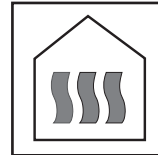


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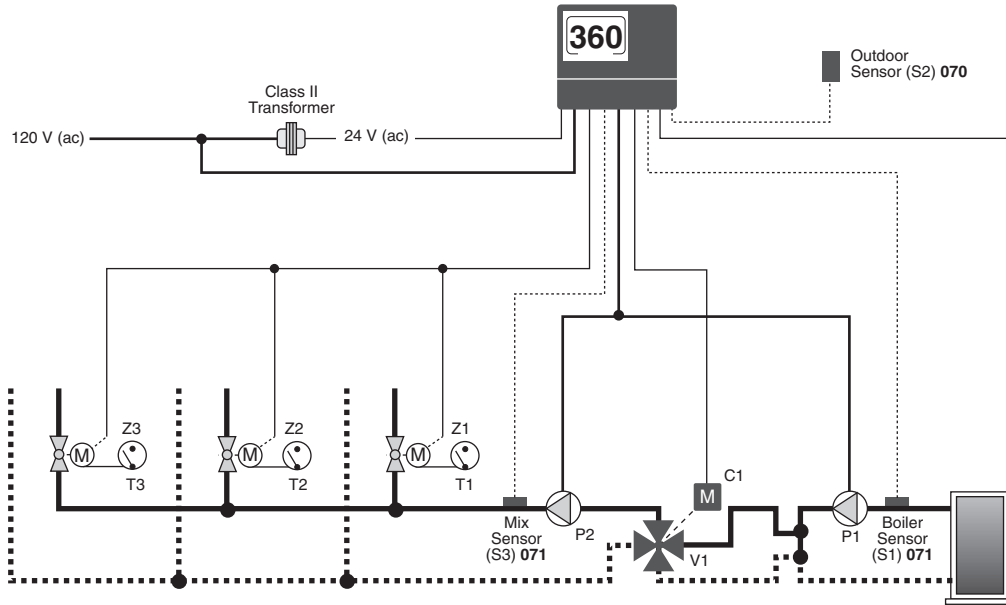
Mixing Control 360



A 360-1

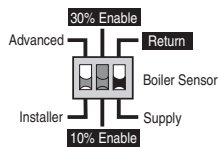
05/00

Mechanical

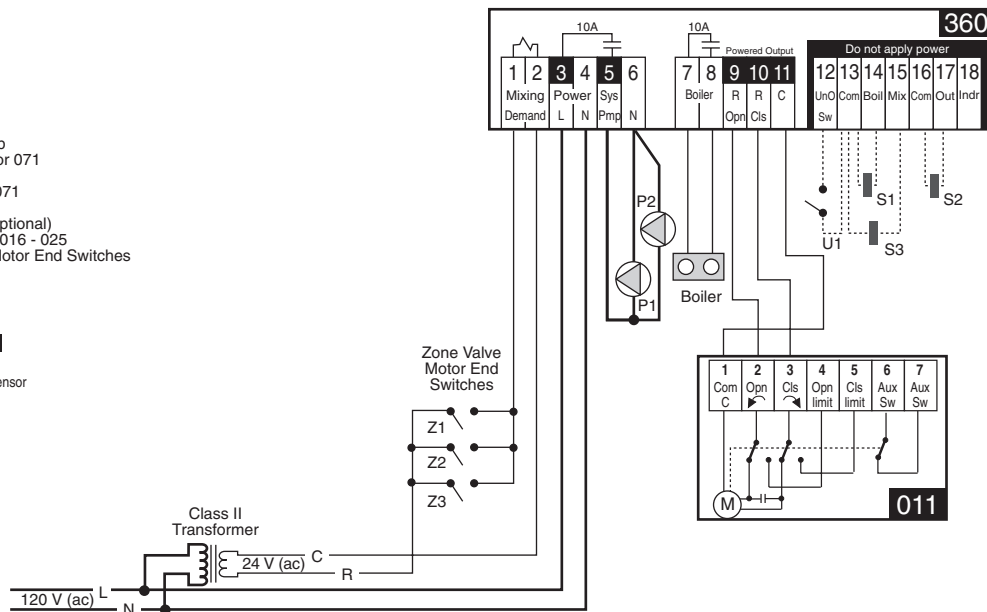


Electrical

C1 = Actuating Motor 011
P1 = Boiler Pump
P2 = Mixing System Pump
S1 = Boiler Supply Sensor 071
S2 = Outdoor Sensor 070
S3 = Mix Supply Sensor 071
T1, ..., T3 = Thermostats
U1 = tekmar Timer 031 (optional)
V1 = 4-Way Mixing Valve 016 - 025
Z1, ..., Z3 = Zone Valve Motor End Switches



= Required
 = Optional
 = Not Used



Note: This is only a concept drawing. The designer must determine whether this application will work in his system and must ensure compliance with code requirements. Necessary auxiliary equipment, isolation relays (for loads greater than the specified tekmar internal relay ratings), and other safety and limit devices must be added.

System Operation

The Mixing Control 360 provides full outdoor reset to three (or more) mixed zones. The position of the mixing valve is modulated to provide a mixed supply water temperature to the zones, and protect the boiler from flue gas condensation. The boiler operates at the required temperature in order to satisfy the load.

