

# QUICK START WS-650 LITE INSTALLATION INSTRUCTIONS



- Open Boxes
- Remove All Contents



- If any parts are missing, contact the factory immediately. Claims for missing parts must be made within 30 days of shipment.

# **WS-650 SPIN PROCESSOR**

## **INCLUDES:**

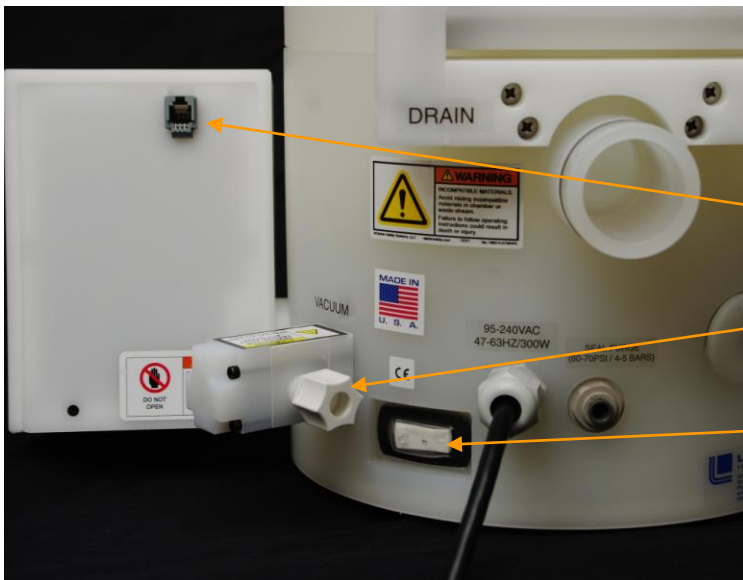
- 5' (1.5m) of 0.5" (12.7mm) chemically resistant Tygon exhaust tubing (optional)
- Drain reservoir connector and two (2) 250ml polypropylene drain catch cups (optional)
- 5' (1.5m) of 1" (25.4mm) FEP Teflon drain tubing & drain connector (optional)
- 3/16" (4.8mm) Allen wrench to tighten set screw drain connector (optional)
- 10' (3m) of 3/8" (9.5mm) polyethylene vacuum tubing
- Spare 3/8" x 1/4" (6.35mm) vacuum fitting (optional)
- 10' of 1/4" polyethylene tubing for CDA / N2 Seal Purge
- 1.75" (45mm) Wafer Chuck for 50 – 150mm substrates (6NPP/TFM models only)
- Wafer Fragment Adapter for 7- 50mm substrate fragments (6NPP/TFM models only)
  - Package of Viton O-rings for fragment chuck for acids and toluene
  - Package of EPDM O-rings for fragment chuck for solvents
- USB adapter
- Document CD with Spin 3000 Software
- Spin 3000 communication cable
- "Bull's Eye" Level

### ➤ **Documentation CD with Spin 3000 Software**

**Please Note:** The documentation CD contains all operation manuals, quick start installation instructions, programming worksheets, spin 3000 software and a list of popular options.

If an option was ordered such as an Alignment Tool, Foot Switch, Liner, Universal Dispense (UD2), Downflow Exhaust, Manual EBR, Porous Chuck Use Guidelines, Programmable Exhaust, etc... please check this folder for your option(s).

# REAR VIEW



- Drain Port
- Seal Purge – CDA or N2 (60 – 70 psi) – (4.1 – 4.9 bar) **REQUIRED FOR OPERATION**
- Backpack Connector Cover for Future Valve Expansion
- Power Cord – Plug Cord into the appropriate power source
- **SEE SECTION 2 IN MANUAL FOR COMPLETE INSTALLATION INSTRUCTIONS**
- Spin 3000 Cable Connector
- Pneumatic Vacuum Valve and Connection
- Circuit Breaker with On / Off Capability

# INSTALL SEAL PURGE TUBING



➤ Cut the end of tubing squarely, using a razor blade or tube cutter, if necessary. Install the 1/4" O.D. tubing by inserting the tubing into the Seal Purge push-to-connect fitting. Push in until the tubing seats completely. Connect the other end of the tubing to a 60 – 70 psi CDA or N2 supply.

