Installation Manual
Snowmelt Controller 1000
Snowmelt Module 0100
Version 1.08

HBX

SNO-1000
SNO-0100

HBX Control Systems Inc.

TABLE OF CONTENTS

Comfort
Control
Innovation

GETTING STARTED

This manual will help with the installation, parameter setting, troubleshooting and general maintenance requirements for the control, and the module. To guarantee the safe and reliable operation of your snowmelt system, you must first read this manual in detail and take particular note of any and all warnings or caution directives prior to connecting to AC power.

Only suitably qualified individuals with formal training in electrical and HVAC controls should attempt the installation of this equipment. Incorrect wiring and installation will affect the warranty provided with this unit. Wiring must be completed in accordance with the codes and practices applicable to the jurisdiction for the actual installation.

The HBX SNO-1000 is a microprocessor based control and as such is not to be regarded as a safety (limit) control. Please consult and install the heating or cooling appliance in accordance with the manufacturer's recommendations.

SAFETY SYMBOLS

Extreme Hazard
This action poses a serious threat that could result in personal injury or death, as well as permanent damage to the equipment. Proceed with caution.

Moderate Hazard
This action may cause personal injury or have adverse effects on the installation process if handled incorrectly.

Disconnect Power Source
The presence of low voltage(24VAC) or high voltage(120VAC) could result in personal injury or permanent damage to components or equipment.

Point of Interest
This point clarifies pertinent information, or brings your attention to an action that may have adverse effects on the installation process.

RECEIVING, UNPACKING, INSPECTION AND STORAGE

The SNO-1000 and SNO-0100 have gone through rigorous quality control tests at the factory before shipment. After receipt and before installation perform the following checks:

Inspection

After unpacking the unit make sure the boxes contain:

SNO-1000 Package:

- SNO-1000 Snowmelt Control
- 1 Terminal Screwdriver (3.0mm)
- 3 Cable Ties
- 1 Remote Outdoor Temperature Sensor
- 3 Universal Temperature Sensors

SNO-0100 Package:

- SNO-0100 Snowmelt Module
- 1 Terminal Screwdriver (2.5mm)
- 32 Pin Connector
- 1 Slab Sensor

Make sure the part number on each unit corresponds to the part numbers on the original box.

Storage

The SNO-1000 and SNO-0100 should be kept in their original shipping cartons prior to installation. In order to retain the warranty coverage they should be stored properly:

- Store in a clean dry place

- Store within an ambient temperature range of +10ºC to +40ºC

- If possible, store in an air-conditioned environment where the relative humidity is less than 95%

- Do not store in places where the unit may come into contact with corrosive gases or liquids

- Do not store in an area or upon an unstable surface where it may become damaged due to falling

GENERAL TECHNICAL DATA (SNO-1000)

Input Voltage:
120 VAC, ± 10%, 60Hz
3 x Optically Isolated Inputs:
20 - 240 VAC
3 x Thermistor Inputs:
Boiler/System Sensor/Outdoor
3 x Pump Output Relays:
240VAC 10A
2 x Auxiliary Output Relays:
240VAC 10A
Standard Communications:
RS-232
Real Time Clock Battery:
Lithium-Ion
Microprocessor:
16Bit, 20MHz
Languages:
English
Graphic Display:
128 x 64 pixels (55mm x 28mm viewable area)
Weight:
0.95 KG (2.1 lbs)
Dimensions:
190mm W x 168.2mm H x 72mm D
ETL Listings:
Meets CSA C22.2 No. 24
Meets UL Standard 873
ETL Control No. 3068143
Storage:
+10ºC to +40ºC

All I/O (inputs and outputs) are both colour coded and keyed indexed for non-interchangeability

Nameplate Information:
The exterior label contains specific information unique to your HBX Snowmelt Control and identifies some of the basic features. The label displays the serial number which will match the serial number on your actual Control, the lot number, the bar code and the product's ETL number.
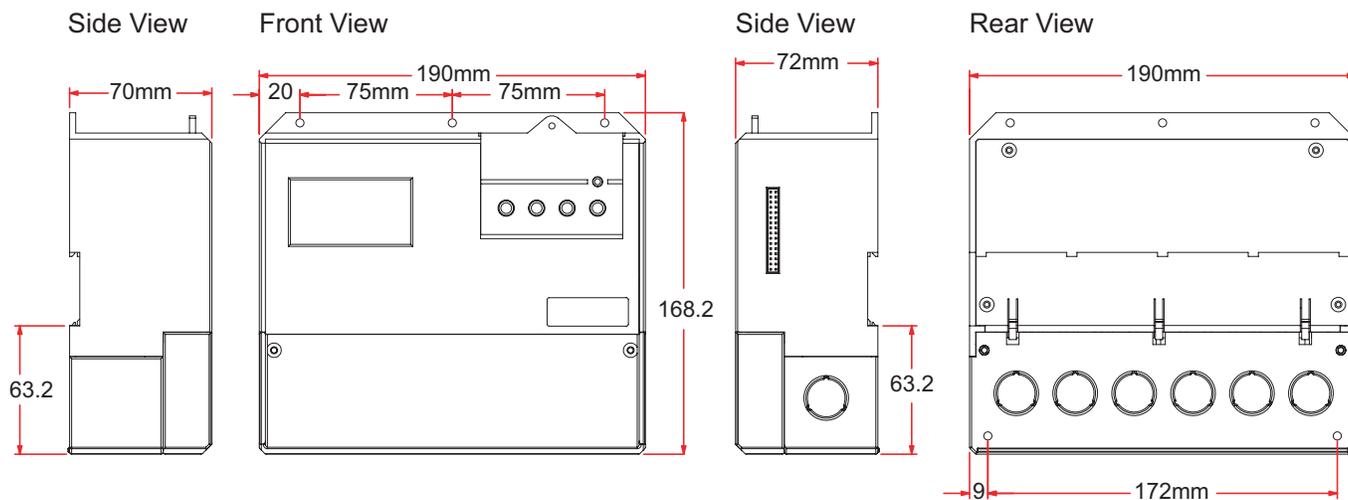

Pulse Modulating Injection Theory:
For information about the controls PMIp/PMIv capabilities see the technical bulletins section of the HBX Control Systems Website: www.hbxcontrols.com

Side View   Front View

Side View   Rear View

GENERAL TECHNICAL DATA (SNO-0100)

2 x Thermistor Input
(10K Ohm)
1 x Snow Sensor Input
2 x Aux. Output Relays
(240VAC 10Amps)
Weight:
0.408Kg
Dimensions:
100mm W x 168mm H x 70mm D
ETL Listings:
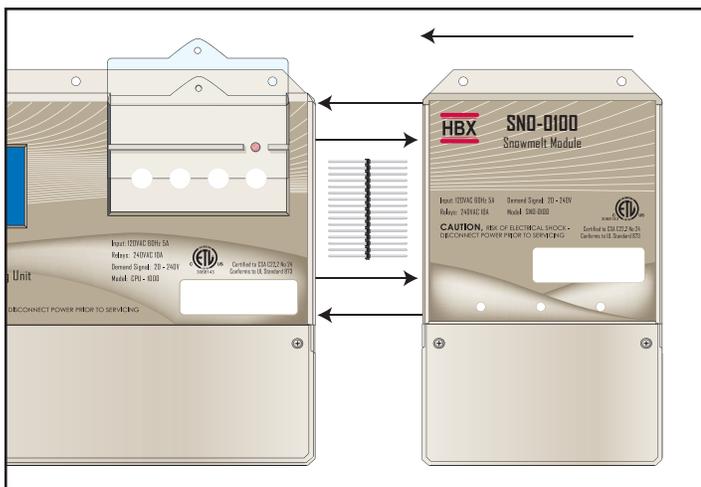Meets CSA C22.2 No. 24
Meets UL Standard 873
ETL Control No. 3068143
Storage:
10ºC to 40ºC

Nameplate Information:

The exterior label contains specific information unique to your HBX Snowmelt Module and identifies some of the basic features. The label displays the serial number which will match the serial number on your actual module, the lot number, the bar code and the product's ETL number.

Side View | Front View | Rear View | Top View | Bottom View

70mm · 17 · 66mm · 168mm · 100mm · 63.2mm · 86mm
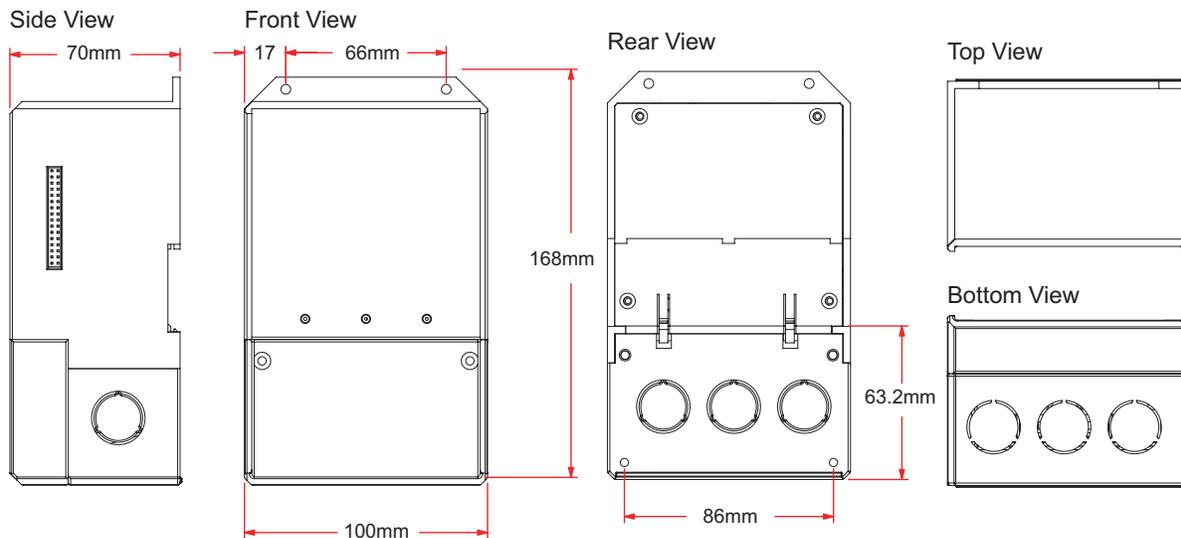
Installing the Module

Place the SNO-1000 and desired SNO-0100 on a flat surface. Align the 32-Pin connector with the holes on the module and gently push into place. Next slide the SNO-1000 onto the 32-Pin connection by carefully matching up the holes and pins. When installed correctly there is virtually no gap between the units. With power applied to the assembly, the first (green) LED should be illuminated on the module. This lit, green LED serves as confirmation of both electrical and communications continuity.

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1. Graphic Display

2. Lockable Keypad Cover

3. Menu / Reset / Programming Buttons

4. Serial Number / Bar Code Tracking

5. Communication Connection

11. Backup Battery

10. Demand Inputs

9. Thermistor / Sensor Inputs

8. Boiler Relays

7. 120 VAC Power Inputs

6. 120 VAC Pump Outputs
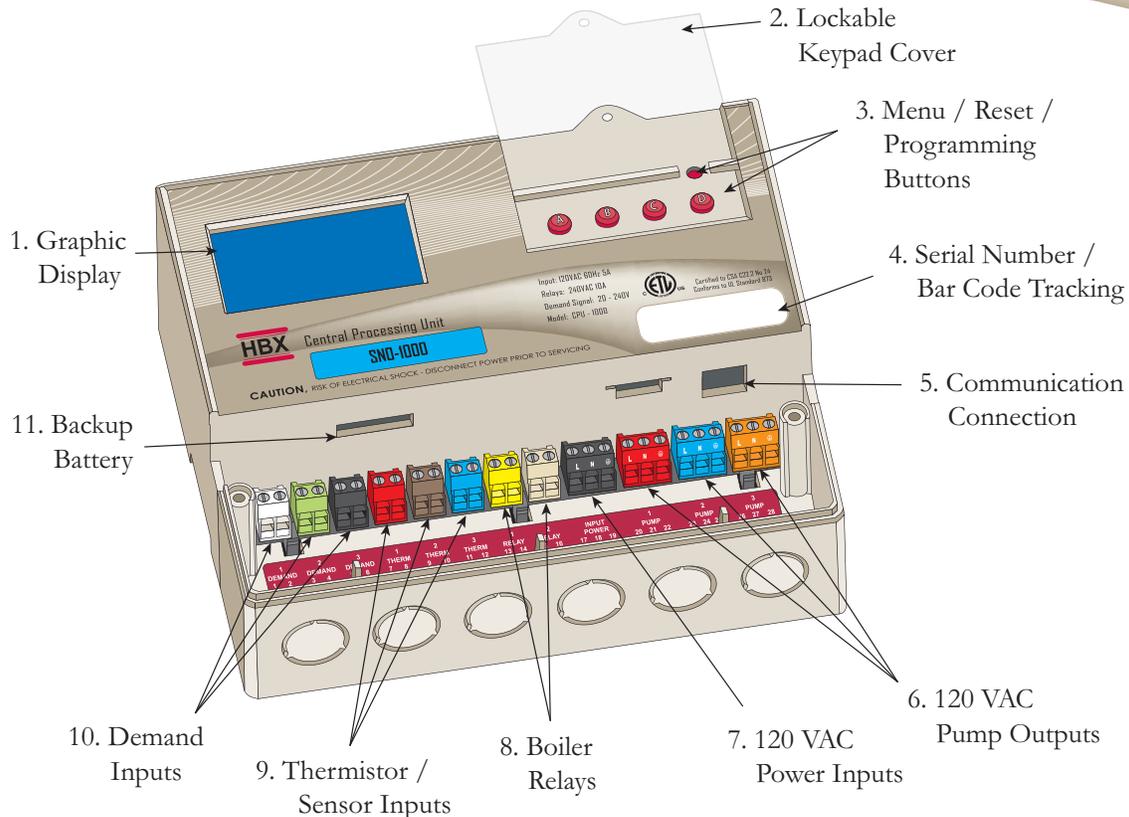
Example:
Viewing from top left and moving right in a clockwise direction:

1. Back-Lit Graphic Display:
The display is one of the key features of the Control. Depending upon which mode of operation is selected, you will be able to view most common system values simultaneously. It will also serve as a visual indicator when in the programming mode.

