

DTC-24 CONTROL SERIES

Snow Melting or Roof and Gutter De-icing Control



Detail 1. DTC-24R model; control panel with RG sensor and VHB pad.



Detail 2. MP Sensor.



Detail 3. MMP Sensor.

DESCRIPTION

The DTC-24 is designed to detect snow or ice and automatically activate a roof de-icing or snow melting cable control panel.

DTC-24 CONTROL

The DTC-24 control consists of a NEMA 4X enclosure with a 2 AMP N.O. (Normally Open) relay output contact and a temperature/moisture sensor. The DTC-24 receives power from an external class 2 transformer.

A low voltage 6-conductor #22 AWG cable connects the DTC-24 control to the sensor. All cable leads are color coded for ease of field wiring.

The DTC-24R comes with a VHB pad for attaching the sensor to the inside of a gutter.

CONTROL FEATURES

- 3-button key pad with single level menu for simple programming.
- LED digital display
 - actual air or slab temperature
 - moisture status (wet or dry)
 - sensor wiring alarm (if open circuit)
 - system status
- Low voltage wiring
- Can be used with optional RID (remote indicating device)
- 0-24 hours adjustable timer, set in increments of one hour with manual timer deactivation
- Manual temperature adjustment
- Dry contact for remote alarm indication

Model #	Application	Standard Sensor		Secondary Sensor		RID
		Model #	Quantity	Model #	Quantity	
DTC-24S	Snow Melting	MP	1	SMP	1	1
DTC-24R	Roof De-icing	RG	1	RGS	3	1
DTC-24A	Snow Melting or Roof De-icing	MMP	1	SMMP	3	1

APPLICATIONS

Snow Melting or Roof De-icing

APPROVALS

Powered by a UL Listed Class 2 transformer

NOMINAL COMPONENT DIMENSIONS

Component	Dimensions
DTC-24 panel	Dia./H/L: 7"/4.75"/2.5" (18/12/6 cm)
MP sensor	Dia./H: 5"/4" (13/10 cm)
MP sensor conduit	Dia./H/L: 3"/4"/6" (8/10/15 cm)
MMP sensor	
RG sensor	Dia./H: 2"/1" (5/2.5 cm)
RG external thermistor	16" (40.6 cm)
RG sensor adhesive pad	2" x 3" (6 x 8 cm)
SMP sensor	Dia./H: 5"/4" (13/10 cm)
SMMP sensor	
RGS sensor	Dia./H: 2"/1" (5/2.5 cm)
RGS sensor adhesive pad	2" x 3" (6 x 8 cm)
RID switch	H/W: 2.75"/4.5" (7/11)

INPUT POWER REQUIREMENTS

24 VAC or 24 VDC

Note: Input power can be provided from a Power Control Panel with G.F.P.E.

SENSOR WIRE EXTENSION CHART

Wire Gauge	Maximum Sensor Cable Length Ft. (m)
16 AWG	1000' (305)
18 AWG	600' (183)
20 AWG	400' (122)
22 AWG	250' (76)

DTC-24 SYSTEM OPTIONS

Part No.	Description
RID	Remote Indication And Activation Timer
RGS	Optional Secondary Gutter Mounted Moisture Sensor
MP	Optional Slab Mounted Temperature/Moisture Sensor
SMP	Optional Secondary Slab Mounted Moisture Sensor
MMP	Optional Aerial Mounted Temperature/Moisture Sensor
SMMP	Optional Secondary Aerial Mounted Moisture Sensor
MPR	Sensor Replacement Kit. Contains Materials To Replace One MP
MMPR	Sensor Replacement Kit. Contains Materials To Replace One MMP
RSW-50	Three Conductor #18 AWG RID Extension Wire
MPSW-50	Non-Plenum Non-UV-Inhibited Rated Seven Conductor #18 AWG Sensor Extension Wire For RG, RGS, MP, or MMP Sensor
MPSWP-50	Plenum Rated And UV Inhibited Six Conductor #22 AWG Sensor Extension Wire For RG, RGS, MP, or MMP Sensor

PRIMARY SENSORS

MP SENSOR

The MP is a slab mounted (flush with the surface) moisture and slab temperature sensor. It is selected when the DTC-24S is being used to control snow melting cables.

MMP SENSOR

The MMP is an aerial mounted ambient temperature and moisture sensor. It is installed when the DTC-24A is being used to control snow melting or roof de-icing cables.

RG SENSOR

The RG is a gutter mounted ambient temperature and moisture sensor. It is installed when the DTC-24R is being used to control snow melting or roof de-icing cables.

OPTIONAL SECONDARY SENSORS

SMP

The SMP is an optional slab mounted moisture sensor. One SMP can be used with the DTC-24S for a total of two sensors.

SMMP

The SMMP is an optional aerial mounted moisture sensor. Up to three can be used with the DTC-24A for a total of four sensors.

RGS

The RGS is an optional gutter mounted moisture sensor. Up to three can be used with the DTC-24R for a total of four sensors.

OPTIONAL TRANSFORMER

DTC-TRANSFORMER

120 volts to 24 volt DT wall mount plug-in transformer class 2, 28.5 watts. It is required with load switching panels that do not provide a 24 VAC or 24 VDC power source.

The DTC-Transformer will not be required when the DTC-24 is installed with the Delta-Therm Power Control Panel with G.F.P.E.

