

Description

The Snow Switch Model HSC-4 and HSC-5 Pavement-Mounted Deicing Controllers reliably operate snow and ice melting heaters based upon pavement conditions. 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 HSC-4 or HSC-5 controller 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. Once the moisture element dries, the built-in, 1-hour (HSC-4) or 5-hour (HSC-5) hold-on timer keeps heaters operating to help ensure complete snow and ice melting.

The HSC-4 and HSC-5 controllers accurately measure 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.

Inventory

Part no.	Item description
24220	HSC-4 Assembly (with 60' leads)
- or -	
24221	HSC-5 Assembly (with 60' leads)
20932 Rev. E	Installation Manual (this document)
20763	Duct Seal, 1 lb.
21630	Screw, Set, Hex Socket, 3/8-16, 0.25" L (Qty. 3)
11632	Screw, Machine, S-BH-SS, #8-32, 0.375" L (Qty. 3)
21631	Hex L-Key, 3/16

NOTE: HSC-4 (P/N 24220) and HSC-5 (P/N 24221) both require the Pavement Sensor Housing (P/N 23832) with its accompanying installation sheet (P/N 23974).

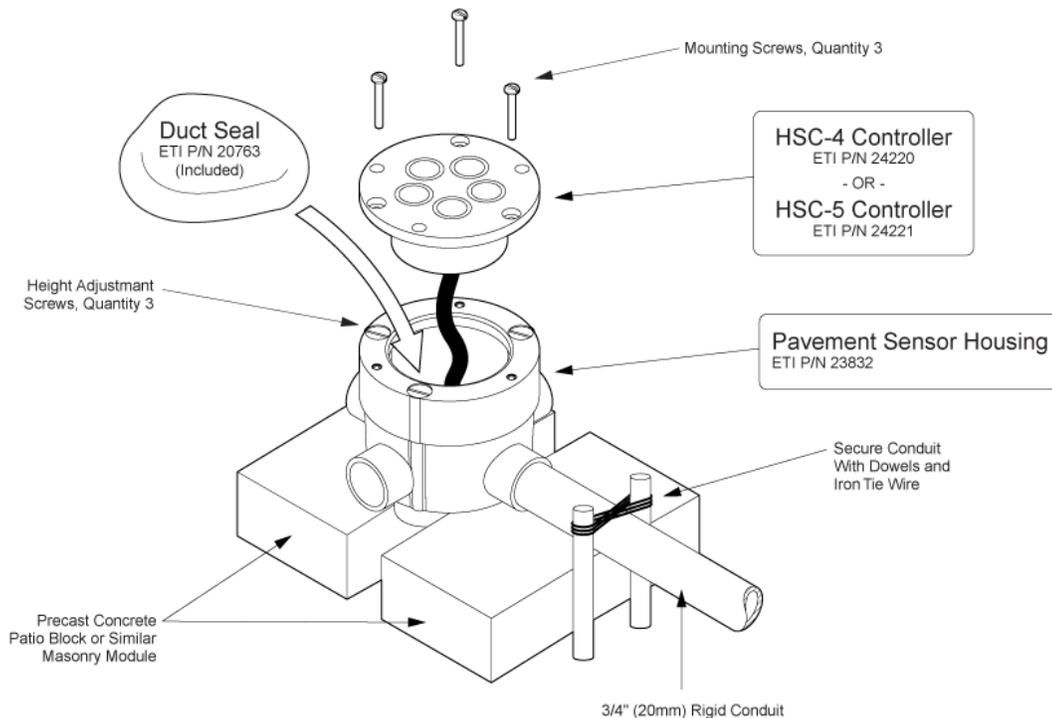
Sensor Housing

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. 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.

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 1/8 and 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, 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. This promotes draining and provides greater stability for each floor box. Refer to Figure 1.



HSC-4/5 Installation Drawing

Figure 1. SUGGESTED SENSOR HOUSING INSTALLATION.

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. 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.
9. Route the 60' leads through the conduit and into the junction box. Once sensor is wired, apply duct sealant to protect the installation inside the housing, leaving room for sensor to be placed down inside the housing.
10. 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. A low sensor will pool water and not function properly. 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 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. Install retaining screws into the sensor to secure it to the housing. Refer to Figure 2.

