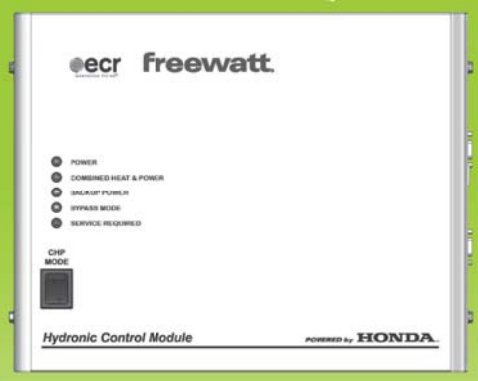
freewatt®

Hydronic Control Module, Model HDJ

POWERED by HONDA™



INSTALLATION, OPERATION AND MAINTENANCE MANUAL

PATH
PARTNERSHIP FOR ADVANCING TECHNOLOGY IN HOUSING
PARTNER

An ISO 9001-2008 Certified Company
ECR International, Inc.
2201 Dwyer Ave.
Utica, NY 13501

ecr innovative living™

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Check our website frequently for updates: www.freewatt.com www.ecrinternational.com

1- SAFETY INFORMATION

TABLE OF CONTENTS

1.1 Safety Symbols

- Manual contains important safety information. Read all **freewatt** PLUS System manuals for safety information and warnings.
- Manual is considered permanent part of your Hydronic **freewatt** PLUS System and should remain with system.

⚠ DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury

⚠ WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

Used to address practices not related to personal injury.

1.2 - Safety Information

⚠ WARNING

Qualified installer or service agency must install module in accordance with manufacturer's instructions, and/or in accordance with all codes and requirements of the authority having jurisdiction. Failure to follow these instructions could cause a malfunction of the system and result in death or serious bodily injury.

NOTICE

IMPORTANT: Hydronic Control Module, Model HDJ requires Kit # 550002143, Installation Kit, included with your system.

1.2 Use this manual in conjunction with following manuals:

- Hydronic **freewatt** PLUS System Model HDJ Installation, Operation, and Maintenance Manual
- **freewatt** Boiler Installation, Operation, and Maintenance Manual, and User's Information Manual
- Honda MCHP Model MCHP 1.2D & DP Installation Manual and Owner's Manual
- HAI Thermostat Owner's Manual
- Applicable ECR Zone Control Manual
- **freewatt** Transfer Switch installation, Operation and Maintenance Manual
- APC Universal Transfer Switch Installation, Site Preparation and Installation Guide.

2- INTRODUCTION

2.1 Specific Application Notes

Control Module

- Control module monitors and controls operation of Hydronic **freewatt** PLUS System. Sensing inside and outside temperature as well as other system temperatures and settings, proprietary heating algorithm controls operation of Honda MCHP to optimize power production and low level heat delivery.
- Control module includes relay/interconnect board, DC power supply, and advanced single-board computer board incorporating powerful microprocessor, RS-232/RS-485 serial ports, and 10/100Base-T Ethernet port.

System Control Design

- Hydronic **freewatt** Control module is designed for central heating with **freewatt** boiler and Honda MCHP unit.
- Hydronic **freewatt** PLUS System replaces existing boiler installation.
- **freewatt** PLUS control module uses inputs from communicating thermostat and outdoor sensor to optimize operation of Honda MCHP unit. (NOTE: Boiler has second, independent outdoor temperature sensor.)
- Control module can operate using display/user interface (ie. laptop computer or PDA) for both information and operation purposes. **freewatt** PLUS MINT software tool is provided for this purpose.
- Control module requires supplied Smart Zone HAI communicating thermostat and supplied outdoor sensor to operate.

Control Module Functions

- Control module integrates boiler and Honda MCHP with communicating thermostat, outdoor temperature sensor and remote monitoring capability.
- Communicating thermostat and outdoor temperature provide control module with desired temperature settings and actual operating temperatures.

Display/User Interface

- Homeowner using a PC can scroll through control settings and change operating settings to customize **freewatt P**LUS System operation.
- See separate document for "**freewatt** PLUS System Webpage" or User's Information Manual for more information on using embedded **freewatt** PLUS web page.

2.2 System Design

- Use With All Standard Forms Of Heat Radiation: Hydronic **freewatt** PLUS System may be applied to variety of heating loads served by conventional, multi-zoned hydronic heating systems. These include
  - base-board radiation,
  - radiant floor heating,
  - domestic hot water via indirect storage tank,
  - powered convective heaters,
  - hydro-air handlers w/ variable-speed ECM motors
  - and others.

  NOTE: Supply hydronic water temperature is set by Outdoor Reset and has maximum high temperature of 160°F.
- **freewatt** Boiler Required For Proper Heating Operation: Hydronic **freewatt** PLUS System is specifically tested and designed to be integrated with **freewatt** PLUS boiler.

  Do not install hydronic **freewatt** PLUS System without also installing **freewatt** boiler. Installing **freewatt** PLUS System in this manner will null and void warranty.

2.3 Controls

- Bypass Mode Of Operation: When "CHP MODE" switch on **freewatt** control module is placed in OFF position, effectively disables operation of MCHP unit and generation of electric power.

  NOTE: Bypass Mode maintains the boiler for heating purposes.

- Correct ECR Relay Controls Required: **freewatt** control module is common to all applications of hydronic **freewatt** PLUS System.

  There are different ECR zone pump/valve relay controls required for use with pump and valve-zoned systems and hydro-air systems. Appropriate pump/valve relay control from ECR family of zone controls, ordered separately, must be used with hydronic **freewatt** PLUS System.

  See specific electric wiring diagrams provided for circulator zoned systems, valve-zoned systems and hydro-air systems.

- Two Outdoor Temperature Sensors: Installation of two different outdoor temperature sensors is required for proper operation of Hydronic **freewatt** PLUS System. Both sensor are supplied with Hydronic **freewatt** PLUS System.

  One sensor (Honeywell) connects directly to the boiler and other sensor (Tekmar) connects to **freewatt** control module.

  NOTE: Two sensor cables must be routed separately to ensure no interference affects temperature reading.

- Expandable To Additional Zones: **freewatt** PLUS communicating thermostat is wired directly to **freewatt** control module circuit board.

  Additional five zones, with compatible conventional heating thermostats (new or existing) may also be connected directly to **freewatt** control module circuit board.

  Hydronic **freewatt** PLUS System can be expanded to include additional heating zones if more than these compatible six zones (including the priority domestic hot water and Smart Zone) are needed.

  Additional ECR zone controls may be required and installed accordingly.

- May Install And Operate Boiler First: Hydronic **freewatt** PLUS System may be installed by first installing **freewatt** boiler and **freewatt** control module in required piping configuration (cap off piping connections to HI Module/MCHP unit) to facilitate need to supply heat to building as quickly as possible. Installation, commissioning and operation of MCHP unit can be completed at future time.

  freewatt boiler should provide sufficient heating capacity to meet normal heating loads until MCHP unit is available for installation, if hydronic system is sized properly for building's heat requirement.

2.4 Configuration

- Must Use One Special Smart Zone Communicating Thermostat: Hydronic **freewatt** PLUS System is supplied with special **freewatt** communicating thermostat, must be utilized on single "Smart Zone", typically Zone 2.

  Select "Smart Zone" as zone with largest heating demand, other than domestic hot water zone (typically Zone 1). Normally, this would be largest space heating zone on first floor of two story home.

  Hydronic **freewatt** PLUS System will produce best electric power generation benefit if Smart Zone represents at least 25% of total home heating load. Consider combining zones to achieve desired heat load for Smart Zone if there is no single large zone in existing distribution system, but many small zones.

- Domestic Hot Water Priority Must Be Properly Setup: Priority domestic hot water heating is available and must be properly selected in setup of **freewatt** control module and ECR zone controls.

  Mixing valve must be used on domestic water supply outlet of any indirect water heating tank applied with hydronic **freewatt** PLUS System.

  NOTE: Failure to install a mixing valve on domestic water supply outlet of any indirect water heating tank will result in hot water scalding hazard.

- System Will Function Without Internet Connection: Full heating operation of hydronic **freewatt** PLUS System is not dependent on maintaining working connection to Internet. However, lack of internet will prevent remote communication with system by homeowner or service provider.

2.5 Application

- External Controls With Their Own 24vac Transformer May Be Used On Zones 3-6. Steering relays can be used through jumpers JPZ3, JPZ4, JPZ5, JPZ6 (for zones 3-6 respectively). These jumpers are located on center of **freewatt** PLUS control board. Control board will use 24V power from external transformer attached to that zone, when Jumpers are installed across pins.

  Board will use 24 VAC power that the board receives from connector J17. 1 ampere maximum with 24VAC (minimum) to 30VAC (maximum), if jumper is not installed across pins.

- Must Use "Mint" Software: Installation, setup, commissioning and maintenance of hydronic **freewatt** PLUS system require use of **freewatt** PLUS MINT software tool loaded on laptop computer running Windows XP or Vista with working serial connection.

3 - INSTALLATION

Figure 3-1 Final Configuration

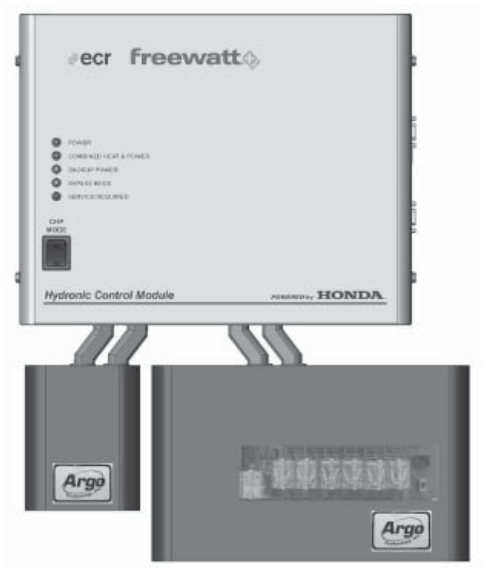
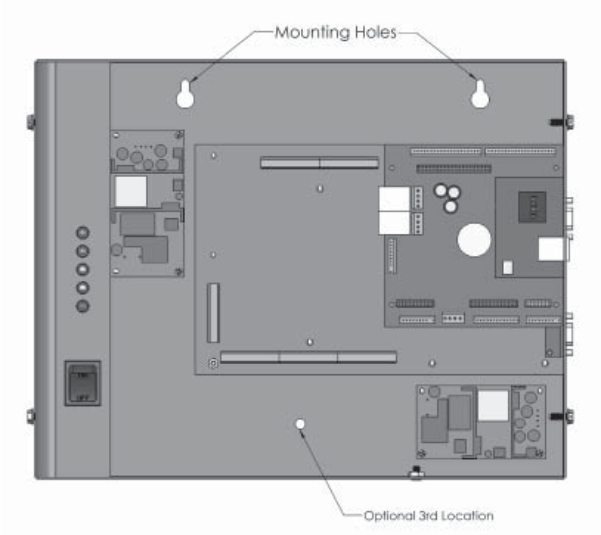


Figure 3-2 Mounting



⚠ WARNING

Electric Shock Hazard. Turn off electrical power supply at service panel before making any electrical connections to avoid possible electric shock hazard. Failure to do so can cause severe personal injury or death.

