CONTROLLER INSTALLATION INSTRUCTIONS

⚠ NOTE: THE CONTROLLER MUST BE INSTALLED BY A LICENSED ELECTRICIAN OR QUALIFIED PROFESSIONAL IN ACCORDANCE WITH LOCAL AND NATIONAL ELECTRICAL CODES. THE CONTROLLER MUST BE CONNECTED TO A CERTIFIED CIRCUIT BREAKER RATED FOR 30 A OR LESS. NO OTHER TYPES OF DEVICES MAY BE PLACED ON THE CIRCUIT BREAKER. REVIEW OPERATIONS MANUAL BEFORE INSTALLATION.

STEP 1: INITIAL INSPECTION AND PLANNING

1. Inspect the controller for any damage that may have occurred during shipping.
2. Lay out and plan the heat tracing system, including all sensors, wiring, conduit, and junction boxes.
3. Determine the controller location. The controller should be mounted on a fixed vertical surface. The controller may be mounted outside but should not be mounted in direct sunlight to reduce the chance of condensation forming in the controller.

STEP 2: ASSEMBLY AND MOUNTING

1. Once you have determined the wiring layout and conduit sizes, mark the bottom face of the controller for power and sensor connections. If the controller is mounted outside, use only NEMA Type 4X (or higher) liquid-tight conduit fittings and cable glands.
2. Remove the white wiring cover and replace the clear cover to ensure you do not drill into any components. Drill holes on the bottom face of the controller inside of the dashed line shown in Figure 1 and remove all plastic shavings. Do not drill holes within 0.5" of the edge of the enclosure. Mount your conduit and cable fittings.

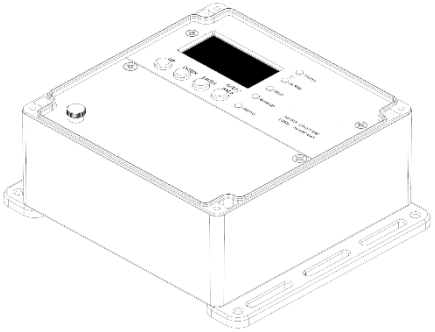

Figure 1: The controller showing the bottom side where to drill wiring holes.

3. Mark hole locations on the vertical surface where you will mount the controller according to the dimensions shown in Figure 2. Ensure the mounting surface is flat, permanent, and the controller is protected from damage.
4. Mount the controller to the vertical surface.

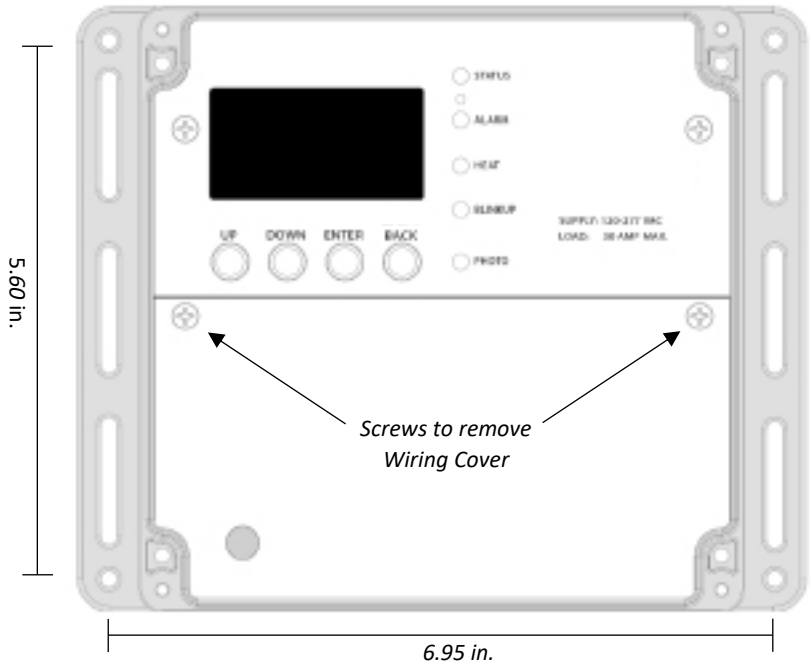

Figure 2: Top View of the Frio S1 controller showing mounting hole dimensions.

Step 3: Low Voltage Connections

1. With the controller mounted and both the clear cover and the wiring cover removed, connect low voltage sensor and communications wires according to the image in Figure 3. Always ensure the system is de-energized before making any wiring connections.
2. For more information on sensor compatibility and setup, please consult the owner's manual.

