



We manage heat®

Model EUR™-5A

Snow and Ice Melting Control

Part Number 21496

Installation and Operation Manual

Environmental Technology, Inc.

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Safety

Make all electrical connections in compliance with the National Electric Code (NFPA 70) and local electrical code. If you have questions concerning the installation or application, contact Customer Service.

Contacting Environmental Technology

For assistance, contact Customer Service. Office hours are 8:00 AM until 5:00 PM EST.

Voice: (800) 234.4239 (USA and Canada) or (574) 233.1202 (elsewhere)

Fax: (888) 234.4238 (USA and Canada) or (574) 233.2152 (elsewhere)

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General Introduction

The EUR-5A Snow and Ice Melting Control is the interface between environmental sensors, building energy management computer (if present), operating personnel and the heater control contactors. Figure 1 shows a typical snow melting system using an EUR-5A. Currently, compatible environmental sensors are available for pavement, aerial and gutter snow and ice melting applications. A special sensor measures ambient temperature.

Using at least two environmental sensors, as shown in Figure 1, improves performance through superior coverage. A single environmental sensor can miss tracked or blowing and drifting snow. The first environmental sensor detecting snow or ice starts the heaters. When both environmental sensors become clear of snow and ice, the heater hold-on interval begins. The EUR-5A accommodates up to eight environmental sensors.

During hold-on, heater operation continues for an adjustable time interval.

This serves the purposes of melting any accumulated snow and ice and drying the pavement. Re-freezing can create hazardous conditions.

The EUR-5A includes an adjustable high temperature limit thermostat. This feature is useful in systems using MI cable and other constant wattage heaters to prevent excessive temperatures. When using self-limiting heaters, this feature can be defeated.

Typically, the EUR-5A is located in an electrical enclosure housing heater contactors

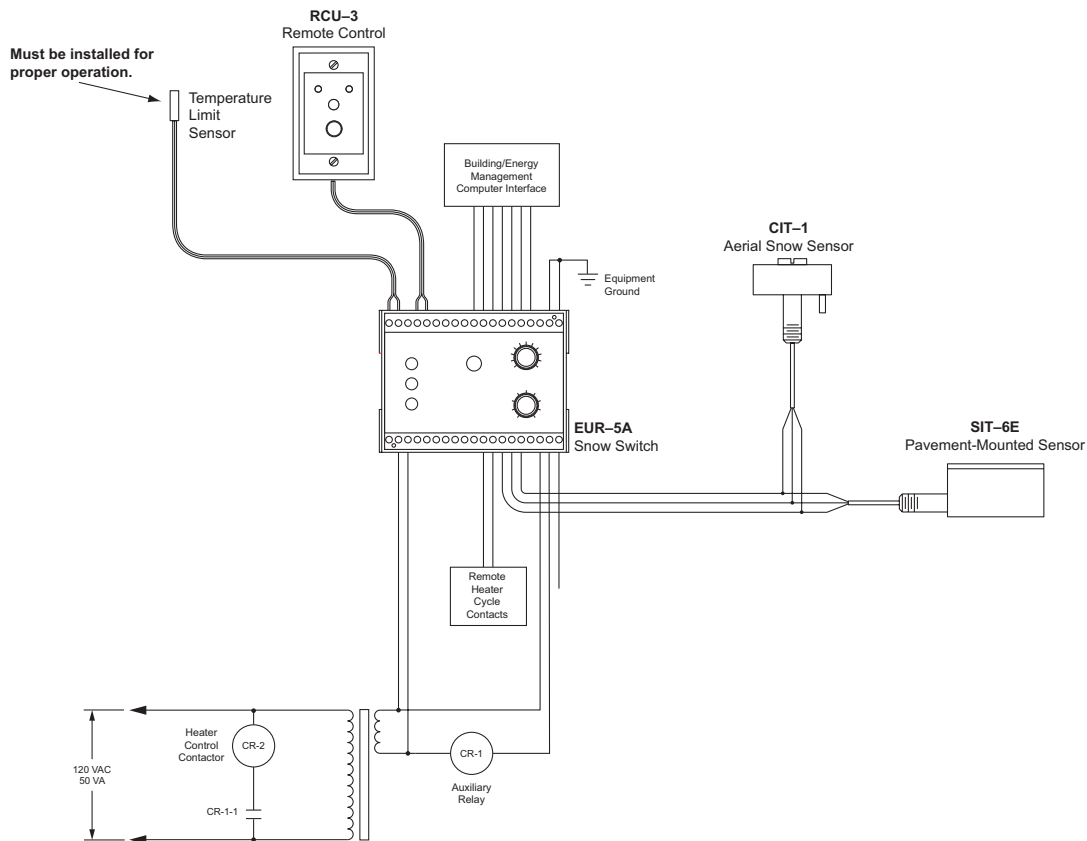


Figure 1. Typical EUR-5A installation.

which is not convenient for operating personnel or accessible to laymen. Supervisory control is sometimes necessary due to the need for testing and unusual environmental conditions which can include blowing, drifting and tracked snow. The EUR-5A itself provides control and indicators for this purpose. However, accessing them requires opening the electrical enclosure thus exposing lethal voltages. This problem is avoided through the use of the RCU-3 Remote Control Unit which is included. Another simple alternative is to mount a customer supplied pushbutton switch in the electric panel door for cycling the hold-on timer.

Environmental Interfaces

The EUR-5A determines when to start heater operation by monitoring the signals produced by up to six environmental customer supplied sensors paralleled together using a three-wire bus. Available sensors include:

- SIT-6E Pavement Mounted Snow and Ice Sensor
- CIT-1 Aerial Snow and Ice Sensor
- GIT-1 Gutter Snow and Ice Sensor

The EUR-5A includes a temperature sensor for measuring air or pavement slab

temperature. **This sensor is required for proper operation of the unit.** Its signal is used to provide an adjustable high limit thermostat function. This feature is essential when using a potentially high temperature heater such as MI cable.

