5 OPERATION..... 9

5.1 PRE-START 9

5.2 FACILITIES PANEL 9

5.3 VACUUM CHUCK..... 10

5.4 LID..... 10

5.5 PROGRAMMING THE G3P 11

 5.5.1 G3P Control Panel..... 11

 5.5.2 G3P Programming..... 12

 5.5.3 Programming Hints and Tricks..... 13

 5.5.4 Recipe Example..... 14

5.6 SELECTING A PROGRAM TO RUN 15

5.7 RUNNING..... 16

5.8 ERROR MESSAGES 17

5.9 TROUBLESHOOTING..... 18

5.10 SHUTDOWN..... 18

SECTION 6 MAINTENANCE 19

6.1 CLEANING..... 19

6.2 DRAIN OPTION 19

6.3 MAINTENANCE SCHEDULE 19

6.4 VACUUM SWITCH ADJUSTMENT 20

6.5 FLOW SWITCH ADJUSTMENT..... 20

6.6 CHANGING THE FUSES 21

SECTION 7 REPLACEMENT PARTS..... 23

OPTIONAL VACUUM CHUCKS..... 23

APPENDIX A: WARRANTY 27

LIMITED WARRANTY POLICY..... 27

TABLE OF FIGURES

Figure 5-1: Facilities (Back) Panel 9

Figure 5-2: G3P Control Panel 11

Figure 5-3: G3P Display 12

Figure 5-4: Example G3P Program..... 14

Figure 6-1: Vacuum Switch Adjustment 20

Figure 6-2 Fuse Replacement 21

SECTION 1 SAFETY

1.1 STANDARDS STATEMENT

This equipment is designed to be used as described here. Operator safety and safe reliable product coating were key elements in the design. The equipment complies with all applicable sections of the NFPA article 79, the National Electric Code (NEC). All commercially standard components used in this machine have a minimum of UL and/or CSA ratings. Components built to CE standards have been used wherever possible. Any local or regional certifications required above and beyond the aforementioned are the responsibility of the customer.

1.2 GENERAL HAZARDS



WARNING: Improper operation or service of this equipment can result in serious injury or death. Read and understand this manual before operating or servicing this equipment.

- **DANGER:** This machine is **not** classified as "Intrinsically Safe." DO NOT use the G3 series spin coater in the presence of an explosive atmosphere.
- **DANGER:** Use only under an exhaust hood.
- **WARNING:** To avoid severe injury, **do not** touch or hold the shaft or chuck while it is rotating.
- **WARNING:** Purging is required as a safety factor to fill the interior of the machine and exclude dangerous gasses. N₂ or clean, dry air can be used when purging.
- **WARNING:** In case of a "Motion Error" (see page 17) the motor will spin freely, and will not be stopped by opening the lid. Wait until you are sure the chuck has stopped spinning before you open the lid.
- **WARNING:** **Do not** operate without lid in place to protect operator and others from injury as wafers or wafer parts may fly off rotating chuck.
- **WARNING:** To avoid electrical shock or injury, **do not** remove lid or try to access any internal parts, while machine is still plugged in. Before servicing the G3, DISCONNECT power cord from outlet and wait 10 minutes (high voltage may exist in the machine for some time after removal of power).
- **CAUTION:** The G3 series spin coater uses a ground type power plug, which **must** be connected to a grounded outlet to prevent electrical shock.
- **IMPORTANT:** **Do not operate** the spin coater with the drain hose disconnected or drained material may not go where it should.
- **IMPORTANT:** If the machine is purchased with an external vacuum pump, **you must add oil** to the pump. Let the pump sit for six hours with the oil prior to starting the pump. See the pump manual for additional details. Pump seals will burn out if proper instructions are not followed.
- **CAUTION:** *Do not* lift the machine using the control panel (keyboard) as a handle. Doing so could damage the machine and cause injury.
- **CAUTION:** Consult your Material Safety Data Sheets for information about any chemicals you use in your process, and their possible toxicity or reaction with the spin coater bowl or drain.

SECTION 2 OVERVIEW

2.1 DESCRIPTION

The G3 series is family of compact spin coaters for low production spin coating applications and experimentation.

The G3's provide the ability to hold your product wafer with a vacuum chuck and spin that chuck at precise speeds and for controlled periods of time. Operations are extremely repeatable and are settable to 0.1 second. The chuck is indexed back to its initial position at the end of each cycle, so that each wafer may be oriented the same way on the chuck. See §3 for actual specifications.

Operation of the spin coater is controlled by a custom-designed controller. During a cycle, the product recipe number, spinning speed, and remaining time are displayed on a user interface screen. The acceleration and deceleration rates are calculated by the controller to provide various ramp profiles.

Programmable machines have provisions to connect a foot pedal as a starter.

The **G3** (without the "P") holds a single recipe at a time. The recipe determines ramp up time, speed and dwell time at speed, and ramp down time. The G3 is available in the 8-inch bowl size only.

The **G3P** can store up to 30 product recipes (programs). Each recipe offers a single setup step plus 20 action steps, with each action step including the ability to specify **RPM 1**) a speed to attain; **ramp 2**) how quickly to change to that speed; and **dwell 3**) how long to remain at the desired speed.

