System Type

(Straight Cool with Electric Heat)

Other selections from set up menu;

Does the system have a two-stage compressor? NO

Does the system have a humidifier connected? YES

Does the system have a standalone De-humidifier? YES

Select ON if you would like to allow the thermostat to automatically control Dehumidification with Electric heat? ON (See note 1 if OFF)

Note 1.

If "*Select ON if you would like to allow the thermostat to automatically control Dehumidification with Electric heat?*" is OFF, the dehumidification sequences listed below would ONLY energize the DEHUM and G Fan contacts during a call for dehumidification.

There are (2) main control "Select buttons". ***FAN*** and ***SYSTEM***. Following is a breakdown of each. Additionally (2) Select buttons can be turned on for control of Humidity, ***HUMIDIFY*** and ***DE-HUMIDIFY***

Fan Modes are **AUTO** and **ON**

Auto In this position the indoor fan is energized with any call for Heat, Cool, De-Humidify, Humidify, and CO2 air change.

ON In this position the indoor fan is energized to run continuously.

System Modes are **OFF**, **COOL**, **HEAT**, **CRUISE CONTROL, DEHUMIDIFY,** and **HUMIDIFY.**

OFF This will command the whole system to shut down. (Fan can still run in the ON position) The detailed sequence will be outlined in more detail.

COOL This will energize the Cooling and Fan contacts based on the actual temp vs. the set temp. There are two stages of cooling, if that option has been selected in the installer setup menu. The detailed sequence will be outlined in more detail.

HEAT This will energize the Heating and Fan contacts. The detailed sequence will be outlined in more detail.

CRUISE CONTROL This will simply command the system to energize the associated contacts as needed for any "out of parameter" condition. This is only available if selected from the installer set up menu.

DE-HUMIDIFY This will energize the Cooling, Fan, Dehum and electric heating. This is only available if selected from the installer set up menu. Additional contacts are used for a stand-alone dehumidifier.

HUMIDIFY This will energize the fan and auxiliary contacts. This is only available if selected from the installer set up menu. The auxiliary contacts are used for a stand-alone humidifier.

Sequence of operation (6) Main control buttons set to **Fan AUTO/ON**, **System OFF**.

If the Fan select button is OFF and the system select button is OFF, all air monitoring remains active, but no action will be initiated regardless of temperature/humidity/CO2.

If the Fan select button is in the ON position and the system select buttons are in the OFF position, all air monitoring remains active, but no action will be initiated regardless of temperature/humidity. If the CO2 rises above 600ppm the *AUX1* CO2 contacts are energized to allow for an outside air damper to open, introducing fresh air into the space. Once the CO2 reaches 500ppm the *AUX1* CO2 contacts are de-energized. The *G* fan contacts simply remain energized since the Fan control button is in the ON position.

(The COOL temp set point is referenced for de-humidify if the system is in the **OFF** position)

If "**DE-HUMIDIFY**" is turned on, humidity is controlled in this mode as well. If the actual humidity rises more than 7% above the humidity set point, The *Y/Y2* compressor contacts, the *G* fan contacts, the *W* electric heating contacts and the *DEHUM* contacts will be energized. This will command the system to cool while reheat is introduced by electric heat to allow the space to dehumidify. Temperature must not go out of range while dehumidifying. Therefore, the *W* electric heat contacts are energized when the actual temp reaches the temp set point -5deg F and are de-energized when the actual temp reaches the set point +5deg F. This modulation will continue until the humidity reaches the humidity set point -3% AND the temperature is within 5deg F of the temperature set point.
Hard parameters are needed to keep the system from "Running away" in the event of a mechanical failure or lack of heating capacity. When/if the actual temp reaches the set point -6deg F, the system will de-energize the *Y/Y2* contacts while maintaining the *W* electric heat, *G* fan, and *DEHUM* contacts. Once the actual temp reaches the set point temp +6deg F then the *Y/Y2 contacts* can be energized again to commence the modulation.
If the temperature is within 5deg F above or below set point AND the humidity is within 5% of the set point, the system simply cycles to "idle". The *Y/Y2* compressor contacts, the *G* fan contacts, the *W* electric heat contacts and the *DEHUM* are all de-energized. The *G* fan contacts will remain energized if the fan control button is in the ON position.

If "**HUMIDIFY**" is turned on, a humidifier can be turned on from this mode. If the actual humidity is 7% below the humidity set point, the *G* fan contacts, and the *Hum* contacts are energized to allow a humidifier to increase space humidity. Once Actual humidity is 3% above humidity set point, the *Hum* contacts and the *G* fan contacts are de-energized. The *G* fan contacts will remain energized if the fan control button is in the ON position.

