

This Quick Setup Guide contains the basic information required to get your new tekmarNet® House Control 402 installed and operational. An Installation and Operation Manual D402 containing all available features and operational details is included with this control or can be found at www.tekmarcontrols.com/literature.html

Basic Installation

The House Control 402 operates a complete hydronic heating system using outdoor reset with indoor feedback. Central control for two system pumps, indirect DHW tank, setpoint and a mixed water temperature supplying four on-board zone valve outputs are included.

Control Location

- The House Control 402 must be mounted to a 4" x 4" electrical box.
- Pump wires will be connected inside the electrical box.
- All tN2 Thermostat and other low-voltage wiring will enter through the knockout panels on the back of the House Control.

Wiring

All pumps must be wired through the back of the control prior to mounting the enclosure. Use the push-in connectors provided.

1. Bring all pump wires into the electrical box and fasten with appropriate wire clamps. Ensure each pump is grounded with the power source ground in the electrical box, as shown in Figure 1.

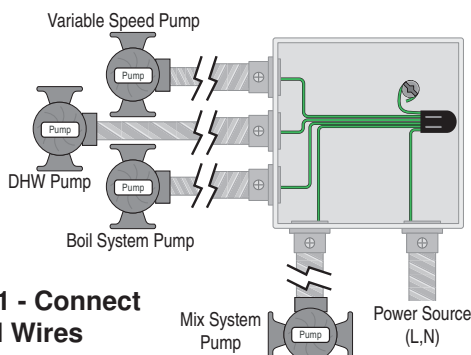


Figure 1 - Connect Ground Wires

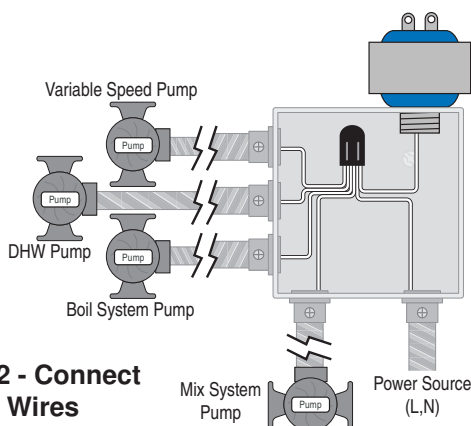


Figure 2 - Connect Neutral Wires

2. Connect the Neutral (N) wires from each pump and wire to the 115 V (ac) Neutral (N) wire. If the transformer has been mounted to this electrical box, connect its neutral wire with this group. This is shown in Figure 2.
3. Connect the 115 V (ac) Line Voltage (L) wire to the red Pump Power (L) wire on the House Control. This is shown in Figure 3.
4. Wire the remaining pump wires from each pair into the push-in wire connectors attached to the pump leads on the back of the House Control. This is shown in Figure 4.

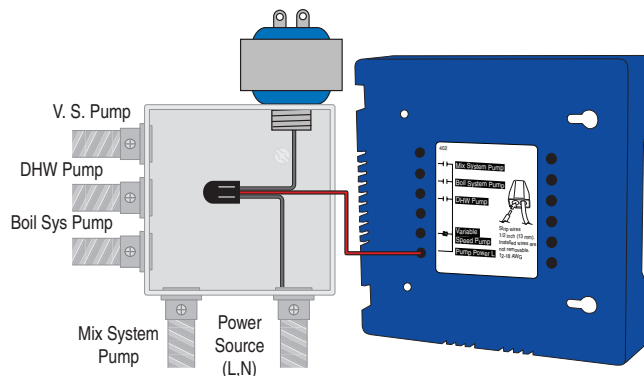


Figure 3 - Connect Line Voltage (Hot)

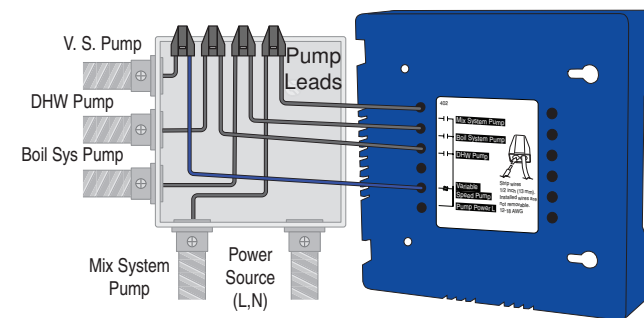


Figure 4 - Connect Pump Line (Hot)

Mount the Control

1. Mount the House Control onto the electrical box, ensuring all pump wiring is neatly tucked inside the box. See Figure 5 on the next page.
2. Secure the House Control to the electrical box with screws through the provided holes in the back of the enclosure.