In addition, if the optional equipment is present, the **G3P's** steps can control dispense switching and timing for each of four optional external operations (dispense coating material, dispense solvent, N₂ release, and edge bead removal). Switching begins at the start of the step's Dwell. The machines are available in bowl sizes of 8, 12, and 15 inches. Also available are interchangeable vacuum chucks.

Use of this machine for anything but its intended purpose may create a safety hazard and voids the equipment warranty.

SECTION 3 SPECIFICATIONS

The G3P-8 spin coater can store 30 recipes with a maximum of 20 action steps each.

Speed	0—9999 RPM
Acceleration/ Deceleration	<1—25.5 Seconds (in 0.1 Sec. Increments)
Dwell (Spin Time) each step	Up to 999 Seconds (in 1.0 Sec. Increments)
Dispense (switch) times (†)	<1—10 seconds (in 0.1-Sec. Increments)
Dimensions	11.8" H (30 cm) 12.0" W (30.5.6cm) 16.5" D (41.9cm)
Weight	38 Lbs. (17.3kg)
Power Input	115/230VAC, 1 Phase, 300VA
Vacuum Input (required)	430 to 635 mm Hg (17" to 25" Hg)
Purge Input (required)	0.55 scfm - at 2 psi (N ₂ or clean, dry air) 5 psi maximum (external)
Drain	0.75" OD outlet at rear of machine

Optional Features:

- Foot Switch
- Vacuum Pump 115VAC 60Hz / 230VAC 50 Hz
5.5A 1 Phase
- Manual Dispense Bar
- Computer Interface for Programming and Operation.
- Single point manual dispensing unit with syringe

Additional Specifications:

- It is recommended that a shut-off valve be installed upstream of the unit on the N₂ or clean, dry air supply. SCS does not supply a shut-off valve.
- The spin coater will not operate without vacuum.
- For safety reasons, the machine will not power up without a purge flow of at least 0.55 scfm of N₂ or clean, dry air.
- Purging (using N₂ or clean, dry air) is required as a safety factor to fill the interior of the machine with inert N₂ or clean, dry air and exclude dangerous gasses.

SECTION 4 INSTALLATION

Note for international applications: The spin coater is provided to international users with an unterminated power cord so that the appropriate power plug (non-locking 250V, 10A), may be attached. The plug must meet the requirements of IEC227 or IEC245. **NOTE:** The supply circuit must be overcurrent protected at a value not exceeding 6 amps.

Do not apply power until all other connections have been made.

- Place the machine on a solid, level surface, free from vibration and temperature extremes. For optimum performance, make sure the chuck is level.
- Refer to the Specifications section or to the nameplate on the machine for electrical requirements.
- Position the bowl with its drain hole aligned over the drainway.
- The machine will not operate without purging N₂ or clean, dry air (0.55 scfm) connected to the "N₂" port in the back of the machine. Purging N₂ or clean, dry air is required as a safety factor to fill the interior of the console and exclude dangerous gasses.
- External vacuum is also required for the machine to operate. Connect vacuum to the "Vacuum" port on the Utility Panel.
- Install and connect options before connecting the spin coater power
- **NOTICE:** See startup instructions for the optional external vacuum pump in the technical section. Improper oil levels may damage the pump. After filling, let the pump sit for six hours before using it.

Note that the machine is not for use in a hazardous atmosphere.

SECTION 5 OPERATION

This machine is designed for use in a normal laboratory or manufacturing working environment. In addition, the installation should be free from temperature extremes and vibration.

5.1 PRE-START

1. Connect the N₂ or clean, dry air purge supply and vacuum.
NOTE: The machine *will not operate* without the vacuum and N₂ or clean, dry air purge.
2. Connect any optional devices: footswitch, dispensers, N₂, etc.
3. Attach power cord (spin coater, and external vacuum pump if so equipped) to properly grounded outlet. (See technical section, and pump operation instructions for starting the vacuum pump.)
4. Verify that the vacuum chuck is secure.
5. Turn power On using the **POWER** switch located on the rear panel.

Remember that the machine will not run unless programmed, and that the top must be opened and closed before each cycle (indicating that material has been placed in the spin coater).

