We manage heat®

Model APS–4

Snow and Ice Melting Control

277 VAC, Single Phase Part Number 17709
208-240 VAC Part Number 18708
277/480 VAC Part Number 18846
600 VAC Part Number 19608

Installation and Operation Manual

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Installation

Install in accordance with the requirements of all applicable electrical and building codes and regulations.

Enclosure

The APS–4 nonmetallic enclosure is suitable for installation in environments corresponding to NEMA 1, 2, 3R, 12 and 13 applications. The APS–4 was designed to operate satisfactorily over an ambient temperature range of −40° to 140° F. (−40° to 60° C.).

Using the integral external mounting flanges, the APS–4 is intended to be installed on fixed, vertical, flat surfaces as it was shipped; no disassembly or component removal is required. The choice of anchors and companion mounting hardware should be appropriate for both the mounting surface and the environment. The mounting flanges accommodate a range of fastener diameters up to 1/4" (6.35 mm).

Conduit

The APS-4 nonmetallic enclosure is furnished with three conduit entries; single-phase models with three (3) 1 3/64" (27 mm) dia. holes, and three-phase models with one (1) 1 3/64" (27 mm) dia. hole on top, and two (2) 1 11/16" (43 mm) dia. holes on the bottom. The conduit entries are to be utilized in the following manner:

- Bottom, right: Line voltage (208, 240, 277, 480 or 600 V. ac) supply branch circuit conductors.
- Bottom, left: Snow/ice melting system load branch circuit conductors.
- Top, right: Low voltage (Class 2) wiring; principally intended for connection of the selected snow/ice sensor. Also to be used for the Class 2 wiring associated with both the SC–40 Satellite Contactor and the RCU–1 Remote Control Unit.

Prior to finalizing the arrangement and selection of raceways, familiarize yourself with the specific requirements of both the grounding and wiring sections of these instructions. If the APS–4 is to be installed in a hostile environment, ensure that all conduit terminations are watertight.

Grounding

Effective grounding is key to the safe, proper operation of the APS–4. Based on the planned installation, you may elect one (or both) of the following means to accomplish this.

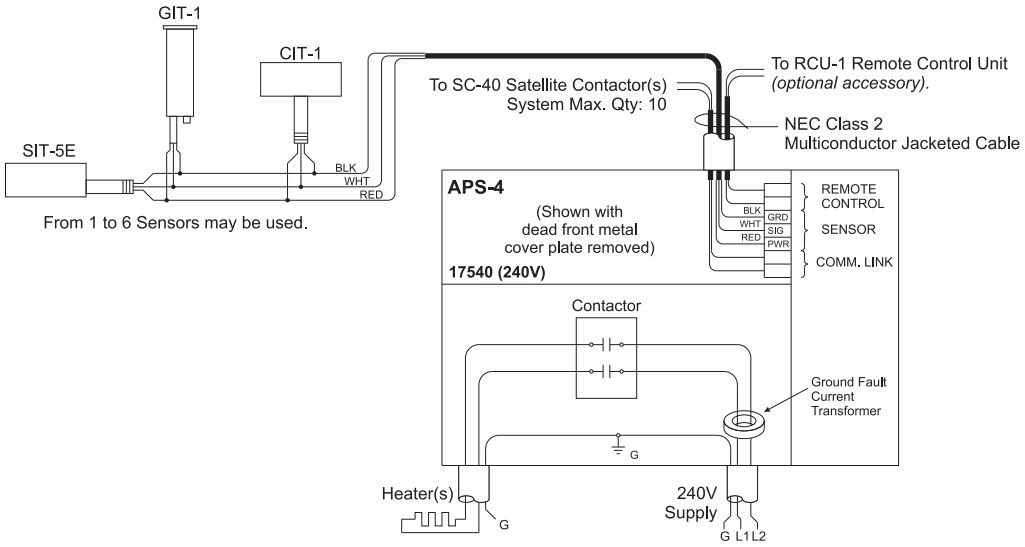
- Provide a continuous copper equipment grounding conductor routed with the branch circuit conductors.
- *Caution:* If the branch circuit conductors are contained within continuous rigid metallic raceway(s), connect a copper bonding jumper to each line voltage race way terminating at the nonmetallic enclosure using a grounding type bushing or conduit hub or locknut having approved grounding provisions.

