MSP-1 In-ground Moisture Sensor for MSC-1 Panel for Snow & Ice Melting Installation & Operation Instructions

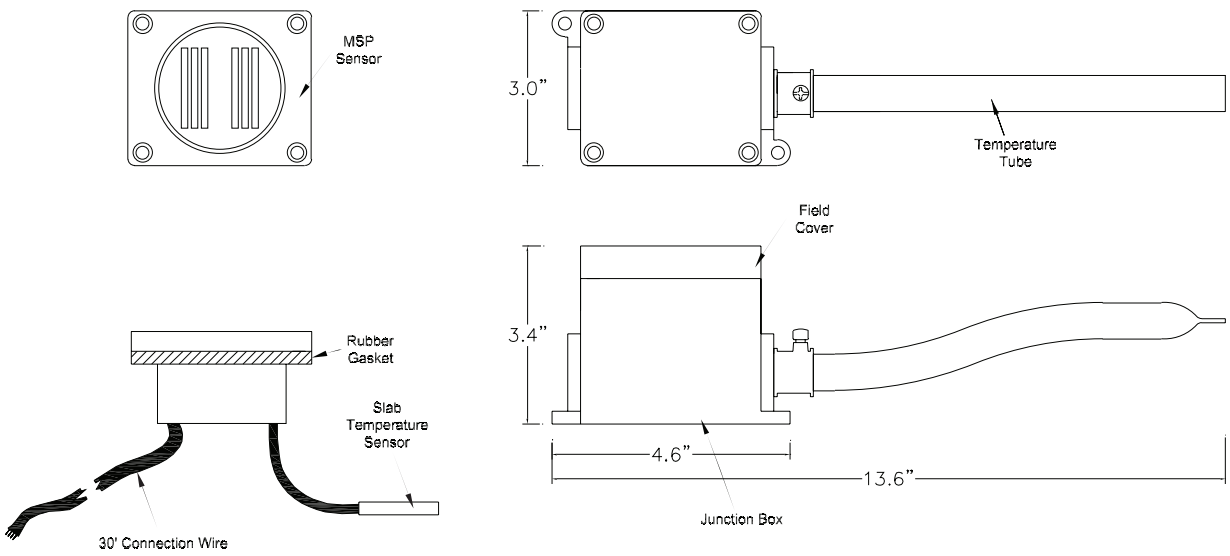
GENERAL

The MSP-1 in-ground sensor is encased within a rugged enclosure and is intended to be embedded within the surface being heated, usually concrete or asphalt. The MSP-1 is supplied with a protective field cover to simplify asphalt or concrete installations, and comes with 30' of wire for connection back to the MSC-1 control unit. The sensor has an integral ½" NPT conduit connection. The MSP-1 connection wire may be extended up to 500' with an appropriately rated 18AWG 4 wire shielded stranded cable.

The low voltage MSP-1 senses falling or drifting snow by melting it on the "grid" area of the sensor and then detecting the presence of moisture by measuring an electrical signal between the grid bars. The MSP-1 also measures the temperature of the surface. This "dual sensing" technique allows the MSC-1 to control the heating equipment (mats, cables, etc.) in the optimum manner possible. This assures minimum energy costs while still providing reliable surface snow detection.

The main components of the MSG-1 are shown in Fig.1.