5.2 FACILITIES PANEL

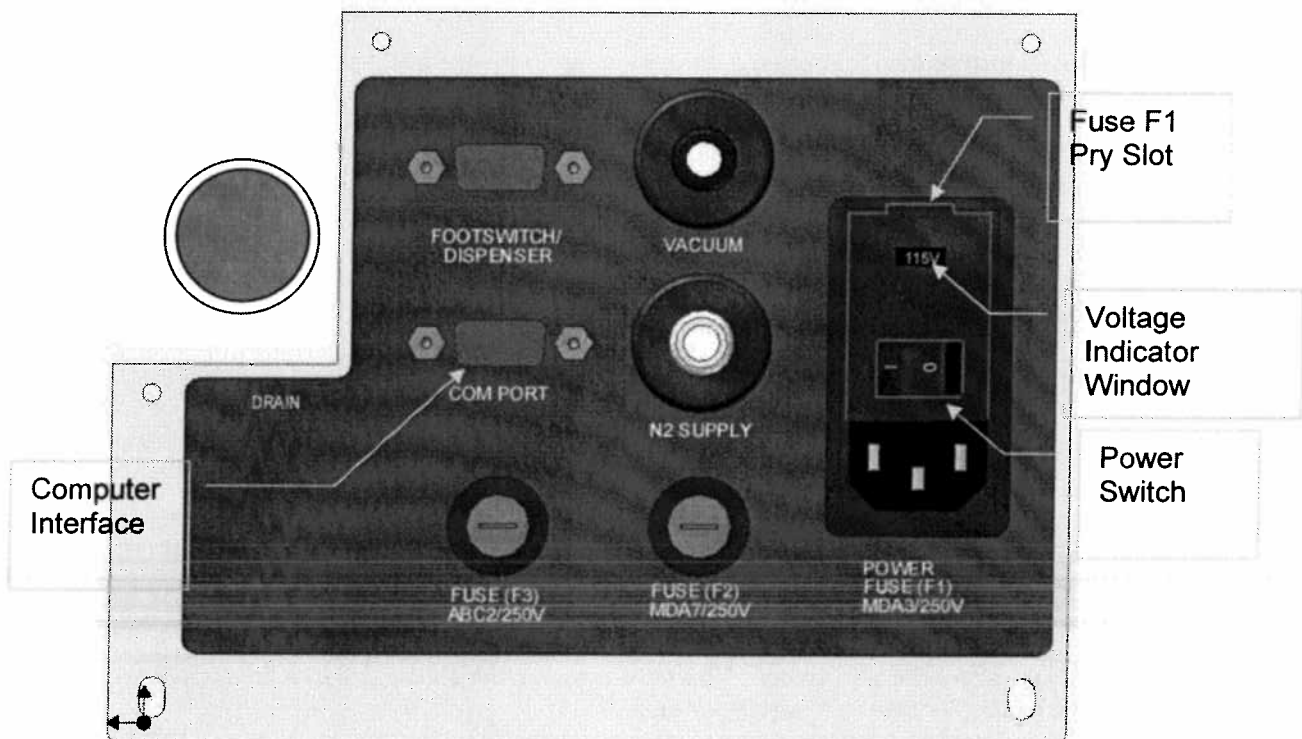


Figure 5-1: Facilities (Back) Panel

FOOTSWITCH/ DISPENSER:

1. Accepts a foot pedal/switch (if desired, to start the cycle).
2. On the G3P spin coater only, provides control signals for an (optional) unit for dispensing materials during the cycle. Note: On the G3P, the foot pedal may be connected through the dispenser.

5.5 PROGRAMMING THE G3P

With the G3P programmable spin coater, you can enter multiple recipes and direct it to do complex operations.

5.5.1 G3P CONTROL PANEL

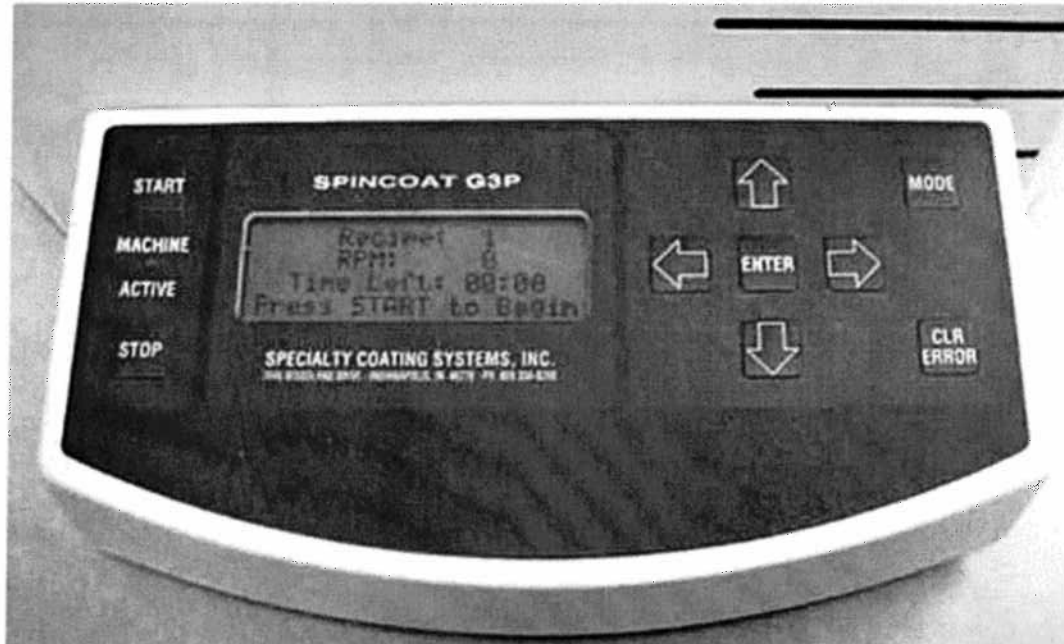


Figure 5-2: G3P Control Panel

- **MODE:** This pushbutton moves the G3P between the **Program/Edit** mode and the **Run** mode. Each time you press it, you change to the other mode.