Heat Source Details The heat source can be either a high mass or low mass non-condensing boiler.

Piping Details Thermostat controlled zone valves are piped into the mixed loop. The mixing valve is piped in primary / secondary in order to isolate the boiler loop flow rate from the mixed loop flow rate. The boiler pump (P1) provides flow through the boiler and ensures flow past the mixing valve take-off.

Mixing Demand When heat is required in the mixed zones, the zone valve end switches send a *Mixing Demand* to the 360. The 360 turns on the mixing system pump (P2) and boiler pump (P1). The mixed supply water temperature is based on the *Characterized Heating Curve* settings. The mixing valve is then modulated to supply the required mixed supply water temperature. As the mixing valve opens and requires more heat from the boiler, the boiler is fired to a temperature that is sufficient to satisfy the requirements of the mixing valve. Whenever the boiler is fired, the 360 aims to maintain the boiler temperature above the BOIL MIN setting. While the boiler is firing, the mixing valve is also modulated to protect the boiler from excessively low water temperatures.

All control functions and specifications are listed in the Product Catalog I 000 and Data Brochure D 360.

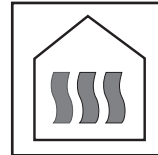


tekmar Control Systems Ltd., Canada
tekmar Control Systems, Inc., U.S.A.
Head Office: 4611 - 23rd Street
Vernon, B.C. Canada V1T 4K7
Tel. (250) 545-7749 Fax. (250) 545-0650
Web Site: www.tekmarcontrols.com



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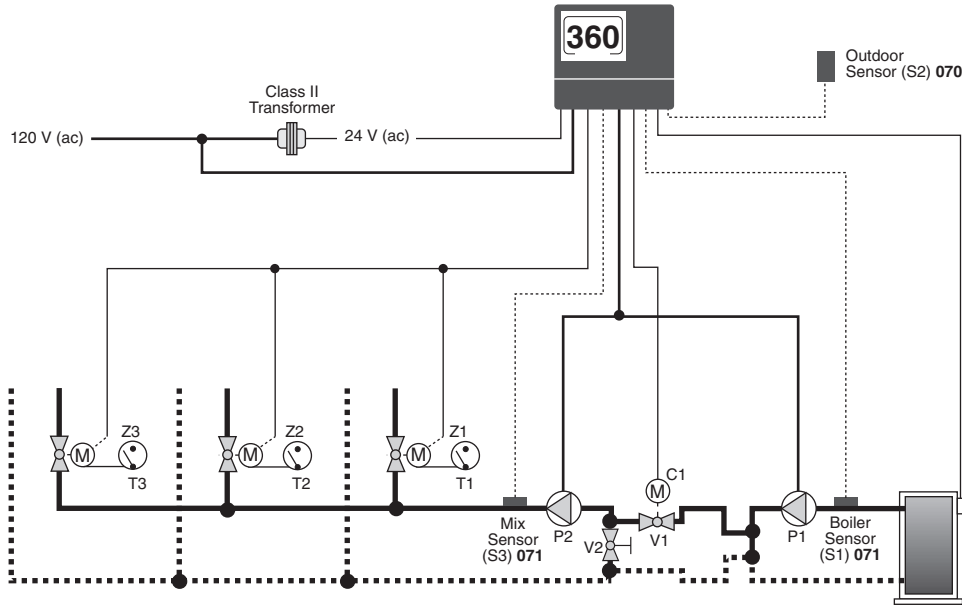
Mixing Control 360



