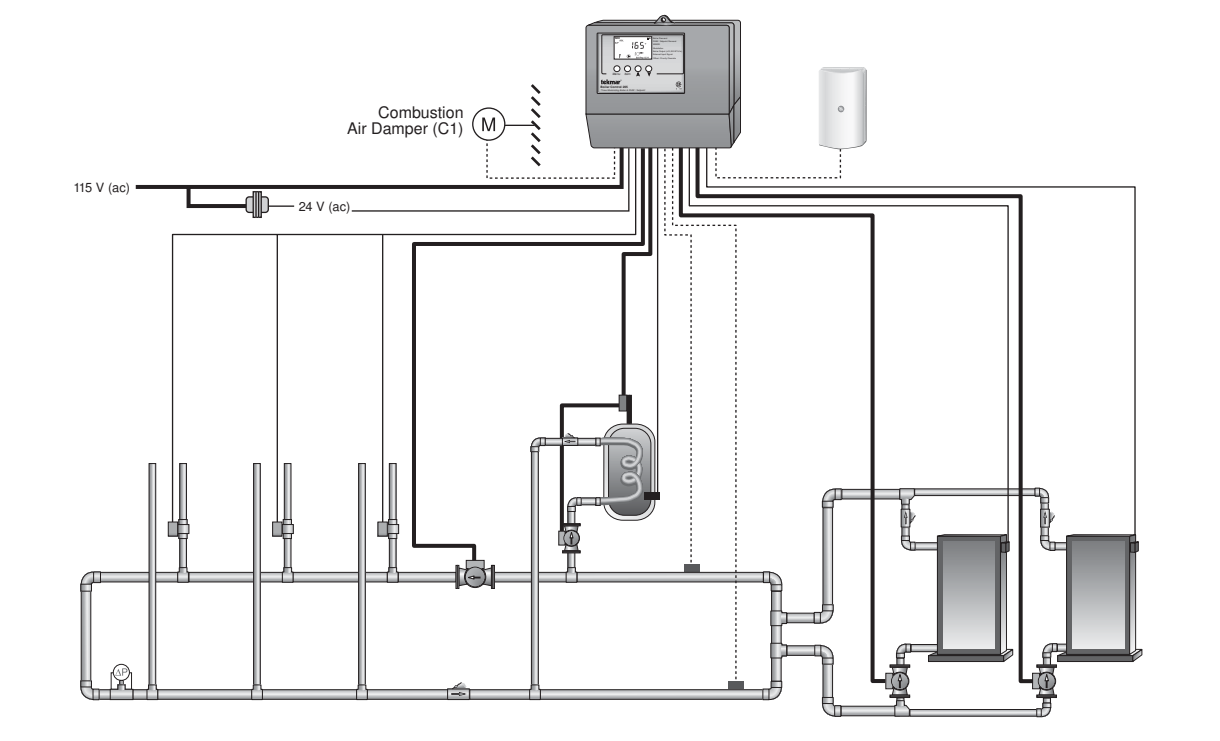
tekmar® - Application Brochure

Boiler Control 265

A 265

07/10



Features of the Boiler Control 265

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

- Outdoor Reset
- Characterized Heating Curve
- Water Temperature Setback
- Boost
- Warm Weather Shut Down
- Boiler Outdoor Reset
- Soft Stop
- Boiler Differential (Automatic)
- Boiler Minimum Supply
- Boiler Post Purge
- PID Staging
- Equal Run Time Rotation
- Sequential Modulation
- Fixed Lead
- Fixed Last
- Fire Delay
- Boiler Mass
- DHW Boiler Reset Override
- DHW Priority
- DHW Priority Override
- DHW Post Purge
- DHW Mixing Purge
- Setpoint Boiler Reset Override
- Setpoint Priority
- Modulating Output
- Parallel Modulation

Application

The tekmar Boiler Control 265 can control the supply water temperature on up to three modulating boilers based on outdoor temperature or setpoint requirements. The control can be set to control up to two modulating boilers based on outdoor temperature or domestic hot water requirements. The control has outputs for a primary pump, individual boiler pumps, and either a combustion air damper or an alert.

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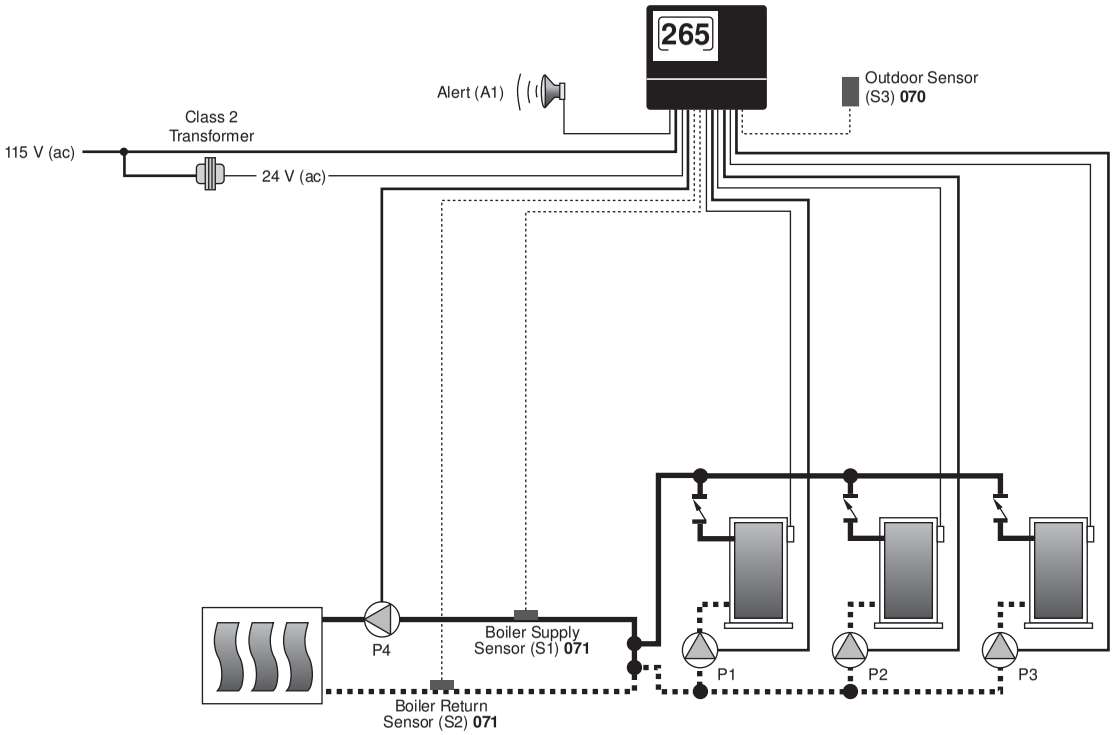
A1 = Alert
P1 = Boiler Pump 1
P2 = Boiler Pump 2
P3 = Boiler Pump 3
P4 = System Pump
S1 = Boiler Supply Sensor 071
S2 = Boiler Return Sensor 071
S3 = Outdoor Sensor 070