2. Lockable Keypad Option:
Once your system has been programmed and optimized there should be little or no reason for further changes. The Control has been designed with the ability to physically "hard-lock" the keypad to prevent tampering with the settings.

Refer to pg 11 for "hard lock" instructions.

3. Menu and Programming Buttons:
These buttons will be used to set up the Control during commissioning and for toggling between displays or troubleshooting at a later date if necessary.

4. Serial Number and Bar Code:
This label will identify the entire factory ordered options and the date of manufacture. It can also be used for re-ordering and will be required in the event of factory service assistance or warranty claim.

5. Communication Connection:
The standard communications port (RS-232) is found directly below the bar code label. Optional communications software needs to be purchased to enable a connection. Please consult factory or dealer.

⚠️ **Only a CAB-0100 can be inserted into this connection without causing damage.**

6. 120 VAC Pump Outputs:
There are three separate (3-wire) 120VAC output power terminals designed to run either a pump or fan.

7. 120 VAC Power Input:
There is one (3-wire) terminal block for incoming 120VAC power.

8. Boiler Relays:
These are used to run boilers. The SNO-1000 can run up to 2 On/Off Boilers by itself.

9. Thermistor/Sensor Inputs:

There are three (2-wire) sensor/thermistor inputs.

Under no circumstance should power be applied to these terminals! Permanent damage to the Control's circuitry may result.

10. Demand Inputs:
There are three (2-wire) "demand" control inputs. Control signals between 20-240VAC are designed
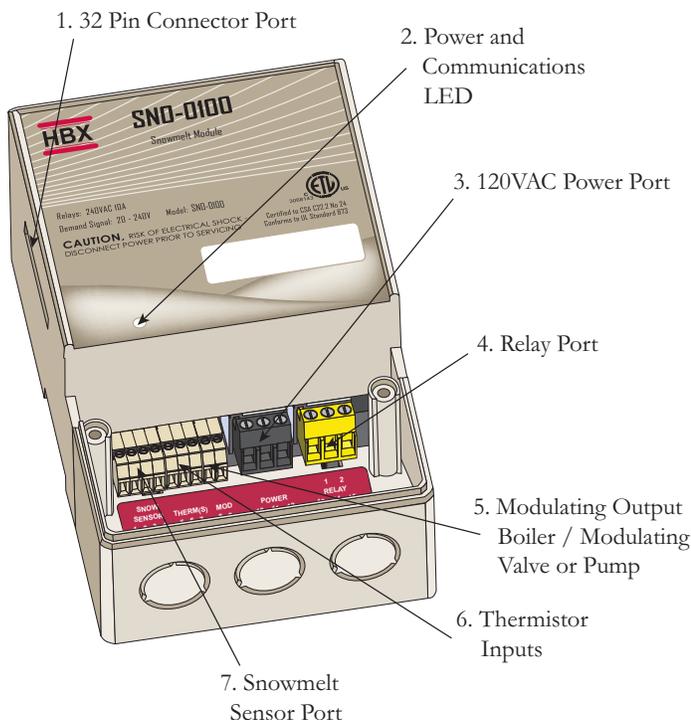
to trigger a variety of commands within the Control.

11. Backup Battery:
The lithium-ion battery is purely a back-up supply for the real time clock and will keep the clock refreshed during a power interruption to the Control.

Prior to installation, please remove the protective paper strip to activate the back-up battery as shown below.
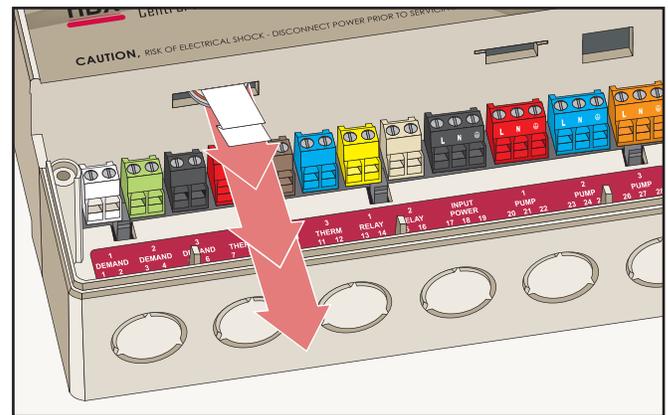
1. 32 Pin Connector Port
The 32-Pin Connector Port allows a 32 pin connector to be used to connect the SNO-0100 to the SNO-1000 leaving virtually no gap between the units.

2. Power and Communications LED
With power applied to the assembly, the first (green) LED should be illuminated on the module. This lit, green LED serves as confirmation of both electrical and communications continuity.

3. 120VAC Power Port

4. Relay Port

5. Modulating Output Boiler / Modulating Valve or Pump

6. Thermistor Inputs

7. Snowmelt Sensor Port

1. 32 Pin Connector Port
2. Power and Communications LED
3. 120VAC Power Port
4. Relay Port
5. Modulating Output Boiler / Modulating Valve or Pump
6. Thermistor Inputs
7. Snowmelt Sensor Port

INSTALLATION & WIRING

The SNO-1000 and SNO-0100 are designed to be wall mounted, DIN rail mounted, or installed inside a separate electrical enclosure. The unit should be mounted inside and be protected from falling water and high humidity conditions. With all the covers in place it is designed to protect any individual from accidental electrical shock.

The Control has a built in 5Amp fast acting fuse to protect the circuitry on the Printed Circuit Board (PCB). The unit is designed to power up to 3 pumps and 2 auxiliary relays of 10Amps each. As such, an upstream customer supplied fuse or circuit breaker rated at a maximum of 30 amps must be in circuit. It is the installers responsibility to provide either a 3 pin (3ft max) grounded plug and cable, or the unit must be wired directly to a breaker and terminated inside the control box (terminals 17, 18 & 19).

All power wiring must be with a minimum of 18AWG wire.

Low power wiring ----------- insulated 18AWG (min.) wire to a max of 500ft.

Thermistor wiring ------------ insulated 18AWG (min.) wire to a max of 500ft.

It is recommended to use 18AWG Single Stranded Wire. It is also recommended to run signal and power wiring in separate conduit.

Only suitably qualified individuals with formal training in electrical and HVAC controls should attempt the installation of this equipment. Incorrect wiring and installation will affect the warranty provided with this unit. Wiring must be completed in accordance with the codes and practices applicable to the jurisdiction for the actual installation.

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Terminal Designations for SNO-1000

	SNO 1000															CENTRAL PROCESSING UNIT

Snow Melt Demand
Forced Melt Demand
Zone Demand
Boiler
System
Outdoor

Injection Pump
System Pump
Boiler Pump
Supply Power 120 VAC
Boiler 2
Boiler 1

1 DEMAND 1 2	2 DEMAND 3 4	3 DEMAND 5 6	1 THERM 7 8	2 THERM 9 10	3 THERM 11 12	1 RELAY 13 14	2 RELAY 15 16	INPUT POWER 17 18 19	1 PUMP 20 21 22	2 PUMP 23 24 25	3 PUMP 26 27 28
White	Green	Black	Red	Brown	Blue	Yellow	Natural	Black	Red	Blue	Orange

Snowmelt Demand - This demand is used for the main Snowmelt demand. This will put the control in idle mode when no snow is present.

Forced Melt Demand - This demand will force the control into melt mode. It will only stay in melt mode for a predetermined amount of time. To use again the user must take the demand away and then reapply.

Zone Demand - This demand is used to tell the control to only watch the extra slab zone. When engaged the control will run the zone slab like a setpoint.

Thermistor 1 - Boiler Sensor

Thermistor 2 - System Sensor

Thermistor 3 - Outdoor Sensor

⚠️ **TM1, TM2 & TM3 are designed for 10K Ohm Thermistors and must never be subjected to any external power supply (voltage or current)**

P3 Relay - Any pump (or fan) output rated to a max of 10Amps 120VAC. This relay is pre-programmed to be the default injection pump relay when PMIp is the injection mixing strategy.

P2 Relay - Any pump (or fan) output rated to a max of 10Amps 120VAC. This relay is pre-programmed to be the default (low temp) system pump. When programmed for a mixing system.

P1 Relay - Any pump (or fan) output rated to a max of 10Amps 120VAC. This relay is pre-programmed to be the default boiler or (High Temp) system pump.

Supply Power - The 3-wire 120VAC input to the control. Protected by a 30Amp breaker or fuse.
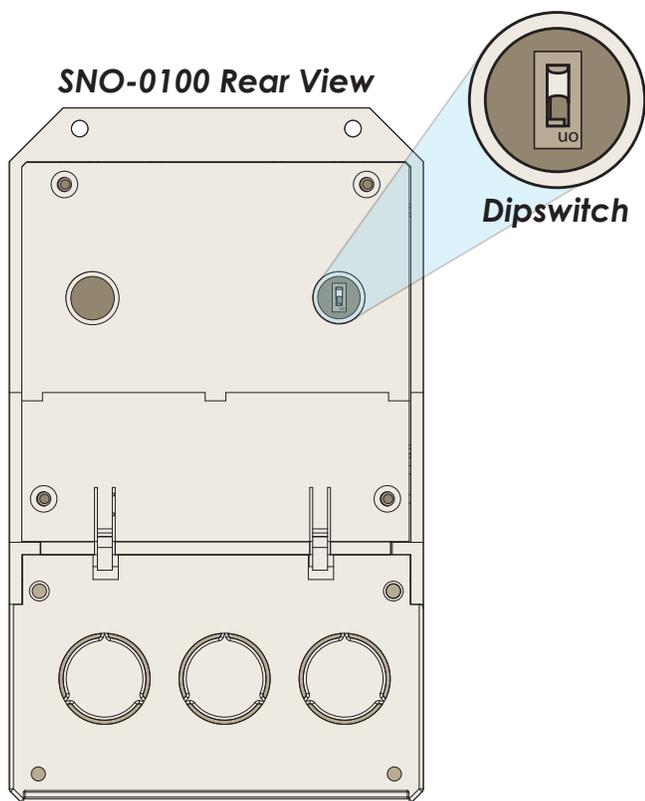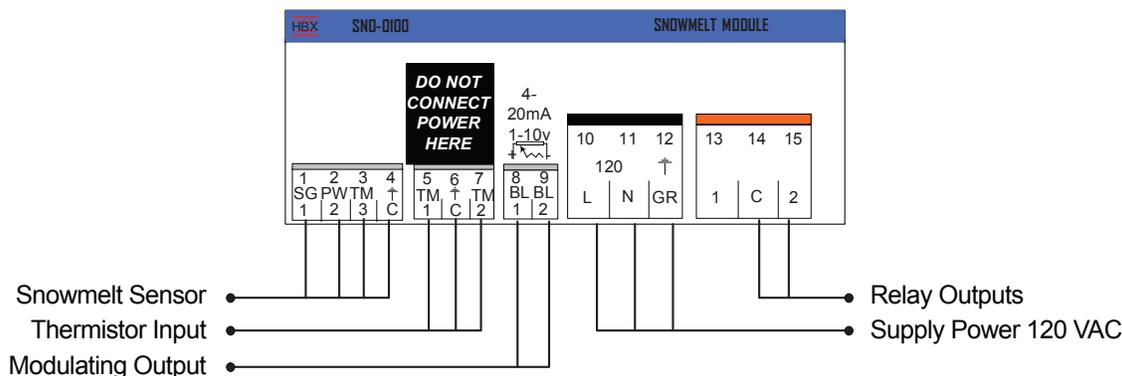
Relay 2 - This relay is the default relay for bringing on the 2nd Boiler or Boiler stage. It can be used as an injection valve.

Relay 1 - This relay is the default relay for bringing on the 1st Boiler or Boiler stage.

⚠️ **Misc Relays 1&2 are Dry Contacts and rated for a max of 10Amps**

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| SNO-0100 | | SNOWMELT MODULE |

DO NOT CONNECT POWER HERE

4-20mA 1-10v

| 1 SG 1 | 2 PW 2 | 3 TM 3 | 4 ⏚ C | 5 TM 1 | 6 ⏚ C | 7 TM 2 | 8 BL 1 | 9 BL 2 | 10 L | 11 N | 12 GR | 13 1 | 14 C | 15 2 |

120

Snowmelt Sensor
Thermistor Input
Modulating Output

Relay Outputs
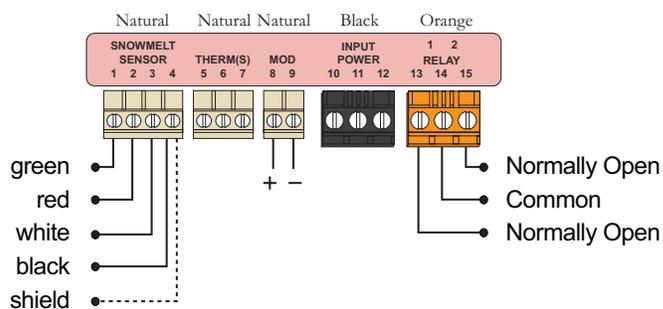Supply Power 120 VAC

SNO-0100 Rear View

Dipswitch

UO

Dipswitch

The SNO-0100 is able to output either a 4-20mA signal or a 1-10VDC signal from contacts 8 and 9 using a modulating output.

For 4-20mA the dipswitch is set to OFF (up position).

For 1-10VDC the dipswitch is set to ON (down position).

Natural Natural Natural Black Orange

| SNOWMELT SENSOR | | | | THERM(S) | | | MOD | | INPUT POWER | | | RELAY | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |

green
red
white
black
shield

+ −

Normally Open
Common
Normally Open

Snowmelt Sensor - This is where you attach the Snowmelt Sensor.

⚠ **Take care not to mix up the wiring.**

Thermistors - These are the inputs for the return sensor and the second (only) slab zone sensor.

