RAPID® InfinityPro™

Control System for 4000-Series Industrial Air Handler

User, Operation & Troubleshooting Manual

⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can result in death, injury or property damage. Read the Installation, Operation and Service Manual thoroughly before installing or servicing this equipment.

Installation must be done by an electrician qualified in the installation and service of control systems for heating equipment.

c UL US LISTED 1090

Installer

Please take the time to read and understand these instructions prior to any installation. Installer must give a copy of this manual to the owner.

Owner

Keep this manual in a safe place in order to provide your service technician with necessary information.

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SECTION 1: INTRODUCTION

This manual is to be used in conjunction with the RAPID® 4000-Series Industrial Air Handler Installation, Operation and Service Manual (P/N RP140000NA).

1.1 Safety

Your Safety is Important to Us! This symbol is used throughout the manual to notify you of possible fire, electrical or burn hazards. Please pay special attention when reading and following the warnings in these sections.

Installation, service and, at a minimum, annual inspection of the controller and its associated heating/cooling equipment must be done by an electrician qualified in the installation and service of control systems for heating equipment, using only replacement parts sold and supplied by Rapid Engineering LLC.

Installation, service and, at a minimum, annual inspection of the heater must be done by a contractor qualified in the installation and service of gas-fired heating equipment, using only replacement parts sold and supplied by Rapid Engineering LLC.

Read this manual carefully before installation, operation and service of this equipment.

The appliance must be applied and operated under the general concepts of reasonable use and installed using best building practices.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

For optimum heater performance and safe heating conditions, inspect and maintain heater before every heating season as necessary. Also, know and maintain heater clearances to combustibles, see heater Installation, Operation and Service Manual for further details. If you require additional manuals, contact Rapid Engineering LLC.

This air handler is designed for heating non-residential indoor spaces. Do not install in residential spaces.

These instructions, the layout drawing, local codes and ordinances and applicable standards that apply to gas piping, electrical wiring, ventilation, etc must be thoroughly understood before proceeding with the installation.

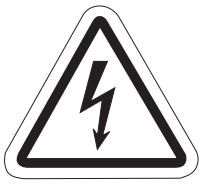
Gas-fired appliances are not designed for use in atmospheres containing flammable vapors or dust or atmospheres containing chlorinated or halogenated hydrocarbons. Recirculated room air my be hazardous if containing flammable solids, liquids and gases.; explosive materials; and/or substances which may become toxic when exposed to heat (i.e. refrigerants, aerosols, etc.)

1.2 What is a RAPID® InfinityPro™ Controller?

The RAPID® InfinityPro™ is a control system for use with a RAPID® 4000-Series air handler. It includes a DDC (direct digital control) controller containing 8 outputs (5 digital, 3 analog) and 6 universal inputs. An optional handheld keypad (remote control device) is available to be used on site as a start-up/ troubleshooting device. It may also be permanently mounted to a column or wall, and cabled to the DDC controller for use as a remote control device. If desired, the DDC controller allows the air handler to communicate with a building management system. The handheld keypad allows the end user to adjust settings, schedules, operating modes, as well as receive data independent of the building management system. Optional off-site communication capability is available.

1.3 Electrical Requirements

⚠ DANGER



Electrical Shock Hazard

Disconnect electric before service.

More than one disconnect switch may be required to disconnect electric from equipment.

Equipment must be properly grounded.

Failure to follow these instructions can result in death or electrical shock.

Failure to comply with the installation instructions will invalidate the limited warranty set out *on Page 61, Section 8*.

The RAPID® InfinityPro™ must be installed and electrically grounded in accordance with the following:

United States: Refer to National Electrical Code®, NFPA 70 - latest revision. Wiring must conform to the most current National Electrical Code®, local ordinances and any special diagrams furnished.

Canada: Refer to Canadian Electrical Code, CSA C22.1 Part 1 - latest revision.

1.4 Communication

The InfinityPro™ has built-in protocol support for BACnet®, Modbus and N2. Lonworks open communication protocol is also available as an option. Front-end air handling system software is available from Rapid Engineering LLC. *See Page 38, Section 5*.

SECTION 2: SEQUENCE OF OPERATION

⚠ DANGER

Electrical Shock Hazard

Disconnect electric before service.

More than one disconnect switch may be required to disconnect electric from equipment.

Equipment must be properly grounded.

Failure to follow these instructions can result in death or electrical shock.

⚠WARNING

Carbon Monoxide Hazard

Do not recirculate air from the heated space over burner.

Air supply to burner must be from outside.

Failure to follow these instructions can result in death or injury.

2.1 Air Handler Model Configurations

Based on the air handler application, the air handler may be configured in any of the four models described in the upcoming sections.

2.1.1 Air Management (AM)

The air handler provides a variable outside air / return air ratio within the range of 100% outdoor air / 0% return air to 20% outdoor air / 80% return air during the heating seasons, and up to 100% return air during the cooling season. The unit controls the amount of outdoor air delivered into the building by modulating outdoor air and return air dampers. Supply air volume is fixed.

2.1.2 Variable Air Volume (VAV)

The air handler provides 100% outdoor air with a variable supply air volume from 20% - 100% with use of bypass section. This air handler has no return air capabilities. The unit controls the amount of outdoor air delivered into the building by modulating dampers.

2.1.3 Make-Up Air (MUA)

The air handler provides a fixed supply air volume of 100% outdoor air to a building. This air handler has no return air capabilities. An optional variable frequency drive is available to modulate the total air volume when desired.

2.1.4 Fixed Recirculation (FR)

The air handler provides a fixed 20% outdoor air and 80% return air to a building. Supply air volume is fixed in both heating and cooling seasons.

2.2 Select Operating Modes

Each air handler is capable of operating in one of three different modes: Off, On or Auto mode can be selected. Flush mode is also available but forced via building sensor, such as carbon dioxide or carbon monoxide. Setting commands (*See Page 13, Table 2*) or status conditions (*See Page 21, Table 5*) can be viewed via front-end software available from Rapid Engineering LLC or handheld keypad (if connected). *See Page 38, Section 5* for additional information on Rapid Engineering LLC provided front-end software.

2.2.1 Off

In this mode of operation, the fan and burner are off and all outdoor air dampers are closed. The air handler continues to report status conditions and other settings based on operating conditions.

2.2.2 On

In this mode of operation, the Time Clock / Schedule is not in use. The fan runs continuously, the available heating and cooling functions respond to maintain their occupied settings.

2.2.3 Auto

In this mode of operation, the air handler is controlled by the Time Clock. During occupied periods, the fan runs continuously. Heating and cooling functions respond as needed to maintain their respective settings. During unoccupied periods, the fan and heat will both cycle on and off as needed to maintain the unoccupied setback temperature setting. Any available cooling functions are not active during unoccupied time periods.

2.3 Outdoor Air Control

Reference RAPID® 4000-Series Industrial Air Handler Installation, Operation and Service Manual (RP140000NA) Installer Responsibility section for building pressure damper relief information.

- Installer is responsible to provide building pressure relief/damper fans to prevent over pressurization of a building, if needed.

2.3.1 Manual Percent Outdoor Air

This is applicable only to Air Management and Variable Air Volume model configuration. Whenever the fan is operating, the mixing dampers are fixed at the Manual Air setting.

2.3.2 Auto Room Pressure

This is applicable only to Air Management and Variable Air Volume model configuration. A pressure transducer compares the pressure inside the building to the pressure outside the building or can be used to compare pressure from a particular room to an adjacent room. Whenever the fan is operating, the dampers are automatically positioned to maintain the Auto Room Pressure setting, except during the following conditions:

1. Economizer is active. (*See Page 6, Section 2.8.1*)
2. Evaporative Cooling is operating. (*See Page 6, Section 2.8.2*)
3. Flush mode is activated. (*See Page 4, Section 2.4*)

2.4 Flush Mode

Flush mode provides 100% outdoor air to the building space. It is applicable to many model configuration styles: Air Management, Variable Air Volume and Make-Up Air. Even if the air handler is in the unoccupied period or Off mode, the fan will start when Flush mode is triggered. The temperature controls respond as needed to maintain the heating and cooling set points. This forced fresh air condition overrides both Manual Percent Outdoor Air (*See Page 4, Section 2.3.1*) and Auto Room Pressure (*See Page 4, Section 2.3.2*) damper operations.

2.5 Heating Control Type Occupied Period

During an occupied period, the fan runs continuously and heat is provided. There are three different types of heating controls available: Room Air Temperature Control, Force Supply Air Heating and Outdoor Air Room Control. When changing a temperature heating type control, careful consideration should be taken.

2.5.1 Room Air Temperature Control

- The heating setting is activated if the room temperature falls below the Occupied Heating setting. The heat is dynamically modulated to maintain the supply air temperature between the minimum and maximum supply air temperature settings as needed to maintain the Occupied Heating setting.
- If the room temperature continues to increase reaching the Heat Off Setting, the heat is deactivated. The heat will remain off until the room temperature drops below Occupied Heating setting.

2.5.2 Forced Supply Air Heating

- If the room temperature drops below the Occupied Heating Setting, the heat will start and modulate as needed to maintain the Forced Supply Air Heating setting.
- If the room temperature continues to increase reaching the Heat Off Setting, the heat is deactivated. The heat will remain off until the room temperature drops below the Occupied Heating setting.

2.5.3 Outdoor Air Room Control

- If the outdoor air temperature drops below the Outdoor Air Heat On setting, the heating function is activated.
- When the heat is on, the supply air temperature is controlled as detailed *on Page 5, Section 2.5.1* - Room Temperature Control.
- The heat will shut off when the outdoor air temperature is above the Heat Off If Outdoor Air Above setting.

2.5.4 Heating Function Notes

- The heat is disabled if the outdoor air temperature is greater than the Heat Off If Outdoor Air Above setting for all of the temperature controls listed above. The factory default setting is 95 °F. This function is available in all three heating types as described *on Page 5, Section 2.5.1 through Page 5, Section 2.5.3*.
- If the heat fails and the supply air temperature drops below the Fan Off If Supply Air Temp Below setting, the fan will shut off and generate an alarm (*See Page 23, Section 3.9*).
- The fan and heat operation are disabled in the unoccupied period.

2.6 Heating Mode Unoccupied Setback

During an unoccupied setback period, the fan and heat will only run when the room temperature falls below the Unoccupied Setback Temp setting. Cooling is disabled during unoccupied periods.

2.6.1 Room Air Temperature Control & Forced Supply Air Heating

If the room temperature falls below the Unoccupied Setback Temp setting, the fan and heat will start. The heat will remain on until the room temperature reaches the Heat Off Setting.

2.6.2 Outdoor Air Room Control

When this function is selected, the fan and heat operation are disabled in the unoccupied period.

2.7 Heating Types

2.7.1 Direct Fired Gas Burner

The burner is controlled by an analog output from the RAPID® InfinityPro™ controller and will operate as described in Heating Mode occupied period *on Page 4, Section 2.5 through Page 5, Section 2.6*.

2.7.2 Electric, Hot Water or Steam Coils

Heat output modulation of the coils is performed via an analog output from the RAPID® InfinityPro™ controller. Upon a call for heat, fan operation is delayed for 60 seconds to allow for coil warm up. When in the heating mode, the controller will modulate the heating coil as described *on Page 4, Section 2.5 through Page 5, Section 2.6*. For electric, hot water or steam as a heat source, configure the controller as per *Page 26, Section 3.12*.

2.8 Cooling Types

RAPID® InfinityPro™ controller provides a single output for cooling control. The cooling output activates an evaporative cooling module or mechanical cooling coil (initiation only). For multiple stages of mechanical cooling, consult the factory.

2.8.1 Economizer (AM & VAV Models)

The Economizer is a selectable feature and must be selected ON with the settings screen (*See Page 13, Section 3.6*) in order to function. Outdoor air for cooling is used when the outdoor air temperature is below a user-specified value for the Economizer Setting. Whenever the outdoor air temperature is above the Economizer Setting, the air handler will operate with the amount of outdoor air determined by the Outdoor Air Control setting.