Concept Drawing
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System Operation
The Boiler Control 265 provides outdoor reset to a space heating system. Line voltage is used to provide a permanent boiler demand. The boilers are piped in primary-secondary and the boiler pumps are controlled by the 265 to allow post purging of the boilers after they have shut off. The control has an alert contact which closes when there is an error message. The Warm Weather Shut Down feature prevents the boilers from firing in the summer months, ensuring the heating space does not overheat.

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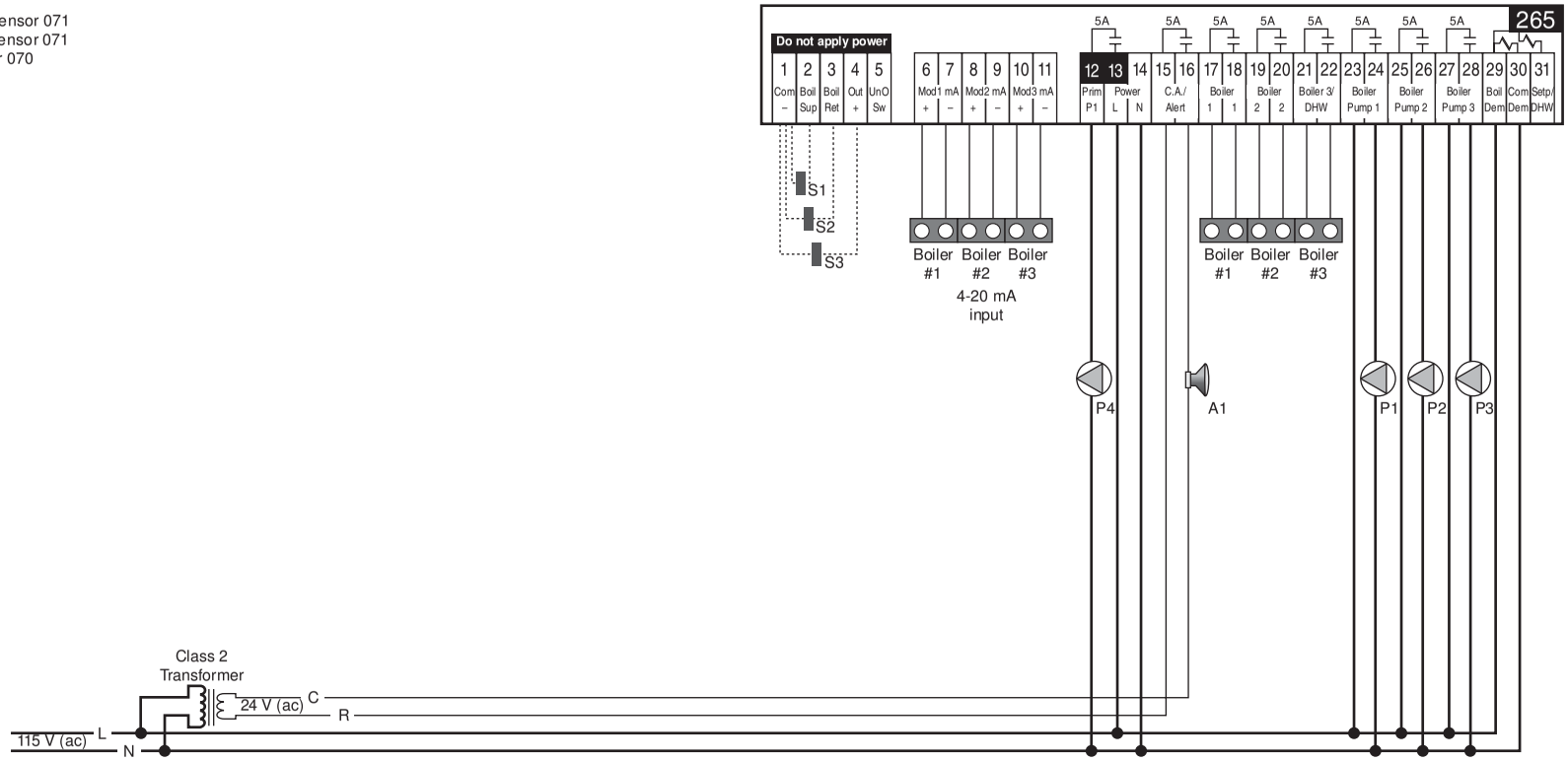

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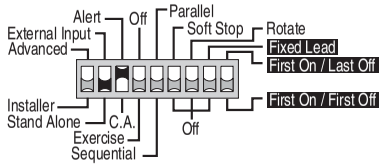
Essential Control Settings
Boil 3 ≠ OFF