➤ **THE SEAL PURGE PRESSURE MUST BE PRESENT FOR THE SYSTEM TO OPERATE.**

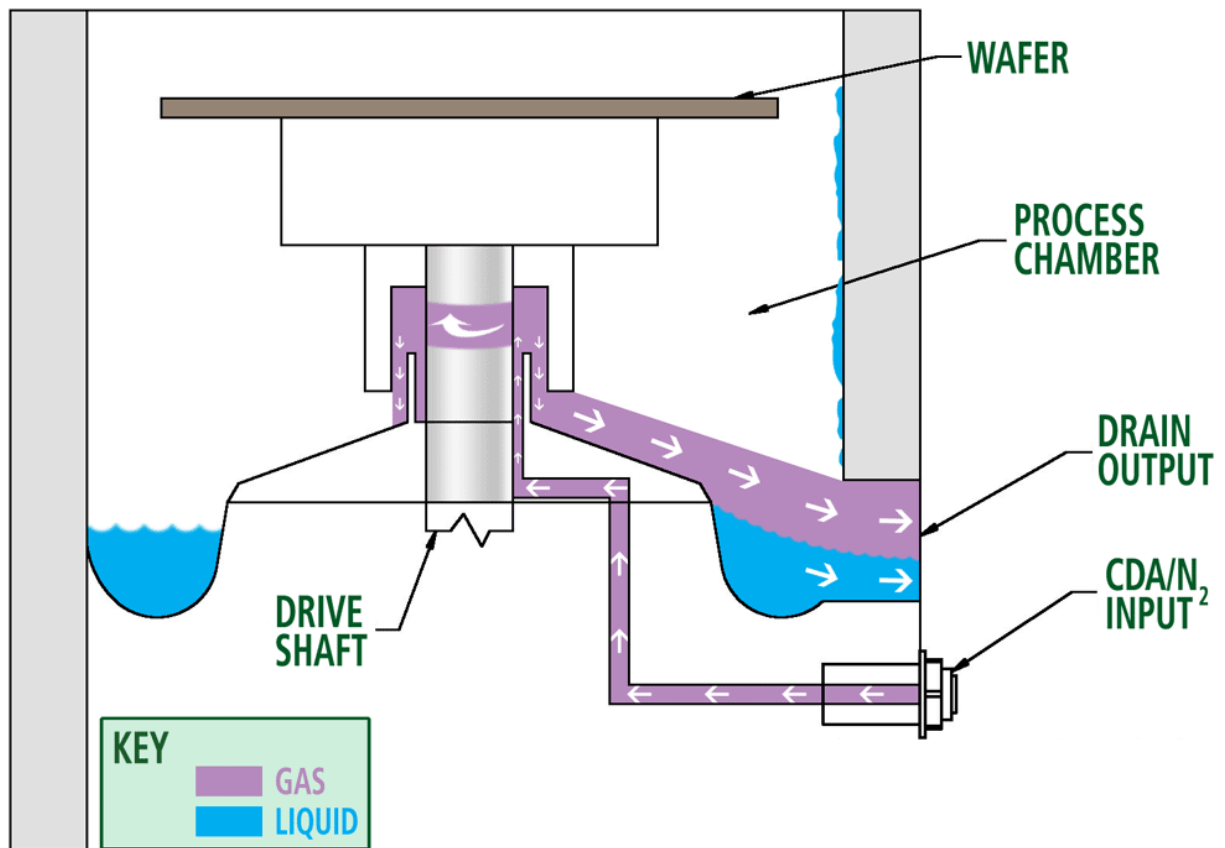
➤ **DO NOT OVERPRESSURIZE THE SYSTEM OR INTERNAL DAMAGE MAY OCCUR.**

➤ **Maximum pressure should never exceed 90psi (6.2bar).**

➤ A “Need CDA” error will appear in the run mode status screen on the 650 controller if this requirement is not met.

➤ To remove tubing, turn off pressure source. With the pressure at 0psi, press in tubing and the *inner collar* at the same time then pull back on the tubing.

# SEAL PURGE SCHEMATIC



➤ This graphic represents the functionality of the seal purge. The seal's purpose is to separate the process chamber from the motor and electronics in order to insure long, service-free operation.

# INSTALL THE PNEUMATIC VACUUM GENERATOR (IVPVG) (option)

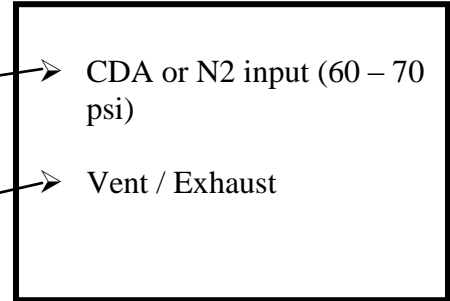
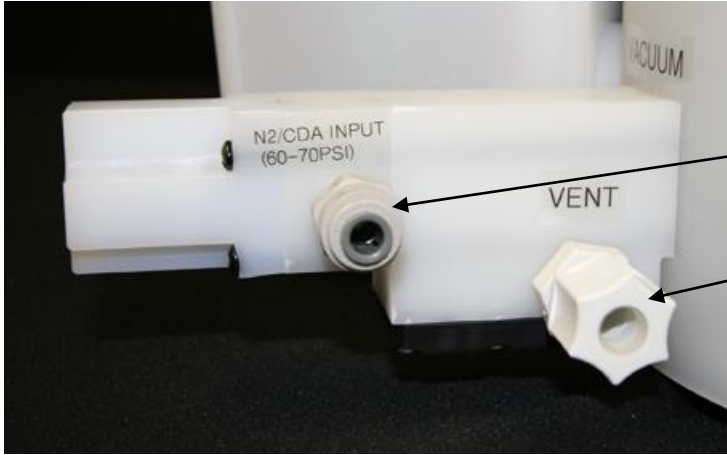


Figure 1

## 1.0 OVERVIEW

The Laurell Technologies’ IV - pneumatic vacuum generator is capable of generating a variable amount of vacuum depending on input air pressure. It creates a vacuum by venturi action.

## 2.0 INSTALLATION

1. For best performance use a dedicated CDA or N2 supply regulator for the vacuum generator. The generator’s flow rate is approximately 1.67cfm at 60psi. See figure 2.

**Note:** It may be possible to “tee” the CDA or N2 supply to both the processor and the IVPVG but there must be a sufficient volume of gas to satisfy both. If there is an insufficient volume, the processor will produce a “Need CDA” error message. Also, there may be a loss of vacuum from its initial level (when the vacuum is first applied).