When selected, the Economizer functions as if there is no call for heat. A condition in which there is no call for heat is if the outdoor air temperature falls below the Economizer Setting and the room air temperature is above the Cooling Setting. If all of these conditions are met, the Economizer control brings in up to 100% outdoor air to maintain the Cooling Setting. When the room air temperature falls below the Cooling setting, the air handler will resume damper modulation determined by the Outdoor Air Control setting.

While bringing in additional outdoor air for cooling, the room pressure may rise above the Room Pressure Setting. To minimize the potential for an excessively high building pressure, relief dampers can be installed. During Economizer operation, if the supply air temperature falls below the Supply Air Min Temp setting, the dampers will modulate to maintain the Supply Air Min Temp setting.

2.8.2 Evaporative Cooling

Evaporative Cooling overrides the Economizer control. The dampers are forced to 100% outside air on AM & VAV models when the room temperature rises above the Cooling Setting. A digital output from the controller will enable the Evaporative Cooler. When the Cooling Setting is satisfied, the air handler will resume damper modulation based on the previously selected Auto Room Pressure or Manual Percent Outside Air setting.

While bringing in additional outdoor air during evaporative cooling operation, the room pressure may rise above the Auto Room Pressure setting. To minimize the potential for an excessively high building pressure, relief dampers can be installed in the space.

2.8.3 Mechanical Cooling

The 20% burner supply air damper on Air Management and Variable Air Volume models is closed at all times during the cooling operation with the exception of Evaporative Cooling. Mechanical Cooling is available in both Auto Room Pressure and Manual Percent Outside Air setting.

2.8.4 Time Clock

The air handler can be controlled by more than one schedule, but not at the same time. The schedule source must be selected by the operator. Selecting the schedule source is accomplished via the configuration screen (*See Page 26, Section 3.12*) using the handheld keypad, a building management (automation) system or WebCTRL software. *See Page 8, Section 3* for more information on keypad screens *and Page 15, Table 3* for schedule options.

2.9 Options

2.9.1 Energy Alert Control (AM &VAV Models)

This control function is only active during occupied periods and when the air hander is in the Auto Room Pressure setting. When activated, this control function monitors the room pressure. If for any reason the room pressure remains 0.01" w.c. below the Auto Room Pressure setting for ten consecutive minutes, the energy alert control reverts back to the Unoccupied Setback Temp setting. The dampers are then forced to the minimum outside air position (20% outdoor air / 80% return air). This condition will be maintained for 20 minutes or until the room under pressure condition has been corrected. Once either of these events occur, the Occupied Heating setting is restored and modulation of the dampers is returned to Auto Room Pressure control. NOTE: Each time the energy alert control reverts to the Unoccupied Setback Temp, an alarm is activated to alert low building pressure.

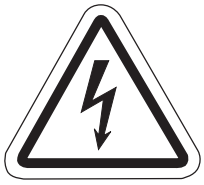
2.9.2 Make Up Air Units with Variable Frequency Drive

When a variable frequency drive is installed on a make-up air unit, the fan modulates between the minimum and maximum air delivery capacity of the air handler vs. the Auto Room Pressure setting to control building pressure. Auto Room Pressure setting can be adjusted within the setting screen (*See Page 13, Section 3.6*) with the handheld keypad or by using head end software (*See Page 38, Section 5*). Burner air velocity is controlled by a profile damper. A pressure transducer compares static building pressure to the static pressure outdoors, or to the pressure in another part of the building.

2.9.3 Forced Occupied

When the air handler is equipped with a room sensor (RS Plus or RS Pro), the unit can be forced to occupied mode by pushing the "manual on" button located on the face of the room sensor. Each time this button is pushed, it adds 30 minutes to occupied period, up to a total of four hours. Holding the "manual on" button in for three seconds cancels the Forced Occupied period.

SECTION 3: USER INSTRUCTIONS

⚠ DANGER	⚠ WARNING		
			
Electrical Shock Hazard **Disconnect electric before service.** **Heater must be connected to a properly grounded electrical source.**	**Explosion Hazard** **Turn off gas supply to heater before service.**	**Burn Hazard** **Allow heater to cool before service.** **Tubing may still be hot after operation.**	**Cut/Pinch Hazard** **Wear protective gear during installation, operation and service.** **Edges are sharp.**
Failure to follow these instructions can result in death, electric shock, injury or property damage.			

3.1 Overview

The handheld keypad allows the user to adjust setpoint values and receive data directly from an individual air handler's RAPID® InfinityPro™ controller. To operate as a remote control device, the handheld keypad requires connection to the bottom of the room temperature sensor. For the handheld keypad to be used as a service tool, it can be directly connected to the air handler mounted RAPID® InfinityPro™ controller. In either case, the handheld keypad provides the user with access to all available controller setpoints and reported status conditions.

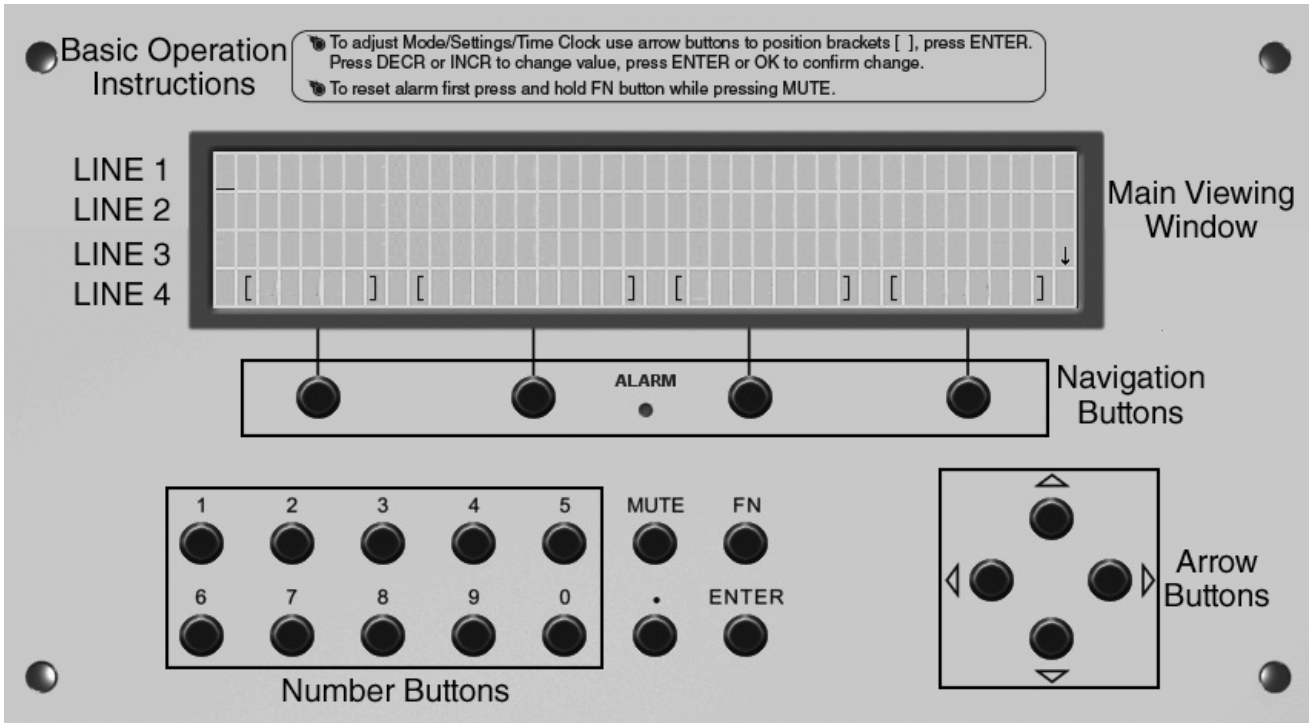
The main viewing window has four lines of text available. *See Page 9, Figure 1*. When navigating through the various screens, text will change as needed to reflect the air handler settings or status conditions appropriate for the currently active screen. Text on line 1 will indicate the air handler operating setting or status condition. Based on active screen, items can be changed or monitored. Text on line 2 and line 3 provide additional information on the features represented. Within active screen, an arrow may appear all the way to the right of line 3. The presence of an arrow on this line represents the viewing area of the screen may be scrolled up or down to access additional features or settings. On line 4 in the main viewing window, bracketed text appears above any of the four navigation buttons. Using the navigation buttons, the user is able to switch screens based on selected bracketed text.

Based on selected screen, temperatures are displayed as a variable setting or status condition. Temperatures indicated are in Fahrenheit.

3.2 Keypad Screen Brightness Adjustment

The contrast of the screen can be adjusted by rotating the adjusting screw with a screwdriver. The adjustment screw is located on the left side of the top edge of the handheld keypad. Rotate it counter clock-wise (CCW) to make it brighter and clock-wise (CW) to make it dimmer.

FIGURE 1: Basic Screen Overview

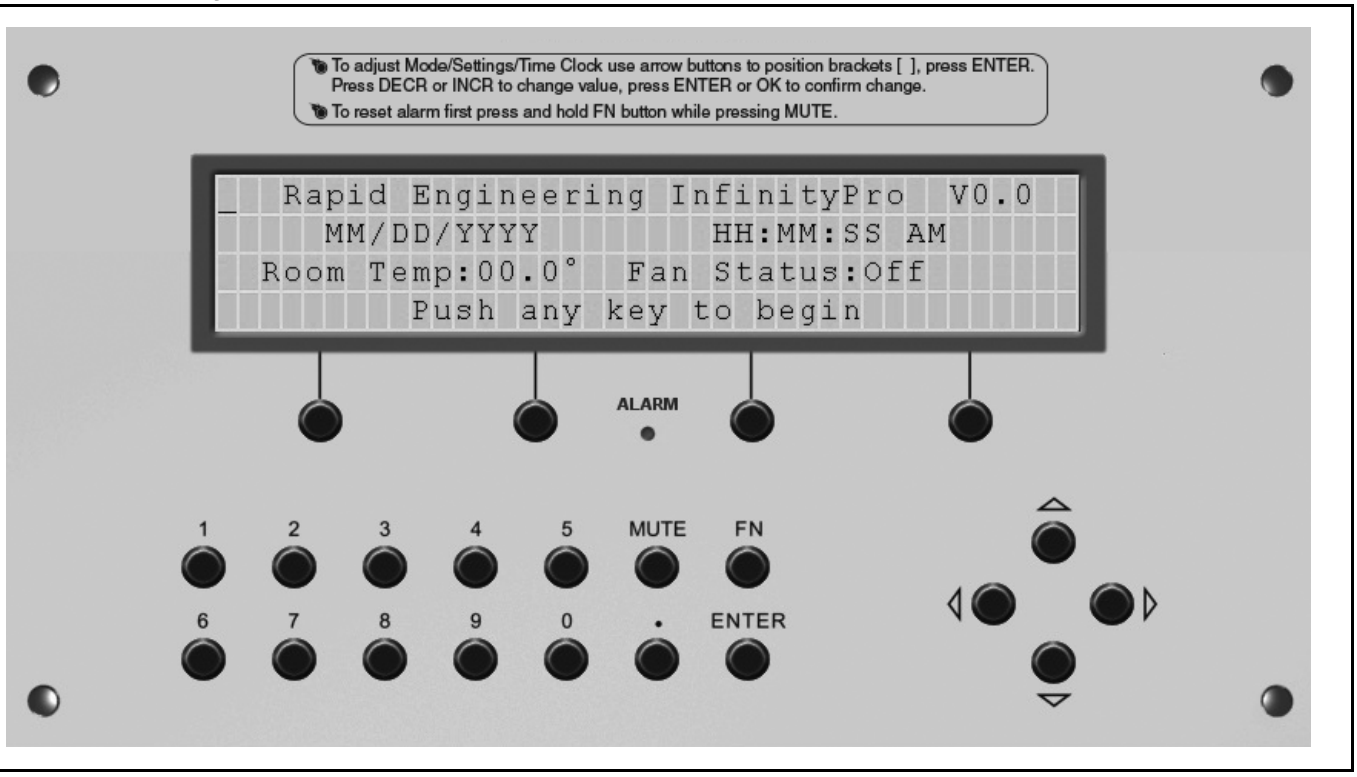


3.3 Standby Screen

When the handheld keypad is connected to the DDC Controller, the first screen to appear will be the Standby Screen. *See Page 10, Figure 2*. User will be able to easily identify room temperature and fan status based on information shown in main viewing window on line 3. For convenience, date and time are also shown on line 2. Within standby screen parameters, information is fixed (room temperature and fan status). In order to implement changes, push any key and follow directions based on subsequent screens.

