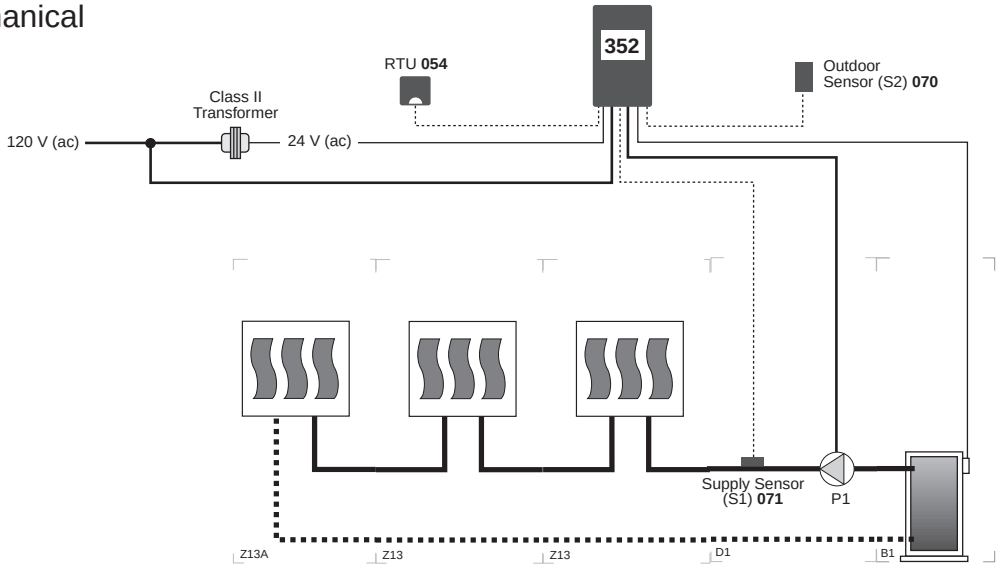
tekmar® - Application

House Control 352

A 352-1

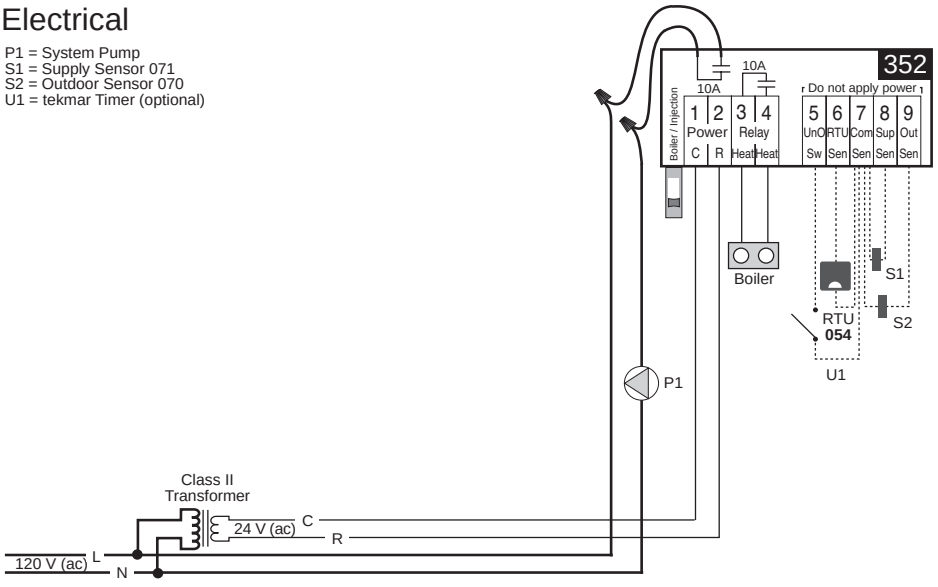
07/95

Mechanical



Electrical

P1 = System Pump
S1 = Supply Sensor 071
S2 = Outdoor Sensor 070
U1 = tekmar Timer (optional)

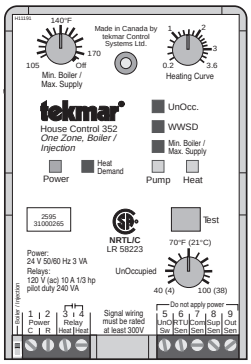


Note: This is only a concept drawing. The designer must determine whether this application will work in his system and must ensure compliance with code requirements. Necessary auxiliary equipment, isolation relays (for loads greater than the specified tekmar internal relay ratings), and other safety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