Figure 2

2. Connect the output side of the regulator, using the provided 1/4" tubing, to the CDA or N2 input on the vacuum transducer box. See figure 3

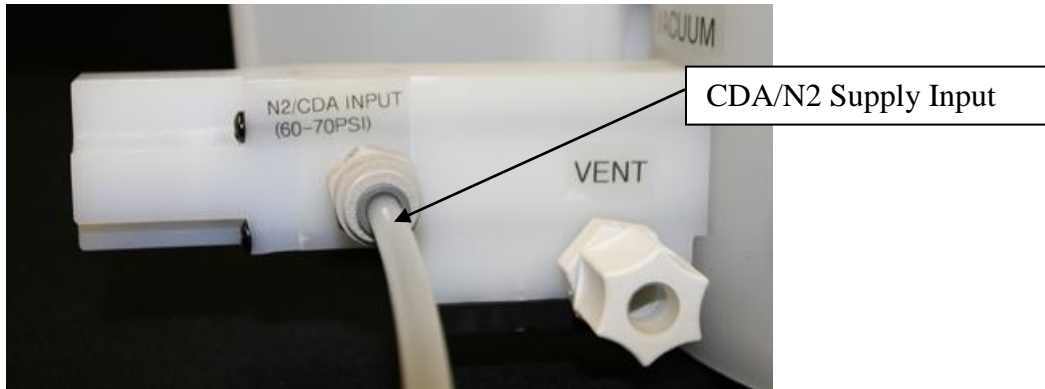


Figure 3

3. 3/8" tubing can be connected to vent / exhaust port. Adding a length of tubing will act as a muffler thereby lowering its noise level. **The tubing length may affect the maximum achievable vacuum. Do not restrict or block the exhaust output; lower vacuum values may result.**

### **3.0 OPERATION**

1. Set the CDA or N2 pressure to 60psi. Turn on pressure.
2. Place a substrate onto the vacuum chuck. Press the vacuum key to apply vacuum to the substrate.
3. A vacuum will be applied onto the substrate and a vacuum reading will be displayed in the upper right corner of the LCD.
4. When the vacuum key is pressed, a "hissing" sound will be generated from the IV-PVG. This is normal; air flow is exhausted as it creates a vacuum. (There is no "hissing" sound when vacuum is not turned off)

### **4.0 TROUBLESHOOTING**

1. If no vacuum is generated try the following;
  - a. Check air supply. Is it 60psi? Is it turned on? Is it at the IV-PVG input?
  - b. Check all connections for tightness.

**If you need assistance contact support at (215)-699-7278 or email us at [support@laurell.com](mailto:support@laurell.com)**

## **Approximate Vacuum Achieved With Different Pressure Settings (3/8” fitting only)**

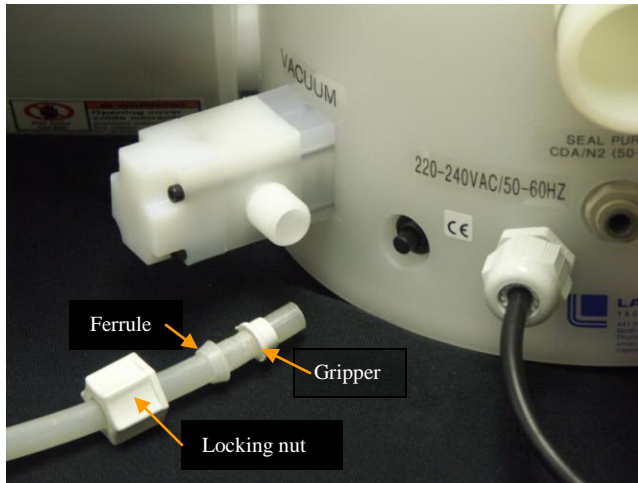
<b>Pressure (psi)</b>	<b>Vacuum in inches of Hg</b>
10	1.3
15	3
20	4.4
25	6.2
30	8.5
35	11.3
40	14.8
45	18
50	24
55	25.3
60	25.3

**NOTE: These values are approximations, actual values may vary.**

**NOTE: The processor has a minimum vacuum setting of 15”. This is a factory setting. The processor must have 15” of vacuum to operate.**



## INSTALL THE VACUUM TUBING



➤ Slide the locking nut, the gripper with the tapered end pointing toward the locking nut and the ferrule with the tapered end toward the vacuum valve, onto the air operated vacuum valve.

➤ Push the tubing into the vacuum valve connector. Slide the ferrules into the vacuum valve and **HAND** tighten nut.

➤ Connect the other end of the tubing to a vacuum source.

➤ **Without seal purge pressurization the pneumatic vacuum valve WILL NOT OPERATE.**

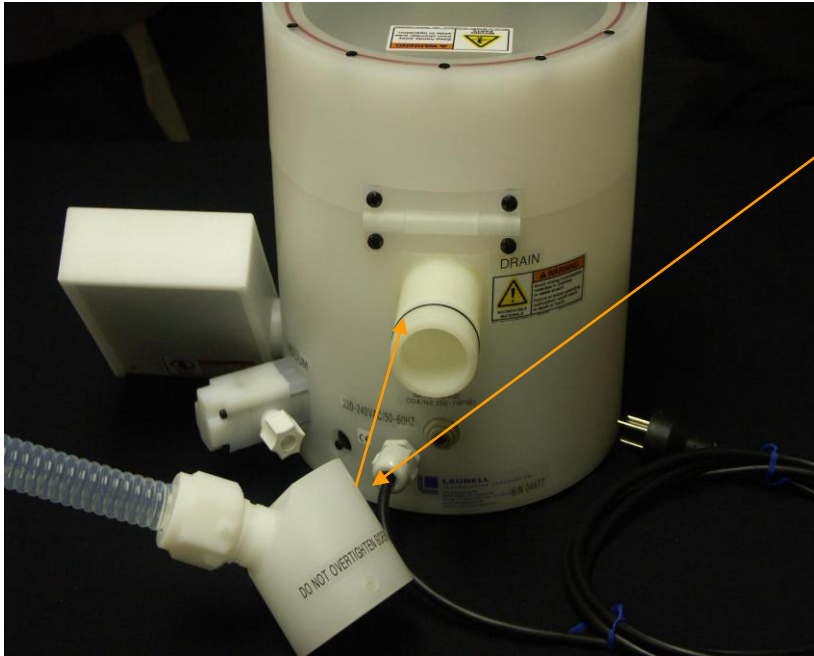
# INSTALL DRAIN CUP CONNECTOR (option)



➤ Install the drain connector onto the Drain Port. Push the connector fully onto the stem. Attach 0.5" (12.7mm) exhaust tubing to an exhaust source.



