Section
6

Wiring the Electrical System

6.1 Before You Begin

The Oasis® Combi Heating System and its electrical Control Board are pre-wired and have been thoroughly tested together as a unit.

To review the wiring system for the Oasis® Combi Heating System, refer to the wiring diagram at the end of this *Section 6, Figure 6-1: System Wiring*.

! WARNING

All electrical connections and wiring must comply with normally-accepted 12 VDC and 120 VAC wiring practices, local regulations, and RVIA standards. Only a qualified electrical installer should complete the wiring. All field wiring is to be in accordance with CSA Standard C22.1, Canadian Electrical Code Part l or the National Electrical Code, ANSI/NFPA 70.

6.2 12 VDC

The following apply to the 12 VDC connections for the Oasis® Combi Heating System:

- There are three 12 VDC electrical connections on the top right of the Oasis® Combi Heating System. They consist of the primary DC positive (red), Zone DC positive (red), and negative (black) connection and are 14 gauge stranded copper wires.

! WARNING

Primary DC power should originate from a dedicated connection on the house battery bank. A 20 amp fuse or breaker must be included close to and inline from the battery to the positive (red) connection on the heater. The primary power wire gauge must be sized to permit no more than a 3% voltage drop from the battery to the heater.

- A properly-shielded power system is required for safe, trouble-free operation.

6.3 120/240 VAC (Optional)

- The Oasis® Combi Heating System is equipped with one 1500 watt, 120 or 240 VAC immersion element . The connection for the electrical supply is located at the top right of the Oasis® Combi Heating System, under a cover, labeled AC Power.

- The power wires for the AC immersion element are three 14 gauge stranded copper leads that use standard AC color code (black-hot, white–neutral, green-ground). These are to be connected using standard 120 VAC electrical connectors and terminals.

  These power wires must be connected to a separate AC circuit breaker. Once the connections are completed (using standard 120/240 VAC electrical connectors and terminals), the wires are to be inserted back into their compartment and the cover secured.

NOTICE

Do not operate the electric immersion element until the coolant mixture is added to the Oasis® Combi Heating System, and all trapped air has been removed.

6.4 Remote Operating Panel Cable

- One connection on top of the heater is a multi- wire, sheathed cable with a 9 pin connector. This connects to a matching connector on a short adapter cable. The other side of the cable has a 8 pin connector that connects to the zone board. There is another 50’ remote cord that has 10 pin connectors on both ends. One end plugs into the matching connector on the zone board and the other end plugs into the remote operating panel. Refer to *Figure 6-1: System Wiring*.

6.5 Main Electronic Control Board

NOTICE

The main electronic Control Board is mounted onboard the heater itself. It has no user adjustable components.

6.6 Zone Control Board

Functions of Multi-Pin Connectors

The Zone Control Board has four, multi-pin connectors, see *Figure 6-2: Plumbing for Five Zones Using the Zone Control Board*, that are to be connected through connector cords (supplied) to the matching multi-pin connectors as follows:

- 10 pin connector to Heater Remote Operating Panel.
- 8 pin connector to Heater (connector cord transitions to a 9 pin connector for the Heater).
- 12 pin connector: *Option 1*: No additional external pumps used (See Figure 6-1) *Option* 2 : Used with one or two additional external pumps (Figure 6-2).
- 14 pin connector to thermostat trailing leads and cabin fan trailing leads.

Cabin Fan trailing leads

- The positive (red) lead from each cabin fan is to be attached to one of the trailing cabin fan leads, color coded for zones, on the Oasis™ Combi Heating System (see Figure 6-1).
- The negative lead from each cabin fan is to be attached to a ground terminal (not provided) that is connected to a battery ground.
- The cabin fan 1 lead (orange) and cabin fan 2 lead (gray) can supply up to a maximum of 10 Amps each. The cabin fan 3 lead can supply up to a maximum of 5 Amps. The total current draw is not to exceed 20 Amps for all cabin fan leads.
- If the system requires higher amperage draws, install a separate relay to power the fans. This relay will use the existing fan circuit as a signal and must be wired to a secondary power source (fused from the battery +'ve). See Figure 5-3.