In the **Run** mode, the following G3P spin coater controls are active:

- **START:** This pushbutton starts a cycle, if all conditions are correct. (For example, the G3P must be in the run mode, the vacuum and purge N₂ sensors must be satisfied, and it may be necessary to open and close the load lid.)
- **CLR-ERROR:** If the machine is in the error mode, it will not reset or run. This pushbutton clears (resets) a machine error so that the **MODE** and **START** buttons become active again.
- **STOP:** This pushbutton will stop rotation even if the G3P is in mid-cycle. NOTE: If the chuck and wafer have unusually great momentum, a Motion Error may occur and the electronic breaking may fail; the chuck will coast to a halt. Do not open the lid until you are sure the rotation has stopped completely.

In the **Program/Edit** mode, the following G3P controls are active. You are able to enter new recipes and modify the settings of existing recipes.

- **ENTER:** This pushbutton "*enters*" (stores) the data you just entered and *advances* the cursor to the next control block. It is important to use **ENTER** in order to make sure the data is stored in the recipe. (Without **ENTER**, the data is ignored.)

Possible options are: coating material, N₂, solvent, edge bead removal, or none. This will not be activated unless the next variable (**Time**) is changed from zero.

☞ When the pointer is at **Disp**, select from these options by using the **↑ and ↓**, then press **ENTER** to accept the choice, and the pointer will move to **Time**.

8. **Time:** (0 to 10 seconds) This setting determines how long the **Disp.** function will be turned On. If **Disp** is set to "None," then the **Time** setting does nothing. Setting **Time** to something other than zero in the *Step 0* turns off Homing after a recipe is completed.

☞ When the pointer is at **Disp**, set how long to have that optional function turned On by using the **↑ and ↓**. (If you set the **Time** to be longer than the **Dwell** setting, then dwell will be extended to accommodate the **Disp.** action.) Press **ENTER** and the number is stored and the pointer moves to the (next numbered) **Step**. Continue this process of entering steps until you have completed your recipe.

9. After entering all of the desired steps for your recipe, use the following to exit properly.
 - If there are any leftover steps at the end with actions/numbers in them, you must remove them. Display an unwanted step. With the pointer at **Step**, press **CLR/ERROR** to clear it, and press **ENTER**. Use the **↑ and ↓** to examine the next steps and clear them if necessary.
 - When done cleaning up, be sure to press **ENTER** to store the changes or they will be lost.
 - Press **MODE** to return to operation, or select another recipe to edit/create (using **→ and ←** and **↑ and ↓**).
- * **PROGRAMMING NOTE:** "**Step 0**" allows you to tell the program what size vacuum chuck you will use with the recipe. This is important so that the spin coater give the right amount of force to accomplish the desired ramps and speeds. **REMEMBER** to program in the chuck diameter in the **Disp** blank on Step 0. **ALSO**, setting the **Time** to something different than zero tells the spin coater **NOT** to return the chuck to its original position after completing the recipe (by skipping the homing process, you save processing time).

5.5.3 PROGRAMMING HINTS AND TRICKS

Note the following hints to make it easier and faster to enter a recipe.

1. **To remove an entire recipe:** Place the pointer at **Recipe** and select the desired recipe number; press **CLR/ERROR** and then **ENTER**. All steps will be removed.
2. **To remove a step at the END of a recipe:** Place the pointer at **Step** and select the step number to be removed; then press **CLR/ERROR** and then **ENTER**. Check to see that there are no more steps after that.
3. **To remove a step from the MIDDLE of a recipe:** (e.g., you discover you have entered a step twice, and want to remove the extra without moving all the rest of the steps) Set all of the variables to zero except the **RPM**; set that to be the same as the preceding step. Press **ENTER**.
4. **To edit or modify a step's variables:** Go to those particular variables by using the **ENTER** or the **→ and ←** and then change the variable by using the **↑ and ↓**. **REMEMBER** to press **ENTER** afterwards, or the change will not be kept.
5. **To extend a function (ramp or dispense) beyond its normal time limit:** Use two similar steps. e.g., For a ramp from 1000 to 2000 RPM over 40 seconds, ramp from 1000 to 1500 over 20 seconds in the first step (and set **Dwell** to zero); then ramp from 1500 to 2000 over 20 seconds in the next step. Use the same idea for extra long dispense by employing two steps instead of one.
6. **To dispense before spinning:** Simply set the **RPM** to zero for the step. Select the **dispense** function and set the **Time** (if you want the chuck to remain still for some time *after the dispense is complete*, set the **Dwell** to be longer than the **Time**). Then use the next step to ramp up to the desired speed.

