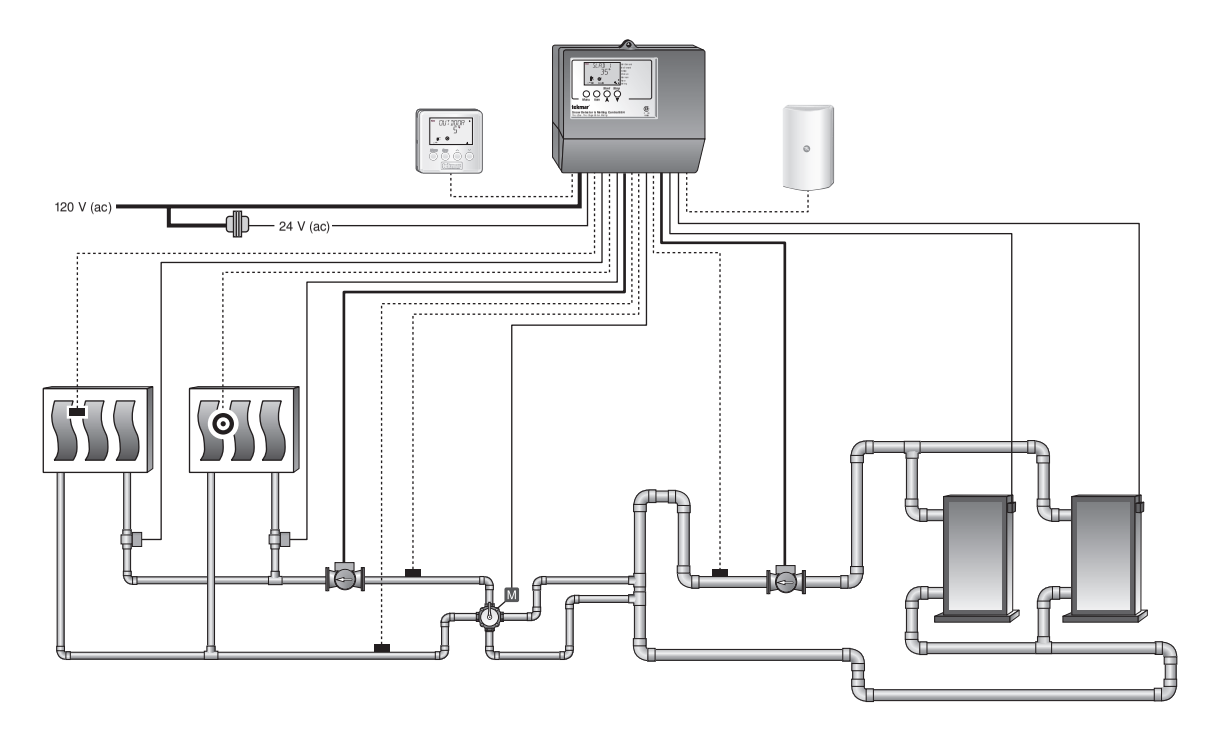
tekmar® - Application Brochure

Snow Detector & Melting Control 664

A 664

12/09



Features of the Snow Detector & Melting Control 664

Please refer to Essay E 005: Control Functions and Benefits for a detailed description of these features.

- 10 Boiler Differential (Automatic)
- 11 Boiler Minimum Supply
- 14 PID Staging
- 15 Equal Run Time Rotation
- 19 Fire Delay
- 20 Boiler Mass
- 21 Boiler Enable
- 32 Floating Action Output
- 33 Modulating Output
- 35 Variable Speed Output
- 37 Boiler Protection
- 38 System Protection
- 52 Snow / Ice Detection
- 53 Slab Protection
- 54 Viscosity Compensation
- 55 Slab Outdoor Reset
- 56 Snow Melting Setpoint
- 57 Snow Idling Setpoint
- 58 Warm Weather Cut Off
- 59 Cold Weather Cut Off
- 60 Pump / Integrated Exercising

Application

The Snow Detector & Melting Control 664 is designed to control up to two zones in a snow melting system. The control automatically adjusts the mixed supply water to the snow melting system by controlling up to two boilers and a single mixing device. For mixing, the 664 can use a variable speed injection pump, a floating action mixing valve or a 4-20 mA device. The snow melting system may be started manually or automatically through the use of a Snow / Ice Sensor 090.

