


Installation Instructions

SNOW MELT MATS



Warning: Snow melt mats must be installed by a qualified electrician. All assembly, installation, and test instructions must be followed. Improper installation can result in property damage, serious injury, or death due to electric shock. **DO NOT SHORTEN HEATER LENGTH.** Please call Delta-Therm Corporation at 1-800-526-7887 with any installation or operating questions.

INTRODUCTION

We designed these instructions to help you with trouble-free installation of snow melt mats embedded in either concrete or asphalt. Before you start to install the mats, please read and thoroughly understand these instructions. If you need help while installing the mats, please call Delta-Therm Corporation at 1-800-526-7887.

PLANNING THE INSTALLATION

Before you select mats for a snow melting area, consider the following:

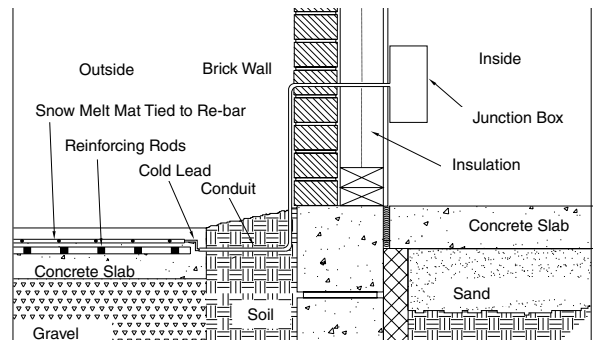
GENERAL

- Measure and plan the area to be heated by snow melt mats, allowing for obstructions such as light poles, columns, and drains. If you desire complete snow removal, select mats to cover the entire area. For large installations, you may wish to melt snow and ice from only the most frequently used areas, such as walkways or truck and auto tracks.
- In some areas, you may need to shape mats around curves and obstacles. To do so, cut mats between cable loops to suit.
- Consider the possibility of planning for separate circuits so that you can independently heat areas within the system as needed.
- Use conduit large enough to accommodate mat cold leads: the diameter of each cold lead is approximately .275" (6.99mm).
- If mats are used in wet locations, ensure that all field connections are waterproof. To ensure a safe and trouble-free snow melt mat installation, use approved exterior-type junction boxes, fittings, and bushings.
- For step mat installation, place mats 1" to 2" (2.54 to 5.08cm) in from the edge of the step.
- All products certified by CSA must be properly identified. Therefore, if you shorten the leads on these mats, make sure that you retain within the junction box a minimum of 6" (15.24cm) of cold lead with the identification tag intact.

FOR CONCRETE

- Determine location of expansion joints. Do not run mats through expansion joints. Doing so can damage cable due to concrete movement.
- Allow 2" to 4" (5.08 to 10.16cm) on each side of the mats for clearance. Allow approximately 4" (10.16cm) between adjacent mats at expansion joints.

- Ensure adequate drainage to prevent accumulation of water and resultant heaving (frost damage).
- Provide a concrete slab at least 4" (10.16cm) thick. In the mix, use crushed rock aggregate, not river gravel.
- Provide suitable reinforcing. Refer to Detail 1.

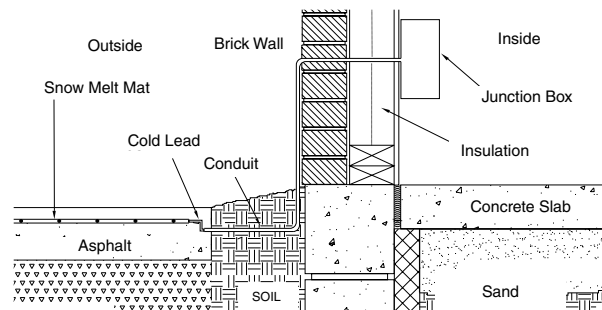


Detail 1.

- Provide a sufficient number of expansion joints.
- Embed mats 1.5" to 3.5" (3.81 to 8.89cm) below the finished surface according to the National Electrical Code, Article 426-20.
- For a brick paver top, embed mats in concrete no less than 1.5" and no more than 3" (3.81 no more than 7.62cm) below the paver top.
- Use a winter formulation for concrete in freezing weather.


FOR ASPHALT

- Select the largest mats which can be used on the straight runs. Place mats 6" to 12" (15.24 to 30.48cm) in from the pavement edge. Do not overlap adjacent mats since doing so may cause excessive temperatures.
- Prepare an adequate base. Refer to Detail 2.



Detail 2.

- Ensure adequate drainage to prevent accumulation of water and resultant heaving (frost damage).



