



Installation and User Manual

Snow Melt Control
SMC 1 to 4 Zone
Version 2.23
201911

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This document describes the installation of the Vortex Snow Melt Control as a stand alone control connected to external pumps.

Mounting

The cabinet is 12x12x8 ½ inches plus a one inch top and bottom mounting flange. Mount the control cabinet on a wall using suitable wall anchors. It must be mounted indoors, in a dry location. The top centre hole may be used a temporary hanging hook until suitable screws and anchors are used to fasten the four corners to the wall. The control will operate normally with the cabinet mounted in any orientation (up, down, sideways) but the control display is oriented for mounting in the up position.

Electrical

The control is rated for a maximum of 12amps total connected pumps. All pumps must be 120vac/1ph/60Hz. Unless otherwise stated on the rating label (240vac is available as special order). The primary pump is an optional connection.

Connect power supply and pumps to the controller using suitable cable (i.e. BX) and connectors through the available knockouts on the bottom of the cabinet.

Note that all side panels can be removed during installation.

Low Voltage and Sensors

All low voltage connections are found on the control box beside the controller. All temperature sensors are 10K type 2 NTC thermistors. Wires may be extended with low voltage (thermostat) wire.

Supply Sensor – Mount on the surface of the pipe supplying heated fluid to the snowmelt loop. Cover with at least ½” of pipe insulation. Connect to Supply therm and Common.

Return Sensor -- Mount on the surface of the pipe returning the fluid from the snowmelt loops. Cover with at least ½” of pipe insulation. Connect to Return therm and Common.

Outdoor Sensor – Mount outdoors, preferably on a wall above snow level and out of direct sunlight (North wall). Connect to Outdoor therm and Common.

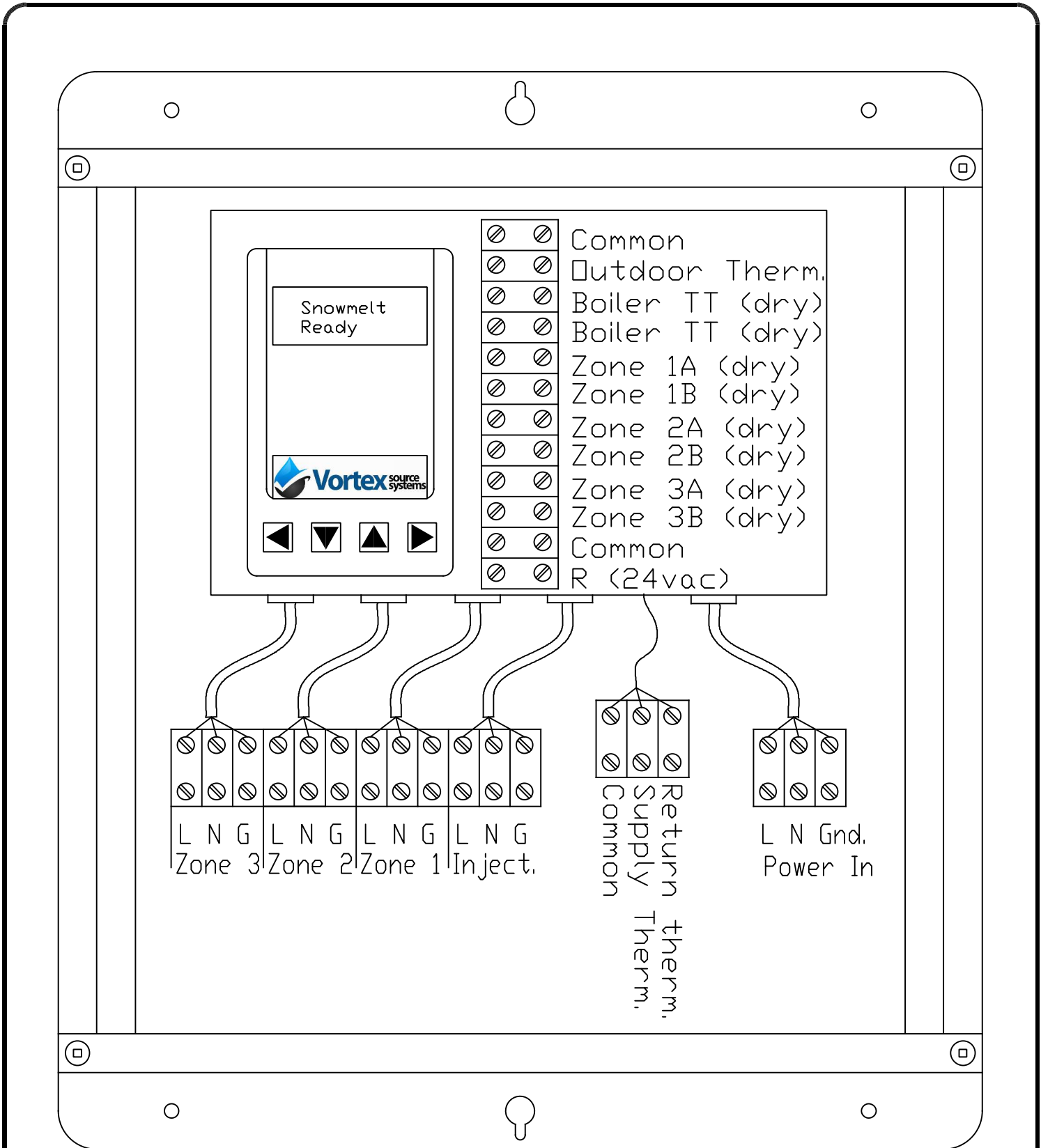
Boiler TT – dry contact/low voltage connection to activate a boiler whenever the snow melt comes on.

