Chapter 14
Electrical Schematics

Wiring Schematic 1
- A3030101 Uponor Thermostats
- A3010522 Thermal Actuators
- A3030003/A3030004 Zone Control Module (ZCM)
- A3010100 Single-zone Pump Relay
- A3050050 50 VA Transformer

Overview: Multiple zone control and boiler enable using Uponor Thermostats, Uponor Thermal Actuators, the Uponor Zone Control Module (ZCM) and the Uponor Single-zone Pump Relay.

Sequence of Operation: On a call for heat, the Uponor Thermostat sends a signal to the Uponor ZCM, illuminating the yellow light on the ZCM. This call for heat sends power to the actuator(s) for that zone, energizing the Y1-Y2 terminals on the ZCM. This activates or opens the actuator(s), allowing flow through these loops on the manifold. Once the actuator(s) have opened to a minimal position, an end switch inside of the actuator(s) will close, illuminating the red light on the ZCM. When end switch closure is detected, a contact will close between the ES-ES terminals on the ZCM, energizing the Uponor Single-zone Pump Relay. Following this control procedure will eliminate any “dead-head” circulator conditions for radiant circulator (P1). The actuators must be open before the circulator will operate.

The ES terminals are considered “dry contacts.” This means any wiring connected to these terminals is unpowered and will require an auxiliary power source. In this schematic, power is applied to the ES terminals by the R/T, G/T terminals on the Uponor Single-zone Pump Relay from an internal transformer. When the circuit is completed between the relay and the ZCM, a coil in the relay is energized, closing the contacts to start the circulator and, in this illustration, fire the boiler. Again, the contact 5 and 6NO on the Uponor Single-zone Pump Relay are dry contacts and require an additional power supply. In most instances, power is supplied to these contacts from a transformer within the boiler control off the T-T or R-G terminals. Consult the heating equipment manufacturer’s wiring schematics for the proper terminals to energize the boiler.

![Wiring Schematic 1](image-url)
Wiring Schematic 2

- A3030101 Uponor Thermostats
- A3070526 Uponor Zone Valve
- A3030003/A3030004 Zone Control Module (ZCM)
- A3010100 Single-zone Pump Relay
- A3050050 50 VA Transformer

Overview: Multiple zone control and boiler enable using Uponor Thermostats, Uponor Zone Valves, the Uponor Zone Control Module (ZCM) and the Uponor Single-zone Pump Relay.

Sequence of Operation: On a call for heat, the Uponor Thermostat sends a signal to the Uponor ZCM, illuminating the yellow light on the ZCM. This call for heat sends power to the Zone Valve for that zone, energizing the Y1-Y2 terminals on the ZCM. This activates or opens the actuator, allowing flow through these loops on the manifold. Once the actuator has opened to a minimal position, an end switch inside the actuator will close, illuminating the red light on the ZCM. When end switch closure is detected, a contact will close between the ES-ES terminals on the ZCM, energizing the Uponor Single-zone Pump Relay. Following this control procedure will eliminate any “dead-head” circulator conditions for radiant circulator (P1). The actuators must be open before the circulator will operate.

The ES terminals are considered “dry contacts.” This means any wiring connected to these terminals is unpowered and will require an auxiliary power source. In this schematic, power is applied to the ES terminals by the R/T, G/T terminals on the Uponor Single-zone Pump Relay from an internal transformer. When the circuit is completed between the relay and the ZCM, a coil in the relay is energized, closing the contacts to start the circulator and, in this illustration, fire the boiler. Again, the contact 5 and 6NO on the Uponor Single-zone Pump Relay are dry contacts and require an additional power supply. In most instances, power is supplied to these contacts from a transformer within the boiler control off the T-T or R-G terminals. Consult the heating equipment manufacturer’s wiring schematics for the proper terminals to energize the boiler.
Wiring Schematic 2
Wiring Schematic 3
- A3030101 Uponor Thermostats
- A3010522 Thermal Actuators
- A3070526 Uponor Zone Valve
- A3030003/A3030004 Zone Control Module (ZCM)
- A3010100 Single-zone Pump Relay
- A3050050 50 VA Transformer

Overview: Multiple zone control and boiler enable using Uponor Thermostats, Uponor Actuators, Zone Valves, the Uponor Zone Control Module (ZCM) and the Uponor Single Pump Relay.

Sequence of Operation: On a call for heat, the Uponor Thermostat sends a signal to the Uponor Zone Control Module (ZCM), illuminating the yellow light on the ZCM. This call for heat sends power to the actuator(s) or Zone Valve for that zone, energizing the Y1-Y2 terminals on the ZCM. This activates or opens the actuator, allowing flow through these loops on the manifold. Once the actuator has opened to a minimal position, an end switch inside of the actuator will close, illuminating the red light on the ZCM. When end switch closure is detected, a contact will close between the ES-ES terminals on the ZCM, energizing the Uponor Single-zone Pump Relay. Following this control procedure will eliminate any “deadhead” circulator conditions for radiant circulator (P1). The actuator(s) must be open before the circulator will operate.