Figure 1



WARNINGS

1. This is not a "do-it-your-self" product. A qualified electrician must install the MSP-1.
2. If after carefully reading these instructions you still have questions regarding installation, operation or maintenance of this product, call the numbers listed for assistance.
3. Prior to installation, check the MSP-1 body, enclosure and wires for possible shipping damage. Do not install a damaged MSP-1 sensor.
4. All heating equipment, controls & associated systems must be installed in compliance with the latest editions of all applicable electrical codes and ordinances.
5. The MSP-1 has been designed for the sole purpose of connection to an EasyHeat MSC-1 Control Panel. The risk of fire or electric shock exists if the MSP-1 is connected to any device other than an MSC-1 Control Panel.
6. These instructions must be saved and made available to owners or users of this product and/or transferred to future owners.
7. The MSP-1 must be located within the heated area, in a spot which gets a snowfall accumulation representative of the entire heated area. Do not locate in an area of heavy traffic, such as a tire track, this may damage the sensor and prevent it from working. Make sure the location chosen will drain the melted snow; if the MSP-1 is located in an area where melting snow or other debris will pool the sensor will not function properly.
8. Do not install an MSP-1 Sensor when the ambient temperature is colder than 32°F (0°C). Installing the sensor below this temperature will damage the connection wire and result in the risk of fire or electrical shock.
9. Ensure that MSP-1 junction box is installed such that water will drain from within the box and that the field connected conduit is sealed at the junction box to prevent water backing up into the conduit. Failure to ensure drainage or failure to seal may result in situations that damage the sensor and prevent it from functioning properly.

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INSTALLATION INSTRUCTIONS

1. The MSP-1 should be located in area that best represents the zone being heated. Placement must be made in a reasonably level area, where surface drainage is unimpeded and free of debris accumulation. Avoid unusual sunny spots or standing water areas, both may adversely affect snow-sensing performance. Ensure the MSP-1 junction box rests on a drainage bed. It is recommended that a drainage pipe (approx. 1" dia.) be positioned below the box. If the MSP-1 mounting location is further than 30 feet from the MSC-1, then the MSP-1 connection wire must be routed to a junction box, and additional connection wire (up to 500´ with an appropriately rated 18AWG 4 wire shielded stranded cable) must be routed from the junction box to the MSC-1. Ensure that all electrical connections into a junction box are water-tight as appropriate. See Fig.2, Fig.5.
2. The MSP-1 box is supplied with a field cover to prevent it from being accidentally filled with asphalt or concrete during surfacing operations. After surfacing operations are completed the top of the field cover must be level with the top surface of the pavement or concrete. Prior to surfacing, adjust the height of the box up or down as necessary to maintain the level. See Fig. 2.
3. The MSP-1 box should be installed at the same time as the snow melting equipment. Centre the box between parallel runs of heating cable, with the temperature tube running centred between the parallel heater runs. Connect supply conduit to the box as required. See Fig. 3.
4. Once the surface material has cured the MSP-1 sensor may be installed. Remove the field cover. Fish the connection wire through the conduit back to the MSC-1 or junction box. Feed the MSP-1 slab temperature sensor into the temperature tube, until it reaches the end. Seal the connection wire in the conduit against water. Set the sensor into the box and secure with the screws provided. See Fig. 4.
5. The MSP-1 is wired directly to the appropriate zone sensor terminal block on the MSC-1 control panel.

