Technical Bulletin #5

WIRING AND CONTROLS

The Greenwood furnace ships pre-wired for 115 volt, 60-cycle operation. Simply plug the power cord into an available outlet and the furnace is ready for operation. If local code requires a dedicated circuit for the furnace, install a 20-amp circuit with a circuit protector device located in a convenient place near the furnace.

> **WARNING:** All electrical wiring related to your Greenwood furnace must conform to the National Electrical Code and all local building codes and ordinances. Turn off electric power at circuit protector device before making any line voltage connections.

Basic Configuration (Wiring Diagrams 1 and 2)

Wiring Diagram 1 shows the wiring of the four components that control the basic operation of the Greenwood furnace.

Aquastat 1

Aquastat 1 regulates the amount of heat produced by the furnace by opening and closing the air intake damper. It is factory pre-set at 180 degrees F with a 15-degree differential. When the internal manifold fluid temperature drops below 165 degrees, the Aquastat opens the air intake damper to ignite the furnace. When the fluid temperature reaches 180 degrees, the damper closes to extinguish the fire.

GREENWOOD Circulation Pump

The Greenwood circulation pump circulates the water and propylene glycol solution from the internal manifold through the external heat exchanger. It operates whenever the furnace has power.

Air Intake Damper Motor

The damper motor responds to signals from the primary aquastat (Aquastat 1) to open and close the damper thereby controlling intake air into the furnace. It draws 8VA at peak load (9.41 watts). In the event of a power outage, the damper motor automatically returns the air intake damper to the closed position.

Aquastat 2

Aquastat 2 serves two purposes -- it provides backup overheat protection if Aquastat 1 fails and it provides a control circuit used to dissipate thermal spikes that normally occur when the furnace shuts down.

At the end of each heating cycle, when the need for home heat has been met, the air intake damper closes and shuts down the wood furnace. Robbed of oxygen, the fire dies down and goes into a dormant state until more heat is needed. This shutdown process is not instantaneous, so there must be a way for the system to off-load heat produced during the shutdown period or else the furnace may overheat and boil off heat transfer fluid. This “thermal spike protection” is best achieved by continuing to operate some or all of the home heating system for a short period after the home thermostat has sent a signal for it to shut down. The additional heat introduced to the house during this period is negligible and will not affect your comfort level.

> **WARNING:** Your Greenwood Furnace must have thermal spike protection installed to help your furnace work properly.

Aquastat 2 is pre-set at the factory at 200º F. with a 5 degree differential. Your installer should wire this device to your home heating system so that the primary heating loop continues to run until the aquastat temperature drops below 200º F. See Wiring Diagram 2 for more information.

Wiring Diagram 1
Basic Furnace Configuration

Legend for Schematic

- Electric Motor
- Earth Ground
- Wire Nut or Connection
- Joining Conduit
- Screw connection
- Aquastat

Notes on electrical connections

1. Make sure incoming power meets all requirments outlined in Installation and Operation Manual.

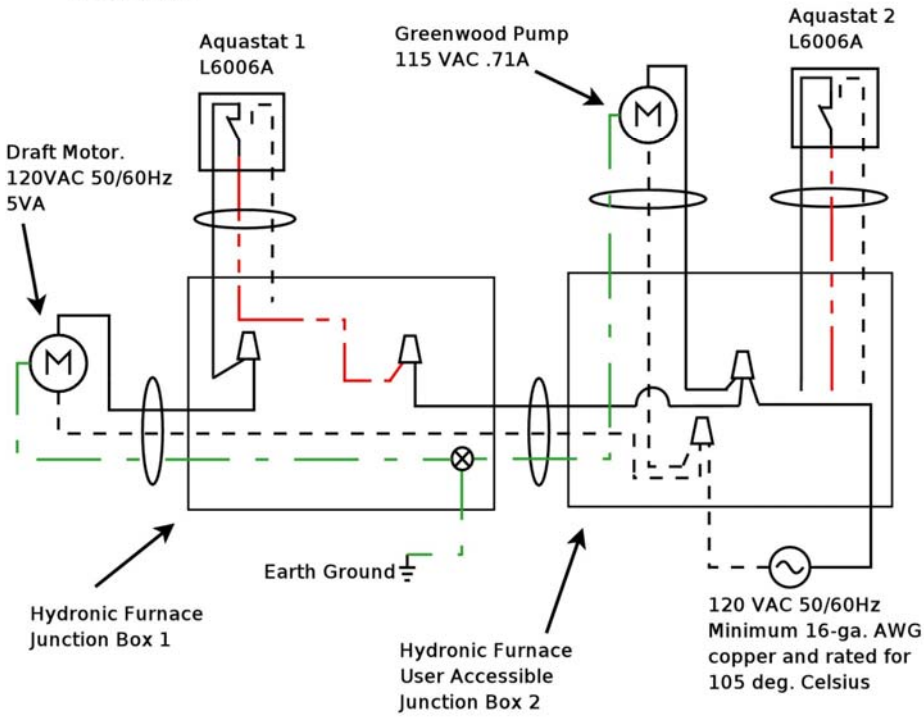
2. The power cord supplied may be be used if local codes and regulations permit. If use of the supplied power cord is not permitted, alternative power supply wiring must meet the minimum standards of 16-ga. AWG copper and rated for 105 deg. Celsius and installed in a metal cable or conduit.