The ES terminals are considered “dry contacts.” This means any wiring connected to these terminals is unpowered and will require an auxiliary power source. In this schematic, power is applied to the ES terminals by the R/T, G/T terminals on the Uponor Single-zone Pump Relay from an internal transformer. When the circuit is completed between the relay and the ZCM, a coil in the relay is energized, closing the contacts to start the circulator and, in this illustration, fire the boiler. Again, the contact 5 and 6NO on the Uponor Single-zone Pump Relay are dry contacts and require an additional power supply. In most instances, power is supplied to these contacts from a transformer within the boiler control off the T-T or R-G terminals. Consult the heating equipment manufacturer’s wiring schematics for the proper terminals to energize the boiler.
Wiring Schematic 3
Wiring Schematic 4
- A3030101 Uponor Thermostats
- A3080301 Three-zone Multi-pump Relay

Overview: Multiple zone control and boiler enable using Uponor Thermostats operating multiple radiant circulators (P1 and P2), using the Uponor Three-zone Multi-pump Relay.

Sequence of Operation: On a call for heat, the Uponor Thermostat sends a signal to the Uponor Three-zone Multi-pump Relay. In this schematic, power is applied to the DT10 Thermostats by the T1 and T2 terminals on the Uponor Three-zone Multi-pump Relay from an internal transformer. When the circuit is completed between the thermostat and the circulator panel, a coil in the relay is energized, closing the contacts to start the circulator and, in this illustration, fire the boiler. Contacts X1/X2 are considered “dry contacts.” This means any wiring connected to these terminals is unpowered and will require an auxiliary power source. In most instances, power is supplied to these contacts from a transformer within the boiler controls off the T-T or R-G terminals. Consult the heating equipment manufacturer’s wiring schematics for the proper terminals to energize the boiler.
Three-zone Multi-pump Relay A3080301

Transformer

L2 CP/ZC L1 X1 X2/ZR

P1 P2

Line Voltage

Boiler Control

C R T1 T1 T2 T2 T3 T3

C1 C1L2 ZC L1 X1 ZR

CP/ X2/

Transformer

Boiler Control

Wiring Schematic 4
Wiring Schematic 5
- A3030101 Uponor Thermostats
- A3010522 Thermal Actuators
- A3030003/A3030004 Zone Control Module (ZCM)
- A3080301 Three-zone Multi-pump Relay
- A3050050 50 VA Transformer

Overview: Multiple zone control and boiler enable using Uponor Thermostats, Uponor Actuators, the Uponor Zone Control Module (ZCM) operating multiple radiant circulators (P1, P2, P3), using the Uponor Three-zone Multi-pump Relay.

Sequence of Operation: On a call for heat, the Uponor Thermostat sends a signal to the Uponor ZCM, illuminating the yellow light on the ZCM. This call for heat sends power to the actuator(s) for that zone, energizing the Y1-Y2 terminals on the ZCM. This activates or opens the actuator(s), allowing flow through these loops on the manifold. Once the actuator(s) have opened to a minimal position, an end switch inside of the actuator(s) will close, illuminating the red light on the ZCM. When end switch closure is detected, a contact will close between the ES-ES terminals on the ZCM, energizing the Uponor Three-zone Multi-pump Relay. Following this control procedure will eliminate any “dead-head” circulator conditions for the radiant circulator (P1). The actuator(s) must be open before the circulator will operate.

The ES terminals are considered “dry contacts.” This means any wiring connected to these terminals are unpowered and will require an auxiliary power source. In this schematic, power is applied to the ES terminals by the T1/T1 terminals on the Uponor Three-zone Multi-pump Relay from an internal transformer. When the circuit is completed between the relay and the ZCM, a coil is energized in the relay, starting the circulator and, in this illustration, fire the boiler. Again, the contacts X1/X2 are dry contacts and require an additional power supply. In most instances, power is supplied to these contacts from a transformer within the boiler controls off the T-T or R-G terminals. Consult the heating equipment manufacturer’s wiring schematics for the proper terminals to energize the boiler.