Sequence of operation (7) Main control buttons set to **Fan AUTO/ON** and **System COOL**.

The thermostat monitors the actual temp inside the space and compares it to the set point selected by the user. Should the actual temperature rise above the set point by .5deg F, the *Y/Y2* compressor contacts and the *G* fan contacts will be energized allowing the system to cool. When the actual temp falls below the set point by .5deg F then the *Y/Y2* and *G* contacts will be de-energized, and system will go back to idle. (Assuming humidity is in range). This small temp offset from set point prevents the system from short cycling while still maintaining close control of the desired temp. Once the contacts are de-energized a short minimum off timer begins a countdown to prevent mechanical short cycling. (timer set in user set up menu)

If "**DE-HUMIDIFY**" is turned on, humidity is controlled in this mode as well. If the actual humidity rises more than 7% above the humidity set point, The *Y/Y2* compressor contacts, the *G* fan contacts, the *W* electric heating contacts and the *DEHUM* contacts will be energized. This will command the system to cool while reheat is introduced by electric heat to allow the space to dehumidify. Temperature must not go out of range while dehumidifying. Therefore, the *W* electric heat contacts are energized when the actual temp reaches the temp set point -.75deg F and are de-energized when the actual temp reaches the set point +.75deg F. This modulation will continue until the humidity reaches the humidity set point -3% AND the temperature is within .5 deg F of the temperature set point.
Hard parameters need to keep the system from "Running away" in the event of a mechanical failure or lack of heating capacity. When/if the actual temp reaches the set point -1deg F, the system will de-energize the Y/Y2 contacts while maintaining the *W* electric heat, *G* fan, and *DEHUM* contacts. Once the actual temp reaches the set point temp +.75deg F then the *Y/Y2 contacts* can be energized again to commence the modulation.
If the temperature is within .5deg F above or below set point AND the humidity is within 5% set point, the system simply cycles to "idle".
The *Y/Y2* compressor contacts, the *G* fan contacts, the *W* electric heat

contacts and the *DEHUM* are all de-energized. The *G* fan contacts will remain energized if the fan control button is in the ON position.

If "**HUMIDIFY**" is turned on, a humidifier can be turned on from this mode. If the actual humidity is 7% below the humidity set point, the *G* fan contacts, and the *Hum* contacts are energized to allow a humidifier to increase space humidity. Once Actual humidity is 3% above humidity set point, the *Hum* contacts and the *G* fan contacts are de-energized. The *G* fan contacts will remain energized if the fan control button is in the ON position.

Carbon Dioxide detection is always active and operates independently/simultaneously with the above sequence.
If the CO2 rises above 600ppm the *AUX1* CO2 contacts and the *G* fan contacts are energized to allow for an outside air damper to open, introducing fresh air into the space. Once the CO2 reaches 500ppm the *AUX1* CO2 contacts and the G fan contacts are de-energized. The *G* fan contacts simply remain energized if the Fan control button is in the ON position.

Sequence of operation (8) Main control buttons set to **Fan AUTO/ON** and **System HEAT**.

The thermostat monitors the actual temp inside the space and compares it to the set point selected by the user. Should the actual temperature fall below the set point by .5deg F, the *W* electric heat contacts and the *G* fan contacts, will be energized allowing the system to Heat. When the actual temp rises above the set point by .5deg F then both contacts will be de-energized, and system will go back to idle. (Assuming humidity is in range). This small temp offset from set point prevents the system from short cycling while still maintaining close control of the desired temp. Once the contacts are de-energized a short minimum off timer begins a countdown to prevent mechanical short cycling. (timer set in user set up menu).

If "**DE-HUMIDIFY**" is turned on, humidity is controlled in this mode as well. If the actual humidity rises more than 7% above the humidity set point, The *Y/Y2* compressor contacts, the *G* fan contacts, the *W* electric heating contacts and the *DEHUM* contacts will be energized. This will command the system to cool while reheat is introduced by electric heat to allow the space to dehumidify. Temperature must not go out of range while dehumidifying. Therefore, the *W* electric heat contacts are energized when the actual temp reaches the temp set point -.75deg F and are de-energized when the actual temp reaches the set point +.75deg F. This modulation will continue until

the humidity reaches the humidity set point -3% AND the temperature is within .5 deg F of the temperature set point.
Hard parameters need to keep the system from "Running away" in the event of a mechanical failure or lack of heating capacity. When/if the actual temp reaches the set point -1deg F, the system will de-energize the Y/Y2 contacts while maintaining the *W* electric heat, *G* fan, and *DEHUM* contacts. Once the actual temp reaches the set point temp +.75deg F then the *Y/Y2 contacts* can be energized again to commence the modulation.
If the temperature is within .5deg F above or below set point AND the humidity is within 5% set point, the system simply cycles to "idle".
The *Y/Y2* compressor contacts, the *G* fan contacts, the *W* electric heat contacts and the *DEHUM* are all de-energized. The *G* fan contacts will remain energized if the fan control button is in the ON position.