SYSTEM OPERATION

The DTC-24 control continually monitors conditions at the sensor. Once the following two conditions are met the roof de-icing or snow melting system is activated:

1. Ambient temperature at the thermistor is below set-point.
2. Snow or moisture is present on the sensor u-shaped clips.

When moisture is no longer detected on the sensor, the roof de-icing or snow melting system will continue to operate for the adjustable internal timer duration and then shut off.

The roof de-icing or snow melting system will remain inactive until the two conditions are met again.

100% FACTORY TESTED

All control components are functionally tested and inspected.

COMPONENT LOCATION

The control can be installed outdoors or indoors. Once the control is mounted you can connect the sensor. You can connect the sensor using the supplied wire or extend the sensor by splicing on extension wires.

MAINTENANCE

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

AUTOMATIC SHUTOFF

The roof de-icing or snow melting system will automatically shut off when one of the conditions at the sensors ceases and the selected time duration ends.

ECONOMICAL

The roof de-icing or snow melting 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.

OPTIONAL REMOTE INDICATOR AND ACTIVATION TIMER (RID)

The optional RID will allow an operator to remotely activate and monitor the system. The RID can be mounted up to 100 Ft. (30m) from the DTC-24 control panel.



The RID switch can be used to manually activate the roof de-icing or snow melting cable(s) using the RID's internal 75-minute or 5-hour timer. Use the jumper pin on the back of the RID to select the timer setting.

When the RID activates the cable(s); it can also deactivate the cable(s) if the DTC-24 sensor(s) have not called for the roof de-icing or snow melting cable to be activated.

When the RID activates the roof de-icing or snow melting system the "system on" light will be on to indicate activation and the "timer on" light will blink on/off to indicate that the system is being activated by the timer.

The roof de-icing or snow melting system will either turn off when the RID times out or remain activated by the sensor(s).

When a DTC-24 sensor activates the roof de-icing or snow melting system, the "system on" light will be on and the "timer on" light will be off.

The RID reset function will only reset the RID and turn off the roof de-icing or snow melting system if no sensors are requiring system activation. If a sensor is requiring system activation and the timer reset button is pushed, the timer will stop but the system will remain on until the sensor is satisfied.

PROGRAMMING

The banner heading “Delta-Therm Corp Heat Trace CTL” is displayed after applying power to the control panel. After the banner heading is displayed the LED screen will display the temperature as detected by the sensor and the control panel setpoint temperature.

If the keypad is locked-out, move the red dipswitch on the inside cover into the enable position.

FACTORY DEFAULT SETTINGS:

Setpoint Temperature = 40°F

With sensor dry continue: 2 hrs.

Temperature cannot be set lower than 20°F.

PROGRAMMING SETPOINT TEMPERATURE AND COUNTDOWN TIMER

There are three dual purpose selector push-buttons: “ENTER/MENU”, “YES/arrow pointed up” (referred to as “YES/up”), and “RETURN/arrow pointed down” (referred to as “RETURN/down”). The parameters can be accessed in the following order:

1. **To access parameters:** Press the “ENTER/MENU” button for up to 4 seconds and the LED screen will display: “Set-up & reset”. Release button and wait for the “Setpoint=40F” message to display.
2. Press the “YES/up” arrow button to raise the setpoint temperature. Press the “RETURN/down” arrow button to

lower the setpoint temperature.

3. When the LED screen displays your setpoint temperature press the “ENTER/MENU” button and “With sensor dry continue: 2hrs.” will display.
4. **To enter the countdown time:** After the “With sensor dry continue: 2hrs.” is displayed you can change the count down timer setting from 0 hours to 24 hours. Press “YES/up” arrow button to raise the count down timer up to 24 hrs. Press the “RETURN/down” arrow button to lower the count down timer down to 0 hrs. Press “ENTER/MENU” button to accept the new time duration.
5. The LED screen will display “System Reset?”. Press the “RETURN/down” arrow button to save the settings and return to automatic mode, or press “YES/up” to reset the melting system.

LED SCREEN ALARM DISPLAYS AND RESETTING ALARMS

The “Sensor wire fail” message will display if either of the blue or black sensor wires are open, the sensor heater fails, or the red and green sensor wires are shorted. Please refer to Section 4.3 Trouble shooting and technical support.

LOCKING THE KEYPAD

A red dipswitch, labeled enabled/disabled input, is located on the inside of the enclosure door. Move the dipswitch into the left position to enable the keypad. Move the dipswitch into the right position to disable the keypad.

TROUBLE-SHOOTING

Display does not turn on	- Check 24 vac or vdc voltage at terminals - Check connector on display - Check connector wiring - Check for damage
Keypad does not respond	- Check enable/disable switch - Check connector wiring
Sensor is dry though display says wet or sensor is wet though display says dry	- Check sensor wiring/splices - Replace sensor
Air temperature is different than shown on display	- Sensor in direct sunlight - Sensor is showing slab temperature - Sensor is in contact with warm object - Incompatible sensors used - Temperature accuracy is less below 30°F
Sensor wire fail shown on display	- Check splices and wire for damage - Replace sensor
DTC-24 does not activate power panel	- Check wiring - Check power panel is operational - DTC-24 control contacts are dry, to be used as a single pole switch
RID control is not shown on display	- Only shown when DTC-24 control is not controlling the power panel
System operates after snow is removed	- Reduce countdown time appropriately