

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

System Serial Number; _____

Prepared for: _____

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

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MODEL NO. **G3P-8** SERIAL NO.

VOLTS AMPS PHASE HZ

INT. CAPACITY AMP MFG. DATE

SCHEMATICS

Specialty Coating Systems



DECLARATION OF CONFORMITY

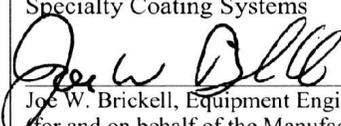
Manufacturer:	Specialty Coating Systems 7645 Woodland Drive, Indianapolis IN 46278, USA
Authorized Representative: (regulatory inquiries only)	Alura Group BV P.O. Box 18626 2502 EP The Hague The Netherlands
Product:	G3-XX, G3P-XX, 68XX & 68XXP Series Spincoaters
Start of Manufacturing:	March 1, 2003
Directives & Standards	
Machinery Directive & Standards:	
Low Voltage Directive & Standards	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) BS EN 61010-1:2001 IEC 61010-1:2001 - Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements
Electromagnetic Compatibility Directive & Standards:	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 EN 61326-1:2006 Electrical equipment for measurement, control and laboratory use — EMC requirements — Part 1: General requirements (IEC 61326-1:2005)
Signature:	Specialty Coating Systems  Joe W. Brickell, Equipment Engineering Manager (for and on behalf of the Manufacturer)
Date:	05/27/10

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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.

1.2.1 HAZARD ICONS

The following symbols may occur at points throughout the rest of the manual. Note and read each warning before attempting any operations associated with it.



This symbol warns of the potential for an **ELECTRICAL SHOCK**.



This symbol signifies a **GENERAL WARNING**, which accompanying text will explain.

1.3 POWER CORD (SHOCK) SAFETY



Emergency Power Disconnect options: Use the power cord as a disconnecting device.

To facilitate disconnect, make sure the power outlet for this cord is readily accessible to the operator.

NOTE for international users: Select the plug that is rated for the supply circuit voltage that is available. The supply circuit must be overcurrent protected at a value not exceeding 6 amps.

1.4 SERVICING



Before servicing, remove all power. **NOTE:** High voltage may still be present after shutdown and disconnecting line power. Allow machine to set without power for 10 minutes before servicing. If it becomes necessary to perform diagnostic service while certain areas of the machine still have power, use only qualified personnel. Follow all normal industrial safety practices when dealing with electrical components. Review and understand the electrical schematic before attempting any electrical diagnostic service.

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)
	OR 2.2 scfm @ 60 to 80 psi if using internal vacuum pump
Drain	0.75" OD outlet at rear of machine

Optional Features:

- Foot Switch
- External Vacuum Pump (external) 115VAC 60Hz / 230VAC 50 Hz
5.5A 1 Phase
- Internal Vacuum Pump Pneumatically powered
- 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.
- Vacuum (internal or external) is also required for the machine to operate. Connect external vacuum to the “Vacuum” port on the Utility Panel, or use the optional pneumatic-powered vacuum pump.
- 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 (if the optional internal pneumatic-powered vacuum pump is used, only the N₂ or clean, dry air purge is needed).
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

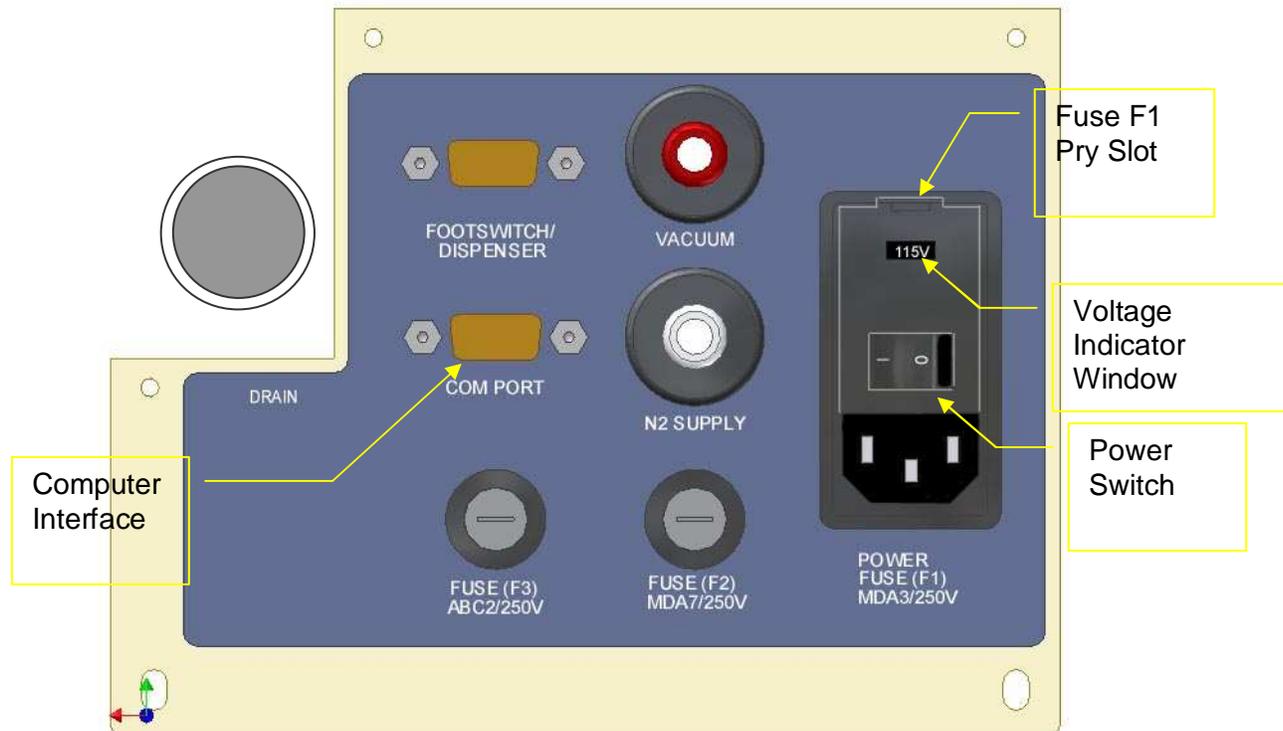


Figure 5-1: Facilities (Back) Panel

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.

FUSE/VOLTAGE SLOT

Use this for access to the F1 Fuse Carrier.

POWER SWITCH

The switch turns the machine power ON and OFF.

FUSE F1:

Line fuse. Replace with an exact electrical equivalent only.

FUSE F2:

Secondary (70 VDC) fuse. Replace with an exact electrical equivalent only.

FUSE F3:

Secondary (18.5 VDC) fuse. Replace with an exact electrical equivalent only.

COMPUTER INTERFACE

A projected future option that would allow access to programming and operation directly from computer.

VACUUM:

The external vacuum supply connects here, using 1/4" OD tube fitting (430 to 635 mm Hg or 17 to 25 inches Hg). **NOTICE:** The machine will not complete a cycle without vacuum or the optional vacuum pump.

If the optional internal vacuum pump is present, this port becomes the exhaust port for that pump (and external pumps cannot be used).

NOTICE: See startup instructions for optional vacuum pump in the technical section. Improper oil levels may damage pump. After filling, let the pump sit for six hours before using the pump.

N2 SUPPLY:

This is the connection for the N₂ or clean, dry air supply to maintain positive pressure in the enclosure (0.55 scfm at 2 psi nitrogen or clean, dry air). **NOTICE:** The machine *will not operate* without N₂ or clean, dry air.

5.3 VACUUM CHUCK

The chucks are machined to close tolerances and provide an exceptionally flat, rigid surface for mounting wafers of different sizes, weights, and shapes. The cross scroll pattern distributes the vacuum over the chuck surface to hold the wafer while spinning at high RPM. This pattern also allows rapid vacuum release.

Proper chuck selection should be based upon wafer size and rigidity. The proper chuck diameter is 1/4 to 1 inch (0.6 to 2.5cm) *smaller* than the wafer diameter. The *entire* wafer should be supported if it is flexible, fragile, or when it is to be wiped or brushed during cleaning.

Proper centering is done manually, but the use of templates and measurements can aid in this operation.

Chuck size and weight affect the spin coater. You must program the chuck size into the recipes for the programmable spin coater, in "Step 0." See §5.5.2 and §5.5.4.

5.4 LID

The lid has an Open/Close switch. You cannot run a recipe with the lid open. In addition, you must open the lid after each cycle is completed. This helps the operator avoid accidentally dispensing twice on the

same wafer. If the lid is opened during a cycle, electronic breaking will be applied*. If a dispense action is in process, it will be terminated.

*In rare instances (heavy chuck, high rotation speed) a "Motion Error" may occur; the chuck will then coast to a stop. This does not damage the machine.

5.5 PROGRAMMING THE G3P

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



Figure 5-2: G3P Control Panel

5.5.1 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.)
- The **↑** and **↓** ("Set Values"): Like the basic G3, the G3P has arrows that cause the control variables (seconds or RPM) to increase or decrease. (Press and *hold* to get bigger changes; the counter will speed up.)
- The **→** and **←** ("Navigation"): These arrows can move the cursor to the next/previous data block. NOTE: The arrows are best used when moving around in a recipe to find an item you wish to change; always use the **ENTER** button after entering/changing an item, so that the data is stored.

5.5.2 G3P PROGRAMMING

In the Program/Edit mode (see Mode key, above), you can make and save up to 30 recipes (programs, cycles), and program up to 20 *steps* into each recipe. A step consists of setting up to five variables (Ramp, RPM, Dwell, Disp., and Time). See the following and the example (Figure 5-4). In the following, the text explains each display item, then the  points out how to use that item.

NOTE that you must program for the size of chuck being used; this affects speed control parameters. Do this by setting the size in Step 0 (mentioned in the following steps).

1. Enter the Program/Edit mode by pressing the **MODE** button. A *pointer* will appear in the display, next to Recipe. (See the figure to the right.)
2. **Recipe:** (30 Recipes, identified by number) Select any recipe number to edit its variables or create a new set from scratch. [NOTE: To remove all the old programming from a recipe, select the recipe number and press **CLR/ERROR**, then press **ENTER**.]
 Use the **↑** and **↓** to select a recipe number, then press **ENTER**. The recipe number will be entered and the *pointer* will move to **Step**.
3. **Step:** (Step 0* plus 20 steps) Each step contains 5 variables, or commands, that you use to program the spin coater (Ramp, RPM, Dwell, Disp, & Time). Steps are executed in order from 1 to 20; unlike computer programming, there are no "Do Loops" or "Jump To" commands. (If you don't need all 20 steps, refer to Programming Hint #2, on the following page.)
 The step number will normally increment properly as you program, and won't require changing; You accept the step # by pressing **ENTER** and the pointer will move to **Ramp**. [If you wish to modify any step, you can simply use the **↑** and **↓** to set the Step number to the desired step and then move with the **→** and **←** to any item in that step and change it. Always press **ENTER** to make sure the changes are actually stored.]
4. **Ramp:** (0 to 25.5 seconds) This number tells the spin coater how many seconds to take to accelerate or decelerate to the new speed (RPM). If **Ramp** is set to zero, the spin coater will try to comply; but if the required change of speed is too great, a Motion Error may occur (see "Error Messages," page 17).

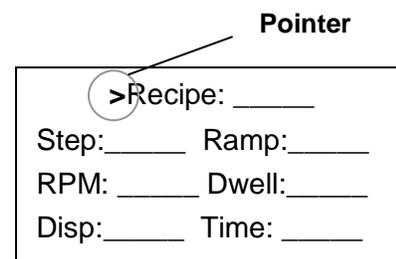


Figure 5-3: G3P Display

- ☞ When the pointer is at **Ramp**, use the **↑ and ↓** to set the Ramp Seconds. Then press **ENTER** and the number will be stored and the pointer will move to **RPM**.
 - 5. **RPM:** (0 to 9999 RPM) This is the rotational speed for the spin coater for this step.
 - ☞ When the pointer is at **RPM**, set the speed by using the **↑ and ↓**. Press **ENTER** and the number will be stored and the pointer will move to **Dwell**.
 - 6. **Dwell:** (0 to 999 seconds) This is how long to spin at the RPM you just selected.
 - ☞ When the pointer is at **Dwell**, set the time by using the **↑ and ↓**. Press **ENTER** and the number will be stored and the pointer will move to **Disp**.
 - 7. **Disp:** (None, Coating, Edge, Solvent, N₂, [1, 2, 4, 6, 8, 10, 12]*) If you have the optional hardware, you can select which external dispense function (**Disp**) to control during this step. The function will be turned on at the beginning of **Dwell**; its duration will be controlled by the **Time** variable (next). 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.
7. **To have two dispense operations, one right after the other (same or different):** Create a step that has the first dispense operation (Coating, perhaps) with zero Dwell time and Dispense time as desired. Use the next step to perform the second Disp. function without ramping up or down in speed.
8. Remember that you must press **ENTER** to accept any step's programming. If you move about using the navigation arrows (**→ and ←**), your changes are not entered and saved. If you change a setting, be sure to press **ENTER** next. (An **ENTER** at any time saves all previous changes that were made during that step.)

5.5.4 RECIPE EXAMPLE

Great flexibility is available in G3P recipes. Figure 5-4 shows RPM versus time for a recipe that demonstrates some of the different actions.

- The length of a step is shown across the bottom with an arrow. (Step 1 is 18 seconds, total.)
- Vertical lines and a number (total seconds) mark each event (start or stop of any ramp, dispense, or dwell).
- Heavy lines show the two dispense operations.
- The numbers at the left show the speeds (RPM) used in this recipe.
- Boxes across the top illustrate the recipe entries for the seven steps.

Note some of the special capabilities accomplished by the recipe:

- Long periods of the same function can be accomplished using multiple steps (Steps 3 & 4).
- Sudden speed changes are accomplished by setting Ramp time to zero or a very low number (Step 5). The actual time required is a function of the size of speed change and the amount of weight being spun.
- Pauses at zero RPM can be programmed into the middle of a recipe (Step 5). It is even possible to program a dispense step at zero RPM if desired.
- Dispensing (option): Two dispense options can be employed, one right after the other and at the same RPM (Steps 1 & 2). They could follow more closely if Dwell 1 were set to 4 instead of 10.
- Ramps to different speeds and employing different Accel/Decel rates can be combined (Steps 6 & 7).

Here is a more detailed explanation of the figure, listing and discussing each step. To help keep things straight, the settings for Step1 will be called **Ramp1**, **RPM1**, **Dwell1**, etc.

Step 0 is the step that tells the spin coater *how large the vacuum chuck is*. Enter the size in the Disp blank by selecting the number that (most nearly) represents the diameter of the chuck. **Homing**: to stop

the chuck from returning to the Home position at the end of the run, set the step 0 Time to some number other than 0.

Step 1 begins with a Ramp1-- 8 seconds up to an RPM1 of 2000. Dwell1 is set to keep the speed at 2000 for 10 seconds. Disp1 is set to COAT; the dispensing always begins as soon as the dwell does. The dispensing Time1 is 4 seconds (as shown by the heavy line), and the dwell continues until its 10 seconds is up.

Step 2 begins at 18 seconds. It has no Ramp2 time and also has the same speed (2000 RPM) so it appears to be a continuation of step 1. Its Dwell2 is set to 10 seconds (combined with step 1 this gives a total dwell of 20 seconds at 2000 RPM). Disp2 is set to N₂ and the Time2 is 7 seconds (of N₂ dispensing).

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.

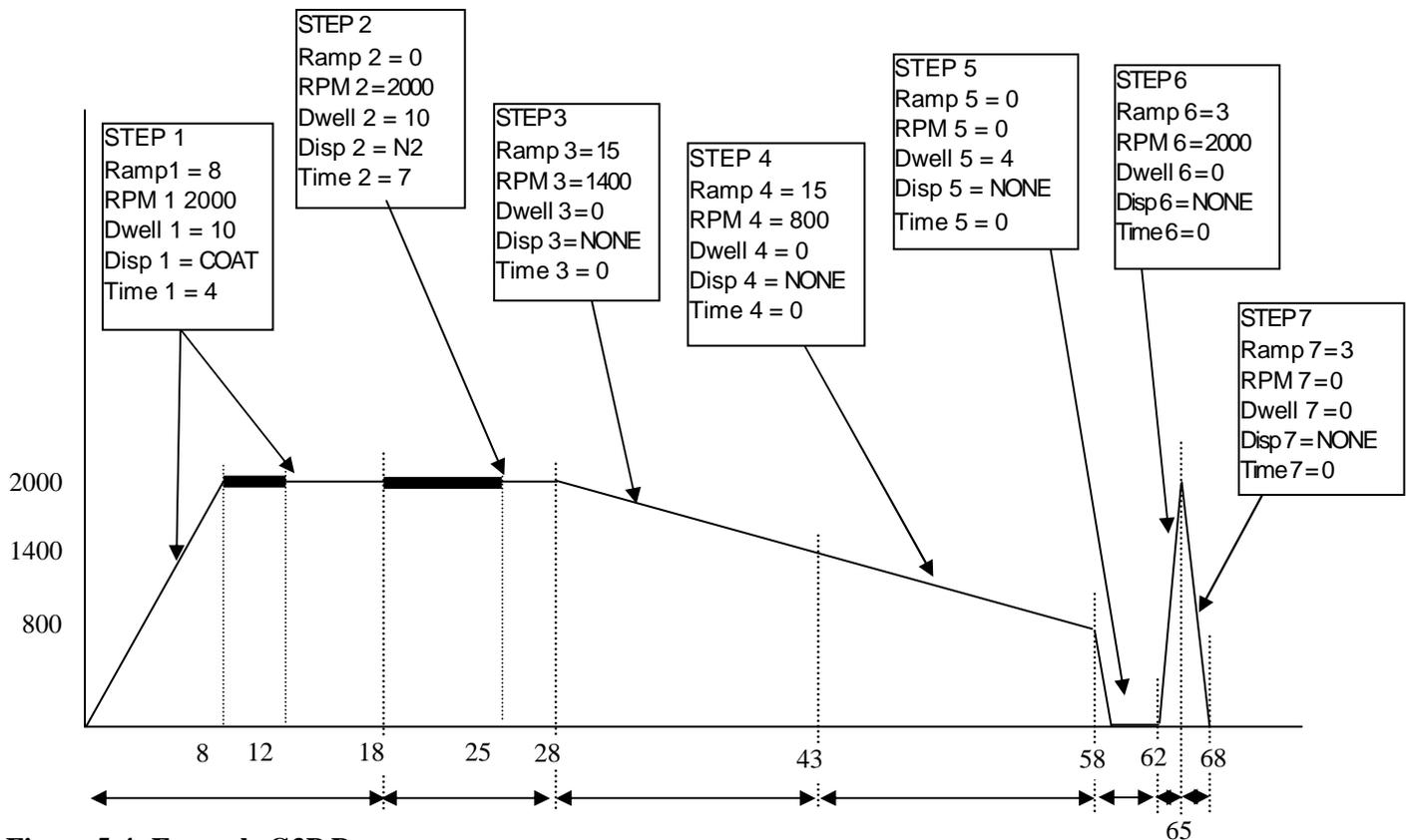


Figure 5-4: Example G3P Program

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.

