

Installation and Operation Manual

The Snow Switch® Model SIT-6E Pavement-Mounted Snow and Ice Sensor reliably detects snow and ice conditions on pavement surfaces when used with any APS series or EUR-5A Control Panel. This ensures that deicing heaters operate only while needed which minimizes energy costs without sacrificing snow melting effectiveness. As part of a snow melting system, an SIT-6E sensor will signal for snow and ice melting at pavement temperatures below 38°F (3.3° C) while moisture in any form—including water, snow, sleet or ice—is present. Operation in the 32° to 38°F (0° to 3.3°C) temperature range speeds the process, eliminating otherwise slow melting. A built-in hold-on timer keeps heaters operating for an hour after snow stops to help ensure complete snow melting.

The SIT-6E sensor accurately measures pavement temperature by compensating for its internal heating. This eliminates the cost and complexity of a separate pavement temperature sensor. For improved efficiency, products mount close to the deicing heaters to ensure that pavement and sensor become dry at about the same time.

Packing List

Item description

- SIT-6E Assembly (with 60' leads)
- Installation Manual (this document)
- Duct Seal, 1 lb.
- Screw, Set, Hex Socket, 3/8-16, 0.25" L (Qty 3)
- Screw, Machine, S-BH-SS, #8-32, 0.375 L (Qty. 3)
- Hex L-Key, 3/16

NOTE: The SIT-6E Sensor requires Pavement Sensor Housing with its accompanying installation sheet .

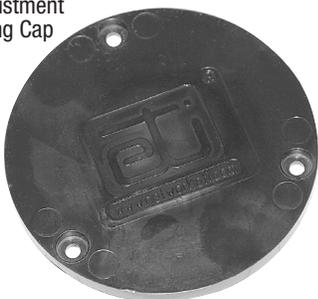
Sensor Housing

General Guidelines

1. For the greatest installation flexibility, use extra pavement sensor housing units per paved slab. NOTE: not all pavement sensor housing units will contain an actual sensor.
2. Prior to paving, make sure the sensor housing units are clear of the heating coil. Do not locate a sensor housing box on top of any portion of the actual heating coil.
3. Because there are two ports on the bottom of each sensor housing unit, dig a little trench slightly deeper underneath each of the housing units to accommodate those ports.
4. Read all enclosed product information sheets for additional information.



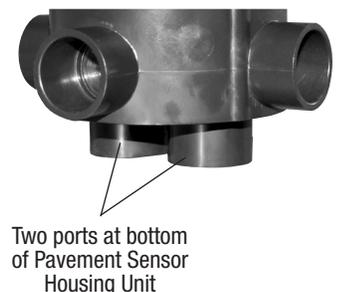
Height Adjustment Ring Cap



Height Adjustment Ring



Pavement Sensor Housing Unit: Height Adjustment Ring cap removed for sensor mounting



