Installation and User Manual

Snow Melt
SM120, 200, 400
With Heat Exchanger

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This document describes the installation of the Vortex Snow Melt system complete with pumps, plumbing components and control. The snow sensor is sold separately.

Mounting

The cabinet is 22 ¼ x 30 x 8 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 cabinet must be mounted an up orientation for the air eliminator to operate properly.

Electrical

Provide a standard outlet 120vac/1ph/60Hz adjacent to the snow melt or remove the cord and hard wire with appropriate wire (i.e BX cable. A switch for the outlet is recommended but not required.

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 – Is factory installed on the surface of the pipe supplying heated fluid to the snowmelt loop. Cover with at least ½" of pipe insulation.

Return Sensor – Is factory installed 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.

Plumbing – Boiler Side

Connect the boiler supply and return (top of cabinet) to the boiler or primary loop. The use of close-coupled tees or low loss header is recommended. For filling/purging purposes, install a full port shut off valve and drain valve on the return leg near the connections to the primary loop.

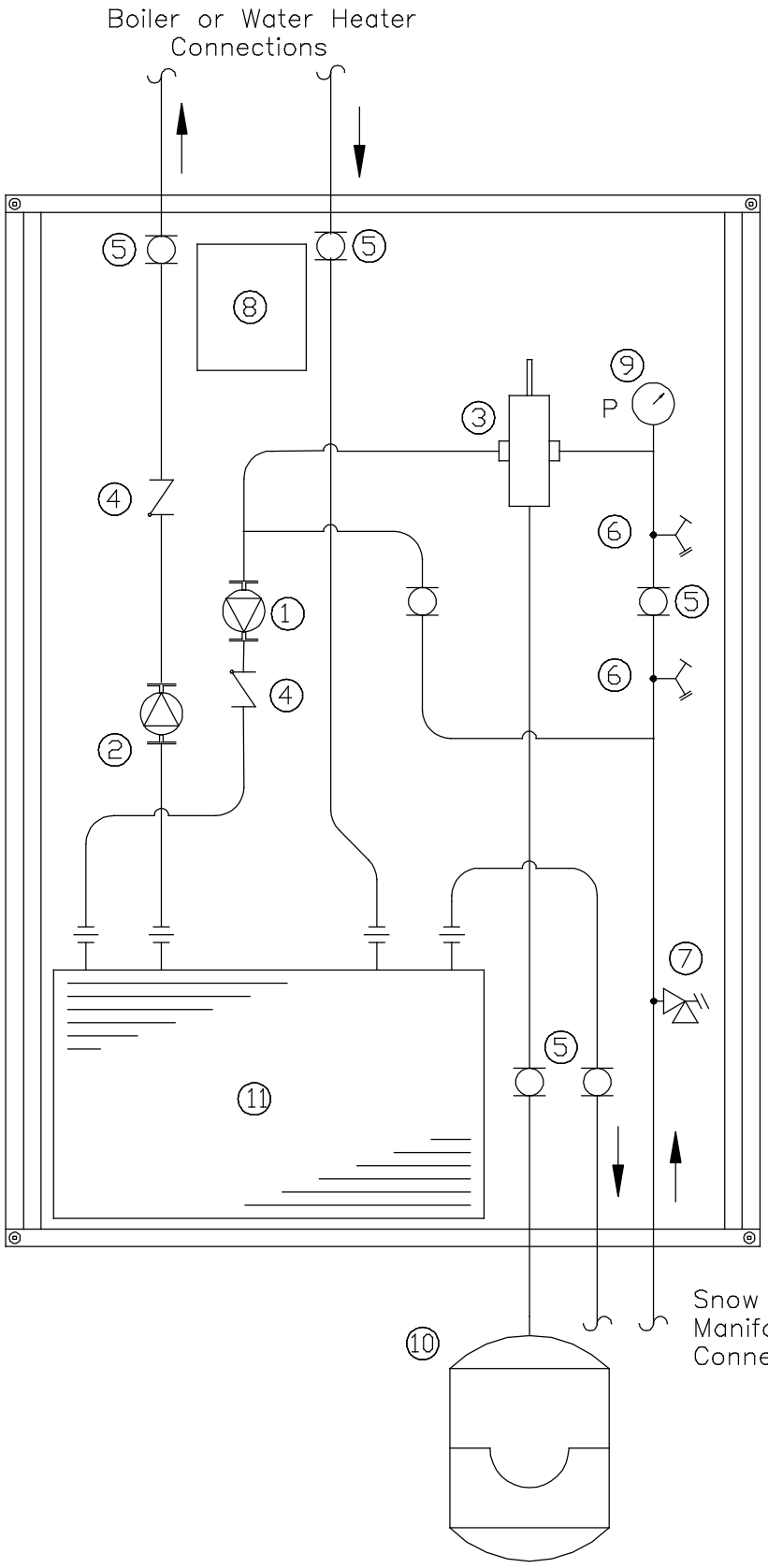
Plumbing – Snow Melt Side

Connect the manifolds to the supply and return of the module and glycol fill system if desired. Connect the expansion tank. Note that the expansion tank which may be provided is based on heating capacity and not system volume. Verify expansion tank sizing required based on system volume.

Plumbing – Start up

Warning: Do not plug in the unit until it has been filled (both sides) and purged of air. Pump failure due to operating dry is not warranted. Use the external isolation and purge valves to fill the boiler side.

The snowmelt side must be filled with a suitable anti-freeze solution. The drain valves and adjacent isolation valve provided can be used to fill and purge air from the system.



1. Slab/Zone Pump
2. Injection Pump
3. Air Purger
4. Check Valve
5. Isolation Valves
6. DrainValve
7. Pressure Relief valve
8. Control
9. Pressure Guage
10. Expansion Tank
11. Heat Exchanger

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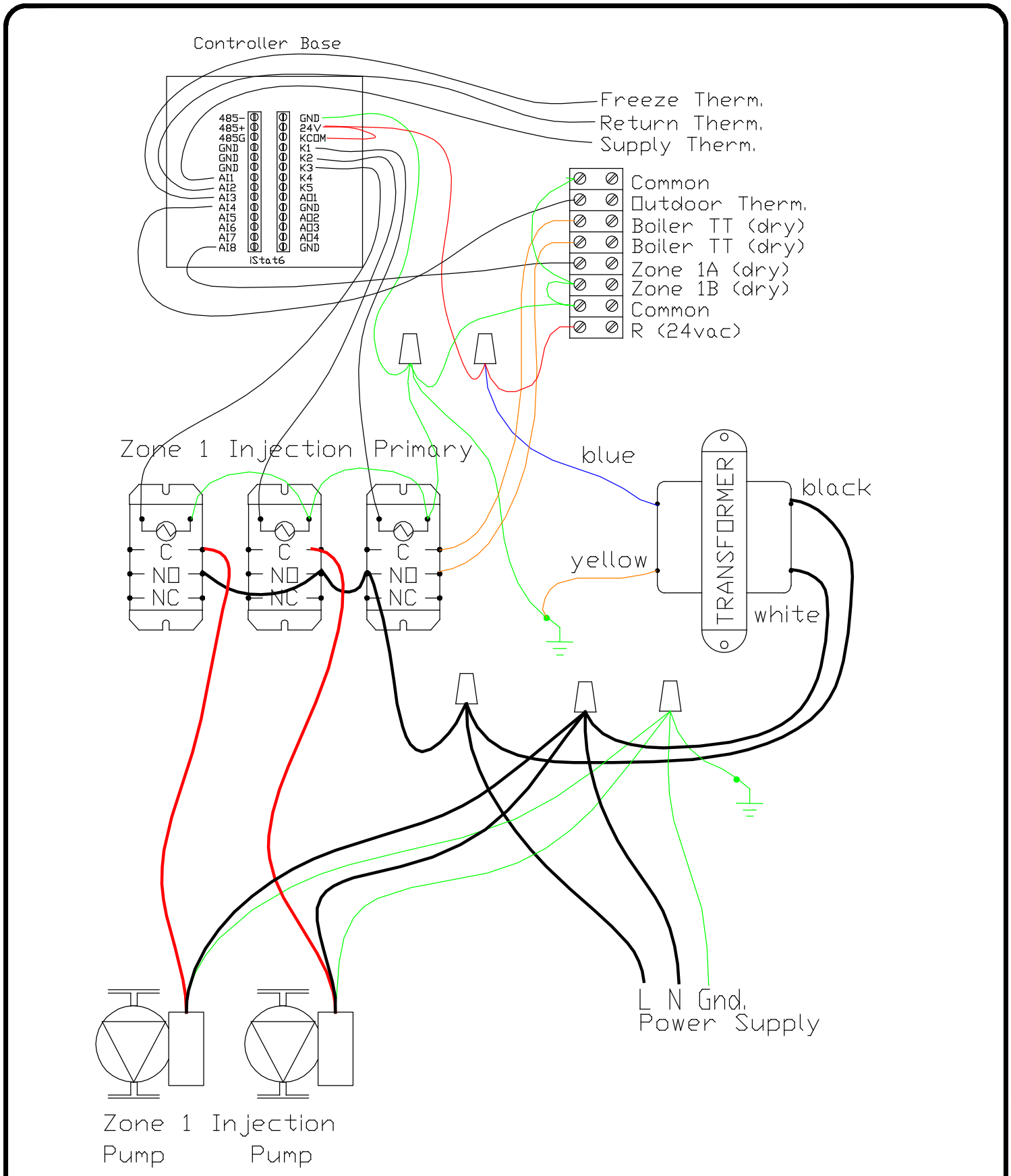
DRAWING TITLE