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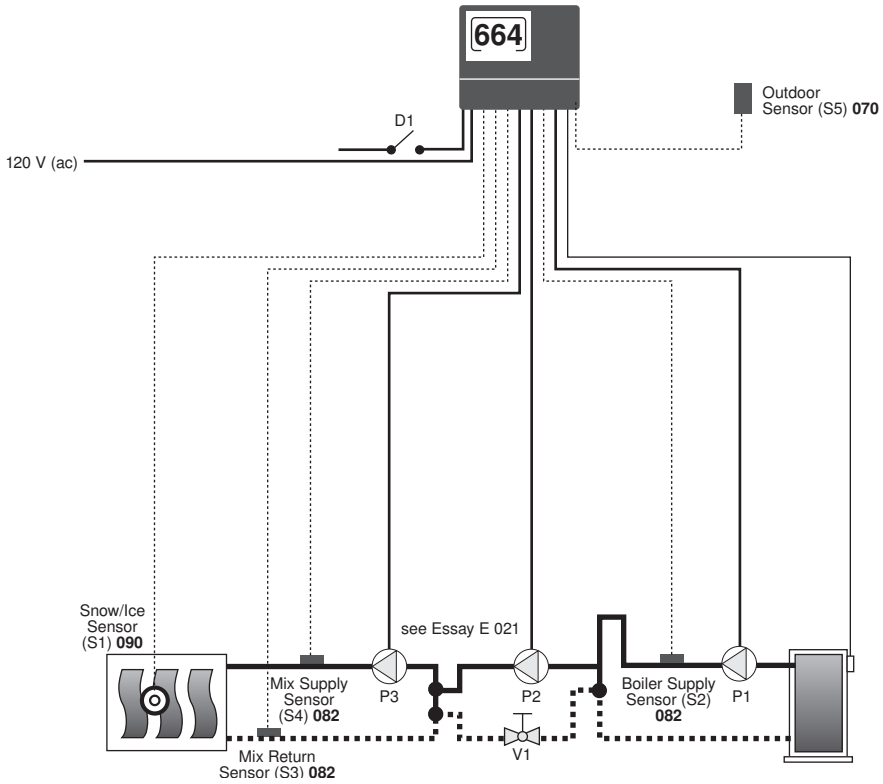
D1 = External Melt / Idle Demand
P1 = Boiler Pump
P2 = Variable Speed Injection Pump
P3 = Zone 1 Pump
S1 = Snow / Ice Sensor 090
S2 = Boiler Supply Sensor 082
S3 = Mix Return Sensor 082
S4 = Mix Supply Sensor 082
S5 = Outdoor Sensor 070
V1 = Balancing Valve or Globe Valve



Concept Drawing
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System Operation
The Snow Detector & Melting Control 664 provides snow melting for a single zone system. The 664 operates the boiler based on the current load on the system in order to provide the required mixed supply fluid temperature that satisfies the load while protecting the slab from thermal stress. The output of the variable speed injection pump (P2) is controlled in order to protect the boiler from flue gas condensation.

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P1 = Boiler Pump
P2 = Variable Speed Injection Pump
P3 = Zone 1 Pump
S1 = Snow / Ice Sensor 090
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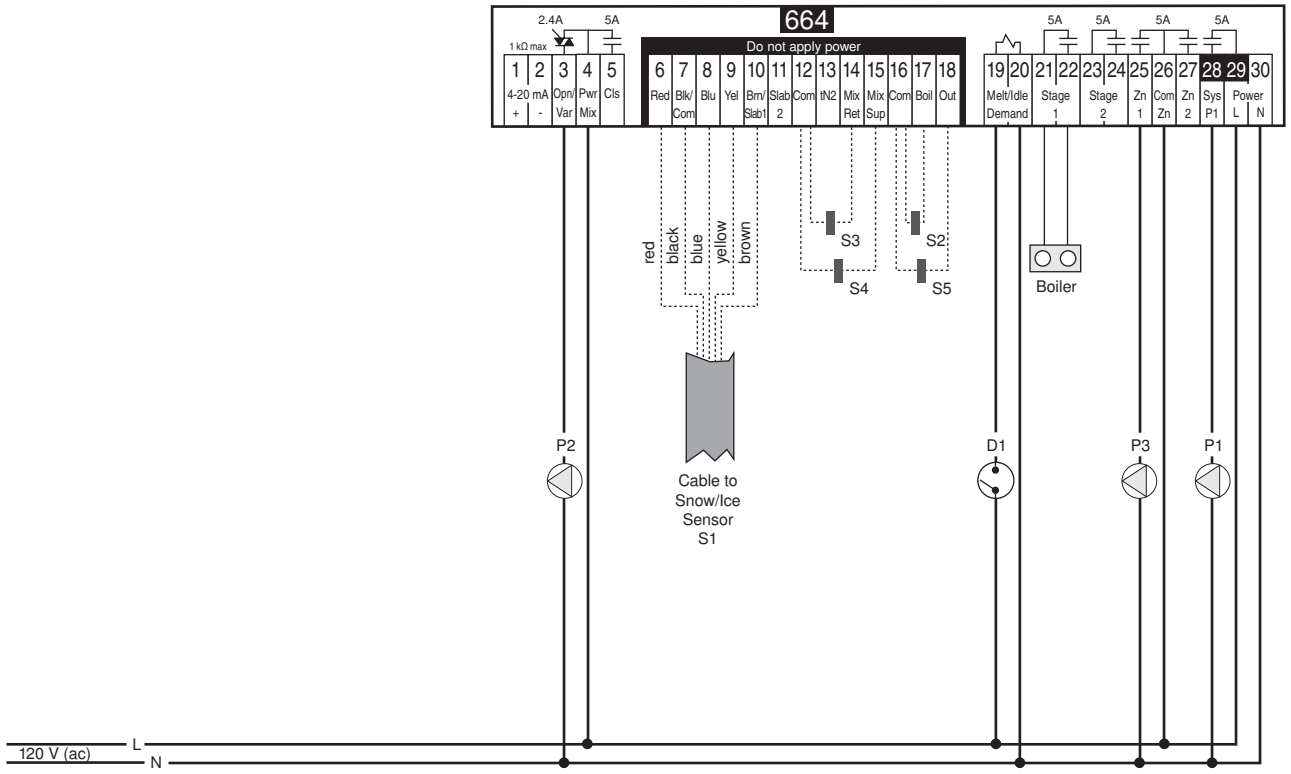
S5 = Outdoor Sensor 070
V1 = Balancing Valve or Globe Valve