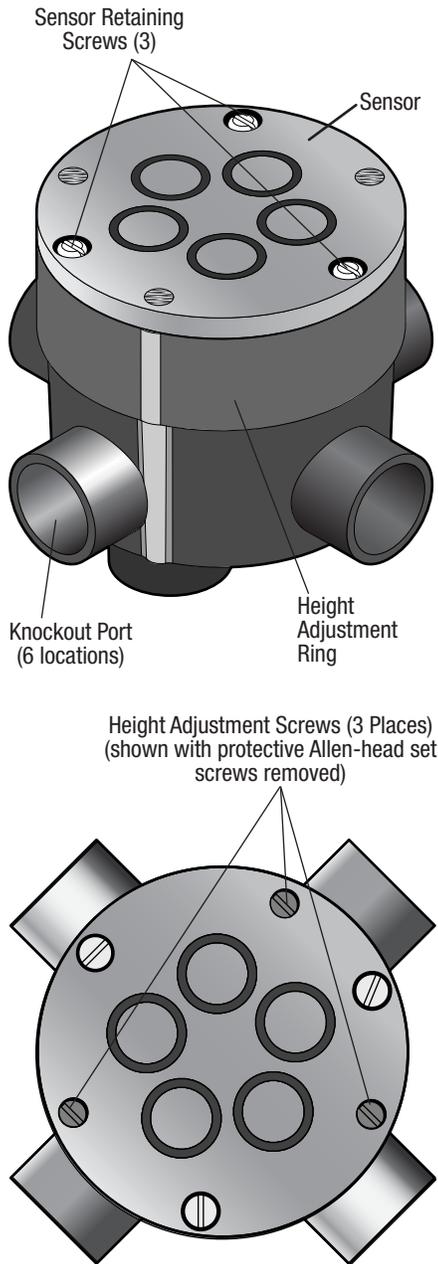


Figure 1. Sensor Housing Adjustment Points

Rotate Height Adjustment Screws to the left to raise the ring or to the right to lower it



Figure 2. Rotate Height Adjustment Screws

Installation Instructions

1. Lay out the sensor housing units or floor boxes according to your plan for the size and shape of the pavement area and traffic overflow area.
2. Using a screwdriver or similar tool, remove the desired knock-out seal(s) from the floor boxes. (Not all are used.) Knock out one of the two bottom seals in each floor box as well for greater stability as described in step 6 below.
3. With the cap off, rotate each of the three height adjustment screws to the left to raise the height adjustment ring between 1/8 and 1/4 of an inch. Refer to Figure 1.
4. Once the adjustment ring has been raised, apply a layer of grease to the outside of the sensor housing body underneath the height adjustment ring. Also apply grease to the adjustment ring itself. Applying plenty of grease ensures the continued and proper operation of the height adjustment ring after the pavement sets up and cures.
5. Rotate each of the three height adjustment screws to the right to lower the height adjustment ring to lowest setting. Put caps back on housing units using the three retaining screws from the accessory kit.
6. Run PVC conduit between the floor box ports opened in step 2, as well as one for the control box wiring. Use PVC glue to secure the PVC conduit in place inside each housing unit port. If not being used for wiring – and unless prohibited by a high water table – *ETI recommends using one of the two bottom ports as a drain with a short piece of conduit extending down past the concrete into sand or gravel to promote draining and to provide greater stability for each floor box.*
7. As the paving material is poured and sets up, make sure the caps of all of the housing units are flush with the pavement. There must be no paving material on the caps of the housing units. Adjust the height flush with the pavement by using the height adjustment ring.
8. To install a sensor into a housing unit, first select the sensor housing unit to be fitted with the sensor. If more than one housing unit has been placed as part of the installation, it is best to select the one it is believed will be closest to the center of the traffic or snow build-up pattern(s).
9. Remove the sensor housing cap from the housing unit by removing the three screws securing it in place. Make sure to retain the cap someplace at the facility in case the location of the sensor needs to be changed in the future and the current housing has to be closed and covered up again.
10. Connect the wires from the power cable inside the conduit to the sensor. Once the sensor is wired, apply duct sealant to protect the installation inside the housing, leaving room for the sensor to be placed down inside the housing. Refer to wiring table below for connections.

Table 1. CABLING CONNECTIONS

CABLE LEAD DESIGNATION	WIRE COLOR WAS	CURRENT WIRE COLOR IS
Sensor 24V	Red	Red
Sensor Ground	Black	Black
Sensor Signal	White	Blue

NOTE: Any designation to sensor white lead applies now to the sensor blue lead.

11. Once the wires are connected, place the sensor down into the housing with the sensor top resting on the top of the housing. Verify that the top of the sensor is flush with the pavement around it. The top of the sensor has three protective set screws, under which are located three access holes to reach the height adjustment screws. As needed, rotate the three adjustment screws (Figure 2) to the left to raise the height adjusting ring or to the right to lower the ring, and then replace the three Allen-head protective set screws (Figure 3). Install retaining screws into the sensor to secure it to the housing.

Conduit

Use individual 3/4" (20 mm) rigid conduit for the entire installed length of the sensor cable, taking care to ensure that all embedded or outdoor couplings and terminations are made watertight. Do not share conduit with other wiring. Do not route conduit across pavement expansion or control joints. For sensors embedded in slab on grade, conduit should be depressed under these joints, as necessary.