Also shown in this schematic is a separate thermostat used to control a second radiant circulator (P2). In this example, the thermostat is directly wired to the relay to operate that second circulator. This scenario exists when a manifold is treated as a single zone, controlled by a circulator instead of a zone valve. Power is supplied to the thermostat from the T2/T2 terminals. When the thermostat calls for heat, the circuit between the T2 terminals is closed and a coil is energized in the relay, starting the radiant circulator (P2) and closing the contacts between X1/X2, starting the boiler.
**Wiring Schematic 6**

- A3030101 Uponor Thermostats
- A3010522 Thermal Actuators
- A3030003/A3030004 Zone Control Module (ZCM)
- A3080301 Three-zone Multi-pump Relay
- A3050050 50 VA Transformer

**Overview:** Multiple zone control and boiler enable using Uponor Thermostats, Uponor Actuators, the Uponor Zone Control Module (ZCM) operating one radiant circulator (P1), along with a single Uponor Thermostat operating a second radiant circulator (P2), using the Uponor Three-zone Multi-pump Relay.

**Sequence of Operation:** On a call for heat, the Uponor Thermostat sends a signal to the Uponor ZCM, illuminating the yellow light on the ZCM. This call for heat sends power to the actuator(s) for that zone, energizing the Y1-Y2 terminals on the ZCM. This activates or opens the actuator(s), allowing flow through these loops on the manifold. Once the actuator(s) have opened to a minimal position, an end switch inside of the actuator(s) will close, illuminating the red light on the ZCM. When end switch closure is detected, a contact will close between the ES-ES terminals on the ZCM, energizing the Uponor Three-zone Multi-pump Relay. Following this control procedure will eliminate any “dead-head” circulator conditions for radiant circulator (P1). The actuator(s) must be open before the circulator will operate.

The ES terminals are considered “dry contacts.” This means any wiring connected to these terminals are unpowered and will require an auxiliary power source. In this schematic, power is applied to the ES terminals by the T1/T1 terminals on the Uponor Three-zone Multi-pump Relay from an internal transformer. When the circuit is completed between the relay and the ZCM, a coil in the relay is energized in the relay, starting the boiler and, in this illustration, fire the boiler. Again, the contacts X1/X2 are dry contacts and require an additional power supply. In most instances, power is supplied to these contacts from a transformer within the boiler controls off the T-T or R-G terminals. Consult the heating equipment manufacturer’s wiring schematics for the proper terminals to energize the boiler.

Also shown in this schematic is a separate thermostat used to control a second radiant circulator (P2). In this example, the thermostat is directly wired to the relay to operate that second circulator. This scenario exists when a manifold is treated as a single zone, controlled by a circulator instead of a zone valve. Power is supplied to the thermostat from the T2/T2 terminals. When the thermostat calls for heat, the circuit between the T2 terminals is closed and a coil is energized in the relay, starting the radiant circulator (P2) and closing the contacts between X1/X2, starting the boiler.
Wiring Schematic 6
Wiring Schematic 7

- A3030101 Uponor Thermostats
- A3010522 Thermal Actuators
- A3030003/A3030004 Zone Control Module (ZCM)
- A3080301 Three-zone Multi-pump Relay
- A3050050 50 VA Transformer
- A3070526 Uponor 1” Zone Valve

Overview: Multiple zone control, multiple circulator control (P1 and P2) and boiler enable using Uponor Thermostats, Uponor Actuators, the Uponor Zone Control Module (ZCM) and the Uponor Three-zone Multi-pump Relay, along with a single Uponor Thermostat operating a zone valve (M1), also wired through the Uponor ZCM.

Sequence of Operation:
On a call for heat, the Uponor Thermostat sends a signal to the Uponor ZCM, illuminating the yellow light on the ZCM. This call for heat sends power to the actuator(s) for that zone, energizing the Y1-Y2 terminals on the ZCM. This activates or opens the actuator(s), allowing flow through these loops on the manifold. Once the actuator(s) have opened to a minimal position, an end switch inside of the actuator(s) will close, illuminating the red light on the ZCM. When end switch closure is detected, a contact will close between the ES-ES terminals on the ZCM, energizing the Uponor Three-zone Multi-pump Relay. Following this control procedure will eliminate any “dead-head” circulator conditions for radiant circulator (P1). The actuator(s) must be open before the circulator will operate.

The ES terminals are considered “dry contacts.” This means any wiring connected to these terminals is unpowered and will require an auxiliary power source. In this schematic, power is applied to the ZCM ES terminals by the T1-T1 and T2-T2 terminals on the Uponor Three-zone Multi-pump Relay from an internal transformer. When the circuit is completed between the relay and the ZCM, a coil in the relay is energized, closing the contacts to start the circulator and, in this illustration, fire the boiler. Again, the contacts X1/X2 on the Uponor Three-zone Multi-pump Relay are dry contacts and require an additional power supply. In most instances, power is supplied to these contacts from a transformer within the boiler control off the T-T or R-G terminals. Consult the heating equipment manufacturer’s wiring schematics for the proper terminals to energize the boiler.