The equipment grounding conductor(s) and/or the bonding jumper(s) are, each, to be properly sized for the rating of the branch circuit overcurrent protective device employed and shall be terminated in the mechanical lug designated “G” *without* passing through the ground fault detection/interruption system toroidal (donut) current transformer.

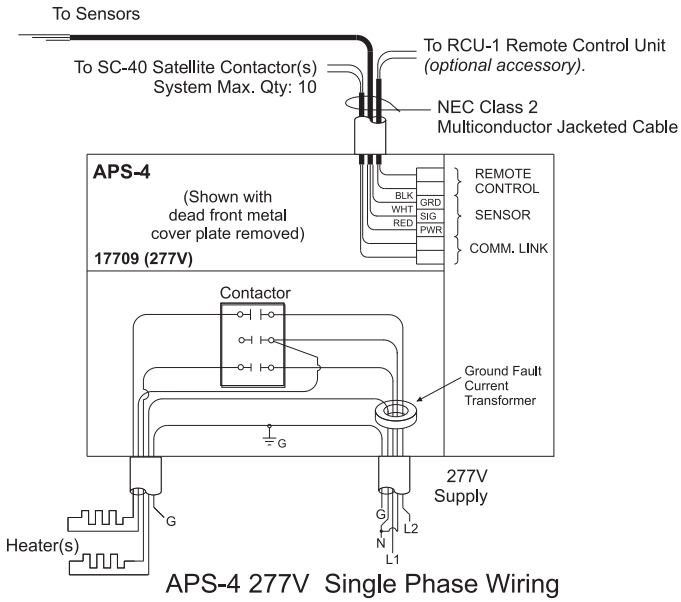
Wiring - Line Voltage

Line voltage (208, 240, 277, 480 or 600 V. ac) supply and load branch circuit conductors must be copper and must have sufficient ampacity to limit the maximum insulation temperature to 60° C. To assist in your selection of a minimum wire size appropriate for the snow/ice melting system load, see Table 1. (*Caution:* For circuits of extraordinary installed length, it may be necessary to utlize larger conductors to minimize voltage drop.)

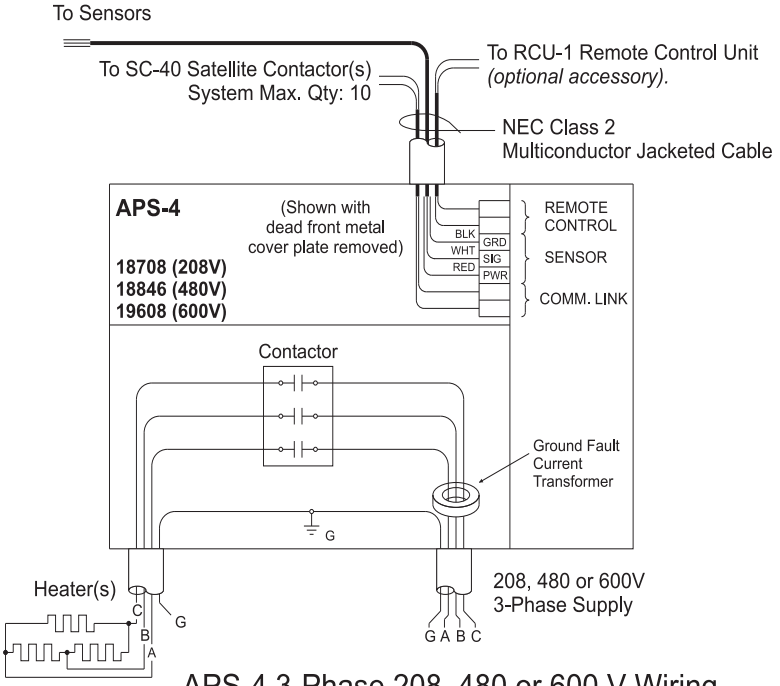
All line voltage supply conductors *must* be passed through the donut current transformer enroute to being connected at the contactor line side terminals. (Snow/ice melting system load conductors should *never* be passed through the donut.) Supply and load conductors are secured at the contactor compression terminals, torqued to 40 lb.-in. Figure 1 shows supply and load connections for line voltages of single and three phase APS-4 units.