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Essential Control Settings
ZONE 1 = AUTO
ZONE 2 = OFF
MIXING = VAR
Boil SENS = SUP
STAGE 1 = AUTO
STAGE 2 = OFF

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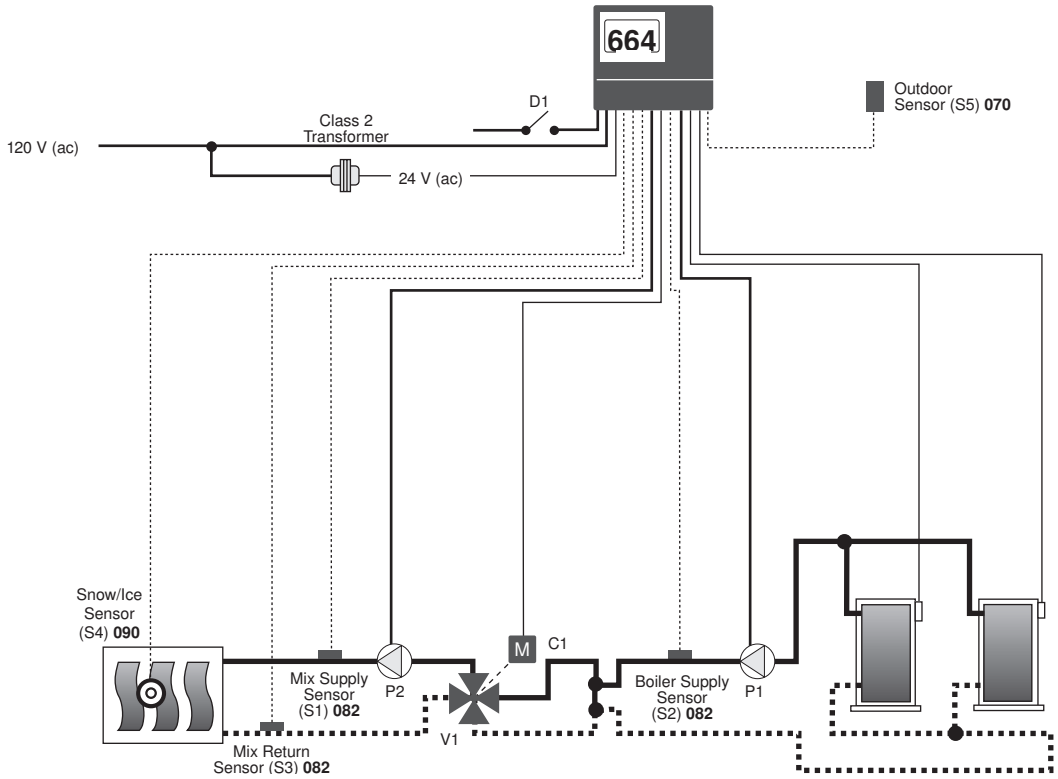
C1 = Actuating Motor 741
D1 = External Melt / Idle Demand
P1 = Boiler Pump
P2 = Zone 1 Pump
S1 = Mix Supply Sensor 082
S2 = Boiler Supply Sensor 082
S3 = Mix Return Sensor 082
S4 = Snow / Ice Sensor 090
S5 = Outdoor Sensor 070
V1 = 4-Way Mixing Valve



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System Operation
The Snow Detector & Melting Control 664 provides snow melting for a single zone system. The 664 stages the boilers based on the current load on the system in order to provide the required mixed supply fluid temperature that satisfies the load while protecting the slab from thermal stress. The position of the mixing valve is controlled in order to protect the boilers from flue gas condensation

