

Supplemental Information - Extended Temperature Range

System Capabilities:

-10°C to 44°C ± 0.5°C * (lights off)

0°C to 44°C ± 0.5°C * (lights on)

* - Defrost programming is required when running temperatures near and below freezing.

Important! The access port stopper must be installed when running temperatures near and below freezing.

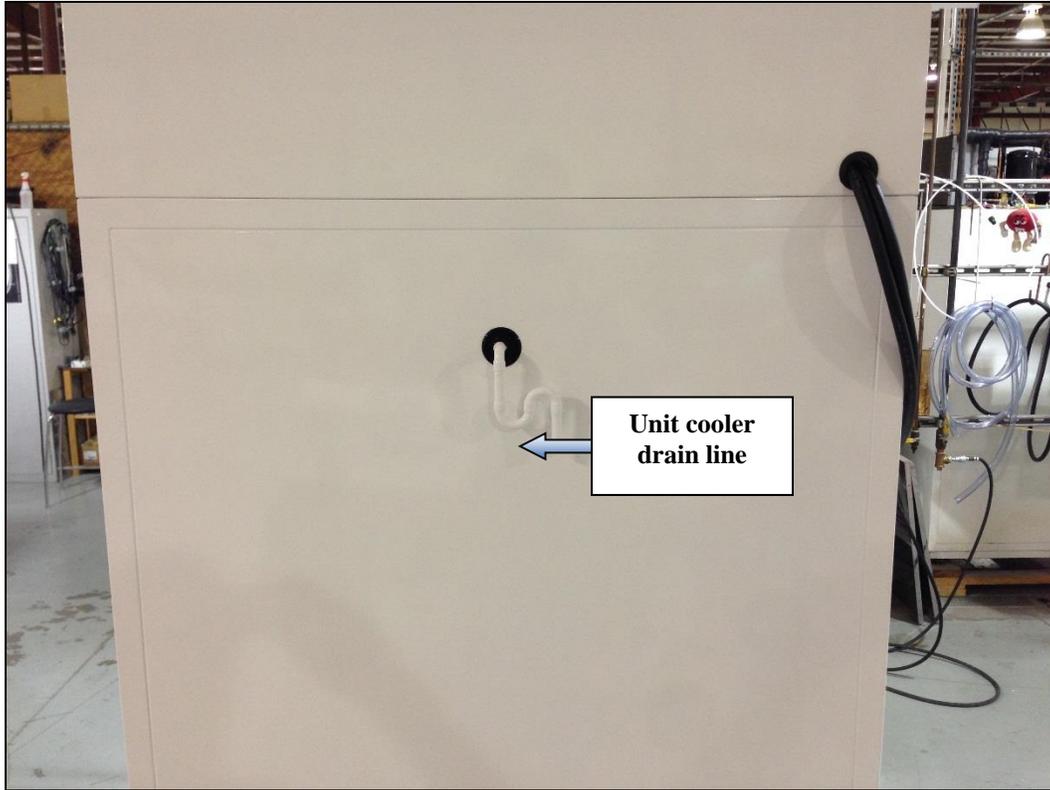


⚠ WARNING

When running the chamber at low temperatures, the humidifier must be drained to prevent freezing of water in the pan. To drain the pan, first shut off the water supply to the humidifier by closing the water supply hand valve located on the outside side wall of the chamber. Next, either siphon the water from the pan or drain it using the internal pan drain. **Using the *Intellus Ultra Controller*, disable the humidification system to prevent the heater from powering when it is not covered with water.**