If "**HUMIDIFY**" is turned on, a humidifier can be turned on from this mode. If the actual humidity is 7% below the humidity set point, the G fan contacts, and the *Hum* contacts are energized to allow a humidifier to increase space humidity. Once Actual humidity is 3% above humidity set point, the *Hum* contacts and the *G* fan contacts are de-energized. The *G* fan contacts will remain energized if the fan control button is in the ON position.

Carbon Dioxide detection is always active and operates independently/simultaneously with the above sequence.
If the CO2 rises above 600ppm the *AUX1* CO2 contacts and the *G* fan contacts are energized to allow for an outside air damper to open, introducing fresh air into the space. Once the CO2 reaches 500ppm the *AUX1* CO2 contacts and the G fan contacts are de-energized. The *G* fan contacts simply remain energized if the Fan control button is in the ON position.

Sequence of operation (9) Main control buttons set to **Fan AUTO/ON** and **System CRUISE CONTROL**.

The thermostat monitors the actual temp inside the space and compares it to both the Cooling *AND* Heating set points selected by the user. Should the actual temperature rise above the cooling set point by .5deg F, the *Y/Y2* compressor contacts, and the *G* fan contacts, will be energized allowing the system to cool. When the actual temp falls below the cooling set point by .5deg F then the *Y/Y2* and *G* contacts will be de-energized, and system will go back to idle. (Assuming humidity is in range). This small temp offset from set point prevents the system from short cycling while still maintaining close control of the desired temp. Once the contacts are de-

energized a short minimum off timer begins a countdown to prevent mechanical short cycling. (Timer set in user setup menu)
Additionally, if the actual temp inside the space falls below the heating set point by .5deg F, the *W* Electric heat contacts and the *G* fan contacts, will be energized allowing the system to Heat. When the actual temp rises above the set point by .5deg F then both contacts will be de-energized, and system will go back to idle. (Assuming humidity is in range). This small temp offset from set point prevents the system from short cycling while still maintaining close control of the desired temp. Once the contacts are de-energized a short minimum off timer begins a countdown to prevent mechanical short cycling. (Timer set in user setup menu)

If "**DE-HUMIDIFY**" is turned on, humidity is controlled in this mode as well. If the actual humidity rises more than 7% above the humidity set point, The *Y/Y2* compressor contacts, the *G* fan contacts, the *W* electric heating contacts and the *DEHUM* contacts will be energized. This will command the system to cool while reheat is introduced by electric heat to allow the space to dehumidify. Temperature must not go out of range while dehumidifying. Therefore, the *W* electric heat contacts are energized when the actual temp reaches the COOL temp set point -.75deg F and are de-energized when the actual temp reaches the COOL set point +.75deg F. This modulation will continue until the humidity reaches the humidity set point -3% AND the temperature is within .5 deg F of the temperature set point.
Hard parameters need to keep the system from "Running away" in the event of a mechanical failure or lack of heating capacity. When/if the actual temp reaches the COOL set point -1deg F, the system will de-energize the Y/Y2 contacts while maintaining the *W* electric heat, *G* fan, and *DEHUM* contacts. Once the actual temp reaches the COOL set point temp +.75deg F then the *Y/Y2 contacts* can be energized again to commence the modulation.
If the temperature is < .5deg F above the cooling set point AND >.5deg F below heating set point AND the humidity is within 5% above or below set point, the system simply cycles to "idle". The *Y/Y2* compressor contacts, the *G* fan contacts, the *W* electric heat contacts and the *DEHUM* are all de-energized. The *G* fan contacts will remain energized if the fan control button is in the ON position.

If "**HUMIDIFY**" is turned on, a humidifier can be turned on from this mode. If the actual humidity is 7% below the humidity set point, the G fan contacts and the *Hum* contacts are energized to allow a humidifier to increase space humidity. Once Actual humidity is 3% above humidity set point, the *Hum* contacts and the *G* fan contacts are de-energized. The *G* fan contacts will remain energized if the fan control button is in the ON position.

Carbon Dioxide detection is always active and operates independently/simultaneously with the above sequence.
If the CO2 rises above 600ppm the *AUX1* CO2 contacts and the *G* fan contacts are energized to allow for an outside air damper to open, introducing fresh air into the space. Once the CO2 reaches 500ppm the *AUX1* CO2 contacts and the G fan contacts are de-energized.
The *G* fan contacts simply remain energized if the Fan control button is in the ON position.