Figure 2 - MSP-1 Junction Box Section View

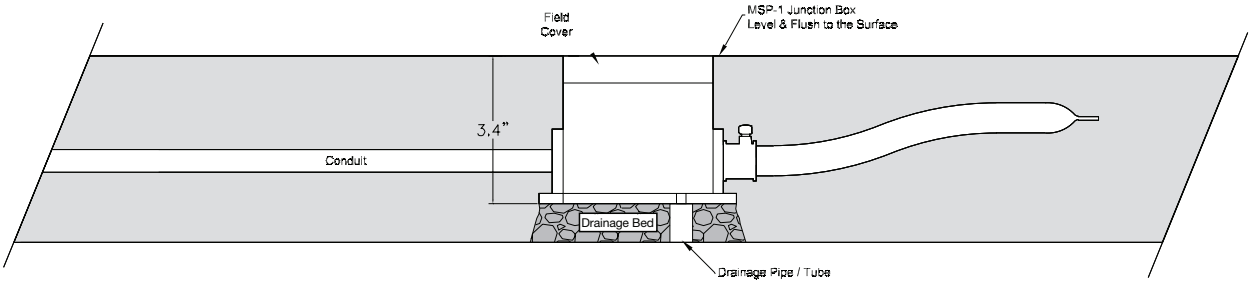


Figure 3 - MSP-1 Junction Box Installation, Plan View

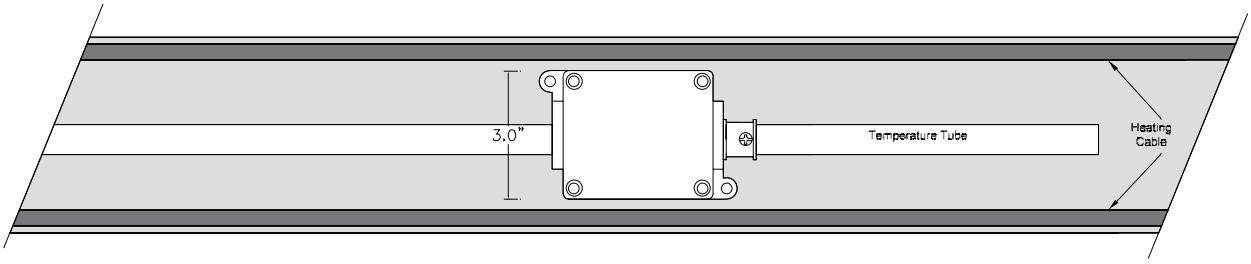
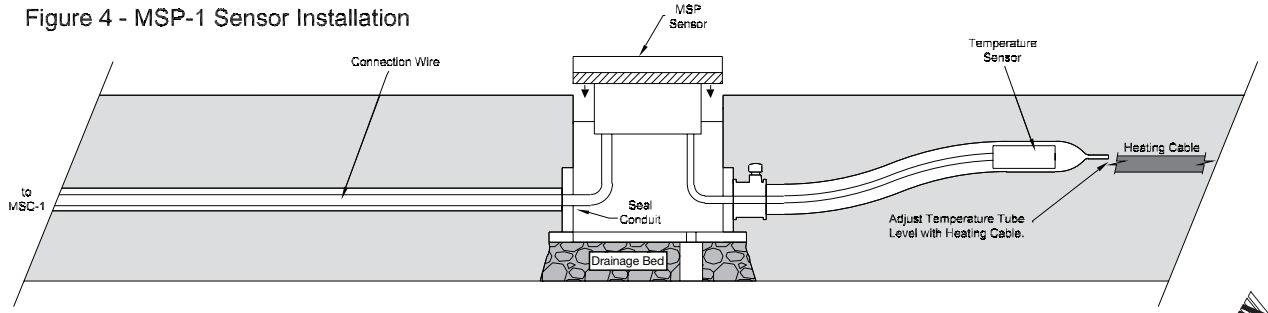


Figure 4 - MSP-1 Sensor Installation



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Figure 5 — MSP-1 Connection Reference

