

Satellite Antenna De-icing Systems for Prodelin Antennas



- **Automatic De-icing System for Protection against Snow and Ice**
- **Simple to Field Install and Operate**
- **Engineered for Customer Specified Voltages**
- **Low Energy Costs**
- **User selectable Automatic, Off or Manual On Modes**
- **Available for Prodelin Antenna Reflector Sizes: .67, .89, .98, 1.0, 1.2, 1.8, 2.4, 3.7, 3.8 and 4.5 Meter**

DESCRIPTION

The SATCOM De-icing system consists of a factory pre-wired control unit, heater pads for reflector coverage, and a feedhorn heater. All systems are engineered to be easily assembled, installed and operated.

The control unit has three modes of operation: Automatic, Manual Off and Manual On. The Automatic mode allows the control to monitor the ambient temperature and sense the presence of moisture. An ambient temperature of less than 40 degrees F and the presence of moisture activate a heater contactor. The heater contactor is rated up to 50 amps. The heaters will remain on for a factory preset time of one hour longer than conditions warrant. The Manual Off mode turns the heaters off, regardless of the weather conditions. The Manual On mode turns the heaters on, regardless of the weather conditions. Control units are factory preset to operate on 120 to 240 volts, single or three phase power. All cabling to attach the heater pads is factory pre-wired. The larger systems have a control unit with remote moisture sensor.

The heater pads consist of heater wire sandwiched between layers of aluminum foil. Heater pads allow for a faster install without the need for templates. The aluminum foil is coated with an aggressive acrylic adhesive and a peel and stick liner. Watt density of the heater pads, depending on the reflector, is between 40 and 55 watts per square foot. The aggressive acrylic adhesive adheres to a variety of substrates and will not release when pad temperature increases. Heater pads have water resistant connectors that plug into the cables from the control unit.

The feedhorn heaters consist of heater wire attached to a strap and covered with heatshrink. They are attached to a rib on the feedhorn.

Installation of the de-ice system consists of applying the heater pads to the backside of the reflector, mounting the control unit / moisture sensor, routing power to the control unit, attaching the feedhorn heater, and connecting the heater pads to the control cables.

The De-icing systems can be custom made for a variety of antennas and applications.

Typical Installation

Instruction Manual for the Prodelin GD 3.7 meter 240 Volt Half Coverage with Two C Band Heater System

Materials Provided List

<u>Quantity</u>	<u>Part Number</u>	<u>Description</u>
16	85405	Heater pad for 3.7 meter half coverage 240 volt
5	85406	Heater pad for 3.7 meter half coverage 240 volt
4	85407	Heater pad for 3.7 meter half coverage 240 volt
4	85408	Heater pad for 3.7 meter half coverage 240 volt
3	85409	Heater pad for 3.7 meter half coverage 240 volt
1	85404	Controller for 3.7 meter half coverage 240 V with mounting brackets and two feedhorn heaters attached
32		Grommets
1		¼-20x1" SS hex bolt with lockwasher and nut
2		Foil strips for lead wire attachment
1		Instruction manual for 3.7 meter 240 volt half coverage with two feedhorns