Building Energy Management Computer (BEMC) Interface

The EUR-5A interfaces a BEMC via relays. Inputs from the BEMC include: OVERRIDE ON which causes heater operation and OVERRIDE OFF which inhibits heater operation. These functions are independent of weather conditions and the status of the hold-on timer. The EUR-5A provides three system status contact closures for the BEMC including SUPPLY, SNOW and HEATER. The SUPPLY relay contact closes on the absence of power since it is reverse acting.

Absent signals from the BEMC, the EUR-5A controls the heaters based upon environmental conditions. Automatic snow melting control is the default condition of the system.

Operator Interfaces

EUR-5A Front Panel

The EUR-5A has indicators, adjustments, and a switch for local control of the snow melting system. These include:

- SUPPLY indicator
- SNOW indicator
- HEAT indicator
- HEATER CYCLE pushbutton switch
- HOLD-ON time adjustment with a range of 0 to 10 hours and off
- HIGH-LIMIT temperature adjustment with a range of 40° to 90° F (4° to 32° C)

Figure 2 shows the EUR-5A front panel layout.

Pushbutton Switch

The EUR-5A provides an interface for a customer-supplied pushbutton switch which initiates the hold-on timer for the interval set by the EUR-5A. This switch also resets the hold-on timer if it is running. Typically, this switch is located on the door of the electrical enclosure. This feature is optional.

RCU-3 Remote Control Unit

Each EUR-5A includes an RCU-3 for monitoring the snow melting and controlling system operation from a convenient observation point. This accommodates unusual environment conditions that could result in heater operation being terminated before the snow was completely cleared and the pavement dry. The RCU-3 provides both a heater hold-on switch and an

independent hold-on time interval adjustment.

The RCU-3 provides the following indicators, switches and adjustments:

- POWER indicator (green)
- HEATER indicator (yellow)
- HEATER CYCLE switch
- HOLD-ON time adjustment (two to eight hours in two hour steps)

Figure 3 shows the front panel layout. The Class 2 for wet locations RCU-3 mounts in a single gang switch box up to 500 feet from the EUR-5A at a location convenient for observing snow melting system operation.

Power Source

The EUR-5A operates from a 24 volt AC NEC Class 2 power source. A 120 to 24 volt 50 VA control transformer is included for this purpose.

Contactor Interface

Since the EUR-5A is a NEC Class 2 device, it usually requires a customer supplied auxiliary relay for operating the heater control contactor solenoids.

Specifications

Environmental Interfaces

Environmental Sensors

Up to 6 sensors from the CIT-1/GIT-1/SIT-6E family.

Temperature Limit Sensor

ETI P/N 19272 Thermistor Temperature Sensor. Locate up to 2,000' (610 meters) from the EUR-5A. Can be eliminated by substituting a fixed resistor for the P/N 19272 (contact Customer Service for additional information)

Building Energy Management Interface

Inputs are relay coils operating from 5 VDC at 0.05 amps (nominal)

OVERRIDE ON

OVERRIDE OFF

Outputs are relay contacts rated at up to 24 VAC or VDC at 0.05 amps

SUPPLY

SNOW

HEAT

Operator Interfaces

EUR-5A Snow and Ice Melting Control

Indicators	SUPPLY SNOW HEAT
Adjustments	HOLD-ON TIME: 0 to 10 hours HIGH-LIMIT TEMPERATURE: 40° to 90°F (4° to 32°C) with a $\pm 0.5^\circ\text{F}$ ($\pm 0.3^\circ\text{C}$) dead-band
Control	HEATER CYCLE: operates heaters for the hold-on time
Panel-mounted Switch	Electrical interface for a SPST dry-circuit panel-mounted switch

RCU-3 Remote Control Unit

Locate up to 500' (152 Meters) from the EUR-5A

Indicators	SUPPLY HEAT
Adjustment	HOLD-ON TIME: 2 to 8 hours
Control	HEATER CYCLE

Contactors Interface

SPDT Class 2 pilot duty relay contact rated at 1 amp

Power Requirements

NEC Class 2 source of 24 VAC

2 volt-amps (nominal)

Temperature Ranges

Operating: -40°F (-40°C) to $+140^\circ\text{F}$ ($+60^\circ\text{C}$)

Storage: -67°F (-55°C) to $+167^\circ\text{F}$ ($+75^\circ\text{C}$)

Mechanical

NEMA 1 housing

35 MM DIN rail or bulkhead mounting

Size is 4" W by 4⁷/₈" D by 3" H

Operation

The snow melting system can be monitored and controlled either locally from the EUR-5A itself or from two remote locations including:

- RCU-3 Remote Control Unit
- BEMC

A third remote option uses a customer-supplied switch to toggle the heaters on for the hold-on time from the front panel of the electrical enclosure.

Local Control from the EUR-5A

Indicators:

- SUPPLY (green) shows that power is present
- SNOW (yellow) shows that it is snowing
- HEAT (yellow) shows that there is a call for heat. This happens during snow and for the hold-on time thereafter or when the heater cycle switch is operated. Please note, if thermistor temperature exceeds the setting on the temperature limit dial, the heaters will shut off; the hold-on timer remains active.

Adjustments:

- HOLD-ON TIME adjustment sets the time that heaters operate after snow stops. Doing this is necessary to make certain the pavement dries before heating ceases. This prevents re-freezing. Try an initial setting of 5 hours. Increase, if necessary. Reduce with care since energy savings are being traded for an increased likelihood of re-freezing.
- HIGH-LIMIT TEMPERATURE adjustment sets the maximum deicing temperature.

Remote Control from the RCU-3

The location for the RCU-3 is chosen for convenient observation of snow melting system operation. It monitors snow melting and permits overriding automatic control in the event that heating terminates before the pavement is dry. The SUPPLY indicator shows that power is available for the snow melting system while the HEAT indicator operates with the snow melting heaters.