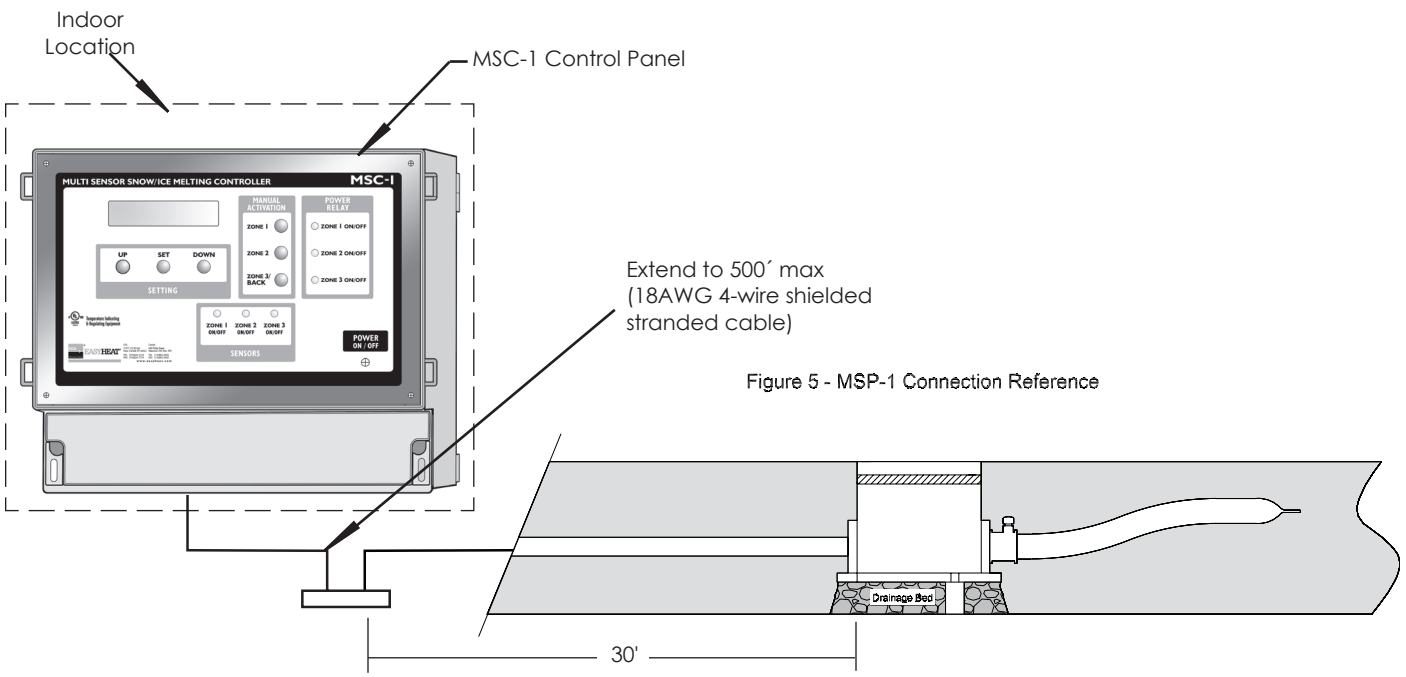


Figure 5 - MSP-1 Connection Reference

OPERATION INSTRUCTIONS

The MSP-1 snow melting control is designed to send a signal to the MSC-1 control panel indicating when snow or ice conditions exist. The MSC-1 control panel uses this information, along with temperature data from the TS-1 to determine when de-icing equipment should be energized.

The MSP-1 may be tested for functionality if the outside temperature and the heated slab temperature is below 3°C (37°F). Apply a small amount of moisture onto the surface of the sensor, the MSC-1 should energise the heating equipment in the associated zone. After this test, dry the sensor surface, the heating equipment in the associated zone should de-energize after the pre-set hold time.

Every year in the fall the MSP-1 must be inspected for physical damage and to clean up the snow sensor surface. To clean the snow sensor surface:

1. Disconnect MSP-1 from the power supply.
2. Scrub the surface of the snow sensor with a nylon brush.
3. Reconnect MSP-1 to the power supply.

ELECTRICAL SPECIFICATIONS

Environmental

Working temperature	-40°C (-40°F) to 70°C (160°F)
Humidity environment	0 to 100 %

Supply requirements

Power supply voltage	24VAC
Maximum amperage	500mA
Connection Lead length	30 feet

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LIMITED WARRANTY

Easy Heat warrants that if there are any defects in material or workmanship in any heating cable or accessory during the first year after the date of purchase. We will provide new products to replace any defective items, or we will refund the purchase price paid for the accessory or cable, not including any labor or other installation costs. As an alternate, we may elect to repair the cable or accessory at our factory with all shipping and other removal costs borne by the purchaser.

