

Micro Control Systems

APPLICATION NOTE

APP-006

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HOME LOAD MANAGER INSTALLATION MANUAL Hardware Revision 1.4 & Higher

Revision History

Date	Author	Description
03/01/97	John Walterick	Created Application Note.
08/01/97	John Walterick	Revised Application Note.

MCS-8 & MCS-I/O INSTALLATION

You may have one MCS-8 and up to three MCS-I/O units on and installation. Figure 1 indicates the preferred mounting for & MCS-8 and one MCS-I/O unit providing a total of 16 outputs, 16 inputs and 2 analog outputs.

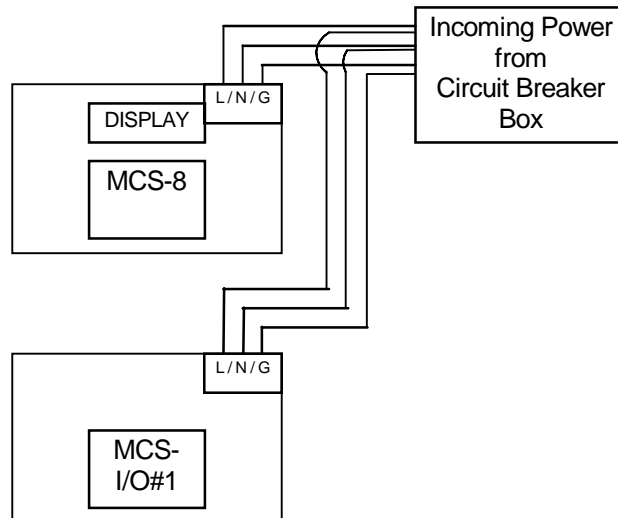


Figure 1

What's Important

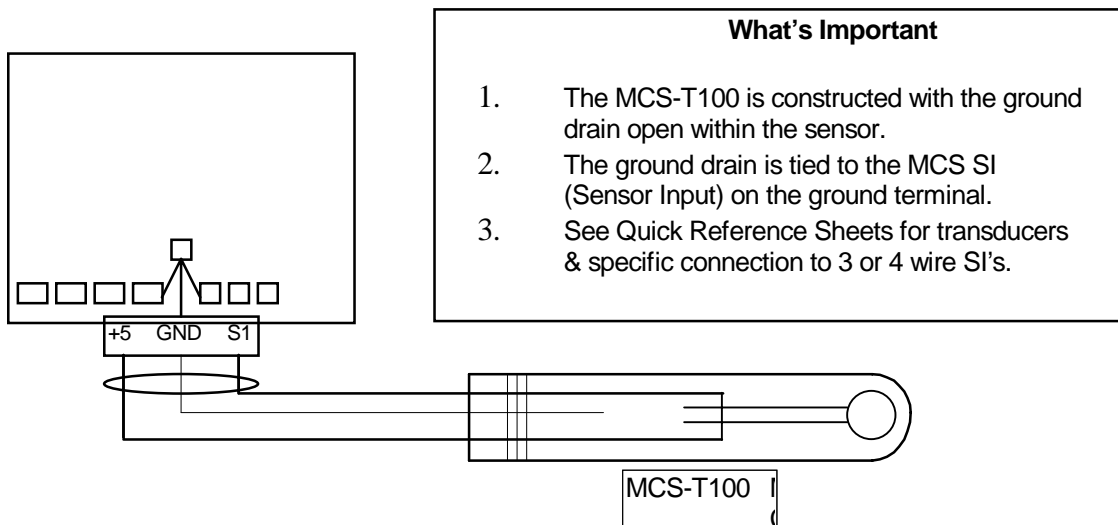
1. MCS units must be located in a Dry area with access to a separate 120 volt (VAC) power source. A good location is near the circuit breaker panel or in a utility room.
2. Line, neutral and ground to MCS units need to be wired to the same source. Only one set of 120 VAC wires should be on the 120 vac input terminals of each unit. (i.e. wire from the circuit breaker to each unit.)
3. There should be no connection between neutral and earth ground.
4. The MCS-8 display should be mounted at or slightly above eye level. (6 o'clock viewing angle)