Technical Data

House Control 352 *One Zone, Boiler / Injection*

Literature	—	A 000, A 352's, D 352, D 001, D 054, D 055, D 070, D 074
Control	—	Microprocessor PID control; This is **not a safety (limit) control**.
Packaged weight	—	1.0 lb. (450 g), Enclosure D, PVC plastic
Dimensions	—	4-3/4" H x 2-7/8" W x 1-7/8" D (120 x 74 x 48 mm)
Approvals	—	CSA NRTL / C, meets ICES & FCC regulations for EMI/RFI.
Ambient conditions	—	Indoor use only, 32 to 122°F (0 to 50°C), < 90% RH non-condensing.
Power supply	—	Class 2, 24 V (ac) ±10% 50/60 Hz 3 VA
Relays	—	120 V (ac) 10 A , 1/3 hp, pilot duty 240 VA
Sensors	—	NTC thermistor, 10 kΩ @77°F (25°C ±0.2°C) ß=3892
included:		Outdoor Sensor 070 and Universal Sensor 071
optional:		10K RTU or 10K Sensor.
UnOccupied	—	40 to 100°F (4 to 38°C)
Heating Curve	—	0.2 to 3.6
Min. Boiler / Max. Supply	—	105 to 170°F, Off (40 to 77°C, Off)



System Operation & Specifications

The House Control 352 controls the space temperature of one heating zone. The required supply water temperature to the zone is controlled by operating a boiler.

Piping and Heat Source Details The system consists of three heating units plumbed in series. Either a high, low or a condensing boiler can be used with this application.

Warm Weather Shut Down (WWSD) When the outdoor temperature rises above the RTU dial setting and the heating zone is satisfied, the 352 turns off the boiler and the system pump (P1).

Boiler Operation The 352 uses an outdoor reset strategy together with indoor temperature feedback from the RTU to adjust the system supply water temeprature. In order to maximize boiler efficiency, the 352 operates the boiler at the lowest possible water temperature. The 352 automatically adjusts the boiler differential to prevent the boiler from short cycling. During low heating loads the 352 turns on the boiler and ensures at least the minimum boiler water temperature is reached. The system pump (P1) remains on when the control is not in WWSD.

UnOccupied (Night Setback) The heating zone can be switched into an UnOccupied (Night Setback) mode by closing an external UnOccupied switch (U1). When the control is switched into UnOccupied mode, the UnOccupied dial is used to set the desired indoor temperature.

Other features Additional control features are given in the table in the Heating Controls section of the Product Catalog I 000.

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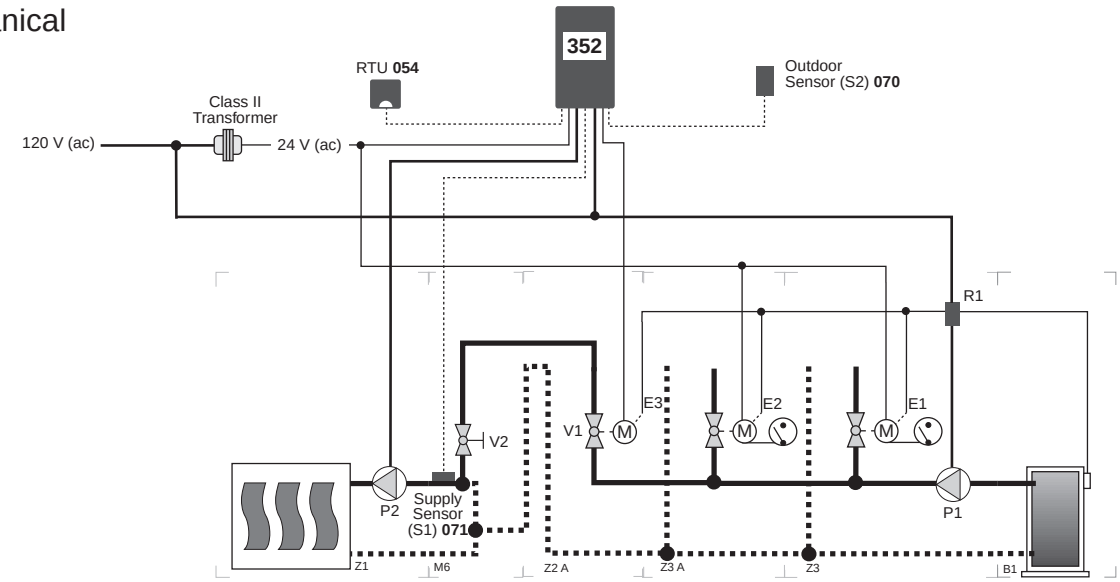
tekmar® - Application