# INSTALL DRAIN CONNECTOR (option)



➤ Install the drain connector onto the Drain Port. Push the connector fully onto the stem.



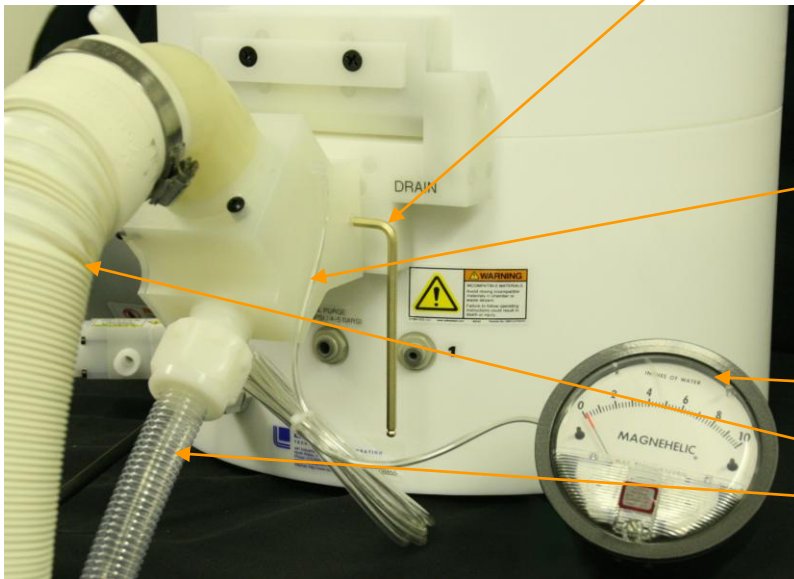
➤ Use a 3/16" (4.8mm) Allen wrench to tighten set screw into the recessed groove.

