



## DANFOSS DS-224/824 Hydronic Snow Melt Controllers/Sensors



### Advanced, Low Voltage and Intuitive

The DS Controllers are primarily designed for hydronic snow melting applications. The DS224 has built in moisture and temperature sensor while the DS824 has a built in temperature sensor and a remote mount moisture sensor (10ft. lead). The units can be powered from a 24VAC/VDC source.

The DS Controllers feature a new Trigger Sensitivity Adjustment. The sensitivity adjustment allows setting the number of seconds the precipitation grid must see continuous rain or snow before the sensor is triggered and ranges from 3 seconds to 4 minutes. A higher sensitivity setting assures quick detection no matter the conditions. A lower sensitivity setting will allow a few stray drops of rain or flakes of snow to be ignored but a heavier downfall will trigger the system.

#### Features:

- Designed for Low Voltage Hydronic and Battery Powered Systems
- Automatic Activation = Lower Deicing Costs
- Reliable Rain and Snow Detection
- 24VAC/VDC Operation, Only 20 VA Required
- Replaceable Precipitation Sensor
- Easy Installation, Full Access to Electronics
- 8 Different Functions
- Adjustable Temperature Trigger Point
- Adjustable Delay Off Cycle, Selectable 30-90 Mins or 2-6 Hrs
- Selectable Low Temperature Cutoff
- Smart "Manual On" Operates for One Delay Off Cycle

## DS-224/824 Specifications

Dimensions	4¾"(120) x 7"(178) x 2¾"(70)
Weight	2 Lbs. (0.9 Kg)
Ambient Temperature	-40°F to +185°F (-40°C to +85°C)
Enclosure Rating	NEMA 3R
Supply Power	22-28VAC/VDC 15VA maximum, 5VA typical
Trigger Temperature	34°F-44°F (1.1°C-6.6°C) Field Selectable
Delay Off (Sensor)	2 Minutes
Delay Off (Controller)	30-90 Minutes/2-6 Hours Field Selectable
Load Contact Capacity	30A @ 24 VAC/100,000 operations minimum at full load
Remote Control and Monitor Contact Capacity	24 VDC/VAC 400mA 10W total

### Technical data

The DS Controllers can be powered from a 24VAC/VDC source. Peak power consumption is 15 VA at startup, 8.5 VA steady state triggered, 5 VA steady state untriggered. Power input is polarity protected for a DC supply. The unit provides a single 24VAC/30A or 24VDC/20A normally open dry contact. This contact is paralleled with a low power contact set to provide remote control and activation monitoring. Operational temperature range is -40°F to 185°F (-40°C to +85°C).

Trigger Temperature (TT) is adjustable from 34°F to -44°F (1°C to -42°C) using an on-board control. When ambient air temperature (AT) is below this trigger point precipitation is assumed to be snow or freezing rain. When above the trigger point, precipitation is assumed to be rain.

"Delay Off" refers to the internal drying cycle timer of the DS Controller. The timer is used to allow the DS Controllers to dry the heated surface through evaporation once precipitation has stopped. The drying cycle reduces the chance that moisture left behind by the melting process will re-freeze into ice. This timer is restarted by each precipitation detection. Therefore, the DS Controllers will continue to operate as long as precipitation and trigger temperature is detected, then for the "Delay Off" time once rain or snow stops. It is assumed that, when operating as a sensor, the controller is supplying an activation signal to an external control system. All "sensor" modes provide a minimum 2 minute closure, reducing cycling of the external controller. The Delay Off cycle has been extended for hydronic applications and is determined by the Long Delay (LD) switch setting, DEL switch setting and the DEL adjustment. Delay Off is 30-90 minutes in non-LD "controller" mode and 2-6 hours in LD "controller" mode.

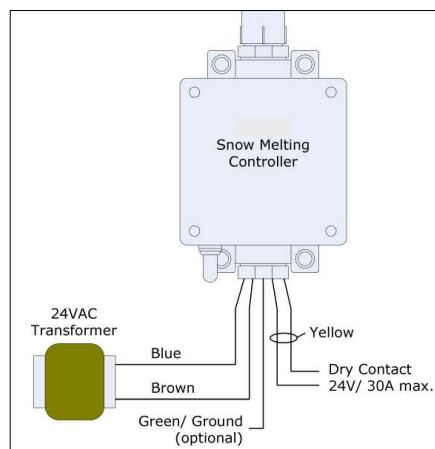
Function	Ambient Temp (AT)	Delay Off (LD Off)	Delay Off (LD On)	Suggested Application
Snow sensor w/o LTC	AT < TT	2 Min	2 Min	Snow and ice alert, Sensor for external deice/snow melt controller (unlimited heat)
Snow sensor w/LTC	TT>AT>15°F (9.5°C)	2 Min	2 Min	Sensor for external deice/snow melt controller (limited heat)
Snow controller w/o LTC	AT < TT	30-90 Min	2-6 Hrs	Stand-alone controller for electric/hydronic snow melting
Snow controller w/LTC	TT>AT>15°F(9.5°C)	30-90 Min	2-6 Hrs	Stand-alone controller for electric/hydronic snow melting

### Ordering Information

Part Number	Description
088L3041	DS-224 Hydronic Snow Melt Controller

Part Number	Description
088L3042	DS-824 Hydronic Snow Melt Controller with 10 ft. sensor cable* *Can be extended up to 30 feet with four-conductor #18 AWG shielded cable

### Typical Wiring



An environmentally sealed control switch is provided. The "Manual On" function activates the controlled equipment for testing and special operational conditions. The "Automatic" position allows the DS Controllers to handle all detections and control. The "Standby/Reset" position disables triggering and can also be used to clear the delay off timer (see below) from true or test activation. If the switch is placed in "Manual On" for less than 2 seconds, then switched back to "Automatic" the controller will execute one delay off cycle. This allows a controlled manual activation of the snow melt system without the fear of forgetting and leaving the system in "Manual On" for an extended and potentially very expensive period of time. "Standby/Reset" can still be used to clear this delay off cycle.

The Low Temperature Cutoff (LTC) option is typically used on deicing or snow melting systems with limited output capacity. If selected, the sensor will not trigger if precipitation is detected below 15°F (-9.5°C). However, if the deicing system has been activated, precipitation continues, and the ambient temperature drops below 15°F (-9.5°C), LTC will be ignored. This assures that water left behind on the surface during the heating cycle will not immediately re-freeze into ice as a result of deactivating the deicing system.

The DS Controllers feature a new innovation, a Trigger Sensitivity Adjustment (TSA). The sensitivity adjustment allows setting the number of seconds the precipitation grid must see continuous rain or snow before the sensor is triggered and ranges from 3 seconds to 4 minutes. A higher sensitivity setting assures quick detection no matter the conditions. A lower sensitivity setting will allow a few stray drops of rain or flakes of snow to be ignored but a heavier downfall will trigger the system.



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