If inactivity takes place for one minute, this screen will be displayed. This is the factory default setting. User can change inactivity time duration in the Configuration Screen. A special button sequence is required to access the Configuration Screen. *See Page 26, Section 3.12*.

FIGURE 2: Standby Screen

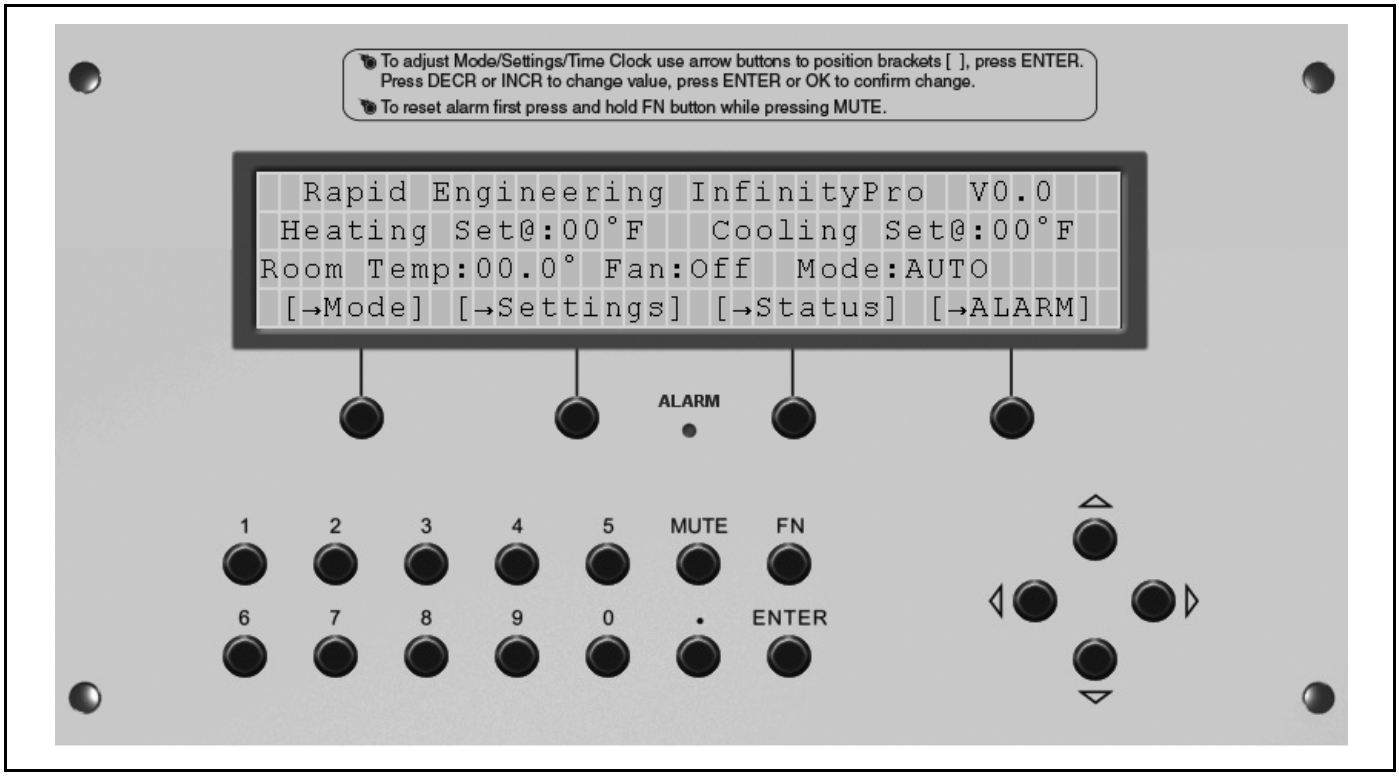


3.4 Home Screen

On the Home Screen (*See Page 11, Figure 3*) the user can easily identify heat/cool settings, room temperature, fan status and mode of operation. Within screen parameters, information is fixed (room temperature, fan status and mode of operation). In order to implement changes, advance to appropriate primary screen based on desired changes. *See Page 29, Section 3.13*.

From the Home Screen, the user can navigate to each subsequent primary screen (Mode, Settings, Status and Alarm). The navigation buttons under the bracketed corresponding text, once selected, advance user to the next screen. Screen advances are [→ Mode], [→ Settings], [→ Status], or [→ Alarm]. For Mode information, *See Page 12, Section 3.5*. For Setting information, *See Page 13, Section 3.6*. For Status information, *See Page 21, Section 3.8*. For Alarm information, *See Page 23, Section 3.9*.

FIGURE 3: Home Screen



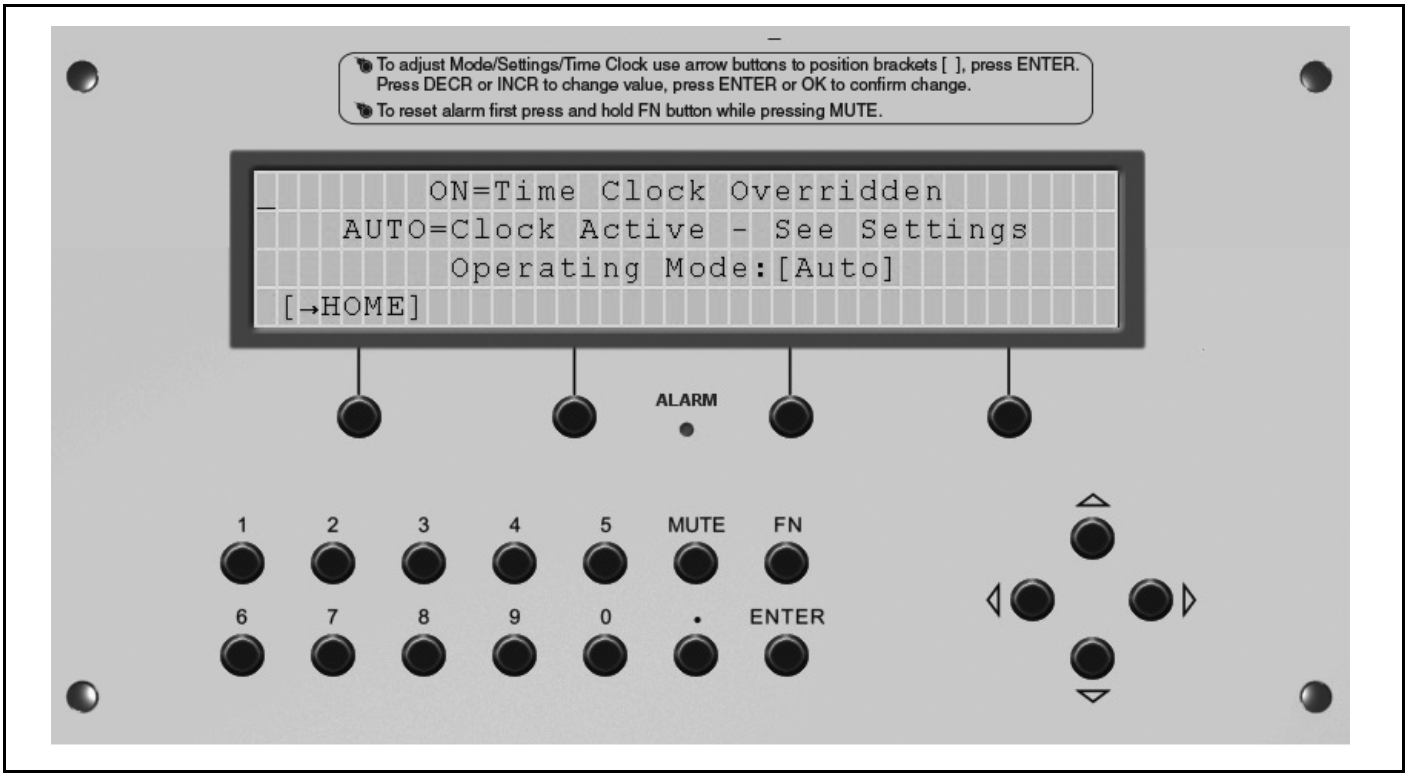
3.5 Mode Screen

On the Mode Screen (*See Page 12, Figure 4*), the air handler mode of operation can be selected. ON, OFF and AUTO are the three modes available. On line 3, bracketed text represents mode of operation selected and is adjustable by the user. In order to change operating mode, use arrow keys to navigate around main viewing window and enclose ON/OFF/AUTO text. Once ON/OFF/AUTO is properly bracketed, press enter on keypad. The text [OK][CANCEL][DECR] and [INCR] will then appear in line 4. Using a combination of the arrow buttons and [INCR] or [DECR] navigation buttons, the mode can be altered. Use the [CANCEL] button to terminate the command and use the [OK] button to accept the command. *See Page 12, Table 1* for operation modes with descriptions.

Table 1: Mode Commands

Mode of Operation	Description
OFF	The fan and heat will not run unless overridden by flush or forced occupied command. The air handler is turned off.
ON	The fan runs continuously, the available heating and cooling functions respond to maintain their occupied settings. The time clock/schedule is not in use.
AUTO	The fan will run continuously in the occupied period and turns off in the unoccupied period unless the room temperature falls below the unoccupied heat setting. The heat cycles on and off based on the heat setting. During scheduled occupied periods, the air handler operates in the occupied sequence of operation. During scheduled unoccupied periods, the air handler operates in the unoccupied sequence of operation. The air handler operates based on the scheduling that is entered into the controller, or as directed by the hand-held keypad, web control or BAS.

FIGURE 4: Mode Screen



3.6 Setting Screen

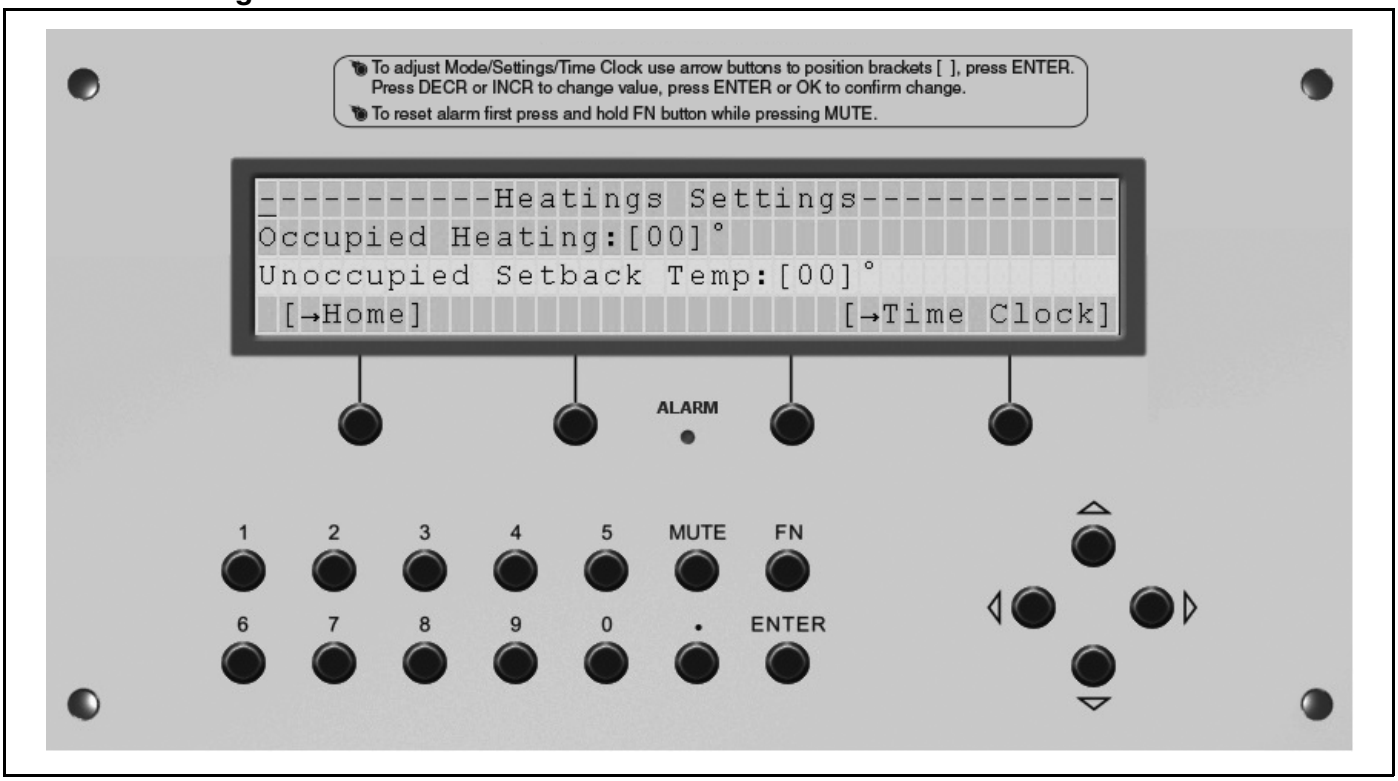
On the Setting Screen (*See Page 14, Figure 5*), various heating and cooling commands are available in addition to outdoor air control adjustments. Each setting is adjustable based on desired user operation.

