

More For Less

Two-Year Study Shows Delta-Therm's Moderately Priced Controllers Match Costly Competition.

SUBJECT

Before purchasing a snow-melt system, an educated buyer will research the product. Some of the information he'll seek will include the cost of running the system, and how effective it's going to be at melting snow. Which system to choose is another question in need of an answer, so comparison of brands and product features is essential.

Wanting to test a variety of systems, engineers at Delta-Therm Corporation in snowy Wauconda, IL decided to set up a series of tests to evaluate various snow-melt controllers' activation, system activation time, and snow removal capabilities. Data was collected on operating costs to evaluate snow sensor design and placement effectiveness. The systems varied in brand, cost, temperature, display, number of components, and settable parameters. More advanced controls were tested to determine if their performance justified their higher price tag.

METHOD

Delta-Therm's engineer Ed Witte set up six test areas adjacent to the west side of building headquarters. Each test area had the same exposure to extreme Chicago wind and snow conditions over the course of the 2008 and 2009 winter seasons. During that time, Witte recalled, the systems worked under weather that was "typical of Chicago - extreme cold spells and too much snow."

Test areas had 50 watts per square foot and were constructed of wood framing in which snow-melt heating mats embedded in sand were covered with brick pavers. Following manufacturers' guidelines, sensors were placed in heated areas. Remote sensors were also part of the testing process. Witte measured on/off time using hour and cycle counters.



Snow Sensor Test Pad sensing snow and beginning to melt the snow.

High-end controllers included in the test were OJ Electronics Model ET02, and Danfoss Model 850, both of which have a price point of approximately \$3,000. These products were stacked against Delta-Therm's moderately priced DTC120-S, and MPS W/MP, with price points of \$1700 and \$1050, respectively.

RESULTS

"The OJ total on-time was 9% less than the average," said Witte. "The other controllers were within 6% (+/- 3%) of the average on-time."

The following is a cost comparison for a 500 square foot snow melt operating at 50 watts per square foot: Average on-time for OJ's ET02 was 116.8 hours per season, costing \$251.10 based on \$.0862/Kw hour. Comparatively, the average on-time for the Danfoss 850 was 129.8 hours per winter season, identical to the on-time of the Delta-Therm DTC120-S and MPS W/MP, costing \$279.72 for the season, which is a difference of only \$28.62.

According to Ada Cryer, Marketing/Customer Support Manager at Delta-Therm, the OJ system "would take 46 seasons to recoup the additional \$1,300 over the DTC120-S, and 69.89 years to recoup the \$1,950 over the MPS W/MP."

Measurable differences were attributed to on/off power cycling, Witte said, adding that, of the six areas tested, all had similar snow removal results.

As expected, remote sensors did not perform as well as sensors placed within the areas of snow accumulation. Remote sensors were affected by wind and lack of snow cover caused by snow drifting, making them more suitable as redundant sensors or in a retrofit situation where embedding a slab sensor in an existing snow melt slab is impractical.

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RESULTS (continued)

Of the slab sensors under test, only the Delta-Therm sensors include housing for simple sensor replacement. Others require removal of concrete, making the Delta-Therm sensor superior in design.

“Without a housing, not only is concrete removal required but you risk damaging the embedded snow melting cable,” said Witte.

Cryer noted that high-end controls are PLC based with programmable parameters. They were designed to control a hydronic snow melting system where slab, cold water return, and ambient temperatures are typically monitored. The end user is expected to turn off the system when the slab heat loss is greater than the boiler BTU capacity; however, most end users prefer a system to automatically start and stop.

For an additional \$300, Delta-Therm’s moderate end controllers have an optional remote indicator and activation timer for end users who want to monitor system activation.



Snow Sensor Test Pad with snow accumulation.

CONCLUSION

Delta-Therm’s controllers are superior to controllers originally engineered for hydronic systems because they’re designed specifically for electrical slab snow melting which provides immediate even heat across a slab.

In the event of failure, only Delta-Therm’s sensors can be easily removed and replaced because of a unique housing design.

Annual operating costs of electric snow melt systems are not as high as perceived, and outweigh the cost of alternate methods of snow removal such as plowing, shoveling and salting.

The complexity and cost of a snow-melt controller have nominal effects on functionality; therefore, programmable snow melting controls are operationally and economically impractical.



Snow Sensor Test Pad sensing snow and beginning to melt the snow.

Delta-Therm Corp. designs controllers to melt 95 to 98% of snow fall hours at a snow-free ratio of 1, leaving nothing but wet pavement, while hydronic typically design for a snow-free ratio of .5, leaving an accumulating layer of snow.

With regard to average snow melting hours, the Delta-Therm two-year study closely matches A.S.H.R.A.E.’s own study, 129.8 compared to 124, underlining that the A.S.H.R.A.E. tables continue to be a reliable source for calculating operating costs, +/- 10%.

“Results of the study reinforce A.S.H.R.A.E. guidelines, understanding how much heat to put into a slab,” Cryer added.

This and other case studies are valuable tools for Delta-Therm sales reps. ■



Snow Sensor Test Pad has melted the snow accumulation.