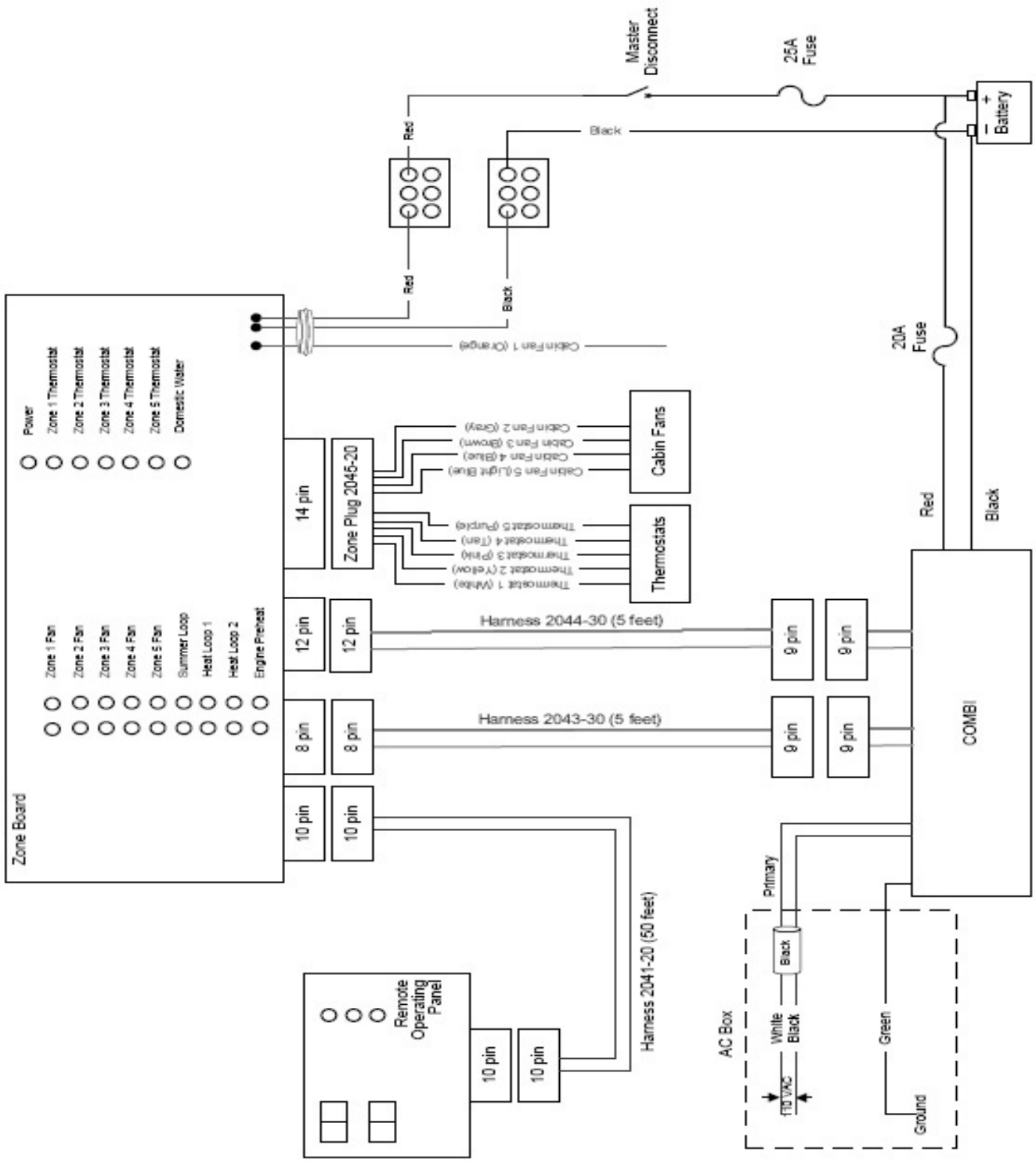

Figure 6-1:Wiring for five zones using the Zone Control Board (no additional external pumps used)