ALSO in step 0 is the ability to turn off the automatic homing after each run (thus saving some time). Set the Time blank to some number larger than 0 to disable homing.

*The spin coater will not run if the vacuum, lid open/close, and N₂ or clean, dry air purge requirements are not fulfilled. See the Troubleshooting section of this manual if a run failure occurs.

5.7 RUNNING

1. Make sure you are in the Run mode and the proper recipe is selected (select recipe in the Recipe/Edit mode).
2. Make sure you have the proper size chuck—corresponding to the size called for in the Disp blank of Step Zero.
3. Place the wafer on the vacuum chuck (wafer must be centered for proper operation).
4. Close lid. Do not open the lid during a cycle; the cycle will be terminated and there is potential for injury.
5. Go to the Run mode, and press **START** to begin a cycle.
6. During the cycle, the display will show the Recipe number, and the approximate RPM and time remaining.
7. At the end of each cycle, the vacuum chuck will slowly rotate to the "Home" position (unless programmed to **not** Home in the Step 0 programming). The display will say **REMOVE COATED PARTS**.
8. Open the lid, remove the coated part, and place the next part on the chuck. NOTE: After each cycle, the spin coater lid must be opened and closed before the next cycle will run. This helps avoid spinning the same wafer twice by accident.
9. You can stop rotation at any time by pressing **STOP** (in some instances the inertia of the rotating chuck can overpower the motor brake and cause a "Motion Error"). A "Short Cycle" error will occur if the lid is opened or the **STOP** button is pressed during a cycle.
10. The **CLR ERROR** button will reset the machine if an error occurs. Pressing **Start** begins at the start of the current recipe.
11. If process is to be repeated, go to step 1.

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.

5.9 TROUBLESHOOTING

Refer to the Error messages in the previous section.

PROBLEM	POSSIBLE CAUSE	
Spin coater will not power up.	A N ₂ or clean, dry air purge is not present, or inadequate flow.	Verify or provide a N ₂ or clean, dry air purge. Have maintenance check sensor FLS-1.
Cycle will not start	<ol style="list-style-type: none"> 1. Error from previous cycle. 2. Wrong/invalid recipe. 3. Vacuum not present 4. Lid open/close not sensed, or lid still open. 	<ol style="list-style-type: none"> 1. Press CLR ERROR 2. Enter, check, or select a recipe 3. Verify or provide necessary vacuum. Have maintenance check sensors FLS-1, VS-1. 4. Open and close lid. . Have maintenance check sensor S1.
Cycle starts, but immediately stops	<ol style="list-style-type: none"> 1. Vacuum lost. 2. Recipe problem. 	<ol style="list-style-type: none"> 1. Check placement of substrate on chuck. Check vacuum supply. 2. Review, edit, and re-enter recipe as needed.
Displayed time or RPM does not seem exact.	The display is an approximation, only updated when the control circuitry has available time. Use it only to verify the correct recipe choice and steps, and as a rough report on time and speed.	For exact timing and speed, use external test equipment, and adjust the recipe as needed. Actual performance is very repeatable.
Recipe "breaks" when changing speed.	Steep ramps are harder for the motor to accomplish. If the motor cannot change the speed fast enough a Motion Error occurs. The motor/chuck spin freely to a halt and the error message is displayed.	Change the recipe to allow a more gradual speed change.
Other performance irregularities	Chuck Size considerations. The control program takes into account the chuck size (actually the chuck's moment of inertia). A customized chuck may cause some irregularities in performance if its mass/inertia are different from the anticipated chuck. If a custom chuck seems heavier than a similar sized standard chuck, select a larger size in "Step 0"; if the custom chuck seems lighter, choose a smaller size in "Step 0."	

5.10 SHUTDOWN

1. Turn power OFF with the **POWER** switch located on the rear panel.
2. Carefully remove vacuum chuck.
3. Clean vacuum chuck and bowl thoroughly using the proper solvents.

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

6.4 VACUUM SWITCH ADJUSTMENT

See Figure 6-1. The Vacuum switch may need adjustment if the "Check Vacuum" error is displayed but no cause for it is apparent (the vacuum pump is working and the hose & motor shaft hole are not blocked). In that case:

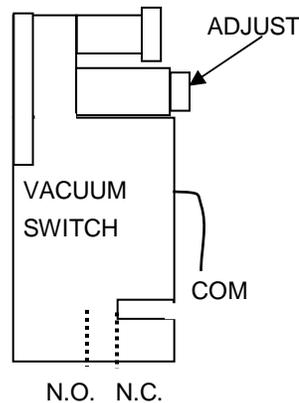


Figure 6-1: Vacuum Switch Adjustment

1. Turn the vacuum adjust screw fully CW and turn on the machine and vacuum.
2. Push the START button.
3. While the cycle is running, slowly turn the vacuum adjust counterclockwise until the machine stops and the "CHECK VACUUM" messages is displayed.
4. Turn back ¼ turn (clockwise).

Verify machine operation.

6.5 FLOW SWITCH ADJUSTMENT

The flow switch is properly adjusted before the spin coater is shipped; if something should make readjustment necessary follow the appropriate procedure.

Machines with external vacuum pump:

1. With machine turned On, adjust flow with incoming pressure regulator up from zero until flow switch actuates (characters will appear on machine display).
2. Verify actual flow of at least 0.55 cfm using an external gauge.
3. The procedure is complete. Verify machine operation.

Machines with internal vacuum pump:

1. Turn power off; remove air pressure.
2. Remove the muffler from the top of the flow switch and connect a flow meter.
3. Set the incoming pressure to 60-80 psi.
4. Adjust the needle valve (at the bottom of the flow switch) to give 0.55 cfm.
5. Remove air pressure, then remove the flow meter and replace the muffler.
6. The procedure is complete. Verify machine operation.

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.*

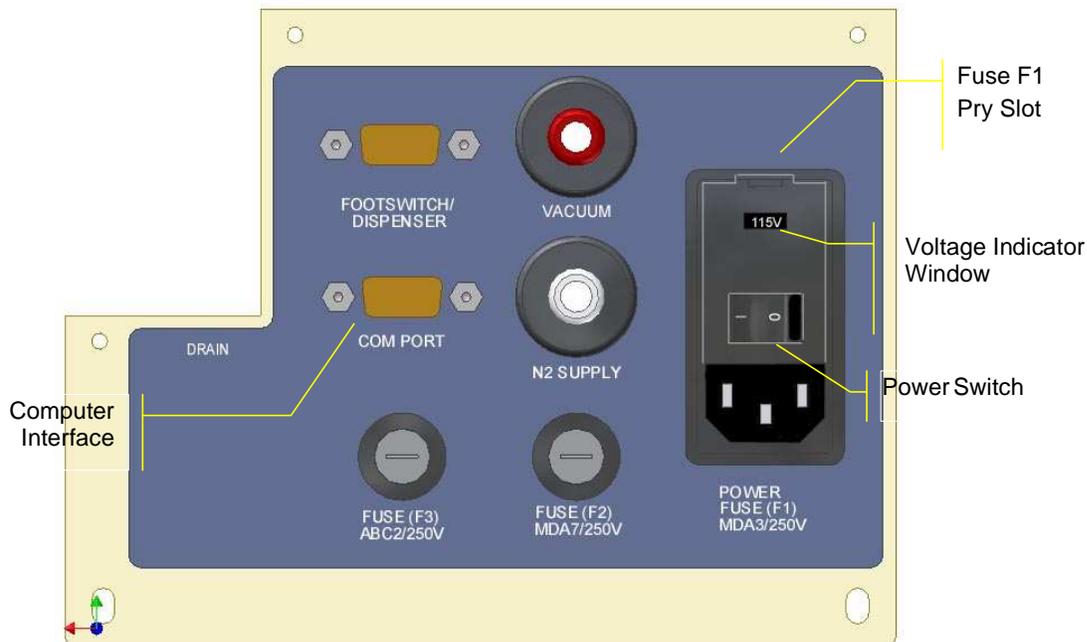


Figure 6-2 Fuse Replacement

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 CS: FLAT SURFACE CROSS AND SCROLL (CS) DESIGN	
Used to hold a thin, planar surfaced substrate such as silicon, glass or germanium on a spinning shaft for maximum rotational speed.	
Part Number	Description
131-047	Vacuum Chuck, Type CS (SST), 1/8" Diameter
131-037	Vacuum Chuck, Type CS (SST), 1/4" Diameter
131-077	Vacuum Chuck, Type CS (SST), 5/16" Diameter
131-038	Vacuum Chuck, Type CS (SST), 3/8" Diameter
131-004	Vacuum Chuck, Type CS (SST), 1/2" Diameter
131-008	Vacuum Chuck, Type CS (SST), 3/4" Diameter
131-007	Vacuum Chuck, Type CS (SST), 15/16" Diameter
131-080	Vacuum Chuck, Type CS (SST), 1 1/4" Diameter
131-005	Vacuum Chuck, Type CS (SST), 1 7/16" Diameter
131-001	Vacuum Chuck, Type CS (SST), 1 3/4" Diameter
131-087	Vacuum Chuck, Type CS (SST), 2" Diameter
131-006	Vacuum Chuck, Type CS (SST), 2 1/4" Diameter
131-083	Vacuum Chuck, Type CS (SST), 2 1/2" Diameter
131-002	Vacuum Chuck, Type CS (SST), 2 3/4" Diameter
131-078	Vacuum Chuck, Type CS (SST), 3" Diameter
131-003	Vacuum Chuck, Type CS (SST), 3 5/16" Diameter
PP-131-1001-0	Vacuum Chuck, Type CS (SST), 4" Diameter
131-086	Vacuum Chuck, Type CS (SST), 4 1/2" Diameter
131-060	Vacuum Chuck, Type CS (ALUM), 5 1/2" Diameter
PP-131-1008-0	Vacuum Chuck, Type CS (ALUM), 6" Diameter
PP-131-1007-0	Vacuum Chuck, Type CS (ALUM), 7" Diameter
PP-131-1028-0	Vacuum Chuck, Type CS (ALUM), 10.5" 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.
- IX. This warranty does not apply to equipment which is broken or damaged in transit. In no event shall SCS be responsible for any liability, loss or damage of such equipment delivered in good order and condition to a carrier or carriers at any point of shipment.
- X. This warranty shall not cover, and SCS shall not be liable for, losses of supplies or time, damages to materials, or consequential damages of any nature, arising from or attributable to equipment sold to the Purchaser by SCS. This warranty is strictly limited to the replacement or repair of the equipment or parts purchased.
- XI. SCS's liability to the Purchaser arising out of the supplying of this equipment or its use, whether based on warranty, contract, or negligence, shall not in any case exceed the cost of correcting defects in the equipment as herein provided, and upon expiration of the applicable warranty period as aforesaid, all such liability shall terminate.
- XII. EXCEPT AS OTHERWISE SET FORTH IN THIS LIMITED WARRANTY, THE EQUIPMENT AND PARTS SOLD BY SCS TO PURCHASER ARE SOLD "AS IS" AND "WHERE IS" AND "WITH ALL FAULTS," AND SCS DOES NOT MAKE AND SHALL NOT BE DEEMED TO HAVE MADE, AND SCS HEREBY DISCLAIMS, ANY REPRESENTATION OR WARRANTY, EXPRESSED OR IMPLIED, REGARDING THE DESIGN, CONSTRUCTION OR CONDITION OF, OR THE QUALITY OF MATERIAL OR WORKMANSHIP IN, THE EQUIPMENT OR PARTS, AND SCS MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS OF THE EQUIPMENT OR PARTS FOR ANY PARTICULAR PURPOSE.

SPECIALTY COATING SYSTEMS

7645 Woodland Drive
Indianapolis, IN 46278-2707

Telephone: 317-244-1200

Fax: 317-240-2073

APPENDIX B: FORMS

TO SAVE YOUR OWN TIME...

... please refer to the following questionnaire before contacting SCS for customer assistance. It tells you what information you will need in order to complete any transactions with SCS. Fill it out even if you intend to communicate by phone; this will enable you to have all the necessary information available to complete the transaction on the first call. REMEMBER you need authorization before attempting a return.

ABOUT YOU...

Company Name _____
Address _____
City _____ State _____ Zip _____

Contact Name _____
Position/Title _____
Phone (____) _____

ABOUT THE EQUIPMENT...

Equipment Type/Model _____
Serial Number _____
Specialty Coating Systems representative (if known)

ABOUT US...

Before taking any other steps, call or fax this information to Specialty Coating Systems, Customer Service.

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

e-mail: SCScustomerservice@scscoatings.com

FAX: (317) 240-2739

Address:

Specialty Coating Systems
7645 Woodland Drive
Indianapolis, IN 46278-2707

APPENDIX C: VENDOR LITERATURE

TIMER

NAIS PM5S

VACUUM PUMP

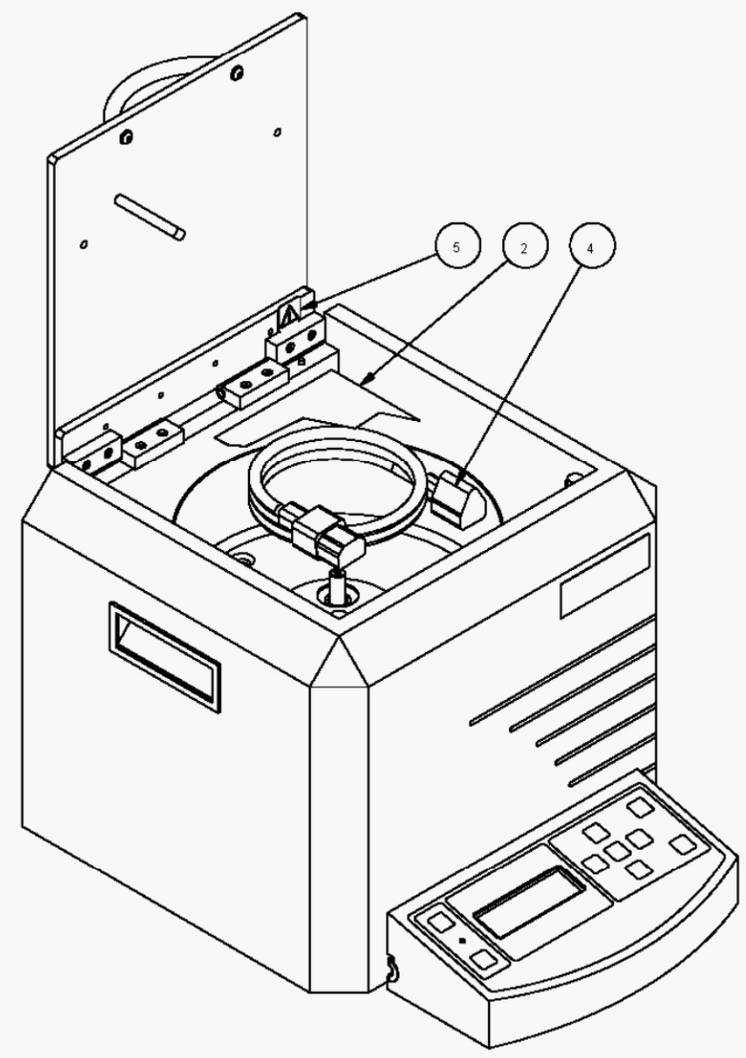
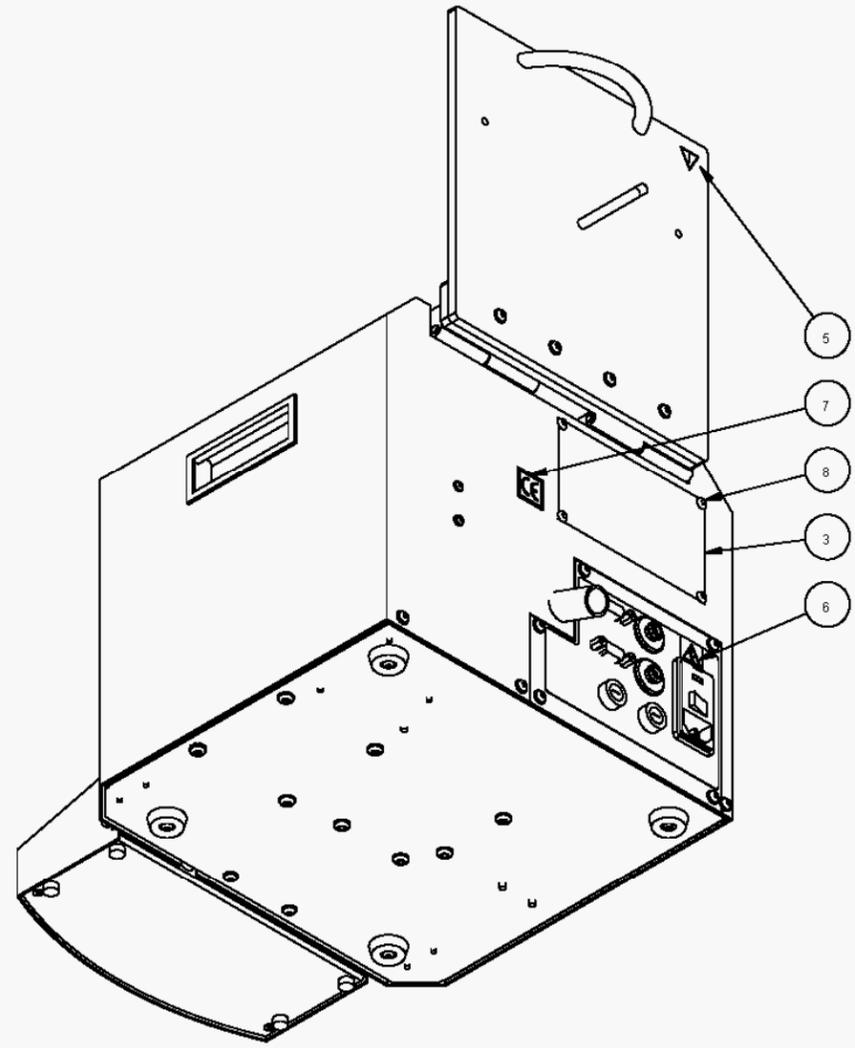
GAST Series 75R

APPENDIX D: DRAWINGS

The following drawings/schematics are provided on the next pages, in the order listed here.

