

**SECTION XXXXXX**

**ELECTRIC HANGAR DOOR RAIL DEICING SYSTEM**

1. GENERAL
	1. SECTION INCLUDES
		1. Hangar door rail deicing cables.
		2. Control unit for hangar door rail deicing cable.
		3. Components and accessories for a complete operating hangar door rail deicing system.
		4. Hangar door rail deicing cable power design: Nominal 25 watts per linear foot.
	2. REFERENCES

		1. Underwriter’s Laboratories (UL)
		2. Canadian Standards Association (CSA)
		3. National Electric Code (NEC): – Article 426 Fixed Outdoor Electric Deicing and Snow-Melting Equipment
	3. SUBMITTALS

		1. Submit under provisions of Section XXXXX
		2. Manufacturer’s product data sheets
		3. Manufacturer’s installation instructions
	4. PROJECT RECORD DOCUMENTS

		1. Accurately record locations of heating cable, temperature and moisture sensors, thermostats and branch circuit connections.
	5. QUALITY ASSURANCE

		1. Manufacturer Qualifications:
			1. Minimum 20 years of experience in design, engineering, manufacture and support of specified system and components
		2. Product Requirements
			1. All hangar rail deicing equipment furnished under this section shall be supplied by a single manufacturer. UL Listed MI snow melting cables.
			2. Automatic control with continuous monitoring of slab temperature and slab moisture.
			3. Self-Regulating cable is not acceptable for this application.
			4. Glycol based systems are not acceptable for this application.
			5. MI hangar rail deicing cable shall be factory assembled, immersed in water for a minimum of 12 hours, and then tested for insulation resistance, high potential breakdown, and continuity before leaving the factory.
	6. COORDINATION
		1. Coordinate installation of heating cable with Electrical Contractor, Concrete, and General Contractor.
		2. Coordinate installation of heating cable with installation of concrete framework and concrete placement.
2. PRODUCTS

	1. MANUFACTURERS

		1. System shall be manufactured by:

Innovair Solutions USA - Delta-Therm Corporation, 6711 Sands Rd Suite A, Crystal Lake, IL 60014, Phone: 800-526-7887,

Fax: 847-526-4456, Email: info@Delta-Therm.com, Web: www.Delta-Therm.com

* + 1. Substitutions: No substitutions are permitted.
	1. HEATING CABLE

		1. Mineral Insulated (MI) Heating Cable:
			1. UL Listed Mineral Insulated (MI), seamless sheathed, series resistance heating cable.
			2. MI heating cable construction shall consist of MI copper sheath or MI stainless steel sheath, terminated in factory splice to stranded wire connection leads.
			3. MI copper sheath heating cable construction shall consist of MI copper sheath and have a Low Smoke Zero Halogen jacketing (LSZH) to provide corrosion and mechanical protection.
			4. Connection leads shall be of enough length to reach junction boxes or power panel as shown on detailed drawings. Connection leads shall be of stranded wire. Only connection leads in conduit shall exit from heated zone.
			5. Insulator shall be Magnesium Oxide only; a Fiberglass insulator is not permitted.
			6. No combustible materials between heating conductor wire and ground sheath.
			7. Cross section of heated portion of cable not to exceed 0.4 of an inch.
			8. Install heating cable within metallic conduit or directly in concrete 1.5”-3” from finished surface.
			9. Install heating cable within metallic conduit or directly in concrete to each side of every individual rail in accordance with manufacturers installation instructions.
			10. Cable rating shall be:
				1. 120 VAC
				2. 208 VAC
				3. 240 VAC
				4. 277 VAC
	2. CONTROLS
	3. ET02, Automatic Deicing Controller:
		+ 1. Controller shall have:
				1. Manual setpoint temperature.
				2. Settable time duration after sensor has dried.
				3. Fully automatic operation.
				4. Adjustable moisture sensitivity.
				5. Direct connection for activating a heating cable power switching panel.
			2. Controller shall have a minimum of:
				1. One Sensor to sense moisture/ slab temperature sensor.
				2. Remote activation capability.
			3. Controller Activation:
				1. When slab/ambient temperature is less than the setpoint temperature and snow or moisture is present on the sensor.
			4. Controller Deactivation:
				1. System will remain active for the pre-set time duration after the sensor has dried or temperature rises about the setpoint.
				2. Controller settable time duration shall be from 0 to 18 hours.
		1. GFEP Power Control Panel:
			1. Controller shall have:
				1. NEMA 4X painted steel enclosure with one Ground Fault Module protecting all circuits.
				2. CSA us Certified to UL Standard 508A.
				3. One yellow “System On” LED, one white “Control Power ” LED, and one red “Trip Indicator” LED on panel door.
				4. Interior ground fault test button and ground fault dry alarm contacts.
			2. Power Control panel model shall be:
				1. GFEP-2-N
				2. GFEP-4-N
				3. GFEP-6-N
				4. GFEP-8-N
				5. GFEP-12-N
	4. ACCESSORIES

A. Brass Embedded Heating System Marker: Fixed electric cable marker (4” by 5” in size) shall be installed flush with heated surface.

1. NEC Article 426 Section 426-13, Identification, states that embedded electric heater cable equipment must be evident by the posting of appropriate caution signs or markings.
2. EXECUTION

	1. EXAMINATION

		1. Installer to verify the framework is ready to receive work.
		2. Installer to verify field measurements are as shown on Drawings.
		3. Installer to verify that required utilities are available, in proper location, and ready for use.
		4. Beginning installation means installer accepts conditions.

* 1. HANGAR RAIL DEICING CABLE INSTALLATION

		1. Install in accordance with manufacturer’s instructions and shop drawings.
		2. Complete installation shall conform to all applicable codes and shall also be in accordance with manufacturer’s specification

* 1. FIELD QUALITY CONTROL

		1. Test continuity of heating cable.
		2. Test total resistance (TR) using an ohmmeter. The ohmmeter reading should be within 10% of the calculated Total Resistance.
		3. Perform Insulation resistance (IR) or “Megger” test on each heating cable before, during and after installation. Insulation resistance should be greater than 10 megohms.
		4. Measure voltage and current of each cable after concrete has set-up.
		5. Enter the total resistance and insulation resistance readings on the warranty card.

* 1. PROTECTION

		1. Protect installed products until completion of project.

END OF SECTION