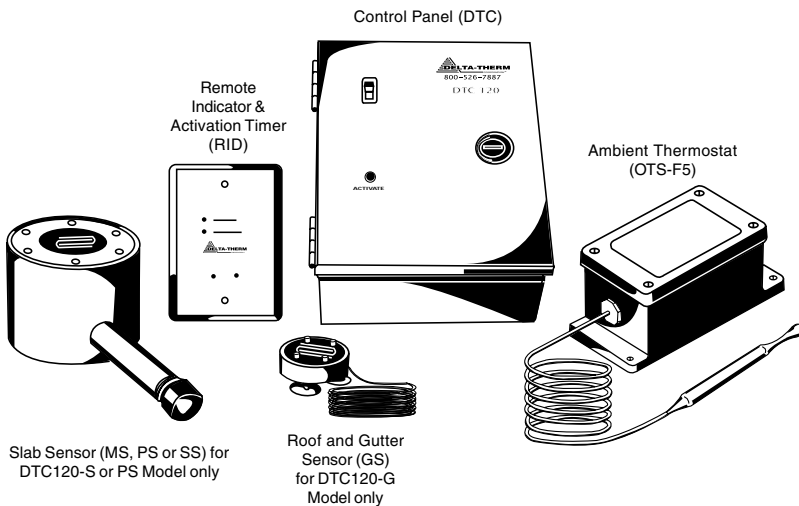


DTC120 SNOW SENSING SYSTEM

The DTC120 is designed to detect snow or ice and automatically activate contactors for snow melting or roof, gutter, and downspout deicing cables. The system will remain activated until conditions at the sensors do not require snow or ice melting.



DTC120-S or PS for Slab Snow Melting

DTC120-G For Roof & Gutter Deicing

100% Factory Tested

Economical

Automatic Start and Stop

Measures Surface Conditions

No Operator Adjustments

Optional Remote Indicator and Activation Timer

1 or 2 Slab Sensors for Snow Melting Mode

Up to 4 Roof Sensors for Roof and Gutter Deicing Mode

Metal NEMA 1 Enclosure

SYSTEM OPERATION

Slab Snow Melting

The system activates when the following three conditions are met:

1. The ambient temperature is less than the set point of 40°F.
2. The slab temperature is less than 40°F.
3. Snow or moisture is present on the sensor.

Once these conditions are met, the heating system remains activated until the slab temperature reaches 60°F (all snow has melted and all water has evaporated) or the ambient temperature exceeds 40°F. The heating system then deactivates and remains deactivated until the three conditions recur.

Roof, Gutter, and Downspout Deicing

The system activates when the following two conditions are met:

1. The ambient temperature is less than the set point of 40°F.
2. Snow or moisture is present on the sensor.

Once these conditions are met, the system activates and checks at 35 minute intervals for moisture on the sensor(s). When no moisture is present on the sensor(s) the system deactivates and remains deactivated until the two conditions recur.

SYSTEM COMPONENTS

Snow Melting

The system consists of a control panel with a 20 AMP N.O. (Normally Open) relay output contact, one or two slab sensors, and one ambient thermostat. The control panel circuit board is equipped with a jumper for selecting slab heating or roof and gutter deicing mode.

The slab sensors can be configured as follows:

1. One main (MS) slab sensor installed to activate the system.
2. Two main (MS) slab sensors installed, either of which can activate the system.
3. One primary (PS) and one secondary (SS) slab sensor is installed. Both must sense conditions for snow melting. This may help prevent false activation.

Each slab sensor is cast epoxy housed in 6061-T6 aluminum corrosive resistant alloy and coated with a nylon powder coat for additional environmental protection against alkalis in concrete. It measures

5" in diameter, 4" deep, and houses the sensing unit, solid state switch and heater.

A low voltage 4-conductor cable is brought from the slab sensor(s) to the control panel. All cable leads are color coded for ease of field wiring.

The ambient thermostat control is located inside a weather proof and corrosion resistant (NEMA 4X) gray thermoplastic noryl enclosure with a 10-foot capillary which allows the enclosure to be mounted either indoors or outdoors. The bulb for this thermostat must be placed outdoors, shielded from the sun.