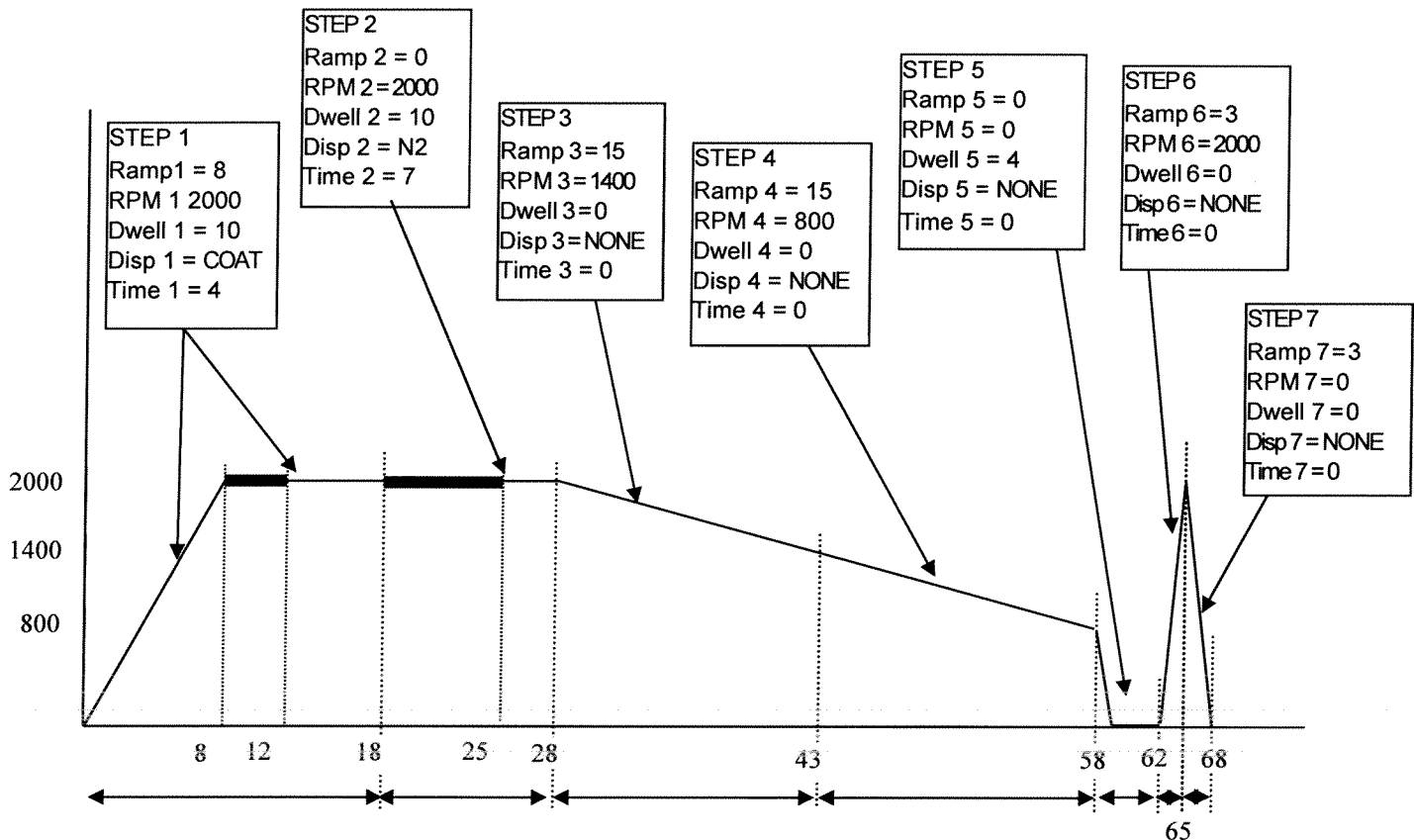
Step 3 begins at 28 seconds on the figure, and has a 15-second Ramp3 down to an RPM3 of 1400. The Dwell3 is set to 0 seconds and there is no Disp3. NOTE that this is half of a 30-second ramp down to 800. Since a 30 second long ramp is not possible, the programmer used two 15-second ramps.

Step 4 is the continuation of the ramp down. The Ramp4 is 15, and the RPM4 is 800.

Step 5 tries to cause an instant stop, followed by 4 seconds without any spinning. The Ramp5 is 0, and the RPM5 is 0. The Dwell5 is set to 4 seconds. If the motor can stop quickly enough, the cycle will continue—if the momentum is too great and the motor cannot stop quickly enough, there will be a "Motion Error.: See the error messages on following page. To avoid the motion error, set Ramp5 to allow a short amount of time for the ramp down.

Steps 6 & 7: consist of two ramps with no dwell time. RPM6 simply goes up to 2000 in the Ramp6 time of 3 seconds and RPM7 takes it back down to 0 in the Ramp7 time of 3 seconds. If necessary, the Ramp could be set to longer times, to avoid the motion error.

5.6 SELECTING A PROGRAM TO RUN



After the spin coater has completed its startup cycle, you can press **START** and it will attempt* to run whatever recipe is shown on its display. If there is no recipe, you must enter/select one.

To select a different recipe on the G3P press **MODE**, change the recipe number, press **ENTER**, and then exit the Program/Edit mode by pressing **MODE** again.