⚠ WARNING

Electric Shock Hazard. Do not install un-switched line-powered cables or wires through hydronic control module enclosure. This may pose potential electric shock hazard. Failure to follow these instructions can cause severe personal injury or death.

3.1 Procedure For Mounting Module

- Read and understand all instructions before attempting to install Hydronic Control Module.
- Determine location of Hydronic Control Module enclosure, mount enclosure on solid wall or partition. We recommend enclosure be located close to boiler, Honda MCHP and Hydronic HI Module for your convenience. Install to mounting surface, such as 2 ft. wide x 4 ft. high sheet of plywood for control module, ECR relay switches and HI Module. HI module may be mounted up to 20 feet away from Honda MCHP unit. Locate enclosure with installation and service accessibility in mind. Figure 3-1 shows installed hydronic control module, Figure 3-2 shows inside of hydronic control module.
  - A. Position enclosure, check for level, and mark mounting holes. Take care to leave footprint for relay switches or pre-install relay switches and connect enclosure to relay switches with four ½" offset nipples.
  - B. Start screws (#10; 2 (Qty); not supplied) for keyhole type mounting holes in upper corner(s). Tighten screws down to about 1/8" (3mm) from surface.
  - C. Hang enclosure on screws, position enclosure and start bottom screws.
  - D. Install four nuts on ½" offset nipples to secure enclosure to relay switch modules.
  - E. Tighten all screws

3.2 Procedure For High Voltage Wiring

- **Serviceman's Switch**
  - A. Provide and install non-fused disconnect service switch (2-pole; 15 amp recommended) as required by code;

- **High Voltage Wiring**
  - A. Route 120 VAC wiring from switch to ECR controls and to control module;
  - B. Terminate 120 VAC wiring with wire nuts inside control module as shown in Figure 3-3;
  - C. Make sure to attach ground wire to enclosure's grounding screw;

- **Low Voltage Wiring**
  - A. Thermostats: Hydronic **freewatt** PLUS System requires HAI communicating thermostat for Zone 2, which needs 10-conductor cable (Honeywell Genesis Series Cable; Model Number 22 AWG 10/C STR CM-CL2 (or equal)) is specified for wiring HAI Thermostat to **freewatt** System control module. This cable is 22 AWG, 10-conductor, stranded PVC polypropylene-insulated, PVC-jacketed cable and meets UL standards 13 & 144; NEC Article 725. Other zones can use standard thermostat cable. HAI thermostat cable should be landed on control module according to electrical schematic and Figure 3-4.

  - B. Boiler: Boiler requires central heating (CH) call for heat and domestic hot water (DHW) call for heat. Cables are landed at control module at positions CH T1/CH T2 and DHW T1/DHW T2.

  - C. MCHP: MCHP communication cable is connected to control module's right side serial connection and extends to MCHP's electrical enclosure. See Figure 3-5.

  - D. MCHP Coolant Pump: MCHP coolant pump connects to control module with factory-supplied cable. Cable is landed on J04 connector found on control board and extends through low voltage knockout to hydronic HI module. Molex connector is attached to pump's pigtail.

Figure 3-3 120 VAC Terminations

Figure 3-4 Thermostat Wiring

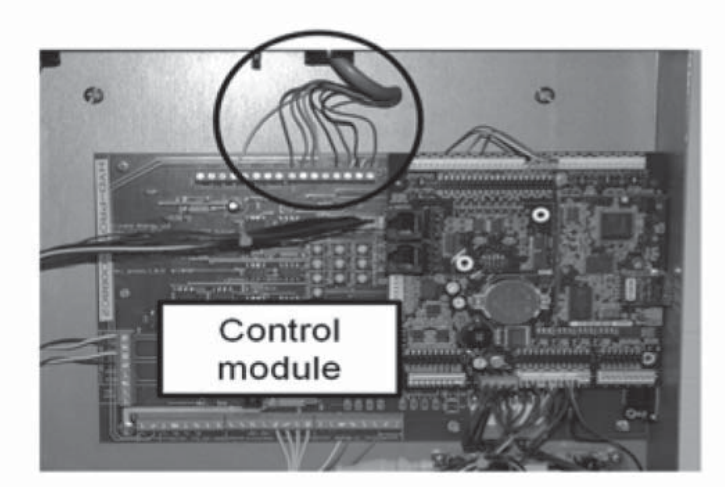


Figure 3-5 MCHP Communication Cable

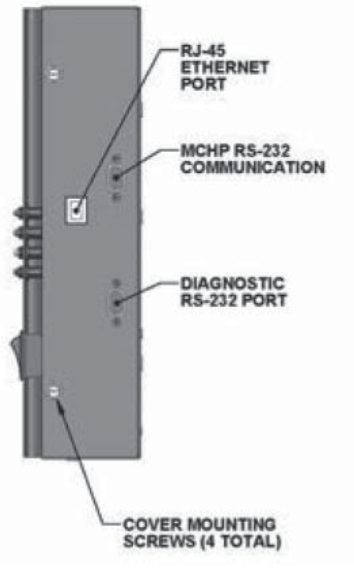


Figure 3-6 Exhaust Gas Sensor Connection at MCHP

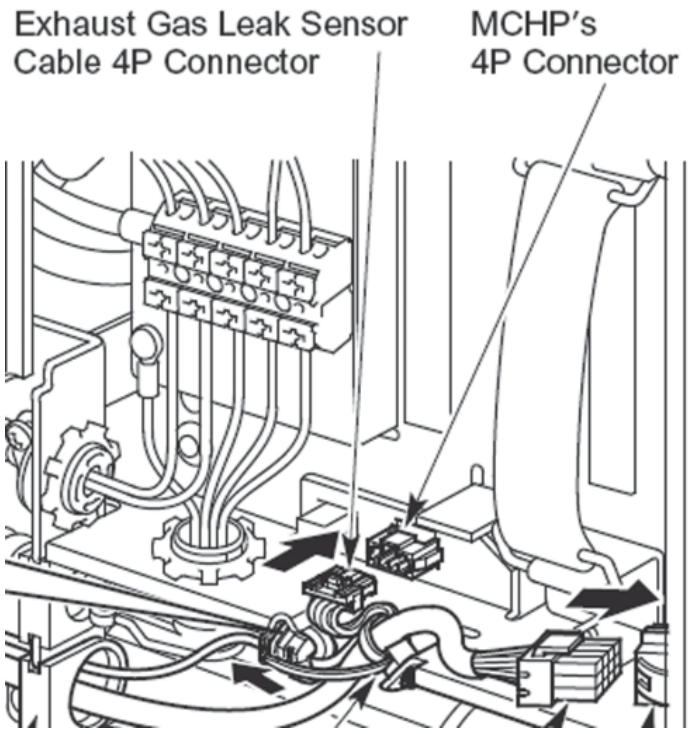
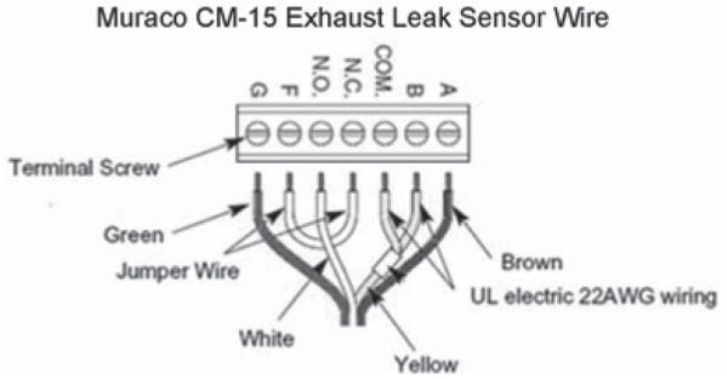


Figure 3-7 Exhaust Gas Sensor Connection



E. MCHP Hydronic Pump: MCHP's hydronic pump controller (AR822II) connects to control module with low voltage thermostat wire. Extend Red cable from control module's PMP1 to AR822's TR. Extend black cable from control module's PMP2 to AR822's TW.

F. ECR Zone Controls: Control module connects to ECR Zone Controls (ARM-6P, AZ-6CP and ARH-3) with low voltage thermostat wire. Follow applicable electrical schematic.

Note: When using ARH-3 with Air Handler on smart zone, G signal from Air Handler MUST be connected to zone 4.

⚠ WARNING

Exhaust gases from this appliance contain chemicals which on some occasions may include carbon monoxide (CO). Carbon monoxide is an odorless, tasteless, clear colorless gas, which is highly toxic. Even low concentrations are suspected of causing birth defects and other reproductive harm.

⚠ WARNING

UL and ULC recognized CO detectors are required for all buildings equipped with **freewatt** PLUS System. Install all CO detectors in accordance with their manufacturer's instructions and/or Authority having jurisdiction. Exhaust gas sensor is a safety device for honda MCHP and does not fulfill this CO detector requirement.

G. Exhaust Gas Sensor: Review Honda MCHP installation manual before performing this task. 4-pin Molex Connector attaches to MCHP (Figure 3 - 6) other end connects to exhaust gas sensor (Macurco CM-15; supplied with system) (Figure 3 - 7). Install jumper wire between second terminal (F) and fourth terminal (N.C.).

H. Internet: Control module has RJ-45 network connection on right side of control module's enclosure (Figure 3-5). RJ-45 connection will accept properly terminated CAT 5e cable.

4 - INITIAL SERVICE VERIFICATION

4.1 Initial Service Verification

Perform prior to troubleshooting:

- Verify circuit breaker is ON or fuse is properly functioning at electrical panel.
- Verify electrical service switch is powered ON.
- Check for 120 VAC (minimum 108 VAC to 132 VAC) to system.
- Check for 240 VAC (minimum 216 VAC to 264 VAC) to Honda MCHP.
- Verify thermostat has been placed in Heat Mode.
- Verify thermostat calling for heat. Inspect thermostat connections to ensure proper contact.
- Verify all external safety controls are installed and working properly or are temporarily jumpered for testing purposes.
- Verify gas supply is open, at all appropriate manual shutoff valves and gas control valves for system.
- Check wire connectors at control module, boiler control and Honda MCHP are securely plugged in or connected.
- Check coolant tubing extending from Honda MCHP to Hydronic Hybrid Integration Module are securely connected and not plugged or damaged.
- Verify MCHP inlet coolant temperature stabilizes between 152° to 154°F, using MINT software.
- Check coolant tank in Hydronic Hybrid Integration Module to ensure level is appropriate for filling system.