Also shown in this schematic is a separate thermostat wired to a ZCM to control a zone valve (M1). The zone valve can be wired to the thermostat using the ZCM. Following the same sequence of operation as above, the red wires from the internal end switch are wired in parallel to the wiring from the multiple circulator relay panel. This wiring configuration will allow a call for heat from either the relay panel or the zone valve to activate the boiler.
Wiring Schematic 7
Wiring Schematic 8
• A3030101 Uponor Thermostats
• A3010522 Thermal Actuators
• A3030003/A3030004 Zone Control Module (ZCM)
• A3010100 Single-zone Pump Relay
• A3050050 50 VA Transformer
• A3040150 Uponor SetPoint 150 Controller (SPC)

Overview: Multiple zone control and circulator control (P1) using Uponor Thermostats, Uponor Actuators, the Uponor Zone Control Module (ZCM) and the Uponor Single-zone Pump Relay. Radiant supply water temperature and boiler enable is controlled by the Uponor SetPoint 150 Controller (SPC).

Sequence of Operation: On a call for heat, the Uponor Thermostat sends a signal to the Uponor ZCM, illuminating the yellow light on the ZCM. This call for heat sends power to the actuator(s) for that zone, energizing the Y1-Y2 terminals on the ZCM. This activates or opens the actuator(s), allowing flow through these loops on the manifold. Once the actuator(s) have opened to a minimal position, an end switch inside of the actuator(s) will close, illuminating the red light on the ZCM. When end switch closure is detected, a contact will close between the ES-ES terminals on the ZCM, energizing the Uponor Single-zone Pump Relay. Following this control procedure will eliminate any “dead-head” circulator conditions for the radiant circulator (P1). The actuators must be open before the circulator will operate.

The ES terminals are considered “dry contacts.” This means any wiring connected to these terminals is unpowered and will require an auxiliary power source. In this schematic, power is applied to the ES terminals by the R/T, G/T terminals on the Uponor Single-zone Pump Relay from an internal transformer. When the circuit is completed between the relay and the ZCM, a coil in the relay is energized, closing the contacts to start the circulator and, in this illustration, fire the boiler. Again, the contact 5 and 6NO on the Uponor Single-zone Pump Relay are dry contacts and require an additional power supply. In most instances, power is supplied to these contacts from a transformer within the boiler control off the T-T or R-G terminals. Consult the heating equipment manufacturer’s wiring schematics for the proper terminals to energize the boiler.

The Uponor SetPoint 150 Controller is added in series to the wiring between the Uponor Single-zone Pump Relay and the boiler control. The SPC is used to control the radiant supply water temperature, possibly through a heat exchanger. For example, if the SPC is set for 120°F and the sensor (S1) is reading a temperature below the setpoint, the contacts 3 and 4 are closed and the boiler is allowed to fire. If the temperature being read on sensor S1 is higher than the desired temperature, the contacts between 3 and 4 are open and the boiler does not fire. The zones open, and the radiant circulator (P1) operates, but it is not necessary to fire the boiler and add heat when the proper supply water temperature is being delivered. Consult the boiler manufacturer’s wiring schematics for the proper terminals to energize the boiler.
Wiring Schematic 8

24 VAC Transformer A3050050

Red Wires
Yellow Wires

Single-zone Pump Relay A3010100
*Factory-installed Jumper

SetPoint 150 Controller A3040150

Transformer

N L
3 4
NO NC
C T R T
5 6
NO NC

S1
C R L M S E

To Boiler Control
Wiring Schematic 9

- A3030101 Uponor Thermostats
- A3010522 Thermal Actuators
- A3030003/A3030004 Zone Control Module (ZCM)
- A3080301 Three-zone Multi-pump Relay
- A3050050 50 VA Transformer

Overview: Multiple zone control and boiler enable using Uponor Thermostats, Uponor Actuators, the Uponor Zone Control Module (ZCM) operating two radiant circulators (P1 and P2) using the Uponor Three-zone Multi-pump Relay.

Sequence of Operation: On a call for heat, the Uponor Thermostat sends a signal to the Uponor ZCM, illuminating the yellow light on the ZCM. This call for heat sends power to the actuator(s) for that zone, energizing the Y1-Y2 terminals on the ZCM. This activates or opens the actuator(s), allowing flow through these loops on the manifold. Once the actuator(s) have opened to a minimal position, an end switch inside of the actuator will close, illuminating the red light on the ZCM. When end switch closure is detected, a contact will close between the ES-ES terminals on the ZCM, energizing the corresponding circulator through the Uponor Three-zone Multi-pump Relay. Following this control procedure will eliminate any “dead-head” circulator condition for the radiant circulators (P1 and P2). The actuators must be open before the circulator will operate.