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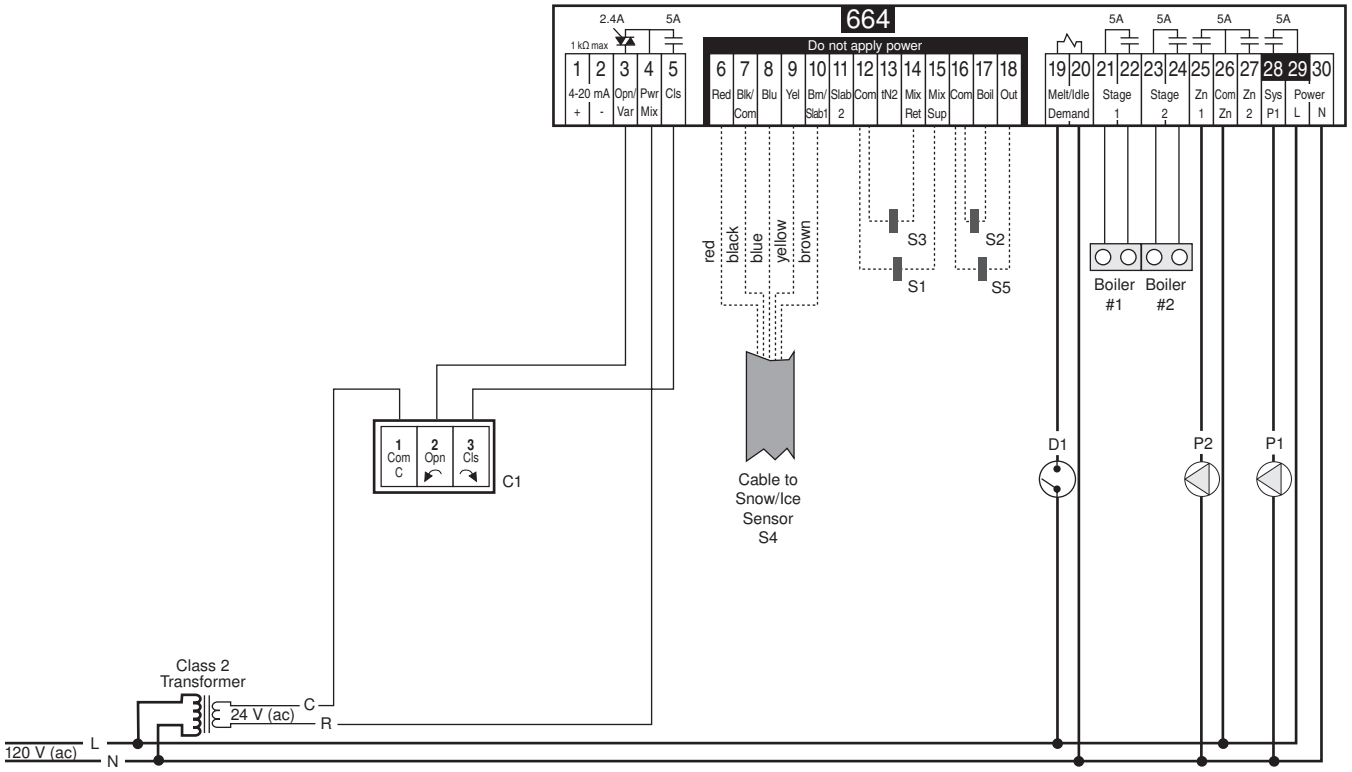
C1 = Actuating Motor 741
D1 = External Melt / Idle Demand
P1 = Boiler Pump
P2 = Zone 1 Pump
S1 = Mix Supply Sensor
S2 = Boiler Supply Sensor 082
S3 = Mix Return Sensor 082
S4 = Snow / Ice Sensor 090
S5 = Outdoor Sensor 090
V1 = 4-Way Mixing Valve



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Essential Control Settings
ZONE 1 = AUTO
ZONE 2 = OFF
MIXING = FLOT
Boil SENS = SUP
STAGE 1 = AUTO
STAGE 2 = AUTO

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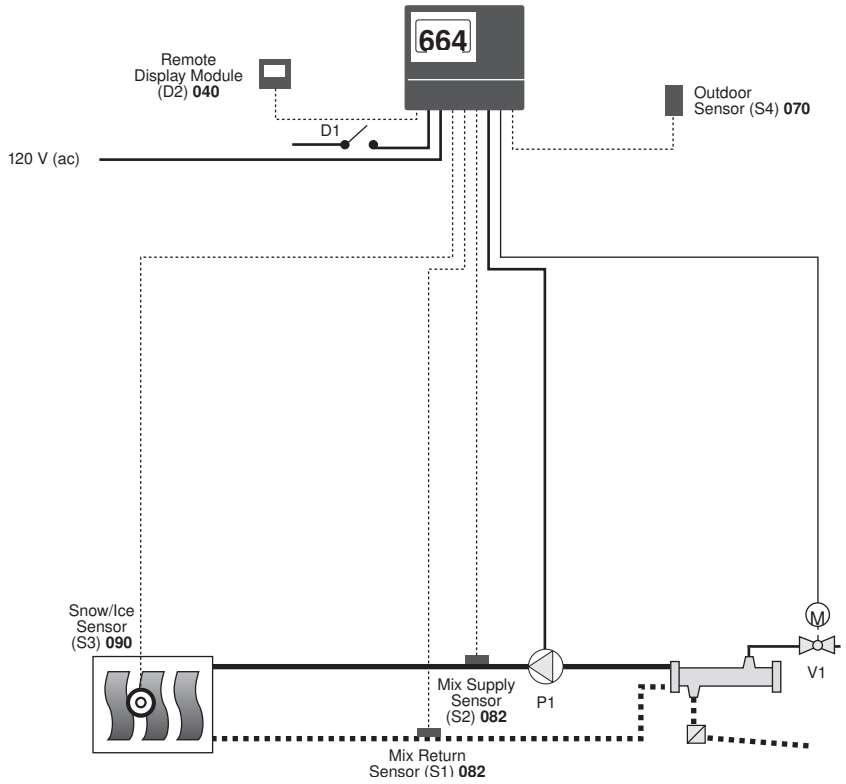
D1 = External Melt / Idle Demand
D2 = Remote Display Module 040 *(optional)*
P1 = Zone 1 Pump
S1 = Mix Return Sensor 082
S2 = Mix Supply Sensor 082
S3 = Snow / Ice Sensor 090
S4 = Outdoor Sensor 070
V1 = 4-20 mA Steam Valve



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System Operation
The Snow Detector & Melting Control 664 provides snow melting for a single zone system. The 664 controls a modulating steam valve to mix down the boiler supply fluid temperature to protect the slab from thermal stress.