House Control 352

A 352-2

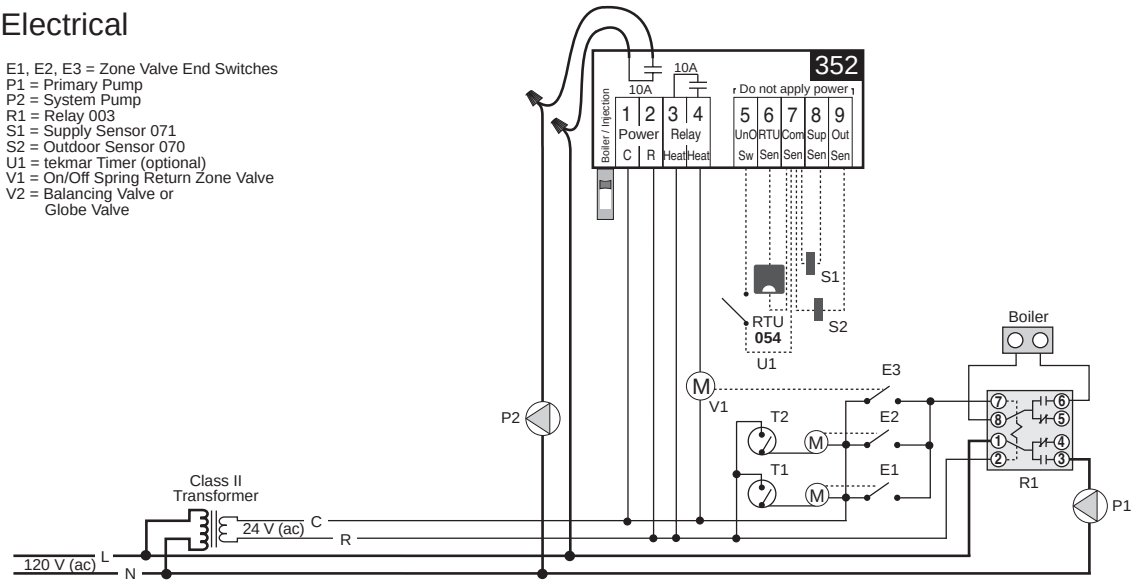
07/95

Mechanical



Electrical

E1, E2, E3 = Zone Valve End Switches
P1 = Primary Pump
P2 = System Pump
R1 = Relay 003
S1 = Supply Sensor 071
S2 = Outdoor Sensor 070
U1 = tekmar Timer (optional)
V1 = On/Off Spring Return Zone Valve
V2 = Balancing Valve or
Globe Valve

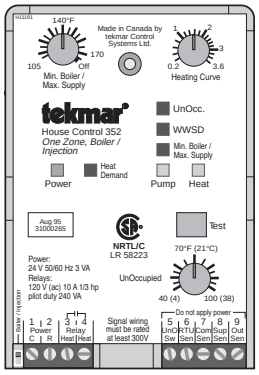


Note: This is only a concept drawing. The designer must determine whether this application will work in his system and must ensure compliance with code requirements. Necessary auxiliary equipment, isolation relays (for loads greater than the specified tekmar internal relay ratings), and other safety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

Technical Data

House Control 352 *One Zone, Boiler / Injection*

Literature	—	A 000, A 352's, D 352, D 001, D 054, D 055, D 070, D 074
Control	—	Microprocessor PID control; This is **not a safety (limit) control**.
Packaged weight	—	1.0 lb. (450 g), Enclosure D, PVC plastic
Dimensions	—	4-3/4" H x 2-7/8" W x 1-7/8" D (120 x 74 x 48 mm)
Approvals	—	CSA NRTL / C, meets ICES & FCC regulations for EMI/RFI.
Ambient conditions	—	Indoor use only, 32 to 122°F (0 to 50°C), < 90% RH non-condensing.
Power supply	—	Class 2, 24 V (ac) ±10% 50/60 Hz 3 VA
Relays	—	120 V (ac) 10 A , 1/3 hp, pilot duty 240 VA
Sensors	—	NTC thermistor, 10 kΩ @77°F (25°C ±0.2°C) ß=3892
included:		Outdoor Sensor 070 and Universal Sensor 071
optional:		10K RTU or 10K Sensor.
UnOccupied	—	40 to 100°F (4 to 38°C)
Heating Curve	—	0.2 to 3.6
Min. Boiler / Max. Supply	—	105 to 170°F, Off (40 to 77°C, Off)



System Operation & Specifications

The House Control 352 controls the space temperature of one heating zone. The required system supply water temperature to the zone is controlled by operating an injection valve. Two heating zones are directly controlled by thermostats.