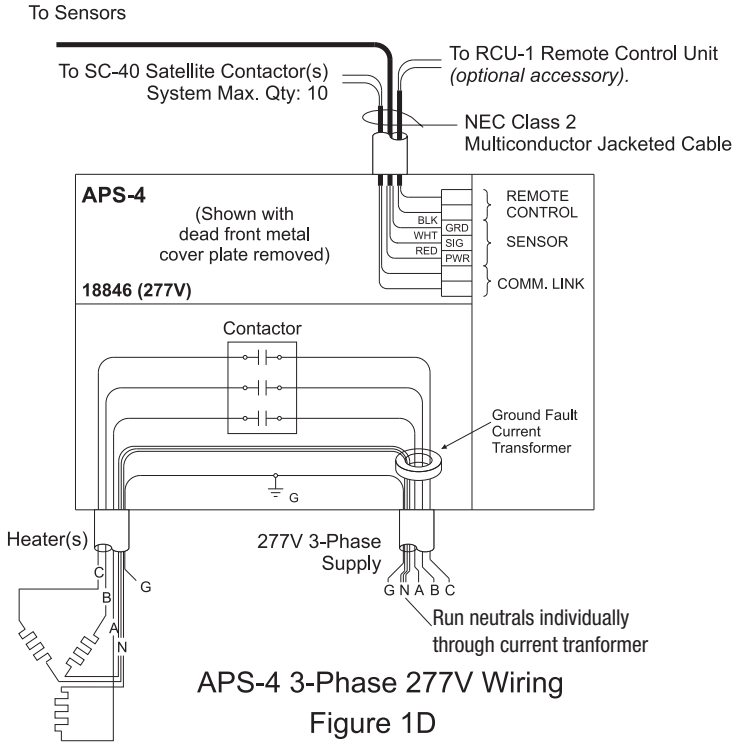
APS-4 240V Wiring
Figure 1A



APS-4 277V Single Phase Wiring
Figure 1B



APS-4 3-Phase 208, 480 or 600 V Wiring



APS-4 3-Phase 277V Wiring

Figure 1D

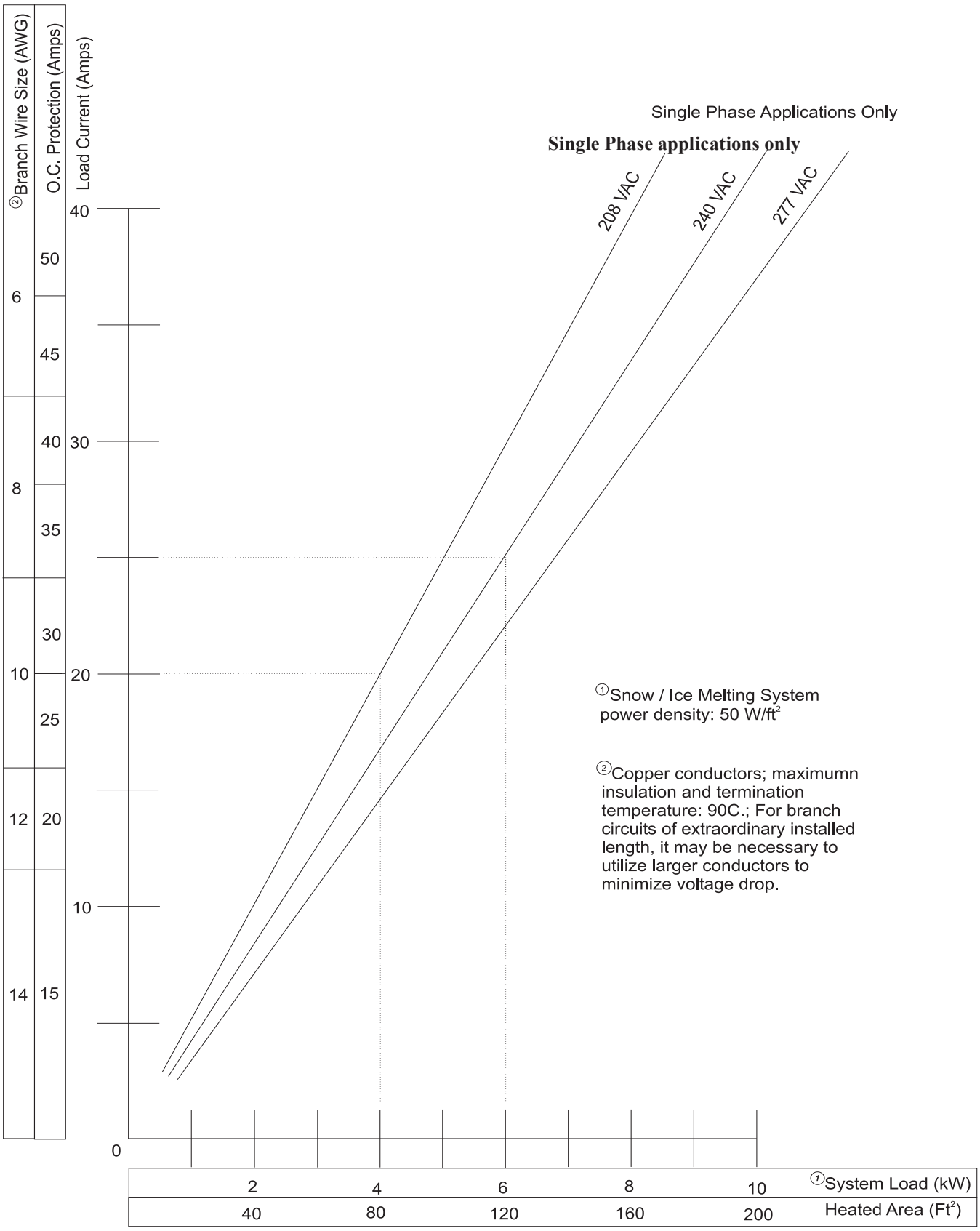


Table 1
Snow / Ice Melting System

Wiring - Class 2 Low Voltage

The low voltage terminal block, shown in Figure 2 below, contains three sets of terminals for, from top to bottom: Remote Control, Sensor, and Comm Link.

Each of these Class 2 circuits may have an equivalent installed length of 2,000' (609.6 meters) utilizing multiconductor #18 AWG jacketed cable. For distances exceeding this length, contact ETI applications personnel for assistance.