Basic Installation (continued)

Connect the Low-Voltage Wiring

tN2 Thermostats

The House Control 402 requires the use of tN2 Thermostats. They are polarity insensitive and are wired directly to the top of the control.

Sensors

All three sensors (Mix, Boil and Outdoor) are included and must be connected to the House Control 402. Refer to the sample mechanical layout on Page 4 for proper sensor locations.

Calls

A call for heat can be given to the House Control through an external dry switch or by applying 24 V (ac).

- DHW Call is typically wired from the aquastat on an indirect DHW tank. A DHW Call signals the control to target 180°F (82°C).
- A Setpoint Call can be used for a number of applications. Please refer to the D402 Manual for more information.

Zone Valves

The on-board zone valve outputs are for mixed water temperature zones. Connect the C and R wires from each zone valve to C and Vlv on the House Control. The House Control 402 supplies 24 V (ac) power to each zone valve. End switches are not required.

Boiler

A boiler dry contact is provided for on/off boilers and is labelled “Boiler”. If using a modulating boiler, wire it to the 0-10 V (dc) output terminals labelled “Mod (dc)”. The Boiler dry contact may not be required in this case.

Floating Action Mixing Output

If using a mixing valve, a 24 V (ac) actuating motor can be connected directly to the House Control 402. Use a tekmar Actuating Motor 741 or equivalent.

tN4 Expansion

The tN4 Expansion terminals allow other tekmarNet® devices with tN4 capability to be connected to the system. Some options include: tN2 or tN4 Wiring Centers, Timer 033, User Switch 479.

- Connect tN4 and C from each device to the corresponding tN4 and C terminals on the 402. Mix temperature devices connect to the Mix Exp. terminals and Boiler temperature devices connect to the Boil Exp. terminals.

Input Power

Ensure that the transformer has been correctly sized. See “Sizing the External Transformer” in the Installation and Operation Manual D402 for more detailed information.

- Connect the 24 V (ac) leads from the transformer to the C and R terminals marked “Input Power” on the House Control.
- Note that tN2 Thermostats draw approximately 2 VA each.

Attach the Cover

Replace the cover of the House Control 402. Fasten with the 2 screws provided as shown in Figure 6.