The HOLD-ON TIME adjustment sets the heater operating time in a 2 to 8 hour range. The range of this adjustment is independent of its equivalent on the EUR-5A for flexibility.

Operating the HEATER CYCLE switch causes snow melting heater operation for the HOLD-ON TIME adjustment setting. Using this switch during hold-on turns the heaters off.

If the heaters turn off before the pavement is dry, operate the HEATER CYCLE switch. This continues heater operation for the HOLD-ON TIME. A trial HOLD-ON TIME of 4 hours is suggested. If the pavement dries during the hold-on interval, operate the HEATER CYCLE

switch to turn the heaters off. Adjust the HOLD-ON TIME in steps of plus or minus two hours to optimize heater operation.

Remote Control from the BEMC

Operation of this interface is defined in the Specifications section of this manual.

Panel-Mounted Switch

Operating this switch initiates heater operation for the hold-on time set by the EUR-5A. If operated during the hold-on time, heater operation is terminated.

Installation

First

Inspect the package and its contents for damage. In the event of damage, immediately contact Environmental Technology, Inc. Customer Service.

Next

Check the contents of the package against the pro forma Packing List shown below. If discrepancies are found, contact ETI Customer Service before starting the installation.

Pro Forma Packing List

Order Number	Quantity	Description
21496	1	EUR-5A Snow and Ice Melting Control
19272	1	Temperature Limit Sensor
14257	1	Power Transformer, 50 VA
21357	1	RCU-3 Remote Control
21776	1	EUR-5A Installation and Operation Manual

Location

The EUR-5A requires a protected unheated location suitable for a NEMA1 enclosure. The electric panel housing the heater control contactors is an ideal location.

Mechanical

Figure 2 shows a mechanical outline drawing of the EUR-5A. It mounts in 35 MM DIN rail (customer supplied). Optionally, the DIN rail locking mechanism can be removed from the bottom of the enclosure for direct panel mounting. For convenience, leave a generous space for wiring connections.

Connections

Safety Information

The EUR-5A is a NEC Class 2 device as are the sensors and remote control accessory devices. The electric panel location creates exposure to lethal voltages. Make certain that the installation adheres to applicable sections of the NEC.

Power Source and Contactor Connections

Figure 3 shows power and contactor connections for a typical installation. If your

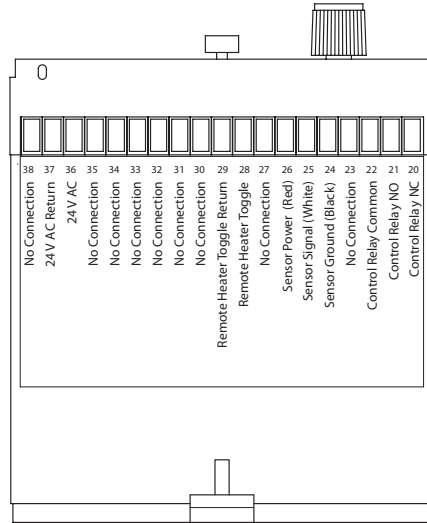
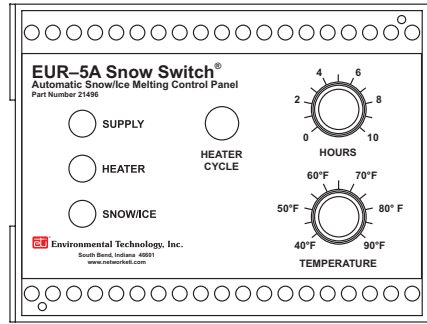
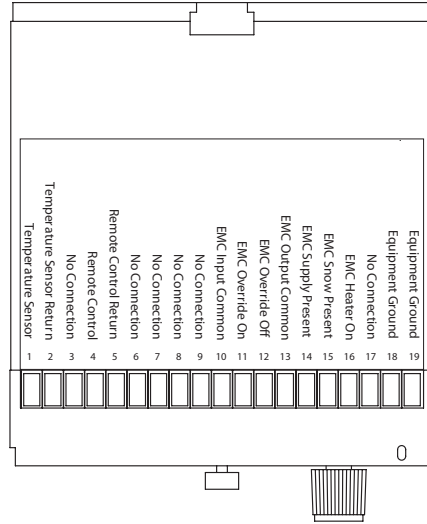