Zone 1A (dry)

Zone 1B (dry)

Common
24vac

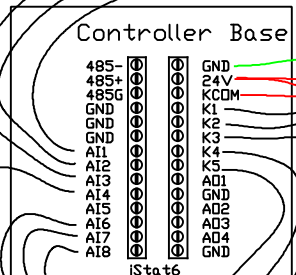
These four connections are for a typical 4-wire snow detector. For 3-wire, do not connect zone 1B. Refer to snow sensor wiring diagram.



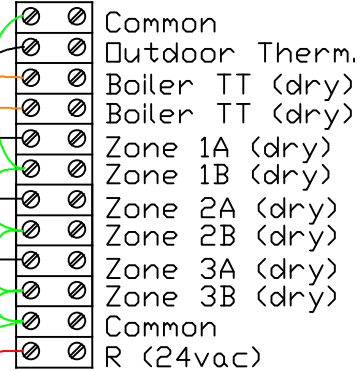
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DRAWING TITLE
**Snowmelt Control
 Three Zone
 Box Layout**

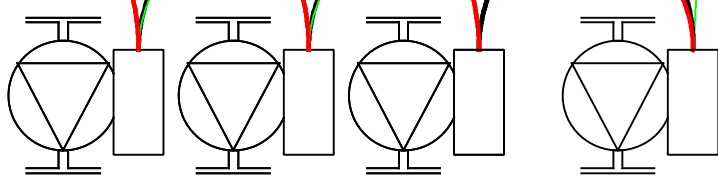
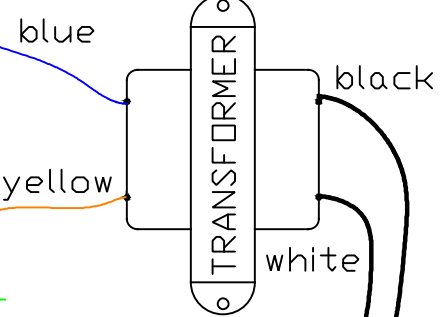
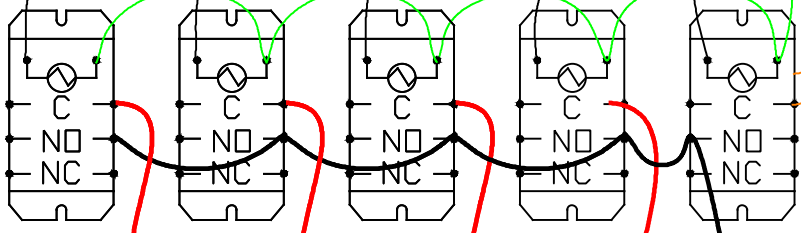
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20191118



Freeze Therm.
Return Therm.
Supply Therm.