**DO NOT OVER TIGHTEN SET SCREW OR IT MAY DEFORM THE PORT AND LEAK!**

# INSTALL DOWNFLOW EXHAUST CONNECTOR (option)

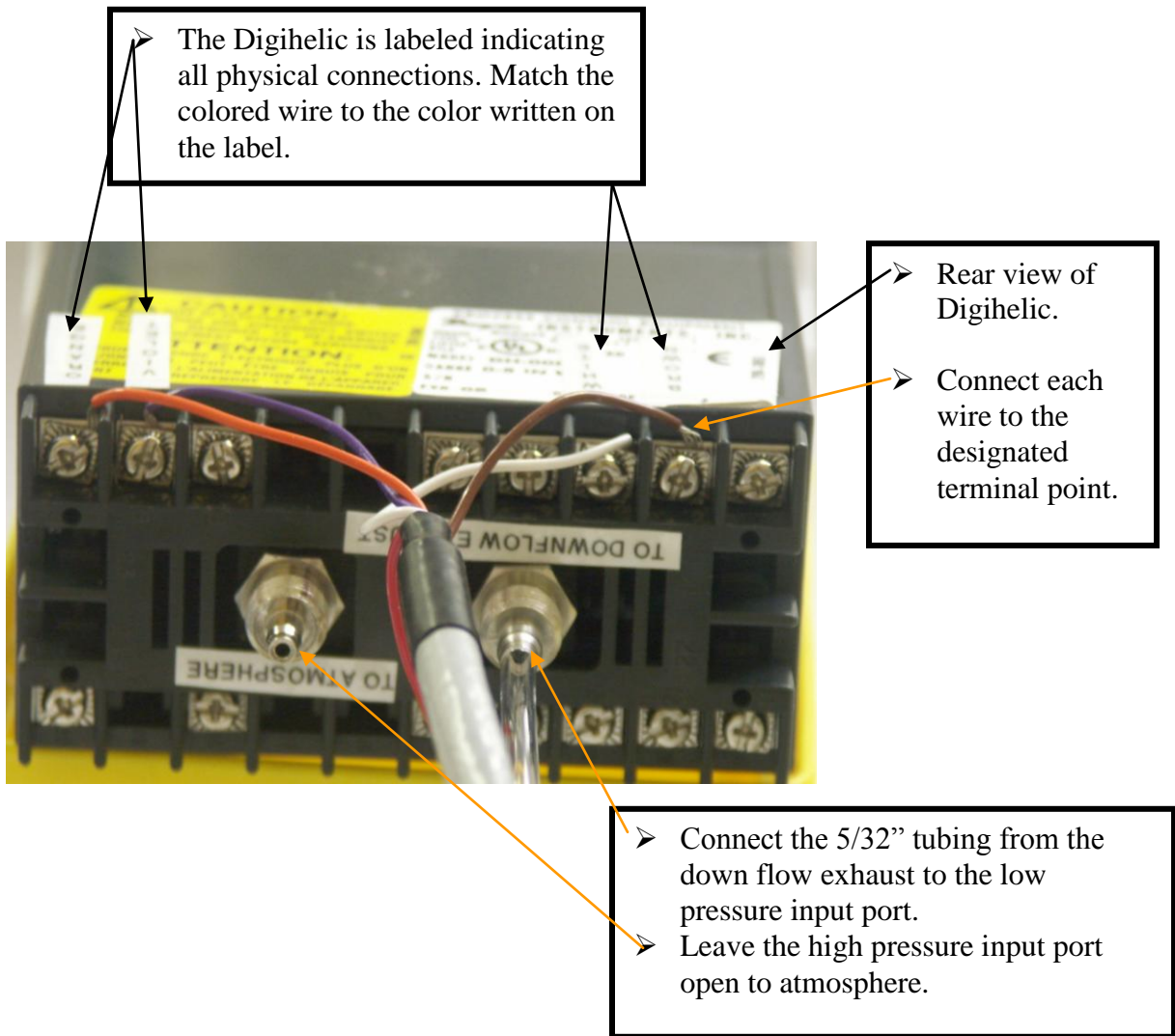


- Install the Down-Flow drain connector onto the Drain/Exhaust Port. Push the connector fully onto the stem.
  - Use a 3/16" (4.8mm) Allen wrench to tighten set screw into the recessed groove.
- DO NOT OVER TIGHTEN SET SCREW OR IT MAY DEFORM THE PORT AND LEAK!**
- 5/32" (3.97mm) tubing from Down-Flow exhaust to Differential Pressure Gauge
  - Differential Pressure Gauge
  - Exhaust
  - Drain

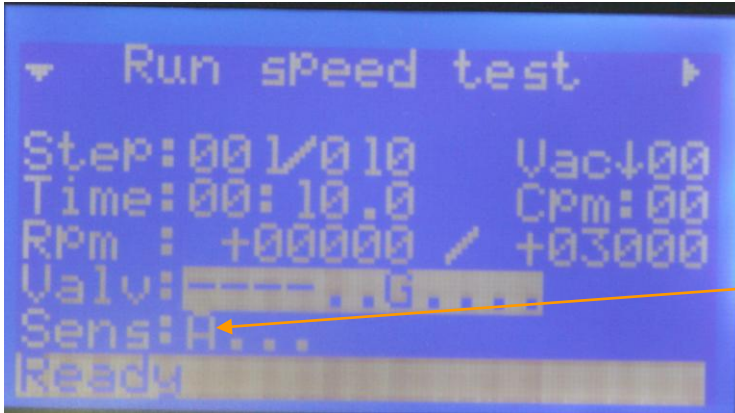


- Optional Digihelic Differential Pressure Gauge – please refer to Digihelic operation manual for instructions. It is located in the large binder or packing box.

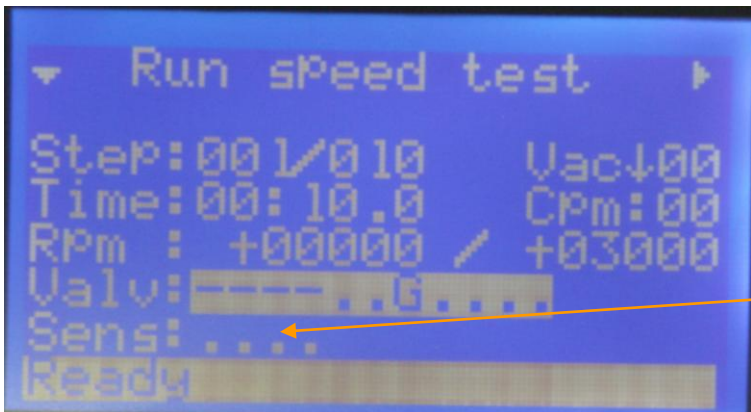
# DIGIHELIC INSTALLATION



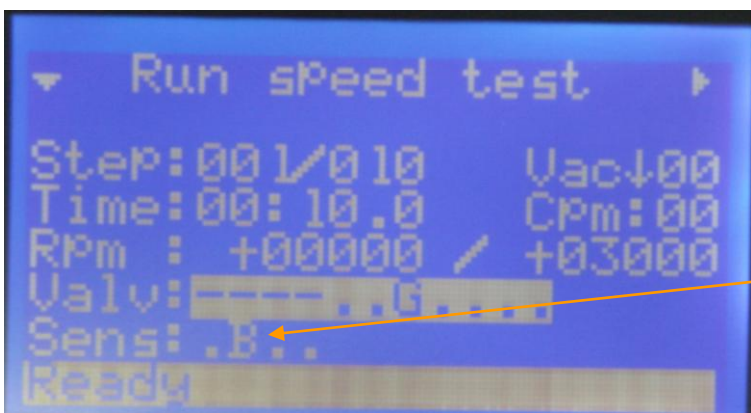
# DIGIHELIC DIFFERENTIAL PRESSURE SENSOR STATES



“A” indicates the exhaust flow is lower than the minimum set point. (Low set point is set to 0.50)



No “A” or “B” indicates the exhaust flow is between the low and high set points.