Figure 2. EUR-5A

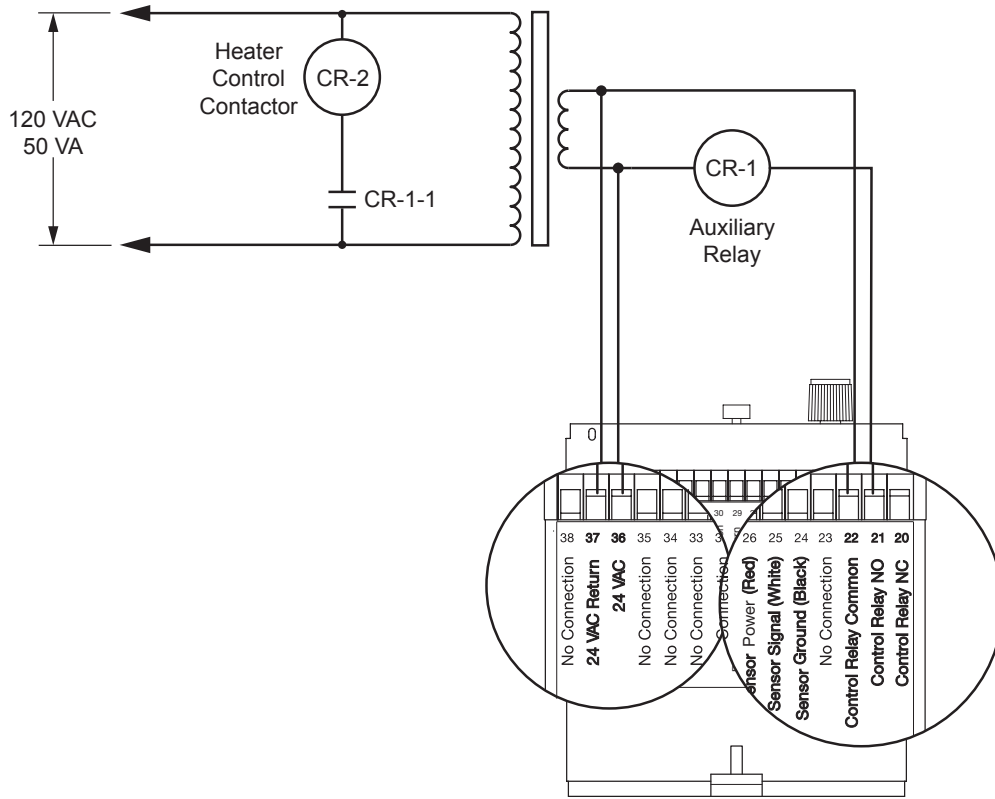


Figure 3. Power and contactor connections.

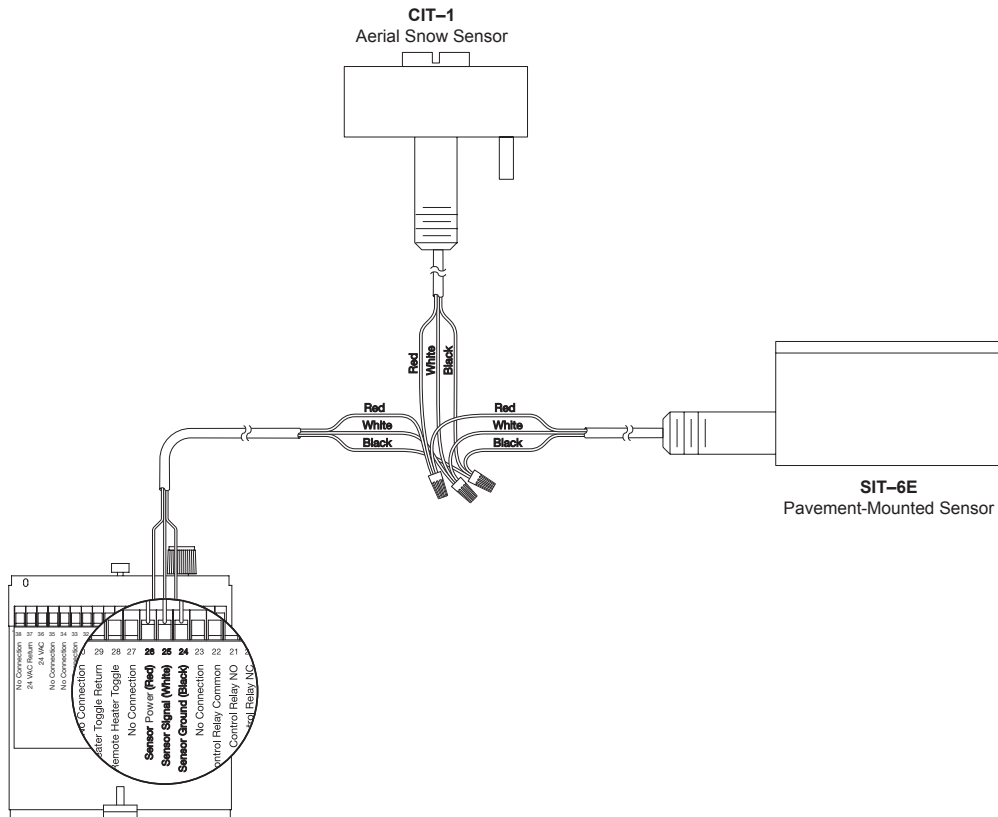


Figure 4. Sensor connections for a typical pavement snow melting application.

installation is atypical, Customer Service is available for assistance at no cost.

Environmental Sensors Connections

Figure 4 shows connections for a typical pavement snow melting application using both a CIT-1 Aerial Snow Sensor and a SIT-6E Embedded Sensor. Up to six sensors can be used with a single EUR-5A. Use #18 AWG extension wire for distances up to 250' and #14 for up to 1,000'. Running sensor and line voltage wiring in the same conduit is not recommended.

Ambient/Slab Temperature Sensor Connections

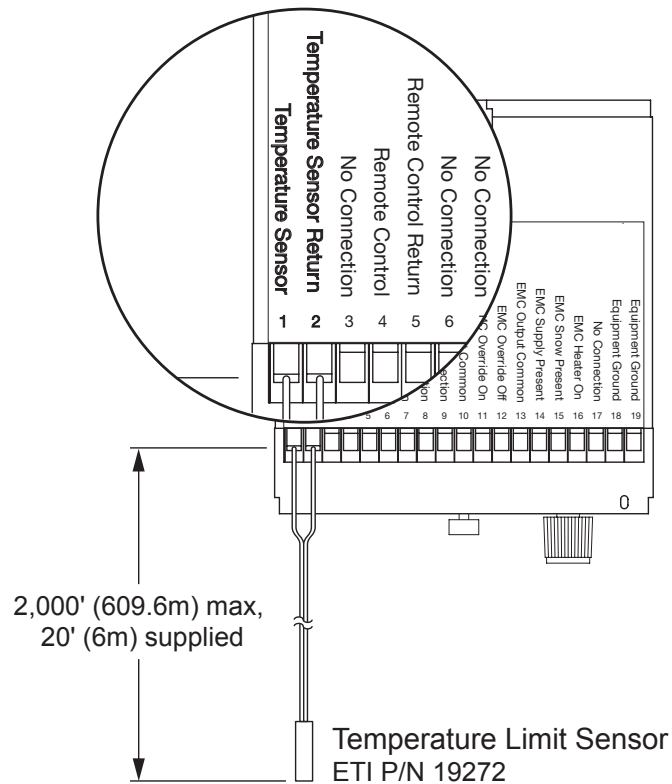


Figure 5. Temperature limit sensor connection.