3. Grounding of equipment must meet all local codes and regulations.

Internal Wiring

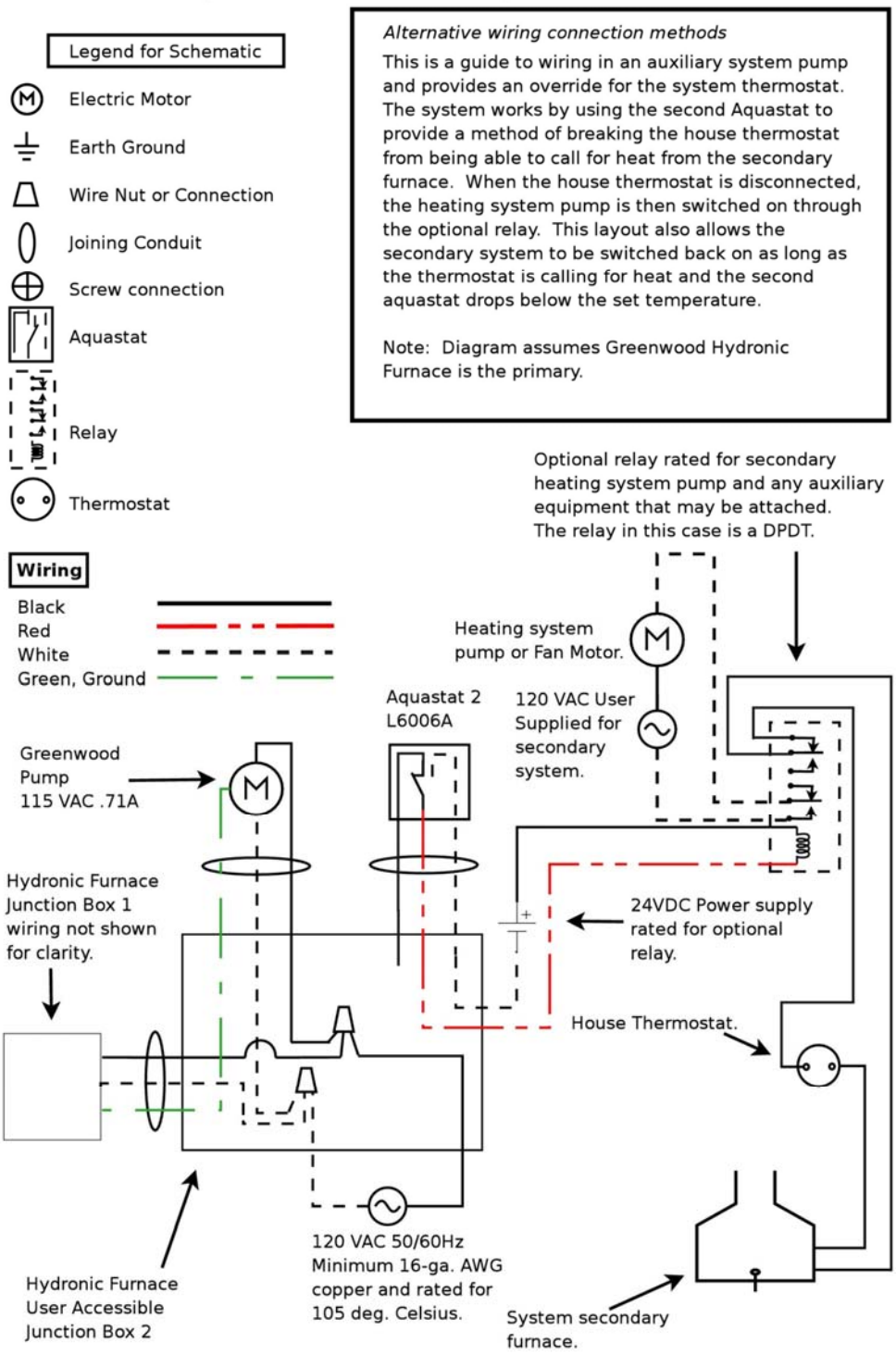
- Hot, Black
- Hot, Red
- Neutral, White
- Ground, Green

Internal wiring must be 16-ga AWG rated for 105 deg. Celsius.



Wiring Diagram 2

Wiring an Auxiliary Pump and Thermostat Override



Home Thermostat Override

Most people use their Greenwood furnace as an add-on to their existing gas or oil furnace. A third aquastat can be wired to keep your existing home furnace from firing when heat is available from the wood furnace. This additional aquastat should be set to 100 degrees F.

Wiring Diagram 3
Wiring an Auxiliary Pump and Secondary Furnace