AD-812-1054-1	Final Assembly
AD-812-1058-1	Final Assembly 220V
AD-812-1046-1	Basic Assembly
AD-812-1050-1	Basic Assembly w/ I VAC
AD-385-1058-1	Housing Assembly
AD-026-1051-1	Base Assembly
AD-490-1046-1	Motor Bracket Assembly
AD-490-1047-1	Motor Bracket w/ I VAC Assembly
AD-215-1033-1	Door Assembly
AD-550-1277-1	Facility Panel Assembly
AD-105-1008-1	Console Assembly
AD-202-1011-1	Optional Dispense Arm Assembly
AD-285-1179-1	Optional Manual Dispense Kit
FP-235-1013-1	Optional External Exhaust Connector
PS-812-1000-1	Pneumatic Schematic
ES-812-1072-1	Electrical Schematic

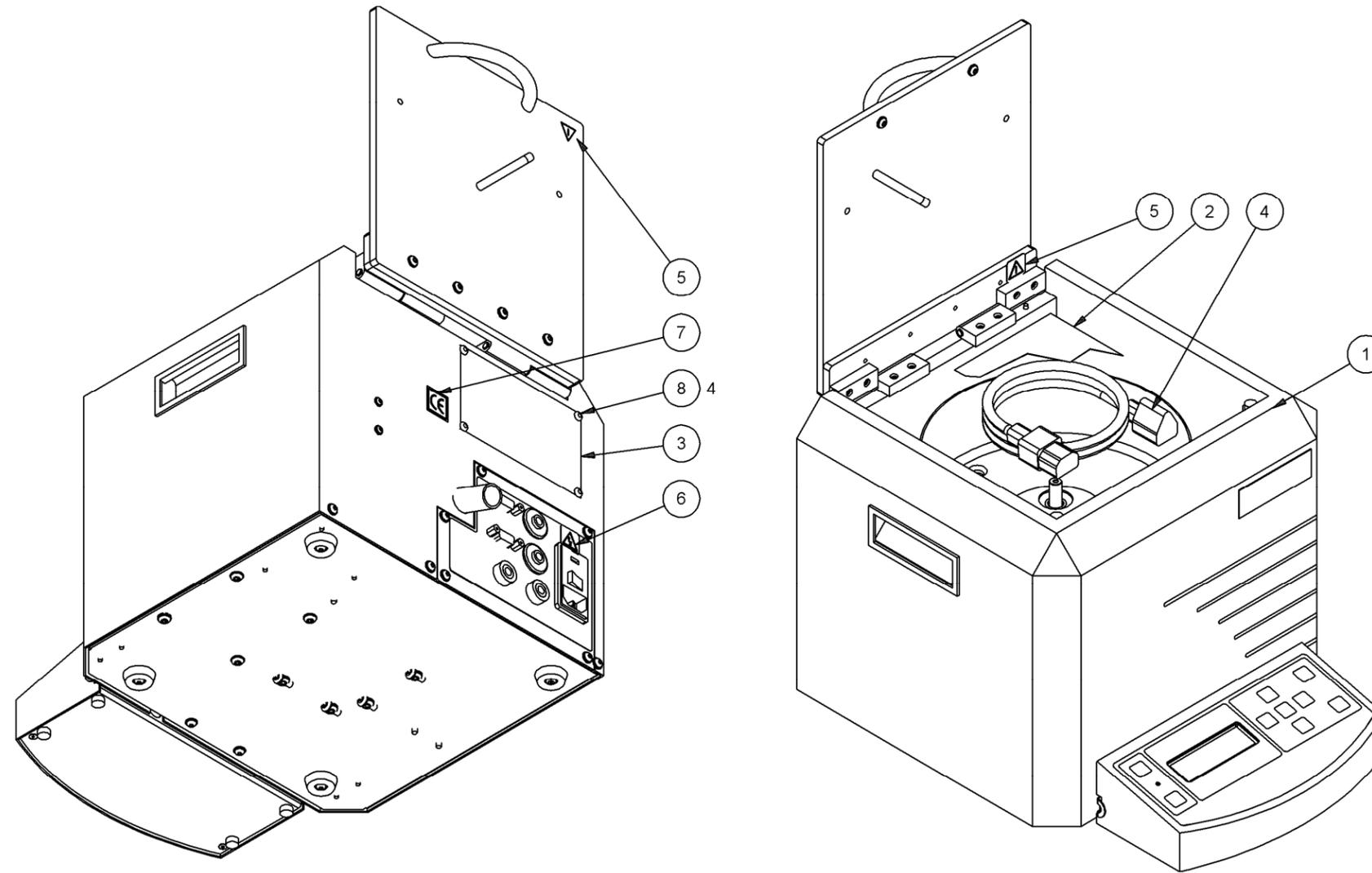
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ITEM	FA-812-1054-1	FA-812-1058-1	FA-812-1062-1	FA-812-1066-1	QTY	TITLE
1	SA-812-1046-1	SA-812-1046-1	SA-812-1050-1	SA-812-1050-1	1	BASIC ASSY, SPINCOAT G3P-8
2	CI-810-1014-1	CI-810-1014-1	CI-810-1014-1	CI-810-1014-1	1	CUST. INSTR. PURGE AIR & VACUUM
3	FP-462-1028-1	FP-462-1028-1	FP-462-1028-1	FP-462-1028-1	1	NAMEPLATE, MACHINE INFO., PARYLENE
4	PP-114-1002-0	PP-114-1003-0	PP-114-1002-0	PP-114-1003-0	1	CORD, ELECTRICAL US, 70401020244 PCC
5	PP-462-1085-0	PP-462-1085-0	PP-462-1085-0	PP-462-1085-0	2	LABEL, CAUTION/CE COMPLIANT MARKING
6	PP-462-1095-0	PP-462-1095-0	PP-462-1095-0	PP-462-1095-0	1	LABEL, WARNING ELECTRICAL VOLTAGE HAZ
7	PP-462-1100-0	PP-462-1100-0	PP-462-1100-0	PP-462-1100-0	1	LABEL, CE, LABEL SAFETY SOLUTIONS CE-K
8	PP-681-1000-0	PP-681-1000-0	PP-681-1000-0	PP-681-1000-0	4	RIVIT, 1/8" DIA., .126-.187 GRIP



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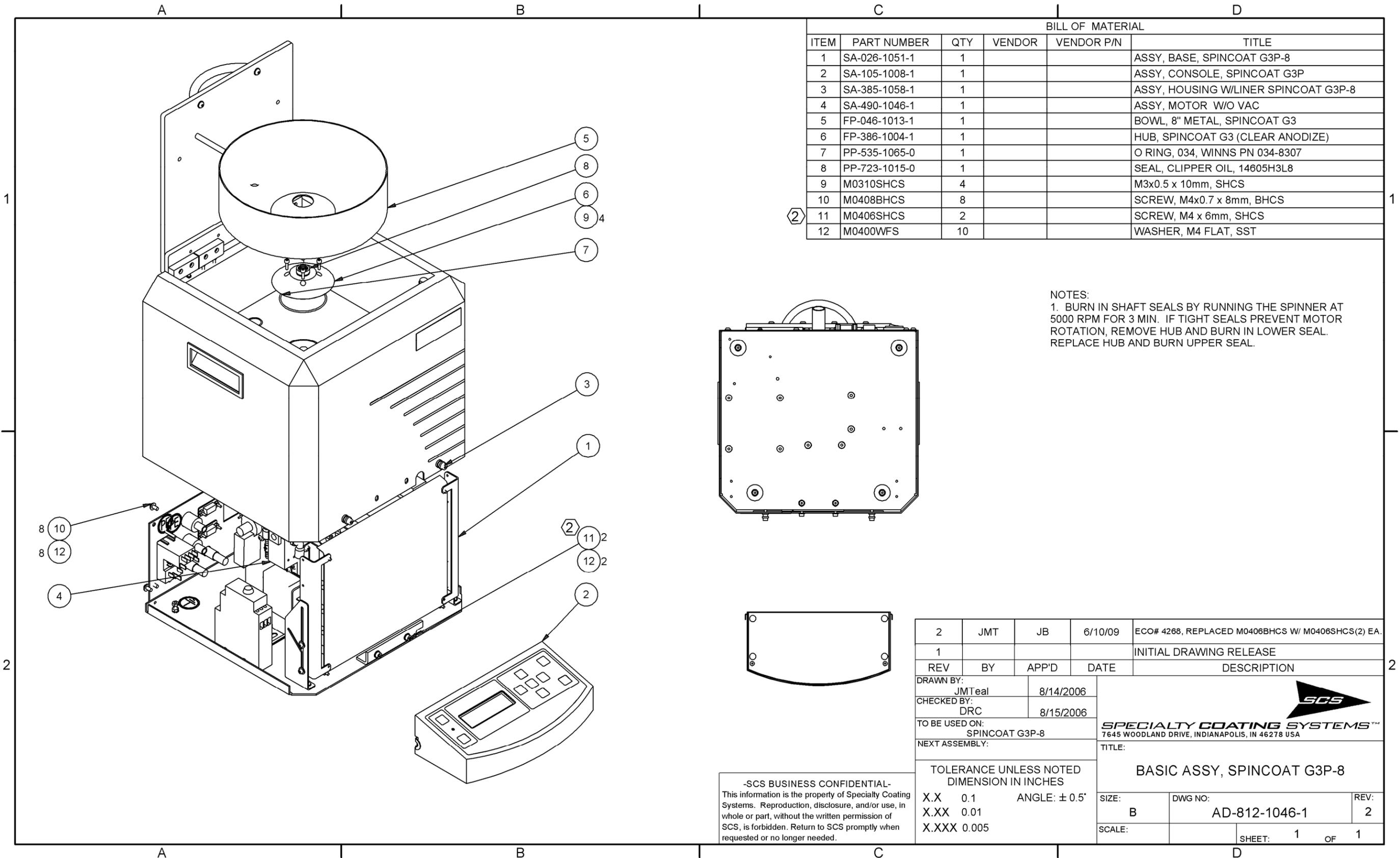
A				INITIAL DRAWING RELEASE	
REV	BY	APP'D	DATE	DESCRIPTION	
DRAWN BY:		8/15/2006		 SPECIALTY COATING SYSTEMS™ 7645 WOODLAND DRIVE, INDIANAPOLIS, IN 46278 USA	
CHECKED BY:		8/15/2006			
TO BE USED ON:		SPINCOAT G3P-8			
NEXT ASSEMBLY:				TITLE:	
				FINAL ASSY, SPINCOAT G3P-8	
TOLERANCE UNLESS NOTED		DIMENSION IN INCHES		SIZE:	DWG NO:
X.X 0.1		ANGLE: ± 0.5°		B	AD-812-1054-1
X.XX 0.01				SCALE:	REV:
X.XXX 0.005				N.T.S.	A
SHEET: 1 OF 1					

BILL OF MATERIAL					
ITEM	PART NUMBER	QTY	VENDOR	VENDOR P/N	TITLE
1	SA-812-1011-1	1			BASIC ASSY, SPINCOAT G3P-8
2	CI-810-1014-1	1			CUST. INSTR. PURGE AIR & VACUUM
3	FP-462-1028-1	1			NAMEPLATE. MACHINE INFO., PARYLENE
4	PP-114-1012-0	1			CORD,ELEC W/O PLUG PCC 70006020300
5	PP-462-1085-0	2			LABLE, CAUTION! CE COMPLIANT MARKING
6	PP-462-1095-0	1			LABEL, WARNING ELECTRICAL VOLTAGE HAZ
7	PP-462-1100-0	1			LABEL, CE, SAFETY
8	PP-681-1000-0	4			RIVIT, 1/8"



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A				INITIAL DRAWING RELEASE
REV	BY	APP'D	DATE	DESCRIPTION
DRAWN BY:				
JMT		8/15/2006		
CHECKED BY:				
DRC		8/15/2006		
TO BE USED ON:				 SPECIALTY COATING SYSTEMS™ 7645 WOODLAND DRIVE, INDIANAPOLIS, IN 46278 USA
SPINCOAT G3P-8				
NEXT ASSEMBLY:				TITLE:
				FINAL ASSY, SPINCOAT G3P-8
TOLERANCE UNLESS NOTED DIMENSION IN INCHES				
X.X	0.1	ANGLE: ± 0.5°		SIZE:
X.XX	0.01			B
X.XXX	0.005			DWG NO:
				AD-812-1058-1
				REV:
				A
SCALE:		SHEET: 1 OF 1		
N.T.S.				

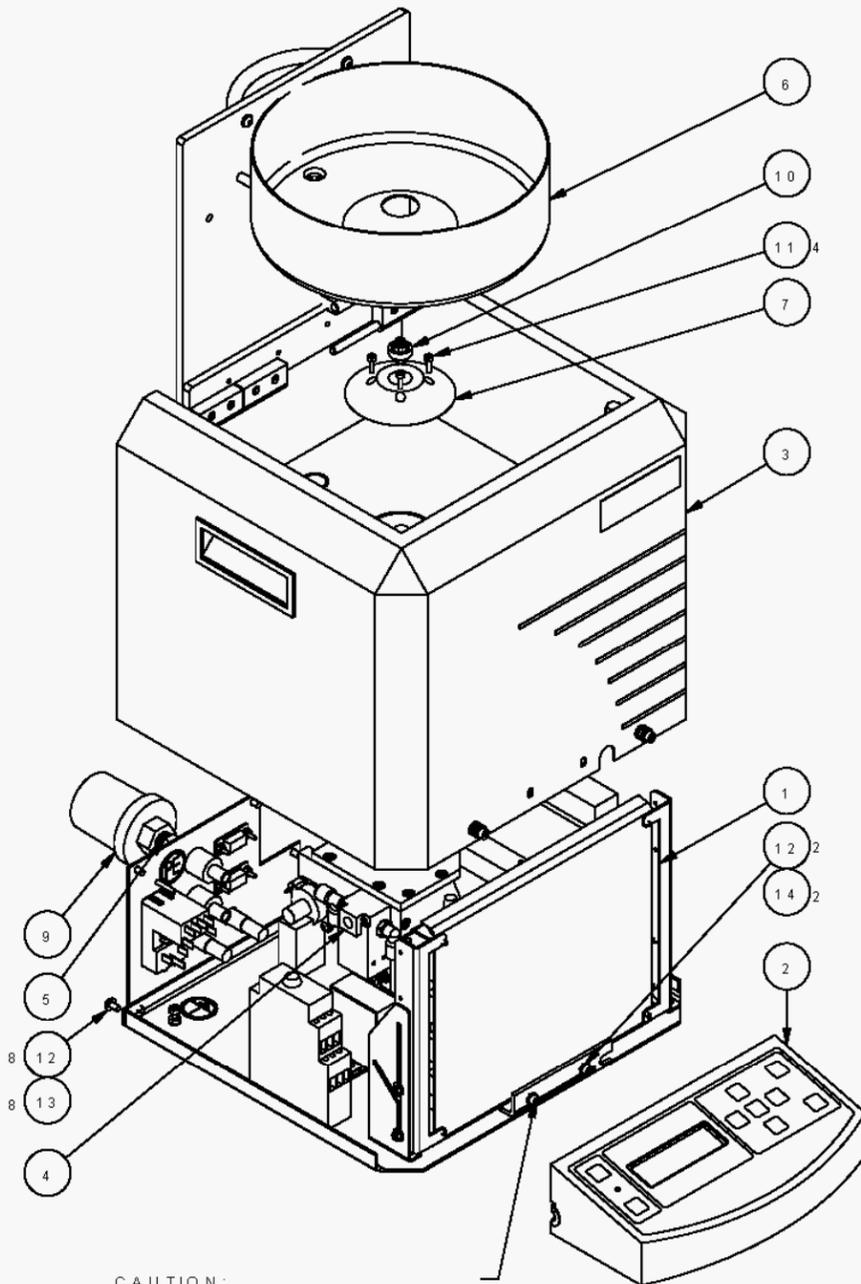


BILL OF MATERIAL						
ITEM	PART NUMBER	QTY	VENDOR	VENDOR P/N	TITLE	
1	SA-026-1051-1	1			ASSY, BASE, SPINCOAT G3P-8	
2	SA-105-1008-1	1			ASSY, CONSOLE, SPINCOAT G3P	
3	SA-385-1058-1	1			ASSY, HOUSING W/LINER SPINCOAT G3P-8	
4	SA-490-1046-1	1			ASSY, MOTOR W/O VAC	
5	FP-046-1013-1	1			BOWL, 8" METAL, SPINCOAT G3	
6	FP-386-1004-1	1			HUB, SPINCOAT G3 (CLEAR ANODIZE)	
7	PP-535-1065-0	1			O RING, 034, WINNS PN 034-8307	
8	PP-723-1015-0	1			SEAL, CLIPPER OIL, 14605H3L8	
9	M0310SHCS	4			M3x0.5 x 10mm, SHCS	
10	M0408BHCS	8			SCREW, M4x0.7 x 8mm, BHCS	
11	M0406SHCS	2			SCREW, M4 x 6mm, SHCS	
12	M0400WFS	10			WASHER, M4 FLAT, SST	

NOTES:
 1. BURN IN SHAFT SEALS BY RUNNING THE SPINNER AT 5000 RPM FOR 3 MIN. IF TIGHT SEALS PREVENT MOTOR ROTATION, REMOVE HUB AND BURN IN LOWER SEAL. REPLACE HUB AND BURN UPPER SEAL.