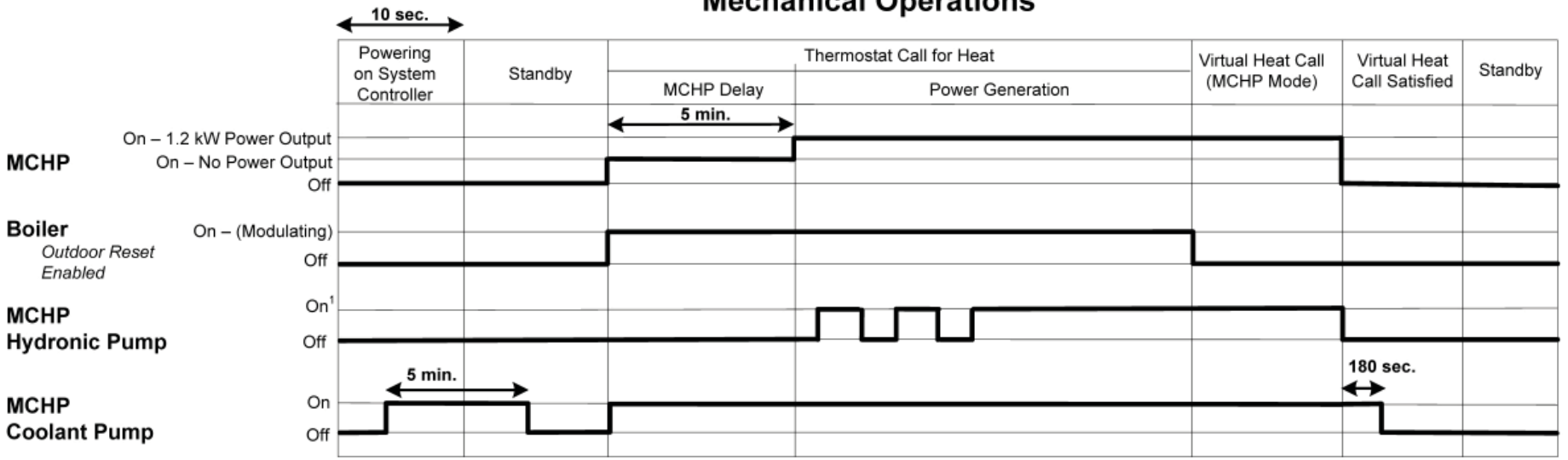
4.2 Internet Connection & Commissioning

- **freewatt** System control module connects to customer's home network in same way any computer or other network appliance does connecting via Ethernet connection available on most routers. **freewatt** PLUS connection uses 10/100 Mbit/s wired Ethernet connection, wireless bridges may be used when wired connection isn't possible.
- **freewatt** control module is assigned static address outside of DHCP range available from router.
- IP address, netmask, gateway and DNS addresses are programmed into control module using **freewatt** PLUS service tool. Common configuration (with router at address 192.168.1.1) would have **freewatt** address set to 192.168.1.200, netmask set to 255.255.255.0, gateway set to 192.168.1.1 and DNS entries set to 208.67.222.222 and 208.67.220.220 (addresses for Open DNS).
- Router configured to allow incoming traffic for diagnostics and (if requested by customer) access to user web page. Routers refer to these settings as 'port forwarding', 'applications'', or 'virtual servers'. Refer to router manufacturer's documentation.
- Remote diagnostics require port 4500 be directed to **freewatt** control module. Port for customer web pages is configurable - usually set to 8082 because many ISPs (Internet Service Provider) block use of standard port 80.
- Number of wireless bridge or gaming bridges have been tested to work with control module if wireless configuration is required. Configure using manufacturer's instructions.

HYDRONIC FREEWATT SYSTEM Model HDJ

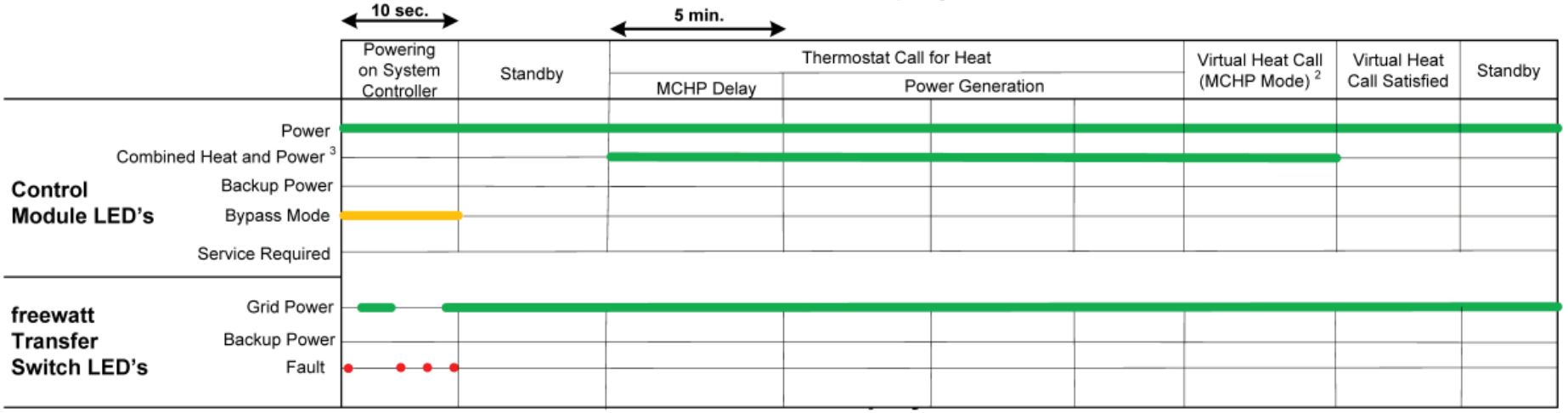
Sequence of Operation/Timeline: ***Normal MCHP Mode***

Mechanical Operations



[1]The System Controller will cycle the MCHP hydronic pump to maintain MCHP coolant temperatures

LED Display



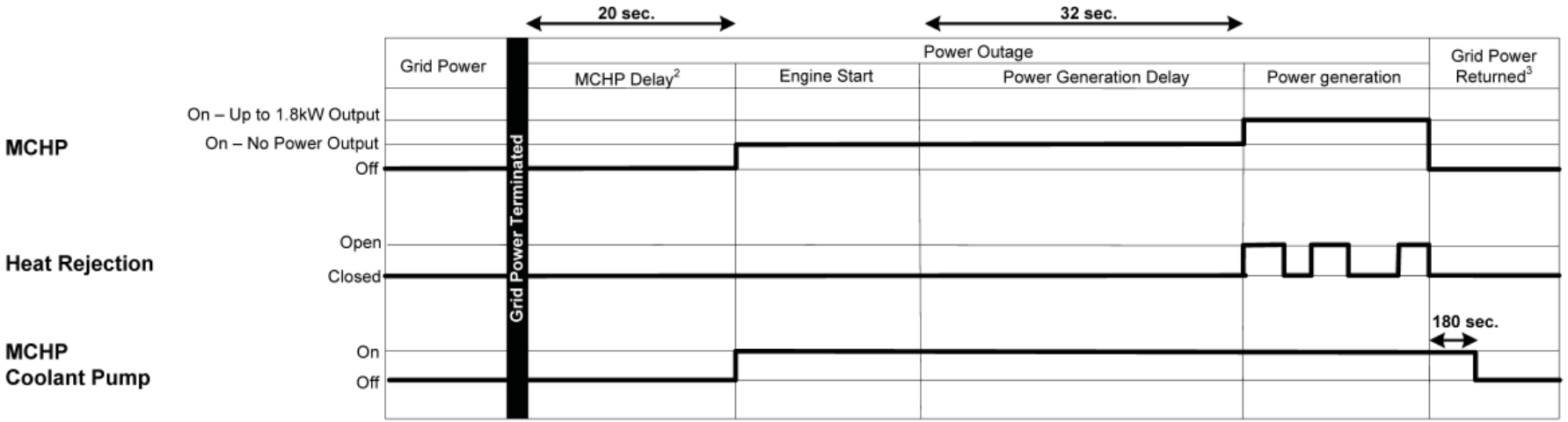
[2]If every 2 minutes the Zone Controller turns OFF for 2 seconds and back ON, this is a normal function to inspect an expansion module for "Heat Call" activity during a Virtual Space Heating Call or Virtual Domestic Hot Water Call.

[3]If the CHP LED (Green) is flashing, this is a safety mode of operation that turns off the MCHP based on a spike of the coolant temperature above its recommended range of normal operation. In most cases, this mode will be temporary, but if it persists, please contact your dealer.

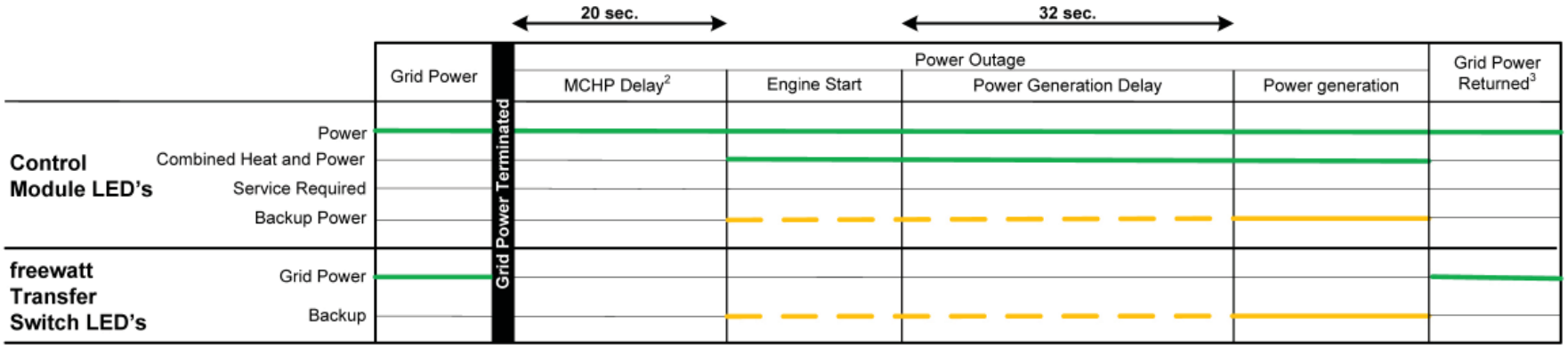
HYDRONIC FREEWATT SYSTEM Model HDJ

Sequence of Operation/Timeline: ***Backup Mode***

Mechanical Operations[1]



LED Display[1]



[1] This sequence of operation assumes no thermostat or aquastat heat call. If there is a call for heat, the heat rejection will turn off and MCHP heat will be directed to the hydronic heating loop and appropriate heating zone. Heat calls are handled in the order of priority as shown below:

1. *Actual Domestic hot water call*
2. *Actual Space Heating call*
3. *Virtual Domestic hot water call*
4. *Virtual Space Heating Call*

In the absence of a heating load, the heat rejection will be turned on for thermal management during backup mode and boost mode.