MCS SENSOR INSTALLATION

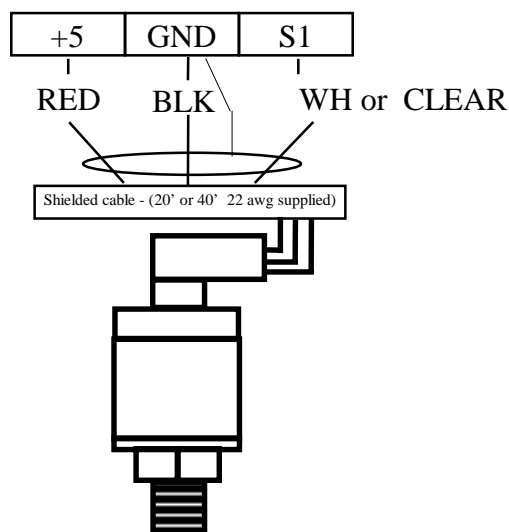
Sensors are be divided into five categories as follows:

1. **Temperature and Pressure sensors**, purchased from MCS, have a shielded cable correctly wired at the sensor end. They can be purchased with different lengths of cable to eliminate splicing during field installation.

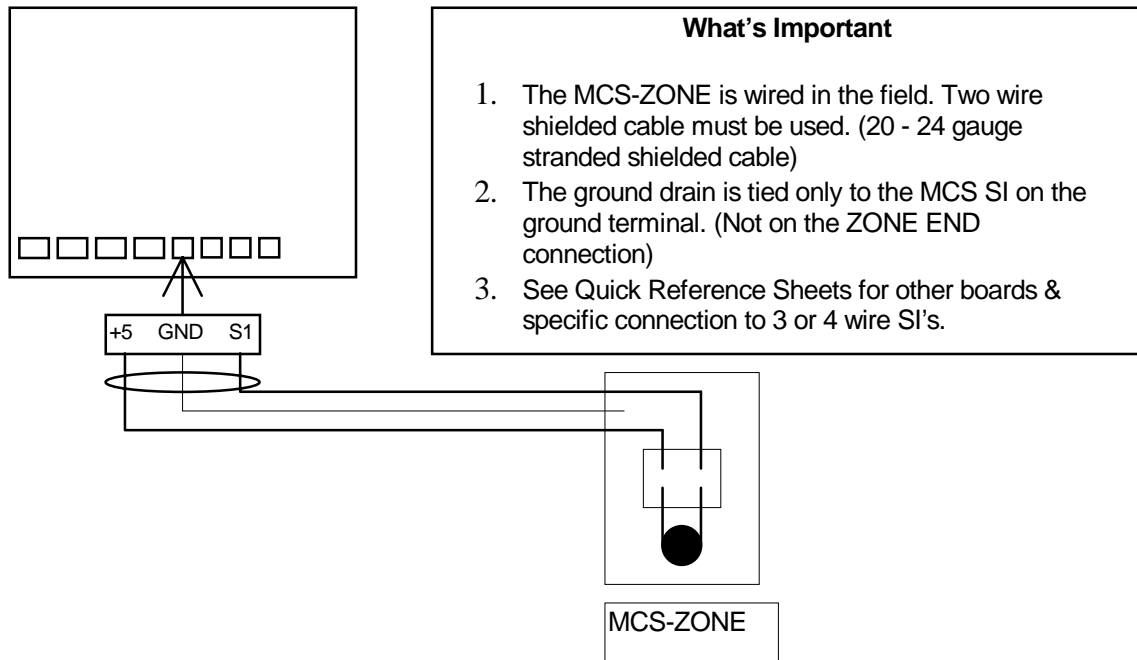
1.1. Figure 2 below shows the correct wiring of the T100 cable to the MCS controller.