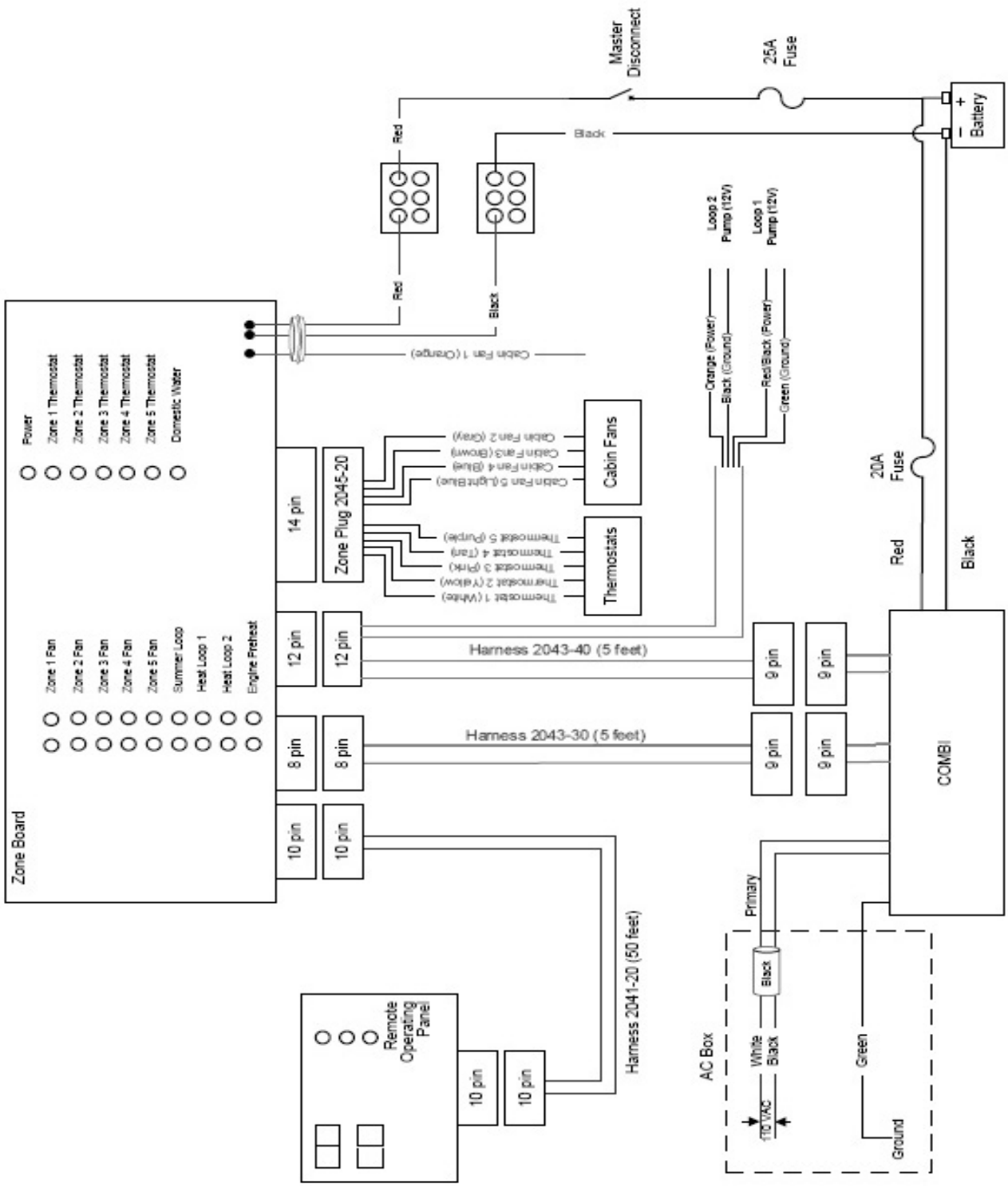

Figure 6-2: Wiring for five zones using the Zone Control Board (with additional external pumps used)

Thermostat Leads

- The power lead to the thermostat is to be attached to a 12 VDC power terminal (not provided) that is connected to the battery.

- The return lead from each thermostat is to be attached to one of the trailing thermostat leads, color coded for zones, from the thermostat and cabin fan connector plug.

6.7 Electrical Components

- **Control box and board –** The main control board contains no serviceable components and is mounted on the front inside panel of the heater.

- **Thermal Cutoff** - The heater burner box contains a non-resettable thermal cutoff that will provide protection against an overheat condition within the burner box. If activated, the thermal cutoff is designed to stop the fuel flow to the burner nozzle.

- **Zone Control Board –** The following components need to be wired into the Zone control board:

    - Thermostats (up to five). Additional zone board available for larger applications.

    - Cabin fans

    - Cabin fan speed switches (if any)

    - 2 external Circulation Pumps (optional). One is in the Combi connected via a harness.