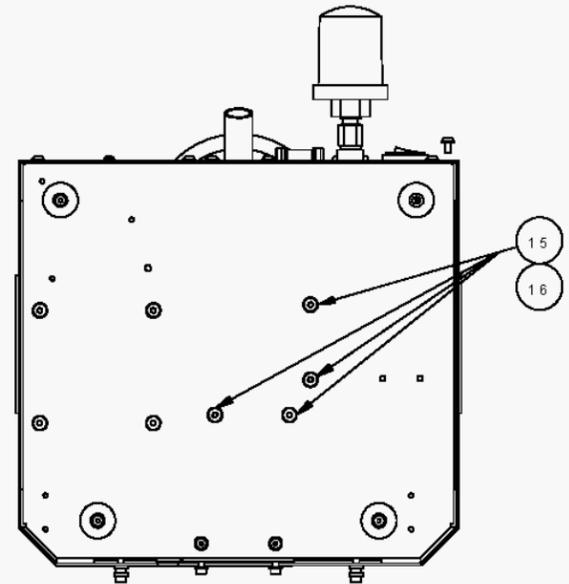
2	JMT	JB	6/10/09	ECO# 4268, REPLACED M0406BHCS W/ M0406SHCS(2) EA.
1				INITIAL DRAWING RELEASE
REV	BY	APP'D	DATE	DESCRIPTION
DRAWN BY: JMTeal 8/14/2006				 SPECIALTY COATING SYSTEMS™ 7645 WOODLAND DRIVE, INDIANAPOLIS, IN 46278 USA
CHECKED BY: DRC 8/15/2006				
TO BE USED ON: SPINCOAT G3P-8				
NEXT ASSEMBLY:				TITLE: BASIC ASSY, SPINCOAT G3P-8
TOLERANCE UNLESS NOTED DIMENSION IN INCHES				SIZE: B
X.X 0.1 ANGLE: ± 0.5°				DWG NO: AD-812-1046-1
X.XX 0.01				REV: 2
X.XXX 0.005				SCALE: SHEET: 1 OF 1

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CAUTION:
DO NOT USE SCREWS LONGER
THAN 6MM. LONGER SCREWS
MAY RESULT IN DAMAGE TO
SPINCOATER.

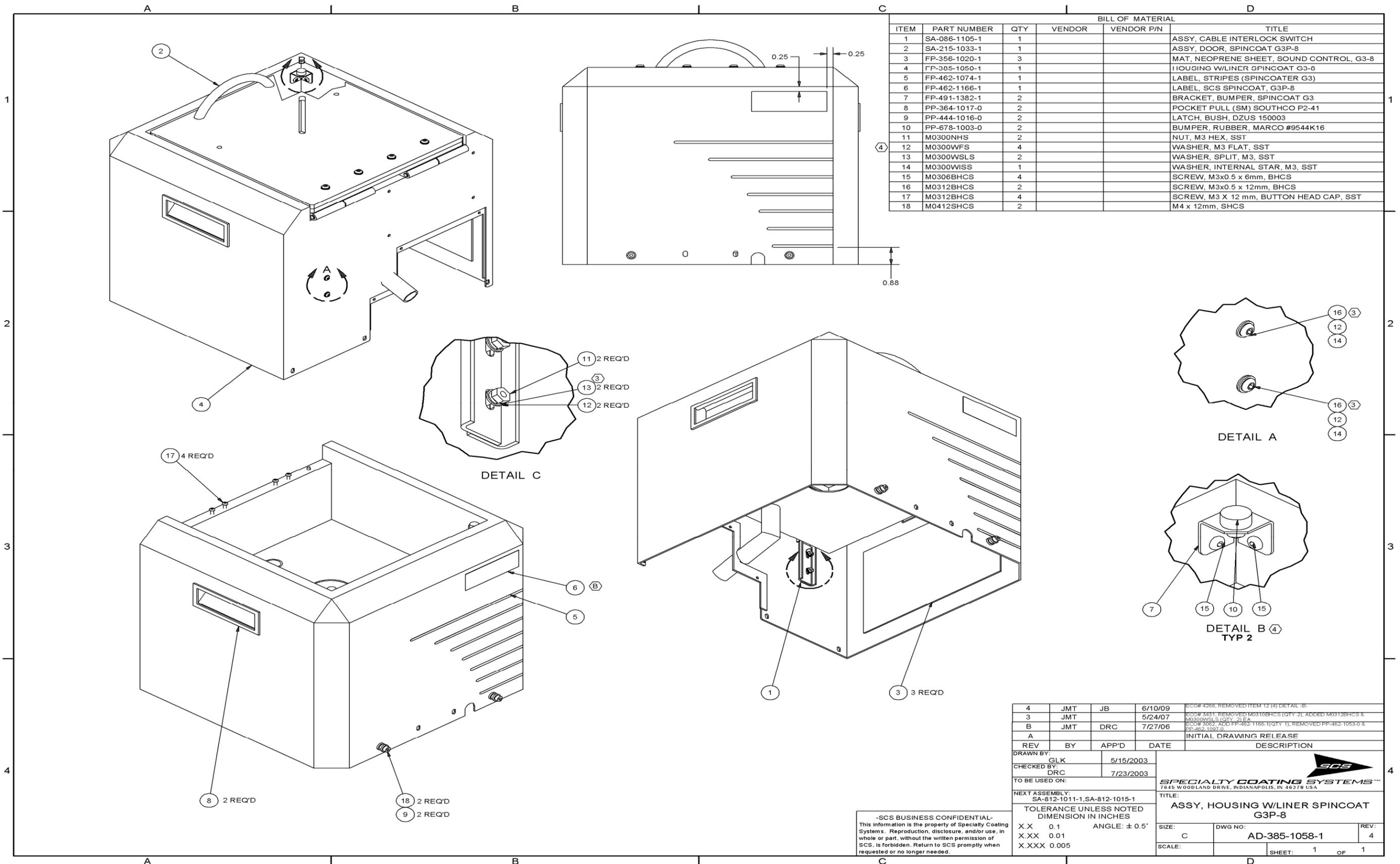
BILL OF MATERIAL					
ITEM	PART NUMBER	QTY	VENDOR	VENDOR P/N	TITLE
1	SA-026-1051-1	1			ASSY, BASE, SPINCOAT G3P-8
2	SA-105-1008-1	1			ASSY, CONSOLE, SPINCOAT G3P
3	SA-385-1058-1	1			ASSY, HOUSING W/LINER SPINCOAT G3P-8
4	SA-490-1047-1	1			ASSY, MOTOR, SPINCOAT G3 WITH INTERNAL VAC
5	263-1018	1			TUBE ADAPTER, FEMALE, SS-4-TA-7-2 CAJON
6	FP-046-1013-1	1			BOWL, 8" METAL, SPINCOAT G3
7	FP-386-1004-1	1			HUB, SPINCOAT G3 (CLEAR ANODIZE)
8	PP-535-1065-0	1			O RING, O34, WINNS PN 034-8307
9	PP-574-1022-0-2	1			PUMP, VACUUM, PNEUMATIC GAST VG-010-00-00, MUFFLER
10	PP-723-1015-0	1			SEAL, CLIPPER OIL, 14605H3L8
11	M0310SHCS	4			M 3x0.5 x 10mm, SHCS
12	M0400WFS	10			WASHER, M 4 FLAT, SST
13	M0408BHCS	8			SCREW, M 4x0.7 x 8mm, BHCS
14	M0406SHCS	2			SCREW, M 4 x 6mm, SHCS
15	M0500WFS	4			WASHER, FLAT M 5
16	M0516BHCS	4			SCREW, M 5x0.8 x 16mm, BHCS

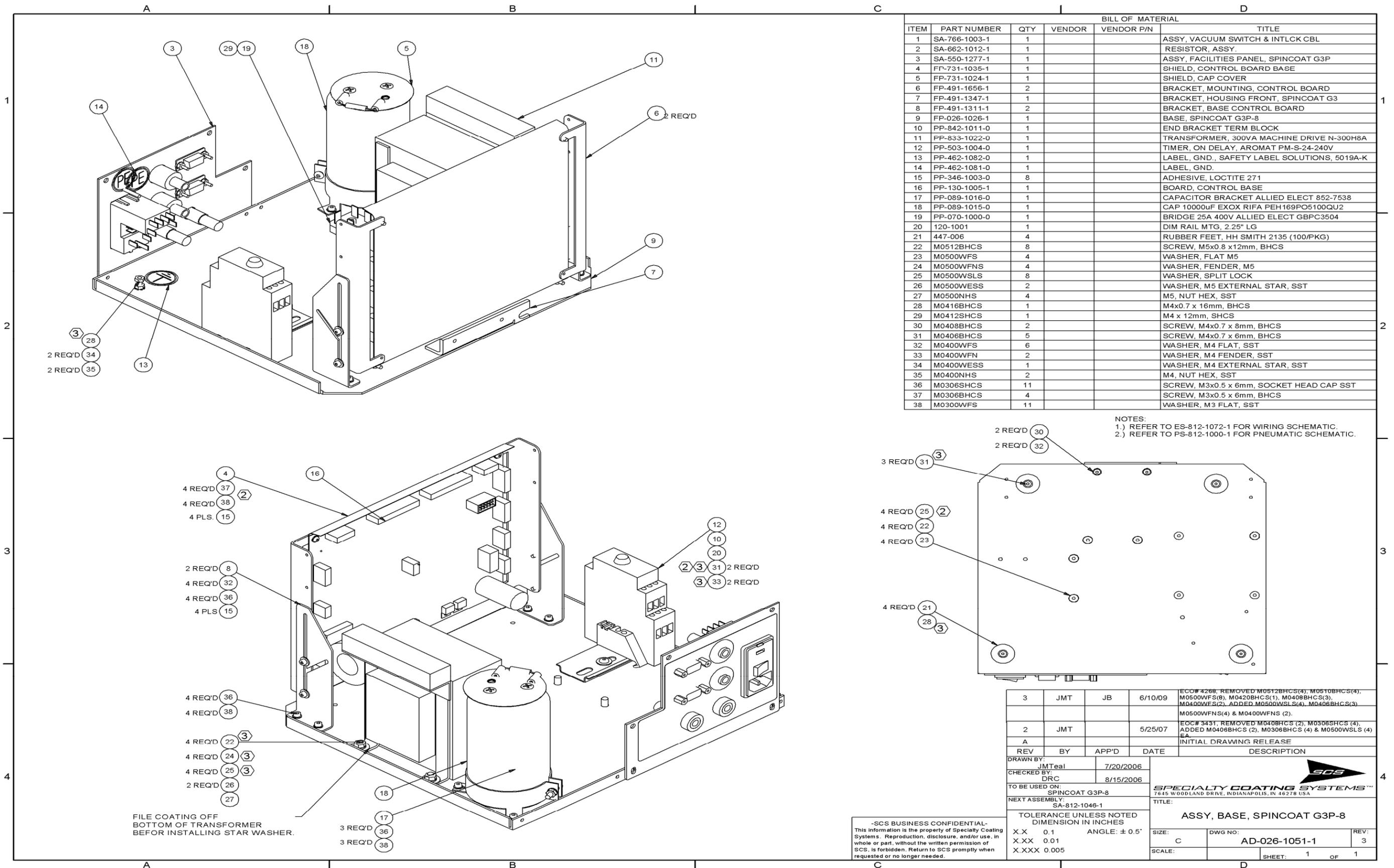


NOTES:
1) BURN IN SHAFT SEALS BY RUNNING THE SPINNER AT
5000 RPM FOR 3 MIN. IF TIGHT SEALS PREVENT MOTOR
ROTATION, REMOVE HUB AND BURN IN LOWER SEAL.
REPLACE HUB AND BURN UPPER SEAL.

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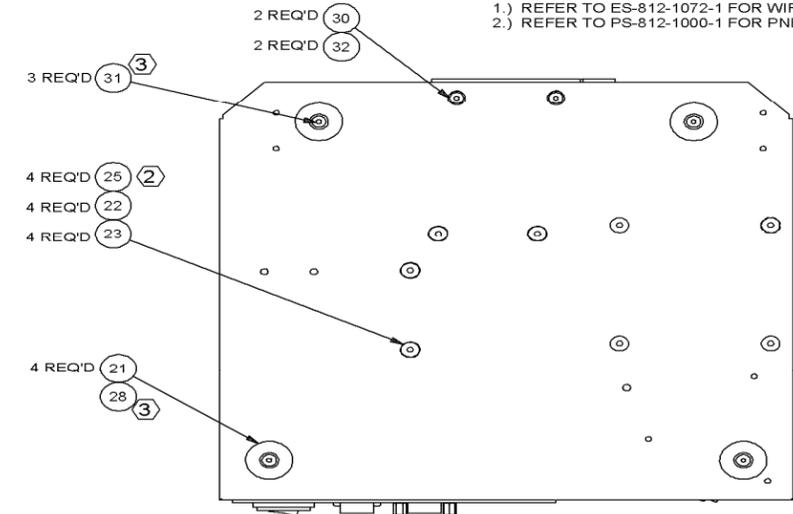
1				INITIAL DRAWING RELEASE
REV	BY	APP'D	DATE	DESCRIPTION
DRAWN BY: JM Teal		1/26/2007		 SPECIALTY COATING SYSTEMS™ 7645 WOODLAND DRIVE, INDIANAPOLIS, IN 46278 USA
CHECKED BY:				
TO BE USED ON: G3P-8 W/IVAC				
NEXT ASSEMBLY:				TITLE: BASIC ASSY, SPINCOAT G3P-8 W/IVAC
TOLERANCE UNLESS NOTED DIMENSION IN INCHES				SIZE: B
X.X 0.1 ANGLE: ± 0.5°				DWG NO: AD-812-1050-1
X.XX 0.01				REV: 1
X.XXX 0.005				SCALE: 1 OF 1
				SHEET: 1 OF 1





BILL OF MATERIAL							
ITEM	PART NUMBER	QTY	VENDOR	VENDOR P/N	TITLE		
1	SA-766-1003-1	1			ASSY, VACUUM SWITCH & INTLCK CBL		
2	SA-662-1012-1	1			RESISTOR, ASSY.		
3	SA-550-1277-1	1			ASSY, FACILITIES PANEL, SPINCOAT G3P		
4	FP-731-1035-1	1			SHIELD, CONTROL BOARD BASE		
5	FP-731-1024-1	1			SHIELD, CAP COVER		
6	FP-491-1656-1	2			BRACKET, MOUNTING, CONTROL BOARD		
7	FP-491-1347-1	1			BRACKET, HOUSING FRONT, SPINCOAT G3		
8	FP-491-1311-1	2			BRACKET, BASE CONTROL BOARD		
9	FP-026-1026-1	1			BASE, SPINCOAT G3P-8		
10	PP-842-1011-0	1			END BRACKET TERM BLOCK		
11	PP-833-1022-0	1			TRANSFORMER, 300VA MACHINE DRIVE N-300H8A		
12	PP-503-1004-0	1			TIMER, ON DELAY, AROMAT PM-S-24-240V		
13	PP-462-1082-0	1			LABEL, GND., SAFETY LABEL SOLUTIONS, 5019A-K		
14	PP-462-1081-0	1			LABEL, GND.		
15	PP-346-1003-0	8			ADHESIVE, LOCTITE 271		
16	PP-130-1005-1	1			BOARD, CONTROL BASE		
17	PP-089-1016-0	1			CAPACITOR BRACKET ALLIED ELECT 852-7538		
18	PP-089-1015-0	1			CAP 10000uF EXOX RIFA PEH169PO5100QU2		
19	PP-070-1000-0	1			BRIDGE 25A 400V ALLIED ELECT GBPC3504		
20	120-1001	1			DIM RAIL MTG, 2.25" LG		
21	447-006	4			RUBBER FEET, HH SMITH 2135 (100/PKG)		
22	M0512BHCS	8			SCREW, M5x0.8 x12mm, BHCS		
23	M0500WFS	4			WASHER, FLAT M5		
24	M0500WFNS	4			WASHER, FENDER, M5		
25	M0500WLS	8			WASHER, SPLIT LOCK		
26	M0500WESS	2			WASHER, M5 EXTERNAL STAR, SST		
27	M0500NHS	4			M5, NUT HEX, SST		
28	M0416BHCS	1			M4x0.7 x 16mm, BHCS		
29	M0412SHCS	1			M4 x 12mm, SHCS		
30	M0408BHCS	2			SCREW, M4x0.7 x 8mm, BHCS		
31	M0406BHCS	5			SCREW, M4x0.7 x 6mm, BHCS		
32	M0400WFS	6			WASHER, M4 FLAT, SST		
33	M0400WFN	2			WASHER, M4 FENDER, SST		
34	M0400WESS	1			WASHER, M4 EXTERNAL STAR, SST		
35	M0400NHS	2			M4, NUT HEX, SST		
36	M0306SHCS	11			SCREW, M3x0.5 x 6mm, SOCKET HEAD CAP SST		
37	M0306BHCS	4			SCREW, M3x0.5 x 6mm, BHCS		
38	M0300WFS	11			WASHER, M3 FLAT, SST		

NOTES:
 1.) REFER TO ES-812-1072-1 FOR WIRING SCHEMATIC.
 2.) REFER TO PS-812-1000-1 FOR PNEUMATIC SCHEMATIC.

