

## Thermostat Controls – Heat Pumps

Most modern thermostats handle 2 stages of cooling and heating and some can control three stages of heating. However, the 3rd heating stage is usually just an auxiliary electrical heater in the air flow to handle peak heating needs.

The thermostat control outputs have traditional names and colors (not rigorously followed):

- Y1 (yellow): Cool Stage 1 (both Heat/Cool for heat pumps)
- Y2 (light blue, or other): Cool Stage 2 (both Heat/Cool for heat pumps)
- G (green): Fan
- O or B (orange or blue): Heat/Cool Select: On most heat pump systems, “O” is energized for “Cooling”.
  - o In heating mode, “O” is not energized and the default-position of the 4-way refrigerant valve is “Heating Mode”.
  - o In cooling mode, “O” is energized (24VAC) and the powers the solenoid coil on the 4-way refrigerant valve moves it to the “Cooling Mode” position.
  - o To prevent overheating the solenoid coil when the compressor is OFF, the coil should not be energized unless “G” or “Y1” is also energized (even if “O” is continuously ON from the thermostat)
- R (red): 24VAC control power
  - o Rc (red): 24VAC power for Cooling
  - o Rh (red): 24VAC power for Heating
- D (any color): Dehumidifier demand
  - o Miami HP units run the compressor in Cooling Mode, compressor on Stage 2, but Fan on the lower speed normally used for Stage 1
  - o This delivers low cooling effect, but still condenses moisture from the air on the unusually cold evaporator coil
  - o Dehumidifier run time must be limited (usually by the thermostat) to avoid freezing water on the evaporator coil
- H (x): Humidifier demand – not supported by heat pumps
- C (black): Common – return wire for 24VAC power
- W1 (white): Heating Stage 1
- W2 (brown): Heating Stage 2
- X or AUX (any color): Auxiliary or emergency heat for exceptional or extreme conditions