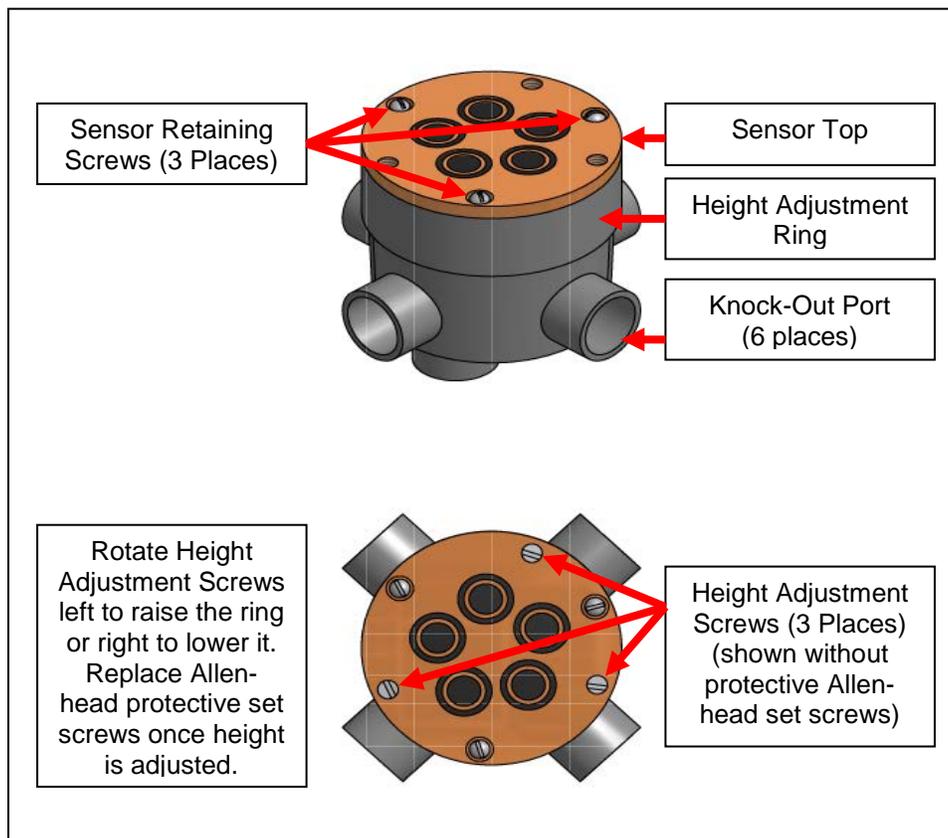


Figure 2. SENSOR HOUSING UNIT WITH SENSOR INSTALLED.

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.

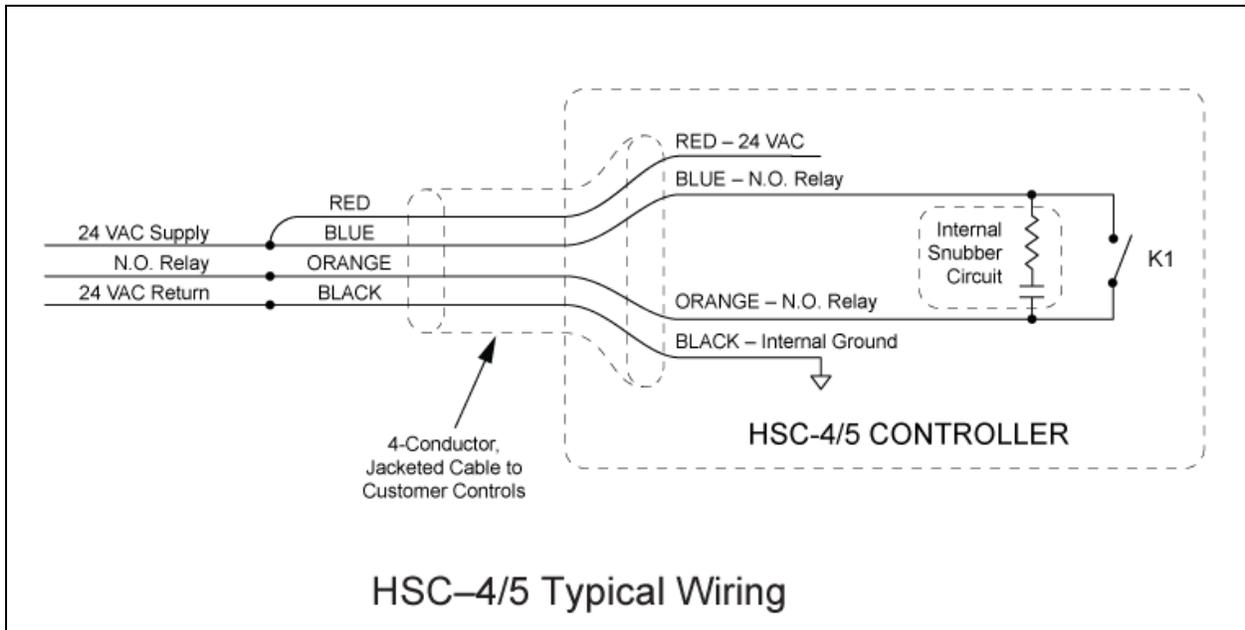
Wiring

The HSC-4/HSC-5 controller is furnished with 60' #18 AWG leads. The unswitched 24VAC power supply is connected across red and black wires, with black being the grounded conductor. Output relay normally-open contact connections are made via the blue and orange relay output wires. Existing installations may use yellow and yellow, or white and green, relay output wires. The relay output wires are not polarized and can be used without discrimination.

After wiring the sensor, kneed the supplied duct sealant till 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.

Install all cable leads through conduit as indicated in Conduit section. Make sure that all cable runs greater than 60' are spliced together, either in the junction box or in some other water-tight location.

Refer to the wiring diagram below.



HSC-4 / HSC-5 WIRING DIAGRAM.

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 identify these problems.

Independent of weather conditions, the functional operation of an installed HSC-4/HSC-5 sensor may be determined using a digital voltmeter (DVM) and a ten pound (4.54kg) bag of crushed ice, in the following manner:

1. If you do not wish to actually energize the snow/ice melting system as a result of this procedure, disconnect the two relay output wires (orange and blue or yellow and yellow or white and green) from the associated control system.
2. 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. A DVM reading between 22 and 28 volts is acceptable.
3. Remove both test leads and connect across the relay output wires (orange and blue or yellow and yellow or white and green).
4. Set DVM to read continuity. There should be an open circuit across the relay wires.
5. Place the entire supply of crushed ice atop the sensor and allow a time lapse in excess of 20 minutes before observing a closed, short circuit between the relay output wires. (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.)
6. With satisfactory results, disconnect the DVM and restore all sensor wiring connections.

QUESTIONS AND COMMENTS

For technical help, questions, or comments concerning this or any Environmental Technology, Inc. product, contact the Customer Service Department between 8:00 a.m. and 5:00 p.m. EST.

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