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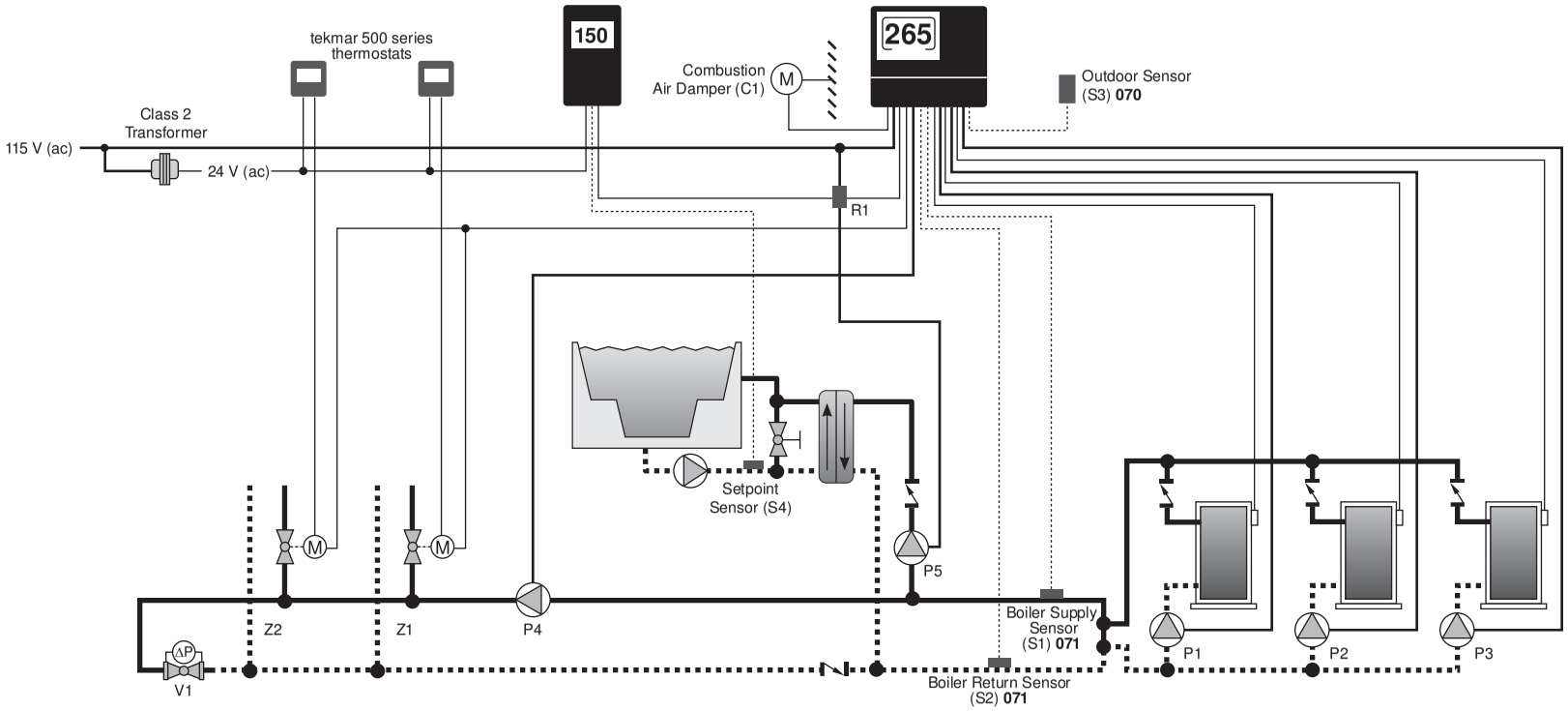
C1 = Combustion Air Damper
P1 = Boiler Pump 1
P2 = Boiler Pump 2
P3 = Boiler Pump 3
P4 = System Pump
P5 = Setpoint Temperature Pump
S1 = Boiler Supply Sensor 071
S2 = Boiler Return Sensor 071
S3 = Outdoor Sensor 070
S4 = Setpoint Sensor 071
R1 = Relay 003
V1 = Pressure Differential Bypass Valve
Z1, Z2 = Zone Valves



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System Operation
The Boiler Control 265 provides outdoor reset to a space heating system and a setpoint load. The 265 provides modulation to three modulating boilers. The boilers are piped in primary-secondary and the boiler pumps are controlled by the 265 to allow for post purging of the boilers after they have shut off. A combustion air damper is also controlled by the 265.