Proper automatic operation of the APS-4 requires the connection of at least one snow/ice sensor, color matching the sensor lead wires to the respective terminals as shown (blk-blk, wht-wht, red-red). Systems employing multiple sensors should be connected in parallel in whatever fashion may conveniently accommodate the planned installation; it is unnecessary to wire radially to each sensor. For guidance in physically installing a specific snow/ice sensor, consult the Installation Instructions for the selected model.

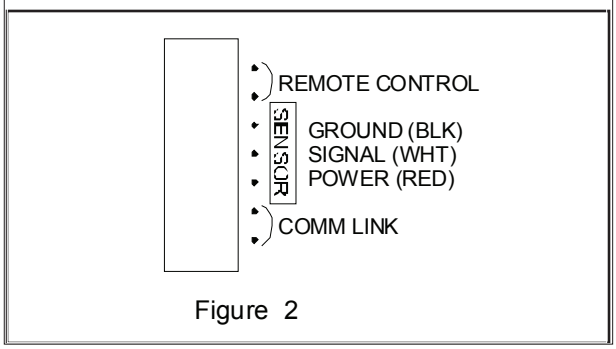


Figure 2

If the system incorporates an (optional) RCU-1 Remote Control Unit, it is unnecessary to discriminate between the two required conductors when terminating. See the Installation Instructions for the unit regarding specific installation requirements.