Modulating Output - This modulating output can be used for a modulating boiler, modulating valve, or it can run a VFD for a pump. This is a 4-20mA or 1-10v Signal.

Supply Power 120VAC - The 3-wire 120VAC input to the control. Protected by a 30Amp breaker or fuse.

Relay Outputs

These relay outputs are only used for a floating action (power open / power close) valve or this is the output for the slab (only) zone pump/valve.

PROGRAMMING
DISPLAY FEATURES

The HBX display is a 128 x 64 pixel, back-lit graphic display on a blue background. In addition to displaying text and icons it has the ability to provide you with visual graphing capabilities. These graphing capabilities will allow you to get representative data and trending information of up to 2 independent feedback values.

Standard Screen
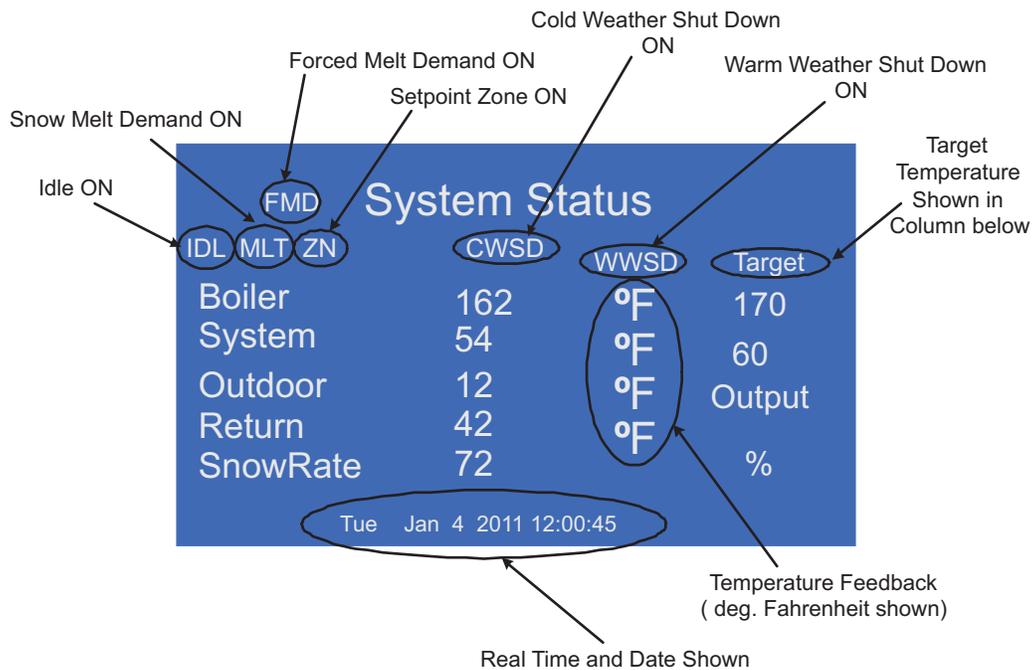
Alternate Screen
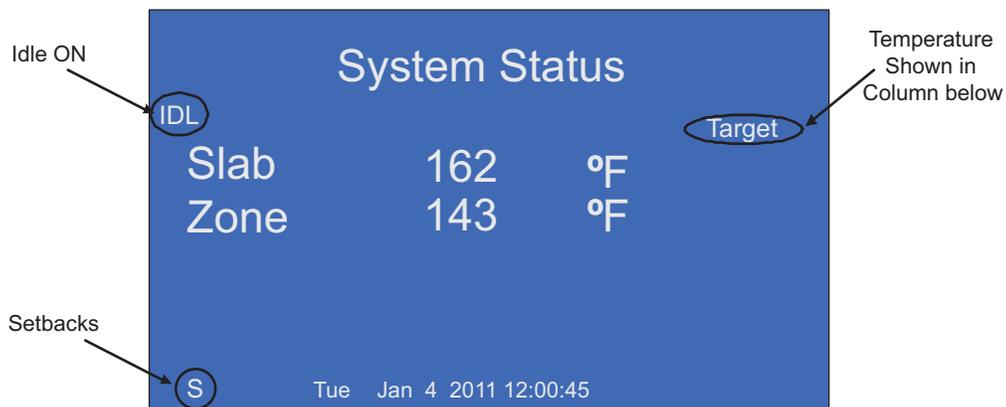
NAVIGATING THE CONTROL

The four large red buttons labeled "A", "B", "C", and "D" are used to make your way through the programming options within the Control.

Pressing the "A" or "B" button while viewing the initial "System Status" and "System Function" main screens will toggle from screen to screen. Pressing the "D" button will take you to the "Programming Options" screen. Pressing the "D" button again will revert to the main system screens.

Once in the "Programming Options" menu you may move the selection indicator up and down by pressing the "A" and "B" buttons, pressing the "C" button will enter the selected option. Pressing the "C" button on options with limited choices (ie. on/off, yes/no) will toggle the selection.

Pressing the "A" and "B" buttons on options with variable numerical choices (ie. temperature values, time settings) will increase and decrease the selected amount. Pressing the "C" button upon completion will forward you to the next step.

The "D" button can be used to revert to the previous menu.

PROGRAM LOCK FEATURE

To minimize the potential for unauthorized tampering of your control after commissioning, you have the ability to limit/lock the programming menus.

To lock the Control, use two fingers to press and hold down the A and B buttons simultaneously for approximately 10 secs.

To unlock the Control, use two fingers to press and hold down the C and D buttons simultaneously for approximately 10 secs.

If the display flashes erratically, remove your fingers from the buttons and try again by pressing both buttons at the same time.
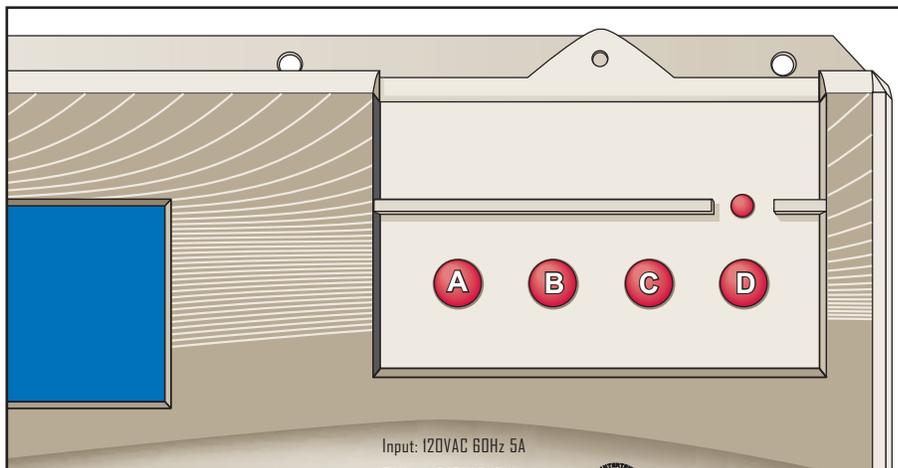
Lock Feature

Unlock Feature

STATUS SCREENS

1

HBX
SnowMelt
Control
Ver 1.00
Control Systems

1 Startup Screen
This screen will be visible for approximately 5 seconds after plugging in the control.
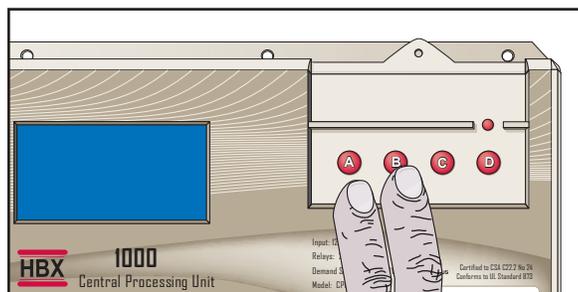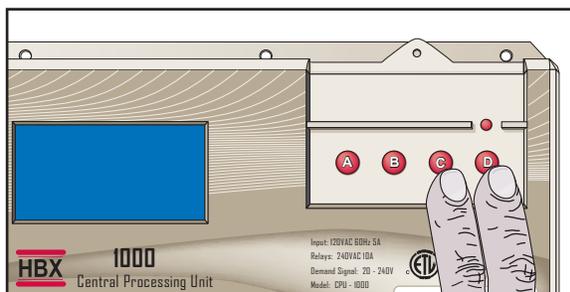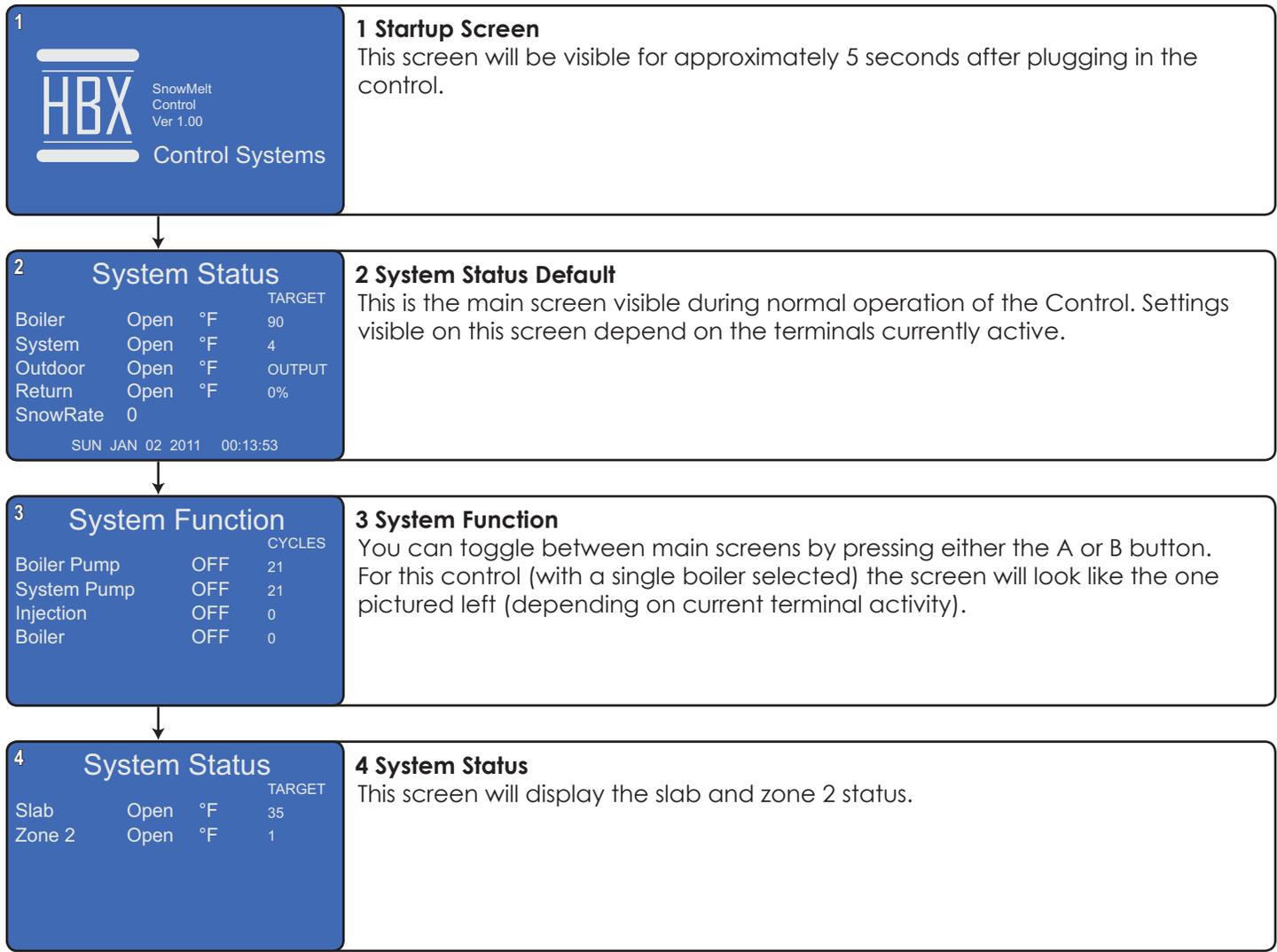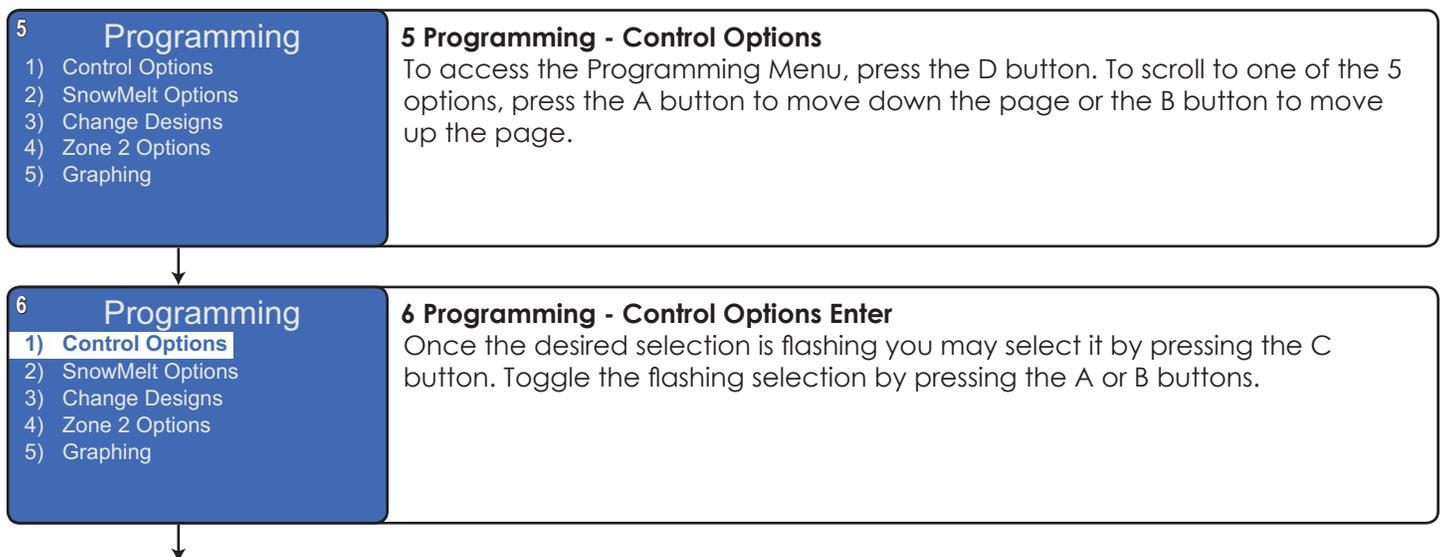
2
System Status

			TARGET
Boiler	Open	°F	90
System	Open	°F	4
Outdoor	Open	°F	OUTPUT
Return	Open	°F	0%
SnowRate	0		

SUN JAN 02 2011   00:13:53

2 System Status Default
This is the main screen visible during normal operation of the Control. Settings visible on this screen depend on the terminals currently active.