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P5 = Setpoint Temperature Pump
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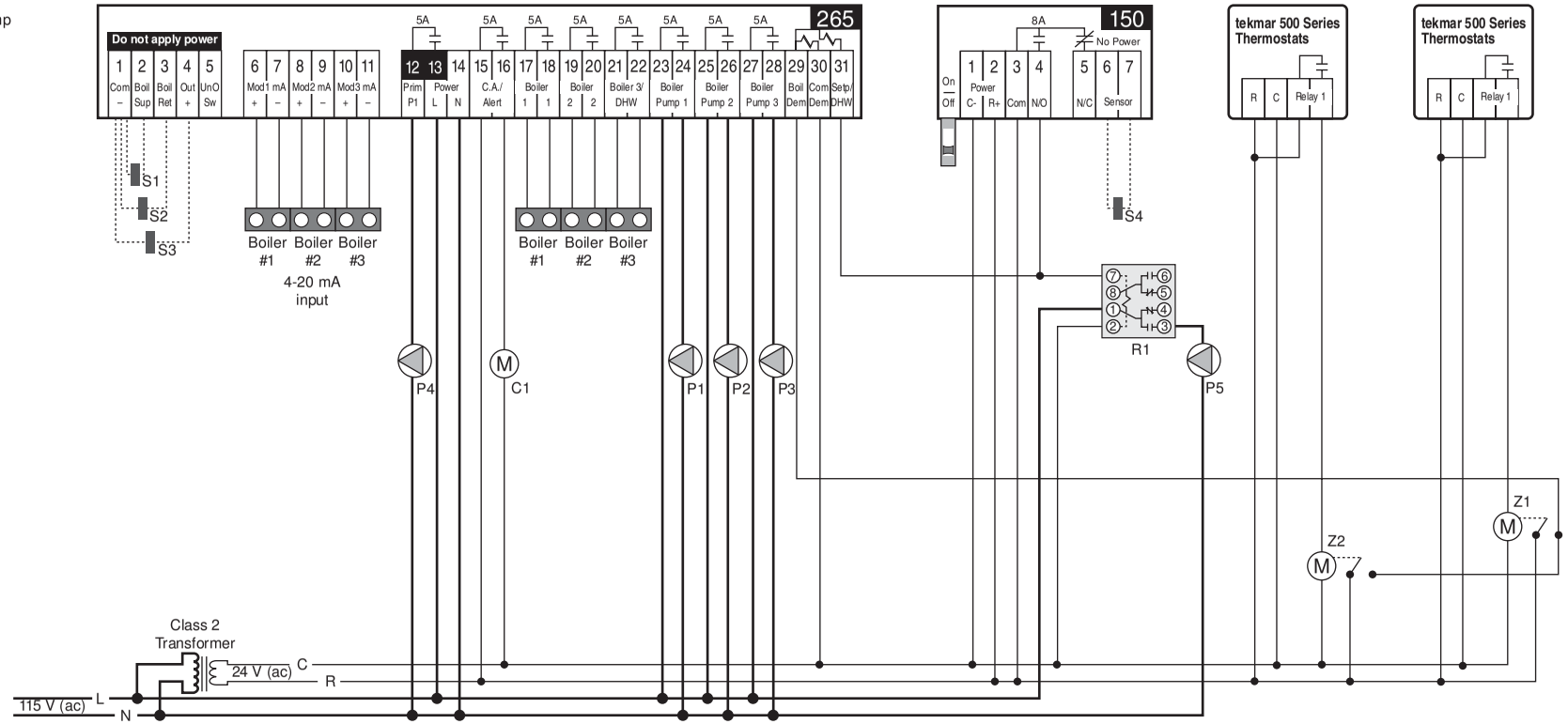
S4 = Setpoint Sensor 071
R1 = Relay 003
Z1, Z2 = Zone Valves



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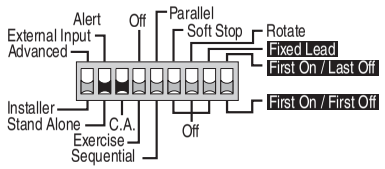
Essential Control Settings
DHW MODE = OFF
Setpoint MODE = 1 (no priority)
2 (priority)



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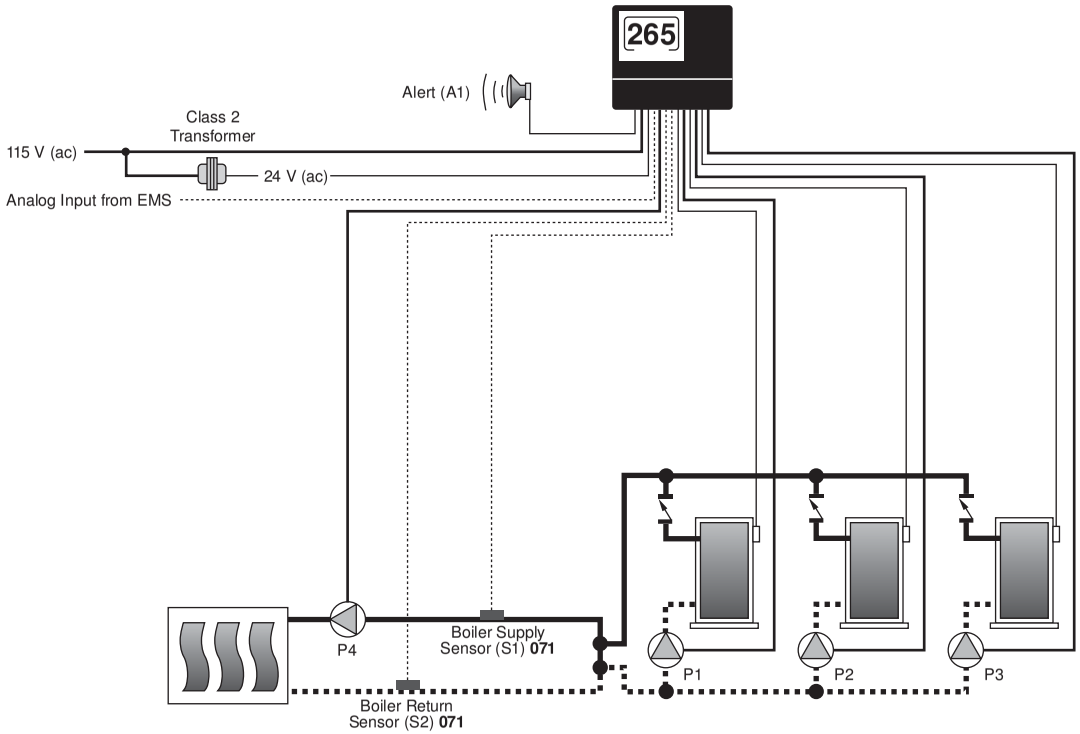
07/10

A1 = Alert
P1 = Boiler Pump 1
P2 = Boiler Pump 2
P3 = Boiler Pump 3
P4 = System Pump
S1 = Boiler Supply Sensor 071
S2 = Boiler Return Sensor 071



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System Operation
An Energy Management (EMS) provides the Boiler Control 265 the Boiler Target temperature using a 0 to 10 V (dc) or 2 to 10 V (dc) signal. The boilers are piped in primary-secondary and the boiler pumps are controlled by the 265 to allow post purging of the boilers after they have shut off. The 265 has an alert contact which closes when there is an error message.