A 360-2

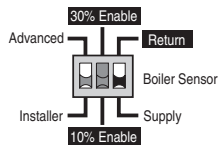
05/00

Mechanical

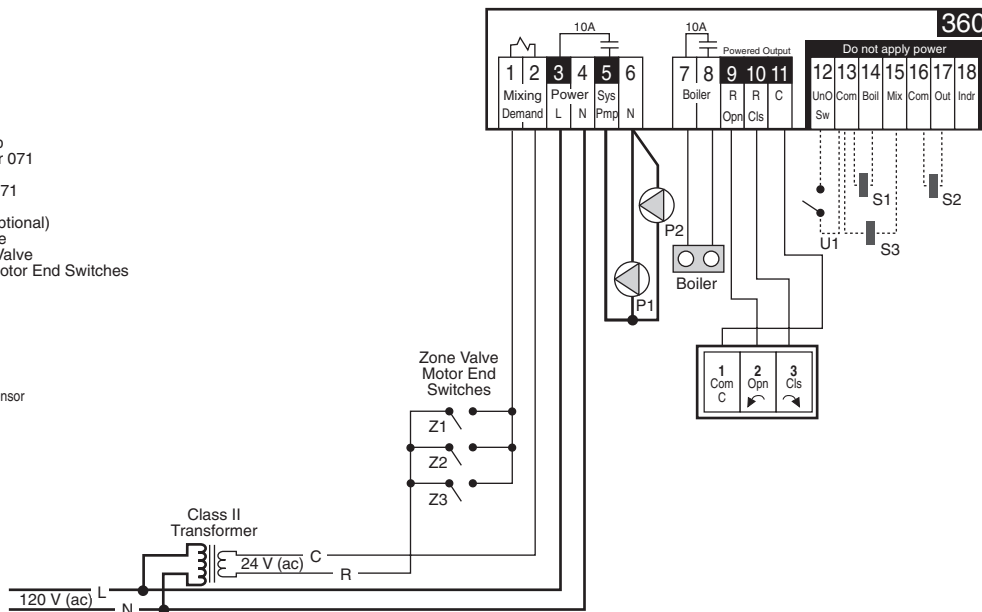


Electrical

C1 = Actuating Motor
P1 = Boiler Pump
P2 = Mixing System Pump
S1 = Boiler Supply Sensor 071
S2 = Outdoor Sensor 070
S3 = Mix Supply Sensor 071
T1, ..., T3 = Thermostats
U1 = tekmar Timer 031 (optional)
V1 = 2-Way Injection Valve
V2 = Balancing or Globe Valve
Z1, ..., Z3 = Zone Valve Motor End Switches



= Required
 = Optional
 = Not Used



Note: This is only a concept drawing. The designer must determine whether this application will work in his system and must ensure compliance with code requirements. Necessary auxiliary equipment, isolation relays (for loads greater than the specified tekmar internal relay ratings), and other safety and limit devices must be added.

System Operation

The Mixing Control 360 provides full outdoor reset to three (or more) mixed zones. The position of the injection valve is modulated to provide a mixed supply water temperature to the zones, and protect the boiler from flue gas condensation. The boiler operates at the required temperature in order to satisfy the load.

Heat Source Details The heat source can be either a high mass or low mass non-condensing boiler.

Piping Details Thermostat controlled zone valves are piped into the mixed loop. The injection valve is piped in primary / secondary in order to isolate the boiler loop flow rate from the mixed loop flow rate. The boiler pump (P1) provides flow through the boiler and ensures flow past the injection valve take-off.

Mixing Demand When heat is required in the mixed zones, the zone valve end switches send a *Mixing Demand* to the 360. The 360 turns on the mixing system pump (P2) and boiler pump (P1). The mixed supply water temperature is based on the *Characterized Heating Curve* settings. The injection valve is then modulated to supply the required mixed supply water temperature. As the injection valve opens and requires more heat from the boiler, the boiler is fired to a temperature that is sufficient to satisfy the requirements of the injection valve. Whenever the boiler is fired, the 360 aims to maintain the boiler temperature above the BOIL MIN setting. While the boiler is firing, the injection valve is also modulated to protect the boiler from excessively low water temperatures.

All control functions and specifications are listed in the Product Catalog I 000 and Data Brochure D 360.

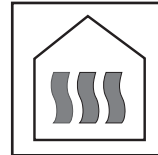


tekmar Control Systems Ltd., Canada
tekmar Control Systems, Inc., U.S.A.
Head Office: 4611 - 23rd Street
Vernon, B.C. Canada V1T 4K7
Tel. (250) 545-7749 Fax. (250) 545-0650
Web Site: www.tekmarcontrols.com



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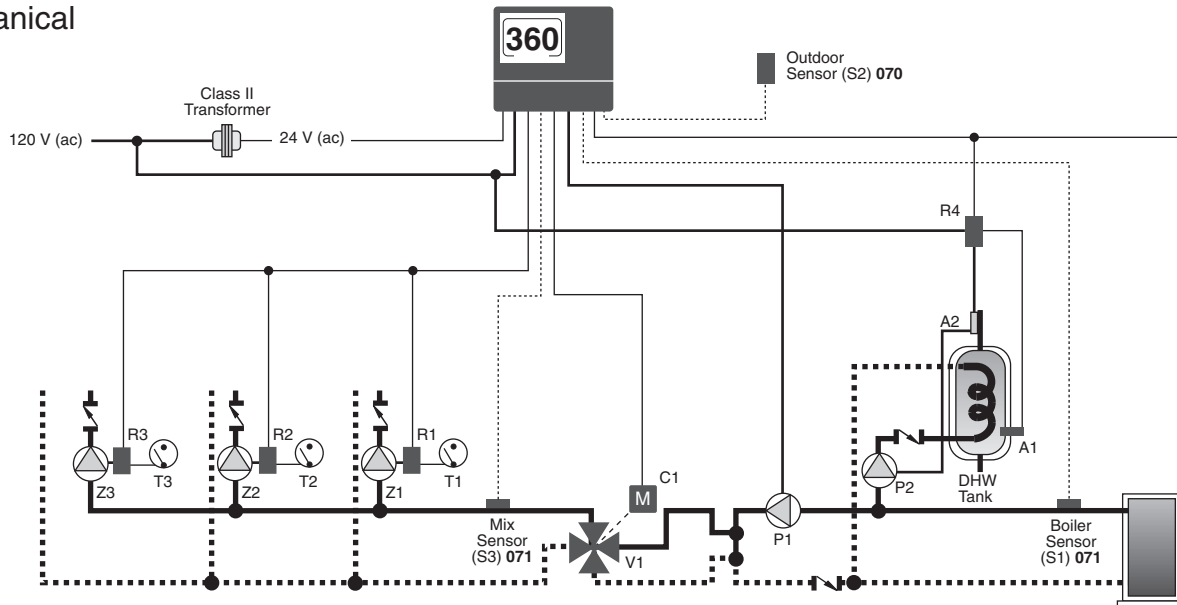
Mixing Control 360