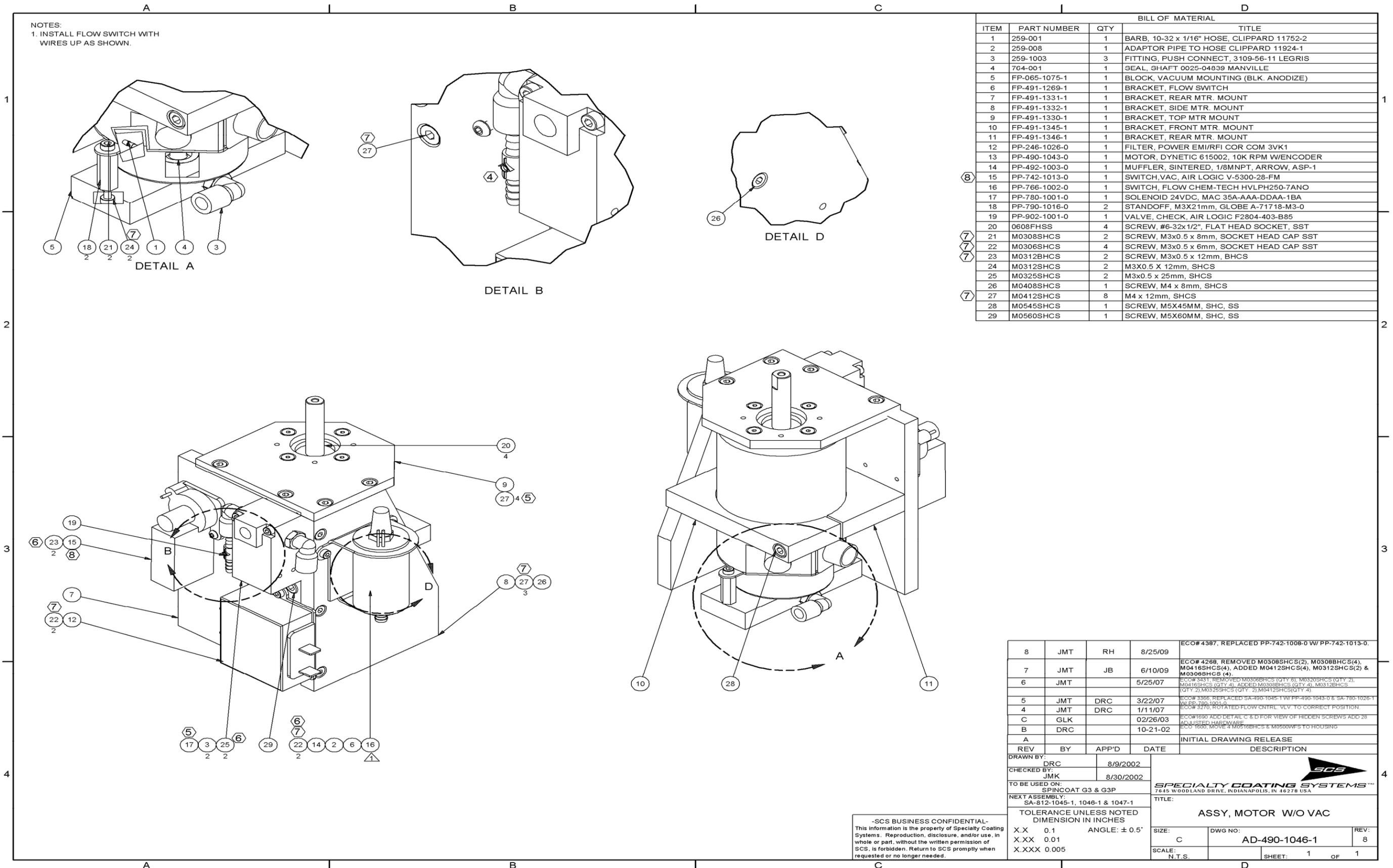


3	JMT	JB	6/10/09	ECN# 4268, REMOVED M0512BHCS(4); M0510BHCS(4); M0500WFS(8); M0420BHCS(1); M0408BHCS(3); M0400WFS(2); ADDED M0500WLS(4); M0406BHCS(3); M0500WFNS(4) & M0400WFS(2).
2	JMT		5/25/07	ECN# 3431, REMOVED M0408BHCS (2); M0306SHCS (4); ADDED M0406BHCS (2); M0306BHCS (4) & M0500WLS (4) EA.
A				INITIAL DRAWING RELEASE
REV	BY	APP'D	DATE	DESCRIPTION
DRAWN BY: JMTeal 7/20/2006				<p>SPECIALTY COATING SYSTEMS™ 7645 WOODLAND DRIVE, INDIANAPOLIS, IN 46278 USA</p>
CHECKED BY: DRC 8/15/2006				
TO BE USED ON: SPINCOAT G3P-8				TITLE: ASSY, BASE, SPINCOAT G3P-8
NEXT ASSEMBLY: SA-812-1046-1				SIZE: C DWG NO: AD-026-1051-1 REV: 3
TOLERANCE UNLESS NOTED DIMENSION IN INCHES				SCALE: SHEET: 1 OF 1
X.X 0.1 X.XX 0.01 X.XXX 0.005				ANGLE: ± 0.5°

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FILE COATING OFF
 BOTTOM OF TRANSFORMER
 BEFORE INSTALLING STAR WASHER.

BILL OF MATERIAL			
ITEM	PART NUMBER	QTY	TITLE
1	259-001	1	BARB, 10-32 x 1/16" HOSE, CLIPPARD 11752-2
2	259-008	1	ADAPTOR PIPE TO HOSE CLIPPARD 11924-1
3	259-1003	3	FITTING, PUSH CONNECT, 3109-56-11 LEGRIS
4	764-001	1	SEAL, SHAFT 0025-04839 MANVILLE
5	FP-065-1075-1	1	BLOCK, VACUUM MOUNTING (BLK. ANODIZE)
6	FP-491-1269-1	1	BRACKET, FLOW SWITCH
7	FP-491-1331-1	1	BRACKET, REAR MTR. MOUNT
8	FP-491-1332-1	1	BRACKET, SIDE MTR. MOUNT
9	FP-491-1330-1	1	BRACKET, TOP MTR MOUNT
10	FP-491-1345-1	1	BRACKET, FRONT MTR. MOUNT
11	FP-491-1346-1	1	BRACKET, REAR MTR. MOUNT
12	PP-246-1026-0	1	FILTER, POWER EMI/RFI COR COM 3VK1
13	PP-490-1043-0	1	MOTOR, DYNETIC 615002, 10K RPM W/ENCODER
14	PP-492-1003-0	1	MUFFLER, SINTERED, 1/8MNPT, ARROW, ASP-1
8	15	PP-742-1013-0	1 SWITCH, VAC, AIR LOGIC V-5300-28-FM
16	PP-766-1002-0	1	SWITCH, FLOW CHEM-TECH HVLPH250-7ANO
17	PP-780-1001-0	1	SOLENOID 24VDC, MAC 35A-AAA-DDAA-1BA
18	PP-790-1016-0	2	STANDOFF, M3X21mm, GLOBE A-71718-M3-0
19	PP-902-1001-0	1	VALVE, CHECK, AIR LOGIC F2804-403-B85
20	0608FHSS	4	SCREW, #6-32x1/2", FLAT HEAD SOCKET, SST
7	21	M0308SHCS	2 SCREW, M3x0.5 x 8mm, SOCKET HEAD CAP SST
7	22	M0306SHCS	4 SCREW, M3x0.5 x 6mm, SOCKET HEAD CAP SST
7	23	M0312BHCS	2 SCREW, M3x0.5 x 12mm, BHCS
24	M0312SHCS	2	M3X0.5 X 12mm, SHCS
25	M0325SHCS	2	M3x0.5 x 25mm, SHCS
26	M0408SHCS	1	SCREW, M4 x 8mm, SHCS
7	27	M0412SHCS	8 M4 x 12mm, SHCS
28	M0545SHCS	1	SCREW, M5X45MM, SHC, SS
29	M0560SHCS	1	SCREW, M5X60MM, SHC, SS



NOTES:
1. INSTALL FLOW SWITCH WITH WIRES UP AS SHOWN.

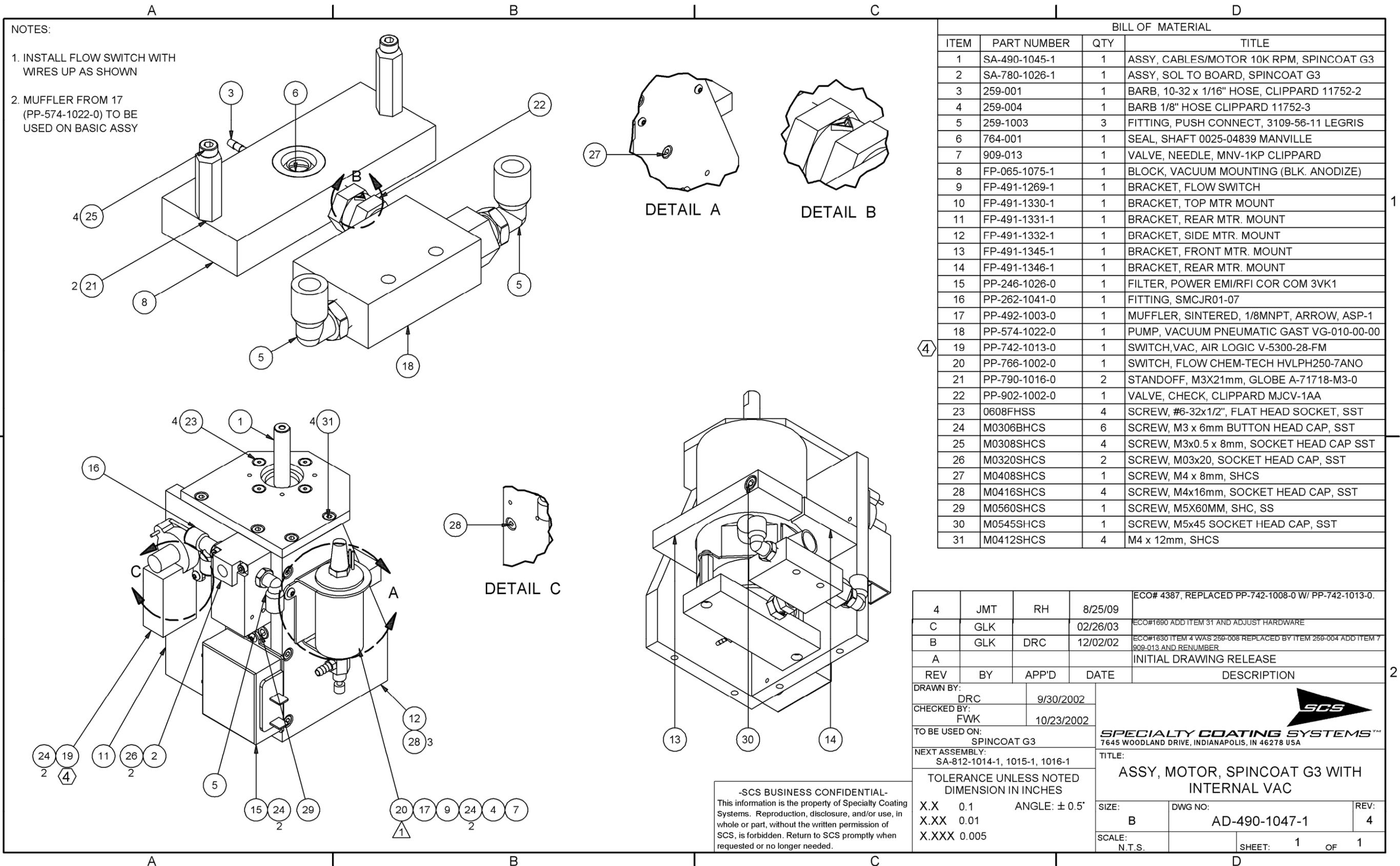
BILL OF MATERIAL			
ITEM	PART NUMBER	QTY	TITLE
1	259-001	1	BARB, 10-32 x 1/16" HOSE, CLIPPARD 11752-2
2	259-008	1	ADAPTOR PIPE TO HOSE CLIPPARD 11924-1
3	259-1003	3	FITTING, PUSH CONNECT, 3109-56-11 LEGRIS
4	764-001	1	SEAL, SHAFT 0025-04839 MANVILLE
5	FP-065-1075-1	1	BLOCK, VACUUM MOUNTING (BLK. ANODIZE)
6	FP-491-1269-1	1	BRACKET, FLOW SWITCH
7	FP-491-1331-1	1	BRACKET, REAR MTR. MOUNT
8	FP-491-1332-1	1	BRACKET, SIDE MTR. MOUNT
9	FP-491-1330-1	1	BRACKET, TOP MTR MOUNT
10	FP-491-1345-1	1	BRACKET, FRONT MTR. MOUNT
11	FP-491-1346-1	1	BRACKET, REAR MTR. MOUNT
12	PP-246-1026-0	1	FILTER, POWER EMI/RFI COR COM 3VK1
13	PP-490-1043-0	1	MOTOR, DYNETIC 615002, 10K RPM W/ENCODER
14	PP-492-1003-0	1	MUFFLER, SINTERED, 1/8MNPT, ARROW, ASP-1
15	PP-742-1013-0	1	SWITCH,VAC, AIR LOGIC V-5300-28-FM
16	PP-766-1002-0	1	SWITCH, FLOW CHEM-TECH HVLPH250-7ANO
17	PP-780-1001-0	1	SOLENOID 24VDC, MAC 35A-AAA-DDAA-1BA
18	PP-790-1016-0	2	STANDOFF, M3X21mm, GLOBE A-71718-M3-0
19	PP-902-1001-0	1	VALVE, CHECK, AIR LOGIC F2804-403-B85
20	0608FHSS	4	SCREW, #6-32x1/2", FLAT HEAD SOCKET, SST
21	M0308SHCS	2	SCREW, M3x0.5 x 8mm, SOCKET HEAD CAP SST
22	M0306SHCS	4	SCREW, M3x0.5 x 6mm, SOCKET HEAD CAP SST
23	M0312BHCS	2	SCREW, M3x0.5 x 12mm, BHCS
24	M0312SHCS	2	M3X0.5 X 12mm, SHCS
25	M0325SHCS	2	M3x0.5 x 25mm, SHCS
26	M0408SHCS	1	SCREW, M4 x 8mm, SHCS
27	M0412SHCS	8	M4 x 12mm, SHCS
28	M0545SHCS	1	SCREW, M5X45MM, SHC, SS
29	M0560SHCS	1	SCREW, M5X60MM, SHC, SS

REV	BY	APP'D	DATE	DESCRIPTION
8	JMT	RH	8/25/09	ECO# 4387, REPLACED PP-742-1008-0 W/ PP-742-1013-0.
7	JMT	JB	6/10/09	ECO# 4268, REMOVED M0308SHCS(2), M0308BHCS(4), M0416SHCS(4), ADDED M0412SHCS(4), M0312SHCS(2) & M0306SHCS (4).
6	JMT		5/25/07	ECO# 3431, REMOVED M0306BHCS (QTY 8), M0320SHCS (QTY 2), M0416SHCS (QTY 4), ADDED M0308BHCS (QTY 4), M0312BHCS (QTY 2), M0325SHCS (QTY 2), M0412SHCS (QTY 4).
5	JMT	DRC	3/22/07	ECO# 3356, REPLACED SA-490-1045-1 W/ PP-490-1043-0 & SA-780-1026-1 W/ PP-780-1001-0
4	JMT	DRC	1/11/07	ECO# 3270, ROTATED FLOW CTRL. VLV. TO CORRECT POSITION.
C	GLK		02/26/03	ECO#1690 ADD DETAIL C & D FOR VIEW OF HIDDEN SCREWS ADD 28 ADJUSTED HARDWARE
B	DRC		10-21-02	ECO 1600, MOVE 4 M0516BHCS & M0500WFS TO HOUSING
A				INITIAL DRAWING RELEASE

DRAWN BY: DRC		8/9/2002	
CHECKED BY: JMK		8/30/2002	
TO BE USED ON: SPINCOAT G3 & G3P			
NEXT ASSEMBLY: SA-812-1045-1, 1046-1 & 1047-1			
TOLERANCE UNLESS NOTED DIMENSION IN INCHES			
X.X	0.1	ANGLE: ± 0.5°	
X.XX	0.01		
X.XXX	0.005		

TITLE: ASSY, MOTOR W/O VAC	
SIZE: C	DWG NO: AD-490-1046-1
SCALE: N.T.S.	SHEET: 1 OF 1

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NOTES:

1. INSTALL FLOW SWITCH WITH WIRES UP AS SHOWN
2. MUFFLER FROM 17 (PP-574-1022-0) TO BE USED ON BASIC ASSY

BILL OF MATERIAL

ITEM	PART NUMBER	QTY	TITLE
1	SA-490-1045-1	1	ASSY, CABLES/MOTOR 10K RPM, SPINCOAT G3
2	SA-780-1026-1	1	ASSY, SOL TO BOARD, SPINCOAT G3
3	259-001	1	BARB, 10-32 x 1/16" HOSE, CLIPPARD 11752-2
4	259-004	1	BARB 1/8" HOSE CLIPPARD 11752-3
5	259-1003	3	FITTING, PUSH CONNECT, 3109-56-11 LEGRIS
6	764-001	1	SEAL, SHAFT 0025-04839 MANVILLE
7	909-013	1	VALVE, NEEDLE, MNV-1KP CLIPPARD
8	FP-065-1075-1	1	BLOCK, VACUUM MOUNTING (BLK. ANODIZE)
9	FP-491-1269-1	1	BRACKET, FLOW SWITCH
10	FP-491-1330-1	1	BRACKET, TOP MTR MOUNT
11	FP-491-1331-1	1	BRACKET, REAR MTR. MOUNT
12	FP-491-1332-1	1	BRACKET, SIDE MTR. MOUNT
13	FP-491-1345-1	1	BRACKET, FRONT MTR. MOUNT
14	FP-491-1346-1	1	BRACKET, REAR MTR. MOUNT
15	PP-246-1026-0	1	FILTER, POWER EMI/RFI COR COM 3VK1
16	PP-262-1041-0	1	FITTING, SMCJR01-07
17	PP-492-1003-0	1	MUFFLER, SINTERED, 1/8MNPT, ARROW, ASP-1
18	PP-574-1022-0	1	PUMP, VACUUM PNEUMATIC GAST VG-010-00-00
19	PP-742-1013-0	1	SWITCH, VAC, AIR LOGIC V-5300-28-FM
20	PP-766-1002-0	1	SWITCH, FLOW CHEM-TECH HVLPH250-7ANO
21	PP-790-1016-0	2	STANDOFF, M3X21mm, GLOBE A-71718-M3-0
22	PP-902-1002-0	1	VALVE, CHECK, CLIPPARD MJCV-1AA
23	0608FHSS	4	SCREW, #6-32x1/2", FLAT HEAD SOCKET, SST
24	M0306BHCS	6	SCREW, M3 x 6mm BUTTON HEAD CAP, SST
25	M0308SHCS	4	SCREW, M3x0.5 x 8mm, SOCKET HEAD CAP SST
26	M0320SHCS	2	SCREW, M03x20, SOCKET HEAD CAP, SST
27	M0408SHCS	1	SCREW, M4 x 8mm, SHCS
28	M0416SHCS	4	SCREW, M4x16mm, SOCKET HEAD CAP, SST
29	M0560SHCS	1	SCREW, M5X60MM, SHC, SS
30	M0545SHCS	1	SCREW, M5x45 SOCKET HEAD CAP, SST
31	M0412SHCS	4	M4 x 12mm, SHCS