[2] If the MCHP is running while grid power is terminated, the MCHP will remain running for 15 seconds (Engine ON; No power Generation) during the MCHP delay.

[3] If the MCHP runs for less than 30 minutes in backup mode, the MCHP will run to complete 30 minutes minimum post-run mode. If there is no serviceable call for heat, the heat rejection will be turned on.

6 - GENERAL TROUBLESHOOTING

⚠ WARNING

Electrical shock hazard may cause serious injury or death. Avoid touching live electrical contacts. Service shall be performed by trained, experienced service technician.

⚠ WARNING

WHAT TO DO IF YOU SMELL GAS

Do not try to light or start any appliance.

Do not touch any electric switch or use any phone in the building.

Immediately call your gas supplier from a neighbor's phone. Follow gas supplier's instructions.

If you can not contact your gas supplier, call fire department.

⚠ WARNING

Fire or explosion hazard. Use only your hand to turn gas control knob. Never use tools. If knob will not turn by hand, don't try to repair it. Force or attempted repair may result in a fire or explosion.

⚠ WARNING

Fire or explosion hazard. If overheating occurs or gas supply fails to shut off, do not turn off or disconnect electrical supply to boiler or hydronic hybrid integration module. Shut off gas at location external to appliance.

⚠ WARNING

Fire or explosion hazard. Do not use system if any part of gas control system (boiler or MCHP unit) has been underwater. Contact qualified service agency to inspect system and replace any part of control system and any gas control which has been underwater.

Hydronic **freewatt** PLUS System consists of eight major components:

- Boiler,
- **freewatt** Control Module,
- Hydronic **freewatt** PLUS Hybrid Integration (HI) Module,
- Honda MCHP,
- **freewatt** HAI Thermostat,
- **freewatt** Transfer Switch,
- Load Balancing Transformer and
- APC Universal Transfer Switch

Each major component has its own installation and service manual outlining troubleshooting information regarding individual component.

Make corrective action. Turn off power and restart system to clear error conditions.

Use BYPASS MODE, (CHP MODE OFF) to sustain heating operation while resolving **freewatt** control module or MCHP unit errors or malfunctions.

6.1 General Troubleshooting

If	And	Check or repair
No Control module or HI Module operation		120 VAC electrical connections Blown fuse on **freewatt** control module circuit board
No boiler operation		Thermostat settings Check Boiler per **freewatt** PLUS Boiler Control Manual and Troubleshooting Guide
Honda MCHP overheats		• Coolant Pump functioning Properly • Circulators Functioning Properly • Air in Coolant Line • Coolant Line Blocked • Coolant lines piped correctly into Honda MCHP • Mixing valve setting
No power to thermostat	Display is blank	Check Control Module Connection Fuse in thermostat 24VAC Fuse in **freewatt** control module or Faulty wire connection
No Honda MCHP operation		See MCHP Manual

7 - ALARM CODE SECTION

7.1 Alarm Codes for Service Required LED on freewatt Control Module

ERROR CODE	INDICATES	CHECK OR REPAIR
1	THERMOSTAT COMMUNICATIONS ERROR	1. CHP MODE SWITCH IN **ON** POSITION 2. CABLES AND CONNECTIONS BETWEEN THE THERMOSTAT AND THE HI MODULE 3. LOWER FURNACE ACCESS PANEL INSTALLED 4. IMPROPERLY PROGRAMMED THERMOSTAT
2	OUTDOOR SENSOR ERROR	1. CHECK OUTDOOR SENSOR AND CONNECTION OR INTERNAL 20k OHM DEFAULT RESISTOR
3	MCHP COMMUNICATIONS ERROR	1. RESET SYSTEM POWER 2. POWER TO MCHP 3. CABLES AND CONNECTIONS BETWEEN HONDA MCHP AND HI MODULE
4	MCHP DEVICE ERROR (MCHP ASSERTING “FAILURE” STATUS, IE. A HARD ERROR)	CHECK HONDA MCHP DIAGNOSTICS
5	MCHP DEVICE WARNING (MCHP ASSERTING “WARNING” STATUS, IE. A SOFT ERROR)	
6	**freewatt PLUS** FLASH PARAMETER INTEGRITY CHECK ERROR	SERVICE REQUIRED
7	SYSTEM POWER SWITCH OFF, UNABLE TO ENTER BACKUP MODE (NOTE: NOT DEFINED IN HYDRONIC SYSTEM)	
8	MCHP PLACED IN LOCKED MODE BY SERVICE TECH, PREVENTS MCHP OPERATION	
9	RESERVED FOR FUTURE USE	
10	ERROR CODE 10 NOT USED	
11	LOW DWELLING TEMPERATURE. BOILER DOWN OR THERMOSTAT “OFF” BY MISTAKE	
12	RESERVED FOR FUTURE USE	
13	VIRTUAL WATCHDOG TIME-OUT. AN UNEXPECTED FIRMWARE EXECUTION ERROR OCCURRED.	REPLACE CONTROLLER MODULE
14	EXHAUST GAS LEAK SENSOR FAILURE, HONDA MCHP ERROR 39.0 (EX_SENS_FAIL)	
15	EXHAUST GAS LEAK SENSOR POWER FAILURE, HONDA MCHP ERROR 39.1,(EX_SENS_POWER_FAIL)	
16	EXHAUST GAS LEAK SENSOR ALARM, COMBUSTION GAS DETECTED, HONDA MCHP ERROR 10.1, (EX_LEAKAGE_FAIL)	
17	NO DC POWER SUPPLY VOLTAGE DETECTED IN BACKUP MODE. (LOAD_PWR_FAULT)	INDICATES A FAULT IN 120V LOAD CIRCUIT
18	DETECTED A **freewatt** TRANSFER SWITCH COMMUNICATIONS FAILURE	Check fTS communications cable
19	DETECTED A **freewatt** TRANSFER SWITCH DEVICE ERROR	see **freewatt** transfer switch IOM
20	ERROR CODE 20 NOT USED	
21	DETECTED A **freewatt** TRANSFER SWITCH STATE ERROR	see **freewatt** transfer switch IOM
22	RESERVED FOR FUTURE USE	
23	DETECTED A **freewatt** TRANSFER SWITCH CONTACTOR #1 ERROR	see **freewatt** transfer switch IOM
24	DETECTED A **freewatt** TRANSFER SWITCH CONTACTOR #2 ERROR	see **freewatt** transfer switch IOM
25	EXHAUST GAS LEAK SENSOR TEST BUTTON PRESSED	
26	VOLTAGE DETECTED ON THE **freewatt** TRANSFER SWITCH ISLAND NODES (I1 OR I2) IN BACKUP POWER MODE	see **freewatt** transfer switch IOM
27	RESERVED FOR FUTURE USE	
28	MISSING L1 OR L2 OF AC POWER (fTS_AC_FAULT)	BLOWN FUSE, FAULTY WIRING, UTILITY FAULT
29-98	RESERVED FOR FUTURE USE	
99	VIRTUAL WATCHDOG TIME-OUT OCCURRED 5 OR MORE TIMES. MULTIPLE UNEXPECTED FIRMWARE EXECUTION ERRORS OCCURRED.	REPLACE CONTROL MODULE

8 - CONTROL MODULE FUSES

⚠ WARNING

Electrical shock hazard. Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Disconnect power to system before servicing. Failure to comply could result in severe personal injury, death.

⚠ WARNING

Never jumper (bypass) any device except for momentary testing as outlined on following pages of this manual. Severe personal injury, death can result.

NOTICE

Check control module fuses before replacing system controller or any major components (pump, motor, etc.). Blown fuse can prevent system control module or other components from operating.

8.1 CONTROL MODULE FUSE

- Turn OFF power to System at external line switch.
- Remove front panel from control module enclosure.
- Remove top cover of fuse and inspect fuse. Replace with new 5mm x 20mm, 250 Volt, 2 amp fuse if necessary.
- Install fuse's top cover and replace control module's front panel.
- Restore power to system at external line switch and verify system operation after completing service.

