ECM Troubleshooting

Before troubleshooting a system, it's a good practice to become familiar with the components and wiring diagram, and take note of flash codes that may be present.

If the motor is running but the system is noisy, shutting down on limits or safeties or the evaporator coil is freezing, most likely there is nothing wrong with the motor, and the problem is external to the motor.

- Check the jumper selections using the provided installation instructions
- Check the air distribution system components for dirt load and closed dampers, registers and grilles.
- Measure the total external static pressure. High static pressure (greater than .5" w.c. total ESP) will the blower to ramp up in attempts to overcome the high static, and noisy operation will result.

If the motor is not running, the following checks will diagnose operation. **Always disconnect the power to the system before disconnecting or reconnecting motor connections.** There are two inputs to verify, a 120 volt AC constant power source, and the low voltage communication that commands blower speed per demand.

Checking the High Voltage Input

First, check the high voltage to terminals (L) and (N). There must be 120 volts AC between these two terminals whenever there is power to the system, regardless of a demand call. The polarity of the line voltage to the motor must be correct.

Checking the Low Voltage Communication Input

The following information must be known before troubleshooting the low voltage communication to the motor.

- Pin locations of low voltage communication based on system mode.
- Sequence of operation of the furnace control board

If no low voltage communication is measured at the motor on the 16 pin plug connector, check the system wiring, controls and demand call.

ECM motors used in the two stage gas furnaces operate in "thermostat mode", meaning that 24 volts AC is sent to various pins on the 16 pin plug based on the system mode of operation. Pin 1 is electrically the same as "C" on the furnace control board.

The exceptions to this are pins 4, 5, 7, and 11, which provide the selected airflow and delay information as set up through the DELAY, COOL, ADJUST, and HEAT jumpers on the control board. These inputs are are as follows:

Full wave signal (“A” setting), half wave (+) signal (“B” setting), half wave (-) signal (“C” setting), or no signal (“D” setting).

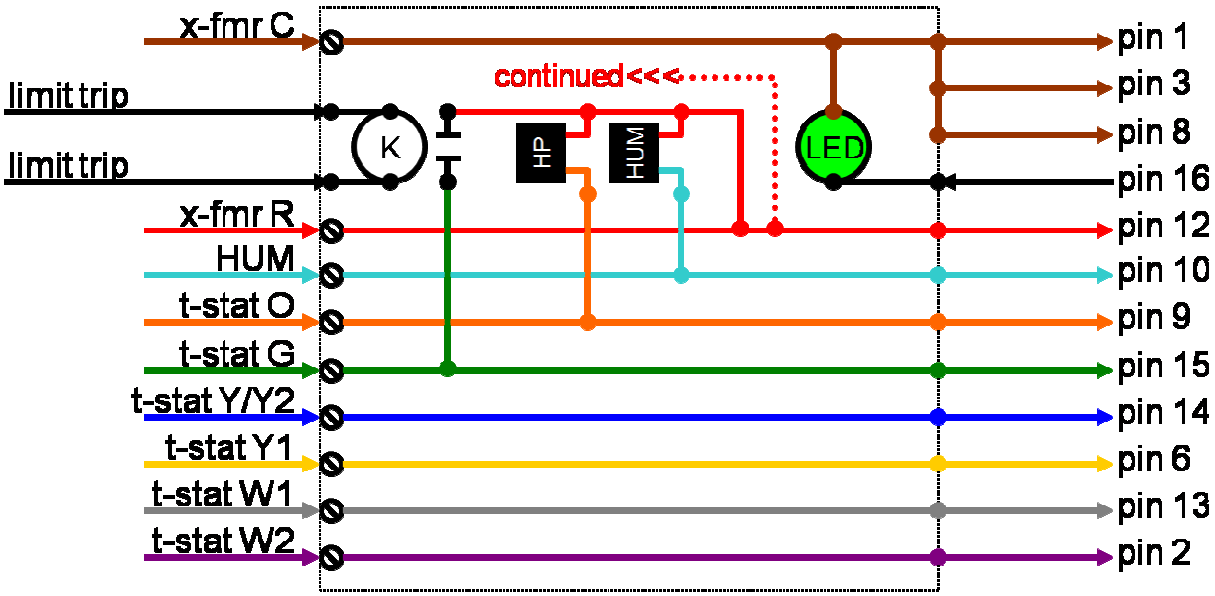
Control Connector

16-pin connector shown viewing the terminal end of the connector with the release snap on the right-hand side