Wiring

General Guidelines

1. *It is critically important to use water-tight wiring connections to the sensor.*
2. A three-wire cable is required to connect the SIT-6E sensor to the control panel. Ensure that a direct-burial, wet-environment cable is used. The 60' of cable supplied by the manufacturer meets these requirements. Longer or extension cable is not supplied by the manufacturer.
3. Failing to ensure a suitable environment for the connection cable run – by correctly using conduit, water tight connections and a direct-burial, wet-environment cable – may greatly decrease the life of the sensor and void the manufacturer warranty.
4. Install all cables leads through conduit as indicated in Conduit section.
5. Make sure that all cable runs greater than 60' are spliced together either in the junction box or in some other water-tight location.

Installation Instructions

The SIT-6E sensor is furnished with 60' #18 AWG leads. The red, black, and blue wires connect to the Control Panel via user supplied cable. For proper wiring connections of the SIT-6E sensor to APS-3C, APS-4C, or EUR-5A controls, consult the Installation Instructions for the appropriate Control Panel while referring to Table 1 in this document (page 2).

After wiring the sensor, knead the supplied duct sealant until it is pliable. Pack duct sealant into the sensor housing, leaving enough space for the sensor electronics and wiring. Properly used, the duct sealant will minimize the accumulation of water and ice in the housing and protect against possible ice damage.

Place wiring and electronics into the housing. Check for alignment between the sensor and pavement surfaces. If the sensor and pavement are not aligned, remove the sensor from the housing and adjust the housing flange. The housing flange can be raised up to 0.63" (16 mm) to allow the sensor surface to be aligned with the pavement surface. A low sensor will pool water and not function properly.

Testing

Should paving material or other residue be adhered to the sensing elements, clean the surface with a Scotch™ Brite Pad. **Do not use metallic or coarse abrasives or detergents.**

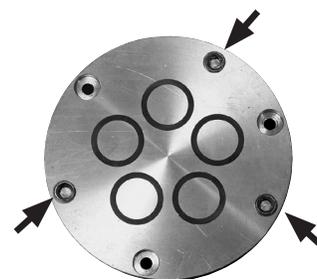
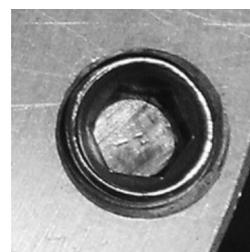
Thoroughly check the system before placing it in service. Our experience shows that installation errors cause the majority of problems. Frequently encountered problems include wiring errors and improper waterproofing. Simple electrical tests and visual inspections can discover potential concerns.

Independent of weather conditions, the functional operation of an installed SIT-6E sensor may be determined using a digital voltmeter (DVM) and a ten pound (4.54kg) bag of crushed ice, in the following manner:

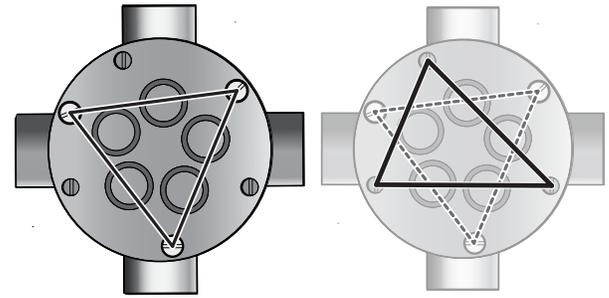
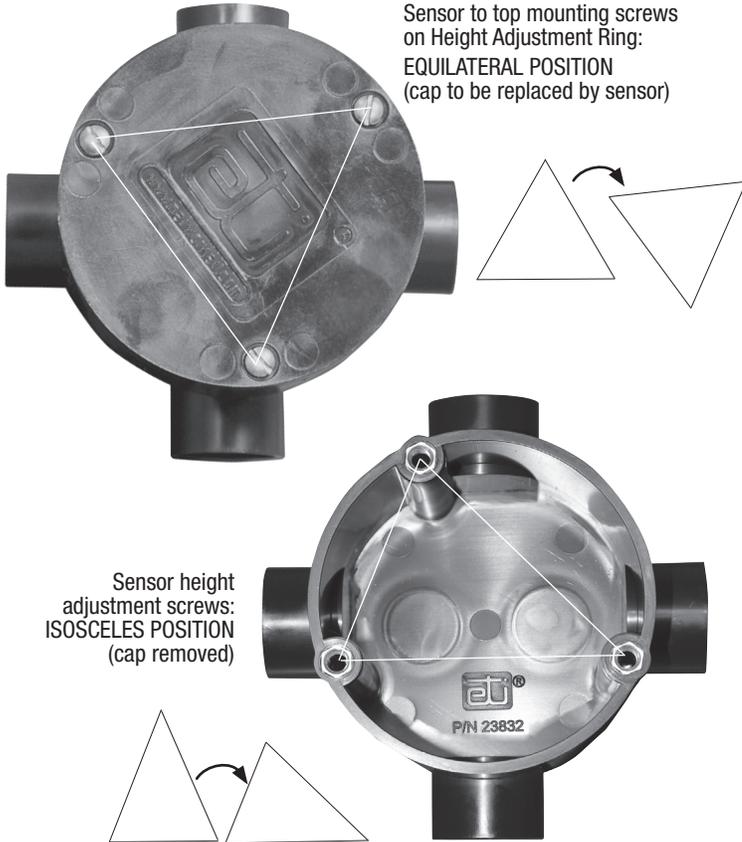
1. With the DVM set the 100 VAC range, verify the sensor supply voltage by connecting the negative (-) test lead to the sensor black wire and the positive (+) test lead to the sensor red wire. Depending on the controller used, a DVM reading between 11-12 VAC or 24-28 VDC is acceptable. An AC component less than 28 VAC is allowed with a DC voltage in the proper range.
2. With the negative (-) test lead remaining in place, reconnect the positive (+) test lead to the sensor blue wire and confirm there is a similar voltage present (may be 1 to 2 volts less).
3. Place the entire supply of crushed ice atop the sensor and allow a time lapse in excess of 20 minutes before observing that a low voltage (2 volts or less) is indicated by the DVM. (A nominal temperature below 38° F (1° C) must be detected before the sensor's normally-open contact is closed. If the sensor surface temperature was excessive prior to commencing this procedure, it will be necessary to extend the cool down time interval by as much as an additional 20 minutes.)
4. With satisfactory results, disconnect the DVM and restore all sensor wiring connections. We recommend the SIT-6E sensor's power supply to operate continuously even though you may elect to de-energize the snow/ice melting system heaters at the season's end. The heat energy dissipated from the internal heater, although modest, will enhance the long-term reliability of the SIT-6E sensor.

Figure 3.
Protective Screws

Replace Allen-head protective set screws once height is adjusted.



Snow Switch Model SIT-6E



Sensor to top mounting screws: EQUILATERAL POSITION

Sensor height adjustment screws: ISOSCELES POSITION

For demonstration only: the sensor height adjustment screws are shown without the sensor-mounted Height Adjustment Ring



For demonstration only: the sensor height adjustment screws shown in position beneath the sensor without the Height Adjustment Ring attached



Helpful Hint

The positions of the *mounting screws* for cap and sensor attachment to the Height Adjustment Ring form the points of an equilateral triangle.

The positions of the *height adjustment screws*, which level the surface of the sensor to the surface of the pavement, form the points of an isosceles triangle.

These positions promote correct assembly of sensor to the height adjustment ring and the pavement sensor housing unit.

LIMITED WARRANTY

ETI's two year limited warranty covering defects in workmanship and materials applies. Contact Customer Service for complete warranty information.