We further warrant that for a period of twelve (12) months after the date of performance any services performed hereunder will be in a good and skillful manner, based on our understanding of pertinent technical data as of the date of performance of such services. Easy Heat's sole responsibility and liability in the event of any defect, error, omission, or failure in the services rendered hereunder shall be to provide corrected services of the type provided for herein, designed to correct such defect, error, omissions, or failure, and in no event shall Easy Heat's liability with respect to such warranty exceed the amount received by it from the Buyer on account of such services.

Our obligation to provide corrected services, new products, refund the purchase price, or perform the repair described above is conditioned upon (a) the installation of the accessory or cable conforming to the specifications set forth in our installation instructions and (b) the accessory or cable not having been damaged by mechanical or electrical activities unrelated to the operation of the accessory or cable.

A refund of your purchase price, provision of replacement products, repair of the accessory or cable or provision of corrected services as described above, shall be your sole and exclusive remedy for a breach of this warranty. THESE ARE THE SOLE AND EXCLUSIVE WARRANTIES GIVEN BY EASY HEAT WITH RESPECT TO THE GOODS AND SERVICES AND ARE IN LIEU OF AND EXCLUDE ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, ARISING BY OPERATION OF LAW OR OTHERWISE, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHETHER OR NOT THE PURPOSE OR USE HAS BEEN DISCLOSED TO EASY HEAT IN SPECIFICATIONS, DRAWINGS OR OTHERWISE, AND WHETHER OR NOT EASY HEAT'S PRODUCTS ARE SPECIFICALLY DESIGNED AND/OR MANUFACTURED BY EASY HEAT FOR YOUR USE OR PURPOSE.

This warranty does not extend to any losses or damages due to misuse, accident, abuse, neglect, normal wear and tear, negligence, unauthorized modification or alteration, use beyond rate capacity, or improper installation, maintenance or application. To the extent that you or your agents have supplied specifications, information, representation of operating conditions or other data to Easy Heat in the selection or design of the Goods and the preparation of Easy Heat's quotation, and in the event that actual operating conditions or other conditions differ from those represented by you, any warranties or other provisions contained herein which are affected by such conditions shall be null and void.

If within thirty (30) days after your discovery of any warranty defects within the warranty period, you notify Easy Heat thereof in writing, Easy Heat shall, at its option, repair, correct or replace F.O.B. point of manufacture, or refund the purchase price for, that portion of the Goods found by Easy Heat to be defective. Failure by you to give such written notice within the applicable time period shall be deemed an absolute and unconditional waiver of your claim for such defects. Goods repaired or replaced during the warranty period shall be covered by the foregoing warranty for the remainder of the original warranty period or ninety (90) days from the date of shipment of the repaired or replaced goods, whichever is longer.

This limited warranty does not cover any costs relating to the repair or replacement of any accessory or cable at the installation site. Our accessories and cables are not easily accessible. A failed accessory or cable usually cannot be easily repaired. Replacement of a failed accessory or cable will require that the materials under which it is installed be removed to permit replacement of the accessory or cable. We will not reimburse any costs relating to the repair or replacement of any accessory or cable at the installation site.

IN NO EVENT, REGARDLESS OF THE FORM OF THE CLAIM OR CAUSE OF ACTION (WHETHER BASED IN CONTRACT, INFRINGEMENT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE), SHALL EASY HEAT'S LIABILITY TO YOU AND/OR YOUR CUSTOMERS EXCEED THE PRICE PAID BY YOU FOR THE SPECIFIC GOODS PROVIDED BY EASY HEAT GIVING RISE TO THE CLAIM OR CAUSE OF ACTION. YOU AGREE THAT WE SHALL NOT BE LIABLE TO YOU OR YOUR CUSTOMERS FOR ANY INCIDENTAL, SPECIAL OR CONSEQUENTIAL OR PUNITIVE DAMAGES. No agent, employee or representative of ours has authority to bind us to any affirmation, representation or warranty concerning the goods sold unless such affirmation, representation or warranty is specifically incorporated by written agreement.

To obtain new products, arrange repair of existing product, or a refund under this warranty, please contact Easy Heat with a description of the defect and proof of purchase at the address noted herein.

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