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- When placing mats on existing pavement, either concrete or asphalt, remember that heating wires must be surrounded by new paving material.
- If you see signs of cracking or heaving in the existing pavement, replace the pavement or apply a full base course before placing the mats. Do not place the mats over existing expansion or construction joints.
- Embed mats 1.5" to 3.5" (3.81 to 8.89cm) below the finished surface according to the National Electrical Code, Article 426-20.
- For a brick paver top, embed mats in asphalt no less than 1.5" and no more than 3" (3.81 and no more than 8.89cm) below paver top.
- Use as fine a grade of asphalt as possible for top course. Gravel should not exceed a .375" (9.65mm) diameter.
- Use a winter formulation for asphalt in freezing weather.

JUNCTION BOXES

The ideal location for junction boxes is indoors with at least 18" (45.72cm) of accessible mat leads. When you plan the location of junction boxes, allow for at least one foot of mat lead to remain embedded.

If you must locate junction boxes outdoors, locate them above grade. The junction boxes must be UL listed for rain tight applications. If you must place junction boxes below grade, or in the pavement, use only watertight junction boxes recommended by the box manufacturer. Fill all below-grade junction boxes with Delta Dry or equivalent.

WIRING

Ensure that all wiring conforms to local codes or to the National Electrical Code, or both as applicable. Locate junction boxes so that they can accommodate the maximum number of mats. Use bushings to protect the wire from abrasion where it enters and exits conduit.

Use double-pole, single-throw switches or tandem circuit breakers to open both sides of the line, except where cables are common phase to neutral. Place the switch gear in any protected, convenient location. Consider including a pilot lamp on the load side of each switch to indicate properly functioning mats.

CONTROLS

To prevent the snow melting system from activating during warm weather, use a high-limit temperature control. You can connect an interlock—set at 55°F to 60°F (12.8°C to 15.6°C)—in series with the contactor coil, allowing the system to operate only when below set point.

Consider automatic control of snow mats since it can lower operating costs, improve snow melting efficiency, and ensure

safety. The system activates and deactivates only when specific atmospheric and surface conditions are met, reducing operating time to clear pavement and ensuring operation only when needed. Contact Delta-Therm for descriptions and specifications of Snow Sensing Systems.

TESTING THE MATS

To help identify damage that has occurred in shipment, or as a result of improper handling on the job site or during the covering operation, Delta-Therm recommends that you perform specific electrical tests on each mat as the installation progresses. Perform the following tests and record the results for future reference.

MEGGER READING

Before, during, and after the installation, test the insulation resistance of each mat by connecting a 500 VDC megohm meter between the copper braid and the inner conductor on one lead. Set the megger at 500V minimum and measure the resistance. The minimum acceptable reading is 10 megohms. Insulation resistance values less than 10 megohm suggest insulation damage which will lead to a hazardous condition and premature mat failure. Repair or replace defective mats before the concrete is poured or the asphalt laid.

RESISTANCE READING

Before, during, and after the installation, measure the resistance of each mat by connecting an ohmmeter between the inner conductors of both leads. Use the table below to determine the approximate resistance for the marked wattage and voltage. Interpolate wattage values if necessary.

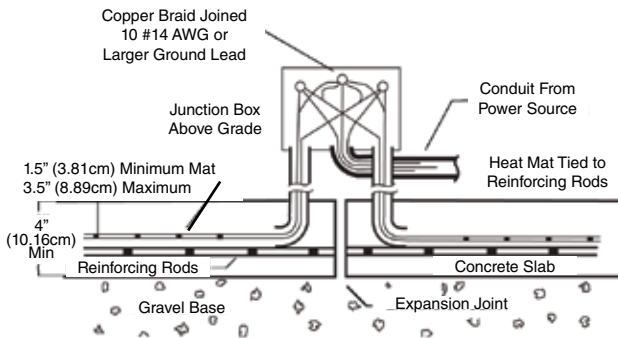
Total Watts	Ohms				Amperes			
	208V	240V	277V	480V	208V	240V	277V	480V
300	144	192	256	768	1.4	1.3	1.1	0.6
400	108	144	192	576	1.9	1.7	1.4	0.8
500	87	115	153	461	2.4	2.1	1.8	1.0
600	72	96	128	384	2.9	2.5	2.2	1.3
750	58	77	102	307	3.6	3.1	2.7	1.6
1000	43	58	77	230	4.8	4.2	3.6	2.1
1250	35	46	61	184	6.0	5.2	4.5	2.6
1500	29	38	51	154	7.2	6.3	5.4	3.1
2000	22	29	38	115	9.6	8.3	7.2	4.2
2500	17	23	31	92	12.0	10.4	9.0	5.2
3000	14	19	26	77	14.4	12.5	10.8	6.3
4000	11	14	19	58	19.2	16.7	14.4	8.3
5000	9	12	15	46	24.0	20.8	18.1	10.4
6000	---	---	13	38	---	---	21.7	12.5
7000	---	---	---	33	---	---	---	14.6