NOTE: The first step shown is numbered "0" and called Step Zero. It is used to tell the spin coater what size vacuum chuck is being used (enter the diameter in inches in the step 0 Disp blank). This is important for the control mechanism, always use the chuck that matches the size called for in the recipe. If different size chucks are used, you can make recipes for each size of chuck.

5.8 ERROR MESSAGES

If the display light does not come on after connecting the power and turning on the power switch, check that the N₂ or clean, dry air purge is connected and has a pressure of at least 2 psi. Correct the cause of the error and press **STOP/CLR ERROR** to ready the machine for operation.

Error Message	Reason	Remedy
CHECK VACUUM .	<ol style="list-style-type: none"> 1. Unable to hold vacuum. OR... 2. No vacuum present. 	<ol style="list-style-type: none"> 1. Make sure wafer is on the chuck. 2. Check the vacuum line connection.
SHORT CYCLE	<ol style="list-style-type: none"> 1. Unable to complete the process. Lid is opened during cycle 2. Loss of vacuum. 3. Stop button is pushed during a cycle. 	<ol style="list-style-type: none"> 1. To start a new cycle, clear the error, open/close lid. 2. Check connections. 3. To start a new cycle, clear the error, open/close lid.
MOTION ERROR	<ol style="list-style-type: none"> 1. Motor could not follow the instructions given by the Recipe. 2. Error in speed sensing circuitry. 	<ol style="list-style-type: none"> 1. Ramp time too short, allow more time; check step 0 chuck size. 2. Electronic or encoder problem– get service check step 0 chuck size.
LID OPEN	<ol style="list-style-type: none"> 1. The lid switch indicates that the lid is open. 	<ol style="list-style-type: none"> 1. Close the lid or get switch fixed.
REMOVE COATED PARTS	<ol style="list-style-type: none"> 1. Not an error, but a reminder that the cycle is complete and coated parts need to be removed. 	<ol style="list-style-type: none"> 1. Open lid, remove parts. Message will clear automatically.

NOTE: When there is a Motion Error, power to the motor is cut and the chuck coasts to a stop.

SECTION 6 MAINTENANCE

6.1 CLEANING

Use an appropriate solvent to clean the lid and the bowl; avoid damaging the bowl, lid, or drain hose. When using solvents such as N-Methylpyrrolidone (NMP) take care to avoid contact with the painted surfaces. These solvents will damage/remove the paint.

6.2 DRAIN OPTION

Use small amount of solvent to clean the left over material in the drainway and hose.

If the material has cured inside the hose, replace the hose. Make sure to use appropriate "compatible" hose material.



Never operate the spin coater with the hose disconnected from the bowl drain. It may cause damage to the machine and possible injury to the operator.

6.3 MAINTENANCE SCHEDULE

Frequency	Task	Responsibility
As Needed	Clean out bowl	Operator
Daily	Clean, Check the N ₂ or clean, dry air connections	Operator
Weekly	Check hoses & fittings, electrical connections	Maintenance
Periodically	Refer to vendor literature to maintain associated components	As appropriate

6.6 CHANGING THE FUSES

Fuses F2 and F3 are in commonly used fuse carriers. Turn the cap with a small flat-blade screwdriver and pull out the fuse and carrier. Replace with only with an exact electrical equivalent.

Fuse F1 is in the main power cord/switch assembly. *Note that the correct voltage (115V or 230V) shows through the window near the top of the assembly.*

1. Above the voltage indication window are two notches. Use a small flat blade screwdriver to pry open the hinged cover.
2. Inside, is the fuse carrier. Space at the sides will allow you to pry the carrier out. *Note which side of the carrier has the fuse in it.*
3. Replace the fuse with an exact electrical equivalent. *Make sure the fuse is in the proper side of the carrier.*
4. Return the carrier and press it fully into its holder. *Make sure the writing for the correct voltage will show through the window when the cover is snapped back into place.*
5. Press the cover into place (it will snap closed if the fuse carrier is properly seated), and *check to see that the proper voltage number shows through the window.*