Zone 3 Zone 2 Zone 1 Injection Primary



Zone 3 Pump Zone 2 Pump Zone 1 Pump Injection Pump

L N Gnd.
Power Supply

* Do not connect 24vac thermostats to Zone 1A, 1B etc., dry contact only

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DRAWING TITLE
Snow Melt Module
Three Zone
Wiring Diagram
iStat6 V2.20

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20191118

This document describes usage and operation of the controller for the Vortex Snow Melt Control (SMC). It is recommended that the installing contractor read through this short manual in order to become familiar with the correct system setup procedure, and to take advantage of the various features available. The controller may be part of a pre-wired, packaged system including pumps and heat exchangers or it may be a stand-alone control with all pumps field wired. The controller has the capacity for up to 3 separate snow melt zones.

Controller Basics

The controller can operate all snowmelt pumps as well as a dry contact TT to activate a boiler. Through its LCD display and keypad, important system parameters may be configured and operating conditions may be monitored.

When the controller keypad has not been pressed for a few minutes, the backlight will turn off and the display may go blank. Simply press any one of the buttons to wake up the controller. By default, the controller will display a short message describing the operating status of the system.

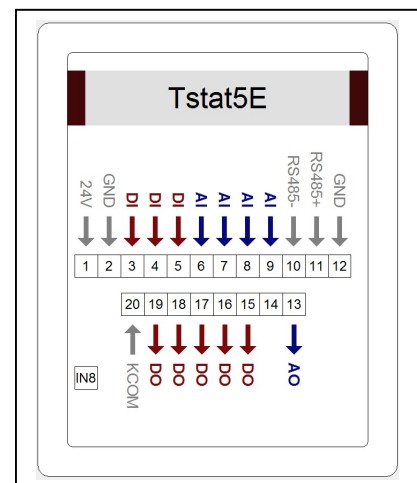
Table 1 provides a list of the different possible status messages and their meaning. There are also a number of small icons that may appear around the edges of the display according to the current operating status. Table 2 below gives an explanation of the different icons.

Table 1 - status messages

Message	Meaning
READY	No calls, but system is ready
IDLE ON	No calls, pumps running in idle mode
NORMAL	At least one zone on and operating normally
OffDly	Off delay – system is running for set period after end of snowmelt call
TooCOLD	Cold weather shutdown, too cold outside to run snowmelt
TooWARM	Warm weather shutdown, too warm outside to run snowmelt
FreezeX	Heat Exchanger is below freeze setting
Test	All pumps running for testing

Table 2 - display icons

Icon	Meaning
Flame	Injection pump on
Snowflake	Zone 1 call
Sun	Zone 2 call
Moon	Zone 3 call
Fan	Idle on



Controller Keypad

By using the *option* and *setting* keys, different parameters and their settings may be displayed and modified. Use the *option* key to scroll through the available parameters, and use the *setting* key to modify the parameter's current setting (if available). By default, the control will remain in 'user' mode, in which a limited selection of parameters may be accessed. By entering 'admin' mode, additional parameters may be made available. Please exercise caution while in 'admin' mode, as these settings are meant to be accessed by the experienced user or installing contractor. A description of each of the modes is found below.

USER MODE

This is the basic display and operating mode, in which only a limited selection of parameters may be accessed and modified. Refer to *Table 3* for description of each item displayed.

Table 3 - User Mode Parameters

Line 1	Line 2	Set.*	Description	Notes
Vortex	####	D	Displays operating condition	Default Display
Outdoor	###.# oC	D	Outdoor Temperature (C)	
Supply	###.# oC	D	Supply fluid temperature going out to the loops	
Return	###.# oC	D	Return fluid temperature coming back from the loops	
HeatExc	###.# oC	D	Heat exchanger temperature (if present)	
VIM4	##.## Rev	D	Program revision number	2.22

* Note: "D" in the set column indicates this parameter is for display only, and cannot be modified using the controller.

ADMIN MODE

This is the advanced display and configuration mode. It is intended only for the properly trained contractor. To enter 'admin' mode, press any button to illuminate the display backlight, then press and hold the two *outside* buttons at the same time ('user' will be displayed at first, hold until 'admin' is displayed). You can now scroll through the display items by using the outer two *option* buttons, and adjust certain values using the inner two *setting* buttons. To return the control to 'user' mode simply wait a few minutes or press and hold both *outside* buttons. Use *Table 4* as a quick reference on the items available in this mode. Detailed descriptions on important parameters are found below.