A 360-3

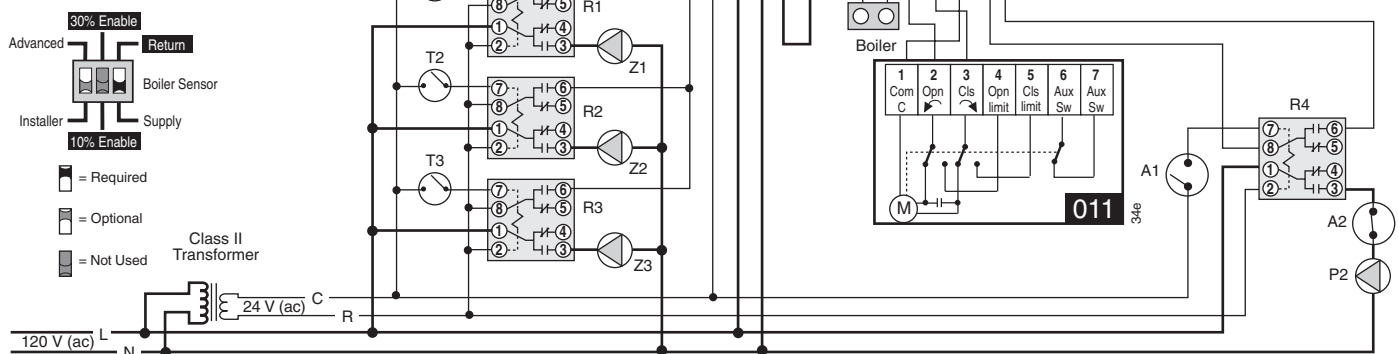
05/00

Mechanical



Electrical

A1 = DHW Aquastat
 A2 = DHW High Limit Aquastat
 C1 = Actuating Motor 011
 P1 = Boiler Pump
 P2 = DHW Pump
 R1, ..., R4 = Relay 003
 S1 = Boiler Supply Sensor 071
 S2 = Outdoor Sensor 070
 S3 = Mix Supply Sensor 071
 T1, ..., T3 = Thermostats
 U1 = tekmar Timer 031 (optional)
 V1 = 4-Way Mixing Valve 016 - 025
 Z1, ..., Z3 = Zone Pumps



Note: This is only a concept drawing. The designer must determine whether this application will work in his system and must ensure compliance with code requirements. Necessary auxiliary equipment, isolation relays (for loads greater than the specified tekmar internal relay ratings), and other safety and limit devices must be added.

System Operation

The Mixing Control 360 provides full outdoor reset to three (or more) mixed zones. The position of the mixing valve is modulated to provide a mixed supply water temperature to the zones, and protect the boiler from flue gas condensation. The boiler operates at the required temperature in order to satisfy the loads. The supply of heat to an indirect Domestic Hot Water (DHW) tank is controlled through an external relay.

Heat Source Details The heat source can be either a high mass or low mass non-condensing boiler.

Piping Details Thermostat controlled zone pumps are piped into the mixed loop. The mixing valve is piped in primary / secondary in order to isolate the boiler loop flow rate from the mixed loop flow rate. Heat is supplied to the DHW tank through a DHW pump (P2). The boiler pump (P1) provides flow through the boiler and ensures flow past the mixing valve take-off.

Domestic Hot Water (DHW) When the DHW tank requires heat, the DHW aquastat (A1) energizes relay R4. Relay R4 provides power to the DHW pump (P2) in order to provide circulation through the DHW tank. Once energized, relay R4 also enables the boiler. The boiler is then allowed to operate up to the operating aquastat's setting.

Mixing Demand When heat is required in the mixed zones, the zone pump relays send a *Mixing Demand* to the 360. The 360 turns on the boiler pump (P1). The mixed supply water temperature is based on the *Characterized Heating Curve* settings. The mixing valve is then modulated to supply the required mixed supply water temperature. As the mixing valve opens and requires more heat from the boiler, the boiler is fired to a temperature that is sufficient to satisfy the requirements of the mixing valve. Whenever the boiler is fired, the 360 aims to maintain the boiler temperature above the BOIL MIN setting. While the boiler is firing, the mixing valve is also modulated to protect the boiler from excessively low water temperatures.

All control functions and specifications are listed in the Product Catalog I 000 and Data Brochure D 360.