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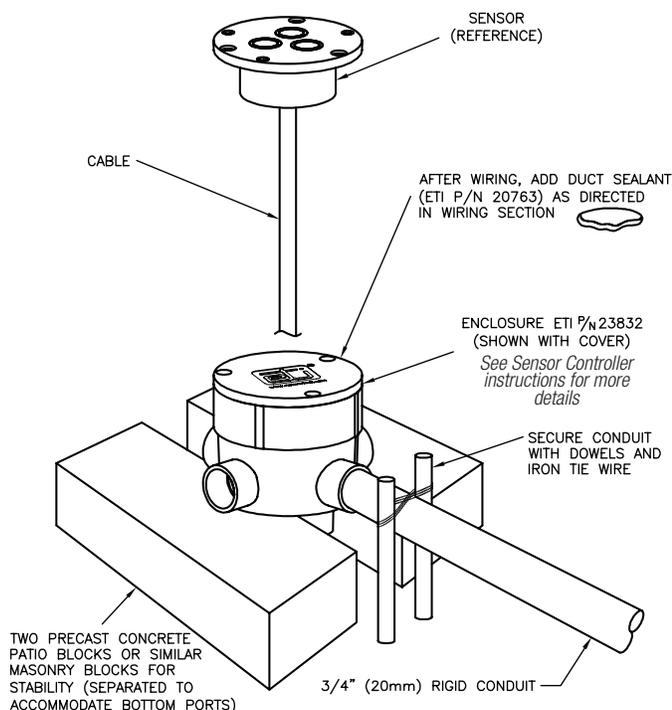
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GENERAL GUIDELINES

1. To provide the greatest installation flexibility, it is advised to use at least three or four sensor housing units per paved slab, even though not all housing units will contain an actual sensor.
2. When the pavement heating coil is laid out prior to paving, make sure the sensor housing units are clear of the heating coil. Do not locate a sensor housing box on top of any of the actual heating coil.
3. Because there are two ports on the bottom of each sensor housing unit, dig a little trench slightly deeper underneath each of the housing units to accommodate those ports.
4. Read all enclosed product information sheets for additional information.
5. For applications using asphalt paving, it is necessary to use a concrete pill box. Ideally, conduit and the pavement sensor housing should be installed as normal. At this time, the sensor should not be installed and the plastic cap should be installed in the pavement sensor housing. Frame an 8" x 8" or larger box, level with the final pavement height. Fill around the pavement sensor housing with concrete. Allow the concrete to cure as per the concrete manufacturer's instructions before laying asphalt. This installation method can also be used with other pavement applications where it may be difficult to form the paving material to the pavement sensor housing; e.g., paver block driveways and patios.

INSTALLATION INSTRUCTIONS

1. Lay out the sensor housing units or floor boxes according to your plan for the size and shape of the pavement area and traffic overflow area.
2. Using a screwdriver or similar tool, remove the desired knock-out seal(s) from the floor boxes. They won't all be used. Knock out one of the two bottom seals in each floor box, as well, for greater stability as described in step 5 below.
3. With the cap off, rotate each of the three height adjustment screws to the left to raise the height adjustment ring between an 1/8 and a 1/4 of an inch. Put caps back on housing units using the three retaining screws from the accessory kit.
4. Once the adjustment ring has been raised, apply a layer of grease to the outside of the sensor housing body underneath the height adjustment ring. Also apply grease to the adjustment ring itself. Applying plenty of grease ensures the continued and proper operation of the height adjustment ring after the pavement sets up and cures.
5. Run PVC conduit between the floor box ports opened in step 2, as well as one for the control box wiring. Use PVC glue to secure the PVC conduit in place inside each housing unit port. If not being used for wiring, it is recommended one of the two bottom ports be used as a drain with a short piece of conduit extending down past the concrete into sand or gravel. This promotes draining and provides greater stability for each floor box. Refer to Figure 1.
6. As the paving material is poured and sets up, make sure the caps of all of the housing units are flush with the pavement. There must be no paving material on the caps of the housing units. Adjust the height flush with the pavement by using the height adjustment ring.
7. To install a sensor into a housing unit, first select the sensor housing unit to be fitted with the sensor. If more than one housing unit has been placed as part of the installation, it is best to select the one it is believed will be closest to the center of the traffic or snow build-up pattern(s).
8. The next step will be to remove the housing cap and install the actual sensor. Refer to the documentation accompanying the sensor for further instructions.



LIMITED WARRANTY

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