3
System Function

		CYCLES
Boiler Pump	OFF	21
System Pump	OFF	21
Injection	OFF	0
Boiler	OFF	0

3 System Function
You can toggle between main screens by pressing either the A or B button. For this control (with a single boiler selected) the screen will look like the one pictured left (depending on current terminal activity).

4
System Status

			TARGET
Slab	Open	°F	35
Zone 2	Open	°F	1

4 System Status
This screen will display the slab and zone 2 status.

PROGRAMMING SCREENS

5
Programming
1) Control Options
2) SnowMelt Options
3) Change Designs
4) Zone 2 Options
5) Graphing

5 Programming - Control Options
To access the Programming Menu, press the D button. To scroll to one of the 5 options, press the A button to move down the page or the B button to move up the page.

6
Programming
1) **Control Options**
2) SnowMelt Options
3) Change Designs
4) Zone 2 Options
5) Graphing

6 Programming - Control Options Enter
Once the desired selection is flashing you may select it by pressing the C button. Toggle the flashing selection by pressing the A or B buttons.

7   Control Options

7

Control Options
1)   **Display Options**
2)   Snow Always HD? N
3)   Zone Always HD? Y
4)   Mins and Maxes
5)   Testing
6)   Stage Run Times

7 Control Options Selections
1) Set up the display and clock
2) Program a permanent snow demand
3) Program a permanent zone demand
4) View temp values effecting each thermistor
5) Manually test each relay
6) View the running times of each boiler stage for all connected boilers

8

Display Options
1)   **Change Time**
2)   Reset Cycles
3)   Display in   °F
4)   D-lite Savings? N
5)   CONTACT HBX
6)   Reset Run Times

8 Display Options
1) Set your date and time (MFG suggests to enter your clock setup now)
2) Reset the internal relay counter for pump and boiler cycles
3) Program and Display either °F or °C
4) Program the Control to allow for Daylight Savings time shifting
5) Phone and website information
6) Clears stage accumulated hours counter

9

Display Options
1)   **Change Time**
2)   Reset Cycles
3)   Display in °F
4)   Dllite savings? N
5)   Contact HBX
6)   Reset Run Times

9 Display Options - Change Time
It is recommended that you setup the correct time on your Control before configuring other options, as the real-time settings are effected by the "Change Time" feature.

9A

Year 2000

9A Display Options - Change Time - Year
Use the programming buttons to set the current year on this screen.

9B

Month 00

9B Display Options - Change Time - Month
Use the programming buttons to set the current month on this screen.

9C

Day 00

9C Display Options - Change Time - Day
Use the programming buttons to set the current day of the month on this screen.

9D Weekday 1 (Sunday = 1)	**9D Display Options - Change Time - Weekday** Use the programming buttons to set the corresponding day of the week on this screen (Sunday = 1).
9E Hour 00	**9E Display Options - Change Time - Hour** Use the programming buttons to set the hour on this screen.
9F Min 00	**9F Display Options - Change Time - Minute** Use the programming buttons to set the current minute on this screen.
10 Display Options 1) Change Time **2) Reset Cycles** 3) Display in °F 4) D-lite savings? N 5) Contact HBX 6) Reset Run Times	**10 Display Options - Reset Cycles** Pressing the "C" button with the "Reset Cycles" option selected will reset the internal relay counter for the systems devices. Those devices are visible on the "System Function" screen.
11 Display Options 1) Change Time 2) Reset Cycles **3) Display in °C** 4) D-lite savings? N 5) Contact HBX 6) Reset Run Times	**11 Display Options - Display in °F/°C** Pressing the "C" button with the "Display in °F/°C" option selected will allow you to program the Control and display in either °F or °C.
12 Display Options 1) Change Time 2) Reset Cycles 3) Display in °C **4) D-lite savings? Y** 5) Contact HBX 6) Reset Run Times	**12 Display Options - D-Lite Savings** Pressing the "C" button with the "D-Lite Savings" option selected will allow you to program the Control to allow for Daylight Savings time shifting.

13

HBX Control Systems
Calgary, AB, Canada
1-403-720-0029

www.hbxcontrols.com

Press B to Continue

13 Contact HBX Controls
By selecting #5 on the Programming screen the manufacturers contact information can be viewed.

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14   Display Options
1) Change Time
2) Reset Cycles
3) Display in °C
4) D-lite savings? Y
5) Contact HBX
6) **Reset Run Times**

14 Display Options - Reset Run Times
Pressing the "C" button with the "Reset Run Times" option selected will clear the stage accumulated hours counter. To view the stage runtime, select the "Stage
Run Times" option within the "Control Options" menu.

---

15   Control Options
1) Display Options
2) **Snow Always HD? N**
3) Zone Always HD? Y
4) Mins and Maxes
5) Testing
6) Stage Run Times

15 Permanent Snow Heat Demand
This setting is used when you would like a permanent demand on your snow zone. If snow always heat demand is set to 'Y' then the snow zone will be in idle mode until snow is seen by the snow sensor and it exceeds the desired settings. The control will shut down the snow zone on a WWSD or CWSD.
(Y or N) Default: N

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16   Control Options
1) Display Options
2) Snow Always HD? N
3) **Zone Always HD? N**
4) Mins and Maxes
5) Testing
6) Stage Run Times

16 Permanent Zone Heat Demand
This setting is used when you would like to have a permanent demand on the setpoint zone. If zone always heat demand is set to 'Y' then the setpoint zone will always try to keep that zone satisfied based on the desired setpoint temperature.
(Y or N) Default: N

---

17   Mins and Maxs
1) **Thermistor 1**
2) Thermistor 2
3) Thermistor 3
4) Thermistor 4
5) Thermistor 5
6) Thermistor 6
7) Reset All

17 Mins and Maxs
Allows you to look at up to six different thermistor min/max temperature extremes and reset back to zero. When formatting the Control, existing min/max values are reset. Selecting the 'Reset All' option clears the time and date stamps.To see updated Min/Max values return to the System Status screen to refresh the view.

---

18   Thermistor 1

30/09/05   Min Temp
03HRS   89°F

24/09/05   Max Temp
16HRS   201°F

18 Thermistor 1
Each min/max value also has a time and date stamp to show when the value was reached.

This can serve as a valuable troubleshooting tool while diagnosing system problems.

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19 Control Options 1) Display Options 2) Always HD? N 3) Use Room Therm? N 4) Mins and Maxs 5) **Testing** 6) Stage Run Times	**19 Control Options - Testing** This allows you to manually test/run each relay for up to 30 seconds. **You can cycle the relay faster by pressing the C button, this skips the 30 second elapse time.**
20 Testing 1) **Relay # 1** 2) Relay # 2 3) Relay # 3 4) Relay # 4 5) Relay # 5 6) Relay # 6 7) Relay # 7	**20 Control Options - Testing Relays** There are five relays on the main control box. Relays six and higher will be run with the corresponding Expansion Module connected. By continually pressing the 'A' button you can access extra screens showing Relays #8 and higher. **Test relay 16 and 17 for floating up and down, test relay 17 for Zone 2.**
21 Control Options 1) Display Options 2) Always HD? N 3) Use Room Therm? N 4) Mins and Maxs 5) Testing 6) **Stage Run Times**	**21 Control Options - Stage Run Times** This allows you to view cumulative running times for your boiler stages. This is reset in the Display Options menu.
22 Stage Run Times 1) 67:48 2) 12:34 3) 01:03 4) 00:00	**22 Control Options - Stage Run Times** When operating a boiler, you can determine the firing sequence and run times of each boiler/stage from this screen.
23 Programming 1) Control Options 2) **SnowMelt Options** 3) Change Designs 4) Zone 2 Options 5) Graphing	**23 SnowMelt Options** The Snowmelt options menu provides settings for your Snowmelt installation.
24 Snow Melt Options 1) **Boiler Options** 2) Snow Melt Settings 3) Demand Melt Time 4) No Priority 5) Priority Time 6) Injection is PMIv	**24 SnowMelt Options - Boiler Options** Selection #1 will direct you to the System Options screen.

25 System Options
1) **Staging Options**
2) Pump Options
3) # of Stages 1
4) Rotate Boilers? Y
5) Mod Boiler Options
6) Mod PrePurge ON? N
7) Use Flow Proof? N

25 System Options
These steps provide the necessary options to configure the boiler staging component in your system.

26 Staging Options
1) **Hi/Lo Fire? N**
2) Fixed First? N
3) Fixed Last? N
4) Lo/Lo - Hi/Hi? N
5) Boiler Diff'ntial
6) Min Boiler LagTime

26 Staging Options - Hi/Lo Fire
Enable the Hi/Lo Fire option if you are utilizing dual stage boilers with high and low output settings.

At least two stages must be selected for Hi/Lo Fire to be programmed to Y.

27 Staging Options
1) Hi/Lo Fire? N
2) **Fixed First? N**
3) Fixed Last? N
4) Lo/Lo - Hi/Hi? N
5) Boiler Diff'ntial
6) Min Boiler LagTime

27 Staging Options - Fixed First
Fixed First designates a boiler to function as the initial firing boiler, regardless of settings such as rotate boiler. This boiler will consistently be the first to fire when a heat demand is present.

28 Staging Options
1) Hi/Lo Fire? N
2) Fixed First? N
3) **Fixed Last? N**
4) Lo/Lo - Hi/Hi? N
5) Boiler Diff'ntial
6) Min Boiler LagTime

28 Staging Options - Fixed Last
Fixed Last designates a boiler to function as the last firing boiler, regardless of setting such as rotate boiler. This boiler will consistently be the last to fire when a heat demand is present.

Hi/Lo Fire option must be selected to Y in order for this option to be enabled.

29 Staging Options
1) Hi/Lo Fire? N
2) Fixed First? N
3) Fixed Last? N
4) **Lo/Lo - Hi/Hi? N**
5) Boiler Diff'ntial
6) Min Boiler LagTime

29 Staging Options - Lo/Lo - Hi/Hi
The Lo/Lo - Hi/Hi function of the Control instructs a heating system containing two dual stage boilers to engage the first stage of each boiler prior to igniting the second stage of either boiler. The Control will turn on the second stages of the boilers as the call for heat is required.

30 Staging Options
1) Hi/Lo Fire? N
2) Fixed First? N
3) Fixed Last? N
4) Lo/Lo - Hi/Hi? N
5) **Boiler Diff'ntial**
6) Min Boiler LagTime

30 Staging Options - Boiler Differential
The Boiler Differential option creates the margin for error above or below the target temperature. A higher boiler differential will allow for a greater discrepancy in target/actual temperature before there is a heat demand.

The boiler differential can only be manually set for single boiler applications.

31
Boiler Diff'ntial

AUTO

NB. Single Stage Only

31 Staging Options - Boiler Differential
This option allows the user to set the differential for a single boiler only. This will override automatic differential and PID control for the boiler.

32
Staging Options
1) Hi/Lo Fire? N
2) Fixed First? N
3) Fixed Last? N
4) Lo/Lo - Hi/Hi? N
5) Boiler Diff'ntial
6) **Min Boiler LagTime**

32 Staging Options - Minimum Boiler Lag Time
The Minimum Boiler Lagtime enforces a minimum time period that must expire before a new boiler cycle may begin. This minimizes short cycling and functions to promote a more energy efficient system.

33
Boiler Min LagTime

3 mins

33 Staging Options - Minimum Boiler Lag Time Cont'd
This screen allows you to set the desired time frame that must pass before consecutive boiler cycles may commence.
(3 - 200mins) Default: 3 Minutes

34
System Options
1) Staging Options
2) **Pump Options**
3) # of Stages 1
4) Rotate Boilers? Y
5) Mod Boiler Options
6) Mod PrePurge ON? N
7) Use Flow Proof? N

34 Pump Options
Access Pump Options to setup and differentiate between boiler pumps and system pumps with post purge features, etc.

35
Pump Options
1) **1 Pump/Boiler? N**
2) Const Sys Pump? N
3) Post Purge 30 Sec

35 Pump Options - 1 Pump/Boiler
This feature asks you whether or not the boiler pumps are controlled by the boiler circuit.
N = Boiler pumps controlled by boiler circuit
Y = Boiler pumps controlled by SNO-1000
When selected 'Y' an automatic 30 sec post purge time is activated for the boiler pumps (Set on Option 3).

36
Pump Options
1) 1 Pump/Boiler? N
2) **Const System Pump? N**
3) Post Purge 30 Sec

36 Pump Options - Constant System Pump
Selection #2 gives you the option to run the system pump continuously regardless of a call for heat.