If the planned installation utilizes one or more SC-40 Satellite Contactors, the two required conductors may be connected to the CommLink terminals at your discretion and without maintaining a uniform convention at each subsequent unit. For additional direction regarding the installation and line voltage connection of the SC-40 Satellite Contactor, refer to its Installation Instructions.

After completing all line and low voltage and grounding terminations, and prior to energizing the APS-4, reinstall the dead front metal compartment cover.

Checkout and Operation

Thoroughly check the system before placing it in service. Our experience shows that installation errors cause the majority of problems. Frequently encountered problems include wiring errors. Simple electrical tests and visual inspections identify these problems.

Once the APS-4 installation has been properly completed, it may be energized. (Note: If the snow/ice melting system is comprised of one or more SC-40 Satellite Contactors, energization will entail the closing of multiple branch circuit overcurrent protective devices.) The green "Supply" LED will be illuminated on each successive unit as its respective supply circuit is energized; the RCU-1 Remote Control Unit LED display, if a part of the system, operates in tandem with the APS-4.

Should *any* individual momentary contact "Heater Cycle" push button be held depressed, *all* LEDs will flash, continuously, at one second intervals until the "offending" push button is released.

Once weather tracking has begun, should any installed sensor detect snow/ice, the amber "Snow" LED on the APS-4 will be illuminated. Subsequently, the APS-4 will initiate operation of the snow/ice melting system, this being signaled by its amber "Heater" LED and the companion display on the RCU-1 Remote Control Unit (if a part of the system). Similarly, the amber "Heater" LED on all installed SC-40 Satellite Contactors having an energized power supply will be illuminated as each initiates its respective snow/ice melting system load.

The APS–4 “Hold-On Time” adjustment, having a range of 0 to 10 hours, may be employed for the following purposes:

- To maintain snow/ice melting function for a selected time duration, beginning when *all* installed sensors concur that snowfall has ceased. This, for example, ensures complete clearing and drying of such sensitive locations as ramps for the physically challenged, or permits effective clearing of zones regularly experiencing excessive drifting, slush deposition or similar anomaly. An initial setting of 3 hours is suggested; for enhanced effectiveness and/or economy, this setting may be altered based upon operational experience.

- To manually energize the snow/ice melting system for a selected time duration by depressing the APS–4 “Heater Cycle” push button for (at least) 3 seconds and releasing. This mode is most useful as an annual, pre-season, operational test of the snow/ice melting system or as a diagnostic aid in troubleshooting. If the outdoor temperature is sufficiently cold, the system will be continuously energized for the selected time duration. This mode may be duplicated utilizing the “Heater Cycle” push button on the remote control accessory, if present in the system.

To verify ground fault detection/interruption operation, momentarily place the “Ground Fault” spring-return toggle in the “Test” (down) position and observe that the red “Ground Fault” LED will continuously flash; restore this system by momentarily placing the spring-return toggle in the “Reset” (up) position. It is suggested the APS–4 (and all SC–40 Satellite Contactors that may comprise the system) be subjected to this functional test annually.

Should a ground fault occur, the snow/ice melting system is automatically deenergized and the red “Ground Fault” LED will continuously flash. If this state persists following an attempt to reset in the manner previously described, a ground fault exists and troubleshooting/servicing is required. The ground leakage current threshold factory setting is 30 ma.

QUESTIONS AND COMMENTS

For technical help, questions or comments concerning this product or any of Environmental Technology, Inc. products contact the Customer Service Department between 8:00am and 5:00pm EST (UTC minus five hours) at

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