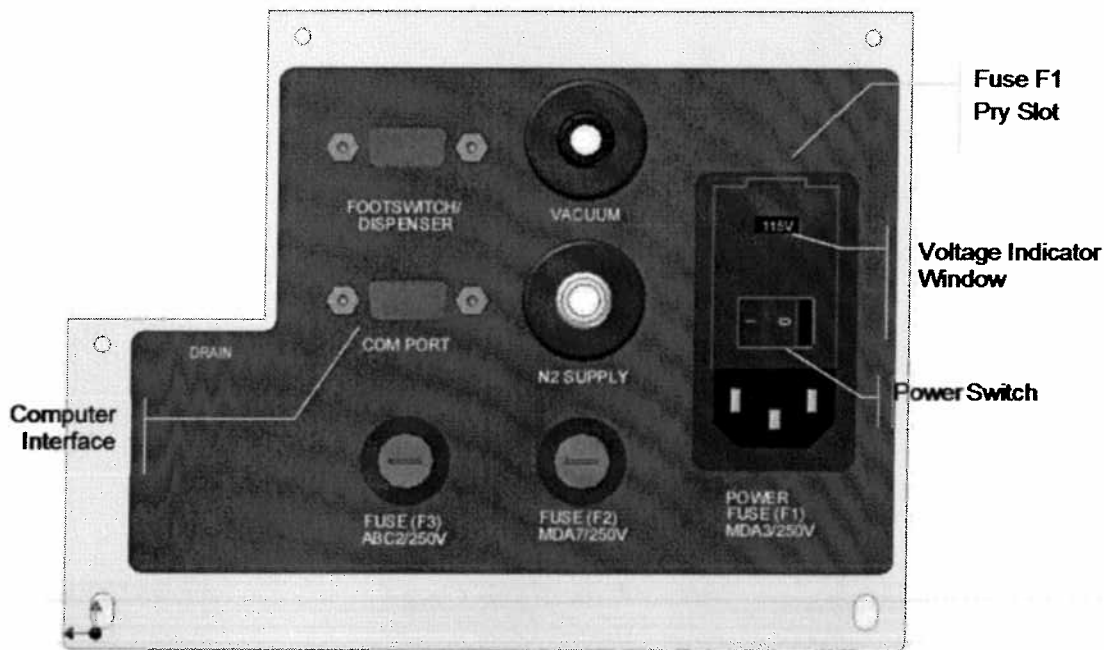


Figure 6-2 Fuse Replacement

SECTION 7 REPLACEMENT PARTS

NOTE: Foldout drawings showing major assemblies for the spin coater are included in the back of this manual (the large folded pages). To help you identify items, we have numbered them on the drawing and in the left-most column of the bill of material listing on the drawing.

OPTIONAL VACUUM CHUCKS

Accessory chucks for SCS Spin Coaters are available in several materials including stainless steel (standard), hard anodized aluminum, DELRIN, and Teflon. Chuck size is specified by the user according to substrate dimension requirements. Chuck components are machined to close tolerances for flatness and rigidity, and a cross pattern to distribute vacuum across mounting surfaces. A chuck size ¼-inch to 1-inch less than the substrate diameter is recommended. Fragile substrates should be supported across the entire surface.

For formal quotation, delivery, and Conditions of Sale, please contact your SCS sales representative or call 1-317-244-1200.

TYPE H: O-RING VACUUM HOLDING (H) DESIGN	
Used to hold relatively heavy substrates such as glass, quartz, ceramic and metal. Features O-ring vacuum seal.	
Part Number	Description
131-039	Vacuum Chuck, Type H (SST), 1/4" Diameter
131-053	Vacuum Chuck, Type H (SST), 3/8" Diameter
131-016	Vacuum Chuck, Type H (SST), 1/2" Diameter
131-014	Vacuum Chuck, Type H (SST), 3/4" Diameter
131-019	Vacuum Chuck, Type H (SST), 15/16" Diameter
131-082	Vacuum Chuck, Type H (SST), 1 1/4" Diameter
131-040	Vacuum Chuck, Type H (SST), 1 7/16" Diameter
131-018	Vacuum Chuck, Type H (SST), 1 3/4" Diameter
131-015	Vacuum Chuck, Type H (SST), 2 1/4" Diameter
131-081	Vacuum Chuck, Type H (SST), 2 3/4" Diameter
131-079	Vacuum Chuck, Type H (SST), 3" Diameter
131-020	Vacuum Chuck, Type H (SST), 3 5/16" Diameter
PP-131-1002-0	Vacuum Chuck, Type H (ALUM), 4 1/2" Diameter

TYPE L: O-RING VACUUM HOLDING CHUCK WITH MECHANICAL LOCATING (L) FINGERS

Designed for heavy, large or unsymmetrical substrates. Guide fingers assist in positioning and holding substrates. An O-ring seal is also provided.

Part Number	Description
131-013	Vacuum Chuck, Type L (SST), 1 3/4" Diameter, Finger Size "A"
131-058	Vacuum Chuck, Type L (SST), 1 3/4" Diameter, Finger Size "B"
131-032	Vacuum Chuck, Type L (SST), 1 3/4" Diameter, Finger Size "C"
131-026	Vacuum Chuck, Type L (SST), 1 3/4" Diameter, Finger Size "D"
131-069	Vacuum Chuck, Type L (SST), 2 1/2" Diameter, Finger Size "___"
131-030	Vacuum Chuck, Type L (SST), 3 5/16" Diameter, Finger Size "E"
131-022	Vacuum Chuck, Type L (SST), 3 5/16" Diameter, Finger Size "F"
131-021	Vacuum Chuck, Type L (SST), 3 5/16" Diameter, Finger Size "G"
PP-131-1022-0	Vacuum Chuck, Type L (ALUM), 5 1/2" Diameter
131-012	Finger Size "A" to Fit Substrate Size 2" - 2 3/8" For Use with Vacuum Chuck, Type L (SST), 1 3/4" Diameter
131-027	Finger Size "B" to Fit Substrate Size 2 3/8" - 2 3/4" For Use with Vacuum Chuck, Type L (SST), 1 3/4" Diameter
131-028	Finger Size "C" to Fit Substrate Size 2 3/4" - 3 1/8" For Use with Vacuum Chuck, Type L (SST), 1 3/4" Diameter
131-035	Finger Size "D" to Fit Substrate Size 3 1/8" - 3 1/2" For Use with Vacuum Chuck, Type L (SST), 1 3/4" Diameter
131-059	Finger Size "E" to Fit Substrate Size 3 1/2" - 3 7/8" For Use with Vacuum Chuck, Type L (SST), 3 5/16" Diameter
131-036	Finger Size "F" to Fit Substrate Size 3 7/8" - 4 1/4" For Use with Vacuum Chuck, Type L (SST), 3 5/16" Diameter
131-023	Finger Size "G" to Fit Substrate Size 4 1/4" - 6" For Use with Vacuum Chuck, Type L (SST), 3 5/16" Diameter
*Four Fingers Required per Chuck	