NOTE: The Ambient/Slab Temperature Sensor or a 470 K ohm resistor is required across terminal 1 and 2 for the unit to properly operate.

RCU-3 Remote Control Connections

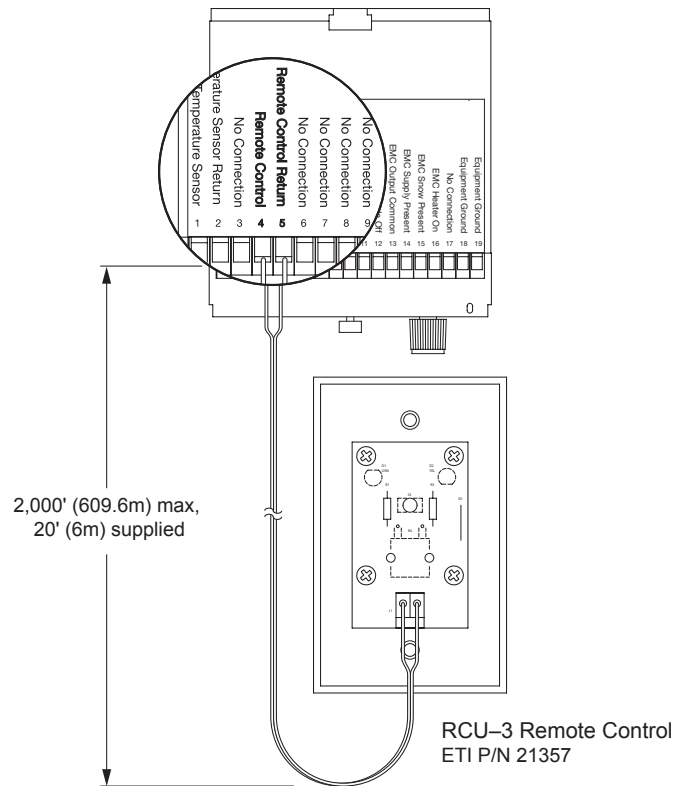


Figure 6. RCU-3 Remote Control connection.

BEMC Interface Connections

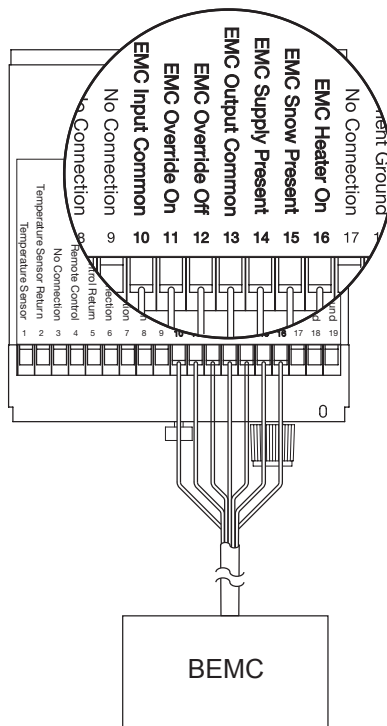


Figure 7. BEMC interface connection.

Heater Cycle Switch Connections

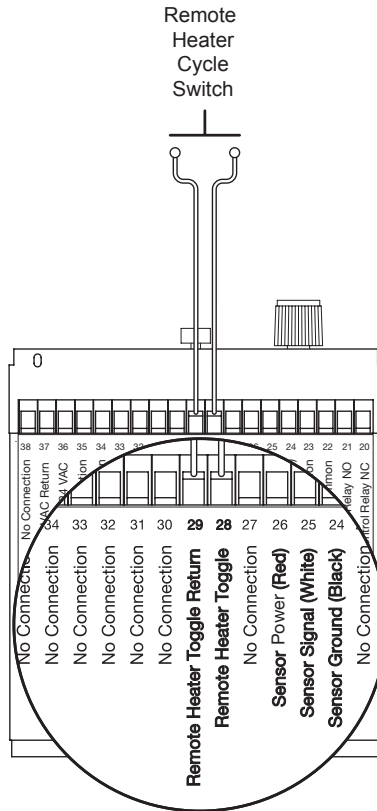


Figure 8. Heater cycle switch connection.

Maintenance

General

The EUR-5A contains no field replaceable components. Defective units must be returned to ETI for repair or replacement.

Troubleshooting

Although the EUR-5A is a relatively simple device electronically, troubleshooting is complicated by the multiplicity of features provided by this product. Hence component-level troubleshooting in the field is not practical. Checking only basic functions is the correct approach. Contact Customer Service if this does not identify the problem.

First, check the installation for security. Make certain that all EUR-5A terminal block screws are snugly tightened. Do not over-tighten! If this is a new installation, check for wiring errors and similar problems.

If none of the LED's on the EUR-5A front panel operate, check for 24 to 28 VAC between terminal block terminals 36 and 37. If the voltage is present, the EUR-5A is defective.