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INSTALLING THE MATS IN CONCRETE

1. Take initial megger and ohmmeter readings on each mat to ensure that no damage occurred in shipping.
2. Thread mat cold leads through conduit stubs and bushings into junction box(es). Do not exert undue force when you pull the cold leads. Using excessive force could damage the hot-cold splice.
3. Position the mats according to plan. (Do not allow workers to walk on mats at any time.)
4. Roll up mat and begin to pour concrete.
5. Pour concrete to within 2" (5.08cm) of the finish level and roll mat over wet concrete. Then complete the pour and finish the surface. Each slab area within expansion joints should be individually poured and finished.
6. When the slab can be walked on, make splices within the junction boxes and install the feeder lines. Twist together a length of the copper grounding braid from all leads and positively connect to a continuous No. 14 AWG or larger insulated copper wire extending to the distribution panel ground. Refer to Detail 3.



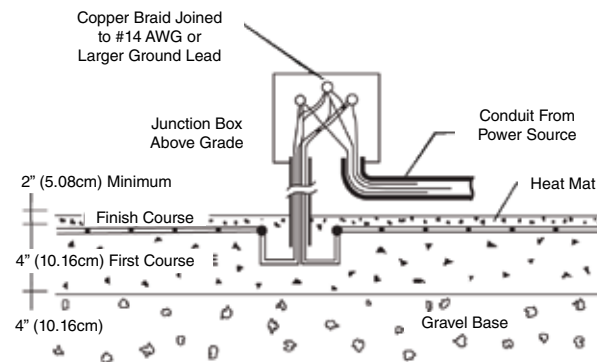
Detail 3. Concrete Slab

7. Secure all splices with approved, pressure-crimped connectors or set-screw-type wiring clamps. Thoroughly tape all power splices with plastic electrical tape. All connections in below-grade junction boxes must be protected with Delta Dry or equivalent.
8. Do not energize the mats until the concrete has thoroughly cured.

INSTALLING THE MATS IN ASPHALT

1. Take initial megger and ohmmeter readings on each mat to ensure that no damage occurred in shipping.
2. Thread mat cold leads through conduit stubs and bushings into junction box(es). Do not exert undue force when you pull the cold leads. Using excessive force can damage the hot-cold splice.
3. Lay and roll the base course, then apply a coat of bituminous binder.

4. Position the mats according to plan, then apply a coat of binder over them. If you place the mats on an existing surface, be sure to sweep it thoroughly to remove any sharp material that could puncture cables during the installation. Ensure that cold leads are positioned at or below mat level. Do not allow workers to walk on mats.
5. Lay the 2" (5.08cm) top coat, covering the entire mat in one continuous slab. Roll the topcoat. Take megger and ohmmeter readings on each mat during and after the roll to check for installation damage.
6. On resurfacing jobs where frost heaving or cracking has occurred, either replace pavement or proceed as follows: apply a full base course, then binder, then the heat mats, then more binder followed by a finish course. When raking and spreading the asphalt, ensure that you do not damage mats or disturb their position. Do not use spades or steel shovels since they can cut cables. Roll paved area with any size power roller. Never stop the roller on a grade while compacting the second course. Doing so could cause asphalt to slide, thereby damaging mats. Hand tamp around junction boxes.
7. Install the feeder lines. Make splices within the junction boxes. Twist together a length of the copper grounding braid from all leads and positively connect to a continuous No. 14 AWG or larger insulated copper wire extending to the distribution panel ground. Refer to Detail 4.



Detail 4. Asphalt Slab

8. Secure all splices as required. Thoroughly tape all power splices with plastic electrical tape. All connections in below-grade junction boxes must be protected with Delta Dry or equivalent.
9. Do not energize the mats until the asphalt has hardened.

ACCESSORIES

- Pre-punched stainless steel strap (T-SSS)
- Snow sensing control (DTC120-S)
- Snow sensing control (MPS)
- Temperature control (A19ANC-1)
- NEC Brass Plate

TECHNICAL SUPPORT

If you need help while installing our products, please call Delta-Therm at 1-800-526-7887.



Grid provided for Snow Mat layout plan.

