

## **CONTROL SYSTEM SPECIFICATION: MODEL SMC**

**AS MANUFACTURED BY HEAT-TIMER CORPORATION  
20 NEW DUTCH LANE, FAIRFIELD, NJ 07004**

### **A WEATHER ACTUATED CONTROL FOR HYDRONIC SNOW AND ICE MELTING SYSTEMS**

The contractor shall furnish and install a microprocessor based control system. The control shall be pre-engineered and programmed exclusively for the operation of "Under Slab" snow and ice melting systems. It shall incorporate the following integrated functions:

Hi/Lo Outdoor temperature cut off; slab temperature and moisture sensing; melting and idle modes of operation; heating system control; circulator(s) control; slab delta T limit; and boiler return limit. The control panel shall be of modular construction to facilitate field modification, upgrading or repair. It shall include the following features:

#### **SENSORS**

The entire sensor circuitry shall be contained on an independent, plug-in printed circuit board, so as to facilitate field modification or repair. It shall be capable of up to 4 inputs. These shall include thermistor type sensors for slab supply, slab return and boiler return temperature feedback as well as an integrated "Snow Sensor" assembly for detection of precipitation and slab temperature monitoring.

#### **IDLE SET POINT**

The control shall incorporate an integral Idle Set Point. It shall be adjustable, in 1° increments, via a multi-turn knob. This set point shall be digitally (LED) displayed at all times. The range of settings shall be 20° to 44°F. The setting selected shall be the slab temperature, which is maintained during the idle mode. The setting shall be stored in EE prom for an indefinite time period.

#### **WARM WEATHER CUTOFF SET POINT**

The control shall incorporate an integral Warm weather Cut Off Set Point. It shall be adjustable, in 1° increments, via a multi-turn knob. This set point shall be digitally (LED) displayed at all times. The range of settings shall be 34° to 44°F. The setting selected shall be the slab temperature below, which the idle mode is activated and is maintained during the "melt" mode. The setting shall be stored in EE prom for an indefinite time period.

#### **COLD WEATHER CUTOFF SET POINT**

The control shall incorporate an integral Cold Weather Cutoff set point. It shall be adjustable, in 1° increments, via a multi-turn knob. This set point shall be digitally (LED) displayed when the appropriate button is pushed. The range of settings shall be 1° to 20°F and OFF. The setting selected shall be the slab temperature, which deactivates the system.

#### **MINIMUM RUN TIME SET POINT**

The control shall provide a Minimum Run Time set point. This shall be adjustable to 0, 1, 2, or 4 hours. The setting selected shall determine the minimum operating time of the Melt Cycle to insure adequate melting and drying.

#### **MAXIMUM SYSTEM SUPPLY TEMPERATURE SET POINT**

The control shall provide a Maximum Supply Temperature set point. The setting selected shall establish the maximum water temperature supplied to the system (tubing and slab). This shall be adjustable from 110° to 190° in 1° increments.

#### **WATER SENSOR SENSITIVITY SET POINT**

The control shall provide a Water Sensor Sensitivity set point. The setting selected shall determine the "Snow Sensors" reaction to moisture and/or other matter contacting it. This shall allow the user to adjust the sensitivity of the sensor to precipitation.

#### **DELTA "T" SET POINT**

The control shall provide a Delta "T" set point. The setting selected shall limit the differential between the system supply and return water temperatures to help protect the slab from thermal stress. This shall be adjustable from 10° to 50° in 1° increments.

## **DIGITAL DISPLAY**

An integral, digital LED display shall be provided. It shall constantly indicate the actual slab temperature. In addition it shall display the system supply temperature, system delta T and boiler return water temperature when the appropriate button is pushed. Additional displays shall constantly show the warm weather cutoff and idle set points.

## **ADDITIONAL INDICATIONS**

LED's shall be provided to indicate Idle Mode active, Melt Mode active, System-in-Alarm, Surface Water Detected, and Warm and Cold Weather Cutoff Active.

## **BATTERY**

A lithium "Coin" type battery shall be contained on the CPU printed circuit board to redundantly backup the control settings in the event of a power outage. Its storage capacity shall be 100 days.

## **SUMMER/WINTER SWITCH**

An integral summer/winter switch shall be provided for summer shutdown. In the summer mode the control panel will not activate the system.

## **OUTPUTS**

The control shall have the capability of providing 5 independent outputs. A LED will indicate which outputs are energized. The outputs are:

- 1 . A N.O. contact to open a 2, 3, or 4-way slab valve.
- 2 . A N.O. contact to close a 2, 3, or 4-way slab valve.
- 3 . A N.O. contact for a remote alarm.
- 4 . A S.P.D.T output for the slab pump.
- 5 . A S.P.D.T for the supply pump or valve, and a N.O. contact for the Burner.

## **ENCLOSURE**

A surface mounted, locking steel enclosure NEMA 1 type, minimum 18 gauge shall be provided.

## **REMOTE INTERCEPT**

The control shall have the capability of being field upgraded to allow for remote communication. Communication shall be via standard telephone lines, or RS232. No external components shall be required for remote communication. Access to the control shall be via a dumb terminal, personal Computer or building energy management system. *No proprietary software shall be required.*

## **SEQUENCE OF OPERATION**

On a drop in slab temperature below the Warm Weather Cutoff set point the heating source and system pumps shall be activated. The control will then cycle the heat source and modulate the motorized valve to maintain the slab temperature at the Idle set point temperature. Upon detection of precipitation the control will initiate the Melt Cycle. During this mode the control will regulate the heat source and modulate the motorized valve to maintain the slab temperature at the Warm Weather Cutoff set point. It shall remain in this mode until no moisture is present or the minimum runtime has elapsed, whichever is longer. If the system is unable to get heat to the supply within one hour, or achieve the Warm Weather Cutoff set point within 24 hours the control will initiate an alarm and energize the remote alarm contacts. During operation should the slab temperature drop to the Cold Weather Cutoff set point the control will shut the system down.

## **CONSIDERATION**

Purchase of a Heat-Timer Model SMC control shall include setup, installation supervision and a full training program for building personnel.

The control must be installed in accordance with the manufacturer's instructions and all applicable codes & regulations.