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A1 = Alert
P1 = Boiler Pump 1
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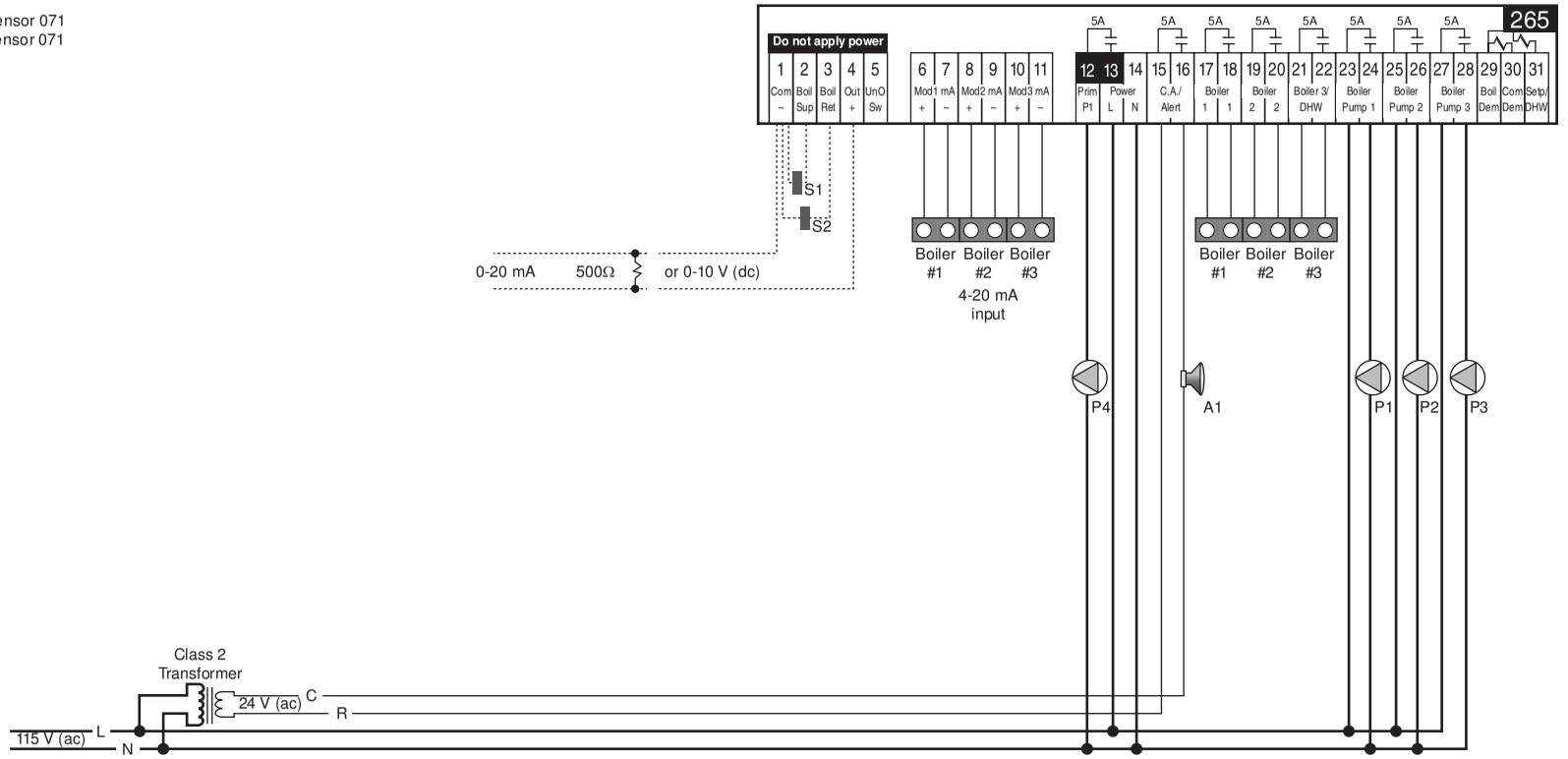
P3 = Boiler Pump 3
P4 = System Pump
S1 = Boiler Supply Sensor 071
S2 = Boiler Return Sensor 071



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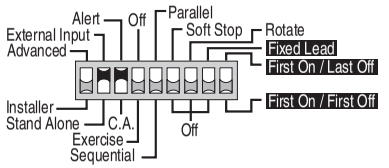
Essential Control Settings