Tools and Supplies Needed

Self tapping screws or U-bolt for sensor mounting

Drill

7/16" drill bit

7/8" drill bit

Adjustable wrench

Clean rags

Windex glass cleaner

Cable ties for cable anchoring

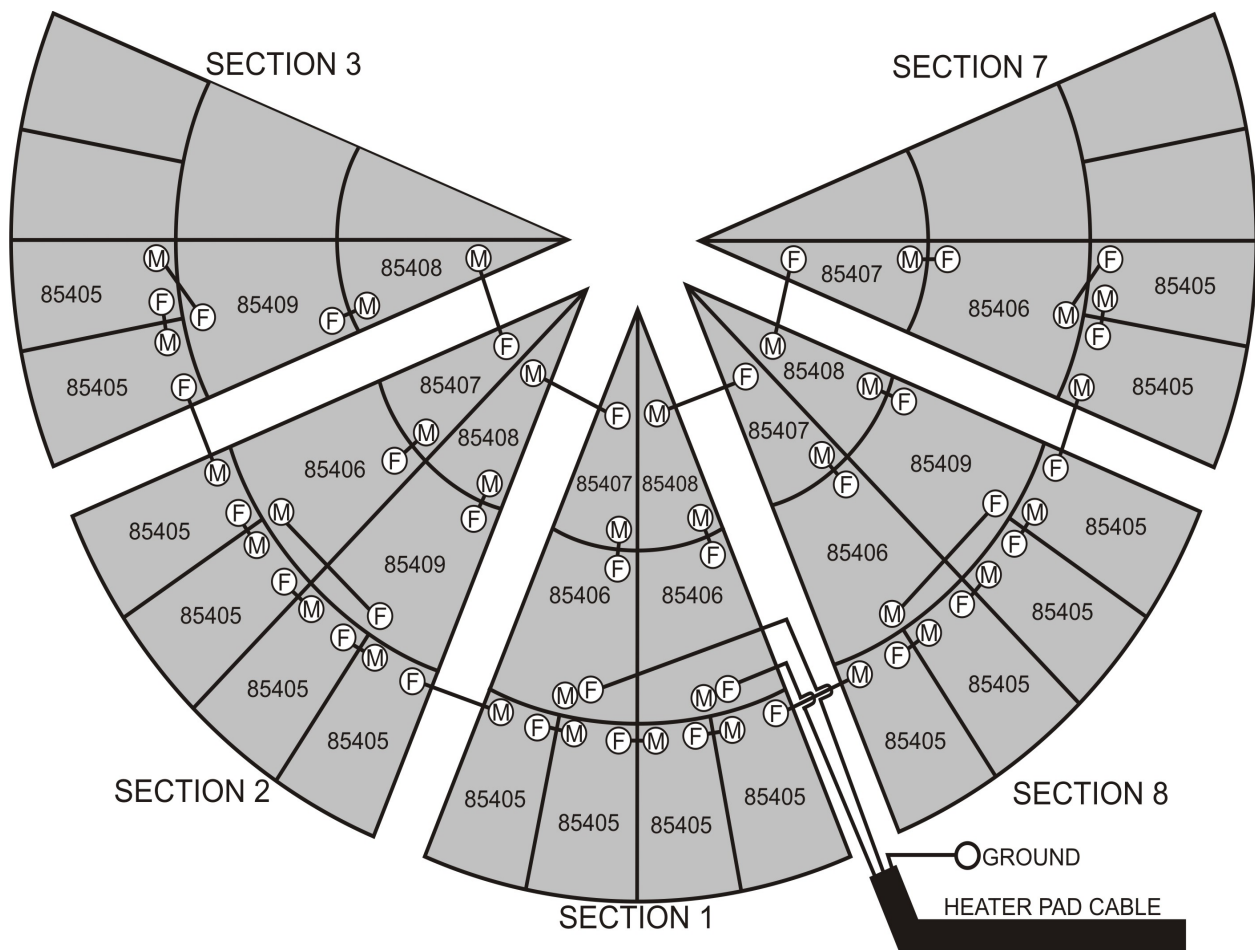
Read these instructions carefully and follow all of the procedures for installing this system. All electrical wiring must be performed in accordance with all applicable electrical codes.



Control and Harness

APPLY THE HEATER PADS TO THE REFLECTOR PANELS

1. Properly support the reflector panel so that no distortion results from heater pad attachment. Verify differences in reflector panels have been accounted for.
2. The surface temperature of the panel should be above 50 degrees Fahrenheit, 10 degrees Celsius for proper adhesion of the heater pads.
3. Thoroughly clean the rear of the reflector panels with Windex and dry thoroughly.
4. Test fit the pads by laying all of them on the back of the reflector. See the Heater Pad Placement and Lead Connections drawing for the proper locations.
5. Remove the backing paper from the heater pads one at a time and carefully apply to the cleaned reflector. Smooth each pad as it is placed on the reflector. The adhesive is pressure sensitive so be sure to apply pressure and rub the heater pad as it is smoothed to activate the adhesive and adhere properly.