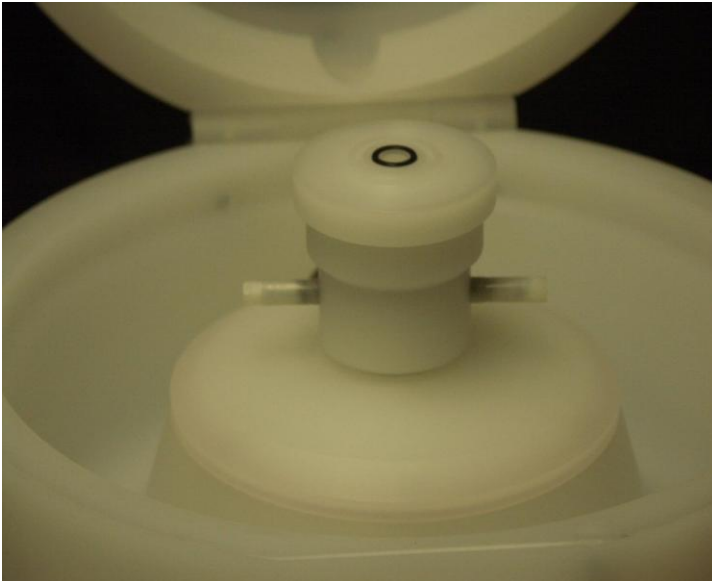
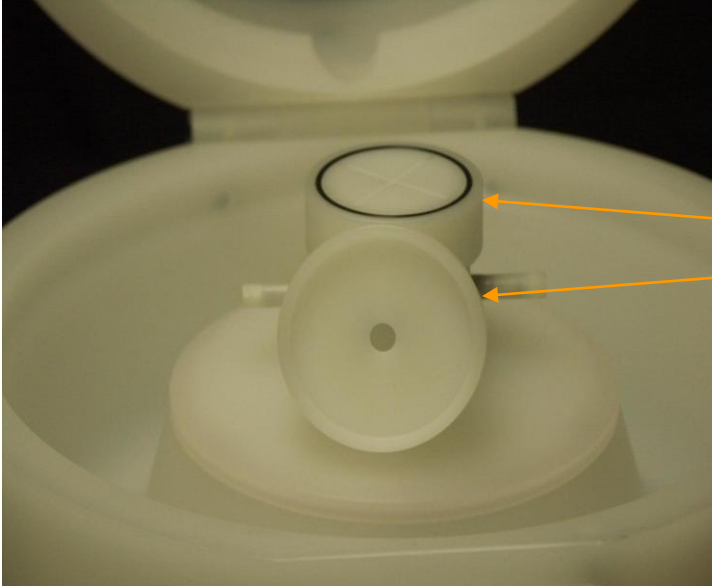
“B” indicates the exhaust flow is higher than the maximum set point. (High set point is set to 3.00)

## USING THE “BULL’S EYE” LEVEL



- It is always a good practice to level the system / wafer chuck before using. A level wafer chuck will help to reduce thickness non-uniformities.
- Use the level either on the chuck itself or on a flat substrate (do not pull vacuum onto to the substrate when leveling).
- Level the system by leveling the bench or table. If this is impractical use shims under the feet of the processor.

# INSTALLING THE FRAGMENT ADAPTER



➤ See section 3 in manual for installing and removing chuck

- Installed 1.75" (45mm) chuck
- Bottom view of Fragment Adapter
- With vacuum off, place fragment adapter onto the low profile chuck
- Place fragment on chuck and press the vacuum key on control panel

➤ **CAUTION:**  
**SUBSTRATE FRAGMENT MUST ALWAYS COVER THE O-RING SEAL TO PREVENT CHEMICAL FROM ENTERING VACUUM PATH AND DAMAGING MOTOR AND SEALS.**

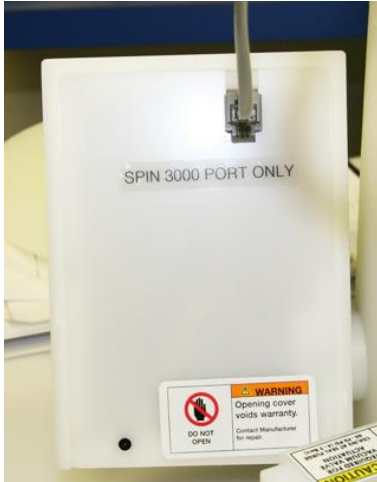
➤ Contact [support@laurell.com](mailto:support@laurell.com) before running a substrate that doesn't fit on chuck properly.



- To remove fragment adapter, turn off vacuum and lift up.



# CONNECTING TO THE 650 CONTROLLER



- Connect the RS-232C cable to the RJ-11 port (looks like a phone jack) on the 650 controller.



- Connect the RS-232C cable to an unused RS-232C port on the PC.
- For more information, see sections 1 and 2 in the Spin 3000 user manual.
- ***The document CD paper sleeve has the required spin 3000 installation serial number and higher level password attached to it.***

- If the computer does not have a 9 pin RS-232 serial port, use a USB port to communicate to the controller.
- Use the enclosed USB adapter to connect to the RS-232C cable. See picture below.
- Use the following instructions to install the USB software.



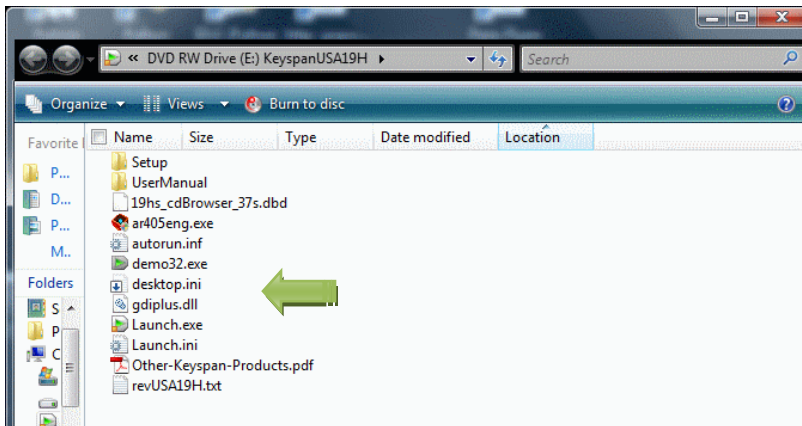
# USB INSTALLATION INSTRUCTIONS

## Keyspan USA-19HS USB-Serial Adapter

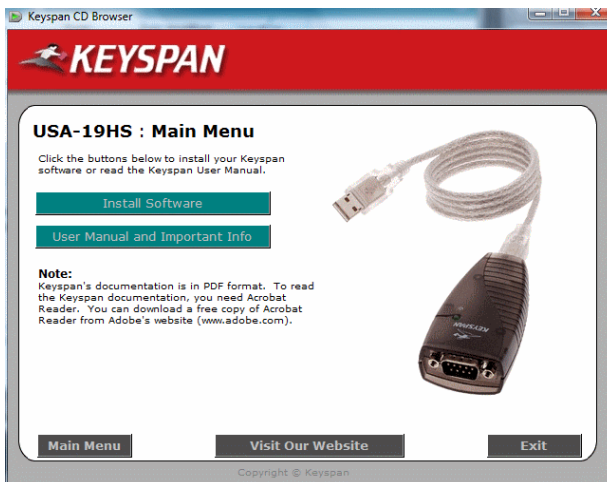
*Before installing the Keyspan USB-Serial Adapter, make sure the adapter is unplugged from your system, as with most USB device installations.*