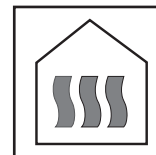


tekmar Control Systems Ltd., Canada
tekmar Control Systems, Inc., U.S.A.
Head Office: 4611 - 23rd Street
Vernon, B.C. Canada V1T 4K7
Tel. (250) 545-7749 Fax. (250) 545-0650
Web Site: www.tekmarcontrols.com



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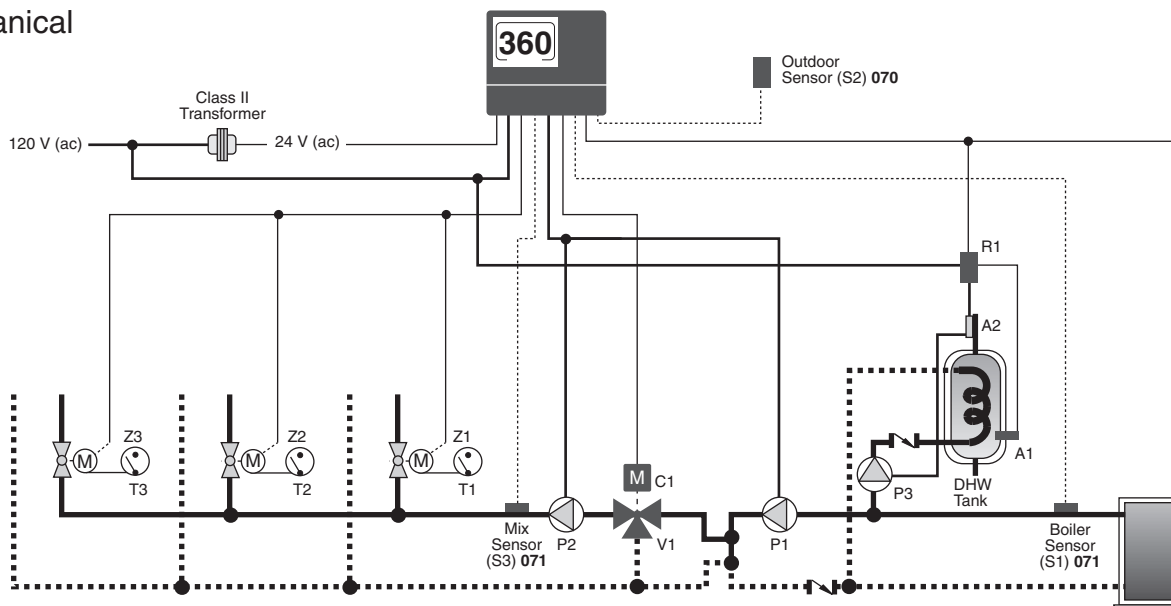
Mixing Control 360



A 360-4

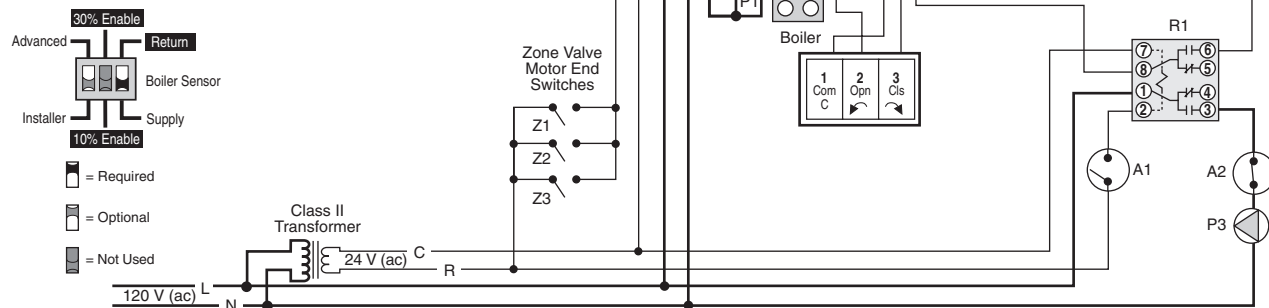
05/00

Mechanical



Electrical

A1 = DHW Aquastat
 A2 = DHW High Limit Aquastat
 C1 = Actuating Motor
 P1 = Boiler Pump
 P2 = Mixing System Pump
 P3 = DHW Pump
 R1 = Relay 003
 S1 = Boiler Supply Sensor 071
 S2 = Outdoor Sensor 070
 S3 = Mix Supply Sensor 071
 T1, ..., T3 = Thermostats
 U1 = tekmar Timer 031 (optional)
 V1 = 3-Way Mixing Valve
 Z1, ..., Z3 = Zone Valve Motor End Switches



Note: This is only a concept drawing. The designer must determine whether this application will work in his system and must ensure compliance with code requirements. Necessary auxiliary equipment, isolation relays (for loads greater than the specified tekmar internal relay ratings), and other safety and limit devices must be added.

System Operation

The Mixing Control 360 provides full outdoor reset to three (or more) mixed zones. The position of the mixing valve is modulated to provide a mixed supply water temperature to the zones, and protect the boiler from flue gas condensation. The boiler operates at the required temperature in order to satisfy the loads. The supply of heat to an indirect Domestic Hot Water (DHW) tank is controlled through an external relay.

Heat Source Details The heat source can be either a high mass or low mass non-condensing boiler.

Piping Details Thermostat controlled zone pumps are piped into the mixed loop. The mixing valve is piped in primary / secondary in order to isolate the boiler loop flow rate from the mixed loop flow rate. Heat is supplied to the DHW tank through a DHW pump (P3). The boiler pump (P1) provides flow through the boiler and ensures flow past the mixing valve take-off.

Domestic Hot Water (DHW) When the DHW tank requires heat, the DHW aquastat (A1) energizes relay R1. Relay R1 provides power to the DHW pump (P3) in order to provide circulation through the DHW tank. Once energized, relay R1 also enables the boiler. The boiler is then allowed to operate up to the operating aquastat's setting.