Heater Pad Placement and Lead Connections

CONNECT THE HEATER PAD LEADS

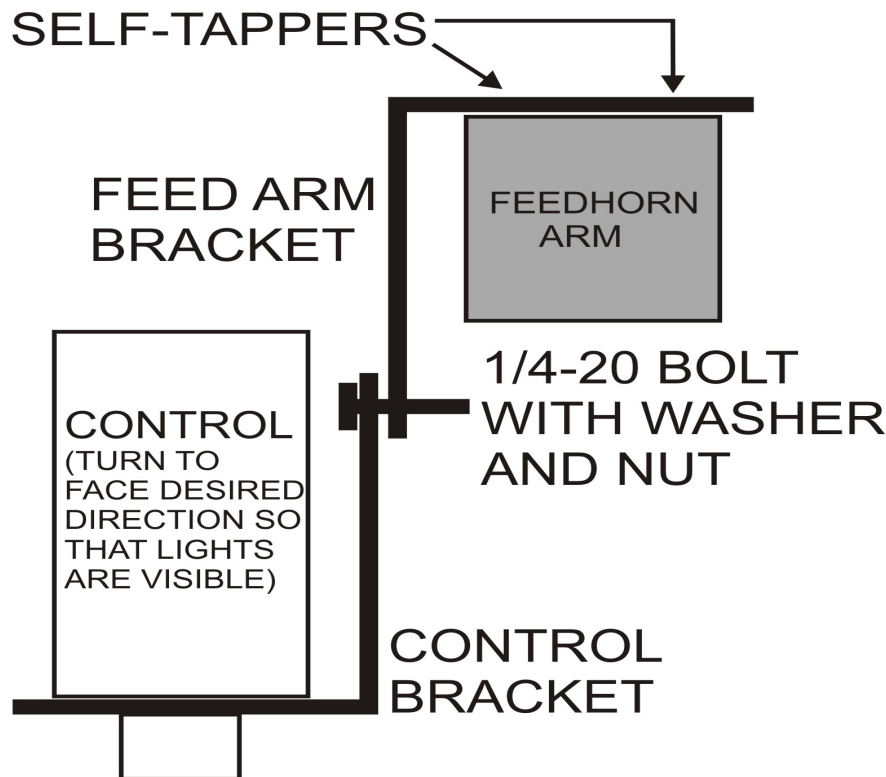
1. Plug the heater pad connectors together as illustrated on the Heater Pad Placement and Lead Connections Drawing. The connectors are difficult to fully seat, and will not properly seal until a small snap is felt. Drill 7/16" holes through ribs and insert grommets if extra lead support is desired.
2. Use the supplied foil strips to anchor connected leads.

ASSEMBLE AND CALIBRATE THE REFLECTOR

ATTACH THE CONTROL ENCLOSURE TO THE FEEDARM

1. Pick a place on the feedarm for Control mounting. The place picked should allow the Heater Pad Cable to reach the heater leads in the center of Section 1 and allow the Feedhorn Heater Cable to reach the feedhorns with enough slack lead for movement, etc. For in-board feedhorn arms, a hole may have to be drilled through the face of the reflector panel for cable passing. DO NOT harm the heater wire in the heater pads if drilling for cable passing. The Control should not be mounted so close to the reflector that shielding from snow and ice will occur. This will prevent the system from operating correctly.

2. Attach a sensor mounting bracket to the feedarm at the desired location. Self tapping screws or a u-bolt may be used for attachment. The down leg of the bracket should be adjusted so that it points downward. See the Sensor Attachment Drawing.
3. Adjust the Control bracket so that the moisture sensor on the top is level with the horizon. If needed, swivel or bend the bracket on the feedarm to level the moisture sensor on top of the Anti-ice Control.
4. Tighten the 1/4-20 bolt and nut to secure the Control. Turn the Control the desired direction for viewing the mode.
5. The cables exiting from the enclosure should exit in the downward direction. The final adjustment of the control enclosure must be done before any cable ties are fully tightened.