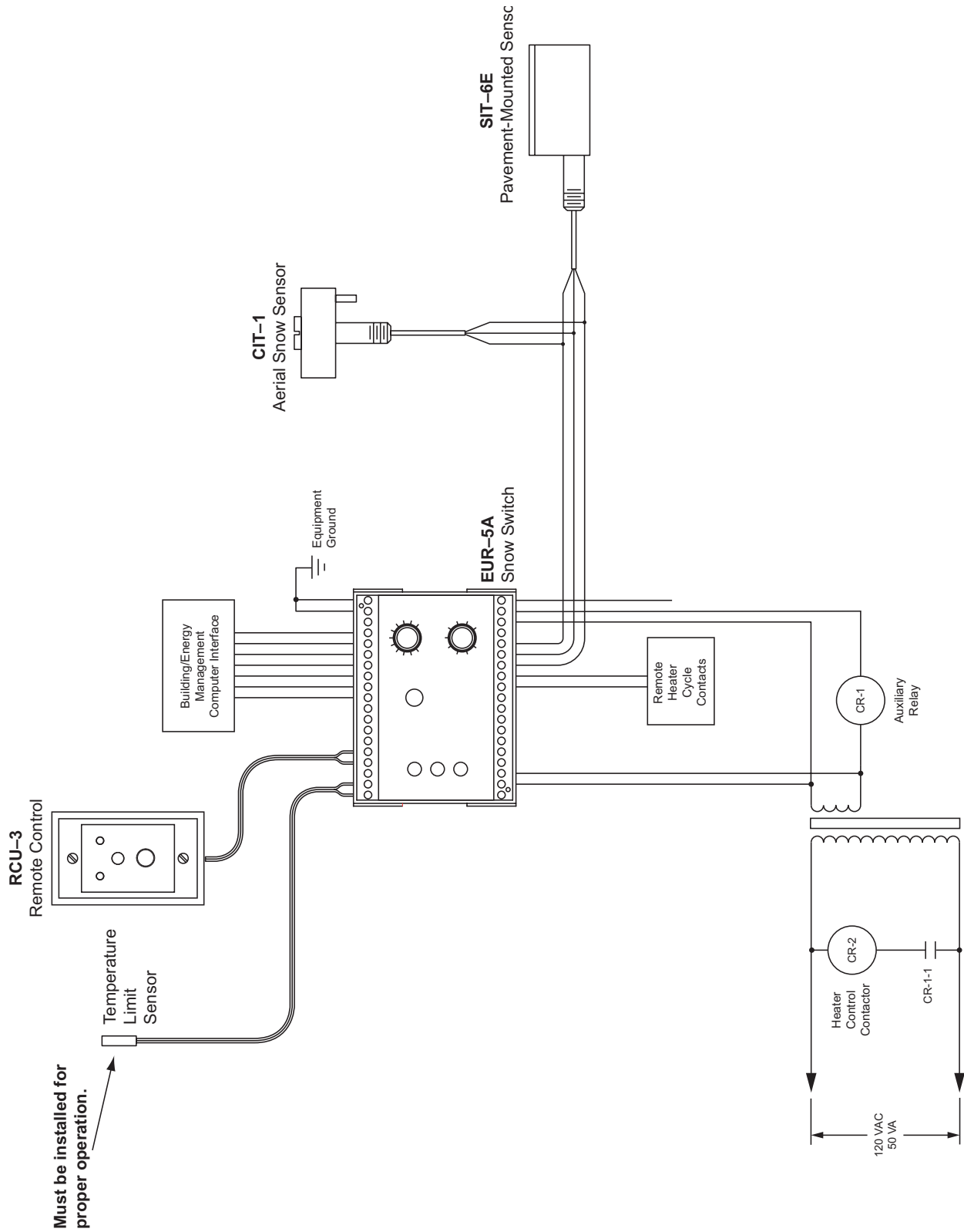
If the "HEAT" LED is flashing it indicates that the Ambient/Slab Temperature Sensor is not properly connected. Check the sensor connection and replace the sensor if necessary.

The next tests determine whether a sensor or the EUR-5A is defective. Remove EUR-5A power. Turn temperature limit dial to 90°; if ambient temperature is above 85°, install 470k resistor in place of temperature limit thermistor. Remove the wire connected to terminal block terminal 25 which is the sensor signal connection. Re-apply EUR-5A power. If the Control Relay operates, the EUR-5A is defective. Connect a short jumper wire between terminal block terminals 25 (sensor signal) and 24 (sensor ground). The Control Relay should close within 10 seconds or the EUR-5A is defective.

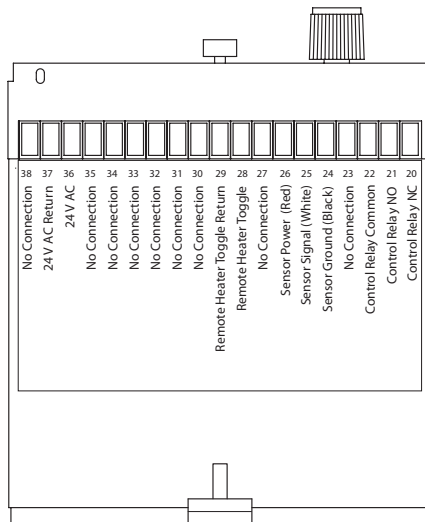
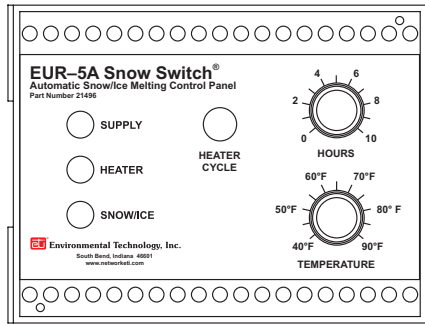
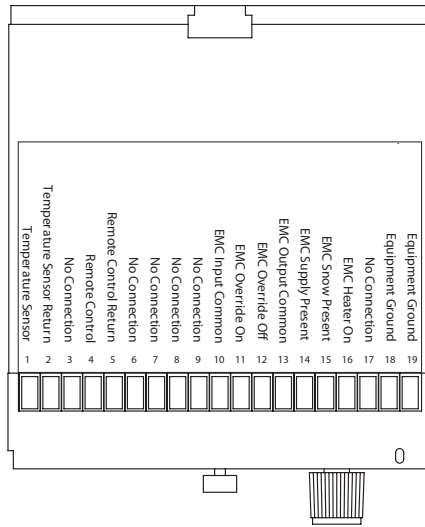
Returns

Contact Customer Service to obtain a Return Authorization before shipment to Environmental Technology, Inc. Otherwise, the shipment may be refused.