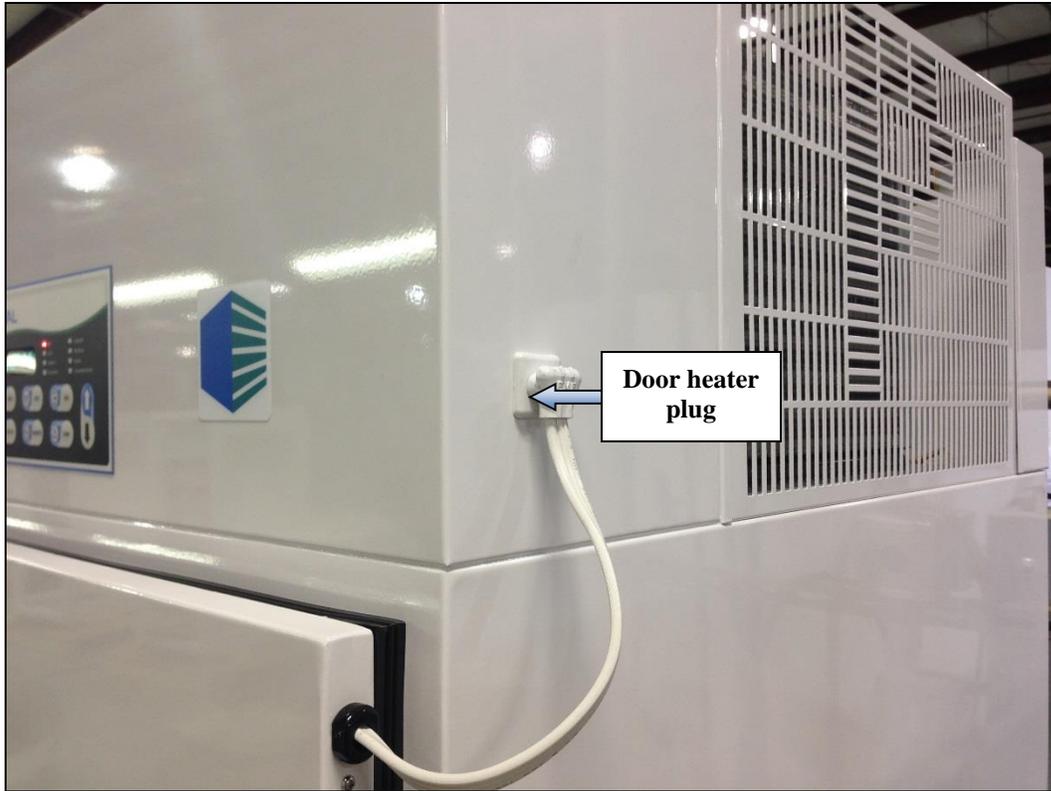
Unit Cooler Drain Line Installation:

The unit cooler drain line is directed outside of the chamber on the rear wall. Connect the supplied plastic tubing to this line. Either route this tubing to a drain pan or connect additional tubing to this line and route to a floor drain.



Door and Door Frame Heaters:

Door and door frame heaters have been provided to reduce the level of condensation that may form around the door. The heaters are designed to automatically turn on below temperatures of 4°C. If you notice condensation forming around the door, verify proper function of the heaters. Make sure the door heater plug is securely inserted into its mating receptacle.



Unit Cooler Pan / Drain Line Heaters:

Unit cooler pan and drain line heaters have been provided to prevent freezing of the water that is to be drained from the chamber. The heaters are designed to automatically turn on below temperatures of 4°C. If you notice that the water is not draining properly from the chamber when running below 4°C, verify proper functionality of the heaters. The unit cooler pan heater can be accessed by detaching the unit cooler cover. The unit cooler drain line heater is typically wrapped around the unit cooler drain line.

Supplemental Information - Defrost Programming

Ice formation on the components within this chamber can have an adverse effect upon temperature control. In order to avoid any ice formation / buildup the defrost system must be programmed to activate when the chamber is constantly running at low temperatures.

The programmable defrost system consists of a hot gas bypass which temporarily diverts hot gas (heated refrigerant) through the refrigeration coils to melt any formed ice. The lights and unit cooler fans will be turned off to minimize the temperature rise during the defrost period. If continuous lighting is important to your experiment, please be sure to program the defrost periods when the lights are off.

Up to six defrost periods can be programmed over a twenty-four hour period. Percival Scientific recommends that two seven minute periods be programmed twelve hours apart. The number of and/or duration of periods may need to be adjusted. * The necessity for programming additional defrost periods or increasing the defrost duration can be gauged by observing the inability of the chamber to hold the set point at low temperatures.