Control Attachment Drawing

ROUTE THE HEATER PAD CABLE AND CONNECT TO THE HEATER PADS

1. Route the Heater Pad Cable toward the male heater pad leads for connection.
2. Choose a rib that will serve as the mounting location for the cordgrip on the Heater Pad Cable. The cordgrip can be slid up or down the cable by loosening the plastic nut. Tighten the nut after adjusting.
3. Drill a 7/8" hole through the middle of the rib at the chosen position.
4. Remove the metal cordgrip locknut from the cable and pass the female leads and ground wire ring terminal through the hole in the rib.
5. Pass the metal cordgrip locknut over the connectors and ring terminal, then thread it back on the cordgrip and tighten.
6. Connect to the heater pads as illustrated in the Heater Pad Placement and Lead Connection drawing on page 2.
7. Affix the grounding ring terminal to a grounded metal support structure.
8. Use tie straps (not supplied) to anchor the Heater Pad Cable.

ATTACH THE FEEDHORN HEATERS TO THE FEEDHORNS

1. Each conductor coming from the Feedhorn Heater Cable connects to a splitter that branches into two female leads. One female lead from each splitter should plug into each feedhorn heater.
2. Route the feedhorn heater cable along the feedhorn support arm.
3. Place each feedhorn heater around its feedhorn and loosely attach it by passing the tail of the strap through the head. Be sure the heater wire in the feedhorn heater is against the feedhorn.
4. Position the heater with the head of the cable tie and the connectors toward the bottom of the feedhorn and tighten the strap fully. Do not cut the tail off of the feedhorn heater at this time. It will be done when the final test of the system is performed. See the Feedhorn Heater Placement picture for proper placement.
5. Use tie straps (not supplied) to anchor the Feedhorn Heater Cable near the feedhorn heater branch and along its length.



Feedhorn Heater Placement

WIRE POWER TO THE CONTROL ENCLOSURE

1. The Anti-ice Control is supplied with a 50 foot 16 gauge 3 conductor power cable. The power cable can be cut to length if needed.
2. Route the power cable to voltage source and connect the black and white wire to 240 volt single phase AC power.
3. Connect the green conductor to a grounding source.

* There is no need to remove any covers on the Anti-ice Control enclosures.

* The entire system supplies 2125 watts of heat and draws approximately 8.9 amps.

SECURE ALL CABLES WITH TIE STRAPS

1. Secure the entire lengths of the heater pad cable, the feedhorn heater cable, and the power cable with tie straps (not supplied).

TEST THE HEATER SYSTEM

1. Apply 240 VAC single phase power to the system.
2. Allow the sensor to go through its start-up test.
3. When the sensor enters the Automatic Enabled mode (steady green indicator), push the selector switch twice to place the sensor in the Manual On mode (steady amber indicator).
4. Wait a few minutes and feel the surface of the reflector for warmth. The feedhorn heaters should also feel warm to the touch. Retighten the feedhorn heater straps while the heaters are warmed and cut off all but ½" of the excess strap material.
5. Return the system to the Automatic Enabled mode by pressing the selector switch one more time.

FINALIZE ALL OTHER INSTALLATION ISSUES

ANTI-ICE CONTROL SPECIFICATIONS

The control operates electric heaters to prevent the build-up of snow and ice on the reflector when conditions are conducive to their formation. That is, during precipitation when the ambient temperature is below 40 F.

1. The controller will assure a minimum On time of approximately one hour. The system will continue to supply heat as long as conditions warrant it.
2. The controller provides AUTO, OFF, and ON functions. These modes are user selectable through a single push button switch which alternates through each mode.
 - The normal power-up mode is AUTO. In this mode, the controller will turn on the heater contactor when conditions are conducive to the formation of snow and ice.
 - When in the OFF mode, the heater contactor remains disengaged regardless of the weather conditions.
 - When in the ON mode, the heater contactor is engaged until the controller mode is changed or the power is reset.
3. The control provides two indicator lights. The green indicator lights when the control is in the AUTO mode. The yellow indicator lights when the heater contacts are closed and the heaters are on.
4. The moisture sensor is heated to melt snow and ice for detection as moisture.
5. The controller has been factory preset to operate on 240 volt single phase power.
6. The heater system draws approximately 8.9 amps.
7. The control is housed in a UL and CSA rated, weather resistant, gasketed enclosure.

Prodelin Gen.Dyn. 3.7 meter 240 Volt Half Coverage with Two C Band Heater System