This screen has a show / hide feature that automatically displays applicable setting commands based on air handler features. *See Page 13, Table 2* for a complete list of setting commands available. Not all settings will be displayed at one time on the handheld keypad. At the end of line 3 (*See Page 9, Figure 1* for reference), when arrow is visible, use arrow buttons to scroll up/down for additional settings. Settings can be changed with the handheld keypad via number buttons to define settings.

Table 2: Setting Commands

Setting	Description of Temperature and Outdoor Air Settings
Occupied Heating	This setting is used to specify the desired room temperature that is maintained during occupied periods.
Unoccupied Setback Temp	This setting is used to specify the desired room temperature that is maintained during unoccupied periods.
Heat Off Above Heating Setting	This setting is added to the Occupied and Unoccupied heat setting to define the temperature at which the heat turns off. This is referred to as the Heat Off Setting on the Status screen of the handheld keypad. (*See Page 21, Table 5*).
Forced Supply Air Heating	Defines the supply air temperature when the temperature controls selected are Forced Supply Air.
Supply Air Min Temp	Defines the supply air minimum temperature when temperature controls selected are Room Air Temperature Control and Outdoor Air Room Control.
Supply Air Max Temp	Defines the supply air maximum temperature when the temperature controls selected are Room Air Temperature Control and Outdoor Air Room Control.
Supply Air Max Temp Locked	This setting is displayed when the unit is configured with a 30 °F plus heat setting lock. It is not adjustable.
Outdoor Air Heat On	When enabled, the heat will turn on based on this setting.
Heat Off If Outdoor Air Above	The heat will shut off if outdoor air temperature raises above this setting.
Fan Off If Supply Air Temp Below	The fan will shut down if supply air temperature falls below this setting for more than 5 minutes.
Cooling	The setting that starts the cooling sequence, if available. The cooling set point cannot be set below Heating Off Setting plus one.
Economizer	Enables or disables the Economizer by turning it ON or OFF.
Economizer Setting	Defines the maximum outdoor temperature allowed for Economizer cooling.
Outdoor Air Control	Pressure: the dampers modulate automatically to maintain Auto Room Pressure. Manual: the dampers are fixed at a user defined setting.
Auto Room Pressure	Defines the setting when Pressure is selected. The dampers modulate automatically to maintain Auto Room Pressure.
Manual Percent Outdoor Air	Defines the setting when Manual is selected. The dampers remain fixed until the setting is changed.

FIGURE 5: Setting Screen



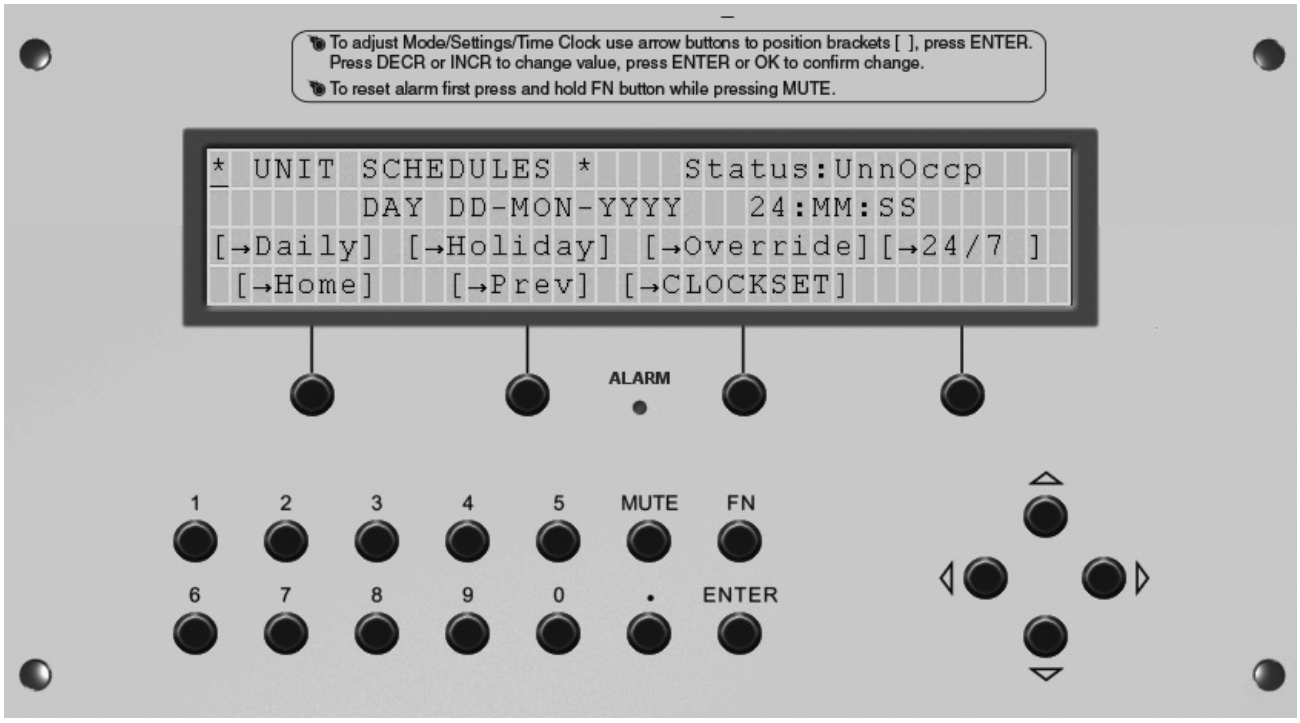
3.7 Time Clock

The air handler can be controlled by more than one schedule, but not at the same time. The schedule source must be selected by the user; the default is handheld keypad. Selecting the schedule source is done using the handheld keypad from the Configuration menu or by the 3rd party front end.

Table 3: Schedules

Schedule Options	Description
Daily	Typical daily schedule defined by normal occupied period.
Holiday	The Holiday schedule forces the air handler to the unoccupied mode overriding the daily schedule for all periods defined as a Holiday.
Override	The Override schedule forces the air handler to the occupied mode overriding all other schedules for the periods defined as Override.
24/7	Forces the air handler to occupied mode 24 hours a day, 7 days a week.
Clockset	Use this feature to update the time and date of the air handler controller to which the hand-held keypad is connected.

FIGURE 6: Time Clock Screen



3.7.1 Daily Schedule

Using the arrow buttons, move the brackets between the start and stop times. Press the ENTER button to change the start and stop times. The text [OK] [CANCEL] [DECR] and [INCR] will appear at the bottom of the screen. Change the values to the desired settings. Next, using the arrow buttons, move the brackets and select the days you want the air handler to operate. Press the ENTER button and use the [DECR] & [INCR] to hide or show the days. Press the [OK] to accept the change.

To activate the schedule, it must be turned on by selecting YES next to the word Use.

There are three daily schedules, two holiday schedules, two override schedules, and one 24/7 schedule available.

Operation is limited to 24-hour clock, astronomical time.

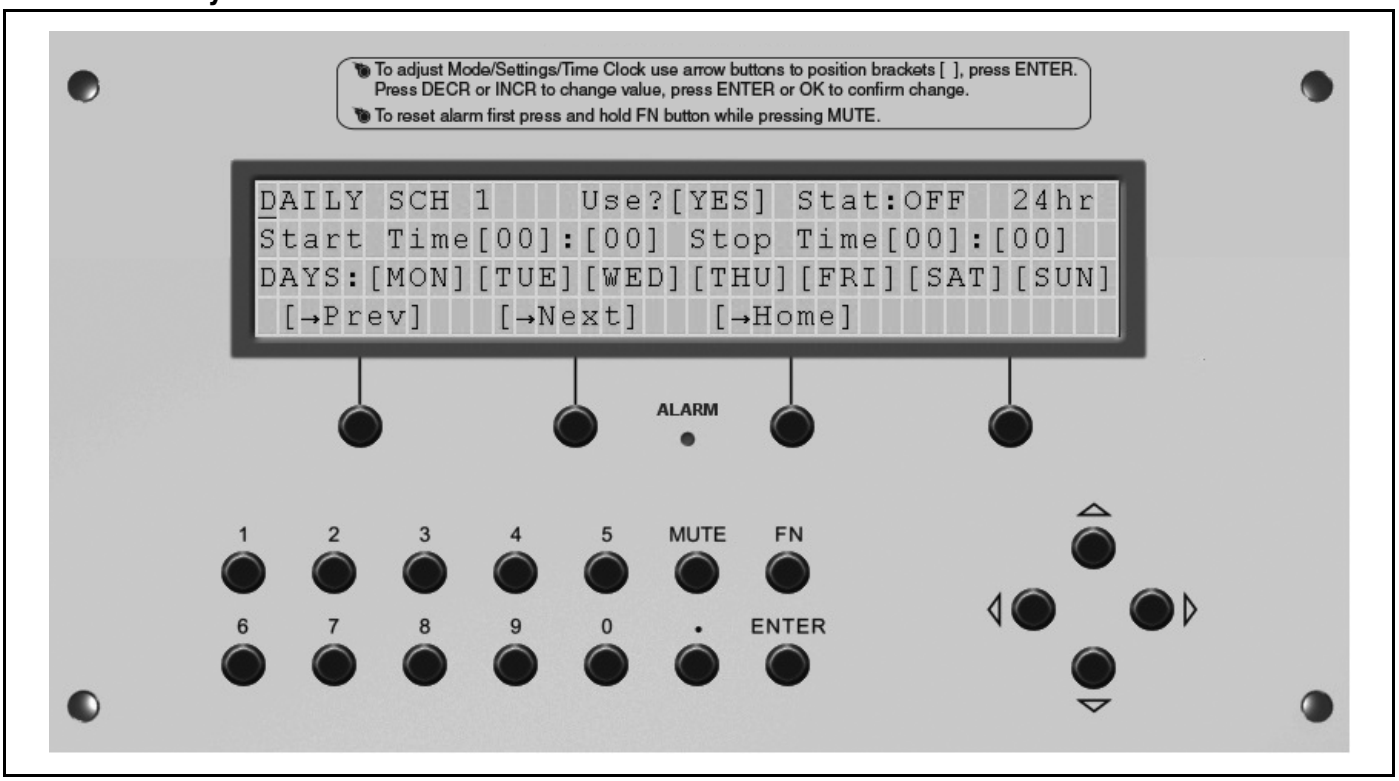
Each day's schedule may not be set to stop later than 23:59 PM. If you want the schedule to run past midnight, two schedules must be established to cover the occupied period.