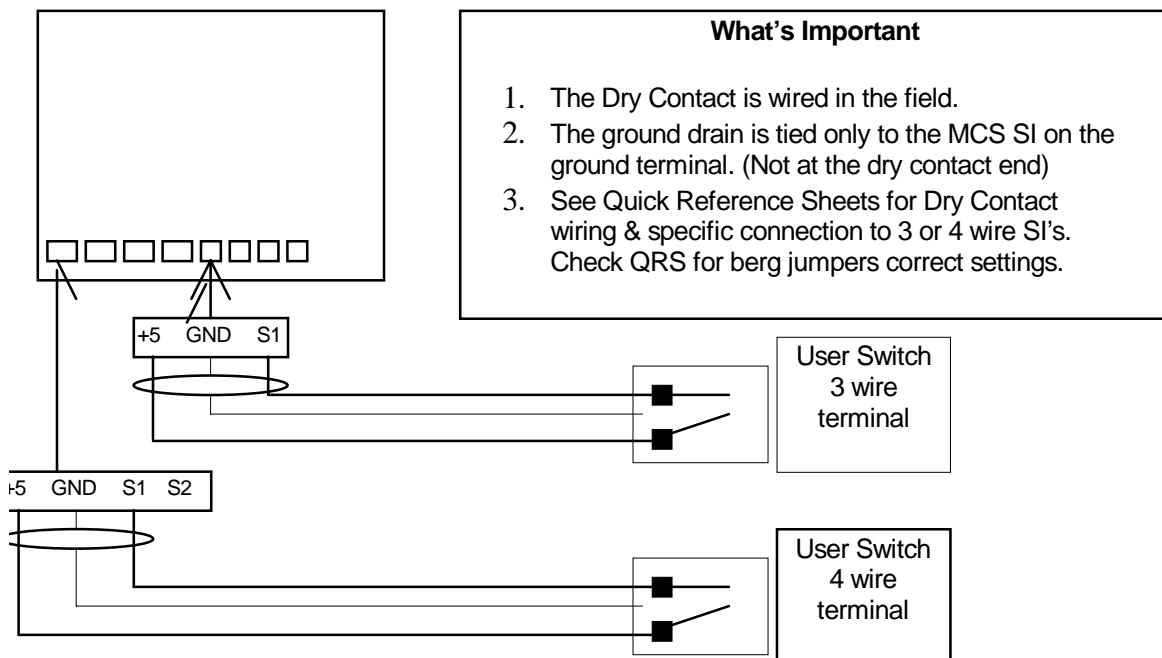
1.2. **MCS-Eclipse pressure sensor** – The figure below shows the correct wiring of the Eclipse pressure sensor.



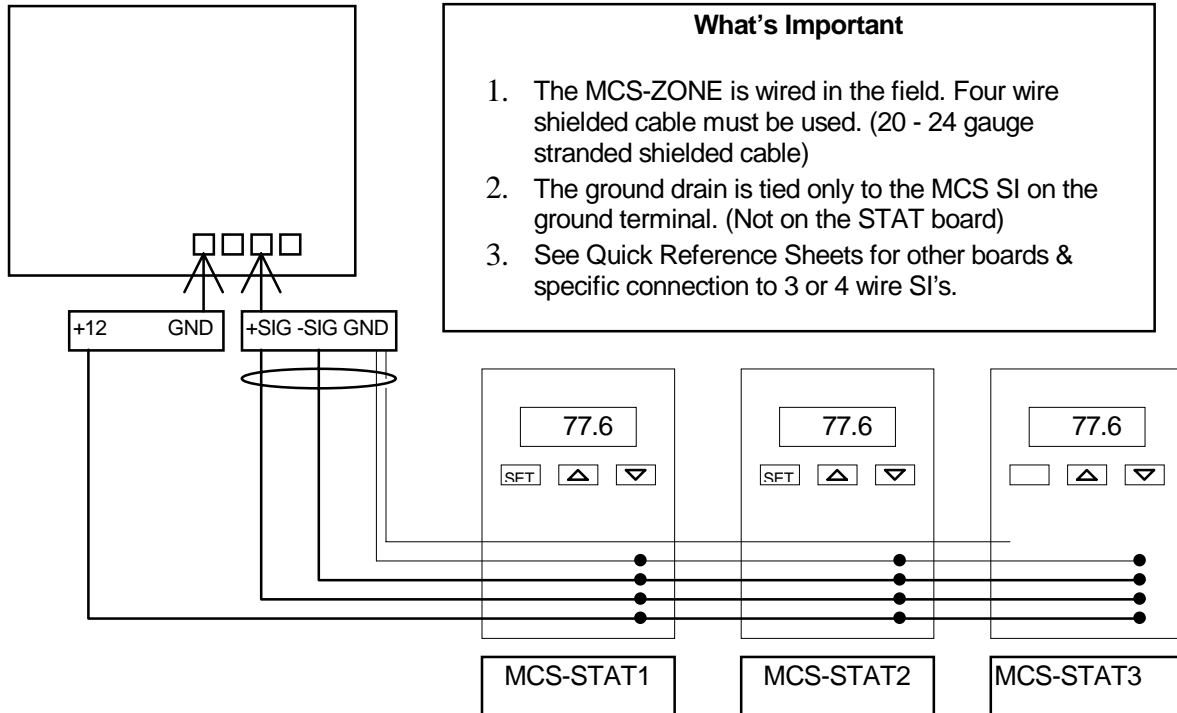
2. **Printed circuit board sensors**, purchased from MCS, which require field wiring using shielded cable. These would include the MCS-HUMD, MCS-ZONE, MCS-AMP-CT, etc.. The figure below shows the correct wiring for a zone sensor.