Roof, Gutter, and Downspout Deicing

The system consists of a control panel with a 20A relay output contact, up to four roof and gutter sensors, one ambient thermostat, and one factory installed roof timer component (RGT). The controller circuit board is equipped with a jumper for selecting slab heating or roof and gutter deicing mode.

The primary roof and gutter sensor is cast epoxy housed in a 2" pvc ring. It measures 2.75" in diameter, .75" deep.

The ambient thermostat control is located inside a weather proof and corrosion resistant (NEMA 4X) gray thermoplastic noryl enclosure with a 10-foot capillary which allows the enclosure to be mounted either indoors or outdoors. The bulb for this thermostat must be placed outdoors, shielded from the sun.

SYSTEM FEATURES

In snow melting mode the primary and secondary slab sensor configuration help prevent activation from accidental moisture such as wet shoes or tires and the ambient thermostat prevents the system from activating at an air temperature above 40°F.

Depending upon the time of day, roof size and design, sunlight can cause varying roof temperatures and conditions. In roof and gutter deicing mode the four roof and gutter sensors detect moisture presence in four different gutter locations, any of which can activate the system. The ambient thermostat prevents the system from activating at an air temperature above 40°F.

Operation Sequence

Snow Melting

Closing the "Control On/Off" switch illuminates the control on/off light, indicating control power. If the ambient thermostat and slab sensor indicate temperature below the setpoint of 40°F and the slab is less than 40°F, the unit is in the ready state. The system activates when moisture is sensed. This closes the relay contacts which can switch power to contactors and also activates the front panel "Activated" light.

Note: The rating of the N.O. contacts in the control unit are 20A resistive at 120 VAC.

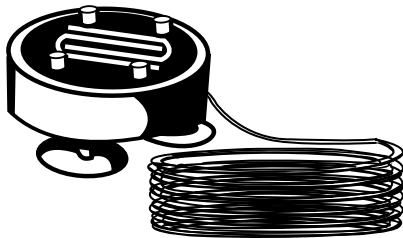
When the system senses snow and the output relay energizes, the system remains energized until the protected area heats to approximately 60°F, ensuring complete removal of ice or snow. This feature prevents the power contactors from short cycling or chattering. The slab sensor detects the temperature of the protected area. When the temperature of the protected area drops below 40°F, the sensor resets for another detection cycle.

Roof, Gutter, and Downspout Deicing

Closing the "Control On/Off" switch illuminates the control on/off light, indicating control power. If the ambient thermostat indicates temperature below the setpoint of 40°F the unit is in the ready state. The system activates when moisture is sensed. This closes the relay contacts which can switch power to contactors and also activates the front panel "Activated" light.

Note: The rating of the N.O. contacts in the control unit are 20A resistive at 120 VAC.

When the system senses snow the output relay energizes. The system checks for moisture on the sensor every 35 minutes. When moisture is not detected the system turns off.



Moisture Sensing

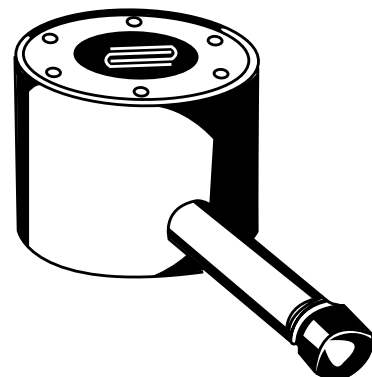
Operation relies in part on the electrical resistance difference between a dry surface and a relatively wet one. This difference can be sensed by closely spaced, mutually insulated electrical conductors. When the conductors receive low electrical potential and the surface is dry, no leakage current flows between the conductors. When wet, the conductors detect a leakage current which signals the presence of moisture. The leakage current between the sensing units of the moisture sensor is DC, and is limited to approximately 200 microamps.

This sensing method performs adequately as long as the moisture bridging the conductors is in the liquid state. Because ice and snow, under some atmospheric conditions, have an electrical resistance similar to dry air, a resistive response sensing element cannot reliably sense them. Therefore, a heater is located near the surface of the sensor. When the system is in a ready state, voltage is applied to the heater, which melts any snow or ice that has collected on the sensor, which activates the system. Installation of the sensors in the heated areas allows system heat to dry the sensing unit.