An example of a schedule to run from 7:00 AM to 2:00 AM Monday through Saturday is as follows:

Table 4: Schedule Example

Example	Start	Stop	Days
Daily Schedule 1	07:00	23:59	- M T W T F -
Daily Schedule 2	00:00	02:00	- - T W T F S

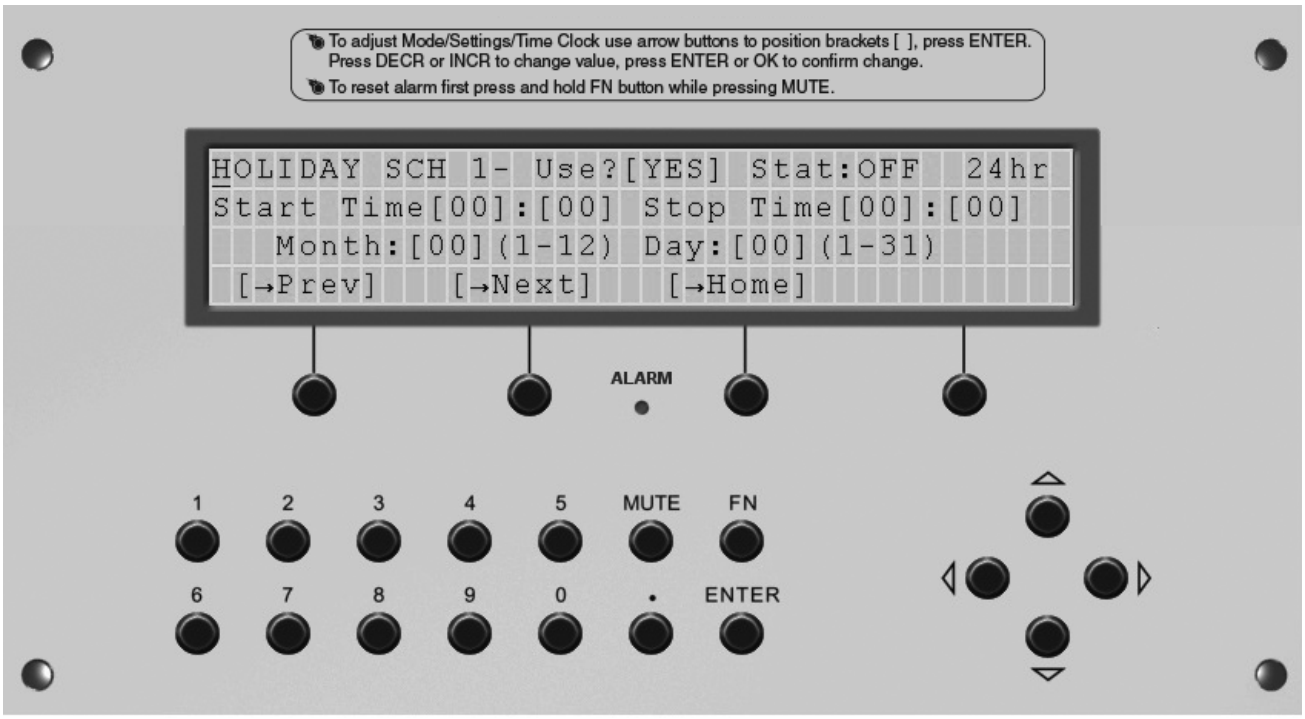
FIGURE 7: Daily Schedule Screen



3.7.2 Holiday Schedule

The holiday schedule forces the air handler to the unoccupied mode. *See Page 5, Section 2.6*.

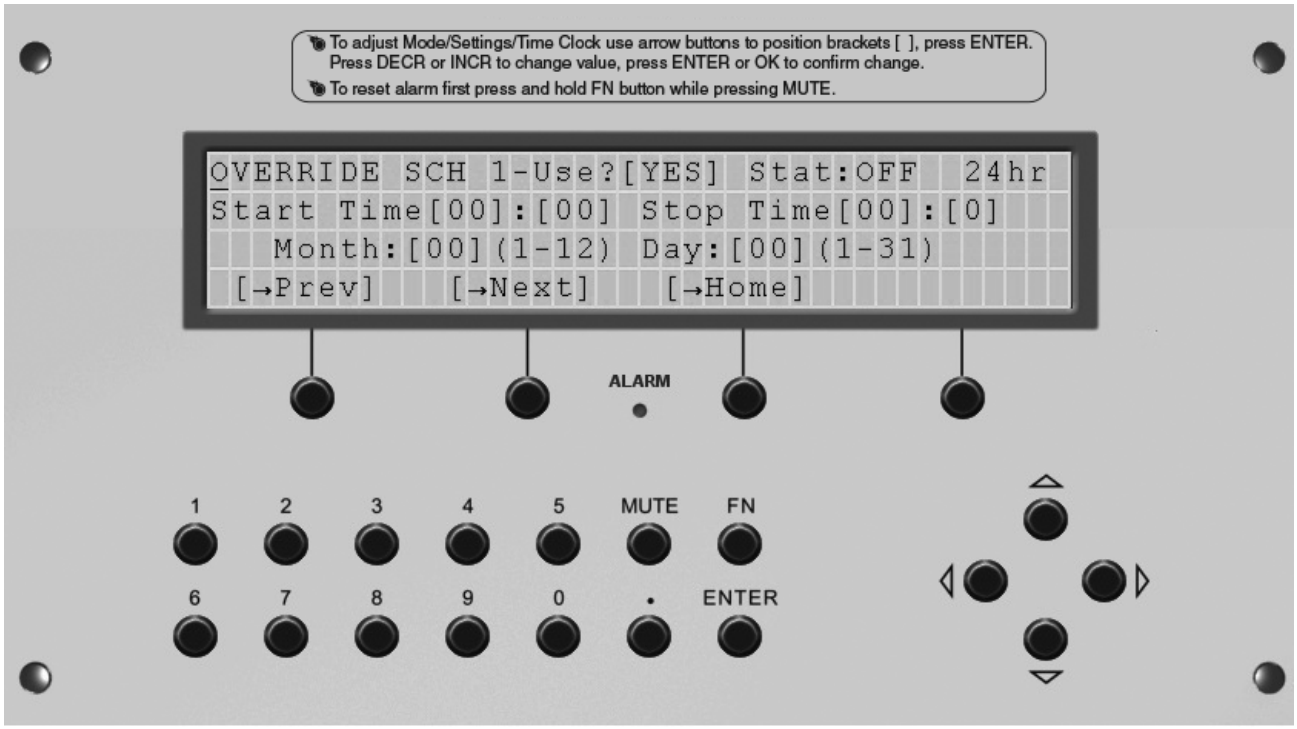
FIGURE 8: Holiday Schedule Screen



3.7.3 Override Schedule

The Override Schedule forces the air handler to the occupied mode overriding all other schedules.

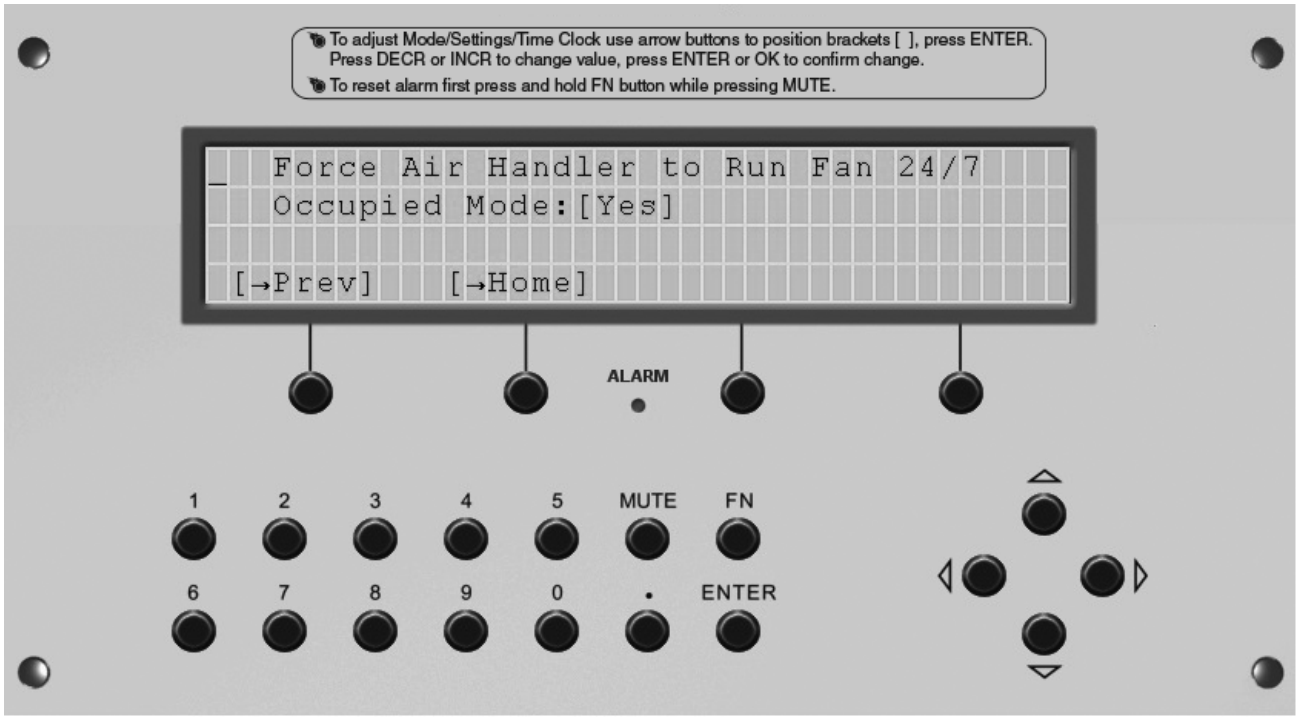
FIGURE 9: Override Schedule Screen



3.7.4 24/7 Schedule

The 24/7 schedule forces the air handler into occupied mode 24 hours a day, 7 days a week.

FIGURE 10: 24 Hours a Day 7 Days a Week (24/7) Screen

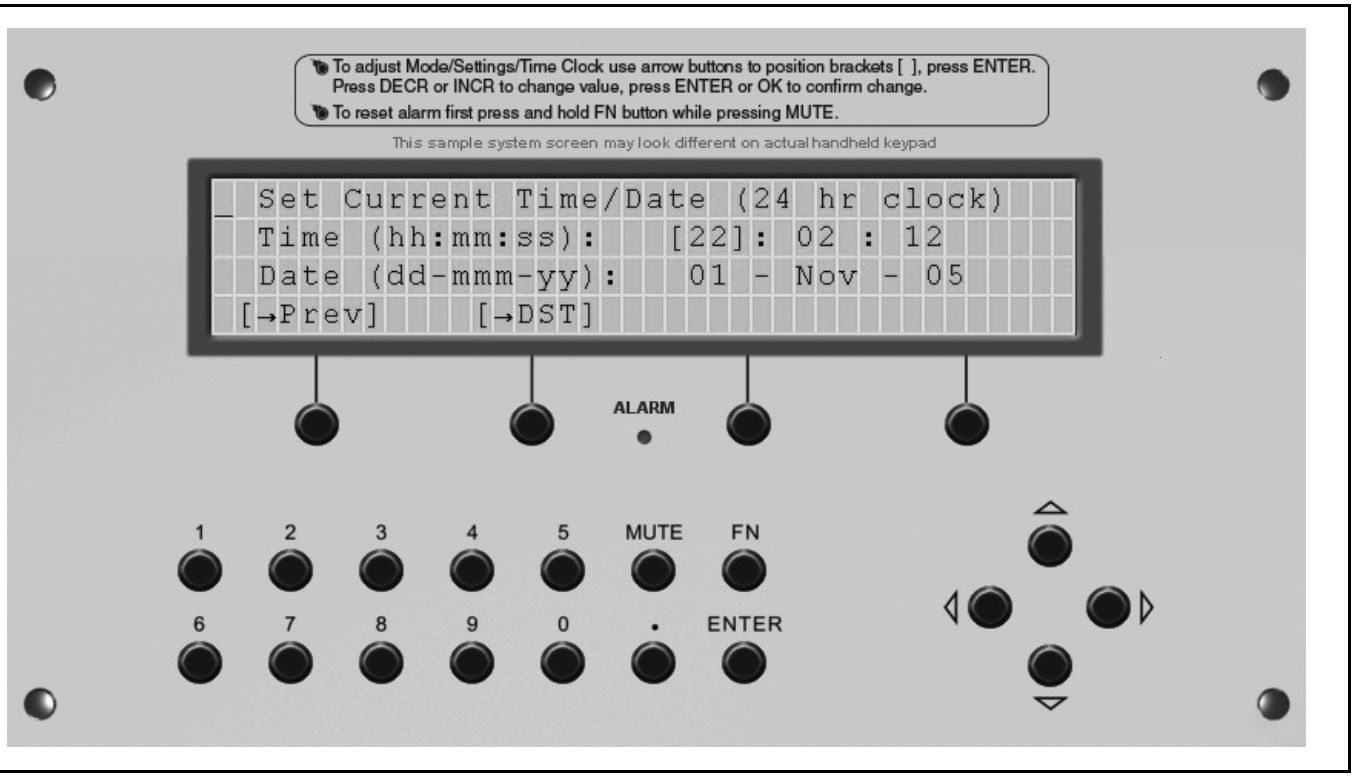


3.7.5 Clock Set

To change the time and date, use the arrow buttons to move the brackets over the desired time or date. Push the ENTER button then use the [DECR] or [INCR] buttons at the bottom of the display to make the change. Push the ENTER or [OK] button to accept the change.