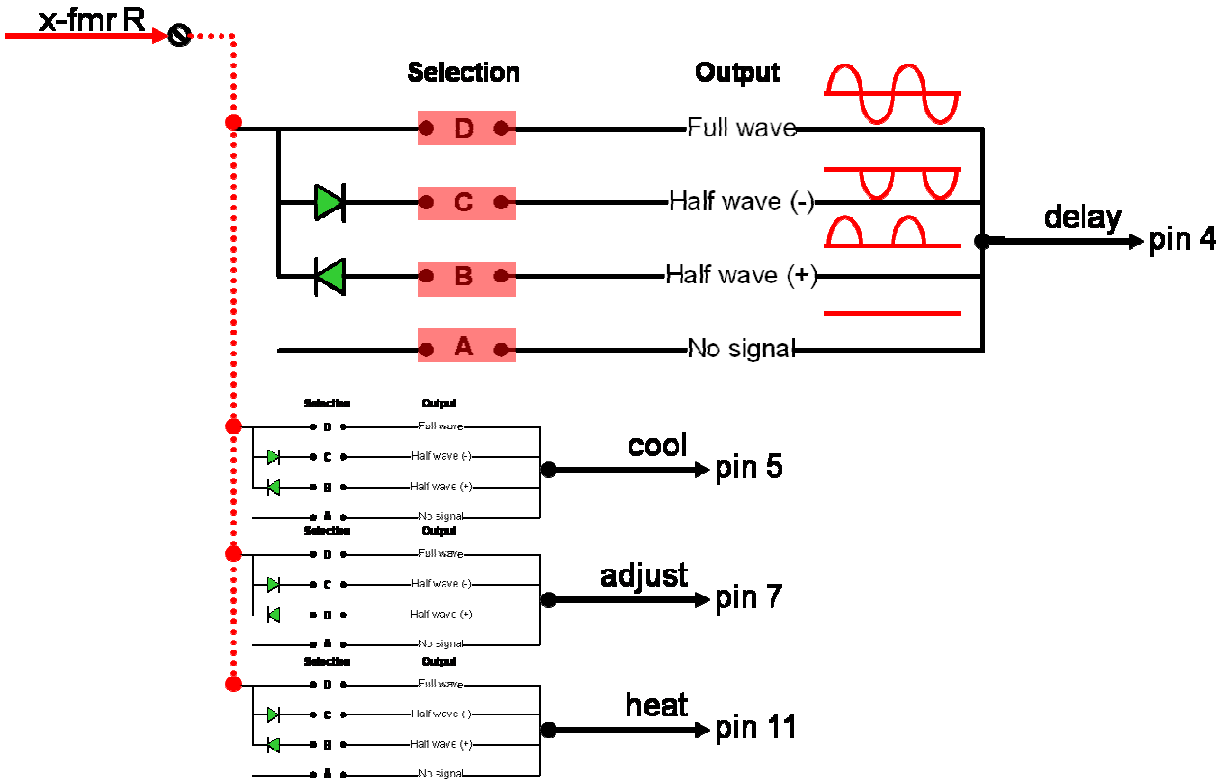
Reference numbers “1”, “8”, “9” & “16” are molded in the plastic connector on the wire entrance end

“O” - ORANGE	9	1	BLACK - common
“HUM” - BLACK	10	2	WHITE - “W2”
heat programmed input - BROWN	11	3	BLACK - common
“R” - RED	12	4	RED - delay programmed input
“W1” - BROWN	13	5	WHITE - cool programmed input
“Y2” - YELLOW	14	6	YELLOW - “Y1”
“G” - GREEN	15	7	PURPLE - adjust programmed input
motor speed feedback - YELLOW/BLACK	16	8	BLACK - common

16 Pin Plug Connector Detail



Electrical Layout – 16 Pin Plug Wiring



Pin Data – Pins 4, 5, 7, 11 (DELAY, COOL, ADJUST, and HEAT Data)