37 CAUTION This setting will turn the system pump on always. Press B To Continue	**37 Pump Options - Constant System Pump** Use caution when activating the constant system pump feature.
38 Pump Options 1) 1 Pump/Boiler? N 2) Const System Pump? N **3) Post Purge 30 Sec**	**38 Pump Options - Post Purge** Selection #3 gives you the ability to program a post purge cycle time which runs all pumps for a selectable duration (30-240 Secs) after the initial off-signal has been sent. Post purge does not effect the injection pumps. **This feature applies to both boiler pumps and system pumps.**
39 Post Purge Time 30 Secs	**39 Pump Options - Post Purge Time** This screen allows you to set the desired time frame for system and boiler pumps to run after a heat demand has been satisfied. This features process is to circulate tempered water into the loop which would otherwise be trapped in the boiler, causing energy waste. (30 - 240secs) Default: 30 Seconds
40 System Options 1) Staging Options 2) Pump Options **3) # of Stages 1** 4) Rotate Boilers? Y 5) Mod Boiler Options 6) Mod PrePurge ON? N 7) Use Flow Proof? N	**40 # of Stages** Access staging options for your heating source which sets the number of stages in the system. (0 - 10 stages) Default: 1 Stage
41 Number of Stages 1 NB. HI/LO = 2 Stages	**41 # of Stages Cont'd** The number of stages available ranges from 0-10. For systems with 3 or more stages expansion modules are required.
42 System Options 1) Staging Options 2) Pump Options 3) # of Stages 1 **4) Rotate Boilers? Y** 5) Mod Boiler Options 6) Mod PrePurge ON? N 7) Use Flow Proof? N	**42 Rotate Boilers** Selection #4 gives you the ability to rotate the boiler sequence for lead/lag and effectively accomplish equal run time per boiler. Rotation is executed every 48 hours (running hours). **The factory default setting for rotate boilers is 'Y'.**

43 System Options	**43 Modulating Boiler Options**
1) Staging Options	Use this setting to setup modulating boilers in your system. Up to 5 modulating devices can be handled by the SNO-1000 with the use of Modulating Modules.
2) Pump Options	
3) # of Stages 1	
4) Rotate Boilers? Y	
5) Mod Boiler Options	
6) Mod PrePurge ON? N	

43 Modulating Boiler Options

Use this setting to setup modulating boilers in your system. Up to 5 modulating devices can be handled by the SNO-1000 with the use of Modulating Modules.

---

44 Mod Boiler Option
1) **Series**
2) Start Percent 10%
3) # of Boilers 0
4) Pump/Boiler? N
5) Fast StepTime? 10s
6) Slow StepTime? 10s
7) Step Percent 1%

44 Modulating Boiler Options - Series / Parallel / Progressive

Toggle between Series, Parallel and Progressive modes.

Refer the Modulating Theory bulletin on the HBX Control Systems web site for more information: www.hbxcontrols.com

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45 Mod Boiler Option
1) Progressive
2) **Start Percent 10%**
3) # of Boilers 0
4) Pump/Boiler? Y
5) Fast StepTime? 10s
6) Slow StepTime? 10s
7) Step Percent 1%

45 Modulating Boiler Options - Start Percent

This value is the percentage of modulation that you would like each modulating boiler to begin firing at. This is also the lowest value that the modulating boiler will drop to before shutting off.

If Modulating Prepurge (#6 in System Options) is set to 'Y' then the boiler will fire at 50%.   (10 - 100%) Default: 10%

---

46 Mod Boiler Option
1) Progressive
2) Start Percent 10%
3) **# of Boilers 0**
4) Pump/Boiler? Y
5) Fast StepTime? 10s
6) Slow StepTime? 10s
7) Step Percent 1%

46 Modulating Boiler Options - Number of Boilers

This option allows you to designate the number of modulating boilers that are installed in your system (up to 5 modulating boilers).

---

47 # of Mod Boilers

0

47 Modulating Boiler Options - Number of Boilers Cont'd

Increase or decrease the number of desired modulating boilers in this screen (up to 5 modulating boilers).

---

48 Mod Boiler Option
1) Progressive
2) Start Percent 10%
3) # of Boilers 0
4) **Pump/Boiler? Y**
5) Fast StepTime? 10s
6) Slow StepTime? 10s
7) Step Percent 1%

48 Modulating Boiler Options - Pump/Boiler

Choose whether or not the modulating boiler pumps are controlled by the boiler circuit.
N = Boiler pumps controlled by boiler circuit
Y = Boiler pumps controlled by SNO-1000
When selected 'Y' an automatic adjustable post purge time is activated for the boiler pumps.

49 Mod Boiler Option
1) Progressive
2) Start Percent 10%
3) # of Boilers 0
4) Pump/Boiler? Y
5) **Fast StepTime? 10s**
6) Slow StepTime? 10s
7) Step Percent 1%

49 Modulating Boiler Options - Fast Step Time
This time is used to fine tune the modulating system. This is the time between each percent of modulating for the boilers. Set this time based on DHW loads or loads that need to modulate faster than normal to catch the boiler up with the load.

50 Fast Step Time

10 Secs

50 Modulating Fast Step Time
The modulating step time works in conjunction with the modulating step percentage to control how fast the boilers modulate up and down.

(2 - 240secs) Default: 10 Seconds per step

51 Mod Boiler Option
1) Progressive
2) Start Percent 10%
3) # of Boilers 0
4) Pump/Boiler? Y
5) Fast StepTime? 10s
6) **Slow StepTime? 10s**
7) Step Percent 1%

51 Modulating Boiler Options - Slow Step Time
This time is used to fine tune the modulating system. This is the time between each percent of modulating for the boilers. Set this time based on normal loads and normal boiler modulation time. Modulating down step time is 1/2 of the step time setting.

52 Slow Step Time

10 Secs

52 Modulating Slow Step Time
The modulating step time works in conjunction with the modulating step percentage to control how slow the boilers modulate up and down.

(2 - 240secs) Default: 10 Seconds per step

53 Mod Boiler Option
1) Progressive
2) Start Percent 10%
3) # of Boilers 0
4) Pump/Boiler? Y
5) Fast StepTime? 10s
6) Slow StepTime? 10s
7) **Step Percent 1%**

53 Modulating Boiler Options - Step Percent
The modulating step percentage works in conjunction with the modulating step time to control how fast/slow the boilers modulate. The percentage can be set from 1-20%.

54 Mod Step Percent

1 %

54 Modulating Step Percent
Pressing the "A" button will decrease the percentage, pressing the "B" button will increase the modulating step percentage.

(1 - 20%) Default: 1%

55   System Options
1) Staging Options
2) Pump Options
3) # of Stages 1
4) Rotate Boilers? Y
5) Mod Boiler Options
6) **Mod PrePurge ON? N**

55 Mod Prepurge
This selection will allow each modulating boiler to start firing at 50% when selected to Y. It will hold this for at least 45 seconds or the time indicated by the step time feature.

(Y/N) Default: No

---

56 Snow Melt Options
1) Boiler Options
2) **Snow Melt Settings**
3) Demand Melt Time
4) No Priority
5) Priority Time
6) Injection is PMIv

56 Snowmelt Settings
The Snowmelt settings option allows you to set options specific to the snow zone.

---

57 Snow Melt Settings
1) **Idle Temp 30**
2) Melt Temp 40
3) Melt Time 1 hrs
4) Visc Comp? Y
5) Intensity Settings
6) Remote Slab? N

57 Snowmelt Settings - Idle Temp
This setting is used to set the temperature in the slab for the snow zone when there is no snow present.

---

58 Snow Idle Temp

30 °F

58 Snow Idle Temp
Set this to be the minimum temperature you would like in the slab when there is no snow present.
(-40°F - 70°F) Default: 30°F

---

59 Snow Melt Settings
1) Idle Temp 30
2) **Melt Temp 40**
3) Melt Time 1 hrs
4) Visc Comp? Y
5) Intensity Settings
6) Remote Slab? N

59 Snowmelt Settings - Melt Temp
This setting is used to set the snow zone slab temperature when snow is present. Going from idle to melt temperature is determined by the snow sensor. If the amount of snow is more than the intensity settings then the control will go into melt mode.

---

60 Snow Melt Temp

40 °F

60 Snow Melt Temp
Set this setting to the temperature that you have designed to melt the snow off the snow-zone slab.
(-40°F - 70°F) Default: 40°F

61 Snow Melt Settings

61	**Snow Melt Settings**
1)	Idle Temp 30
2)	Melt Temp 40
3)	**Melt Time 1 hrs**
4)	Visc Comp? Y
5)	Intensity Settings
6)	Remote Slab? N

61 Snowmelt Settings - Melt Time
Set this time to the desired amount of time you would like the control to stay in melt mode after the control has no longer detected snow on the sensor.

62	Snow Melt Time
	1 hrs

62 Snow Melt Time
This setting allows for the system to stay on even after no snow is present. This will melt any residual snow that has accumulated and not melted.
(1h - 240hrs) Default: 1 hours

63	**Snow Melt Settings**
1)	Idle Temp 30
2)	Melt Temp 40
3)	Melt Time 1 hrs
4)	**Visc Comp? Y**
5)	Intensity Settings
6)	Remote Slab? N

63 Snowmelt Settings - Viscosity Compensation
Viscosity compensation is used when more than 20% glycol is used in the system. This setting will adjust for slower flow rates when the slab is very cold. This setting will help to heat the slab efficiently in extremely cold conditions.
(Y or N) Default: Y

64	**Snow Melt Settings**
1)	Idle Temp 30
2)	Melt Temp 40
3)	Melt Time 1 hrs
4)	Visc Comp? Y
5)	**Intensity Settings**
6)	Remote Slab? N

64 Snowmelt Settings - Intensity Settings
The intensity settings are used to set the point at which you would like the control to come out of idle into melt mode.

65	**Intensity Setting**
1)	**Instant Intensity**
2)	Constant Intensity
3)	Constant Time 3h

65 Instant Intensity
The instant intensity setting is used to set the intensity of the snow fall at which the control will come out of idle into melt mode. Set this setting for times of fast or high snow fall.

66	Instant Intensity
	35 %

66 Instant Intensity
If the snow melt sensor sees a greater snowfall rate than this set percentage the control will come out of idle mode into melt mode.
(0% - 100%) Default: 35%

The intensity settings allows the user to set any snowfall rate for the control to go into melt mode. These settings allow for great flexibility in how the control works. The setting allows the user to tune the control for the installation and cut down on false readings that would normally turn the control on.

67

Intensity Setting
1) Instant Intensity
2) Constant Intensity
3) Constant Time 3h

67 Constant Intensity
The constant intensity setting is also used to set the snow fall rate at which the control will come out of idle mode and go into melt mode.
Set this setting for times of slow, but constant snowfall.

68

Constant Intensity

10 %

68 Constant Intensity
If the snowfall rate is greater than this set percentage, for longer than the constant time set below, then the control will come out of idle mode and go into melt mode.
(1% - 100%) Default: 10%

69

Intensity Setting
1) Instant Intensity
2) Constant Intensity
3) Constant Time 3h

69 Constant Time
The constant time setting is used in conjunction with constant intensity. If the snowfall rate is greater than the constant intensity for longer than the constant time the control will go into melt mode.

70

Constant Time

3 hrs

70 Constant Time
Set this time in conjunction with constant intensity.
(1h - 24hrs) Default: 3 Hours

The intensity settings allows the user to set any snowfall rate for the control to go into melt mode. These settings allow for great flexibility in how the control works. The setting allows the user to tune the control for the installation and cut down on false readings that would normally turn the control on.

---

71 Snow Melt Settings
1) Idle Temp 30
2) Melt Temp 40
3) Melt Time 1 hrs
4) Visc Comp? Y
5) Intensity Settings
6) Remote Slab? N

71 Remote Slab
This is set to Y when the Snow/Ice Optical Sensor is remotely installed or otherwise not in the slab that it is controlling.

(Y/N) Default: No

---

72 Snow Melt Options
1) Boiler Options
2) Snow Melt Settings
3) Demand Melt Time
4) No Priority
5) Priority Time
6) Injection is PMIv

72 Demand Melt Time
The demand melt time is used in conjunction with the forced melt demand input. When the forced melt demand input is on the control will go into melt mode regardless of snowfall rate. It will remain in melt mode for the set demand melt time. The forced melt demand input must be turned back off before it can be used again.

⚠ **It is best to use a momentary switch for the "Force Melt Demand" option.**

73	Demand Melting Time

4 hrs

73 Demand Melt Time
When the forced melt demand is used the control will stay in melt mode for this amount of time. After this time is up the control will return to the mode it was in before the forced melt demand was activated.
(1 - 100hrs) Default: 4 hours

74	Snow Melt Options
1)	Boiler Options
2)	Snow Melt Settings
3)	Demand Melt Time
4)	**No Priority**
5)	Priority Time
6)	Injection is PMIv

74 Priority
This setting is used to set the system priority. If set to "No Priority" then the snow zone and other zone can run without interference from Zone 2.
No Priority - No system priority.
Snow Priority - The snow zone takes priority.
Zone Priority - The second slab zone takes priority.

75	Snow Melt Options
1)	Boiler Options
2)	Snow Melt Settings
3)	Demand Melt Time
4)	No Priority
5)	**Priority Time**
6)	Injection is PMIv

75 Priority Time
This setting is use to set the priority time. When a priority is set this time must elapse before the zone that is not prioritized can get heat from the system.