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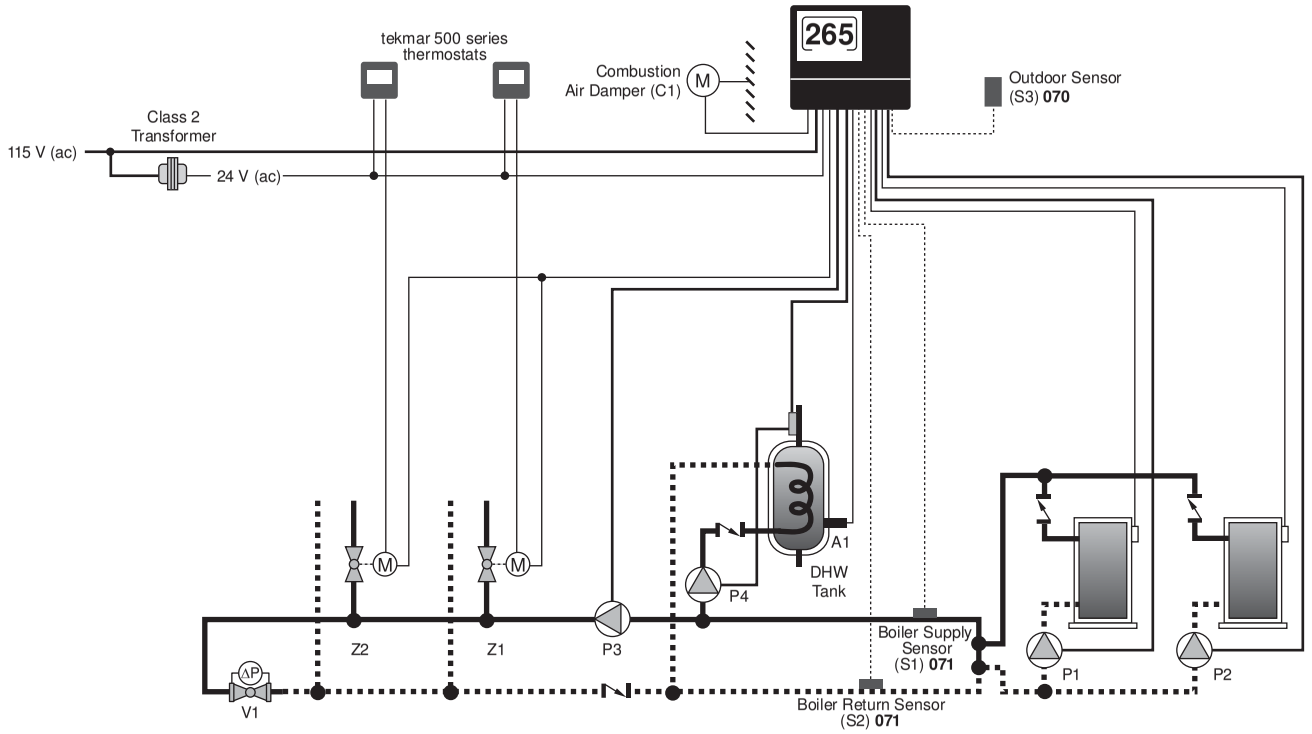
A1 = Aquastat
C1 = Combustion Air Damper
P1 = Boiler Pump 1
P2 = Boiler Pump 2
P3 = System Pump
P4 = DHW Pump
S1 = Boiler Supply Sensor 071
S2 = Boiler Return Sensor 071
S3 = Outdoor Sensor 070
Z1, Z2 = Zone Valves



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System Operation
The Boiler Control 265 provides outdoor reset to a space heating system and domestic hot water load. The 265 provides modulation to two modulating boilers. The boilers are piped in primary-secondary and the boiler pumps are controlled by the 265 to allow for post purging of the boilers after they have shut off. A combustion air damper is also controlled by the 265.

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P2 = Boiler Pump 2
P3 = System Pump
P4 = DHW Pump
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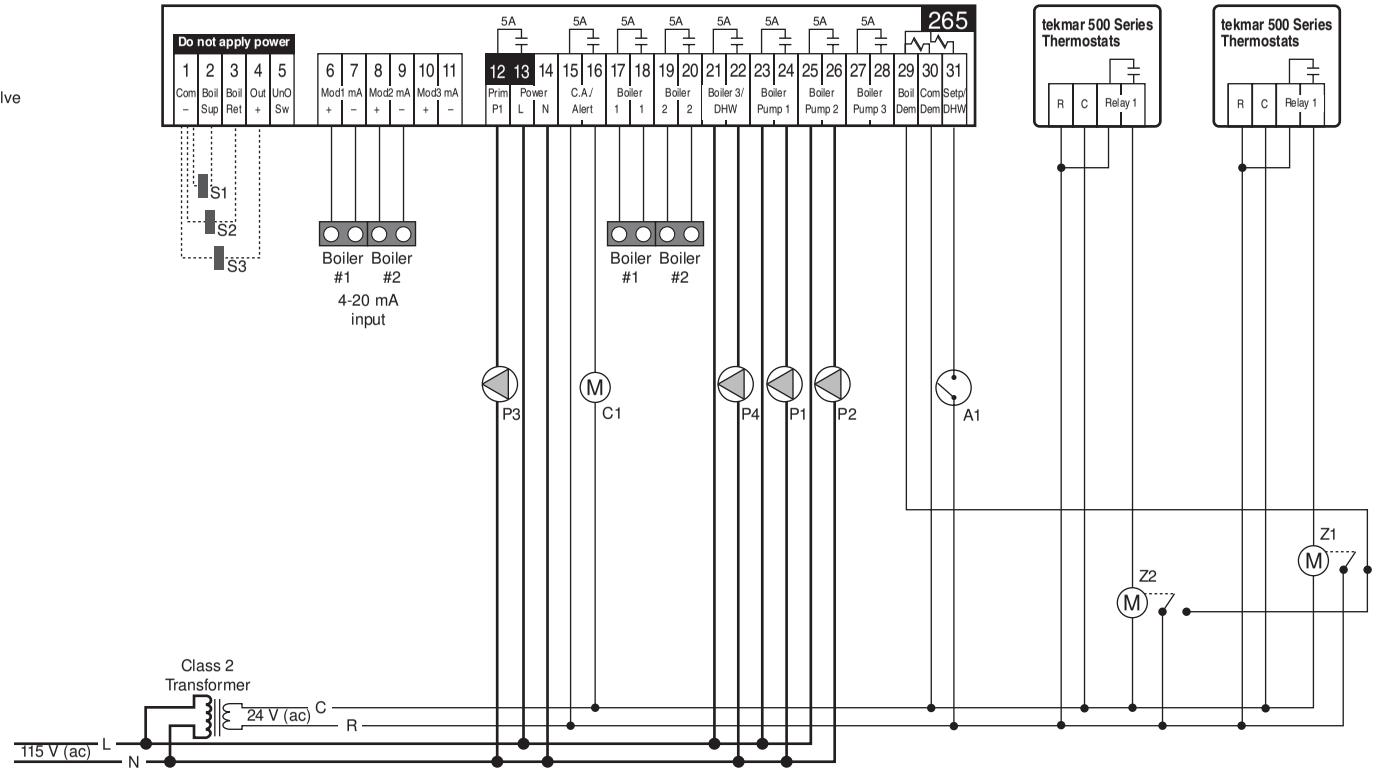
S2 = Boiler Return Sensor 071
S3 = Outdoor Sensor 070
V1 = Pressure Differential Bypass Valve
Z1, Z2 = Zone Valves