The ES terminals are considered “dry contacts.” This means any wiring connected to these terminals are unpowered and will require an auxiliary power source. In this schematic, power is applied to the ES terminals on either ZCM by the T1/T1 and T2/T2 terminals on the Uponor Three-zone Multi-pump Relay from an internal transformer. When the circuit is completed between the relay and the ZCM, a coil in the relay is energized, closing the contacts to start the circulator and, in this illustration, fire the boiler. Again, the contacts X1/X2 are dry contacts and require an additional power supply. In most instances, power is supplied to these contacts from a transformer within the boiler controls off the T-T or R-G terminals. Consult the heating equipment manufacturer’s wiring schematics for the proper terminals to energize the boiler.
24 VAC Transformer A3050050

24 VAC Transformer A3050050

Three-zone Multi-pump Relay A3080301

Wiring Schematic 9
Wiring Schematic 10

- A3030101 Uponor Thermostats
- A3010522 Thermal Actuators
- A3030003/A3030004 Zone Control Module (ZCM)
- A3010100 Single-zone Pump Relay
- A3050050 50 VA Transformer

**Overview:** Multiple zone control and boiler enable using Uponor Thermostats, Uponor Actuators, the Uponor Zone Control Module (ZCM) and the Uponor Single-zone Pump Relay.

**Sequence of Operation:** On a call for heat, the Uponor Thermostat sends a signal to the Uponor ZCM, illuminating the yellow light on the ZCM. This call for heat sends power to the actuator(s) for that zone, energizing the Y1-Y2 terminals on the ZCM. This activates or opens the actuator(s), allowing flow through these loops on the manifold. Once the actuator(s) have opened to a minimal position, an end switch inside of the actuator(s) will close, illuminating the red light on the ZCM. When end switch closure is detected, a contact will close between the ES-ES terminals on the ZCM, energizing the Uponor Single-zone Pump Relay. Following this control procedure will eliminate any “dead-head” circulator conditions for radiant circulator (P1). The actuator(s) must be open before the circulator will operate.

This wiring schematic is typical of piping arrangements using a mixing tank to add mass to the system and control water temperature. In this schematic, there is no wiring between the single circulator relay panel and the heat plant. This heat plant could be a non-condensing boiler, condensing boiler, heat circulator, etc. A call for heat from any of the zones will start the radiant circulator (P2) and begin to circulator the heat away from the buffer tank. An aquastat (AQ1) is added to the tank to control the heat plant. Depending on the differential setting on the aquastat, once the tank temperature has dropped below the desired temperature setting, the contact will close and fire the heating equipment. The terminals inside of the aquastat are considered “dry contacts.” This means any wiring connected to these terminals is unpowered and will require an auxiliary power source. In most instances, power is supplied to these contacts from a transformer within the boiler control off the TT or R-G terminals. Consult the heating equipment manufacturer’s wiring schematics for the proper terminals to energize the boiler.

It is also important to understand how this type of wiring scheme de-energizes. Once the call from the thermostat is ended, signifying a satisfied space temperature, the radiant circulator (P1) is shut off. However, depending on the water temperature inside the tank, the aquastat contacts will remain closed, continuing to fire the heat plant, until the required water temperature is achieved by the buffer tank. After the set temperature is sensed in the tank by the aquastat, the contacts open and interrupt the signal to the heat plant.
Wiring Schematic 10

Transformer
A3050050

Plug Relay
AQ1

Single-zone Pump Relay
A3010100
*Factory-installed Jumper
**Wiring Schematic 11**

- A3030101 Uponor Thermostats
- A3010522 Thermal Actuators
- A3030003/A3030004 Zone Control Module (ZCM)
- A3010100 Single-zone Pump Relay
- A3050050 50 VA Transformer

**Overview:** Multiple zone control and boiler enable using Uponor Thermostats, Uponor Actuators, the Uponor Zone Control Module (ZCM) and the Uponor Single-zone Pump Relay.

**Sequence of Operation:** On a call for heat, the Uponor Thermostat sends a signal to the Uponor ZCM, illuminating the yellow light on the ZCM. This call for heat sends power to the actuator(s) for that zone, energizing the Y1-Y2 terminals on the ZCM. This activates or opens the actuator(s), allowing flow through these loops on the manifold. Once the actuator(s) have opened to a minimal position, an end switch inside of the actuator(s) will close, illuminating the red light on the ZCM. When end switch closure is detected, a contact will close between the ES-ES terminals on the ZCM, energizing the Uponor Single-zone Pump Relay. Following this control procedure will eliminate any “dead-head” circulator conditions for radiant circulator (P1). The actuator(s) must be open before the circulator will operate. This wiring schematic is typical of piping arrangements using a water heater for a heat plant. In this schematic, there is no wiring between the single circulator relay panel and the heat plant primarily because water heaters use milivolt controls and cannot be interfaced with low or 24-volt wiring. A call for heat from any of the zones will start the radiant circulator (P1) and begin to circulator the heat away from the water heater. The thermostatic gas valve on the water heater controls the water temperature inside the tank, opening and closing the main gas valve depending on the water temperature inside. Once the tank temperature has dropped below the temperature setting on the tank thermostat, the main gas valve will open and begin to heat the water. After the call for heat has ended, the water heater’s main burner will continue to fire until the tank thermostat setting is achieved.