APPENDIX A: WARRANTY

LIMITED WARRANTY POLICY

- I. Subject to the limitations hereinafter set forth, SPECIALTY COATING SYSTEMS ("SCS") warrants that all component parts manufactured by SCS are free from defects in materials and workmanship for a period of twelve (12) months from the date of shipment. SCS will replace materials for a period of twelve (12) months from the date of shipment, and provide labor, if required, for a period of six (6) months from the date of shipment to correct warranty defects.
- II. Components such as gauges and meters, controllers, pumps, motors and valves are warranted by their respective manufacturers and these warranties are extended to the end user. Alcohol solutions and D.I. columns are not warranted.
- III. If, within the warranty period, any equipment or components manufactured by SCS shall prove to SCS's satisfaction to be defective, such equipment or parts shall be replaced or repaired, at SCS's option, at SCS's expense. Installation of replacement equipment or parts shall be at the Purchaser's expense.
- IV. The foregoing warranty shall be limited with respect to parts which are subject to wear or chemical reactions or which have a variable life expectancy, including but not specifically limited to, protective coatings, thermocouples, heaters, seals, o-rings, drive belts, relays, lamps and bearings (but not including filters) to a period of ninety (90) days from the date of shipment. Test cells are warranted for six (6) months from the date of shipment.
- V. SCS's obligation hereunder shall be limited to repair or replacement, F.O.B. SCS's factory, and shall be conditioned upon receipt of written notice of such defect within ten (10) days after its discovery. Prior written approval is required, for return shipment of equipment or components to SCS at SCS's expense.
- VI. This warranty shall not apply to equipment or parts which have been repaired or altered by any party other than SCS as, in SCS's judgment, adversely affects the same, or which shall be subject to negligence, accident, damage or circumstances beyond SCS's control (including fire, earthquake, flood or other acts of God), or improper installation, operation, maintenance, or storage, or to other than normal use of service. Improper operation of equipment or any part thereof shall include, without limitation, operation under loads, speeds, pressures or electrical current characteristics, or with supplies not complying with SCS's specifications.
- VII. SCS will not accept responsibility for repairs or the cost of any work done without specific written SCS authorization.
- VIII. This warranty does not apply to used or second-hand equipment, nor does it extend to any person other than the original Purchaser.

APPENDIX B: NEED ASSISTANCE?

TO BETTER ASSIST YOU:

Please have the following available, when contacting SCS for customer assistance. Providing all of the requested information will help to ensure the most rapid response to a request for service when contacting us.

Equipment Type/Model _____

Serial Number _____

PLEASE NOTE: SCS requires all returns are accompanied by a Return Material Authorization (RMA).

IF YOU PREFER, YOU MAY FAX, PLEASE INCLUDE THE FOLLOWING INFORMATION:

Company Name _____

Contact Name _____

Phone (____) _____

Email: _____

Address _____

City _____ State _____ Zip _____

YOU MAY CONTACT US AT:

PHONE: (317) 244-1200 or (800) 356-8260

FAX: FAX (317) 240-2073

EMAIL: SCScustomerservice@SCScoatings.com

MAIL: Specialty Coating Systems

7645 Woodland Drive

Indianapolis, IN 46278-2707

NOTE: We hope that this manual meets all of your needs. If, however, you notice an error, typo, omission, or organizational problem, please send e-mail to

SCStechwriter@SCScoatings.com

APPENDIX C: DOCUMENTATION

For maintenance and part identifying purposes a complete set of assembly drawings, schematics and vendor literature have been provided on the CD located on the inside of the back cover.

INDEX

For general areas of Information, refer first to the Table of Contents in the front of the manual. For specific items, see this index.

Back Panel, 9	Options, 5
Check Vacuum, 17	Programming, G3P, 11
Chuck, Vacuum, 10	Ramp, 12
Disp., 13	Recipe, 12
Dwell, 13	RPM, 5, 13
Error Messages, 17	Short Cycle, 17
Facilities Panel, 9	Step, 12
Homing the Chuck, 14	Step Zero, 13, 14, 16, 18
Motion Error, 17	Time, 13
Nitrogen, 7	Troubleshooting, 18
Operation, 3	Vacuum, 7