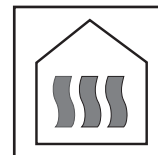
Mixing Demand When heat is required in the mixed zones, the zone valve end switches send a *Mixing Demand* to the 360. The 360 turns on the boiler pump (P1) and the mixing system pump (P2). The mixed supply water temperature is based on the *Characterized Heating Curve* settings. The mixing valve is then modulated to supply the required mixed supply water temperature. As the mixing valve opens and requires more heat from the boiler, the boiler is fired to a temperature that is sufficient to satisfy the requirements of the mixing valve. Whenever the boiler is fired, the 360 aims to maintain the boiler temperature above the BOIL MIN setting. While the boiler is firing, the mixing valve is also modulated to protect the boiler from excessively low water temperatures.

All control functions and specifications are listed in the Product Catalog I 000 and Data Brochure D 360.

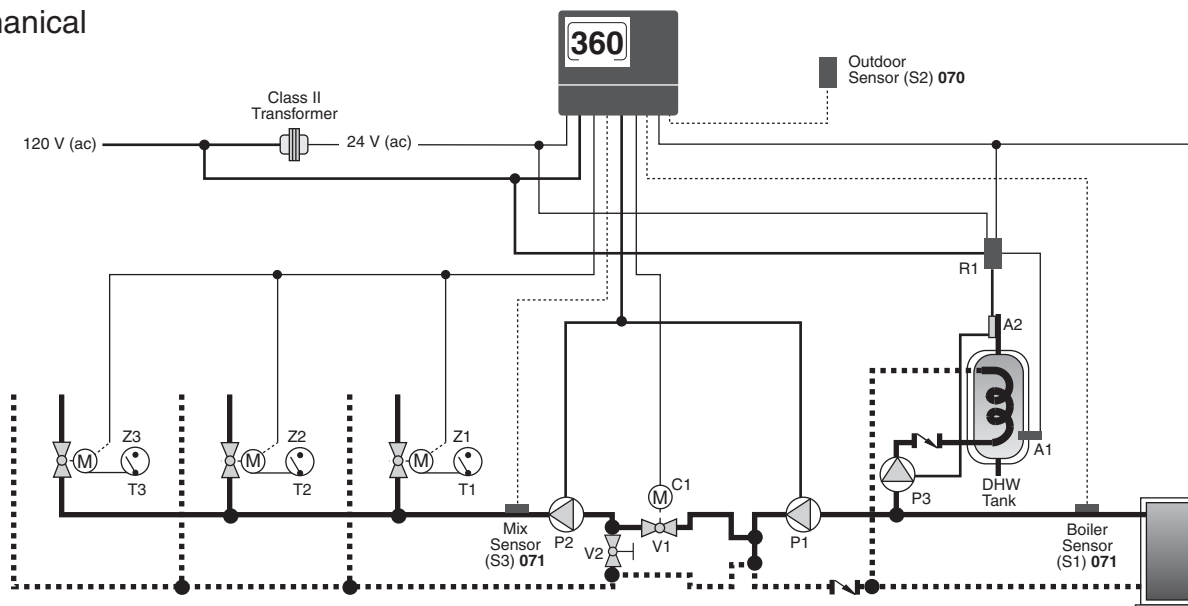


tekmar Control Systems Ltd., Canada
tekmar Control Systems, Inc., U.S.A.
Head Office: 4611 - 23rd Street
Vernon, B.C. Canada V1T 4K7
Tel. (250) 545-7749 Fax. (250) 545-0650
Web Site: www.tekmarcontrols.com



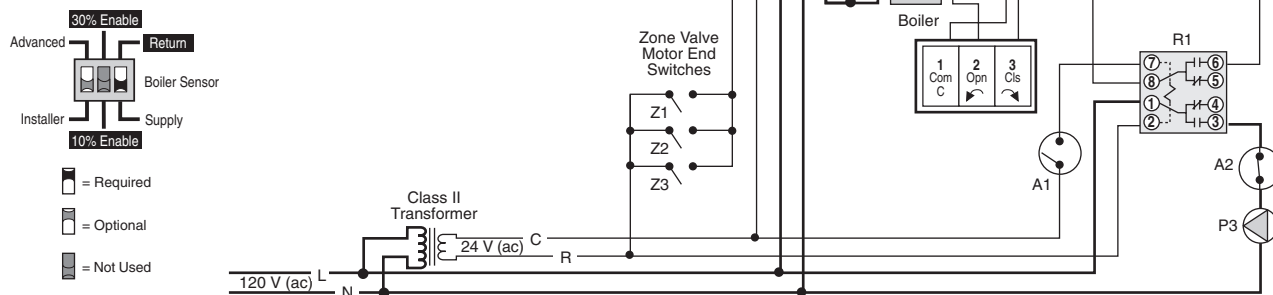


Mechanical



Electrical

A1 = DHW Aquastat
A2 = DHW High Limit Aquastat
C1 = Actuating Motor
P1 = Boiler Pump
P2 = Mixing System Pump
P3 = DHW Pump
R1 = Relay 003
S1 = Boiler Supply Sensor 071
S2 = Outdoor Sensor 070
S3 = Mix Supply Sensor 071
T1, ..., T3 = Thermostats
U1 = tekmar Timer 031 (optional)
V1 = 2-Way Injection Valve
V2 = Balancing or Globe Valve
Z1, ..., Z3 = Zone Valve Motor End Switches



Note: This is only a concept drawing. The designer must determine whether this application will work in his system and must ensure compliance with code requirements. Necessary auxiliary equipment, isolation relays (for loads greater than the specified tekmar internal relay ratings), and other safety and limit devices must be added.