Pushing the DST button will enable the operator to shift the controller to daylight savings time.

FIGURE 11: Clock Set Screen



3.8 Status Screen

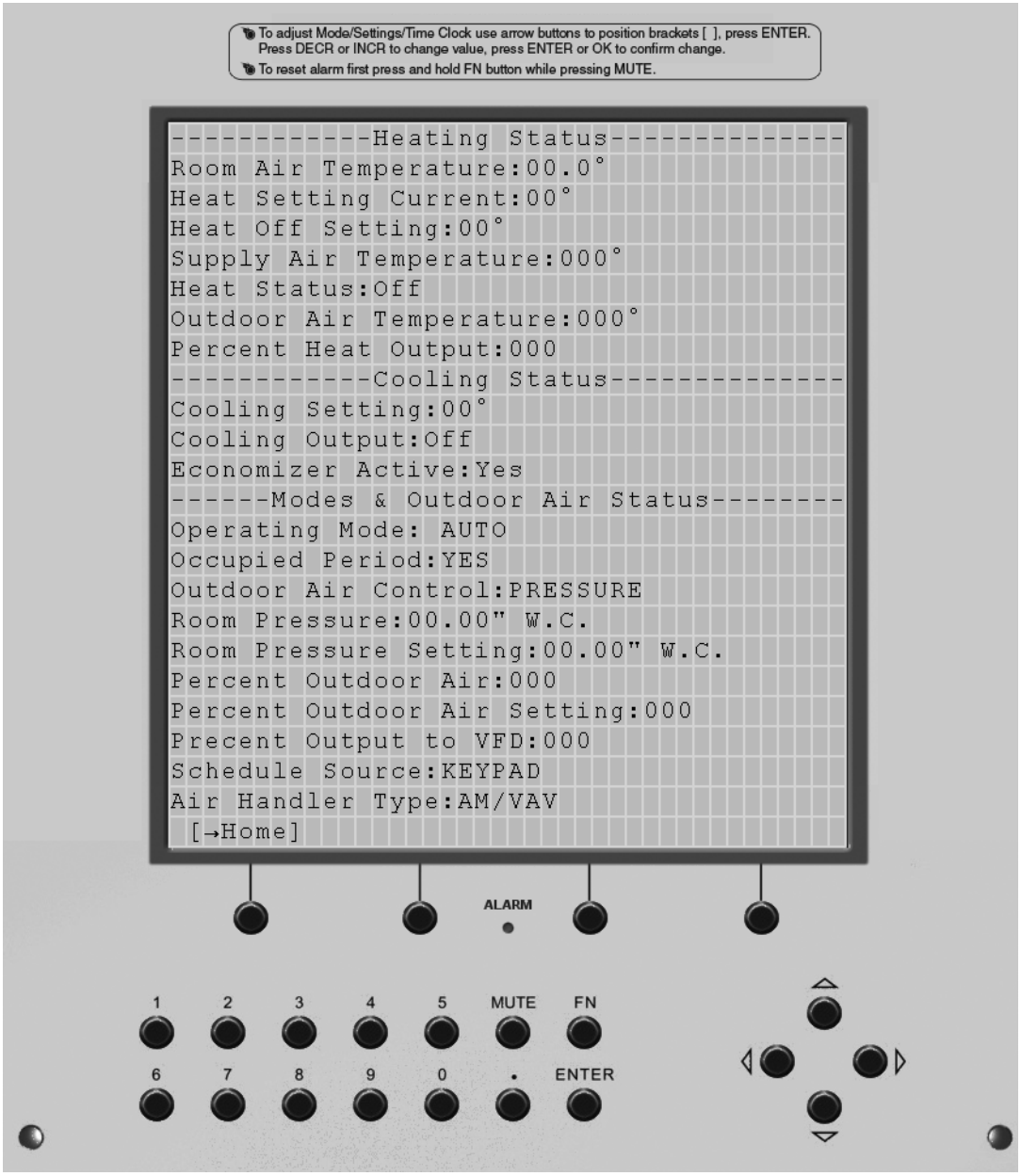
On the Status Screen (*See Page 22, Figure 12*), users are able to view all current conditions with heating, cooling and outdoor air status. Within screen parameters, results displayed are fixed. In order to change air handler status, advance to appropriate setting screen based on desired changes.

This screen has a show / hide feature that automatically displays applicable status conditions. *See Page 21, Table 5* for a complete list of status conditions available. Depending on the model and features of the air handler, not all status conditions will be displayed at one time on the handheld keypad. At the end of line 3, when arrow is visible, use arrow buttons to scroll up/down for additional status options.

Table 5: Status Conditions

Status	Description
Room Air Temperature	Displays current room temperature
Heat Setting Current	Displays current heat setting for either occupied or unoccupied period determined by time clock
Heat Off Setting	Displays current heat off setting for either occupied or unoccupied period
Supply Air Temperature	Displays current supply air temperature
Heat Status	Displays if the heat is ON or OFF
Outdoor Air Temperature	Displays current outdoor air temperature
Percent Heat Output	Displays the current output percent to the heat source
Cooling Setting	Displays the current cooling setting
Cooling Output	Displays if the cooling output is ON or OFF
Economizer Active	Displays if the economizer is active by YES or NO
Operating Mode	Displays the current mode of operation: ON, OFF, AUTO or FLUSH
Occupied Period	Displays YES if occupied and NO if unoccupied
Outdoor Air Control	Displays current outdoor air control: Pressure or Manual
Room Pressure	Displays current room pressure
Room Pressure Setting	Displays current setting for room pressure
Percent Outdoor Air	Displays the current percent of outdoor air
Percent Outdoor Air Setting	Displays the current manual outdoor air setting
Percent Output to VFD	Displays current output to variable frequency drive
Schedule Source	Displays the schedule source: Handheld keypad, BAS or WebCTRL
Air Handler Type	Displays the air handler type: MUA, VAV, AM, FR

FIGURE 12: Status Screen



NOTE: Image is larger than handheld screen. Shown for reference only.

3.9 Alarm

When an alarm is triggered, the red alarm light will illuminate on the handheld keypad. To clear the alarm light, the fault must be corrected. The alarm screen stores the last 100 alarms. Alarms are time stamped and stored in RTN. RTN or "Return to Normal" is part of the alarm screen and can be viewed if scrolled down. If alarm is reset, it is not stored in RTN. (To reset alarm see information below)

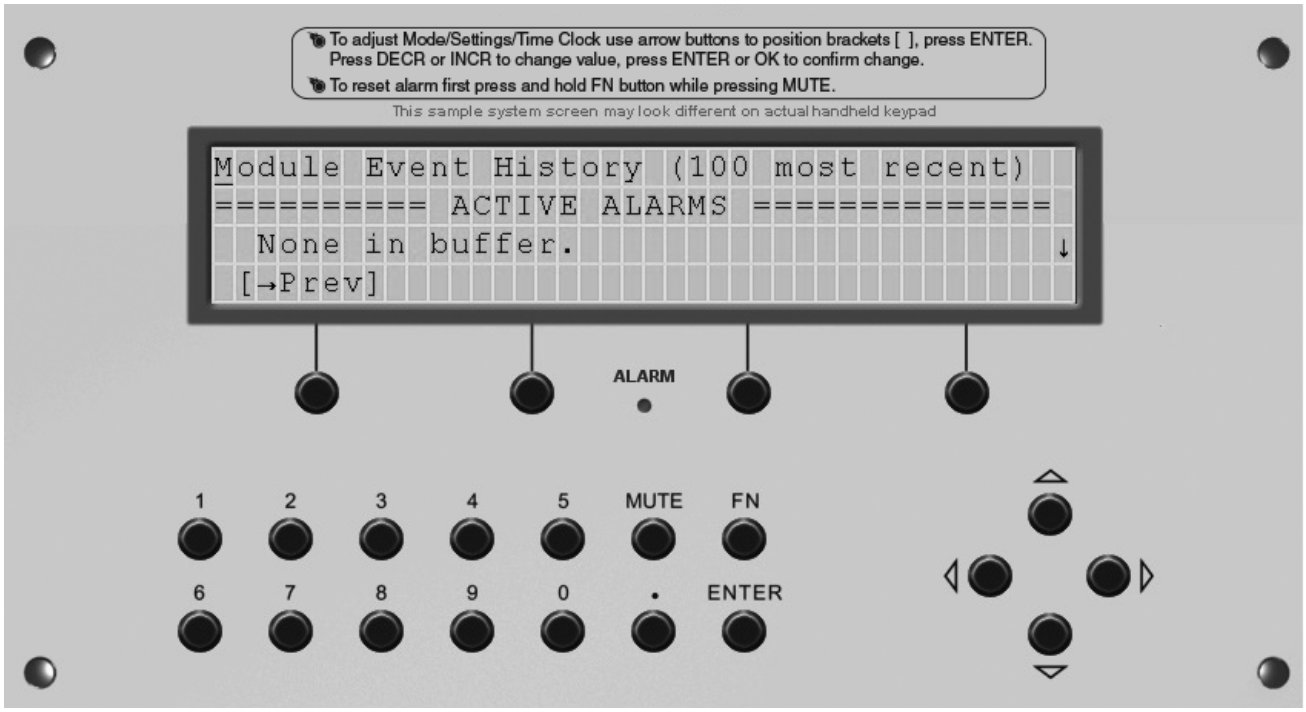
Alarms run newest to oldest within alarm screen. Real time run info is available in the status screen. *See Page 21, Section 3.8*.

To reset the alarm light, push and hold the FN button then push MUTE.

Table 6: Alarm Description

Description of Alarm	Reference
Fan Contactor Not On	*See Page 52, Section 7.3.1*
Fan Contactor On When Should Be Off	*See Page 52, Section 7.3.2*
Damper for Heat Air Not Open.	*See Page 52, Section 7.3.3*
Damper for Heat Air Not Closed	*See Page 53, Section 7.3.4*
Burner Lockout or Safety SW Not Made	*See Page 53, Section 7.3.5*
Low Supply Air Temp Shutdown	*See Page 56, Section 7.3.6*
Dirty Filters	*See Page 57, Section 7.3.7*
Low Building Pressure	*See Page 58, Section 7.3.8*

FIGURE 13: Alarm Screen



3.10 Calibration

This screen should be used by qualified personal only. The Calibration Screen is used to calibrate input sensors, if needed. Move the brackets around the number for the sensor to be calibrated, press ENTER, and then use the arrow buttons or [DECR] and [INCR] to increase or decrease. Press ENTER or [OK] to save the changes.