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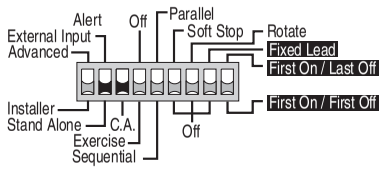
Essential Control Settings
Boil 3 = OFF
DHW MODE = 1 (no priority)
2 (priority)



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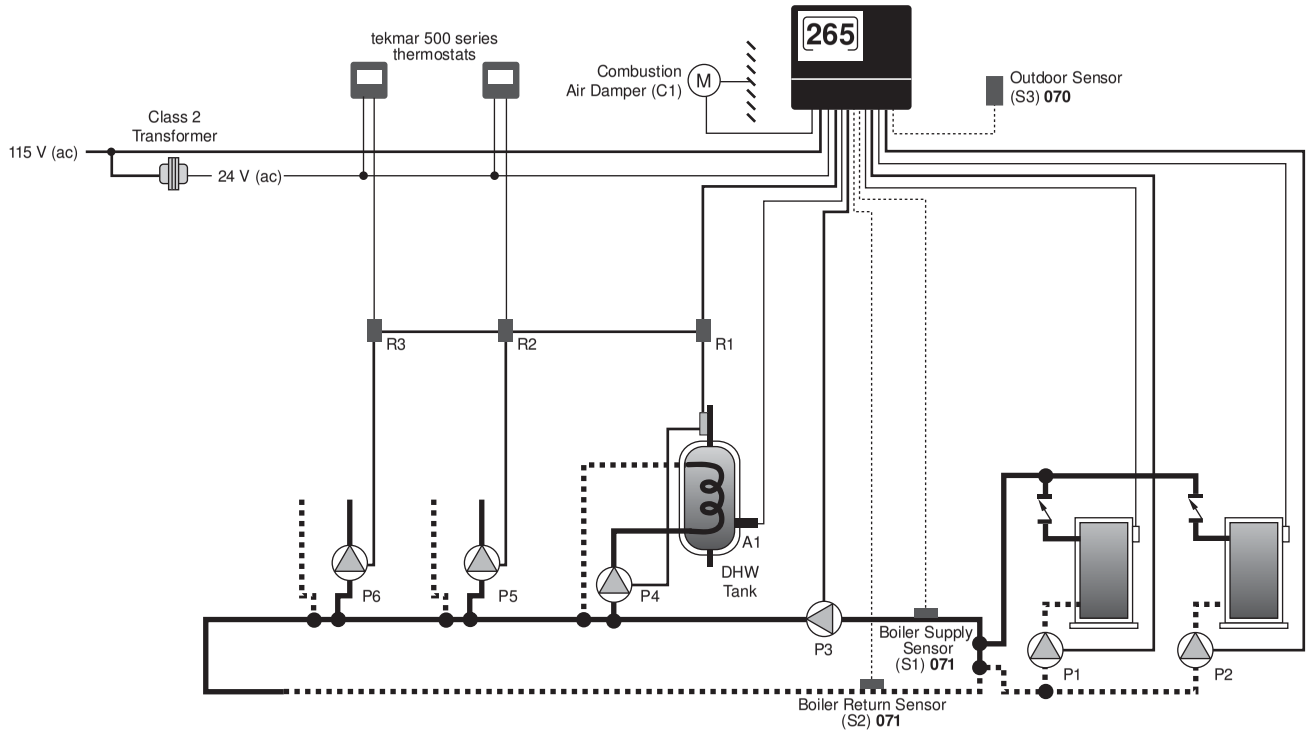
A1 = Aquastat
C1 = Combustion Air Damper
P1 = Boiler Pump 1
P2 = Boiler Pump 2
P3 = System Pump
P4 = DHW Pump
P5, P6 = Zone Pumps
R1 = Relay 004
R2, R3 = Relay 003
S1 = Boiler Supply Sensor 071
S2 = Boiler Return Sensor 071
S3 = Outdoor Sensor 070



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System Operation
The Boiler Control 265 provides outdoor reset to a space heating system and domestic hot water load with all zones piped in primary-secondary. The 265 provides modulation to two modulating boilers. The boilers are piped in primary-secondary and the boiler pumps are controlled by the 265 to allow for post purging of the boilers after they have shut off. A combustion air damper is also controlled by the 265. The domestic hot water tank is piped in primary-secondary and has an external relay to provide priority over the space heating.

