

Star Installation Instruction Check List

Pre Installation Information

- Before arranging a time for installation, ensure that the site prep sheet has been signed by **your** contact. This is evidence that the contact is aware of the space and power requirements as well as the materials that are necessary to properly install the unit.
- Setting up the Star takes time. You will need half a day for installation and training.
- Bring extra ferrules and fittings a flathead and Phillips screwdriver there is a good chance you will need them.
- Bring the methods you will be adding to the unit
- The most important thing for any installation, **the unit must be at the installation site when you arrive.**

Check List and Instructions

- Install vapor collection module on top of the main instrument and secure on bolts with locking nuts. Secure the vapor manifold (small block) to instrument using 2 screws.
- Place reagent addition module (pumping station) to the left of the Star unit and the scrubber module at least 8" to the right of the unit. Connect the serial cable from the back of the unit to the reagent addition module.
- Remove cover from cells and begin running lines from the reagent module to the reagent head using the numbered lines. These lines will be bundled together in a sleeve. **Note:** *The number of lines is dependent on the number of reagents being used.* **Tip:** *It may be necessary to cut the length of the sleeve by 2-4" to attach the lines to the reagent arm, do not unbundle the lines.*
- **Instructions 1:** Slide a fitting on the end of the line with approximately 2" of line extended beyond the fitting. Slide a ferrule on the line with the tapered end of the ferrule facing the installed fitting. Insert the ferrule into the fitting until it is snug. Insert one length of line in the bundle into one of the four ports in the reagent head of the arm #1, insuring that the line extends beyond the tip into the chamber of the arm, but beyond the tip, which fits into the vessel. Tighten the fitting finger tight. Install a solid plug into any port that does not contain a reagent line.
- **Repeat these instructions for each cell**
- **Instructions 2:** Connect the 1/4" lines extending from the back of the vapor collection module to the vapor manifold. These are the top lines extending down; the bottom lines should be placed in a waste bottle. **Note:** *The bottom of the waste lines cannot be placed in or under liquid they should be suspended in the bottle otherwise the vacuum will suck the liquid up the tubes.* **Tip:** *Use ties to bundle waste lines together*
- **Instructions 3:** Once lines and or plugs are installed place the cover over the arm. Place the 1/8" lines into the smaller slot in the back of the cover and the 1/4" line in the larger slot. Position the back of the cover over the locator pin on the back of the arm, ensuring that the line is not crimped. Then push the front of the cover into place, ensuring that the locator pins engage the holes in each side of the cover. **Repeat these instructions for each cell**

- Place reagent lines from addition module into the proper reagent bottles using caps with holes drilled in them or the stoppers that come with the accessory kit. **Note:** *It may be necessary to widen the opening in the caps if you are installing a Star 6, widen the 3 holes to make one large hole that will accept 6 lines, make sure the lines are not crimped in the cap, be sure each line reaches the bottom of the bottle.*
- Attach the 1/4" x 3' to the vapor manifold from the scrubber bottle #1 (Bottle #1 should contain 1 liter of H₂O). Attach a 1/4" x 1' line from Bottle #1 to Bottle #2 this line should be connected to the inlet port that extends to the bottom of the bottle. (Bottle #2 should contain 20 -30% NaOH) Attach a 1/4" x 1' line from Bottle #2 to Bottle #3 this line should be connected from the outlet port of Bottle #2 to the inlet port of Bottle #3. (Bottle 3 should contain 1 liter of H₂O) Attach the 3/8" from scrubber Bottle #3 to the vacuum port of the vacuum pump. Attach the other 3/8" to the pump port of the vacuum pump and run line to hood.
- Plug power cords in for Star and vacuum pump. Flip power switch on the reagent addition module. To access service menus, start unit by holding the back button on control panel and turning on the power. Hit the select button on any cell press setup button use arrow up and down buttons to go through setup choices. Go to the Reagent Volume option use the Next button and change reagents using the Up and Down buttons choose reagent and change the reagent volume to reflect the volume in the bottle. **Do this for each reagent.**
- **Note:** *The Star unit monitors all reagent used, the unit will not let you start a method if there is not sufficient reagent to complete it.*
- Calibrate the temperature by selecting a cell and then pressing Setup choose the calibrate temperature option, choose the proper vessel, choose calibrate with liquid reagent, select vessel, place 30 ml of water and a boiling tube in a vessel, press Next and then Start when the count remains steady at a number between 800 -1200 press Stop. **Note:** *If the count does not stabilize in the proper range (1) ensure the IR sensor is pushed all the way up on the stubs (2) check alignment of sensors on its mounting block (3) clean the Teflon bag on the IR sensor using water bottle, dry and try again. Calibration must be done for each cell*
- Create a method that ramps to 430 deg. in 1 sec. no hold time the unit will go into overtime to verify the boil temperature is 100(+/-2c). Do this 1 cell at a time remember overtime is not under control. **Note:** *The temperature should drift no more than 3 degrees per minute if it does recalibrate.*
- Calibrate the pumps by choosing calibrate pumps option in setup menu press Next to change to the reagent of choice, choose pump speed **Note:** *Sulfuric is always set to slow.* Press Next, change pump cal value to 50, this will be used as a prime step. Press Next, Place 20 ml grad 15-20 ml graduate under the vapor arm to collect the reagent, place cover over cell press Start. Once the pumps stop press Back change the pump cal value to 25 and press Next and Start the final volume should be 5ml +/- 1 stroke if it is not you will need to adjust the strokes until the proper volume is reached when you are finished press Back and Home.
- **Tip:** *You can calibrate more than one cell at time* **Note:** *Calibration must be done on each pump, it is cell specific, to calibrate the pumps for cell 1 you must select and setup on cell 1 and repeat for each cell, the stroke values will vary from pump to pump*

Star Tips

- Ensure vapor lines on back of unit are not hanging or pulling, the force of spring on vapor arm is affected by the drag on the back
- Peroxide can outgas and lose prime if left in the pump
- Check prime of peroxide pumps every morning
- Reagent addition lines must terminate below take off for vacuum pump (About 1" inside fitting)
- If pump won't prime, force reagent up the pump by holding the bottle above the pumps when doing initial prime.
- Unit functions best when under control so do not set unreasonable times to achieve temperature
- Remember overtime is not under control
- Sulfuric Acid is the default for Reagent 1 if you are not using Sulfuric you will need to change the Reagent name and change the pump speed from slow to fast and calibrate each Sulfuric pump.
- Make sure the vapor module arm fits securely over the condensers and forms a good seal if you don't have a good seal vapors will escape and may damage the unit
- Ensure that the safety shields are not pushing up on the vapor arm. If this occurs it will cause the vapors to escape and cause the ball joint to lose its seal this may damage the unit.
- A Star 6 with three reagents has 18 pumps you must calibrate all of them
- Bring the methods you are going to install