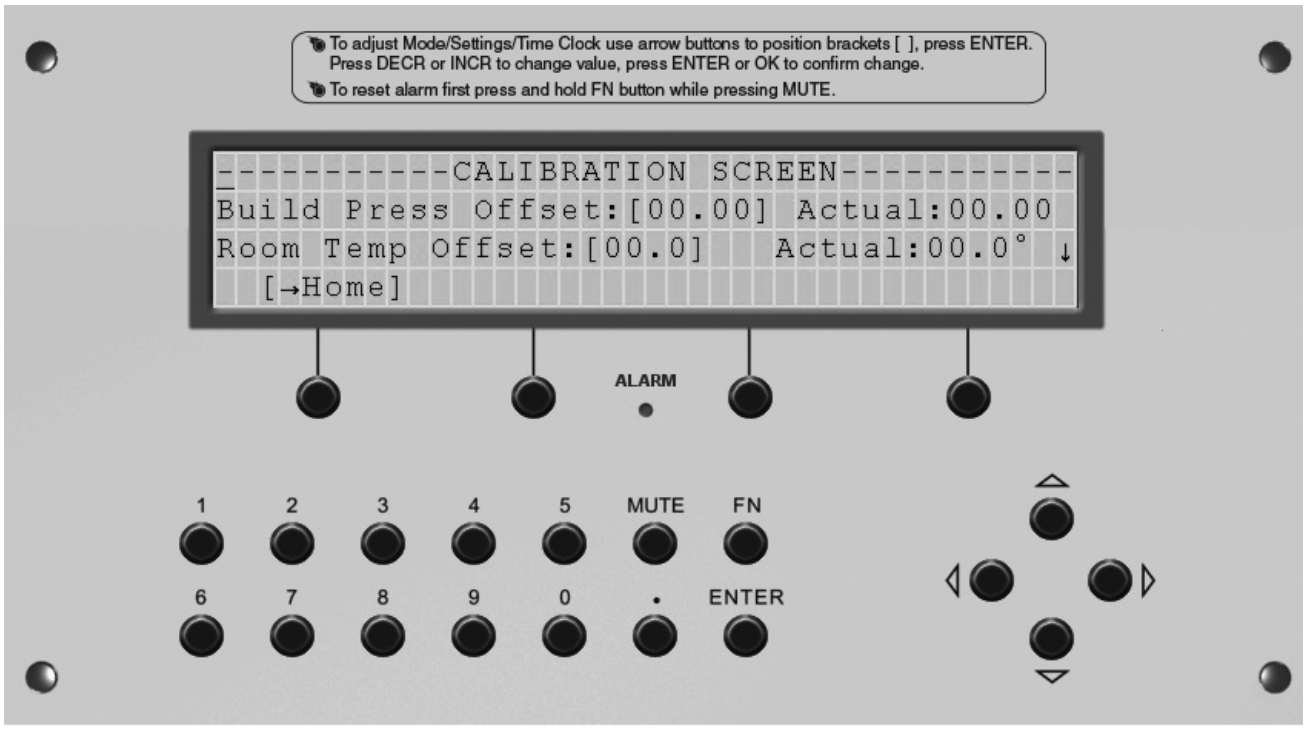
To access, push and hold the FN button then push number 7.

Table 7: Calibration Adjustments

Text	Status	Description
Build Press Offset	00.0	Increase or decrease the offset to change the actual reading
Room Temp Offset	00.0	
OA Temp Offset	00.0	
DA Temp Offset	00.0	

NOTE: OA=Outside Air; DA=Discharge Air

FIGURE 14: Calibration Screen



3.11 Manual Overrides

⚠ CAUTION

Product Damage Hazard

Do not override burner output lock timer.

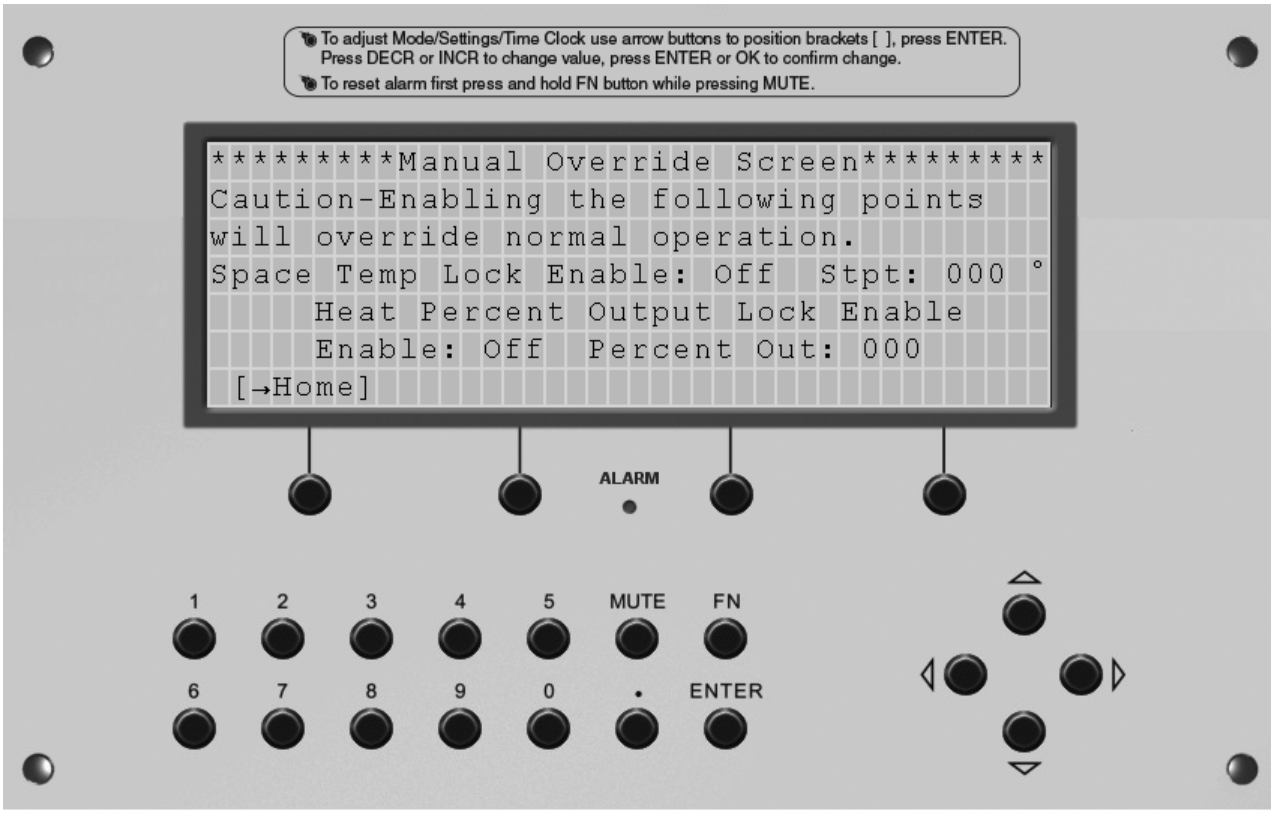
Verify normal heater operation after one minute.

Failure to follow these instructions can result in product damage.

This screen is intended for use by qualified personal only. When needed, the field start up technician can lock the burner output to 100% in order to set up the gas fired burner. Caution must be exercised to avoid possible damage to the equipment when enabling this feature. The burner output lock has a timer that will shut off this feature after one minute.

To access, push and hold the FN button and then push number 8 button.

FIGURE 15: Manual Overrides - Technician Use Only



NOTE: Image is larger than handheld screen. Shown for reference only.

3.12 Configuration

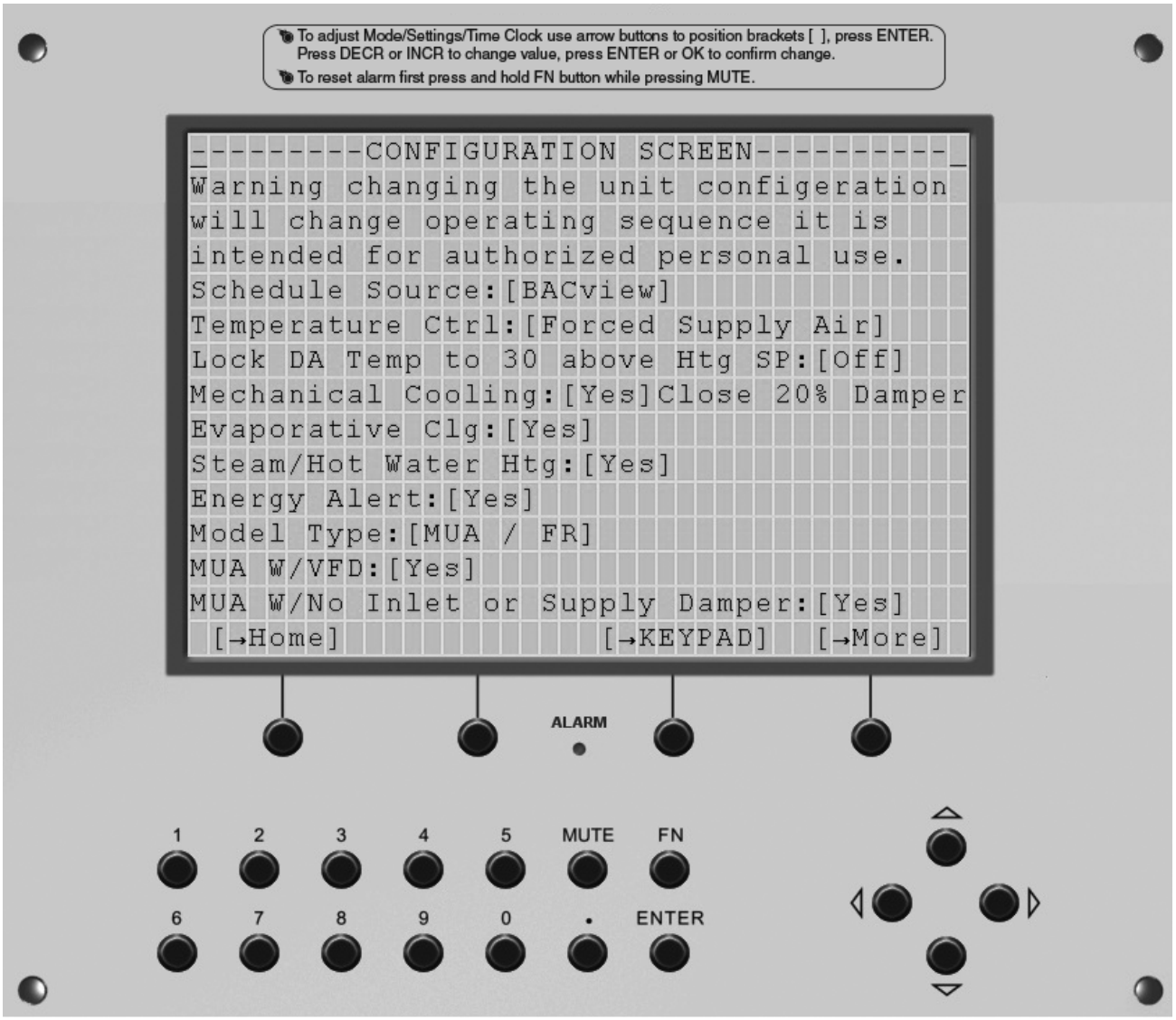
This screen (*See Page 27, Figure 16*) is used to configure the air handler for specific options. The controls are pre-configured from the factory prior to shipping. The default schedule source is handheld keypad. If the time clock is controlled by a BAS (*See Page 46, Section 6*) or Webctrl software (*See Page 38, Section 5*) it may need to change in the field.

To access, push and hold the FN button and then push number 9.