3. **Dry contact inputs** which are supplied from another source. (Inputs from Meter Pulse, Security (door / window open), etc.) The figure below shows the correct wiring for dry contact inputs.



4. **Communicating MCS-STAT** (communicating thermostat) is wired in the field using a four wire shielded cable. (20 - 24 gauge stranded shielded cable) The figure below illustrates the correct wiring for up to three MCS-STATS.



MCS WIRE PULLS

1. MCS - Three (3) jacketed wires from power source to MCS-8. (Line, Neutral & Ground.) Wire from the circuit breaker to the MCS-8. If you have & MCS-I/O it should also be wired from the circuit breaker to the MCS-I/O. Use 14 to 18 gauge stranded wire. (NO SOLID WIRE & NO BARE GROUND WIRE)
2. HVAC - Number of wires to pull is equal to the number of outputs plus one (1). If you have 4 outputs then you will pull 5 wires. (One for each output plus the 24 vac line.) Bring a line from 24 vac transformer on HVAC to the common on 1st relay output (Fan) on MCS unit. Jumper commons on relay outputs for each stage of HVAC output. (Compressor, Reversing valve, Aux. Heat, Emer. Heat, etc.). Use 14 to 20 gauge stranded wire. (NO SOLID WIRE & NO BARE GROUND WIRE)
3. WATER HEATER - Mount water heater interface box on or near the water heater.
 - 3.1. Wire 120/240 vac from supply to **input** terminals on water heater interface box printed circuit box.
 - 3.2. Wire 120/240 vac from **output** terminals on water heater interface box to water heater.
 - 3.3. Mount MCS-T100 temperature sensor next to upper water heater temperature control. Feed wire up through top with power wires. Use foam pipe insulation to wedge MCS-T100 sensor against tank. Wire the two temperature sensor wires and the drain shield to the input terminal on the water heater interface printed circuit board.
 - 3.4. Pull a four (4) wire shielded cable, 20 to 22 gauge stranded, from the water heater interface printed circuit board to the MCS. Record wire colors for use in connecting at the MCS end.
 - 3.4.1. Connect one lead to the Normally open of the relay output for the water heater. Wire from the common of this relay to the +12 vdc to the right of the sensor inputs.
 - 3.4.2. Connect one lead to the ground of the temperature sensor input with the shield drain.
 - 3.4.3. Connect the other two leads to the +5 vdc and the signal of the temperature sensor input.
4. MCS-STAT - Mount the communicating thermostat at or slightly below eye level. (12 o'clock viewing angle).

- 4.1. Pull one (1) 4 wire shielded cable from the STAT location to the MCS. (Use 20 to 22 gauge stranded cable.)
 - 4.2. For multiple STATs pull the 4 wire shielded cable from the 1st STAT to the next STAT, etc.. Connect at STAT end noting color's used. (DO NOT CONNECT SHIELD DRAIN AT STAT END)
 - 4.3. Connect + & - communications wires to MCS-I/O communications terminal on the MCS unit.
- 4.4. Connect +12 vdc and ground to +12 vdc terminal on MCS. Tie ground shield to ground on this terminal.