REV	BY	APP'D	DATE	DESCRIPTION
4	JMT	RH	8/25/09	ECO# 4387, REPLACED PP-742-1008-0 W/ PP-742-1013-0.
C	GLK		02/26/03	ECO#1690 ADD ITEM 31 AND ADJUST HARDWARE
B	GLK	DRC	12/02/02	ECO#1630 ITEM 4 WAS 259-008 REPLACED BY ITEM 259-004 ADD ITEM 7 909-013 AND RENUMBER
A				INITIAL DRAWING RELEASE

DRAWN BY: DRC 9/30/2002
 CHECKED BY: FWK 10/23/2002
 TO BE USED ON: SPINCOAT G3
 NEXT ASSEMBLY: SA-812-1014-1, 1015-1, 1016-1

SPECIALTY COATING SYSTEMS™
 7645 WOODLAND DRIVE, INDIANAPOLIS, IN 46278 USA

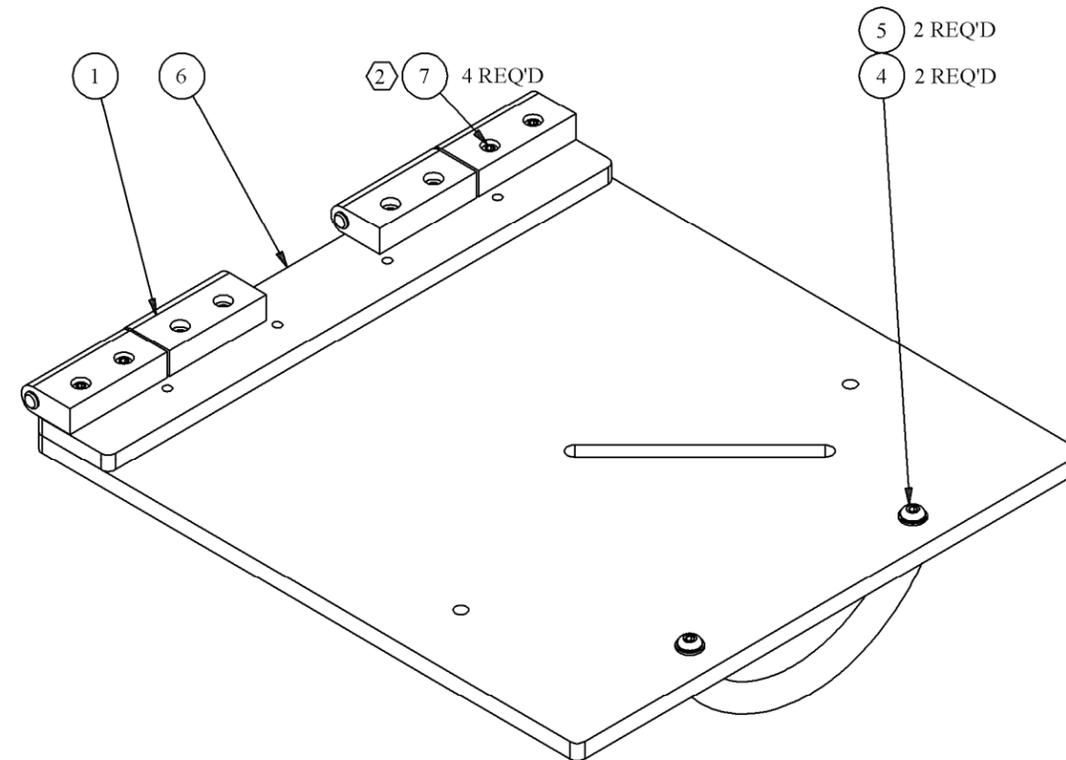
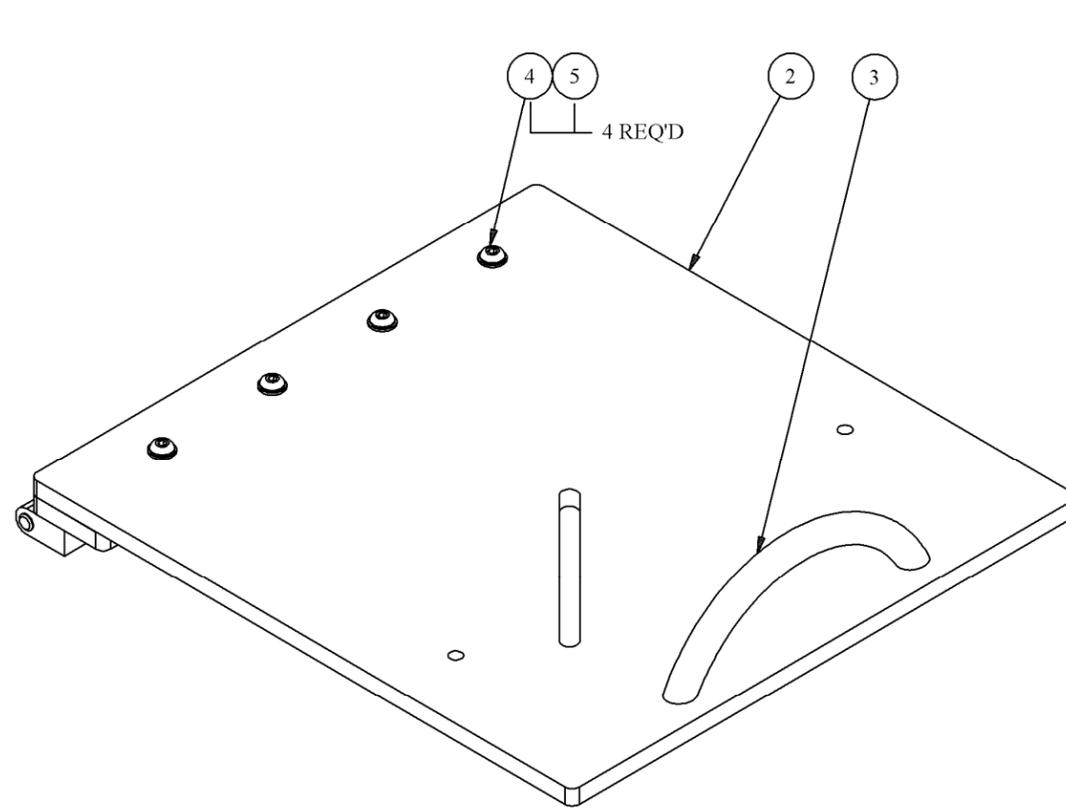
TITLE: ASSY, MOTOR, SPINCOAT G3 WITH INTERNAL VAC

TOLERANCE UNLESS NOTED DIMENSION IN INCHES
 X.X 0.1 ANGLE: ± 0.5°
 X.XX 0.01
 X.XXX 0.005

SIZE: B DWG NO: AD-490-1047-1 REV: 4
 SCALE: N.T.S. SHEET: 1 OF 1

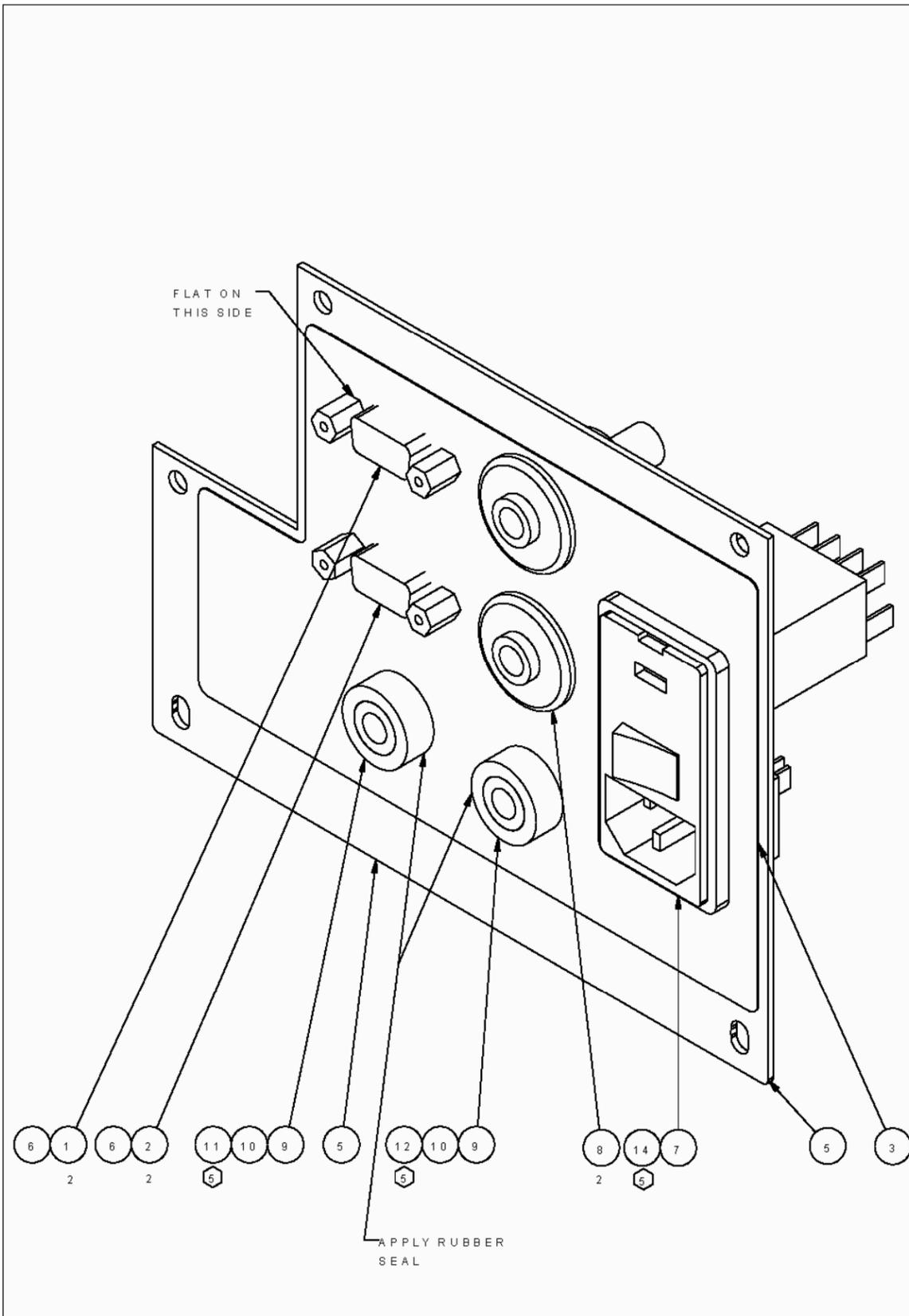
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BILL OF MATERIAL					
ITEM	PART NUMBER	QTY	VENDOR	VENDOR P/N	TITLE
1	PP-369-1013-0	2			HINGE, TORQMASTER ZC-250-ZC-101-7-7-R
2	FP-215-1033-1	1			WINDOW, SPINCOAT G3P-8
3	PP-364-1019-0	1			HANDLE, ELSA GN 26325
4	M0412BHCS	6			M4x0.7 x 12mm, BHCS
5	M0400WFS	6			WASHER, M4 FLAT, SST
6	FP-045-1015-1	1			BAR, DOOR ASSY, G3P-8
7	M0310BHCS	4			SCREW, M3x0.5 x 10mm, BHCS

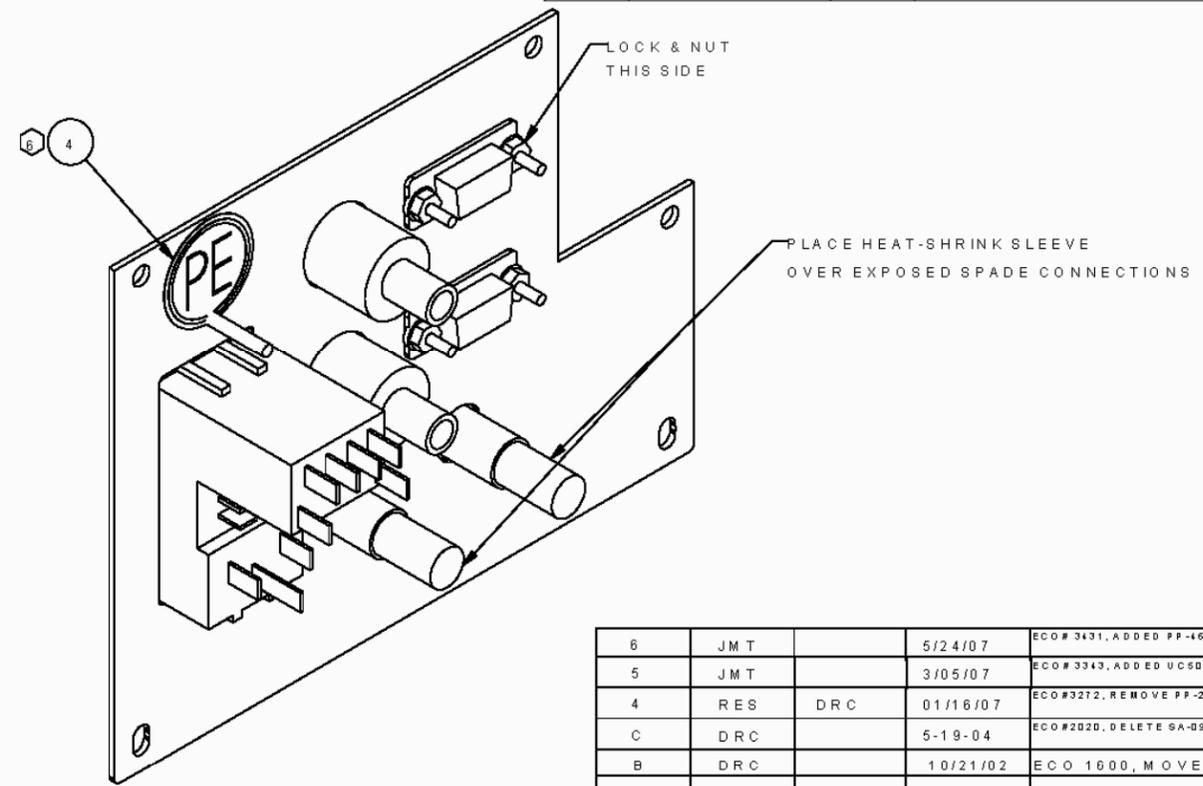


2	JMT	RH	08/09/10	ECO# 4742, REPLACED M0312BHCS(4) W/ M0410BHCS(4).
1				INITIAL DRAWING RELEASE
REV	BY	APP'D	DATE	DESCRIPTION
DRAWN BY:		7/23/2003		 SPECIALTY COATING SYSTEMS™ 7645 WOODLAND DRIVE, INDIANAPOLIS, IN 46278 USA
CHECKED BY:				
TO BE USED ON:				
NEXT ASSEMBLY: SA-385-1058-1				TITLE: ASSY, DOOR, SPINCOAT G3P-8
TOLERANCE UNLESS NOTED DIMENSION IN INCHES				SIZE: B
X.X 0.1 ANGLE: ± 0.5°				DWG NO: AD-215-1033-1
X.XX 0.01				REV: 2
X.XXX 0.005				SCALE:
				SHEET: 1 OF 1

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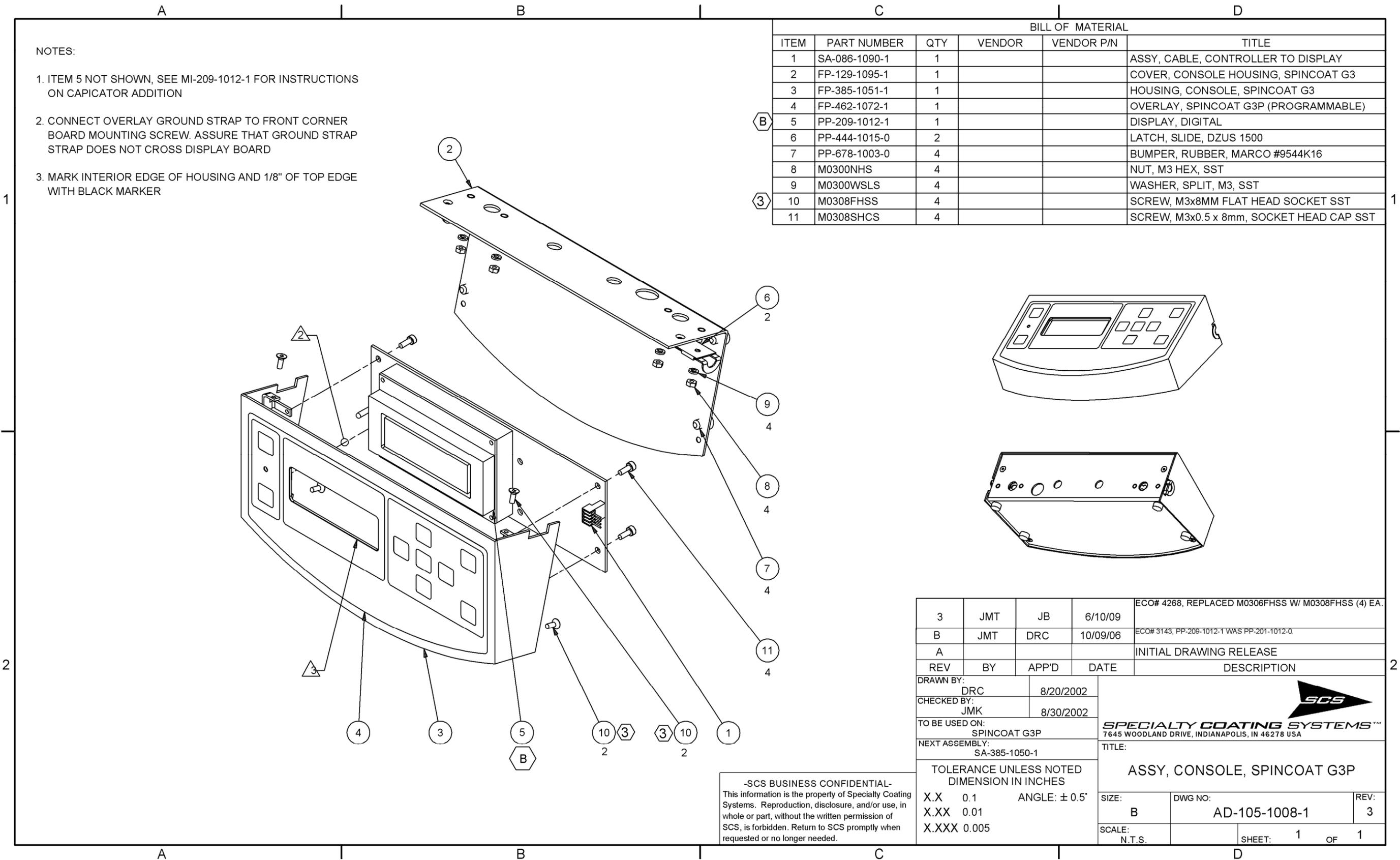
BILL OF MATERIAL			
ITEM	PART NUMBER	QTY	TITLE
1	SA-086-1099-1	1	ASSY, DB9 TO CONTROLLER CABLE, SPINCOATER G3
2	SA-086-1094-1	1	ASSY, RS232 COMMUNICATION CABLE SPINCOAT G3
3	FP-462-1089-1	1	OVERLAY, SPINCOAT G3P
4	PP-462-1081-0	1	LABEL, GND.
5	FP-550-1277-1	1	PANEL, FACILITIES, SPINCOAT G3
6	PP-106-1039-0	4	CONNECTOR HARDWARE, DSUB 510-2507 ALLIED
7	PP-106-1136-0	1	CONNECTOR MAIN POWER
8	PP-259-1044-0	2	FITTING, BULKHEAD, LEGRIS 3156-50-00
9	PP-269-1055-0	2	FUSE HOLDER CE 10A
10	PP-269-1056-0	2	FUSE CARRIER
11	UC50-TM-12	1	FUSE, 2AMP, ABC-2, BUSSMAN
12	9592	1	FUSE, 7AMP, 250V AC, BUSSMAN, MDA-7
13	9593	1	FUSE, 3AMP, 250V AC, MDA-3 BUSSMAN