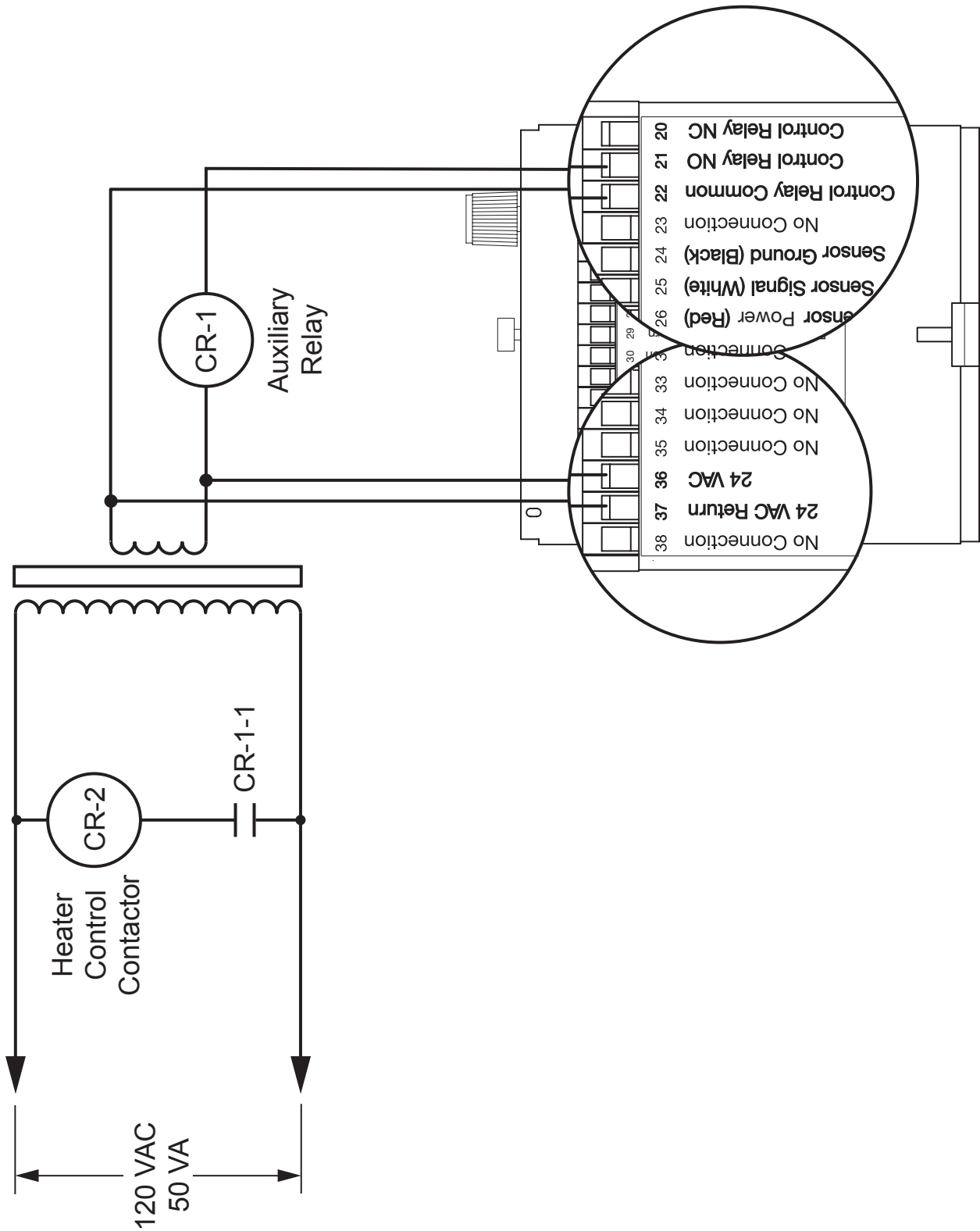
Appendix A. Typical EUR-5A Installation.