System Operation

The Mixing Control 360 provides full outdoor reset to three (or more) mixed zones. The position of the injection valve is modulated to provide a mixed supply water temperature to the zones, and protect the boiler from flue gas condensation. The boiler operates at the required temperature in order to satisfy the loads. The supply of heat to an indirect Domestic Hot Water (DHW) tank is controlled through an external relay.

Heat Source Details The heat source can be either a high mass or low mass non-condensing boiler.

Piping Details Thermostat controlled zone valves are piped into the mixed loop. The injection valve is piped in primary / secondary in order to isolate the boiler loop flow rate from the mixed loop flow rate. Heat is supplied to the DHW tank through a DHW pump (P3). The boiler pump (P1) provides flow through the boiler and ensures flow past the injection valve take-off.

Domestic Hot Water (DHW) When the DHW tank requires heat, the DHW aquastat (A1) energizes relay R1. Relay R1 provides power to the DHW pump (P3) in order to provide circulation through the DHW tank. Once energized, relay R1 also enables the boiler. The boiler is then allowed to operate up to the operating aquastat's setting.

Mixing Demand When heat is required in the mixed zones, the zone valve end switches send a *Mixing Demand* to the 360. The 360 turns on the boiler pump (P1) and the mixing system pump (P2). The mixed supply water temperature is based on the *Characterized Heating Curve* settings. The injection valve is then modulated to supply the required mixed supply water temperature. As the injection valve opens and requires more heat from the boiler, the boiler is fired to a temperature that is sufficient to satisfy the requirements of the injection valve. Whenever the boiler is fired, the 360 aims to maintain the boiler temperature above the BOIL MIN setting. While the boiler is firing, the injection valve is also modulated to protect the boiler from excessively low water temperatures.

All control functions and specifications are listed in the Product Catalog I 000 and Data Brochure D 360.



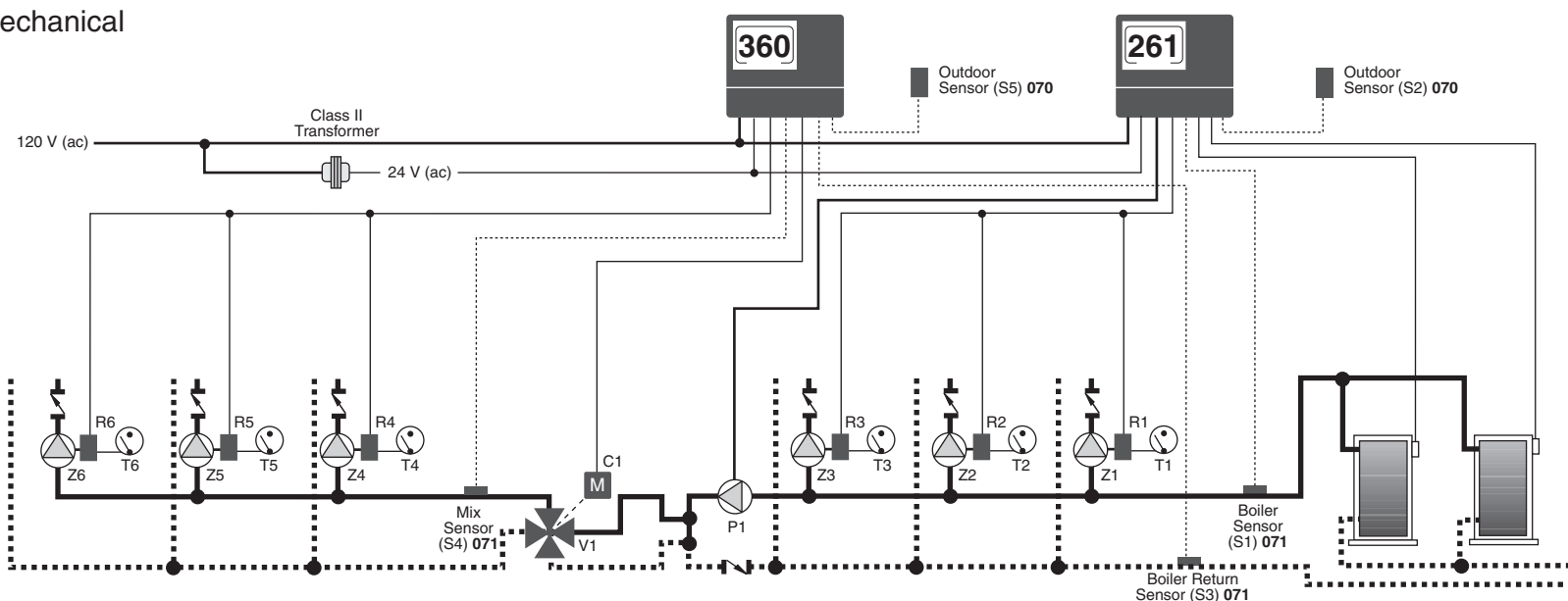
tekmar Control Systems Ltd., Canada
tekmar Control Systems, Inc., U.S.A.
Head Office: 4611 - 23rd Street
Vernon, B.C. Canada V1T 4K7
Tel. (250) 545-7749 Fax. (250) 545-0650
Web Site: www.tekmarcontrols.com