- **NOTE**: if wiring a single loop system, ensure the jumper marked "series loop" on the zone board is bridged. This will allow zones one through five to activate both loop one and loop two pumps. Otherwise zones 1,2, and 3 will activate the loop one pump and zones 4 and 5 will activate the loop two pump. Note: the internal pump is activated if any of the zones are calling for heat.

- **Diagnostic display –** This is a set of LED indicators located on the front panel of the heater. It indicates the diagnostics

of the heater. See chapter 10, functions of the heater control panel.

- **Circulating pump activation switch –** This OFF/ON switch located on the top of the Zone Control Board box allows you to run the circulating pump and test the system circulation without turning the heater on.

- **Hour meter –** Located on the top of the heater unit, the hour meter counts the accumulated operating hours for the heater.

- **Fan Speed switch –** Wired to the yacht's wiring system and installed between the Zone Control board training lead and the positive DC fan connection using #16 wire. See figure 6-3, Wiring for a fan speed switch.

6.8 What NOT to Do

NOTICE

Never shut off the Oasis™ Combi Heating System primary DC power via an inline battery or master switch while the system is running. Never disconnect the battery when the Oasis™ Combi Heating System is running, and never disconnect the battery while the inverter is charging. Do not wire the primary DC power of the Oasis™ Combi Heating System through a disconnect that is used as a normal shut-down of the DC system.

Doing either will severely damage the Oasis™ Combi Heating System because it fails to automatically purge the combustion chamber. Such damage is detectable upon inspection and will *not* be covered under warranty. Always shut the system off using the normal system controls.

When running in bypass mode, never leave the heater unattended

6.9 Procedure

Consult the following table for required wire gauges and lengths. Consult Figures 6-1 and 6-2 to view how various components are connected.

CONDUCTOR SIZES (GAUGE) FOR 3% DROP IN VOLTAGE

Length of Conductor from Source of Current to Device and Back in Feet

AMPS	10	15	20	25	30	40	50	60	70	80	90	100
5 -	18	16	14	12	12	10	10	10	8	8	8	6
10 -	14	12	10	10	10	8	6	6	6	6	4	4
15 -	12	10	10	8	8	6	6	6	4	4	2	2
20 -	10	10	8	6	6	6	4	4	2	2	2	2

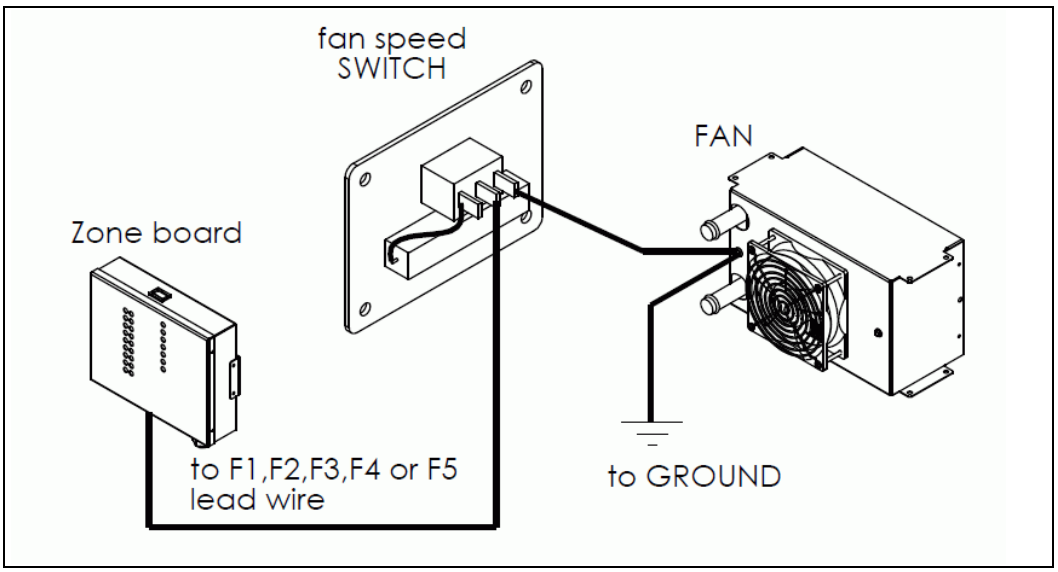

Figure 6-3: Wiring for a Fan Speed Switch