9 - WIRING DIAGRAMS

Figure 9-1 HDJ - 240 VAC Wiring Only

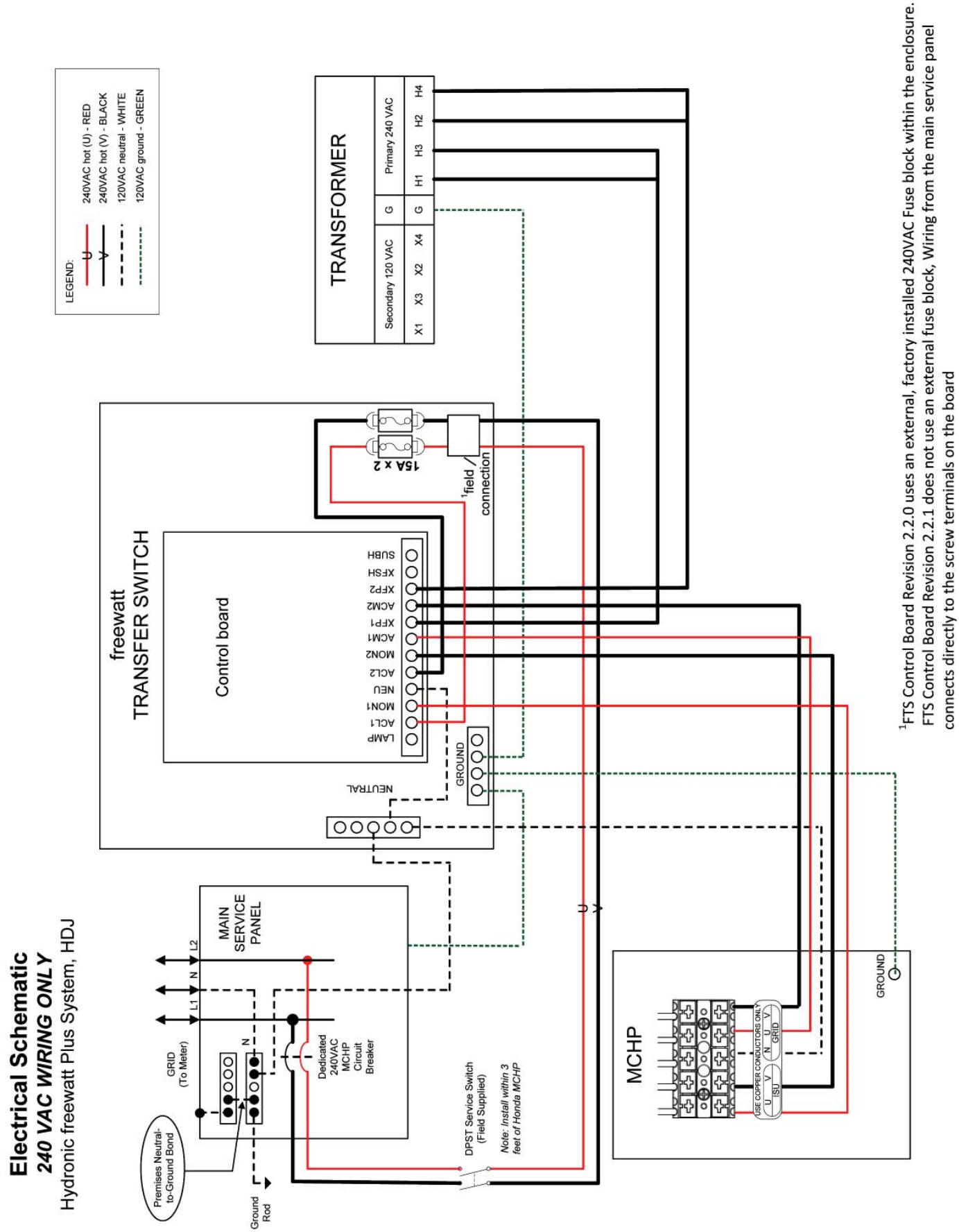
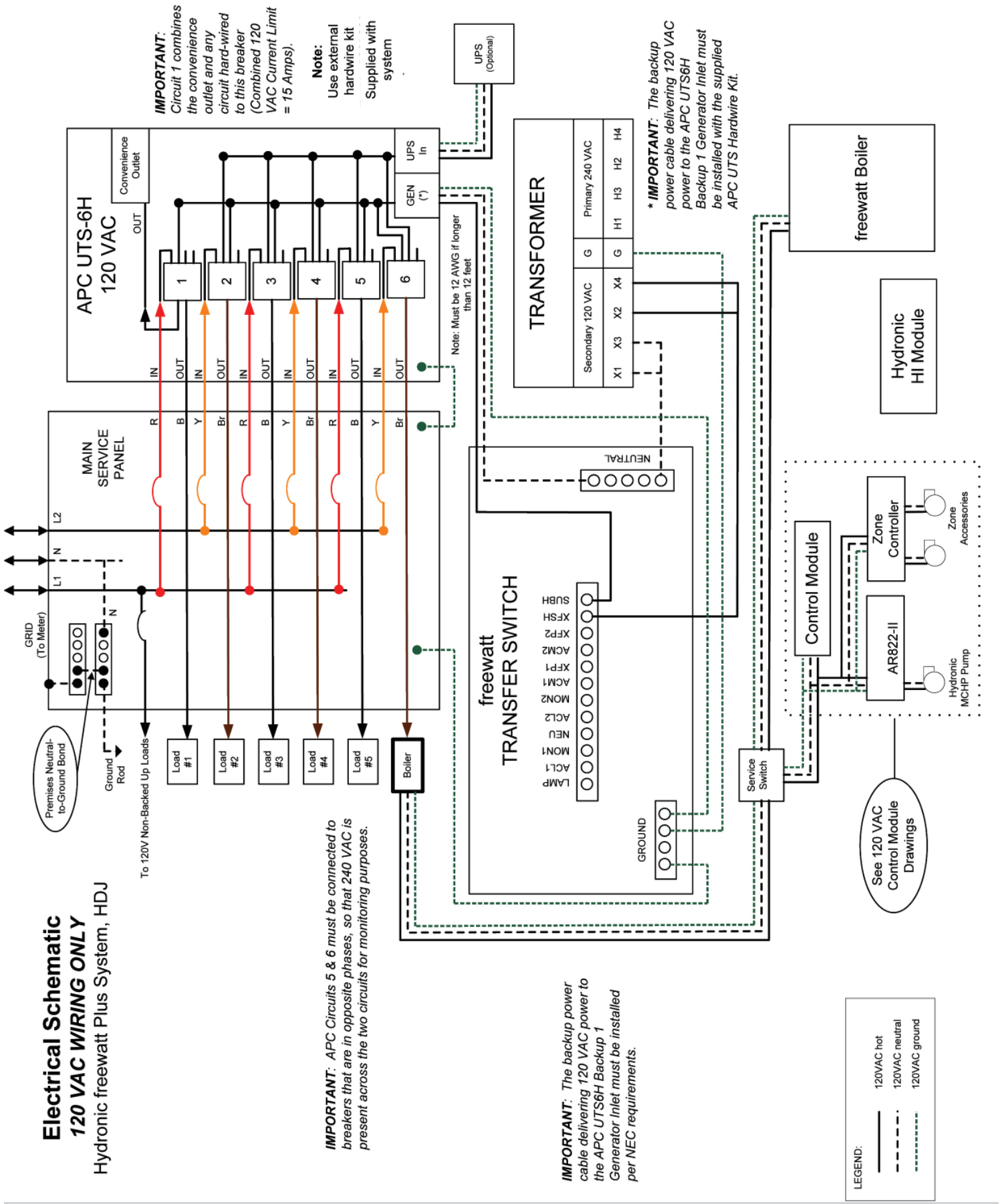
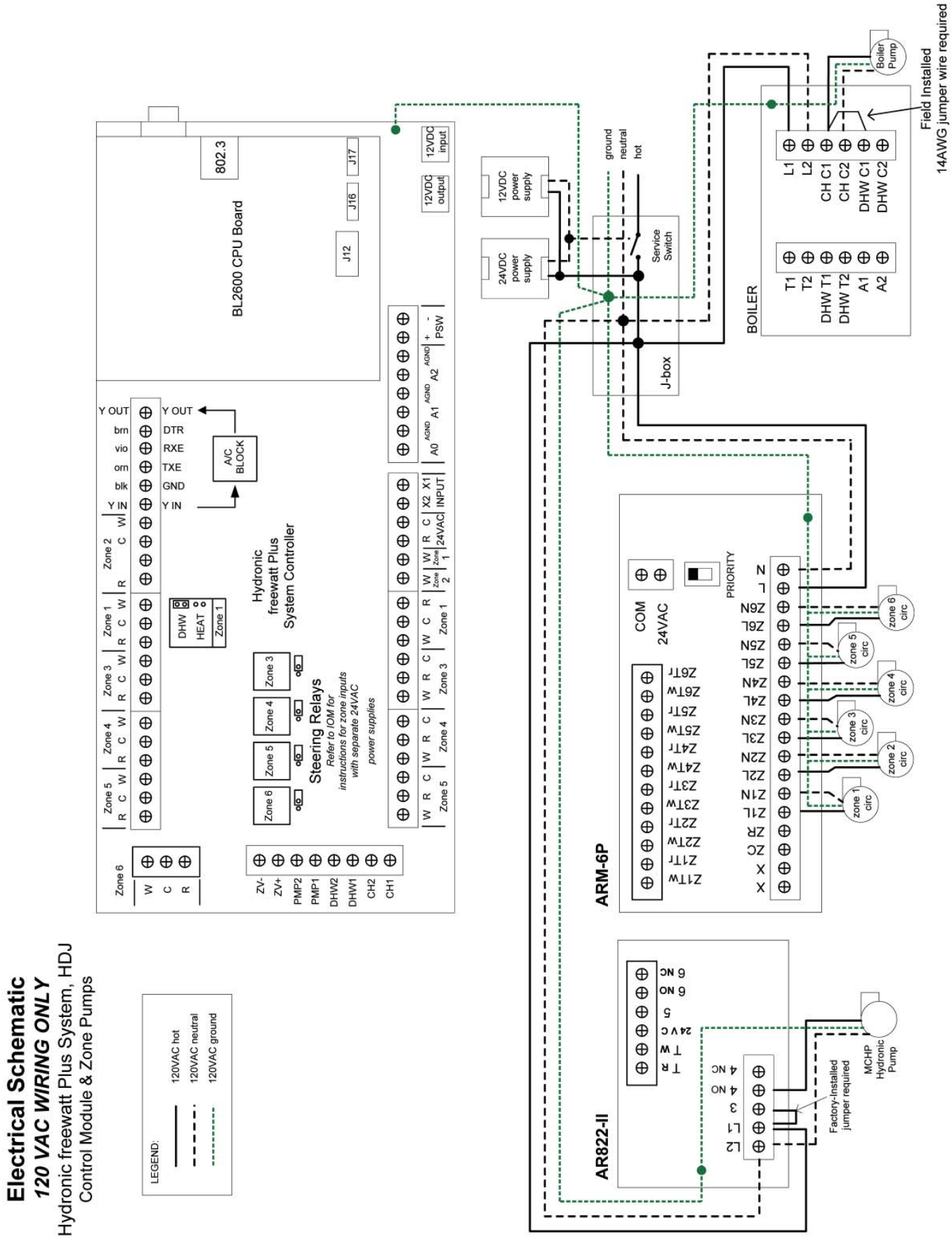