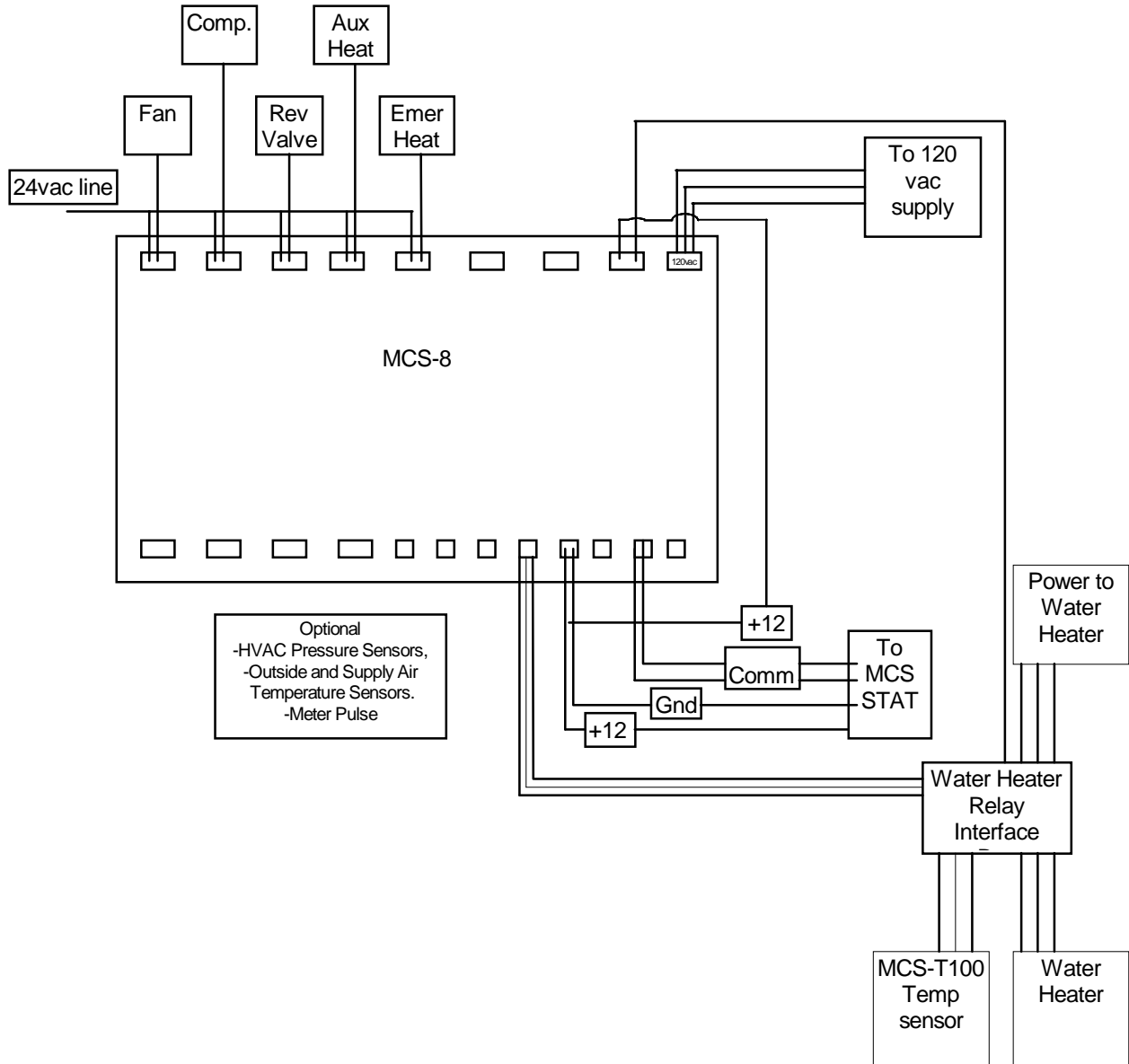
What's Important

1. Stranded cable only.
2. Pull three (3) jacketed stranded wire from 120 vac power to MCS. Use 14 to 18 gauge.
3. Pull number of outputs plus one wires from MCS to the HVAC unit. Use 14 to 20 gauge stranded wire.
4. Pull normal high voltage to water heater but wire to water heater interface box.
5. Pull four (4) wire shielded stranded cable from MCS to water heater interface box. Use 20 to 22 gauge.
6. Pull four (4) wire shielded stranded cable from MCS to communicating thermostat. Use 20 to 22 gauge. They must be daisy chained.
7. The communication terminations jumpers should be on at MCS and last MCS-STAT. (If you have an I/O unit the MCS-STAT should be attached to the I/O unit and jumpers positioned as stated above.