76	Priority Time

60 mins

76 Priority Time
Set this time for the time you would like to prioritize the system this setting works in conjunction with the priority setting.
(1 - 100mins) Default: 60 Minutes

77	Snow Melt Options
1)	Boiler Options
2)	Snow Melt Settings
3)	Demand Melt Time
4)	No Priority
5)	Priority Time
6)	**Injection is PMIv**

77 Injection Type
Selection #6 allows you to select up to four mixing methods (devices).

Refer the Pulse Modulating Injection bulletin on the HBX Control Systems web site for more information: www.hbxcontrols.com

78	Injection Type
1)	PMI Valve
2)	PMI Pump
3)	Modulating
4)	Floating Action

78 Injection Type
Select one of the following:
1) PMI Valve
2) PMI Pump
3) Modulating
4) Floating Action

The modulating and floating contacts are on the SNO-0110

79 Programming 1) Control Options 2) SnowMelt Options **3) Change Designs** 4) Zone 2 Options 5) Graphing	**79 Change Designs** Selection #3 guides you through the steps to adjust system design parameters; optimizing your systems performance.
80 Change Designs **1) Manual** 2) Factory Defaults 3) Format Control	**80 Change Designs Manual Design** Manual design allows you to customize each design temperature for your system.
81 Boiler Maximum 190 °F	**81 Boiler Maximum** Set this to the maximum boiler temperature. The boiler will not go over this temperature even if it is calculating for it. (50°F - 210°F) Default: 190°F
82 System Maximum 130 °F	**82 System Maximum** Set this to the maximum temperature you would like in the slab. This is for the low temperature system loop. (50°F - 210°F) Default: 130°F
83 Boiler Delta t 30 °F	**83 Boiler Delta T** Set this to the temperature that you would like the boiler to calculate its target. The boiler target is calculated using this number plus what the system target is: Boiler Δt + System Target = Boiler Target (2°F - 150°F) Default: 30°F
84 System Delta t 20 °F	**84 System Delta T** Set this temperature to the Δt you would like in the system. This will calculate the system target. The target is calculated by using system supply and system return temperatures: System Target = System return + System Δt (2°F - 100°F) Default: 20°F

85 Min Boiler Temp (Sup) 90 °F	**85 Min Boiler Temp (Sup)** Min boiler temp is the minimum you would like the boiler to run at. This is also used to protect the boiler if the boiler is of a non condensing type. (50°F - 225°F) Default: 90°F
86 Min System Temp 1 °F	**86 Min System Temp** Min System Temp is the lowest water temp in your system loop. (1°F - 150°F) Default: 1°F
87 W.W.S.D. 40 °F	**87 Warm Weather Shutdown** W.W.S.D. is the temp at which you decide that the control will no longer turn on. Set this to the temperature at which the slab is able to melt itself. (-50°F - 100°F) Default: 40°F
88 C.W.S.D. -30 °F	**88 Cold Weather Shut Down** If the outdoor temperature is below this setting the control goes into C.W.S.D. This prevents the control from running in extremely cold weather when the snow is not likely to melt properly. (100°F - -50°F) Default: -30°F
89 Change Designs 1) Manual 2) **Factory Defaults** 3) Format Control	**89 Change Designs - Factory Defaults** When selected, the original factory defaults and numerical values are reloaded.
90 CAUTION This Setting will Reset Designs to Factory Defaults Press B to Continue Press C to EXIT	**90 Factory Default Caution** This screen will appear to advise you that you are about to reset your application design settings. ⚠ **Use caution when selecting Factory Defaults, any user programmed numerical design values will be overwritten.** By pressing B you will be returned to screen 1 - Startup Screen.

91

Change Designs
1) Manual
2) Factory Defaults
3) **Format Control**

91 Change Designs - Format Controls

When selected, all of the original settings are reloaded as in the Factory Defaults option. In addition, the Format Control option will reset the designated functions for each terminal. Eg. the default value for PMlp vs. the default value for PMlv.

92

CAUTION

All Settings will be Reset to FACTORY Settings

Press B to Continue
Press C to EXIT

92 Default Designs Caution

This screen will be appear to advise you that you are about to reset your entire control. Both design and terminal settings will be effected.

⚠️ **Use caution when selecting Format Controls, all user programmed options will be overwritten.**

93

Programming
1) Control Options
2) SnowMelt Options
3) Change Designs
4) **Zone 2 Options**
5) Graphing

93 Zone Options

Zone 2 is used if a second zone is needed on the control. This zone works independently of the snow zone and is unaffected by the snowfall rate. Zone 2 can be turned on by the zone demand or programming in a permanent zone demand.

94

Zone Options
1) **Melt Temp 35**
2) Zone Differential
3) Melt Time 60

94 Melt Temp

The zone melt temp is set to the temperature you would like to keep the zone 2 slab at. The zone 2 is essentially a setpoint for the slab.

⚠️ **Not suitable for DHW usage.**

95

Zone Melt Temp

35 °F

95 Zone Melt Temp

Set this temperature to the desired temperature in the zone 2 slab. If set to off, Zone 2 is deactivated.
(OFF - 200°F) Default: 35°F

96

Zone Options
1) Melt Temp 1
2) **Zone Differential**
3) Melt Time 60

96 Zone Differential

Set this to the desired differential for the zone 2 slab.

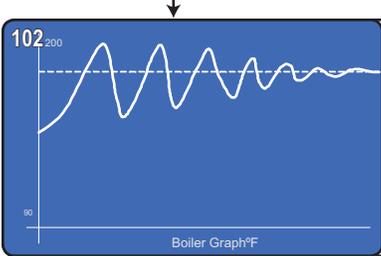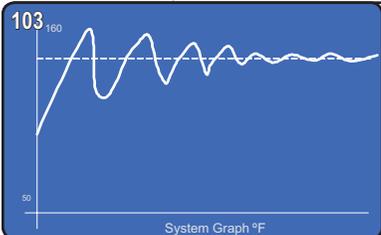|	
97 Zone Differential 25 °F	**97 Zone Differential** Set this temperature to the differential needed in the zone 2 slab temperature. (2°F - 40°F) Default: 25°F
98 Zone Options 1) Melt Temp 1 2) Zone Differential **3) Melt Time 60**	**98 Zone Melt Time** The zone melt time is used to get the time the zone 2 will continue to run even after it has reached temperature. This will ensure proper melting of the snow or ice on that zone.
99 Zone Melt Time 60 mins	**99 Zone Melt Time** Set this time to the desired time you would like this zone to run even after reaching temperature. ⚠ **If a permanent zone demand is present keep this number very low to prevent over heating.** (0 - 240m) Default: 60 Mins
100 Programming 1) Control Options 2) SnowMelt Options 3) Change Designs 4) Zone 2 Options **5) Graphing**	**100 Graphing Options** The display allows you to get a visual impression of how your system is performing by selecting choice #5 in the programming menu.
101 Graphing 1) Boiler Graph 2) System Graph	**101 Graphing** You have the option to look at either the Boiler Graph (Actual vs. Target) or System Graph (Actual vs. Target).
102 200 90 Boiler Graph°F	**102 Boiler Graph** The Y and X axis are not adjustable. The dotted line represents the target Temperature and the solid line represents the actual temperature. One full screen will display approx 10 mins of temperature data in 20 sec intervals.
103 160 50 System Graph °F	**103 System Graph** The Y and X axis are not adjustable. The dotted line represents the target temperature and the solid line represents the actual temperature. One full screen will display approx 10 mins of temperature data in 20 sec intervals.

SNOWMELT CONTROL 001

Snowmelt Control with 1 On/Off boiler and only a snow zone for snow melting. Mixing style is injection.
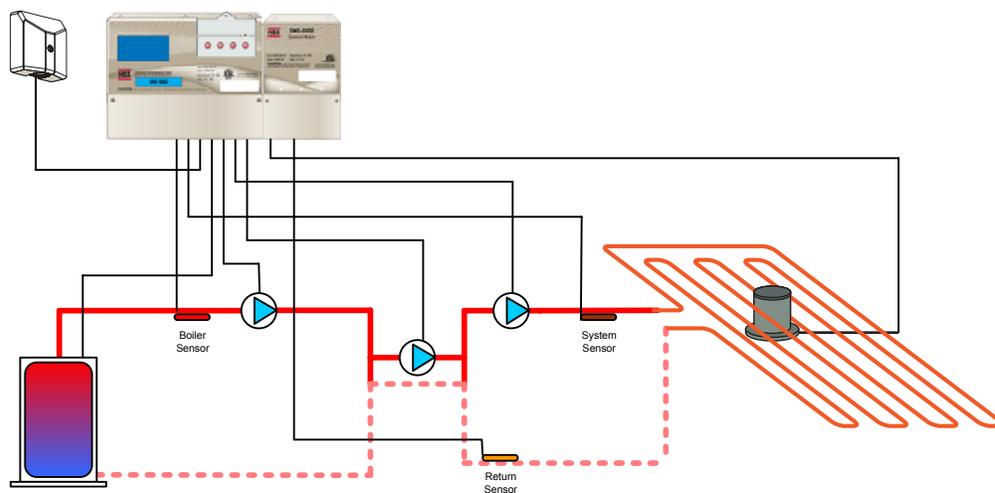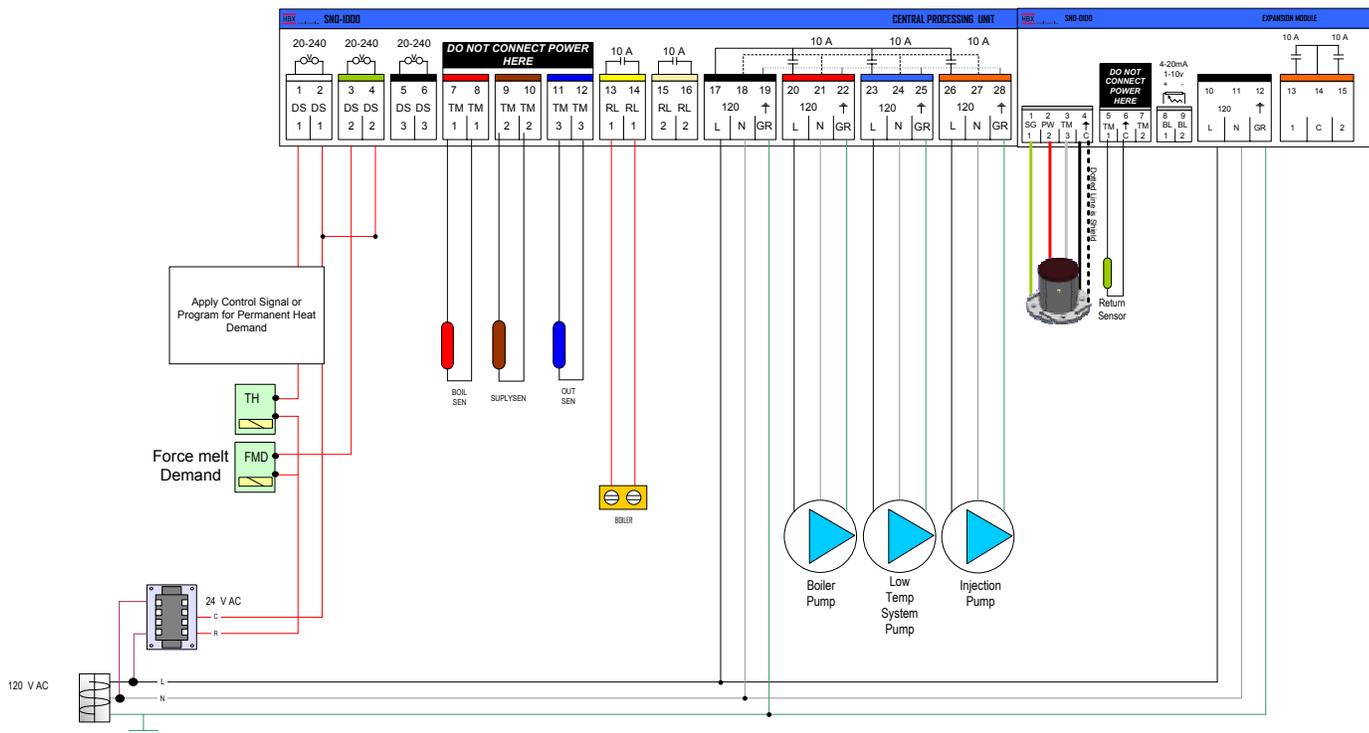
These are not engineered drawings and do not necessarily include all the components for an entire system. They are intended as representations of how the Control may be wired for a sample application. It is the responsibility of the installer to seek professional advice and/or install the system to meet all necessary codes for the jurisdiction of the actual installation.
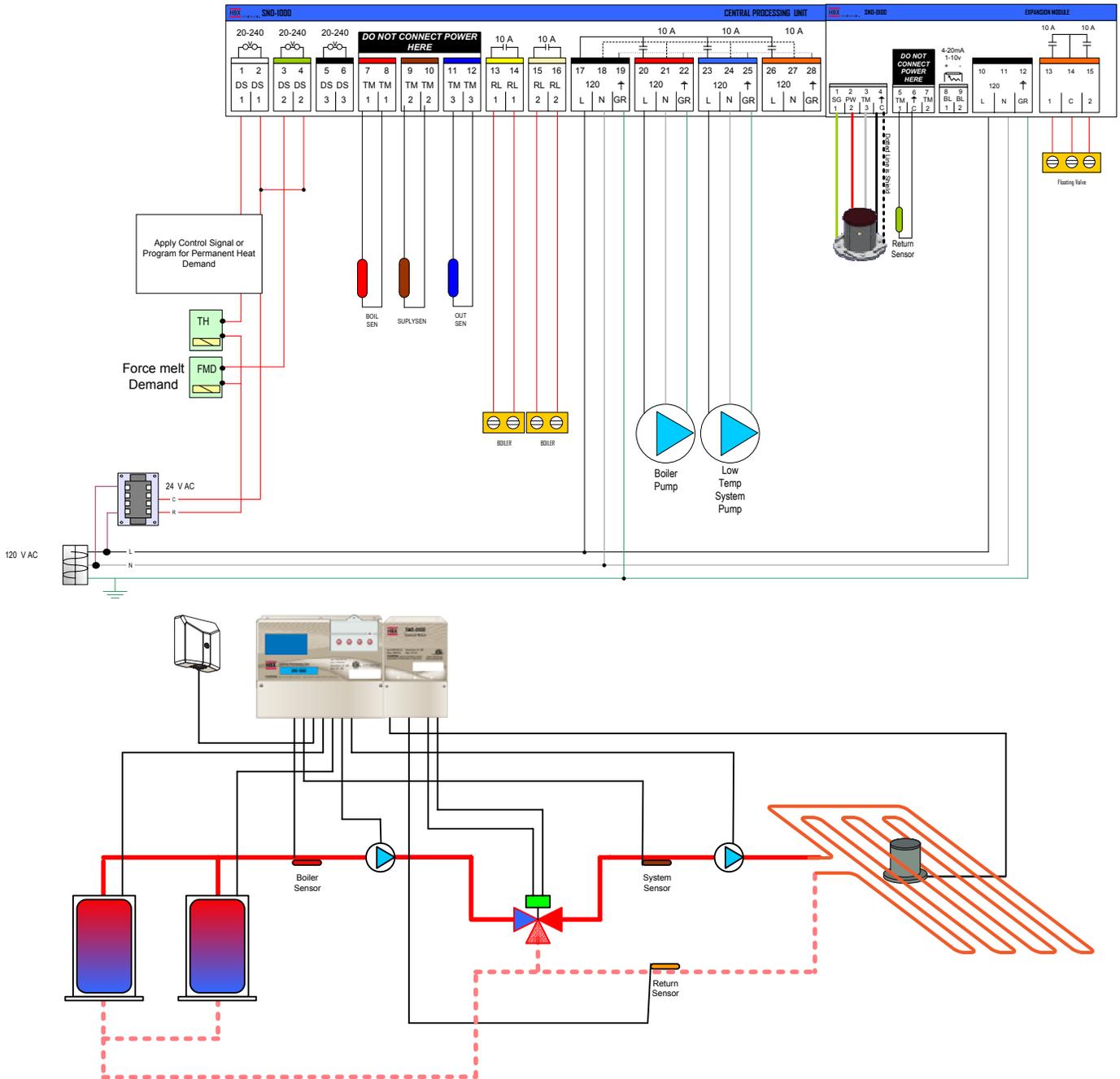
SNOWMELT CONTROL 002