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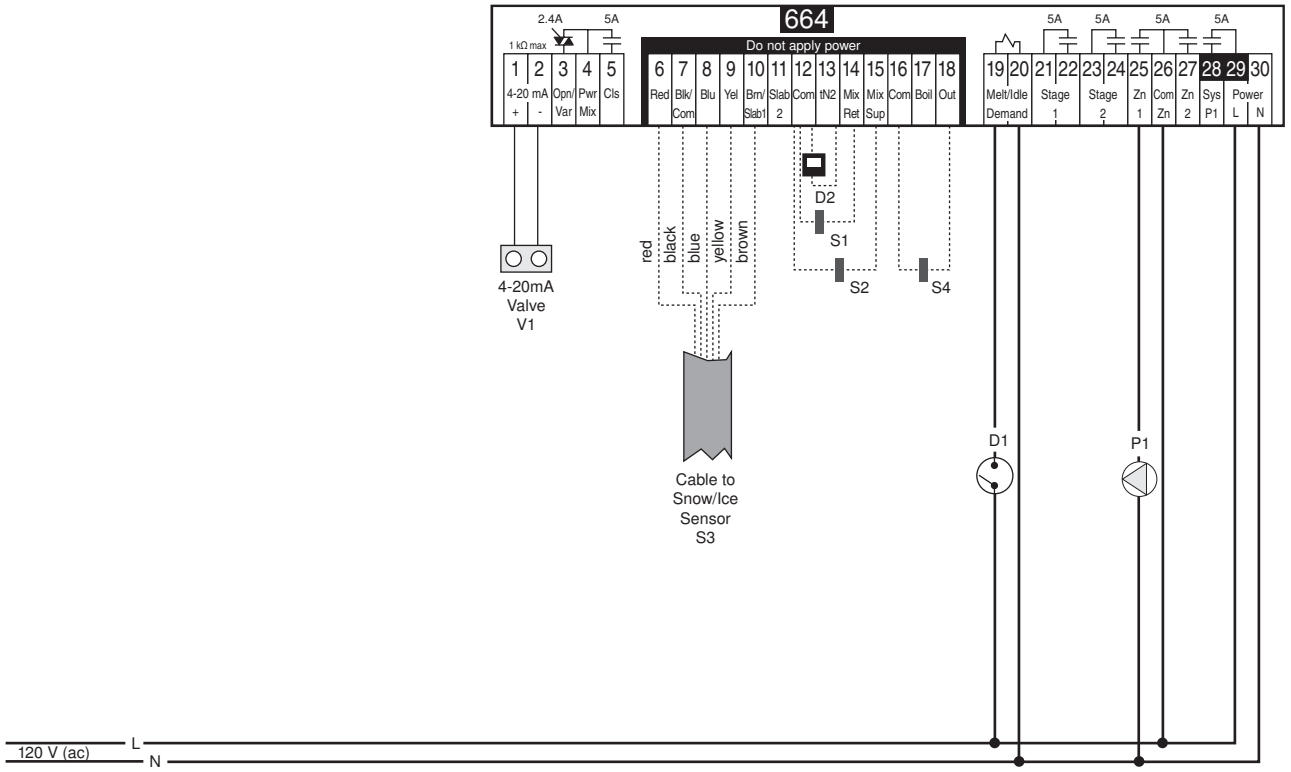
D1 = External Melt / Idle Demand
D2 = Remote Display Module 040 *(optional)*
P1 = Zone 1 Pump
S1 = Mix Return Sensor 082
S2 = Mix Supply Sensor 082
S3 = Snow / Ice Sensor 090
S4 = Outdoor Sensor 070
V1 = 4-20 mA Steam Valve



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Essential Control Settings
ZONE 1 = AUTO
ZONE 2 = OFF
MIXING = 4-20 mA
Boil SENS = NONE