Figure 9-2 HDJ - 120 VAC Wiring Only



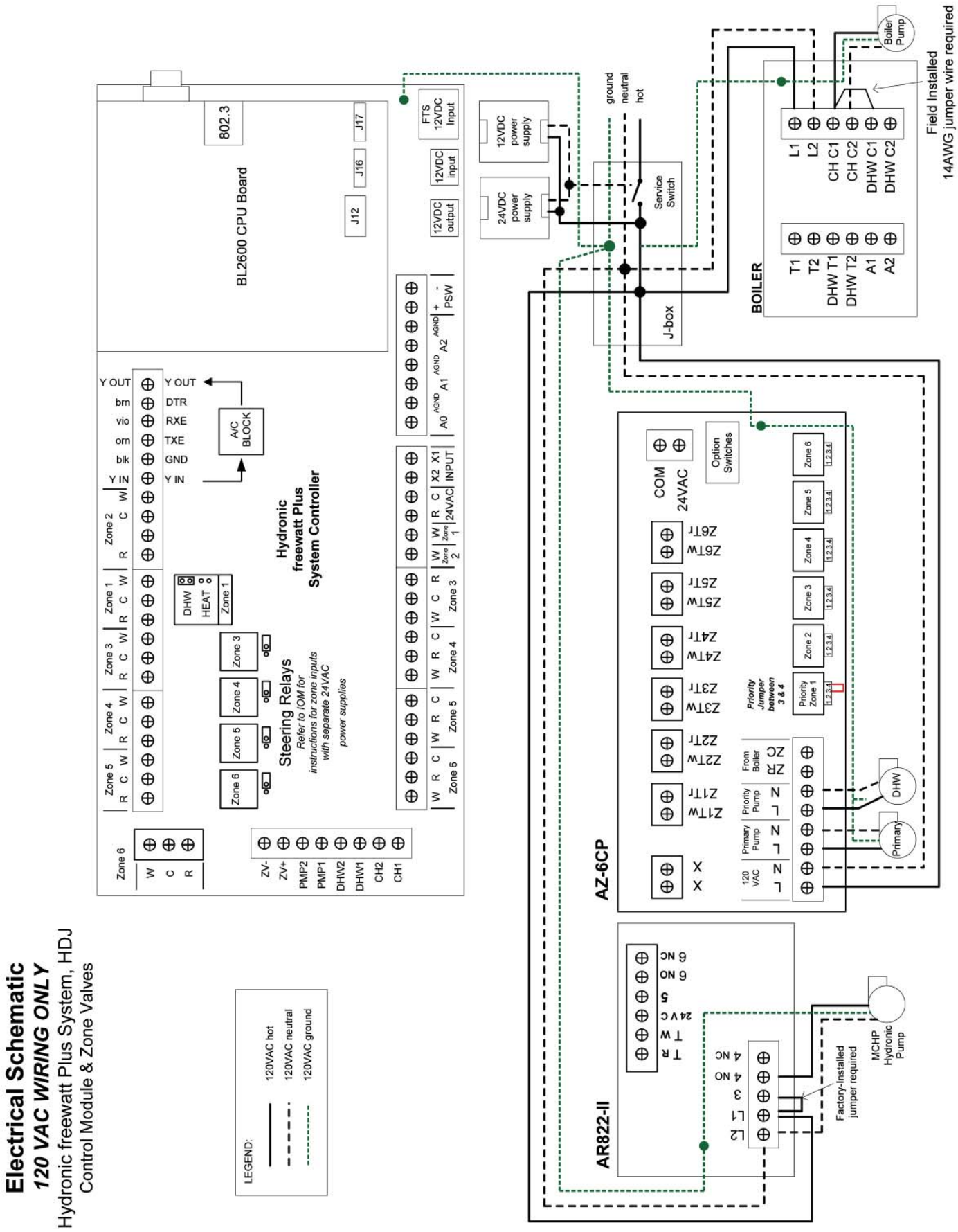
9 - WIRING DIAGRAMS

9-3 HDJ - 120 VAC Wiring - Control Module & Zone Pumps



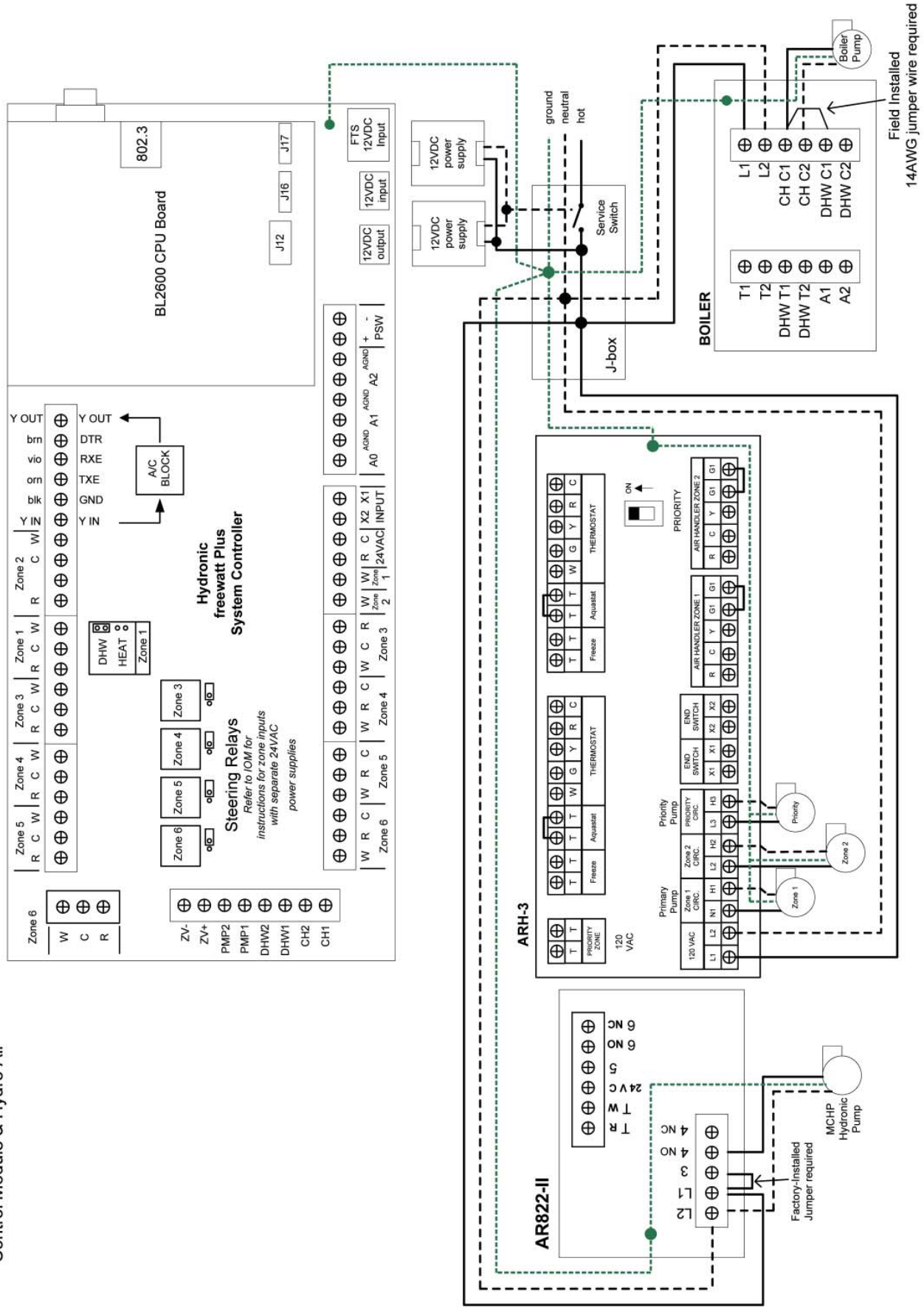
9 - WIRING DIAGRAMS

9-4 HDJ - 120 VAC Wiring - Control Module & Zone Valves



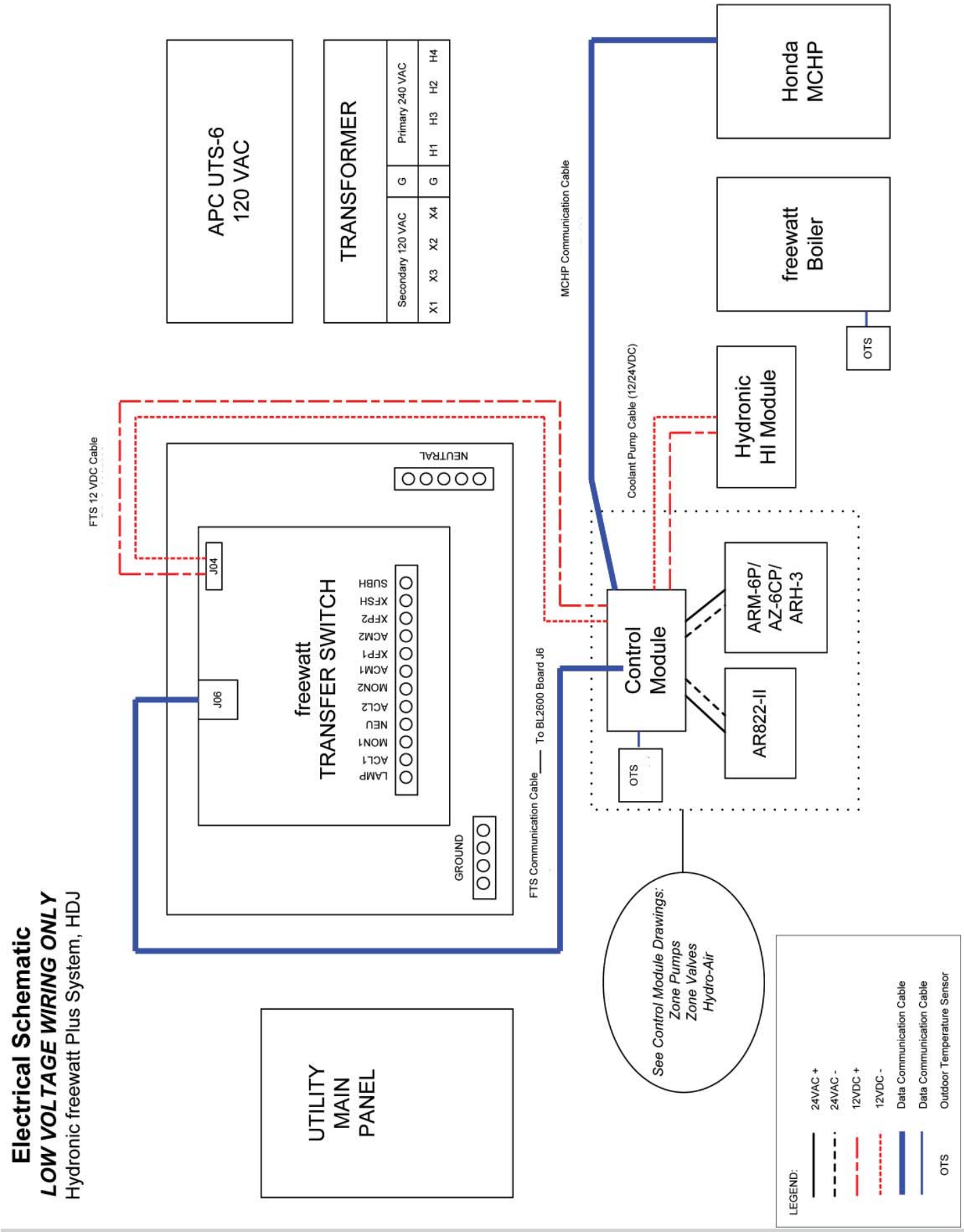
9 - WIRING DIAGRAMS

9-5 HDJ - 120 VAC Wiring - Control Module & Hydro Air



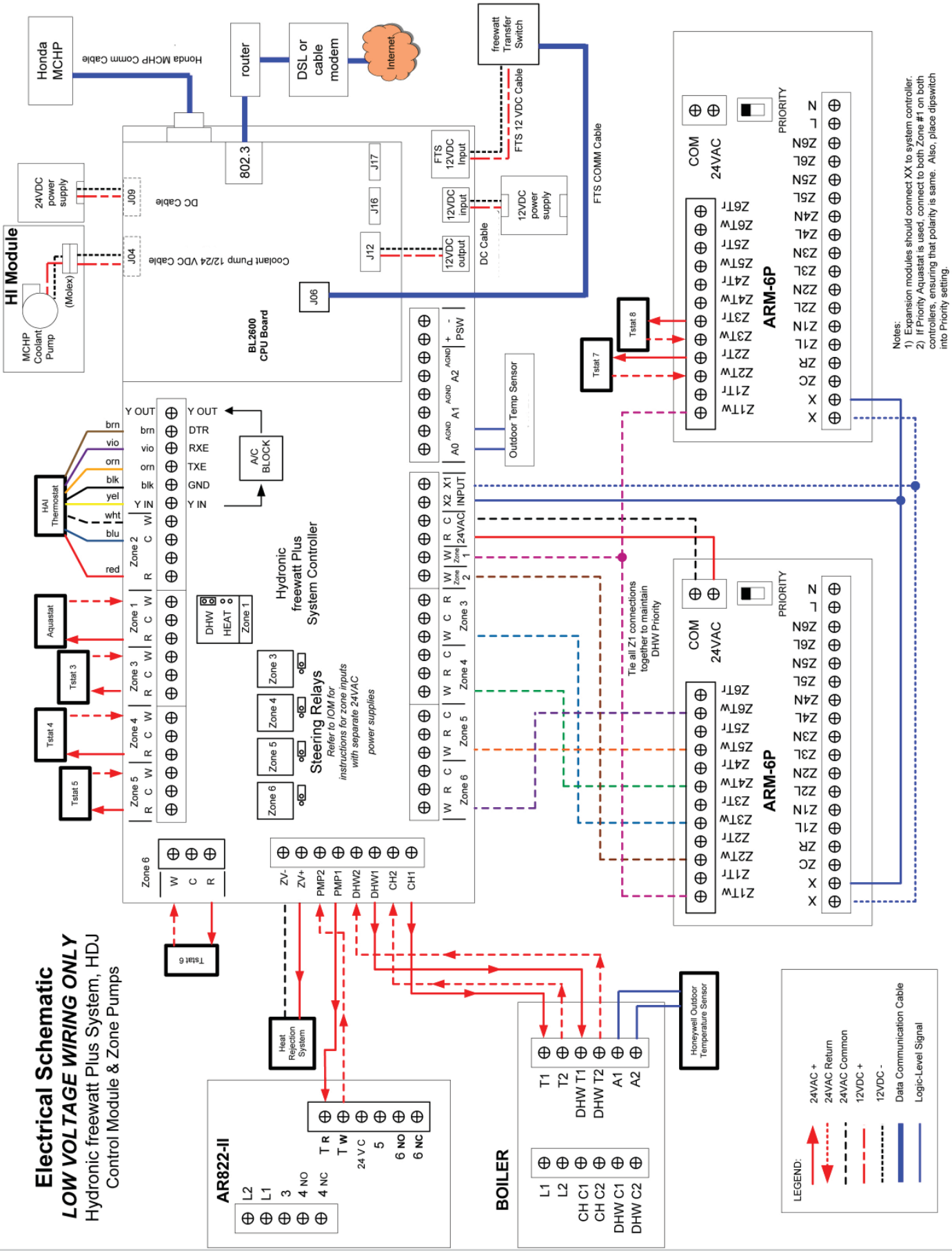