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R2, R3 = Relay 003
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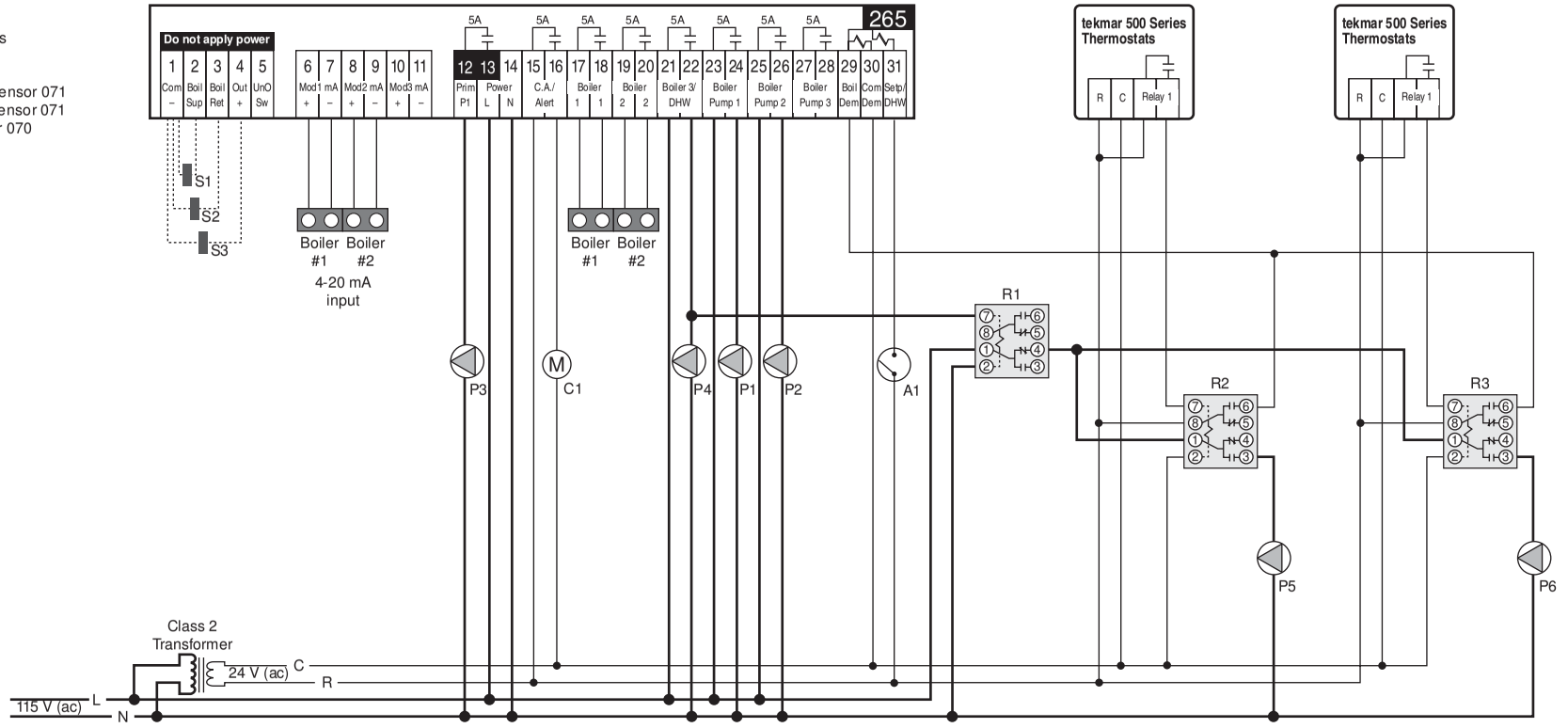

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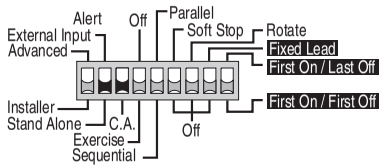
Essential Control Settings
Boil 3 = OFF
DHW MODE = 4



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Specifications

The following are the recommended specifications for the Boiler Control 265

- The control shall be able to operate one, two, or three modulating boilers.
- The control shall be able to operate one or two boilers during a call for domestic hot water heating.
- The control shall have the ability to calculate the boilers' target temperature based on outdoor reset.
- The control shall have the ability to have the boilers' target temperature set using an adjustable setpoint.
- The control shall have an adjustable warm weather shut down. The warm weather shut down only applies to outdoor reset operation.
- The control shall have a primary pump contact that operates during a call for space heating.
- The control shall have the ability to operate a domestic hot water contact that operates during a domestic hot water call.
- The control shall have the ability to display the current temperature difference between the return temperature and the supply temperature, ΔT.
- 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 modulating the boilers.
- The control shall have the option to modulate the boilers in sequential order.
- The control shall have the option to modulate the boilers in parallel.
- 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 of an automatic differential calculation in order to prevent short cycling of the boilers.
- The control shall have the ability to operate a primary pump plus individual boiler pumps.
- The boiler pumps shall have an adjustable post purge setting that allows the pump to run for a set period after the boiler has been shut off.
- The control shall have the option for a fixed lead rotation and when this option is selected, the control shall have an option for either a first on / first off, or first on / last off modulating sequence.
- The control shall have the option for either an alert output or a combustion air damper output. If the combustion air damper is selected, the control shall have an adjustable combustion air damper opening time.
- The control shall have an adjustable minimum inter-stage delay that can be set manually or calculated automatically by the control.
- The control shall have the option of accepting a 0 – 10 V(dc) input signal from an energy management system.
- When operating with a 0 – 10 V(dc) signal, the control shall have an adjustable offset as well as an adjustable input range.
- The control shall have two separate lockable access levels to limit the number of setting adjustments available to various users.
- The control shall have a test button that activates a pre-programmed test sequence testing all the control's outputs.
- The control shall have the ability to show the current outdoor, boiler supply, and boiler return temperatures.
- The control shall continually monitor the temperature sensors and provide an error message upon a control or sensor failure.
- The control shall record and display the running hours of each boiler.
- During extended periods of inactivity, the pumps or valves that are operated by the control shall be periodically exercised to prevent seizure during long idle periods.
- The control shall have the option to gradually modulate the boilers down to low fire before the boilers are shut off.
- The control shall have three 4 – 20 mA or 0 – 20 mA modulating external outputs.
- The control shall have the field upgradable option of converting the modulating output to 0 – 10 V(dc), 2 – 10 V(dc) and 0 - 135 Ω.

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