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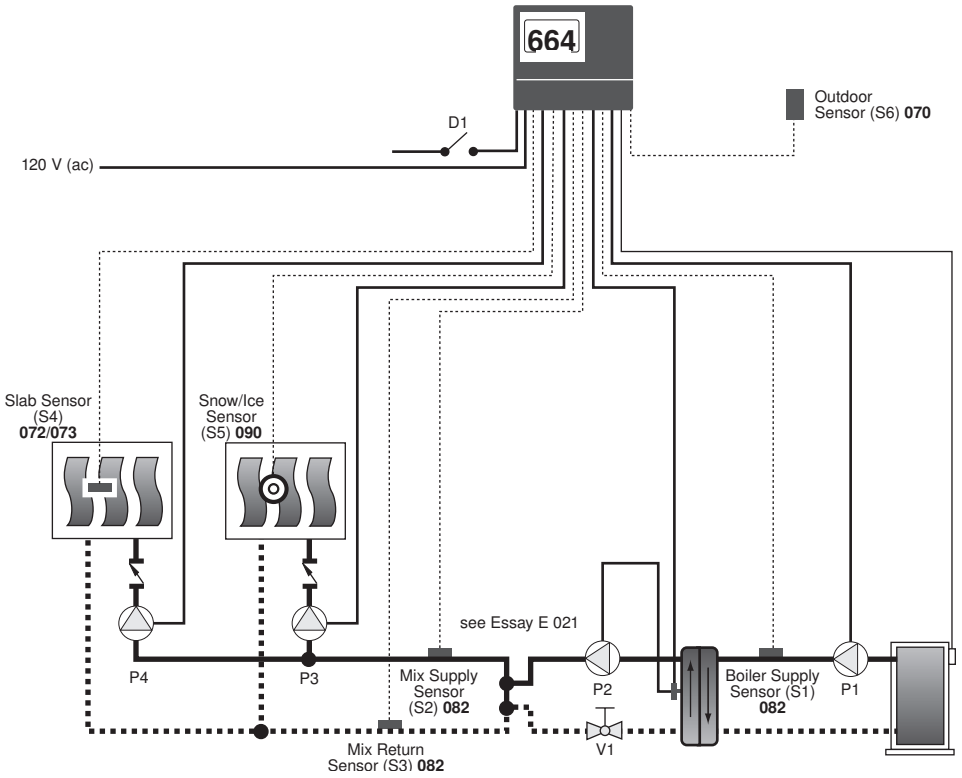
D1 = External Melt / Idle Demand
P1 = Primary Pump
P2 = Variable Speed Injection Pump
P3 = Zone 1 Pump
P4 = Zone 2 Pump
S1 = Boiler Supply Sensor 082
S2 = Mix Supply Sensor 082
S3 = Mix Return Sensor
S4 = Slab Sensor 072/073
S5 = Snow / Ice Sensor 090
S6 = Outdoor Sensor 070
V1 = Balancing Valve or Globe Valve



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System Operation
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P1 = Primary Pump
P2 = Variable Speed Injection Pump
P3 = Zone 1 Pump
P4 = Zone 2 Pump
S1 = Boiler Supply Sensor 082
S2 = Mix Supply Sensor 082
S3 = Mix Return Sensor
S4 = Slab Sensor 072/073
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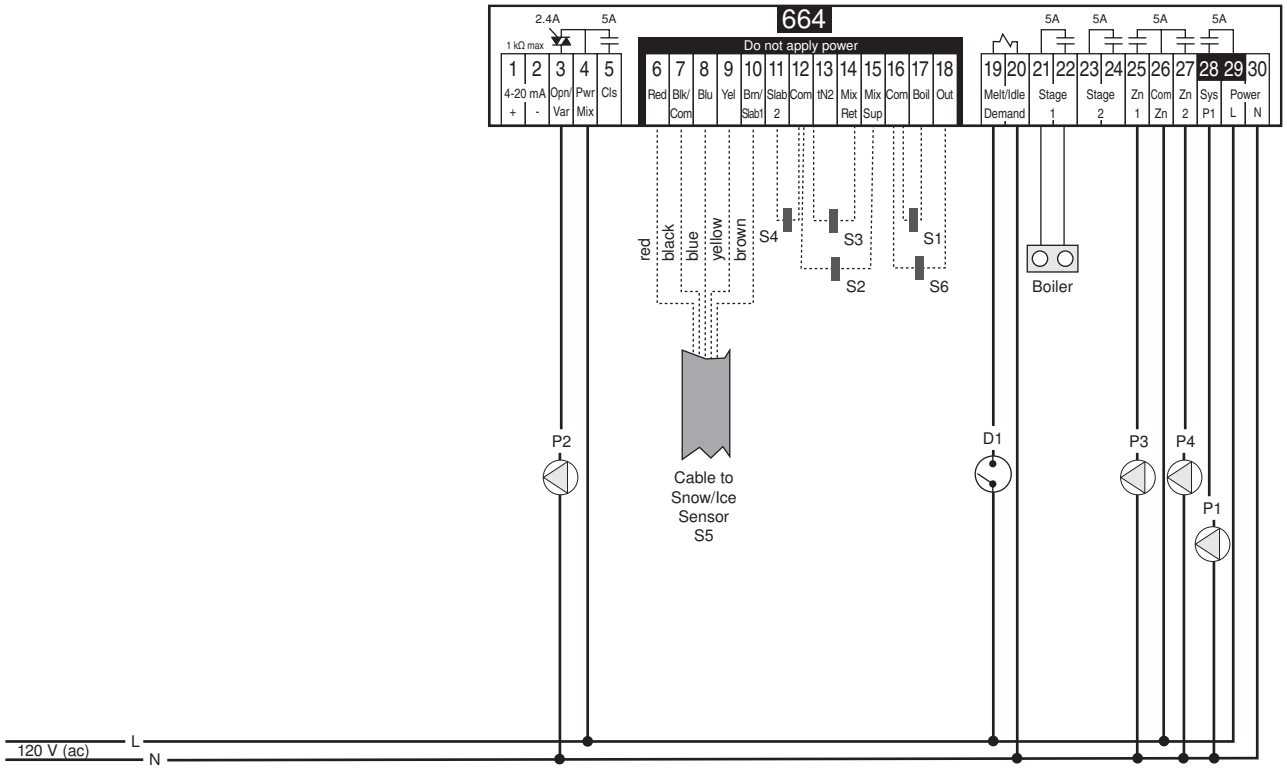
S6 = Outdoor Sensor 070
V1 = Balancing Valve or Globe Valve