To provide a useful signal (that is, operate a relay), the leakage current from the sensing unit triggers the solid state device in the sensor. With the solid state device in the sensor instead of in the control box, the lead length between the sensor and the control box doesn't affect sensitivity.

Maintenance

The only field maintenance required is surface cleaning of the sensing units prior to the winter season. Washing the sensors with a mild soap solution and bristle brush will remove oil, dirt, or any other foreign substance that may have accumulated.



Mutually Insulated Electrical Conductors are located on top and bottom of the sensor unit. The conductors are made of copper and are coated with an epoxy resin.

MI Manufacturing Group, LLC

1802 North Carson Street Carson City, NV 89701

Primary slab sensor embedded flush with floor surface. Secondary sensor flush with floor surface.

1-866-770-9416

100% Factory Tested

All controls and sensors are functionally tested and must activate a contactor before shipping from the factory.

Automatic Shutoff

For slab snow melting, the system is designed to deactivate automatically at 60°F — when all snow has melted and all water has evaporated. For roof and gutter the system checks the sensors for moisture on 35 minute intervals. The system deactivates if no moisture is present.

Economical

The system activates only when specific atmospheric and surface conditions exist. The system automatically deactivates when it is no longer needed, helping keep utility costs to a minimum.

Measures Surface Conditions

When in snow melting mode the control measures slab temperature, ambient temperature and moisture conditions on the slab with 1 or 2 sensors.

When in roof and gutter deicing mode the system measures ambient temperature and moisture conditions on the roof with up to 4 sensors.

Helps Eliminate False Activation

When in snow melting mode the control will activate only when the slab temperature drops below 40°F, the air temperature drops below 40°F, and moisture is present on any one or two sensors. Installing a primary & secondary snow melting sensor helps prevent accidental activation of the system. Both must sense conditions for activation, specify PS & SS on order

When in roof and gutter deicing mode the control will activate only when the ambient temperature drops below 40°F, and moisture is present on any of up to four sensors.

DTC120-S Base Model

1 - DTC	DTC120-S Adders:
1 - MS	1 - MS
1 - OTS-F5	1 - RID

DTC120-PS Base Model

1 - DTC	DTC120-PS Adders:
1 - PS	1 - RID
1 - SS	
1 - OTS-F5	

DTC120-G Base Model

1 - DTC	DTC120-G Adders:
1 - RGT	3 - GS
1 - GS	1 - RID
1 - OTS-F5	

Part No.	Description
DTC	Control Panel
RGT	Roof Timer (factory installed component in DTC)
RID	Remote indication and activation timer option
GS	Roof and gutter sensor
MS	Main slab temperature/moisture sensor
PS	Primary slab temperature/moisture sensor
SS	Secondary moisture sensor
OTS-F5	Ambient Thermostat

No Operator Adjustments

The system operates automatically. The optional remote indicator and activation timer option will allow an operator to remotely activate and monitor the system.

Remote Indicator and Activation Timer

The Delta-Therm system automatically deactivates when specific conditions exist. Systems operating on a timer may remain activated after the heated surface has dried.

An optional remote indicator and activation timer can be mounted up to 100 feet from the control unit. The indicator alerts the user when the system is on. The activation timer allows the user to heat a slab for 5 hrs and roof cable for 75 minutes.

UL Listed

This system is listed by Underwriters Laboratories.

2 Sensors For Snow Melting Mode

The system uses an ambient thermostat, and 1 or 2 slab sensors. This ensures that the melting system is activated only when appropriate conditions exist.

4 Sensors For Roof & Gutter Deicing Mode

The system uses an ambient thermostat and up to 4 moisture sensors. This ensures that the melting system is activated only when appropriate conditions exist.

Replaceable Sensors

If for any reason a moisture sensor becomes inoperable, it is easily replaced. Unscrew the top of the snow melting sensor container and replace the sensor. Remove the roof & gutter sensor and rewire the new sensor.

Disclaimer

Delta-Therm reserves the right to make changes and improvements to the products described and to revise this publication without notice.

Limited Warranty

Two year limited warranty covering defects in materials and workmanship.