**Important:** Consult local codes prior to using a water heater as a heat plant.
Wiring Schematic 11

24 VAC Transformer
A3050050

Red Wires
Yellow Wires
Red Wires
Yellow Wires
Red Wires
Yellow Wires

Transformer
Plug Relay

Single-zone Pump Relay
A3010100
*Factory-installed Jumper
Wiring Schematic 12
- A3030101 Uponor Thermostats
- A3010522 Thermal Actuators
- A3030003/A3030004 Zone Control Module (ZCM)
- A3050050 50 VA Transformer

Overview: Multiple zone control and boiler enable using Uponor Thermostats, Uponor Actuators and the Uponor Zone Control Module (ZCM).

Sequence of Operation: On a call for heat, the Uponor Thermostat sends a signal to the Uponor ZCM, illuminating the yellow light on the ZCM. This call for heat sends power to the actuator(s) for that zone, energizing the Y1-Y2 terminals on the ZCM. This activates or opens the actuator(s), allowing flow through these loops on the manifold. Once the actuator(s) have opened to a minimal position, an end switch inside of the actuator(s) will close, illuminating the red light on the ZCM. When end switch closure is detected, a contact will close between the ES-ES terminals on the ZCM, completing the boiler circuit. The actuator(s) must be open before the boiler will operate.

The ES terminals are considered “dry contacts.” This means any wiring connected to these terminals is unpowered and will require an auxiliary power source. In this schematic, power is supplied to these contacts from a transformer within the boiler control off the T-T or R-G terminals. Consult the heating equipment manufacturer’s wiring schematics for the proper terminals to energize the boiler.
Wiring Schematic 12
**Wiring Schematic 13**

- A3030101 Uponor Thermostats
- A3010522 Thermal Actuators
- A3030003/A3030004 Zone Control Module (ZCM)
- A3050050 50 VA Transformer
- A8020000 Climate Control™ Multifunction Controller

**Overview:** Multiple zone control and boiler enable using Uponor Thermostats, Uponor Actuators, the Uponor Zone Control Module (ZCM) and the Multifunction Controller and Modulating Valve to control the radiant supply water temperature.

**Sequence of Operation:** On a call for heat, the Uponor Thermostat sends a signal to the Uponor ZCM, illuminating the yellow light on the ZCM. This call for heat sends power to the actuator(s) for that zone, energizing the Y1-Y2 terminals on the ZCM. This activates or opens the actuator(s), allowing flow through these loops on the manifold. Once the actuator(s) have opened to a minimal position, an end switch inside of the actuator(s) will close, illuminating the red light on the ZCM. When end switch closure is detected, a contact will close between the ES-ES terminals on the ZCM, energizing the Multifunction Controller and Modulating Valve. Following this control procedure will eliminate any “dead-head” circulator conditions for radiant circulator (P1). The actuator(s) must be open before the circulator will operate.

When the circuit is completed between the control and the ZCM, the appropriate circulator (P1) will start along with the mixing function based on the user setup. When this occurs, the secondary pump (P1) will run continuously until the heat demand has ended. At the same time, the modulating valve will become active. This valve will automatically adjust itself to deliver the correct water temperature based on the user set-up information and the current outdoor temperature. The boiler will turn on and operate as the Multifunction Controller determines that hotter water is required for mixing. Sensor S2 provides boiler return water protection. This sensor will not allow the Modulating Valve to increase water temperature to the radiant panel unless the set temperature for minimum return has been satisfied, eliminating low return water temperatures and protecting the boiler from flue gas condensation and thermal shock.

The boiler connections through the on/off boiler relay are considered “dry contacts.” This means any wiring connected to these terminals are unpowered and will require an auxiliary power source. In this schematic, power is applied to these contacts from a transformer within the boiler control off the T-T or R-G terminals. Consult the heating equipment manufacturer’s wiring schematics for the proper terminals to energize the boiler.
Wiring Schematic 13
**Wiring Schematic 14**
- A3030101 Uponor Thermostats
- A3020522 Thermal Actuators
- A3030003/A3030004 Zone Control Module (ZCM)
- A3050050 50 VA Transformer
- A8020000 Climate Control Multifunction Controller

**Overview:** Multiple zone control and boiler enable using Uponor Thermostats, Uponor Actuators, the Uponor Zone Control Module (ZCM) and the Uponor Multifunction Controller to control two radiant supply water temperatures.