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Essential Control Settings
ZONE 1 = AUTO
ZONE 2 = AUTO
MIXING = VAR
Boil SENS = SUP
STAGE 1 = AUTO
STAGE 2 = OFF

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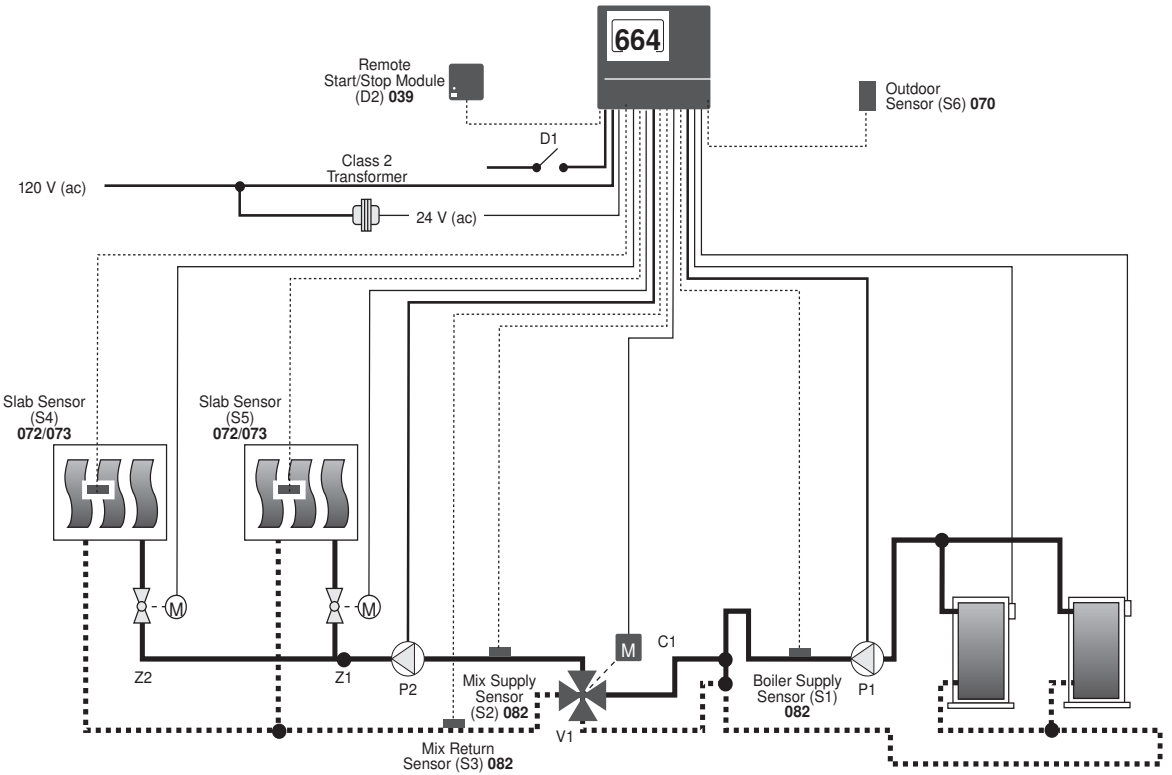
C1 = Actuating Motor 741
D1 = External Melt / Idle Demand
D2 = Remote Start/Stop Module 039
P1 = Primary Pump
P2 = System Pump
S1 = Boiler Supply Sensor 082
S2 = Mix Supply Sensor 082
S3 = Mix Return Sensor 082
S4, S5 = Slab Sensor 072/073
S6 = Outdoor Sensor 070
V1 = 4-Way Mixing Valve
Z1 = Zone 1 Valve
Z2 = Zone 2 Valve