Snowmelt Control with 2 On/Off boilers, a snow zone, and a second slab (only) zone. Mixing style is injection.
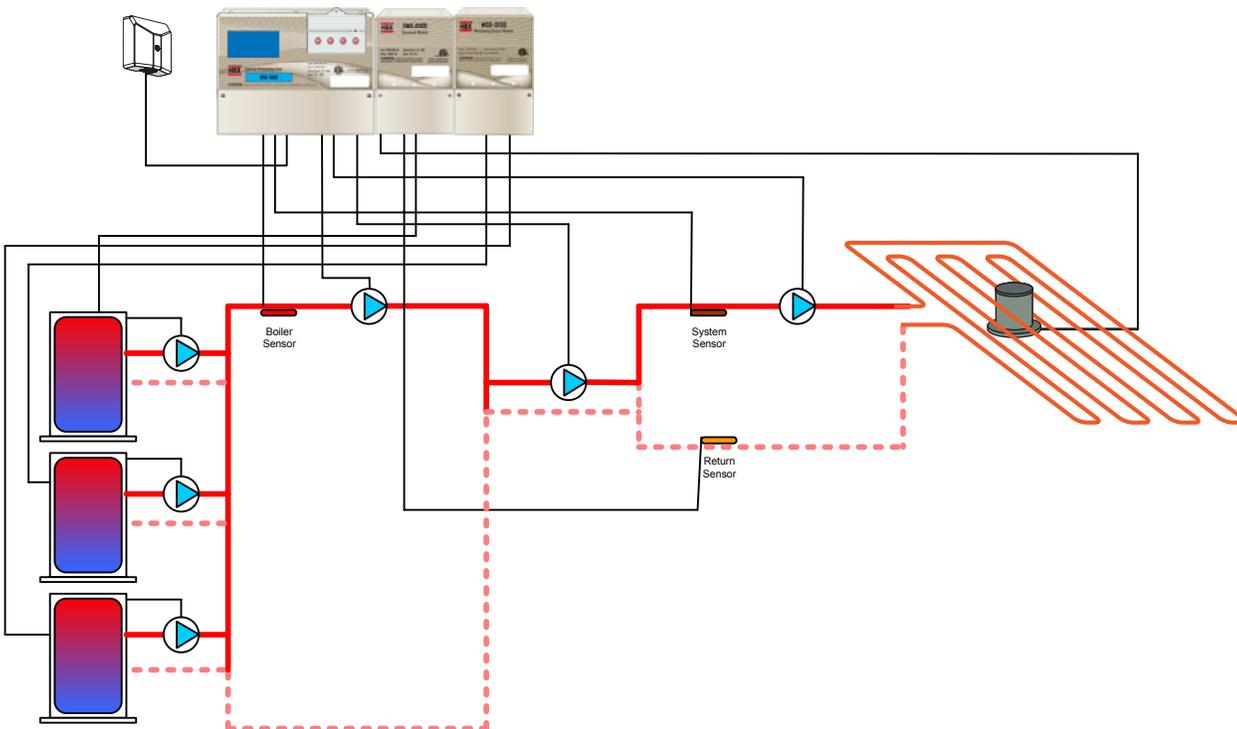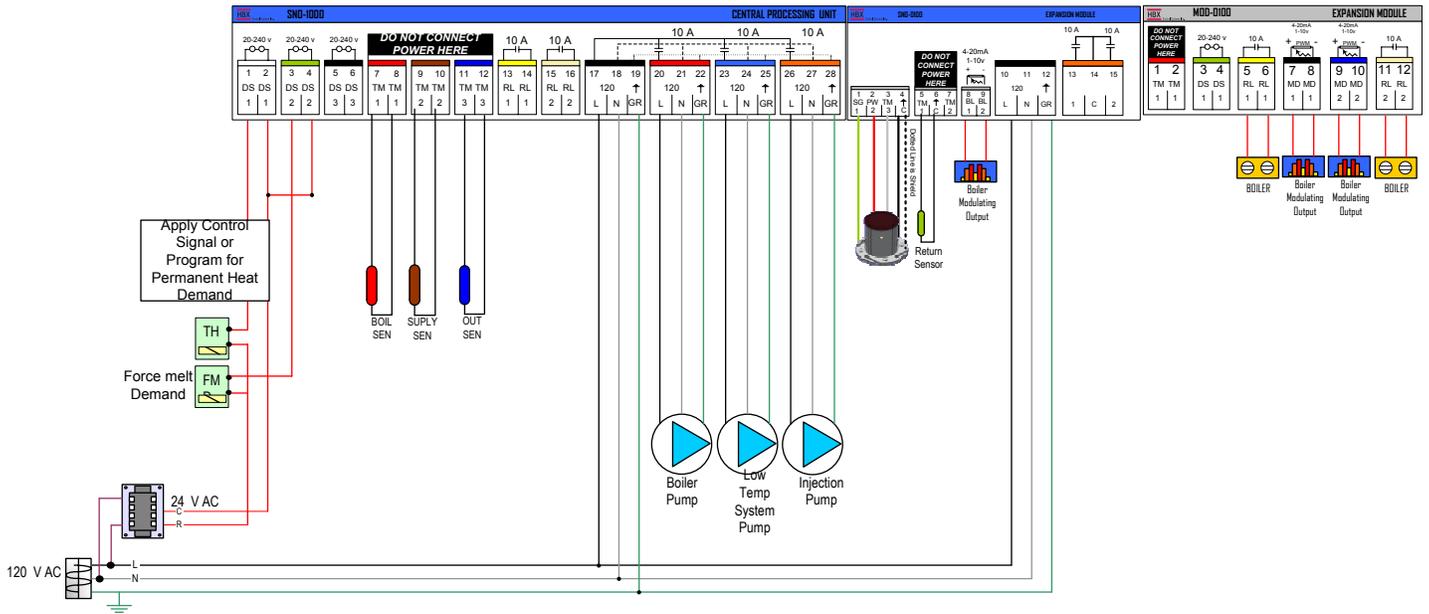
© HBX Control Systems Inc. 2014
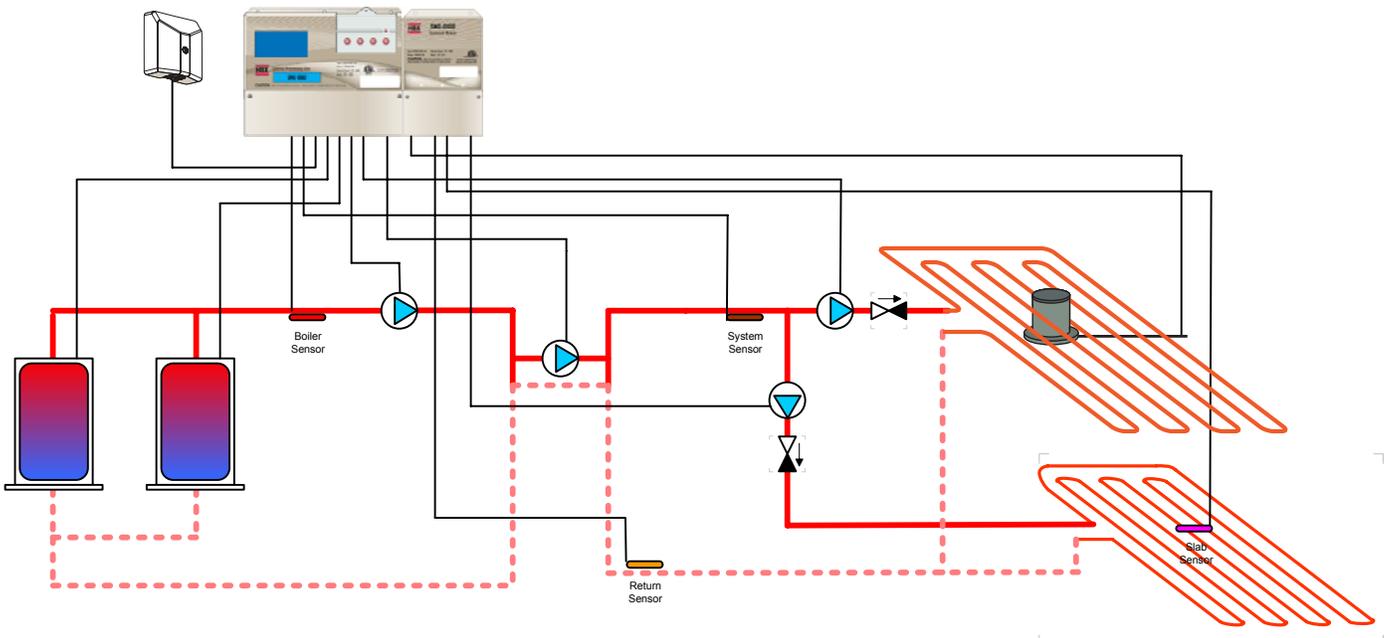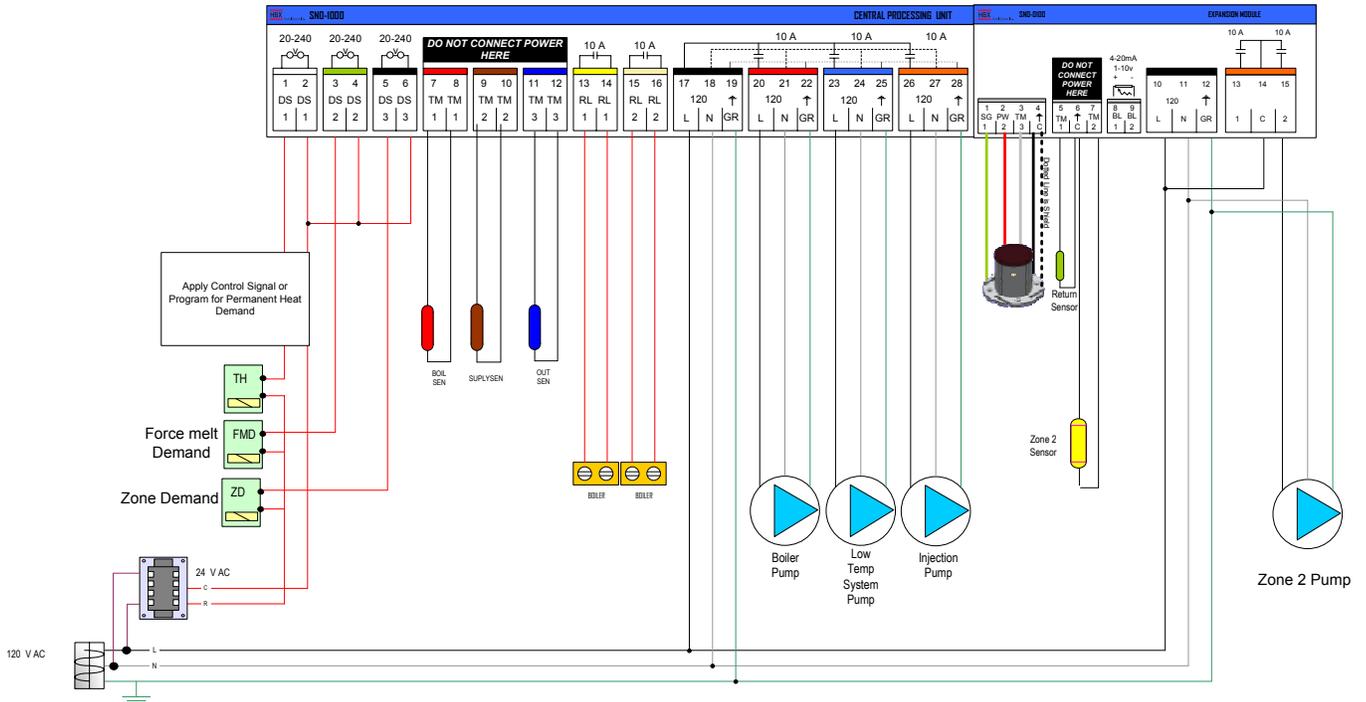
SNOWMELT CONTROL 003

Snowmelt Control with 2 On/Off boilers. Snow zone only with mixing style as floating valve (power open, power close)