REV	BY	APP'D	DATE	DESCRIPTION
6	JMT		5/24/07	ECO# 3431, ADDED PP-462-1081-0 (QTY.1) EA.
5	JMT		3/05/07	ECO# 3343, ADDED UC50-TM-12, 9592 & 9593 (QTY.1) EA.
4	RES	DRC	01/16/07	ECO#3212, REMOVE PP-259-1045-0 & PP-259-146-0 QTY (1) EACH
C	DRC		5-19-04	ECO#2020, DELETE SA-096-1094-1, ADD SA-086-1094-2
B	DRC		10/21/02	ECO 1600, MOVED FASTENERS TO BASIC ASSY
A				INITIAL DRAWING RELEASE

DRAWN BY: DRC		8/19/2002	 SPECIALTY COATING SYSTEMS™ 7645 WOODLAND DRIVE, INDIANAPOLIS, IN 46278 USA
CHECKED BY: JMK		8/30/2002	
TO BE USED ON: SPINCOAT G3P			TITLE: ASSY, FACILITIES PANEL, SPINCOAT G3P
NEXT ASSEMBLY: SA-026-1026-1			SIZE: B
TOLERANCE UNLESS NOTED DIMENSION IN INCHES			DWG NO: AD-550-1277-1
X.X 0.1 ANGLE: ± 0.5°			REV: 6
X.XX 0.01			SCALE: N.T.S.
X.XXX 0.005			SHEET: 1 OF 1

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NOTES:

1. ITEM 5 NOT SHOWN, SEE MI-209-1012-1 FOR INSTRUCTIONS ON CAPICATOR ADDITION
2. CONNECT OVERLAY GROUND STRAP TO FRONT CORNER BOARD MOUNTING SCREW. ASSURE THAT GROUND STRAP STRAP DOES NOT CROSS DISPLAY BOARD
3. MARK INTERIOR EDGE OF HOUSING AND 1/8" OF TOP EDGE WITH BLACK MARKER

BILL OF MATERIAL					
ITEM	PART NUMBER	QTY	VENDOR	VENDOR P/N	TITLE
1	SA-086-1090-1	1			ASSY, CABLE, CONTROLLER TO DISPLAY
2	FP-129-1095-1	1			COVER, CONSOLE HOUSING, SPINCOAT G3
3	FP-385-1051-1	1			HOUSING, CONSOLE, SPINCOAT G3
4	FP-462-1072-1	1			OVERLAY, SPINCOAT G3P (PROGRAMMABLE)
5	PP-209-1012-1	1			DISPLAY, DIGITAL
6	PP-444-1015-0	2			LATCH, SLIDE, DZUS 1500
7	PP-678-1003-0	4			BUMPER, RUBBER, MARCO #9544K16
8	M0300NHS	4			NUT, M3 HEX, SST
9	M0300WLS	4			WASHER, SPLIT, M3, SST
10	M0308FHSS	4			SCREW, M3x8MM FLAT HEAD SOCKET SST
11	M0308SHCS	4			SCREW, M3x0.5 x 8mm, SOCKET HEAD CAP SST

REV	BY	APP'D	DATE	DESCRIPTION
3	JMT	JB	6/10/09	ECO# 4268, REPLACED M0306FHSS W/ M0308FHSS (4) EA.
B	JMT	DRC	10/09/06	ECO# 3143, PP-209-1012-1 WAS PP-201-1012-0.
A				INITIAL DRAWING RELEASE

DRAWN BY: DRC		8/20/2002	
CHECKED BY: JMK		8/30/2002	
TO BE USED ON: SPINCOAT G3P			
NEXT ASSEMBLY: SA-385-1050-1			
TOLERANCE UNLESS NOTED DIMENSION IN INCHES			
X.X	0.1	ANGLE: ± 0.5°	
X.XX	0.01		
X.XXX	0.005		

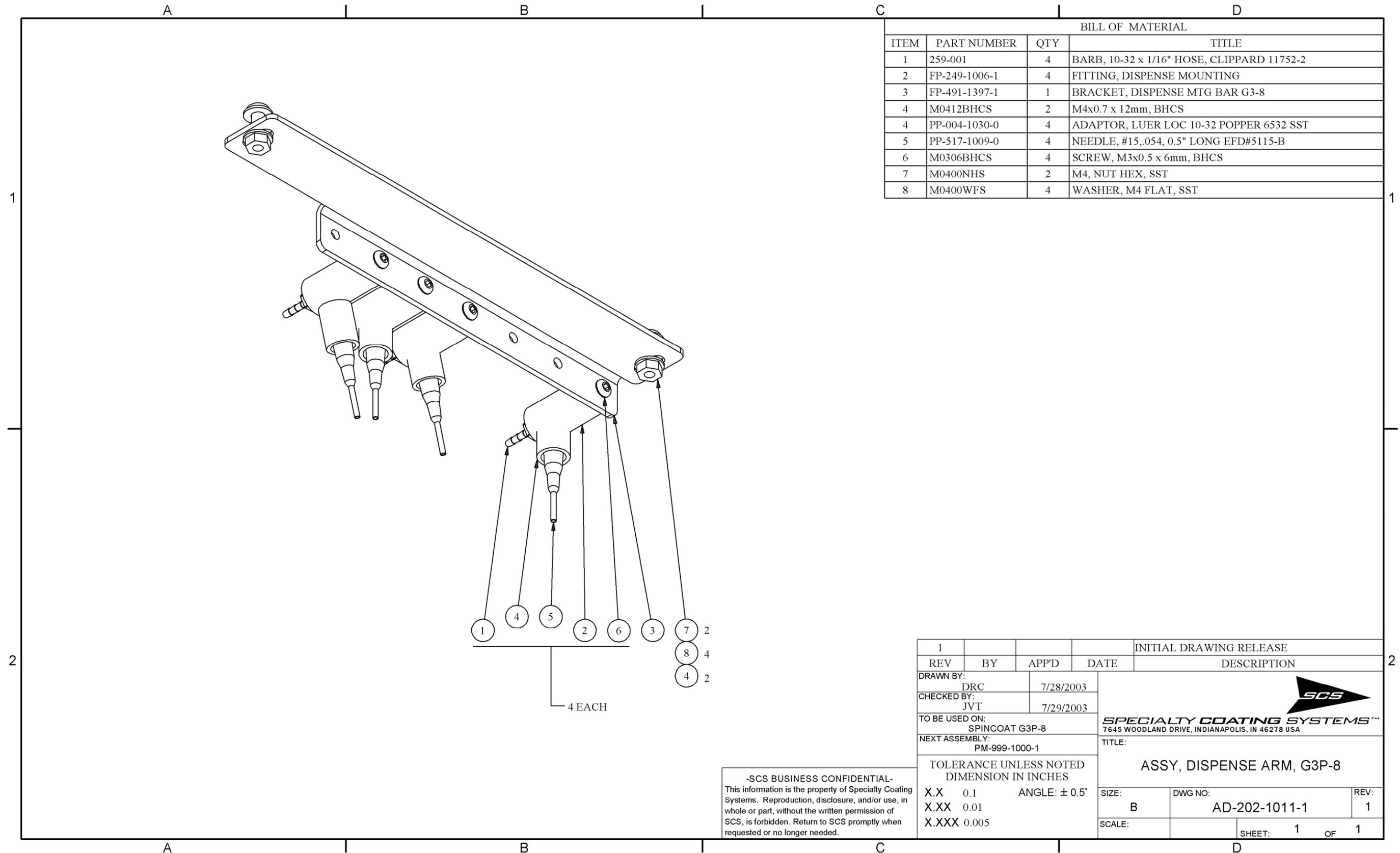


SPECIALTY COATING SYSTEMS™
7645 WOODLAND DRIVE, INDIANAPOLIS, IN 46278 USA

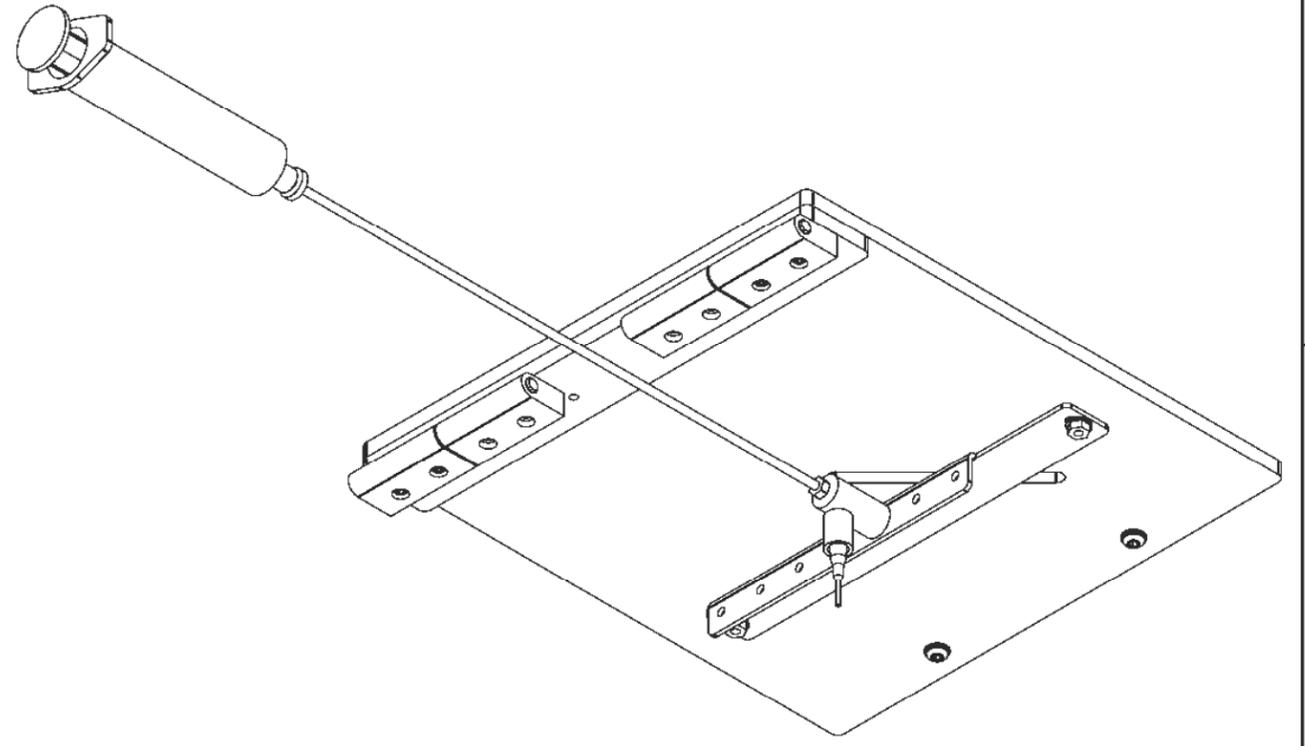
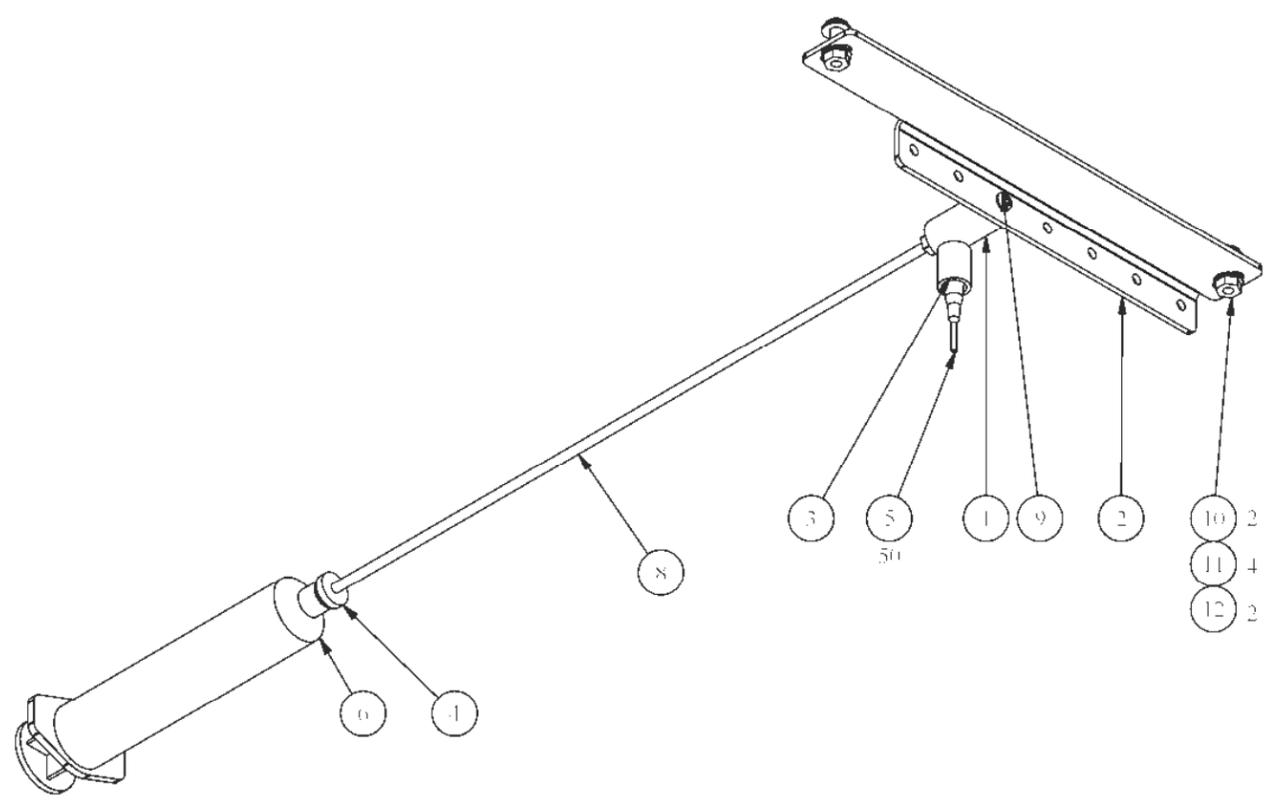
TITLE:
ASSY, CONSOLE, SPINCOAT G3P

SIZE: B	DWG NO: AD-105-1008-1	REV: 3
SCALE: N.T.S.	SHEET: 1 OF 1	

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BILL OF MATERIAL					
ITEM	PART NUMBER	QTY	VENDOR	VENDOR P/N	TITLE
1	FP-249-1006-1	1			FITTING, DISPENSE MOUNTING
2	FP-191-1397-1	1			BRACKET, DISPENSE MTG BAR G3-8
3	PP-001-1030-0	1			ADAPTOR, LUER LOC 10-32 POPPER 6532 SST
4	PP-262-1042-0	1			FITTING, BARR POLY MCCARR 51525K261
5	PP-517-1009-0	50			NEEDLE, #15, 054, 0.5" LENGTH #5115-13
6	PP-817-1000-0	1			SYRINGE, .68 OZ, MCCARR 7510A654
7	259-001	1			BARB, 10-32 x 1/16" HOSE, CLIPPARD 11752-2
8	837-029	1			1/8" TEL TUBE (YELLOW) (ZEUS BRAND)
9	M0306B1CS	1			SCREW, M3x0.5 x 6mm, B1CS
10	M0100N1S	2			M1, NUT HEX, SST
11	M0400W1S	4			WASHER, M4 FL AT, SST
12	M0412B1CS	2			M4x0.7 x 12mm, B1CS