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System Operation
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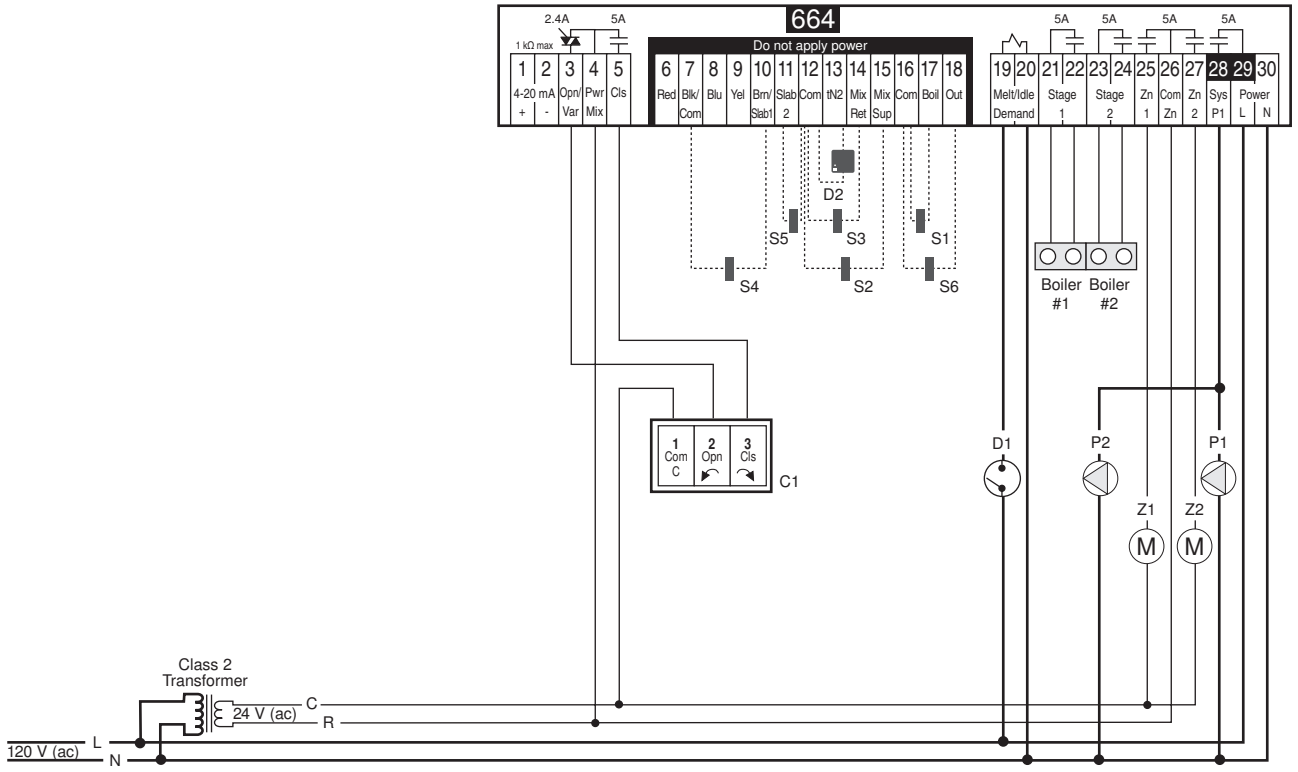
D2 = Remote Start / Stop Module 039
P1 = Primary Pump
P2 = System Pump
S1 = Boiler Supply Sensor 082
S2 = Mix Supply Sensor 082
S3 = Mix Return Sensor 082
S4, S5 = Slab Sensor 072/073
S6 = Outdoor Sensor 070
V1 = 4-Way Mixing Valve
Z1 = Zone 1 Valve
Z2 = Zone 2 Valve



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Boil SENS = SUP
STAGE 1 = AUTO
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Specifications

The following are the recommended specifications for the Snow Detector & Melting Control 664

- The system water temperature shall be based on the outdoor temperature and feed back from sensors located in the snow melting slabs.
- The control shall have an adjustable Minimum Supply water temperature setting to help prevent condensation of flue gases and subsequent corrosion and blockage of the boiler's heat exchanger and chimney.
- The control shall have the option to directly operate a variable speed injection pump, a mixing valve with a floating action actuator motor, or a 4-20 mA device.
- The control shall have the ability to limit the amount of cool water being returned to the boiler through the mixing device in order to prevent low boiler operating temperatures and flue gas condensation.
- The control shall have the ability to directly control the supply temperature of one or two boiler stages or to send a boiler enable signal to another boiler operating control to allow for a staging control to be connected.
- The control shall have the option of an automatic differential calculation for the operation of one or two boiler stages in order to prevent short cycling.
- The control shall have an option to rotate the firing sequence of the boilers and the option for rotating the boiler firing sequence shall be based on the boilers' accumulated running hours.
- The control shall use proportional, integral and derivative (PID) logic when staging boiler stages.
- The control shall have four separate lockable access levels to limit the number of adjustments available to various users.
- The control shall have a test button that activates a pre-programmed test sequence testing all of the control's outputs.
- The control shall show a number of current sensor temperatures depending on the access level that has been selected.
- The control shall continuously monitor its temperature sensors and provide an error message upon a control or sensor failure.
- The control shall record and display various device running hours and minimum and maximum temperatures depending on the access level that has been selected.
- During extended periods of inactivity, the pumps and valves that are operated by the control shall be periodically exercised to prevent seizure during long idle periods.
- The control shall have the ability to operate two zones of snow melting.
- The control shall have three levels of priority when operating two zones of snow melting.
- The control shall have the ability to use a snow / ice sensor in order to automatically detect snow or ice and begin operation of the system. The system shall continue to run until the sensor is dry or the control is manually stopped.
- The control shall have the ability to be manually started with an adjustable running time that counts down and automatically stops the system.
- The control shall have the option of connecting a Remote Display Module to allow for remote monitoring and adjustment of the control.
- The control shall have the option of connecting a Remote Start / Stop Module to allow for starting and stopping of the system.
- The control shall not operate the system to provide heat to the snow melting zones when it enters into either a Warm Weather Shut Down (WWSD) or a Cold Weather Cut Off (CWCO) mode.

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All specifications are subject to change without notice.
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