Note: When using floating mixing you do no have access to the second slab (only) zone.
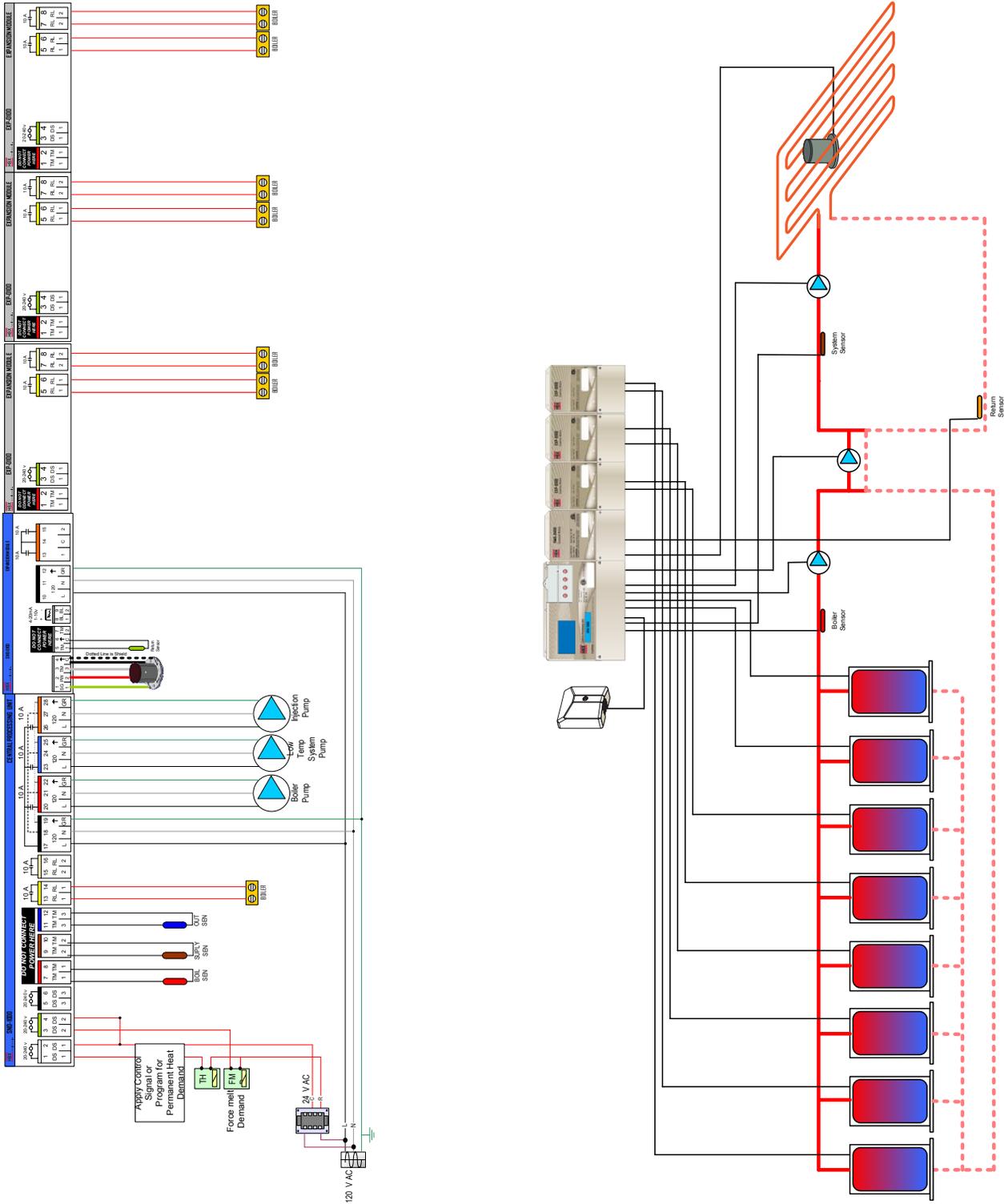
SNOWMELT CONTROL 004

Snowmelt Control with 3 modulating boilers. Snow zone only with injection mixing.

SNOWMELT CONTROL 005

Snowmelt Control with 2 On/Off boilers. It has both snow zone and slab (only) zones. Mixing is using a modulating output (1-10VDC or 4-20mA) for a mixing valve or a VFD to a pump.

Signal can also be used to run a 4-20mA or 1-10vdc modulating valve

SNOWMELT CONTROL 006

Snowmelt Control with 8 On/Off stages. Snow zone only with injection mixing.

TROUBLESHOOTING & FAULT CODES

Display does not come on	Check power connection at terminals 17,18,19. If no power (120VAC) present then trace power back to source. Cycle power to Control.
No snowmelt demand	Check that you have at least 20VAC being supplied to the demands.
Injection not working	Make sure that in the mixing settings you have selected the appropriate device you are using to mix with. If it is PMIp then your connection should be attached to 26 to 28 and if it is PMIv then connect the valve to 15,16.
Buttons do not respond or cannot go into Programming Mode	Hold down buttons C and D to unlock the buttons. Hold until display says BUTTONS UNLOCKED.
Parameters set in control do not seem to be taking effect	Manually Reset Control by using a small blunt tool and gently press the reset button.
Boilers not staging on	Make sure in the boiler options that you have selected the appropriate amount of stages for the system.
Snowmelt Control not responding or warming the slab	Control may be in Warm Weather Shut Down mode, see "System Status" display. Is the acronym "WWSD" visible? If yes, check in "Change Designs" menu under WWSD, factory default is 75ºF. Adjust accordingly to your own design parameters. **Remember to check and install your Outside temperature sensor away from direct sun or potential heat sources etc.**

TYPICAL DESIGN OUTSIDE TEMPERATURES IN NORTH AMERICA

The statistical data presented below is taken as excerpts from the 1989 ASHRAE Handbook Fundamentals, Chapter 24. It is intended as sample design temperatures for winter conditions, in numerous locations. HBX has made every effort to provide accurate data but reserves all rights against misprints or typographical errors.

City	Temp	City	Temp	City	Temp	City	Temp
Canadian Cities	°F	Fort Smith, AR Little Rock, AR	17 20	Boston, MA Greenfield, MA	9 -2	Allentown, PA Philadelphia, PA	9 14
Edmonton, AB Calgary, AB	-25 -23	Los Angeles, CA San Francisco, CA	43 38	Detroit, MI Traverse City, MI	6 1	Newport, RI Providence, RI	9 9
Fort Nelson, BC Vancouver, BC	-40 -19	Boulder, CO Denver, CO	8 1	Fergus Falls, MN Minnesota, MN	-17 -12	Charleston, SC Georgetown, SC	28 26
Churchill, MB Winnipeg, MB	-39 -27	Bridgeport, CT Hartford, CT	9 7	Clarksdale, MS Jackson, MS	19 25	Aberdeen, SD Rapid City, SD	-15 -7
Fredericton, NB Moncton, NB	-11 -8	Dover, DE Wilmington, DE	15 14	Hannibal, MO St. Louis, MO	8 6	Chattanooga, TN Memphis, TN	18 18
Goose Bay, NL St. John's, NL	-24 -7	Andrews, DC Washington, DC	14 17	Billings, MT Kalispel, MT	-10 -7	Amarillo, TX Dallas, TX	11 22
Inuvik, NT Yellowknife, NT	-53 -46	Miami, FL Gainesville, FL	48 31	Hastings, NE Omaha, NE	-3 -3	Logan, UT Salt Lake City, UT	2 8
Halifax, NS Yarmouth, NS	5 9	Atlanta, GA Savannah, GA	22 27	Las Vegas, NV Reno, NV	28 11	Barre, VT Rutland, VT	-11 -8
Ottawa, ON Toronto, ON	-13 -1	Boise, ID Coeur D'Alene, ID	10 -1	Berlin, NH Laconia, NH	-9 -5	Charlottesville, VA Norfolk, VA	18 22
Charlottetown, PE	-4	Aurora, IL Chicago, IL	-1 -4	Newark, NJ Phillipsburg, NJ	14 6	Seattle, WA Yakima, WA	26 5
Montreal, PQ Quebec City, PQ	-10 -14	Bloomington, IN Indianapolis, IN	5 2	Alberquerque, NM Los Alamos, NM	16 9	Beckley, WV Huntington, WV	4 10
Regina, SK Saskatoon, SK	-29 -31	Cedar Rapids, IA Des Moines, IA	-5 -5	Buffalo, NY New York, NY	6 15	Ashland, WI Milwaukee, WI	-16 -4
Whitehorse, YT	-43	Dodge City, KS Wichita, KS	5 7	Charlotte, NC Jacksonville, NC	22 24	Cheyenne, WY Newcastle, WY	-1 -12
American Cities	°F	Lexington, KY Louisville, KY	8 10	Bismark, ND Fargo, ND	-19 -18		
Birmingham, AL Huntsville, AL	21 16	Baton Rouge, LA New Orleans, LA	29 33	Cincinnati, OH Toledo, OH	6 1		
Anchorage, AK Fairbanks, AK	-18 -47	Augusta, ME Lewiston, ME	-3 -2	Oklahoma City, OK Tulsa, OK	13 13		
Phoenix, AZ Tucson, AZ	34 32	Baltimore, MD Cumberland, MD	13 10	Baker, OR Portland, OR	6 23		

Limited Warranty

HBX Controls warrants each of its products to be free from defects in workmanship and materials under normal use and service for a period of 24 months from date of manufacture or 12 months from date of purchase from an HBX Authorized Dealer, if within the above documented period after date of manufacture.

If the product proves to be defective within the applicable warranty period, HBX on its sole discretion will repair or replace said product. Replacement product may be new or refurbished of equivalent or better specifications, relative to the defective product. Replacement product need not be of identical design or model. Any repair or replacement product pursuant to this warranty shall be warranted for not less than 90 days from date of such repair, irrespective of any earlier expiration of original warranty period. When HBX provides replacement, the defective product becomes the property of HBX Controls.

Warranty Service, within the applicable warranty period, may be obtained by contacting your nearest HBX Controls office via the original Authorized Agent and requesting a Return Material Authorization Number (RMA #). Proof of purchase in the form a dated invoice/receipt must be provided to expedite the issuance of a Factory RMA.

After an RMA number has been issued, the defective product must be packaged securely in the original or other suitable shipping package to ensure that it will not be damaged in transit. The RMA number must be visible on the outside of the package and a copy included inside the package. The package must be mailed or otherwise shipped back to HBX with all costs of mailing/shipping/insurance prepaid by the warranty claimant.

Any package/s returned to HBX without an approved and visible RMA number will be rejected and shipped back to purchaser at purchaser's expense. HBX reserves the right, if deemed necessary, to charge a reasonable levy for costs incurred, additional to mailing or shipping costs.

Limitation of Warranties

If the HBX product does not operate as warranted above the purchasers sole remedy shall be, at HBX's option, repair or replacement. The foregoing warranties and remedies are exclusive and in lieu of all other warranties, expressed or implied, either in fact or by operation of law, statutory or otherwise, including warranties of merchantability and fitness for a particular purpose/application. HBX neither assumes nor authorizes any other person to assume for it any other liability in connection with the sale, installation maintenance or use of HBX Controls products.

HBX shall not be liable under this warranty; if its testing and examination discloses that the alleged defect in the product does not exist or was caused by the purchasers or third persons misuse, neglect, improper installation or testing, unauthorized attempts to repair or any other cause beyond the range of intended use, or by accident, fire, lightning or other hazard.

Limitation of Liability

In no event will HBX be liable for any damages, including loss of data, loss of profits, costs of cover or other incidental, consequential or indirect damages arising out of the installation, maintenance, commissioning, performance, failure or interruption of an HBX product, however caused and on any theory of liability. This limitation will apply even if HBX has been advised of the possibility of such damage.

Local Law

This limited warranty statement gives the purchaser specific legal rights. The purchaser may also have other rights which vary from state to state in the United States, from Province to Province in Canada and from Country to Country elsewhere in the world.
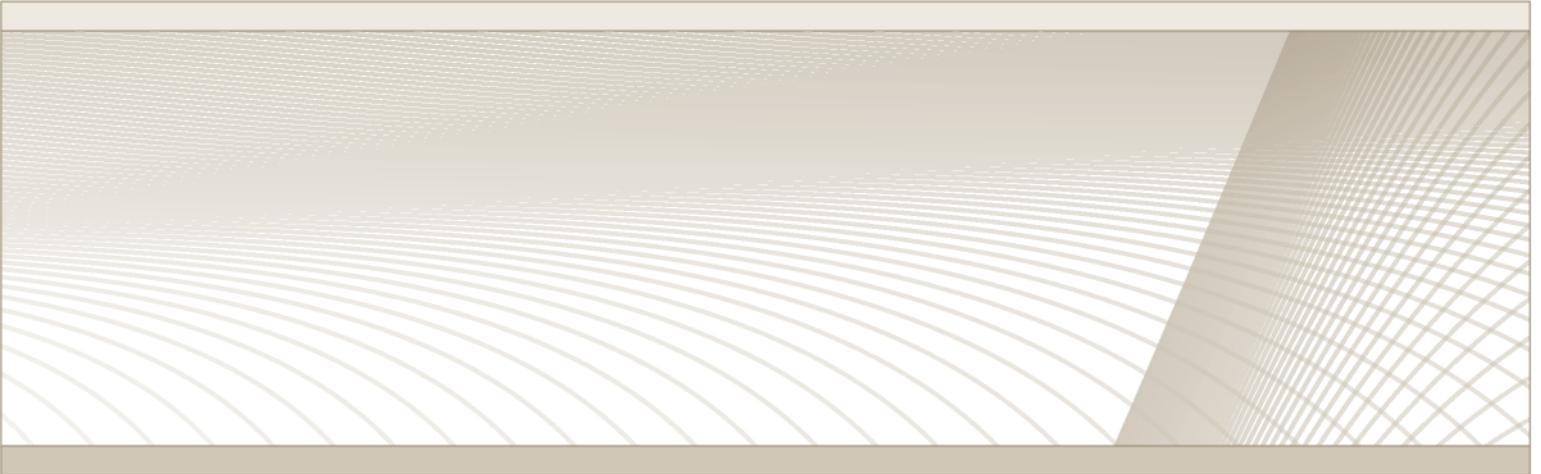
To the extent this Limited Warranty Statement is inconsistent with local law, this statement shall be deemed modified to be consistent with such local law. Under such local law, certain disclaimers and limitations of this statement may not apply to the purchaser. For example, some states in the United States, as well as some governments outside the United States (including Canadian Provinces), may:

Preclude the disclaimers and limitations in this statement from limiting the statutory rights of a consumer (e.g. United Kingdom);

Otherwise restrict the ability of a manufacturer to enforce such disclaimers or limitations; or grant the purchaser additional warranty rights which the manufacturer cannot disclaim, or not allow limitations on the duration of implied warranties.

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