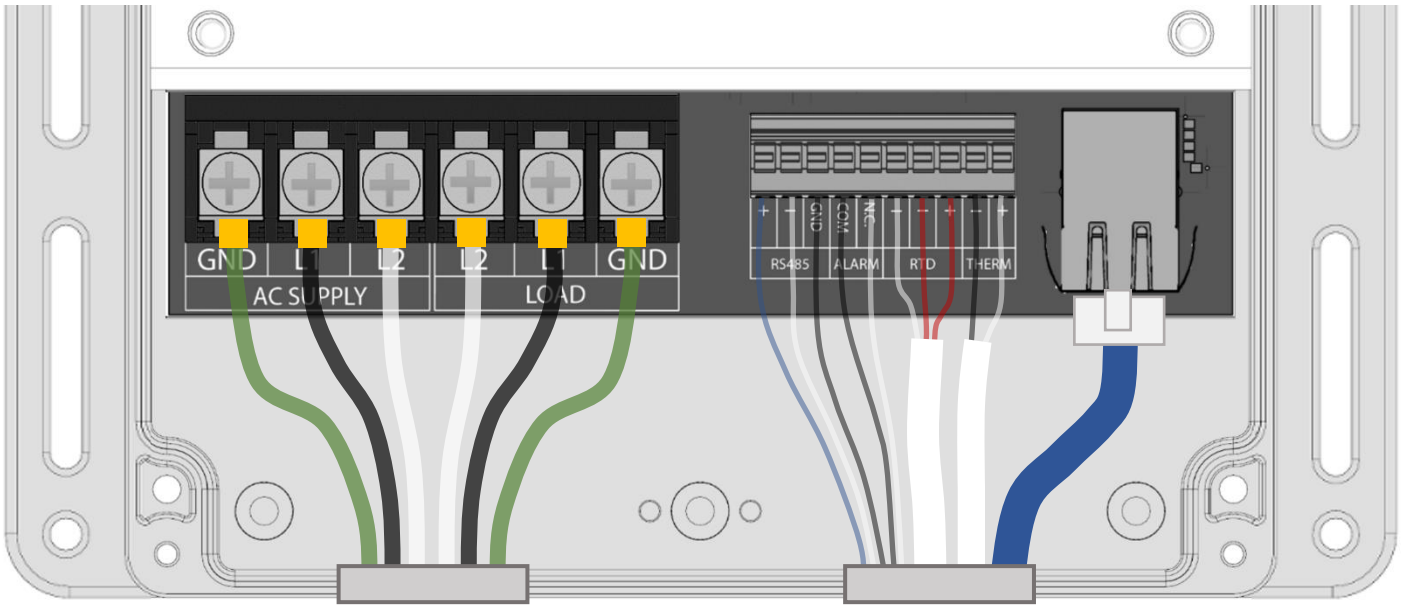

Figure 3: Top view of the Frio S1 controller with the wiring cover removed, showing all possible wiring connections.

NOTE: THE SYSTEM SHOULD NEVER BE ENERGIZED WHEN THE WIRING COVER IS NOT IN PLACE.

Step 4: Heat Trace and Power Connection

1. Ensure the circuit breaker connected to the controller is turned off.
2. Use an insulation tester resistance meter (Megger test) to check the integrity of the heat trace in accordance with the heat trace manufacturer's instructions.
3. Connect heat trace leads to the **LOAD** side as shown in Figure 3. The ground sheath of the heat trace must be connected to the ground terminal on the controller.
4. Connect the power leads to the **AC SUPPLY** as shown in Figure 3. The ground connection on the controller must be properly connected to ground in accordance with local and national electrical codes.
5. All power connections and wires should be installed in accordance with all local and national electrical codes. Use crimp connected spade terminals to ensure proper mounting in the power terminal blocks.

Step 5: Start Up and Configuration

1. Close the wiring cover before energizing the system.
2. Energize the system by turning on the circuit breaker connected to the controller.
3. Once the device has finished booting up, press any button to access the **Main Menu**, then select **Settings** to configure the device. Refer to section 5.4 of the S1 Operating Manual for available settings and consult section 3 to determine the control mode and configuration that will best serve your purpose.

Step 6: Internet Connection (BlinkUp)

1. Download and log in to the Frio App.
2. Complete app setup and enter all required information.
3. Connect to the Frio S1 controller via BlinkUp as directed in the Frio App.
4. Follow the in-app instructions to connect the Frio S1 controller to the internet and the Frio Cloud Platform.

Step 7: Ground Fault Test

The Frio S1 controller includes built-in Ground Fault Equipment Protection (GFEP). The GFEP circuit must be tested during installation. To test the GFEP circuit, follow the instructions below.

1. Press any button on the controller to enter the **Main Menu**.
2. Select **GFEP Test** and press enter.
3. You will be prompted to **Test GFEP now** to test the GFEP circuit. Select **Yes** to run the test.
4. The controller will display **RUNNING GFEP TEST** during the test and **TEST SUCCESS** for a successful test. If the test is not successful, the device will display **TEST FAILED**. If the GFEP test fails, turn off the system at the breaker and disconnect the heat trace. Rerun the test with nothing connected to the load terminal blocks. If the test is successful with nothing connected, there is a wiring error or a fault with the heat trace.
5. If the test is successful with heat trace connected, record the test on the GFEP Test Form on the next page. Ensure that the GFEP Test Form is retained by those in charge of the building's electrical installation in order to be available to the authority having jurisdiction.

GFEP TEST FORM

DATE	GFEP TEST RESULT	TEST PERFORMED BY	COMPANY

NOTE: THIS TEST FORM MUST BE RETAINED BY THOSE IN CHARGE OF THE BUILDING'S ELECTRICAL INSTALLATION IN ORDER TO BE AVAILABLE TO THE AUTHORITY HAVING JURISDICTION.