

# **CRYOGENIC EXPERTS, INC.**

World Wide Web <http://www.cexi.com> E-mail [cexi@cexi.com](mailto:cexi@cexi.com)

Toll Free 1-800-FOR CEXI

Phone (805) 981-4500

Facsimile (805) 981-4501



## **Steam Heated Static Water Bath Vaporizer Installation And Operating Instructions**

### **Installation**

1. Mount the unit on a level concrete base. The concrete base should be built in accordance with local codes and capable of supporting approximately unit's full or curb weight.
2. Connect the steam train (supplied) back onto the top of the unit. Reconnect stainless instrument air lines per markings.
3. Install interconnecting plumbing. Note: Make every effort to keep plumbing away from the top of the unit. The reason for this is to allow for easy removal in the event of a problem with the tube assembly. The tube assembly lifts straight out of the top and that area should be kept clear. Do not weld on or drill into the vessel wall. The tank is painted with epoxy paint for corrosion resistance. Welding or drilling will damage the epoxy coating making the tank susceptible to rust and corrosion (carbon steel tanks only).
4. Note: If isolation valves are used on the process system, a pressure relief device must be used to prevent the possibility of over-pressurization. Once the process connections are completed, bubble check all joints with at least system pressure - recommended test pressure is 1.25 times operating pressure.
5. Connect condensate line to the condensate connection on the bottom of the tank. Make sure that the condensate line is large enough to handle the condensate flow with only gravity head. No back pressure is allowed on this line at all. If the condensate is to be returned to the boiler, a condensate collection system and a pump must be used.
6. Make sure the drain plug is in place and snug, or the drain valve is turned off.
7. The tank can now be filled with water - the easiest method for filling the tank is to put a hose in the inspection port and allow the water to fill to the point where water is running out of the condensate connection.
8. Adjust the temperature control for the desired gas outlet temperature. The unit is preset to maintain 140<sup>0</sup>f –160<sup>0</sup>f water temperature. This will yield 100<sup>0</sup>f-120<sup>0</sup>f outlet gas temperature. If this is too hot or cold, adjust the temperature setting to a higher or lower set-point.

9. Close the bypass valve and open the main valve block valves on the steam train.
10. On high pressure units, above 3,000 psig, units in hazardous gas service, oxygen service or flammable gas service, a 100 psi air supply must be connected to the air pressure regulator. This air supply is used to operate the steam controls.

### **Operation**

1. Close the gas supply valve on the discharge of the unit.
2. Turn on liquid supply to the vaporizer.
3. Turn on steam supply to vaporizers and allow water tank to heat to set point.
4. Once water tank is heated, turn gas supply valve on. The unit is now fully operational.
5. If the gas outlet temperature is too hot, adjust the temperature controller to a lower set point. If the gas is too cold, adjust the pressure to a higher set point.
6. During operation, the tank water temperature may be as hot as 200<sup>o</sup>f. This is normal because of the steam condensing in the water and on the tubing.
7. On units equipped with low temperature cut-off controls, several variables are monitored. The first is steam pressure. The steam is monitored by a pressure switch which is set below the minimum required pressure to operate the unit. If the pressure drops below the set point, the low temperature cut-off will shut off the liquid supply. The other variable that is monitored is the water and gas temperature, one sensor for water and one sensor for gas. The water temperature sensor should be set for no less than 80<sup>o</sup>f and the gas temperature sensor should be set no lower than 0<sup>o</sup>f. If the temperature drops below the set point, process flow is stopped again. Both pressure and temperature must be acceptable or the flow will be stopped.

### **Tube bundle removal**

1. Turn off the steam supply to the unit. De-pressurize the steam train by opening the bypass valve and venting the steam into the water tank. If bypass valves are not supplied, de-pressurize by turning steam temperature control setting to maximum set point. This will allow the steam to enter the tank.
2. Remove process inlet and outlet connection.
3. Remove temperature sensor probe (capillary assembly) from the outlet header well. The silicone rubber must be removed to accomplish this. The bulb is sealed in place to keep

water out - be careful not to damage the capillary assembly. On units with LTCO system, the thermistor assembly must be removed also.

4. Eight to ten nuts are located around the perimeter of the lid, about one inch in from the edge of the tank. These bolts are the bolts that hold the tube bundle/lid assembly onto the top of the tank.
5. Use the lifting lugs provided on the top of the tank and begin lifting the tube bundle assembly. Lift slowly - be sure that all the nuts are removed. The tube bundle assembly should lift out easily.
6. Replace tube bundle in the reverse order of the removal procedure.