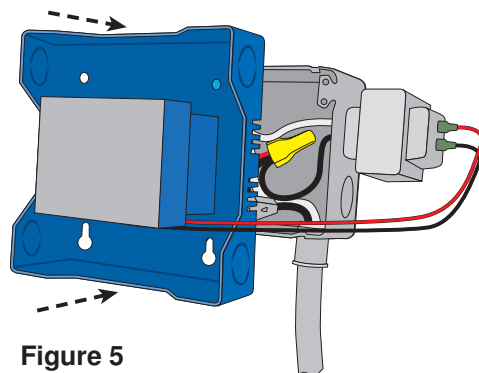


Figure 5

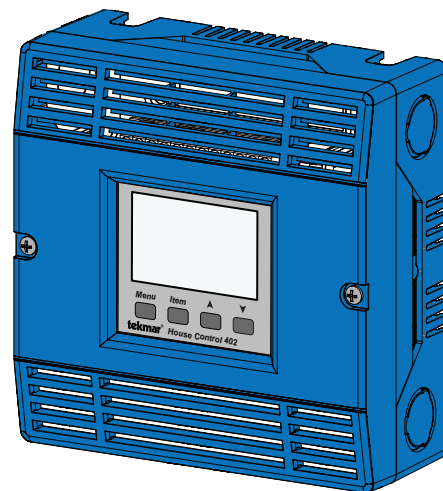


Figure 6

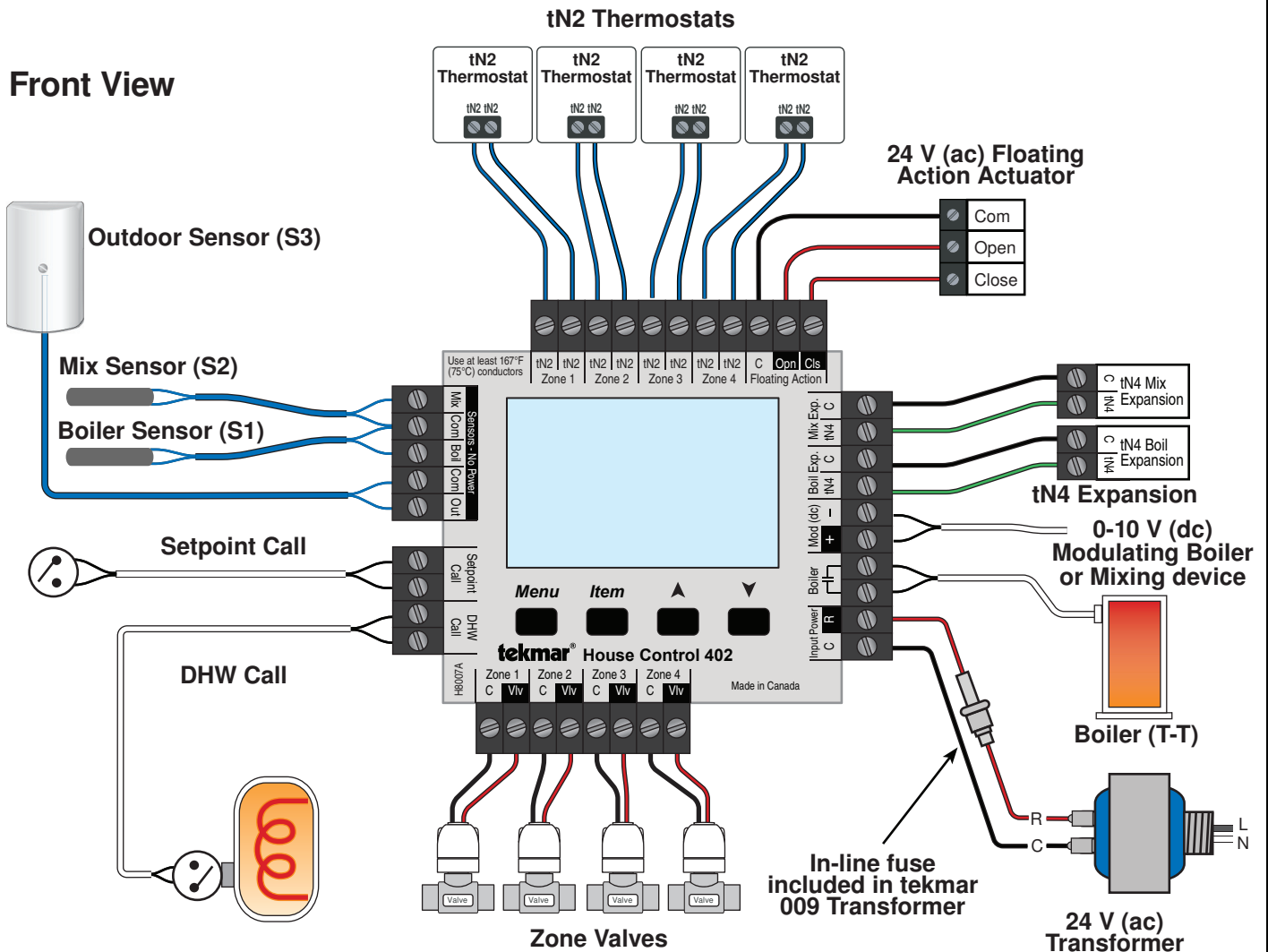
Sizing the External Transformer:

Add up all the thermostat and zone valve loads (VA) connected to the House Control. If using a mixing valve, include the actuating motor VA draw (Floating Action column). The transformer must have higher capacity than this total load.

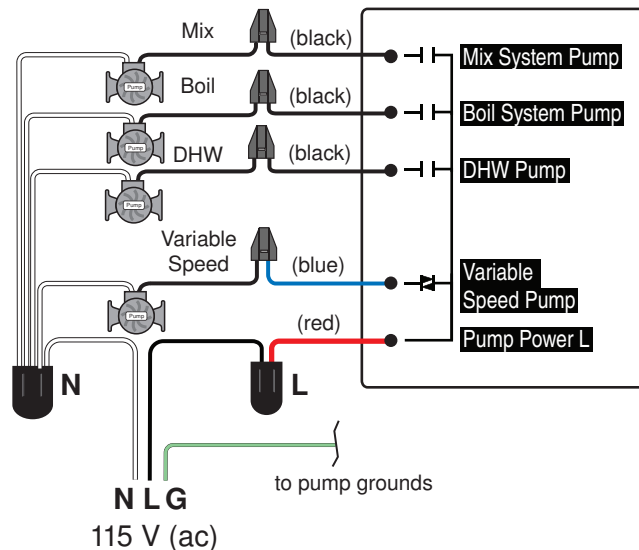
$$\boxed{} + \boxed{} + \boxed{} + \boxed{2 \text{ VA}} = \boxed{}$$

T-stats + Zone Valves + Floating Action + Control = Total Load

Front View



Back View



Note: This drawing illustrates every terminal being used. There are NO applications that will be wired exactly like this. Certain applications will use either floating action actuators or variable speed injection pump mixing, not both. Also, not all applications will use a 0-10 V (dc) modulating boiler, therefore, it is not expected that every terminal be wired. Wire the control based on the particular application.