### Windows (32-bit) Instructions

1. Disable any anti-virus software you may have running
2. Insert & browse to the Driver Installation CD on your computer
3. Launch the driver installation main menu (if not automatically started):  
*launch.exe*



4. Click *Install Software*

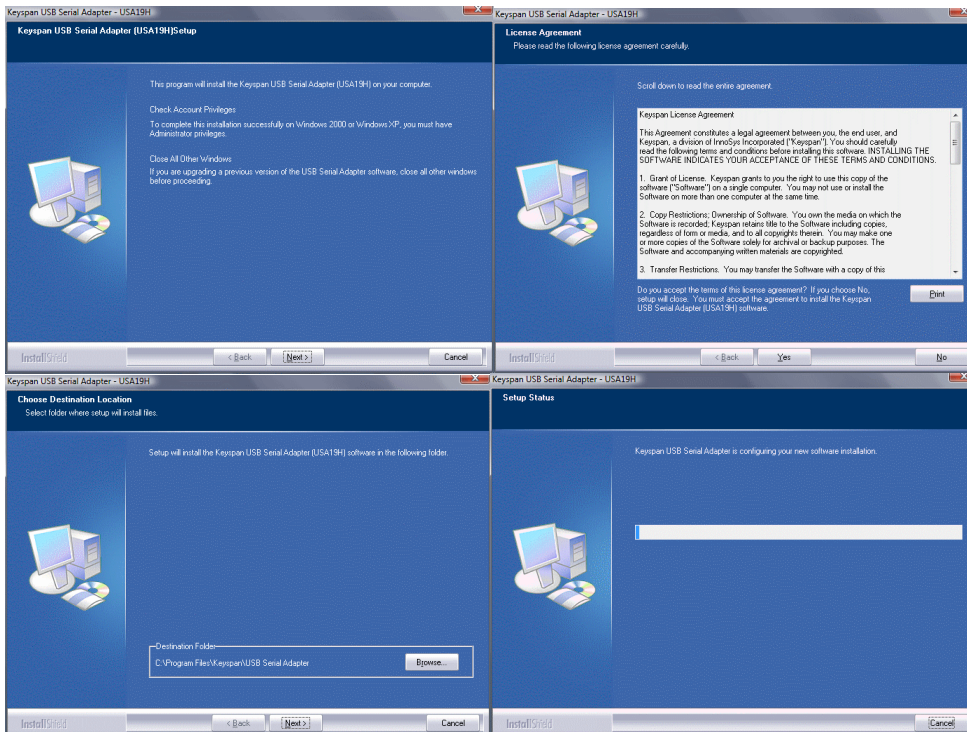


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5. Click the button that launches the installer that matches your computer's operating system. Ensure that the USB-Serial adapter is **unplugged** from your system until **after** you have installed the drivers.



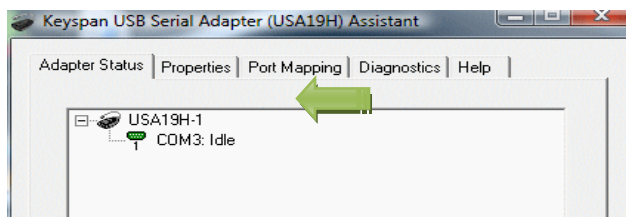
6. Follow the default instructions to install the drivers on your computer



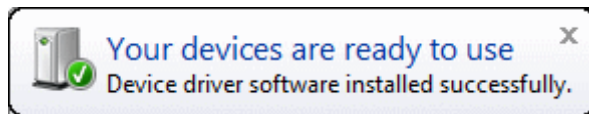
After installing the drivers, you may register the adapter (optional). Click *Finish* to complete installation. You may now re-enable anti-virus protection.



7. From your Start menu, find & launch the *Keyspan USB Serial Adapter Assistant*



8. Plug in the Keyspan adapter to a free USB port on your computer (connecting to a USB hub is not recommended). After a minute or so, you should see a tray notification indicating that your adapter is installed.



Note: If the above tray does not appear, do the following.

- a. Make note of the COM port that is idle. (See above, “COM 3 Idle”)
- b. Open up the Spin 3000 application
- c. Login into Spin 3000 using the password located on the front of the CD sleeve.
- d. Click on “EDIT”
- e. Click on “RS-232 Interface”
- f. Change the COM port to the idle COM port
- g. When communication is established, a data stream will appear in the lower “From Spin Processor” data window

Your computer should now be set up to interface with Laurell Technologies® *Spin 3000* software.