Piping Heat Source Details The system is plumbed with zone valves and a primary pump (P1). A system pump (P2) is located on the low temperature heating zone. Either a high mass, low mass or a condensing boiler can be used with this application.

Warm Weather Shut Down (WWSD) When the outdoor temperature rises above the RTU dial setting and the heating zone is satisfied, the control enters WWSD mode and turns off the system pump (P2) and the on / off injection valve (V1).

Mixing Operation The 352 uses an outdoor reset strategy together with indoor temperature feedback from the RTU to adjust the system supply water temperature. When heat is required in the zone, the 352 operates the injection valve (V1) to supply the required water temperature. When the injection valve is open, the end switch (E3) closes and powers up the relay (R1). The relay turns on the boiler pump (P1) and allows the boiler to run on its aquastat. The system pump (P2) remains on when the 352 is not in WWSD.

Zone Operation If a high temperature zone requires heat, its thermostat calls for heat and opens its zone valve. Once the zone valve is completely open, the end switch (E1 or E2) closes and powers up the relay (R1). The boiler and the primary pump (P1) are then turned on.

UnOccupied (Night Setback) The heating zone can be switched into an UnOccupied (Night Setback) mode by closing an external UnOccupied switch (U1). When the control is switched into UnOccupied mode, the UnOccupied dial is used to set the desired indoor temperature.

Other features Additional control features are listed in the table in the Heating Controls section of the Product Catalog I 000.

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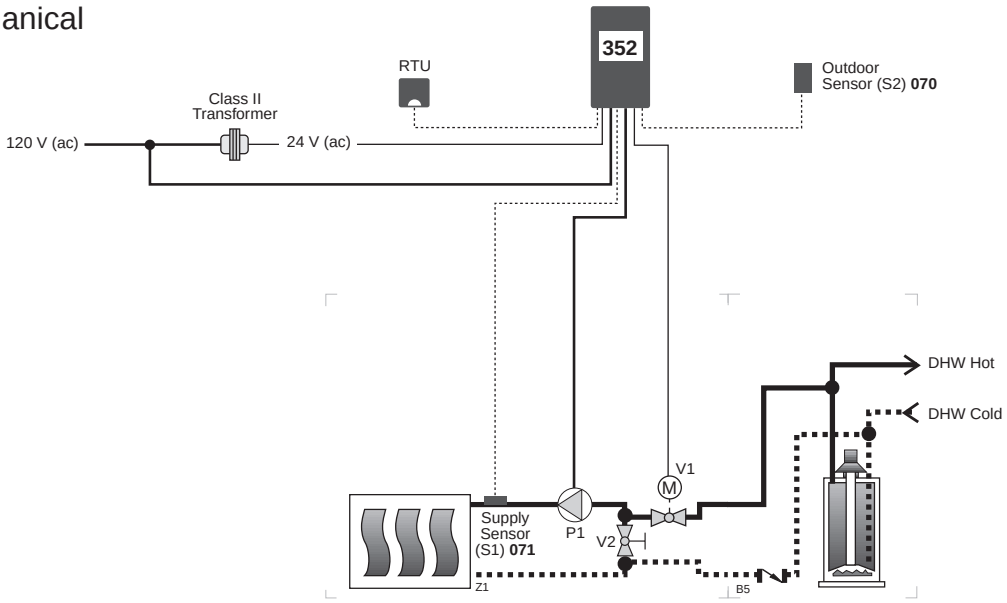
tekmar® - Application