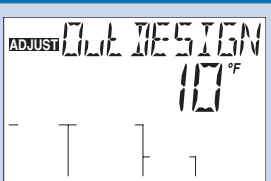
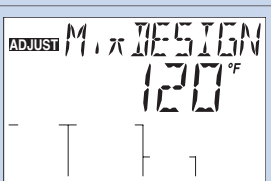
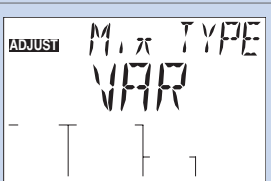
Basic Settings

The House Control 402 is pre-programmed with default settings that will accommodate the majority of hydronic applications. The following three basic settings are the most commonly adjusted, and should be checked to ensure they match what is required for the specific building and mechanical setup. See the Installation and Operation Manual D402 for all settings.

To Adjust Settings

1. Press the Menu button to access the Adjust Menu
2. The first Item will be Outdoor Design. Use the Up and Down buttons to set the appropriate value.
3. Press the Item button to advance to the next Item. This will be Mix Design.

ADJUST MENU

Item Field	Range	Description
	-60 to 45°F (-51.0 to 7.0°C) Default = 10°F (-12.0°C)	OUTDOOR DESIGN Typically set to the temperature of the coldest day of the year. The design outdoor air temperature used in the heat loss calculations for the heating system.
	70 to 180°F (21.0 to 82°C) Default = 120°F (49.0°C)	MIX DESIGN The supply water temperature required for the Mix 1 zones on the typical coldest day of the year.
	VAR, FLOT, 0-10 Default = VAR	MIX TYPE Select the type of mixing device. Can be variable speed injection pump (VAR), floating action (FLOT) or 0-10 Vdc actuator. Note: 0-10 is only available when Boiler Type = OnOf

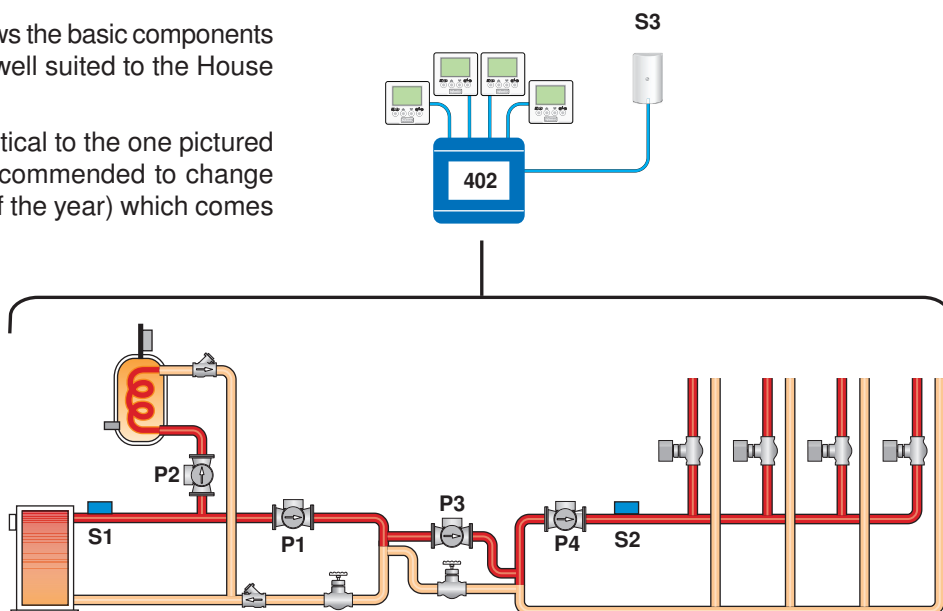
After the last item, the control returns to the first item in the menu.

Mechanical Layout

This mechanical application drawing shows the basic components of a simple hydronic application that is well suited to the House Control 402.

Setting Notes: If your application is identical to the one pictured below (using slab radiant heat), it is recommended to change only the Outdoor Design (Coldest day of the year) which comes default at 10°F (-12°C).

S1	Boiler Sensor
S2	Mix Sensor
S3	Outdoor Sensor
P1	Boil System Pump
P2	DHW Pump
P3	Injection Pump
P4	Mix System Pump



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