**Sequence of Operation:** On a call for heat, the Uponor Thermostat sends a signal to the Uponor ZCM, illuminating the yellow light on the ZCM. This call for heat sends power to the actuator(s) for that zone, energizing the Y1-Y2 terminals on the ZCM. This activates or opens the actuator(s), allowing flow through these loops on the manifold. Once the actuator(s) have opened to a minimal position, an end switch inside of the actuator(s) will close, illuminating the red light on the ZCM. When end switch closure is detected, a contact will close between the ES-ES terminals on the ZCM, energizing the Multifunction Controller. Following this control procedure will eliminate any “dead-head” circulator conditions for radiant circulators (SP1 and SP2). The actuator(s) must be open before these circulators will operate.

In this schematic, power is applied to the ES terminals by the Demand terminals on the Multifunction Controller, powered by an external transformer. When the circuit is completed between the control and the ZCM, the appropriate circulator will start along with the mixing function based on the user setup. When this occurs, the secondary pump (SP1 or SP2) will run continuously until the heat demand has ended. At the same time, the mixing devices (pumps or valves) will become active. These will automatically adjust themselves to deliver the correct water temperature based on the user set-up information and the current outdoor temperature. The boiler will turn on and operate as the Multifunction Controller determines that hotter water is required for mixing. Sensor S2 provides boiler return water protection. This sensor will not allow the injection circulators to increase the water temperatures unless the minimum boiler return temperature is met, eliminating low return water temperatures and protecting the boiler from flue gas condensation.

The boiler connections through the on/off boiler relay are considered “dry contacts.” This means any wiring connected to these terminals is unpowered and will require an auxiliary power source. In this schematic, power is applied to these terminals by the boiler operating control. In most instances, power is supplied to these contacts from a transformer within the boiler control off the T-T or R-G terminals. Consult the heating equipment manufacturer’s wiring schematics for the proper terminals to energize the boiler.
Wiring Schematic 14
Wiring Schematic 15
- A3030101 Uponor Thermostats
- A3010522 Thermal Actuators
- A3030003/A3030004 Zone Control Module (ZCM)
- A3050050 50 VA Transformer
- A8020000 Climate Control Multifunction Controller
- A9013061 Snow-melt Control

Overview: Multiple zone control and boiler enable using Uponor Thermostats, Uponor Actuators, the Uponor Zone Control Module (ZCM) and the Multifunction Controller to control radiant and snow-melt supply water temperatures.

Sequence of Operation: On a call for heat, the Uponor Thermostat sends a signal to the Uponor ZCM, illuminating the yellow light on the ZCM. This call for heat sends power to the actuator(s) for that zone, energizing the Y1-Y2 terminals on the ZCM. This activates or opens the actuator(s), allowing flow through these loops on the manifold. Once the actuator(s) have opened to a minimal position, an end switch inside of the actuator(s) will close, illuminating the red light on the ZCM. When end switch closure is detected, a contact will close between the ES-ES terminals on the ZCM, energizing the Multifunction Controller. Following this control procedure will eliminate any “dead-head” circulator conditions for radiant circulators (SP1 and SP2). The actuators must be open before these circulators will operate.

In this schematic, power is applied to the ES terminals by the Demand terminals on the Multifunction Controller, powered by an external transformer. When the circuit is completed between the control and the ZCM, the appropriate circulator will start along with the mixing function based on the user setup. When this occurs, the secondary pump (SP1 or SP2) will run continuously until the heat demand has ended. At the same time, the mixing devices (IP1 and IP2) will become active. These will automatically adjust themselves to deliver the correct water temperature based on the user set-up information and the current outdoor temperature. The boiler will turn on and operate as the Multifunction Controller determines that hotter water is required for mixing. Sensor S2 provides boiler return water protection. This sensor will not allow the injection circulators to increase the water temperatures unless the minimum boiler return temperature is met, eliminating low return water temperatures and protecting the boiler from flue gas condensation.

In this schematic, snow melting is set up for automatic operation using the Automatic Snow Ice Sensor. However, snow melting can be started manually if the Snow-melt Control (A9013061) and an optional remote push button are installed. For automatic operation, when moisture is detected on the sensor, a contact (green/white wires) will close to start snow-melting operation. When this happens, SP2 will turn on and run until the sensor is clear and the minimum run timer (user-adjustable setting) has timed out. Once the snow-melting operation begins, the slab will heat to the target melting temperature (user adjustable setting). Once this setting is reached, SP2 will continue to run, but the injection pump will turn off as to not add any additional heat.