Snow Melt with Heat Exch. Plumbing Layout with Opt. Bypass

DRAWING NUMBER

REVISION
20140107



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DRAWING TITLE

Snow Melt Module
Single Zone
Wiring Diagram
iStat6

DRAWING NUMBER
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REVISION
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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.

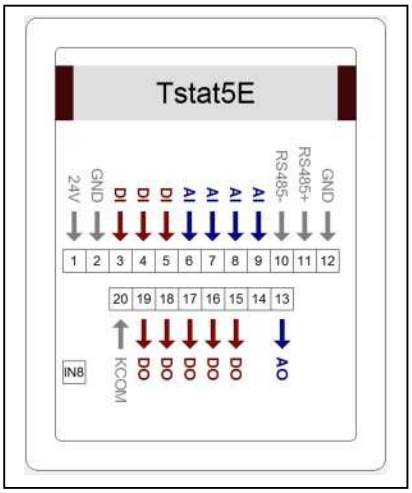
When the controller keypad has not been pressed for a few minutes, the backlight will turn off and the display may go blank. Simply press any one of the buttons to wake up the controller. By default, the controller will display a short message describing the operating status of the system. *Table 1* 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
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

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.

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 inner two *option* buttons, and adjust certain values using the upper 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

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

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

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

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

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

FRZ_SP (default is 4°C) – Below this heat exchanger temperature, the snow melt will not operate.

Control Parameters – User and Admin Mode

Table 3 - User Mode Parameters

Line 1	Line 2	Set.*	Description	Notes
SnowMlt	####	D	Displays operating condition	Default Display
Outdoor	###.# oC	D	Outdoor Temperature (C)	
SMC4	##.## Rev	D	Program revision number	2.00

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

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_SP	##.# oC		Setpoint outdoor temperature for cold weather shutdown (low limit)	Default setting is -20
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	
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_SP	#### oC		Heat exchanger freeze setpoint	Default setting is 4
Pmp_Exr	ON/OFF		Runs all pumps for 30sec. once a day	Defualt is OFF
SMC4	##.## Rev	D	Program revision number	2.00
Modbus	####		Modbus address for Net/Web Communications	Default setting is 182

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

Test Mode

Push the button under the control to run all pumps for 20 seconds.

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.