Snow Melt Operation

The following parameters may be useful in system commissioning and troubleshooting.

CWS_ON Enable the cold weather shutdown feature. If disabled, snowmelt can operate down to any outdoor temperature.

CWS_SP (default is -20°C) – Below this outdoor temperature it is too cold for the snowmelt or idle to operate.

WWS_ON Enable the warm weather shutdown feature. If disabled, snowmelt can operate up to any outdoor temperature.

WWS_SP (default is 5°C) – Above this outdoor temperature it is too warm for snowmelt or idle to operate.

Note: If both WWS_ON and CWS_ON are set to off, the outdoor temperature sensor is ignored and not required. A jumper resistor is also not required.

Supp_SP (default is 30°C) – The supply fluid setting when in snow melt or idle mode.

IDLE_ON Enable idle mode. Loop pump will run continuously the cold weather shutdown feature. If disabled, snowmelt can operate down to any temperature.

IDLE_SP (default is 2°C) – The return fluid setting when idle mode is on. Typically slightly above or below freezing.

FRZ_ON Enable the heat exchanger freeze protection. If disabled, a heat exchanger thermistor or jumper resistor is not required. Set to OFF if no heat exchanger present.

FRZ_SP (default is 4°C) – Below this heat exchanger temperature, the snow melt will not operate. Slab pump shuts off; injection pump continues to operate.

Off1_Dly (zones 1, 2, 3, 4) – The system will continue to run for # hours after the call has ended. Useful if the snow sensor is in a poor location and an area requires extra melting.

RUN_ALL (Test Mode) Run all pumps for testing or purging. The display will show “Test”. Be sure to turn it OFF for normal operation. **OR** Push the small black button under the control to run all pumps for 20 seconds.

Pmp_Exr (Pump Exerciser) Set to ON to run all pumps for 30 seconds once a day. Useful to prevent pump seizing during off season. Default is OFF.

Table 4 – Admin Mode Parameters

Line 1	Line 2	Set.*	Description	Notes
SnowMlt	####	D	Displays operating condition	Default Display
Outdoor	###.# oC	D	Outdoor Temperature (C)	
CWS_ON	ON/OFF		Enable cold weather shutdown feature	Default is ON
CWS_SP	##.# oC		Setpoint outdoor temperature for cold weather shutdown (low limit)	Default setting is -20
WWS_ON	ON/OFF		Enable warm weather shutdown feature	Default is ON
WWS_SP	#### oC		Setpoint outdoor temperature for warm weather shutdown (high limit)	Default setting is 5
Supply	###.# oC	D	Supply fluid temperature (C) to snowmelt loops	
Supp_SP	#### oC		Setpoint fluid supply temperature	Default setting is 30
Return	###.# oC	D	Return fluid temperature (C) from snowmelt loops	
IDLE_ON	ON/OFF		Enables idle function	Default is OFF
IDLE_SP	#### oC		Setpoint fluid return temperature for idle mode	Default setting is -2
HeatExc	###.# oC	D	Heat Exchanger surface temperature used for freeze protection	
FRZ_ON	ON/OFF		Enable freeze protection for heat exchanger	ON if HX is present
FRZ_SP	#### oC		Heat exchanger freeze setpoint	Default setting is 4
Off1_Dly	### hr		Hours zone 1 will continue to run after call ends	Default is 0
Off2_Dly	### hr		Hours zone 2 will continue to run after call ends	Default is 0
Off3_Dly	### hr		Hours zone 3 will continue to run after call ends	Default is 0
Off4_Dly	### hr		Hours zone 4 will continue to run after call ends	Default is 0
RUN_ALL	ON/OFF		Manually run all pumps for initial test and purge	Default is OFF
Pmp_Exr	ON/OFF		Runs all pumps for 30sec. once a day	Default is OFF
VIM4	### Rev	D	Program revision number	2.23
Modbus	####		Modbus address for Net/Web Communications	Default setting is 185

* Note: "D" in the set column indicates this parameter is for display only, and cannot be modified using the controller.