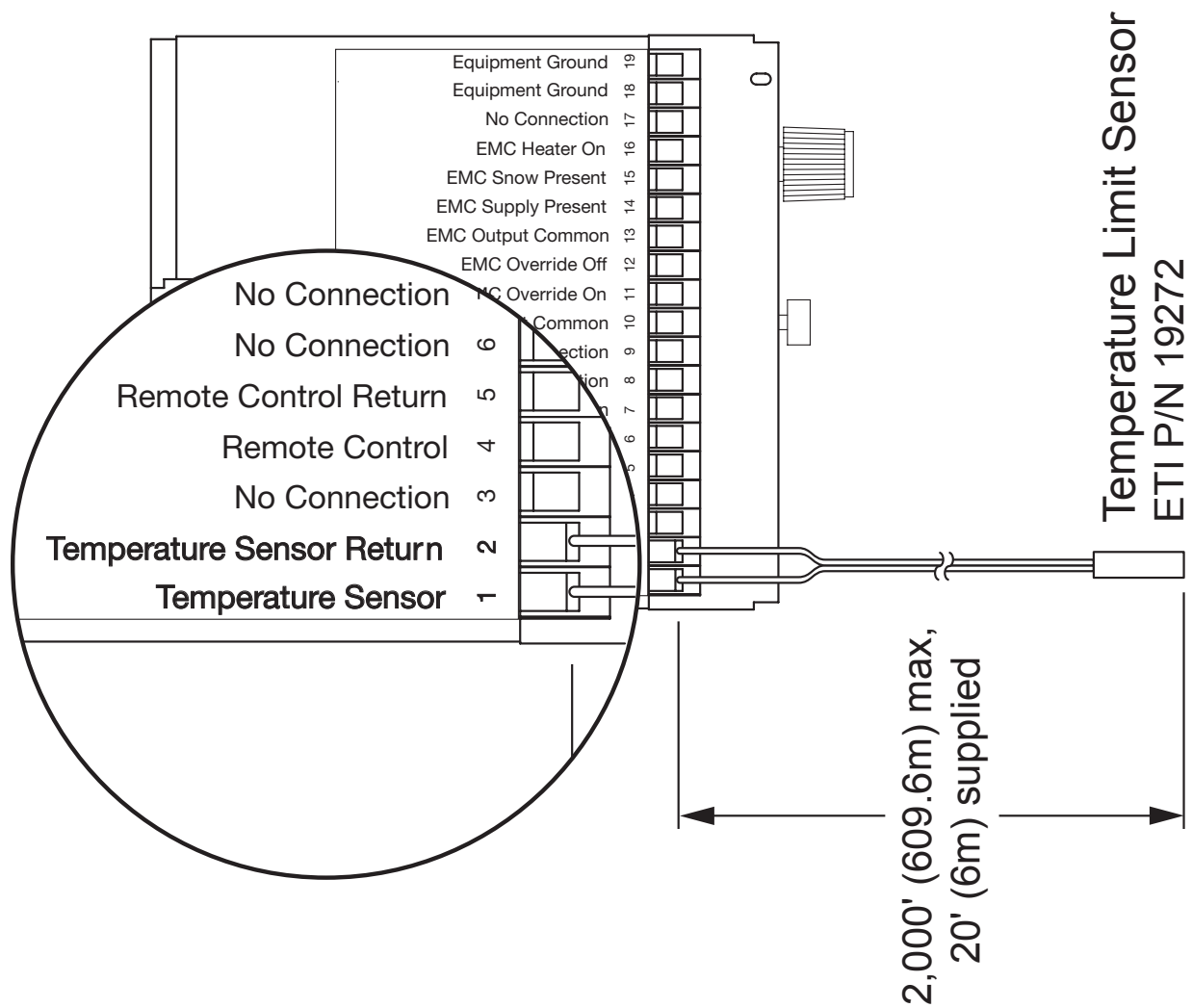
Appendix B. EUR-5A



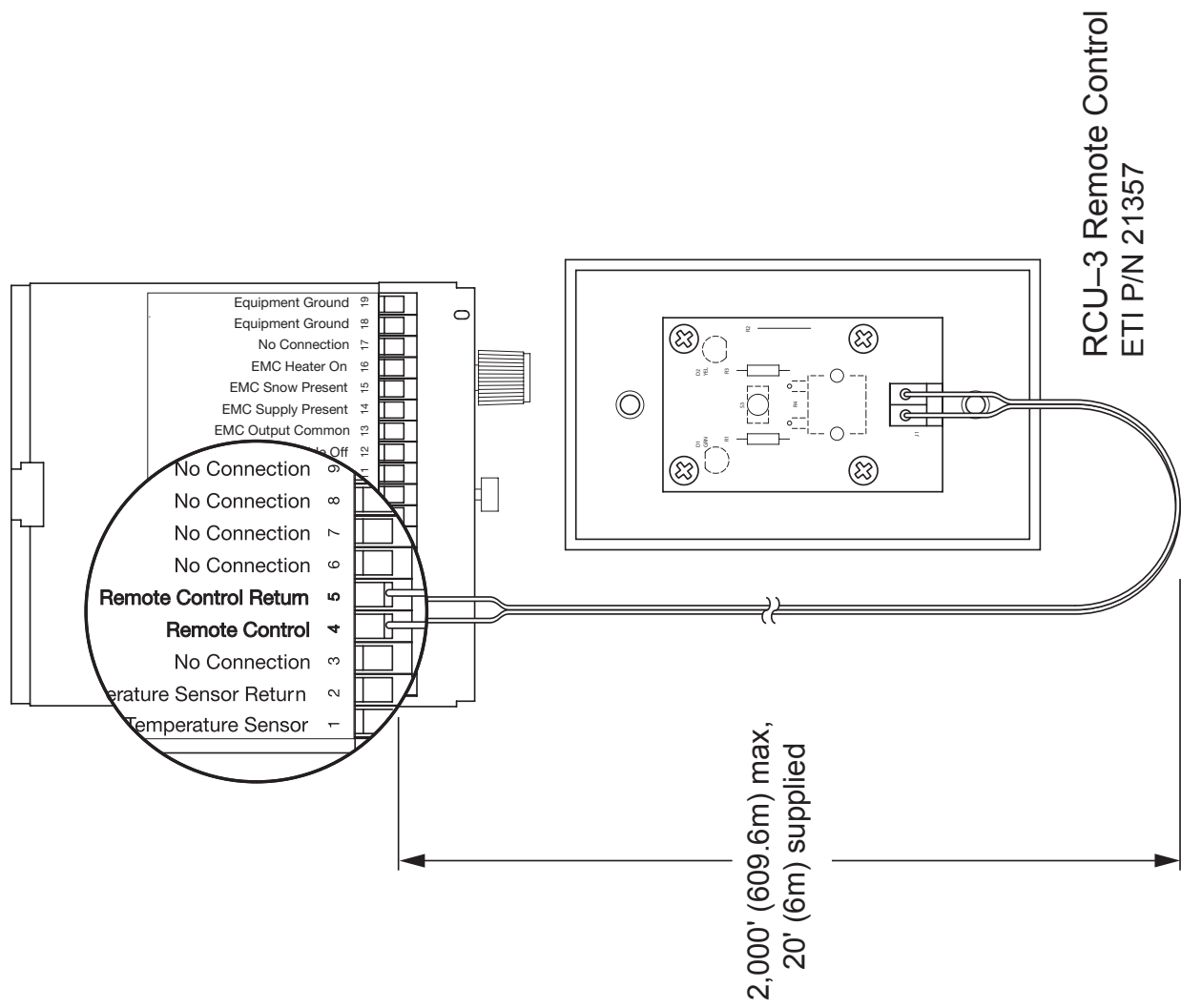
Appendix C. Power and Contactor Connections.



Appendix E. Temperature Limit Sensor Connections.



Appendix F. RCU-3 Remote Control Connections.



Appendix G. Heater Cycle Switch Connections.

