

Proposed iLocator HVAC System Commissioning

1. 50°F Glycol loop PID Tuning

Purpose – to obtain tuning parameters to minimize overshoot, offset and settling time for modulating V-1.

2. AHU Glycol loop PID Tuning

Purpose – to obtain tuning parameters to minimize overshoot, offset and settling time for modulating V-2.

3. Reheat calibration

Purpose – to establish subcooling and reheat setpoints for normal Mode 1 operation. The design allows for 2°F subcooling and then reheat to meet the required enclosure loads. This evaluation would optimize the subcooling toward 0F.

4. Optimize glycol loop temperature (currently 50°F)

Purpose – to establish a leaving glycol temperature in the tertiary loop that does not allow condensation at high ambient dew points with the lowest mixed temperature (currently designed for 50°F). The lower the temperature, the greater the cooling capacity circulating to our project for a maximum circulating flow rate.

5. Mode 1 steady state temperature control (200 hr short test)

Purpose – to verify that ambient environmental conditions (outdoor air temperature) can be offset by the HVAC system to maintain design conditions (+/- 0.5 °F) under normal glycol temperature and flow conditions. May result in adjustments to individual filter air flow volumes and baffle placement.

6. Mode 1 steady state temperature control (2,000 hr long test)

Purpose – to verify that ambient environmental conditions (outdoor air temperature) can be offset by the HVAC system to maintain design conditions (+/- 0.5 °F) under normal glycol temperature and flow conditions.

7. Mode 1 temperature uniformity

Purpose – to determine or visualize the temperature profile across the outer enclosure (or against the outer surfaces of the inner enclosure) in horizontal and vertical planes. Note that there are no design criteria for this condition, but it may prove helpful to understand the in repositioning air baffles that direct air flow across the inner enclosure to ensure good mixing. Test to occur under normal glycol temperature and flow conditions.

8. Mode 1 ISO cleanliness classification verification

Purpose – to verify that ISO class 7 can be maintained. Note that there is no design criteria for meeting any ISO classification when the iLocator is sealed, the inner enclosure is sealed and the outer enclosure is sealed and unoccupied. However, there is no identified process that is generating particles (usually all generated by occupants in the space) so there is every expectation that the space will eventually reach a cleanliness classification perhaps 2 orders of magnitude below ISO class 7 (ISO Class 5). This test should verify this expectation or indicate that openings in the outer enclosure (perhaps seals around the instrument mount or openings for cable trays) are not sufficiently sealed against ambient conditions outside the outer enclosure.

9. Mode 2 ISO Class 7 cleanliness classification verification

Purpose – to verify that ISO class 7 can be maintained during mode 2 operation when two occupants are properly gowned and active in the space. This test should be performed with the inner enclosure disassembled, a model of the instrument installed on the instrument mounts and measurement are taken at the work surface.

10. Mode 2 ISO Class 7 recirculation evaluation

Purpose – to verify that under Mode 2 operation, air from the ceiling plane leaves the space without recirculating back from the floor to above the work plane (assumed to be approximately 38 inches above the outer enclosure floor).

11. Mode 1 space temperature response to internal step loads

Purpose – to characterize and verify and possibly establish upper limits that an instantaneous load that is artificially imposed within the outer enclosure can be managed within acceptable limits (to be defined but expected to never exceed +/- 0.25 °F in a 15 minute period). Test to occur under normal glycol temperature and flow conditions.

12. Loss of primary glycol coolant

Purpose – to verify that isolation valves for the HVAC system and the process cabinet operate properly and characterize the operating limits of the cryo-compressors and WCU (approximately 15 minutes during a loss of coolant).