Electrical Schematic
120 VAC WIRING ONLY
Hydronic freewatt Plus System, HDJ
Control Module & Hydro Air

9-6 HDJ - Low Voltage Wiring Only



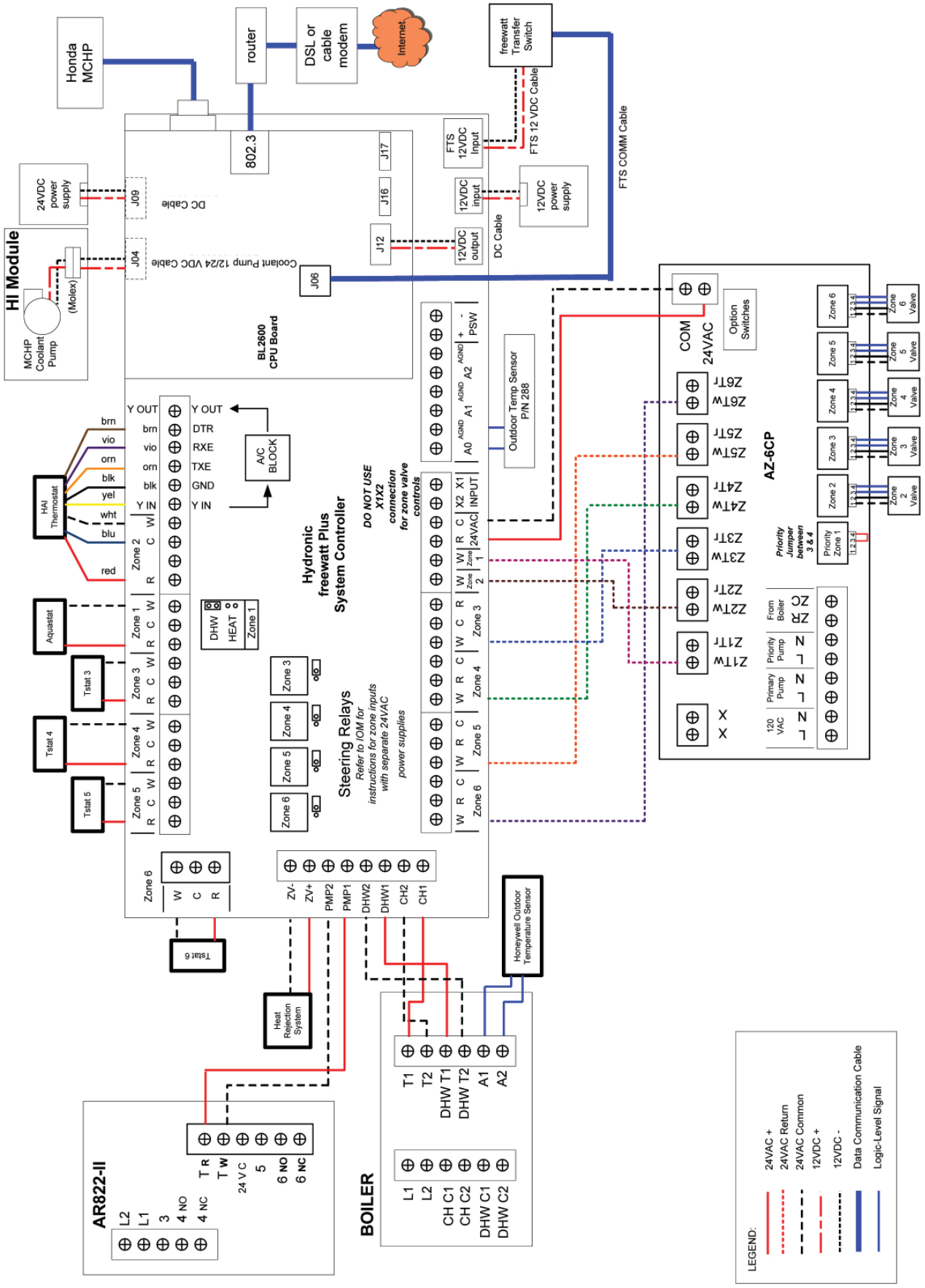
9 - WIRING DIAGRAMS

9-6 HDJ - Low Voltage Only Wiring - Control Module and Zone Pumps



9 - WIRING DIAGRAMS

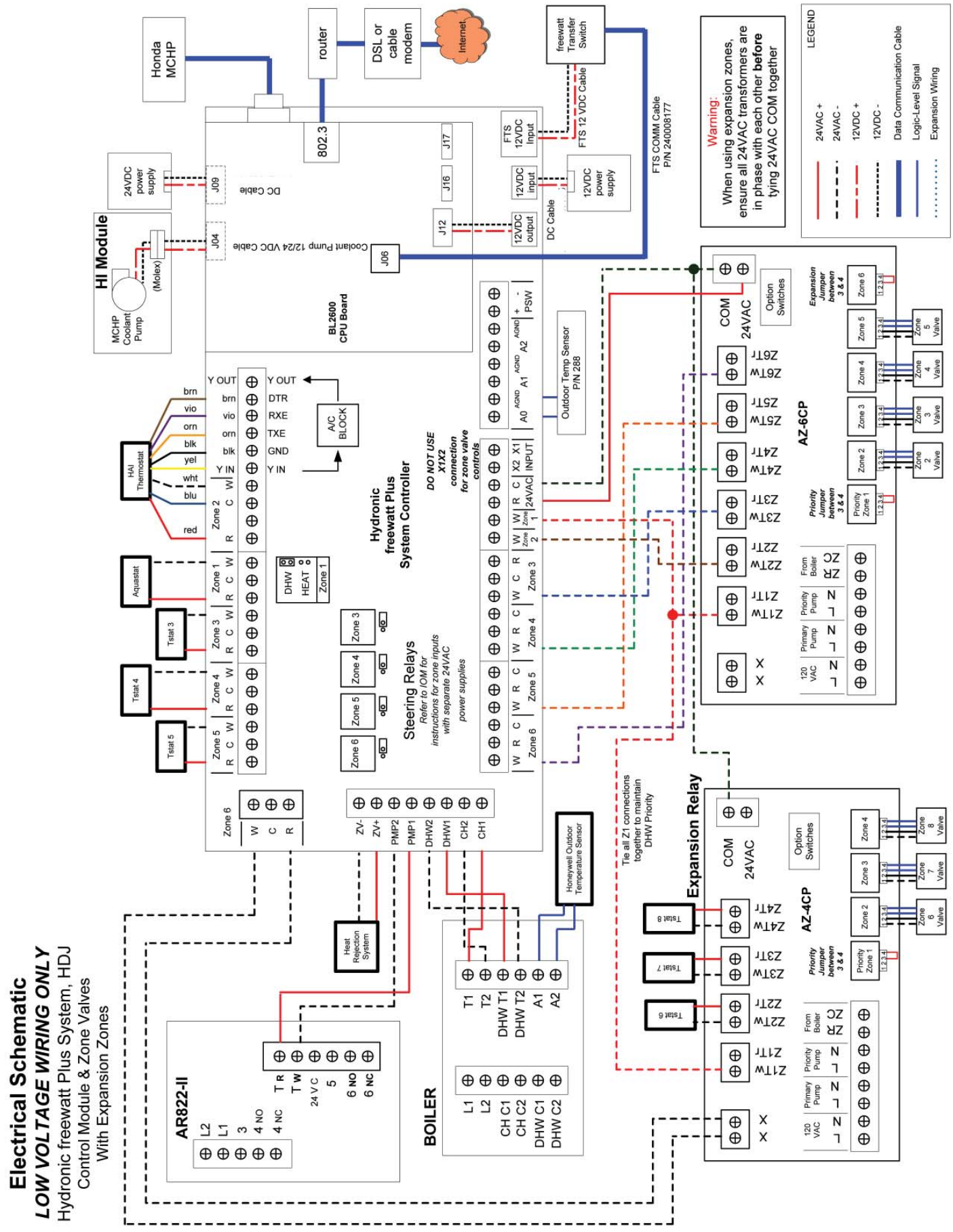
9-7 HDJ - Low Voltage Only Wiring - Control Module & Zone Valves