House Control 352

A 352-3

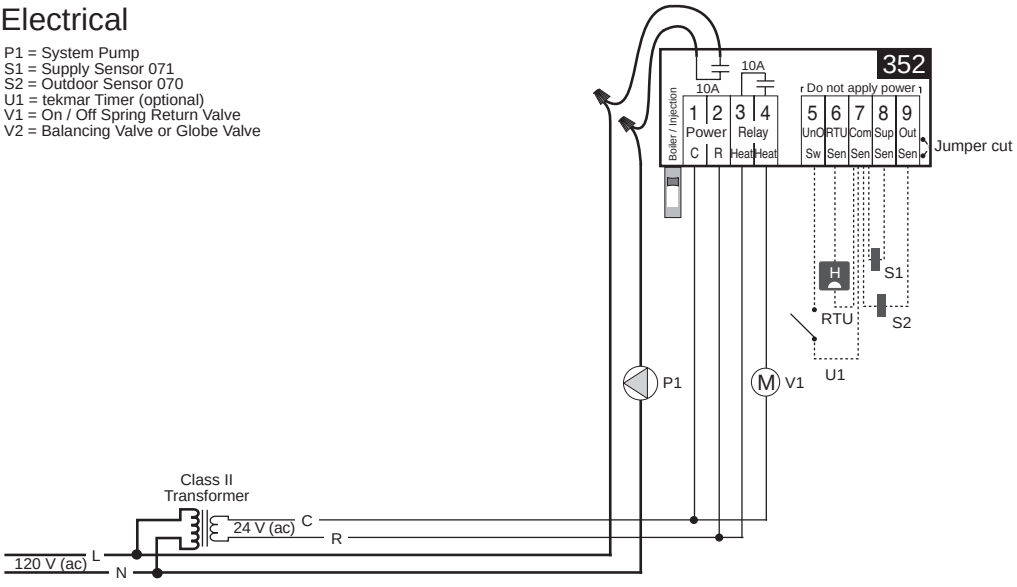
12/96

Mechanical



Electrical

P1 = System Pump
S1 = Supply Sensor 071
S2 = Outdoor Sensor 070
U1 = tekmar Timer (optional)
V1 = On / Off Spring Return Valve
V2 = Balancing Valve or Globe Valve



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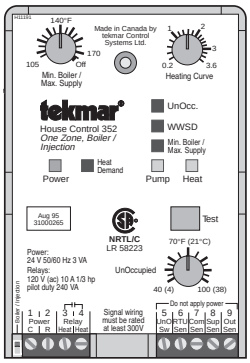
Technical Data

House Control 352 *One Zone, Boiler / Injection*

Literature	—	A 000, A 352's, D 352, D 001, D 054, D 055, D 070, D 074
Control	—	Microprocessor PID control; This is **not a safety (limit) control**.
Packaged weight	—	1.0 lb. (450 g), Enclosure D, PVC plastic
Dimensions	—	4-3/4" H x 2-7/8" W x 1-7/8" D (120 x 74 x 48 mm)
Approvals	—	CSA NRTL / C, meets ICES & FCC regulations for EMI/RFI.
Ambient conditions	—	Indoor use only, 32 to 122°F (0 to 50°C), < 90% RH non-condensing.
Power supply	—	Class 2, 24 V (ac) ±10% 50/60 Hz 3 VA
Relays	—	120 V (ac) 10 A , 1/3 hp, pilot duty 240 VA
Sensors	—	NTC thermistor, 10 kΩ @77°F (25°C ±0.2°C) ß=3892
included:		Outdoor Sensor 070 and Universal Sensor 071
optional:		10K RTU or 10K Sensor.
UnOccupied	—	40 to 100°F (4 to 38°C)
Heating Curve	—	0.2 to 3.6
Min. Boiler / Max. Supply	—	105 to 170°F, Off (40 to 77°C, Off)



System Operation & Specifications

The House Control 352 controls one low temperature heating zone through the use of an On / Off Injection mixing method combined with Indoor Temperature Feedback.

Piping and Heat Source Details The heat source for this application is a direct fired DHW tank which is controlled by the manufacturer's control package. The system consists of a constant circulation loop utilizing an On / Off Injection mixing method.

Warm Weather Shut Down (WWSD) When the outdoor air temperature rises above the RTU dial setting and the heating zone is satisfied, the control enters the Warm Weather Shut Down mode of operation. In this mode of operation, the control continues to monitor its sensors but does not operate the heating system until the outdoor temperature falls bellow the WWSD point.

Mixing Operation The 352 uses an Outdoor Reset strategy, together with Indoor Temperature Feedback from the heating zone in order to adjust the system supply water temperature. In this application, the 352 is used as an injection control and the installer / operator is required to adjust the *Heating Curve* and *Max. Supply* dials to best suit their application. The 352 then uses the information from the Outdoor Sensor 070 (S2) and the RTU to reset the supply water temperature. With the temperature measurement from the supply sensor 071 (S1), the 352 operates the on / off injection valve (V1) in order to maintain the desired supply water temperature. The system pump (P1) operates continuously until the 352 enters a Warm Weather Shut Down (WWSD) mode of operation at which point the pump is turned off. For a description of the On / Off Injection mixing method, refer to Data Brochure D 352 and Application Catalog A 000.

Flushing By cutting the jumper on the right side of the wiring enclosure, the Flushing feature is enabled while the control is in the Injection mode of operation. This feature is designed to prevent the water in the heating system from becoming stagnant while the control is in a WWSD. If the system remains in a WWSD for an extended period of time, the control will periodically operate the heating system in order to replace the existing water with fresh water to ensure that the heating system water does not become stagnant and contaminated.

Additional Functions Additional functions are listed in the table in the Heating Controls section of the Product Catalog I 000 and the Application Catalog A 000.

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