The boiler connections through the on/off boiler relay are considered “dry contacts.” This means any wiring connected to these terminals is unpowered and will require an auxiliary power source. In this schematic, power is applied to these terminals by the boiler operating control. In most instances, power is supplied to these contacts from a transformer within the boiler control off the T-T or R-G terminals. Consult the heating equipment manufacturer’s wiring schematics for the proper terminals to energize the boiler.
Note: Outdoor temp provided with Climate Control Multifunction Controller.

Note: Snow ice sensor must be powered by dedicated transformer.

Wiring Schematic 15
Wiring Schematic 16
• A3030101 Uponor Thermostats
• A3010522 Thermal Actuators
• A3030003/A3030004 Zone Control Module (ZCM)
• A3050050 50 VA Transformer
• A8020000 Climate Control Multifunction Controller

Overview: Multiple zone control, multiple circulator control (SP1 and SP2) and boiler enable using Uponor Thermostats, Uponor Actuators, the Uponor Zone Control Module (ZCM) and the Multifunction Controller to control radiant and domestic hot water (DHW).

Sequence of Operation: On a call for heat, the Uponor Thermostat sends a signal to the Uponor ZCM, illuminating the yellow light on the ZCM. This call for heat sends power to the actuator(s) for that zone, energizing the Y1-Y2 terminals on the ZCM. This activates or opens the actuator(s), allowing flow through these loops on the manifold. Once the actuator(s) have opened to a minimal position, an end switch inside of the actuator(s) will close, illuminating the red light on the ZCM. When end switch closure is detected, a contact will close between the ES-ES terminals on the ZCM, energizing the Multifunction Controller. Following this control procedure will eliminate any “dead-head” circulator conditions for radiant circulators (SP1 and SP2). The actuator(s) must be open before the circulator(s) will operate.

The ES terminals are considered “dry contacts.” This means any wiring connected to these terminals is unpowered and will require an auxiliary power source. In this schematic, power is applied to the ES terminals by the Demand terminals on the Multifunction Controller, powered by an external transformer. When the circuit is completed between the control and the ZCM, the appropriate circulator will start along with the mixing function based on the user setup. When this occurs, the secondary pump (SP1 or SP2) will run continuously until the heat demand has ended. At the same time, the mixing devices (valves) will become active. These will automatically adjust themselves to deliver the correct water temperature based on the user setup information and the current outdoor temperature. The boiler will turn on and operate as the Multifunction Controller determines that hotter water is required for mixing. Sensor S2 provides boiler return water protection. This sensor will not allow the modulating valves to increase the water temperatures unless the minimum boiler return temperature is met, eliminating low return water temperatures and protecting the boiler from flue gas condensation.

Also connected to the Multifunction Controller is domestic hot water (DHW) when using an indirect water tank. The Multifunction Controller can control the DHW either through a 10K sensor (as shown) or an internal aquastat included with the hot water tank. When piped off of a primary loop, the control will automatically manage both the hot water production and space heating. If the internal target for the primary loop cannot be met, the control will begin to close the mixing device(s). Once the DHW tank is heated, the mixing device(s) will return to normal operation.

Also shown in this schematic is a separate Uponor Thermostat used to control a separate radiant circulator (ZP1). Power is supplied to the thermostat from the demand terminals of the Multifunction Controller. When the thermostat calls for heat and completes that circuit, the circulator will start and fire the boiler for the high temperature requirement for the baseboard.
Wiring Schematic 16
Wiring Schematic 17

SetPoint 150 Controller
A3040150

Transformer
Plug Relay

Single-zone Pump Relay
A3010100

*Factory-installed Jumper
SetPoint 150 Controller A3040150

SetPoint 150 Controller A3040150

S1

Transformer

Three-zone Multi-pump Relay A3080301

Wiring Schematic 18

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Wiring Schematic 19
Wiring Schematic 20

Heat-only Thermostat
A3030101

24 VAC
Transformer
A3050050

Transformer

Plug Relay
A3010100

Single-zone Pump Relay
A3010100
*Factory-installed Jumper

Boiler Control
Chapter 14 – Electrical Schematics

Wiring Schematic 21
Wiring Schematic 22

Heat-only Thermostat
A3030101

24 VAC Transformer
A3050050

¾" Zone Valve A3070525
1" Zone Valve A3070526

Single-zone Pump Relay
A3010100
*Factory-installed Jumper

Boiler Control
Wiring Schematic 24
Chapter 14 – Electrical Schematics

Wiring Schematic 25

- Heat-only Thermostat A3030101
- Red Wires
- Yellow Wires
- 24 VAC Transformer A3050050
- Plug Relay A3010100
*Factory-installed Jumper
- Boiler Control

N
L

3

4NO

4NC

G/T

C

R/T

S

6NO

6NC

¾” Zone Valve A3070525
1” Zone Valve A3070526

Wiring Schematic 25