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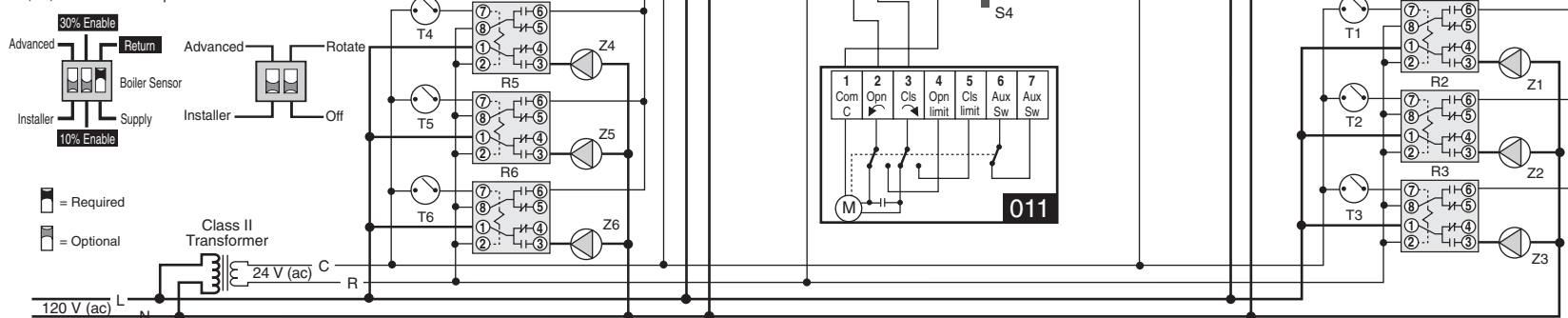
Boiler Control 261 and Mixing Control 360

Mechanical



Electrical

C1 = Actuating Motor 011
P1 = Boiler Pump
R1, ..., R6 = Relay 003
S1 = Boiler Supply Sensor 071
S2, S5 = Outdoor Sensor 070
S3 = Boiler Return Sensor 071
S4 = Mix Supply Sensor
T1, ..., T6 = Thermostats
U1, U2 = tekmar Timer 031 (optional)
V1 = 4-Way Mixing Valve 016 - 025
Z1, ..., Z6 = Zone Pumps



Note: This is only a concept drawing. The designer must determine whether this application will work in his system and must ensure compliance with code requirements. Necessary auxiliary equipment, isolation relays (for loads greater than the specified tekmar internal relay ratings), and other safety and limit devices must be added.



A 360-6
05/00

System Operation

The Mixing Control 360 and the Boiler Control 261 are combined to provide full outdoor reset to mixed zones and partial outdoor reset to boiler zones. The position of the mixing valve is modulated to provide a mixed supply water temperature to the mixed zones, and protect the boilers from flue gas condensation. The 261 stages the boilers based on the current loads in order to provide the required temperature that satisfies all the loads.

Heat Source Details The heat source can be either a high mass or low mass non-condensing boiler.

Piping Details Thermostat controlled zone pumps are piped into the mixed loop. The mixing valve is piped in primary / secondary in order to isolate the boiler loop flow rate from the mixed loop flow rate. Thermostat controlled zone pumps are piped into the boiler loop. The boiler pump (P1) provides flow through the boilers, and ensures flow past the mixing valve take-off.

Mixing Demand When heat is required in the mixed zones, the zone pump relays send a *Mixing Demand* to the 360. The mixed supply water temperature is based on the *Characterized Heating Curve* settings. The mixing valve is then controlled to supply the required mixed supply water temperature. As the mixing valve opens, the 360 uses its *Boiler* contact (terminals 7 and 8) to send a *Boiler Demand* to the 261. While the 360 is sending a *Boiler Demand* to the 261, the mixing valve is also modulated to protect the boilers from excessively low water temperatures.

Boiler Demand When heat is required in the boiler zones, the zone pump relays send a *Boiler Demand* to the 261. When the 261 receives a *Boiler Demand*, the 261 turns on the boiler pump (P1). The boiler supply water temperature is based on the *Characterized Heating Curve* settings. The boilers are staged to satisfy the required boiler supply water temperature. Whenever the boilers are fired, the 261 aims to increase the boiler supply water temperature to at least the BOIL MIN setting.

All control functions and specifications are listed in the Product Catalog I 000 and Data Brochures D 360 and D 261.



tekmar Control Systems Ltd., Canada
tekmar Control Systems, Inc., U.S.A.
Head Office: 4611 - 23rd Street
Vernon, B.C. Canada V1T 4K7
Tel. (250) 545-7749 Fax. (250) 545-0650
Web Site: www.tekmarcontrols.com