To program defrost periods, use the following steps:

1. Press the **INPUTS** key on the IntellusUltra controller. Press the **ENTER** key to accept **TEMP** as the input you wish to work with.
2. Use the **▼** key as necessary to select 'Number Of Defrosts'.
3. Press the **ENTER** key. Use the **▲** and **▼** keys as necessary to select the number of defrost periods required and then press the **ENTER** key.
4. Press the **▼** key. You will be prompted to enter the 'Defrost Duration'.
5. Press the **ENTER** key. Use the **▲** and **▼** keys as necessary to set the duration of each defrost period and then press the **ENTER** key.
6. Press the **▼** key. You will be prompted to enter the 'Defrost 1 Start'. This is the time that the first defrost period will start.
7. Press the **ENTER** key. Use the **▲** and **▼** keys as necessary to set the start time of the first defrost period and then press the **ENTER** key.

If you programmed to have more than one defrost period then you will need to set the remaining start times. To set the remaining times:

1. Press the **▼** key to advance to the next period.
2. Press the **ENTER** key. Use the **▲** and **▼** keys as necessary to set the start time of the defrost period and then press the **ENTER** key.
3. Repeat steps 1 & 2 as necessary.

Once you have set the start times for each period, press the **INPUTS** key to exit the inputs menu.

* - Defrost periods determined with an empty chamber.

Note! During a defrost cycle, the process temperature within the chamber will temporarily rise above the specified set point (all cooling functions are essentially disabled during the process). The temperature will return to the set point once the defrost cycle is complete. Longer defrost cycles will cause more temperature swing from the set point, but also more thoroughly defrost the components. Therefore, defrost cycle times should be optimized to be as short as possible, while maintaining adequate de-icing within the chamber.

▲ CAUTION

The Intellus controller is configured to prevent defrosts from occurring at temperatures above 4°C.

The access port stopper must be installed when running temperatures near and below freezing.

Supplemental Information – LED Fixtures

Three (3) SciWhite® LED tiles per tier are provided which contain dimmable white LEDs capable of producing *up to 405 $\mu\text{mol}/\text{m}^2/\text{sec}$ at 6" / 15 cm from the fixture at 25°C.*

***Please Note:** Temperatures above 40° C may significantly dim the LEDs. It is recommend that you verify the light intensity using an independent sensor.*

Dimmable Lighting Process:

LED dimming is accomplished in an “open loop” configuration, where set points are entered into the Intellus controller as percentages and the controller scales its output voltage to the LED control modules to correspond with the set point.

Intellus Display and Setup:

The lighting outputs are set up on the Intellus controller as follows:

- Light 1 controls the white LEDs on the *top / first* tier.
- Light 2 controls the white LEDs on the *second / bottom* tier.

When running manual settings, LED lighting levels are input as percentages, and are set on the Intellus Controller in the Lights menu. To enter the Lights menu so that the lighting set points can be changed, press the **LIGHTS** key on the Intellus Controller. Use the arrow keys to navigate through the menu and select the desired light output (the number of available outputs will vary according to the type of chamber and options ordered). To change a light setting, press the **ENTER** key and use the arrow keys as necessary to change the setting. Press the **ENTER** key a second time to accept the changed setting. To exit the Lights Menu and return to the Main menu, press the **LIGHTS** key.

Lighting levels can be programmed using the programming features of the Intellus controller. For more information on using the Intellus controller to program the lighting levels, please refer to the attached *Intellus Controller Manual*.

NOTE: Running the chamber in Diurnal mode will cause all LED modules to energize at full intensity. Conversely, during the night cycle in Diurnal mode, all light outputs will be de-energized. Only the Manual and Program modes are conducive to the intermediate light intensities available through the dimming option.

On the main display screen, the lighting level for each dimmable lighting output will be displayed as a bar corresponding to the lighting set point (percentage).

Example: A chamber with two dimmable light outputs with settings of 75% and 50% will show two bars in the light outputs portion of the main display, with the first bar 75% full and the second bar half full.

Service and Maintenance:

LED modules not working:

- ✓ **Power plugs:** Check to ensure that the power plugs for the fixture are securely installed in their receptacles.
- ✓ Refer to the electrical diagram provided in the *Associated Diagrams, Schematics, and Miscellaneous Information* section of this manual. Check the DC power supplies for the LED modules. A green LED illuminates on each power supply when the LED modules are programmed on. Each power supply is powered with 115V power and output a signal of 24VDC between each V+ and V- terminal.
- ✓ If other troubleshooting steps do not correct the issue, replace LED interface board.

Individual LED module not working:

- ✓ Replace module with a known working module. If the known working module does not work, check wiring from fixture receptacle to LED module located inside fixture.