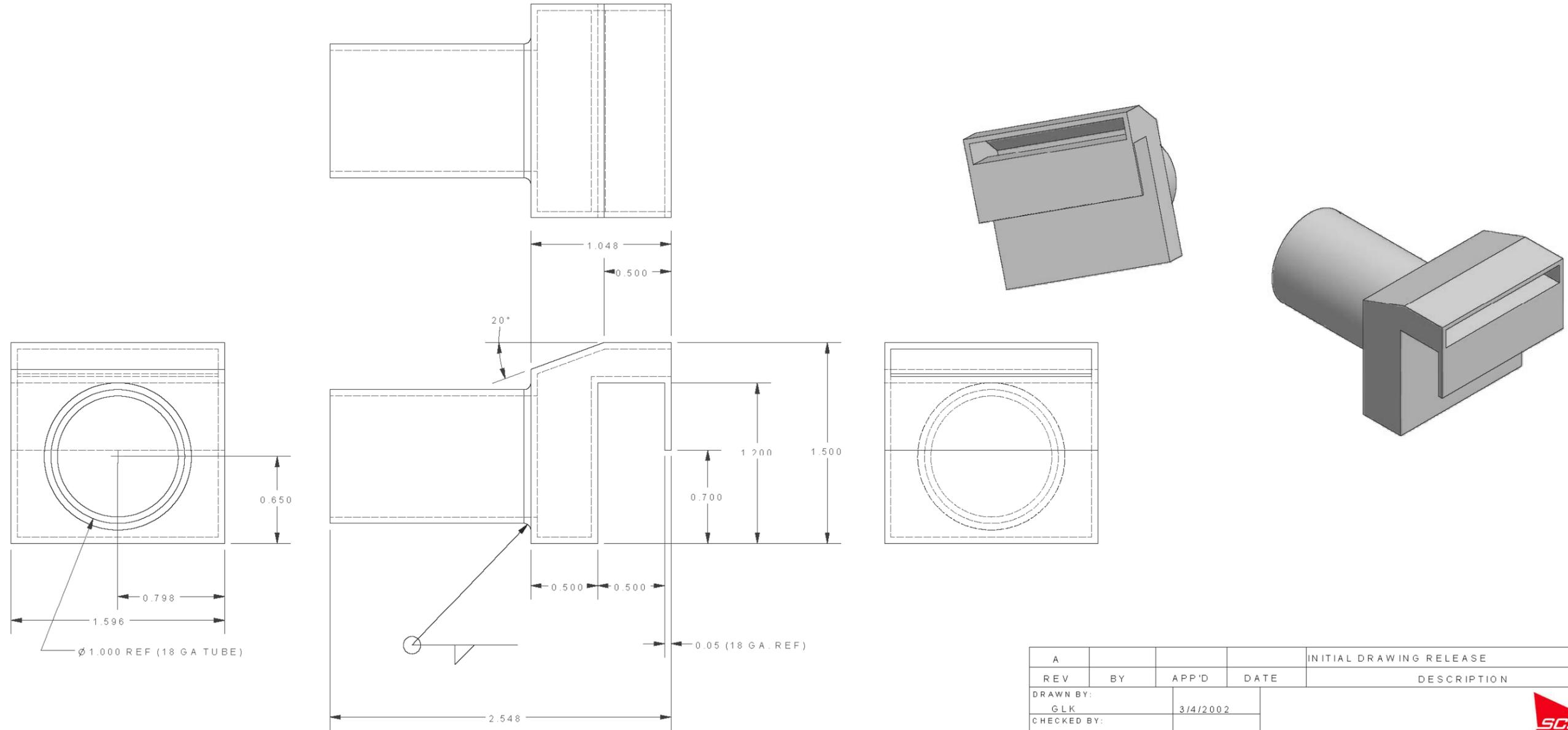


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REV	BY	APP'D	DATE	INITIAL DRAWING RELEASE:
				DESCRIPTION
DRAWN BY:		7/28/2003		 SPECIALTY COATING SYSTEMS™ 7645 WOODLAND DRIVE, INDIANAPOLIS, IN 46278 USA
CHECKED BY:		7/28/2003		
TO BE USED ON:				TITLE:
SPINCOAT G3P-8				KIT, MANUAL DISPENSE G3P-8
NEXT ASSEMBLY:				SIZE:
PM-812-1000-1				B
TOLERANCE UNLESS NOTED				DWG NO:
DIMENSION IN INCHES				AD-285-1179-1
X.X 0.1		ANGLE: ± 0.5°		REV:
X.XX 0.01				1
X.XXX 0.005				SCALE:
		SHEET: 1 OF 1		

- NOTE:
 1. REMOVE ALL BURRS AND SHARP EDGES.
 2. WELD ALL MATING EDGES.
 3. FINISH: BEAD BLAST. THIS IS AN APPEARANCE ITEM.

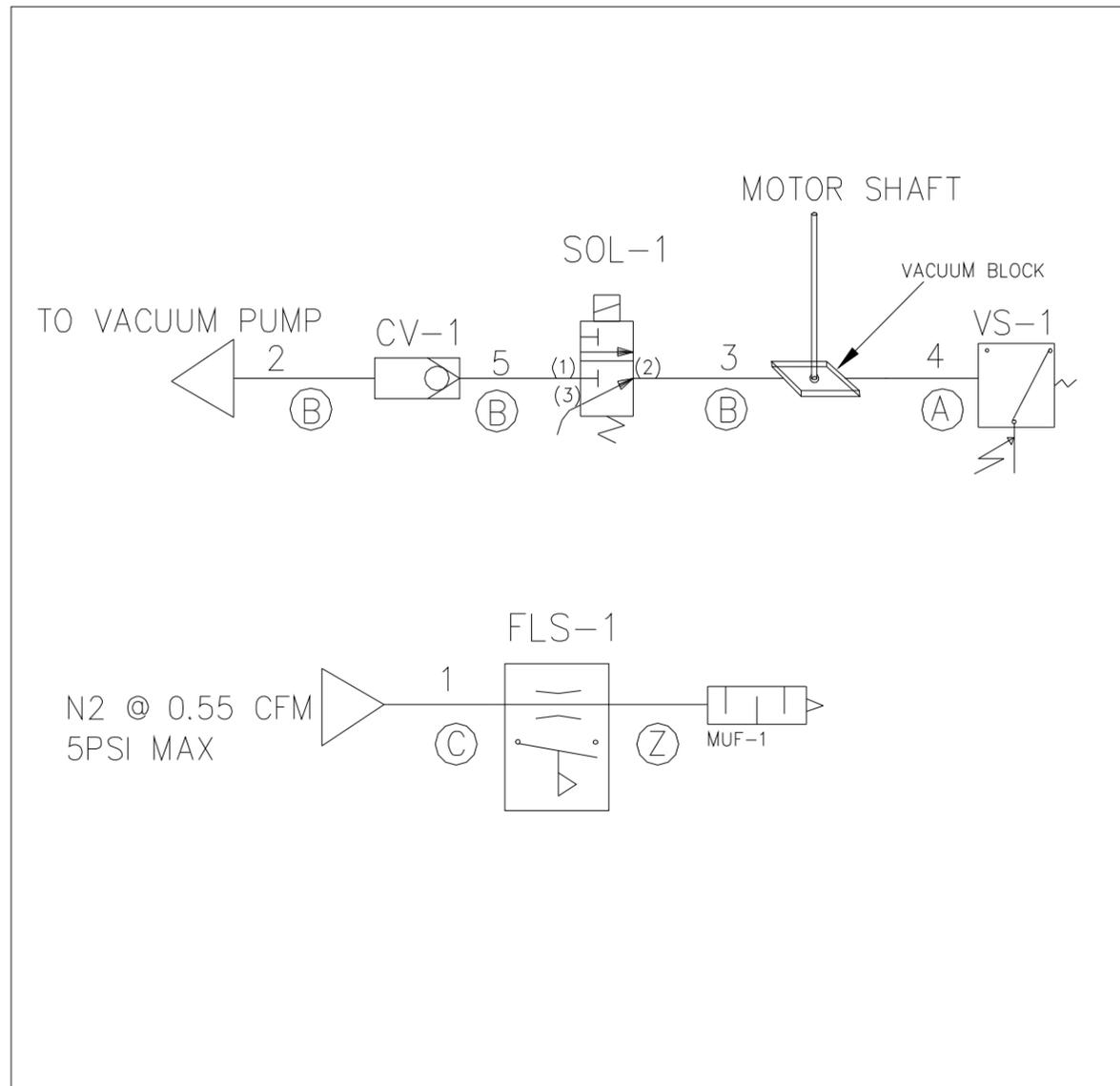
BILL OF MATERIAL			
ITEM	PART NUMBER	QTY	TITLE
1	FP-235-1013-1	1	MATERIAL: 18 GA. STAINLESS STEEL



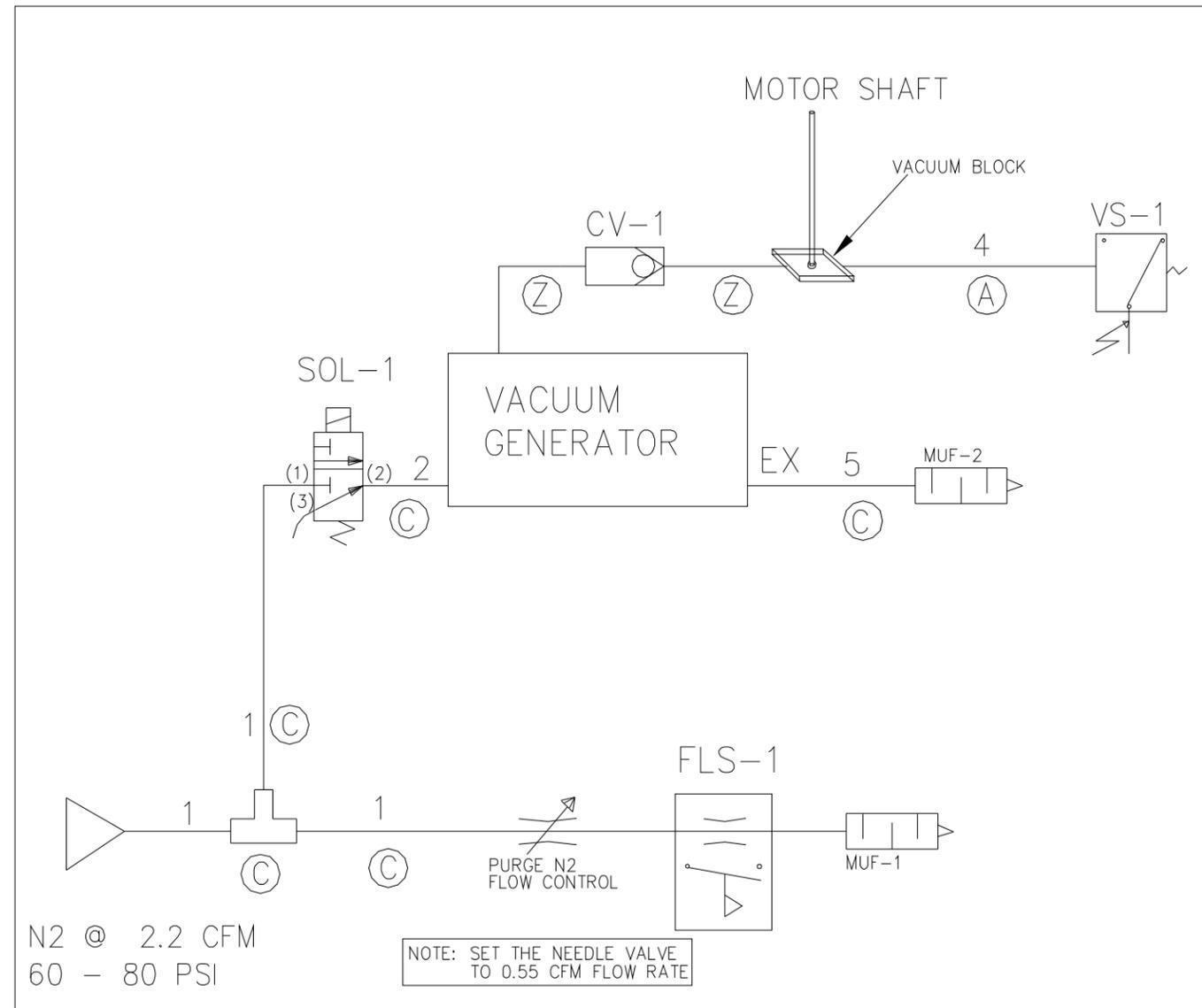
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A				INITIAL DRAWING RELEASE
REV	BY	APP'D	DATE	DESCRIPTION
DRAWN BY:		3/4/2002		 SPECIALTY COATING SYSTEMS™ TITLE: EXHAUST, EXTERNAL CONNECTOR, SPINCOAT G3
CHECKED BY:		5/29/2002		
TO BE USED ON: 136090				
NEXT ASSEMBLY: N/A				
TOLERANCE UNLESS NOTED DIMENSION IN INCHES				
X.X	0.1	ANGLE: ± 0.5°		
X.XX	0.01			
X.XXX	0.005			
SIZE:	DWG NO:		REV:	
B	FP-235-1013-1		A	
SCALE: NTS	SHEET: 1		OF	1

MACHINES WITH EXTERNAL VACUUM PUMP



MACHINES WITH INTERNAL VACUUM GENERATOR



TUBING LEGEND

SYM	DESCRIPTION	SCS PART#
(A)	BLACK URETHANE; 1/8"OD	837-001
(B)	BLACK POLYETHYLENE; 1/4"OD	837-012
(C)	RED POLYETHYLENE; 1/4"OD	837-011
(Z)	MECHANICAL CONNECTION	



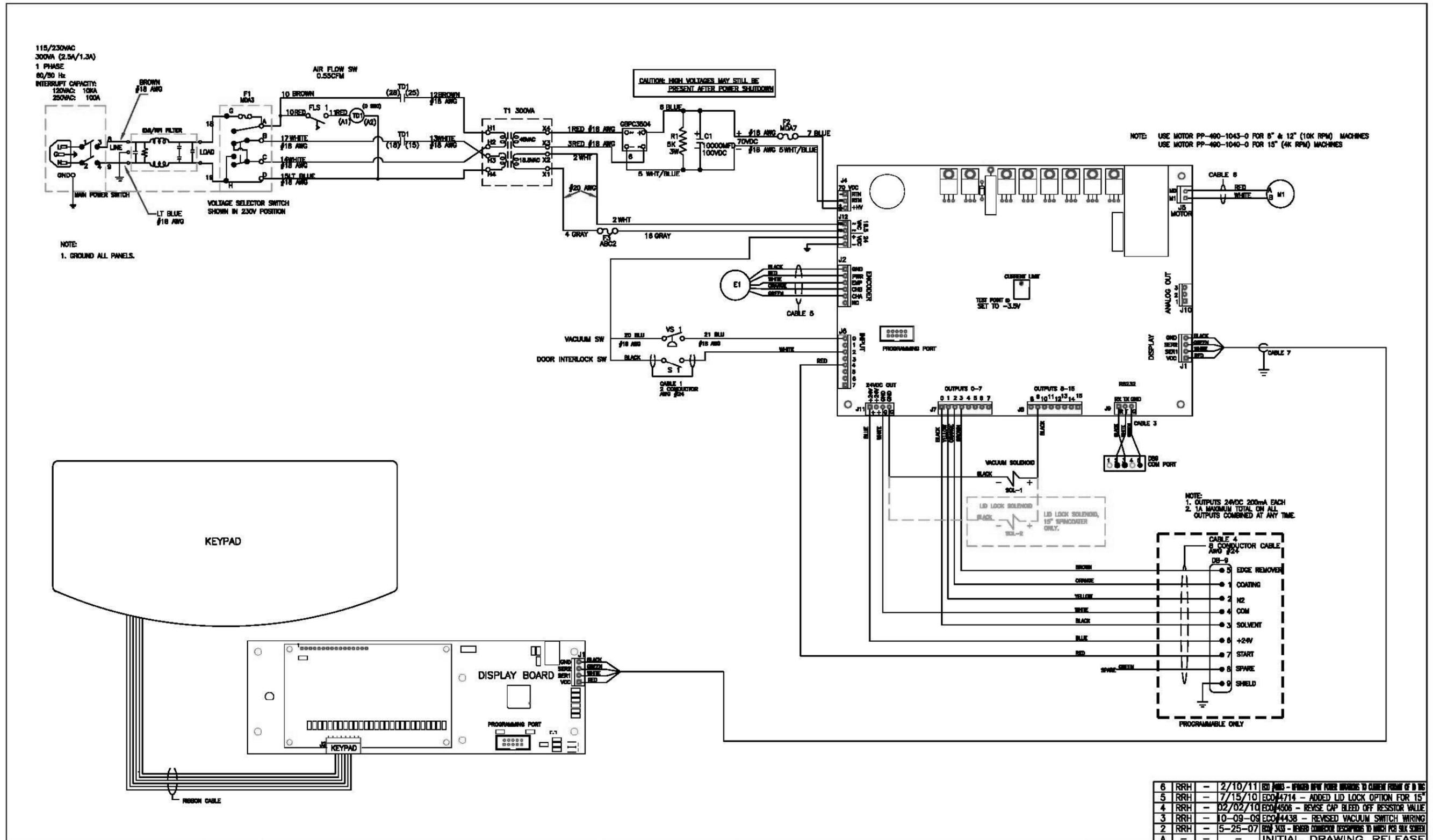
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TOLERANCE UNLESS NOTED
DIMENSIONS IN INCHES
X.X ± 0.1 ANGLE ± 0.5°
X.XX ± 0.01
X.XXX ± 0.005

DRAWN BY: Imran
DATE: 2-18-02
CKD. BY: JVT
DATE: 8/26/02

TITLE: PNEUMATIC SCHEMATIC
SPINCOATER G3

REV	BY	APP'D	DATE	DESCRIPTION
C	IA		1-9-03	ECO #1644 ADDED MUFFLER AND CHANGED LOCATION OF CHECK VALVE
B	IA		6-19-02	ECO #1533 ADDED NEEDLE VALVE
A	IA		2-18-02	INITIAL RELEASE
PART NUMBER:				REVISION:
PS-812-1000-1				C



<p>SPECIALTY COATING SYSTEMS™ 7645 WOODLAND DRIVE, INDIANAPOLIS, IN 46278</p>	<p>—SCS BUSINESS CONFIDENTIAL— This information is the property of Specialty Coating Systems. Reproduction, disclosure, and/or use, in whole or part, without the written permission of SCS, is forbidden. Return to SCS promptly when requested or no longer needed.</p>	<p>TOLERANCE UNLESS NOTED DIMENSIONS IN INCHES X.X ± 0.1 X.XX ± 0.01 X.XXX ± 0.005</p>	<p>DRAWN BY: RRH</p>	<p>DATE: 9-21-06</p>	<p>TITLE: ELECTRICAL SCHEMATIC G3 FOR CONTROLLER BOARD 2ND GEN.</p>	<p>SPRINGT 02-812 & 18 TO BE USED ON</p>	<p>SCALE: NTS</p>	<p>REV BY APP'D DATE DESCRIPTION</p>	<p>PART NUMBER: ES-812-1072-1</p>	<p>REVISION: 6</p>
			<p>CKD. BY:</p>	<p>DATE:</p>		<p>TO BE USED ON NEXT ASSEMBLY</p>	<p>SHEET: 1 OF 1</p>			

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