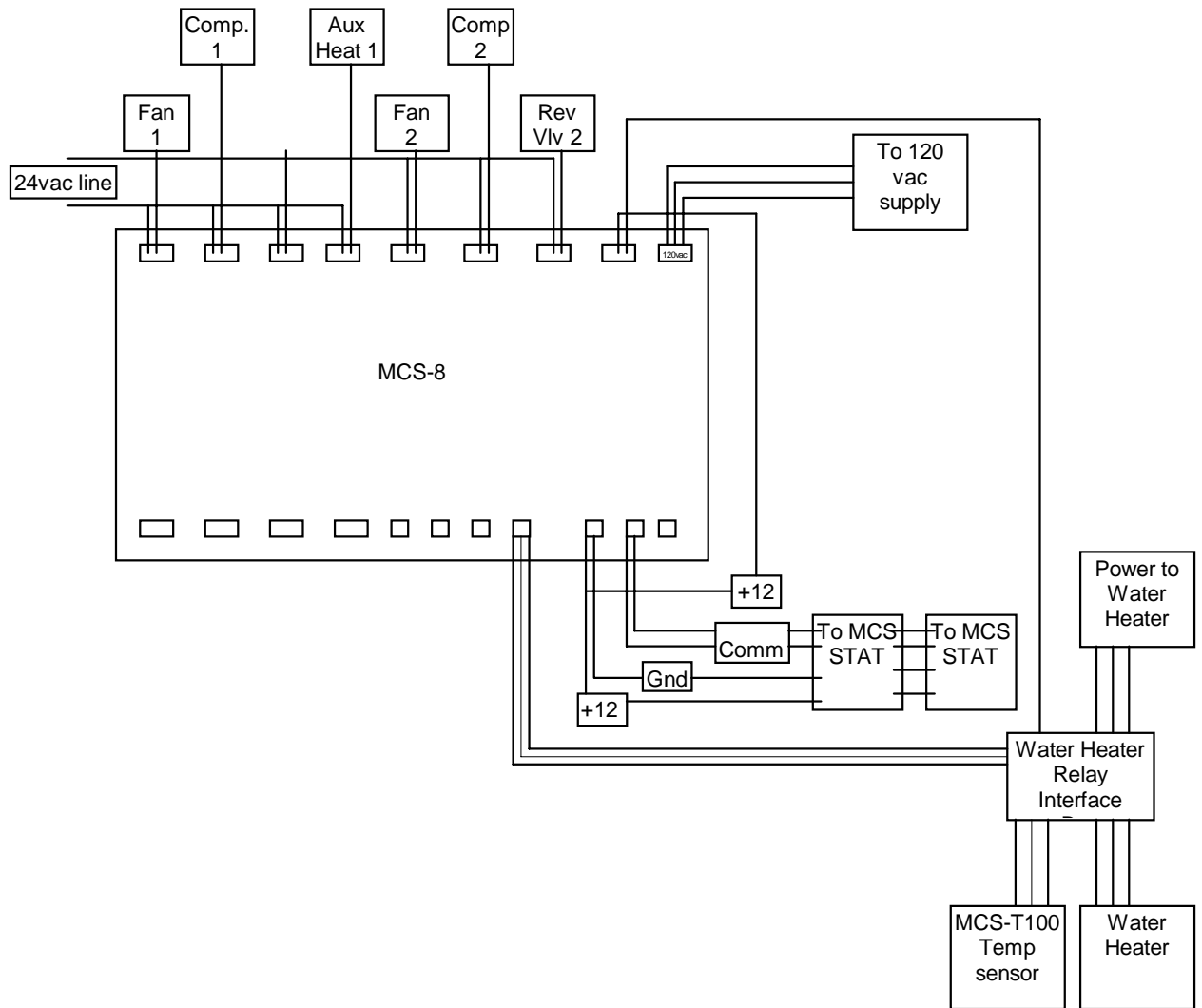
See attached wiring diagrams

1. Single unit (MCS-8) with one heat pump and water heater.
2. Single unit (MCS-8) with two heat pumps and water heater.
3. Two units (MCS-8 & MCS-I/O) with two heat pumps and a water heater.

Single Unit - (MCS-8) One Heat Pump and Water Heater



Single Unit - (MCS-8) Two Heat Pumps & Water Heater



Two Units - (MCS-8 & MCS-I/O) Two Heat Pump's and Water Heater