If you experience difficulties, support is available from the factory at:  
**support@laurell.com**

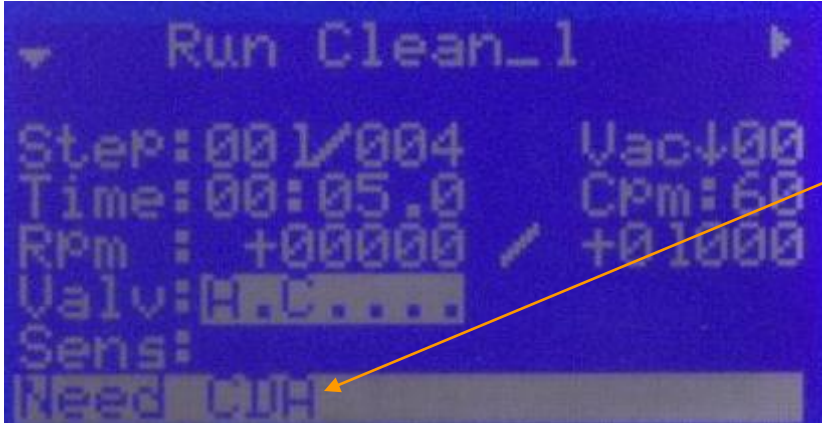
# **SPIN 3000 SOFTWARE** **INSTALLATION INSTRUCTIONS**

**Note:** To minimize potential installation problems, please follow these best practices installation instructions for this (or any) software.

1. Close all currently running applications
2. **Verify computer's color setting is set to 32 bit. Use medium to maximum resolution.**
3. Disable any running anti-virus software
4. Complete software installation (*as per following instructions*)
5. Re-enable anti-virus software
6. Restart the system & run application on subsequent startup

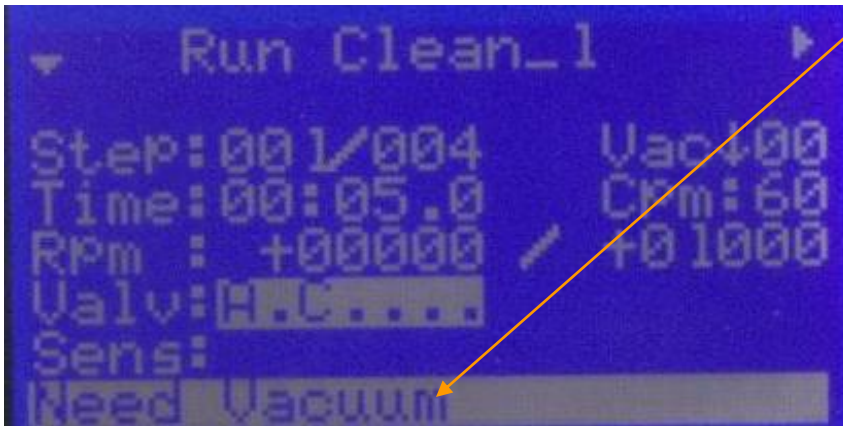
**Note:** Refer to sections 1 and 2 in the Spin 3000 Operation Manual for additional information.

# STARTUP ERRORS



- “LID OPEN” message, close lid
- If system is installed but there is insufficient CDA or N2, “NEED CDA” message will appear.

- See section 3 in manual for programming
- See section 4 in manual for maintenance and errors



- To hold a substrate, press the vacuum button on keypad. If there is insufficient vacuum <15” (381mm) Hg (factory set point) the “NEED VACUUM” message will appear.

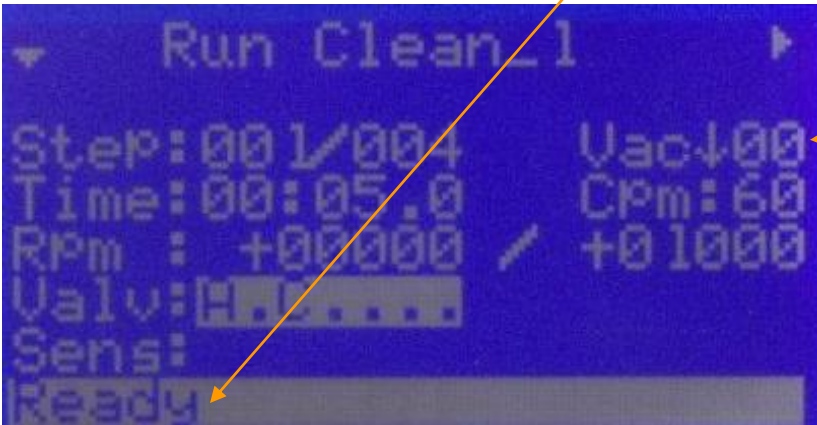
# INSTALLTION COMPLETE AND READY FOR PROGRAMMING



- Drain attached
- Vacuum tubing installed
- Seal Purge tubing installed
- Power Cord plugged-in

➤ If CDA and vacuum are present at the required pressures, the processor is ready for programming.

➤ With a substrate on the chuck and the vacuum button enabled, the amount of vacuum present will be indicated.



**A chuck without a substrate on it will not allow the vacuum level to be sensed and “Need Vacuum” error message will be displayed.**

- **TIPS:**
- **ALWAYS USE LAURELL CHUCKS**
- **ALWAYS PREVENT CHEMICALS FROM ENTERING THE VACUUM PATH**
- **FOR SUPPORT CONTACT:**  
[SUPPORT@LAURELL.COM](mailto:SUPPORT@LAURELL.COM)

# NEVER DO THIS !!



- For extended use, clean, rinse, then dry your spin processor after each use, taking care to prevent any chemicals from entering the vacuum path. Do not fill up or overflow the process chamber or bowl – fluids must not be permitted to flow under the substrate. If the chuck face shows signs of chemical residue, remove and clean immediately. Cleaning the o-ring surface will improve the seal. See Section 4 in manual “VACUUM CHUCK WET TEST”. Examine and adjust your process to prevent such occurrences.
- Do not at any time force fluids or pressuring gas in the center of the vacuum chuck. Cleaning the vacuum path in this manner is dangerous and can cause significant damage to your spin processor.