Electrical Schematic
LOW VOLTAGE WIRING ONLY
Hydronic freewatt Plus System, HDJ
Control Module & Zone Valves

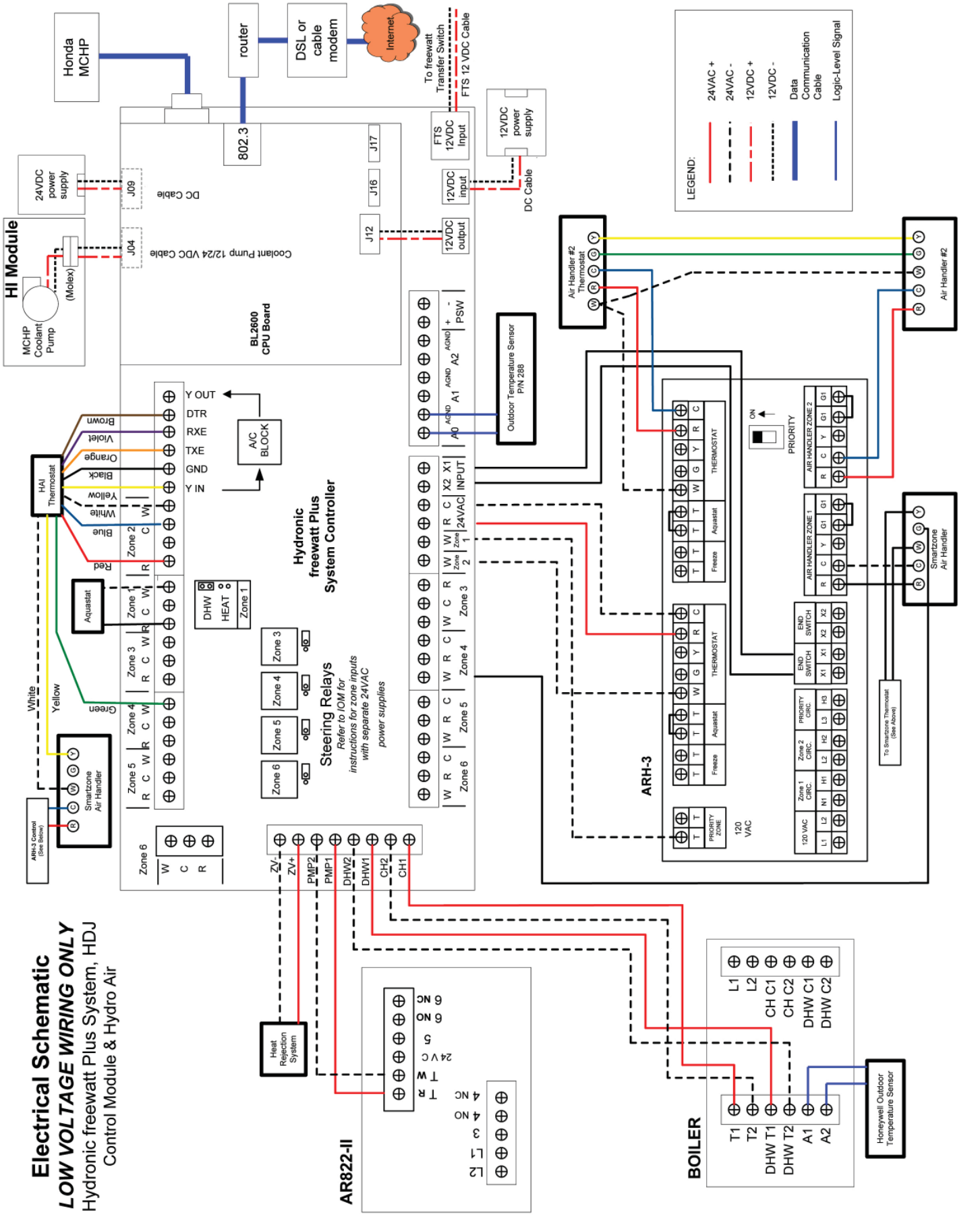
9 - WIRING DIAGRAMS

9-8 HDJ - Low Voltage Only Wiring - Control Module & Zone Valves with Expansion Zones



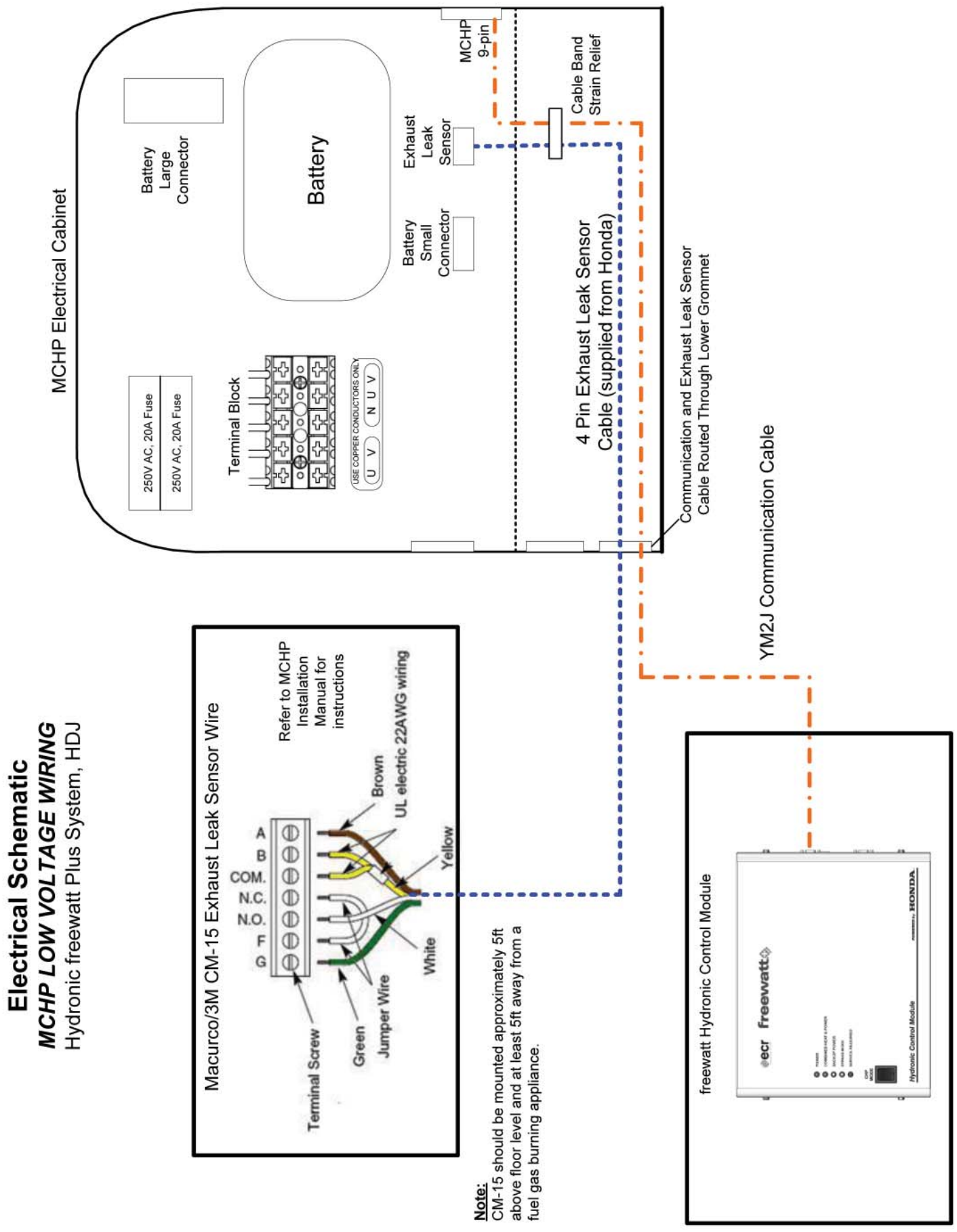
9 - WIRING DIAGRAMS

9-9 HDJ - Low Voltage Only Wiring - Control Module & Hydro Air



Electrical Schematic
LOW VOLTAGE WIRING ONLY
Hydronic freewatt Plus System, HDJ
Control Module & Hydro Air

9-10 MCHP - Low Voltage Wiring



Installation Checklist

Check the following upon completion of Hydronic Control Module Installation:

- ☐ Inspect controller for properly secured connections
- ☐ Inspect hydronic pump's power cable for properly secured connections
- ☐ Visually inspect all fuses

11 - INSTALLATION NOTES

11 - INSTALLATION NOTES

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Hydronic Control Module was installed and commissioned by:		
DATE	**freewatt PLUS TECHNICIAN**	**freewatt PLUS DEALER**

ecr innovative living™

P.O. Box 4729
Utica, NY 13504-4729
www.freewatt.com
www.ecrinternational.com