Table 8: Configuration Status

Text	Status	Description
Schedule Source	Handheld keypad / BAS / WebCTRL	Selects the schedule source: Handheld keypad, BAS (building automation system) or WebCtrl can be used for factory provided software.
Temperature Ctrl	Room Temp Ctrl OA Rm Temp Ctrl Forced Supply Air	*See Page 4, Section 2.5*.
Lock DA Temp to 30 above Htg SP	On / Off	Locks the supply air maximum temp to 30 °F above the heating setting
Mech Cooling	No / Yes	Select Yes if the unit has mechanical cooling. The 20% burner supply air damper will close when in the cooling mode
Evaporative Clg	No / Yes	Select Yes if unit equipped with evaporative cooling
Coil Heat Source	No / Yes	Select Yes if the heat source is steam, hot water or electric
Energy Alert	No / Yes	Select Yes to enable feature, *See Page 7, Section 2.9.1*.
Model Type	AM/VAV or MUA/FR	Defines the model of the air handler and the features available
MUA W/VFD	No / Yes	Select Yes if the air handler is an MUA with a factory installed variable frequency drive.
MUA W/No Inlet or Supply Damper	No / Yes	Select Yes if the air handler is an MUA with no inlet or supply air damper

FIGURE 16: Configuration - Technician Use Only



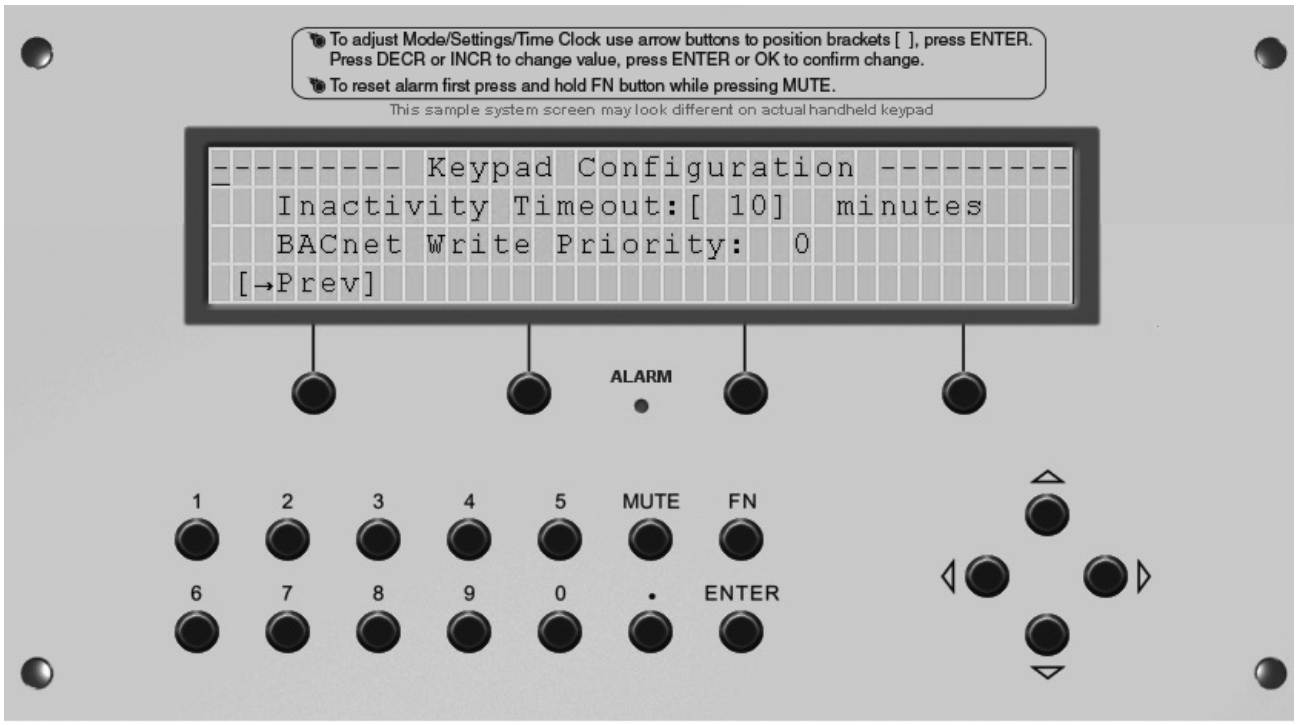
NOTE: Image is larger than handheld screen. Shown for reference only.

3.12.1 Keypad Configuration

From this screen, inactivity timeout can be adjusted. Increasing the inactivity timeout will delay the amount of time before the screen reverts back to the Standby Screen when the handheld keypad sits idle.

The range available is 1-255 minutes. Changes can be made via number or arrow buttons.

FIGURE 17: Keypad Screen



3.13 Model Flow Charts

FIGURE 18: MUA/FR with Forced Supply Air Heating

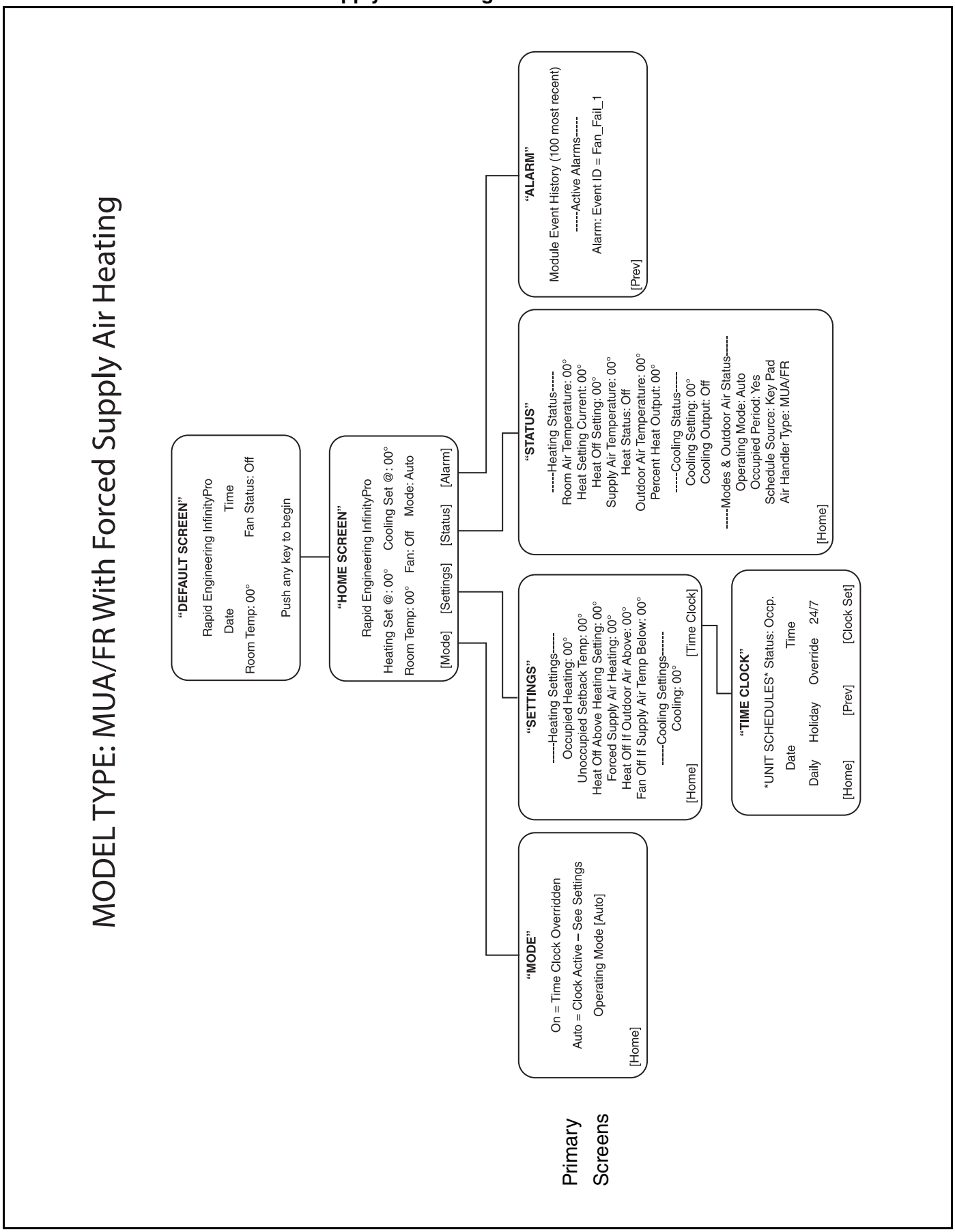


FIGURE 19: MUA/FR with Room Air Temperature Control

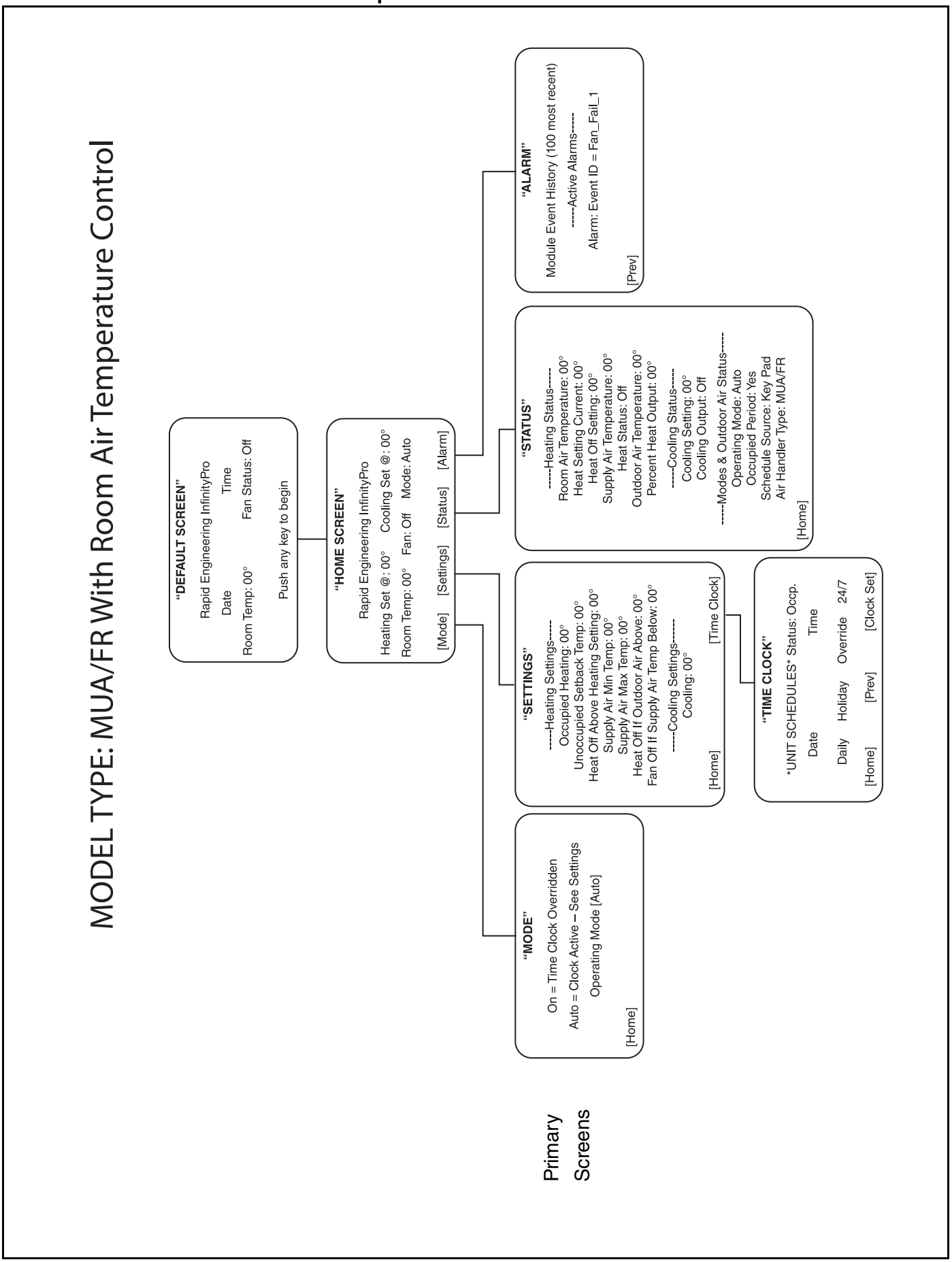


FIGURE 20: MUA/FR with Outdoor Air Room Temperature Control

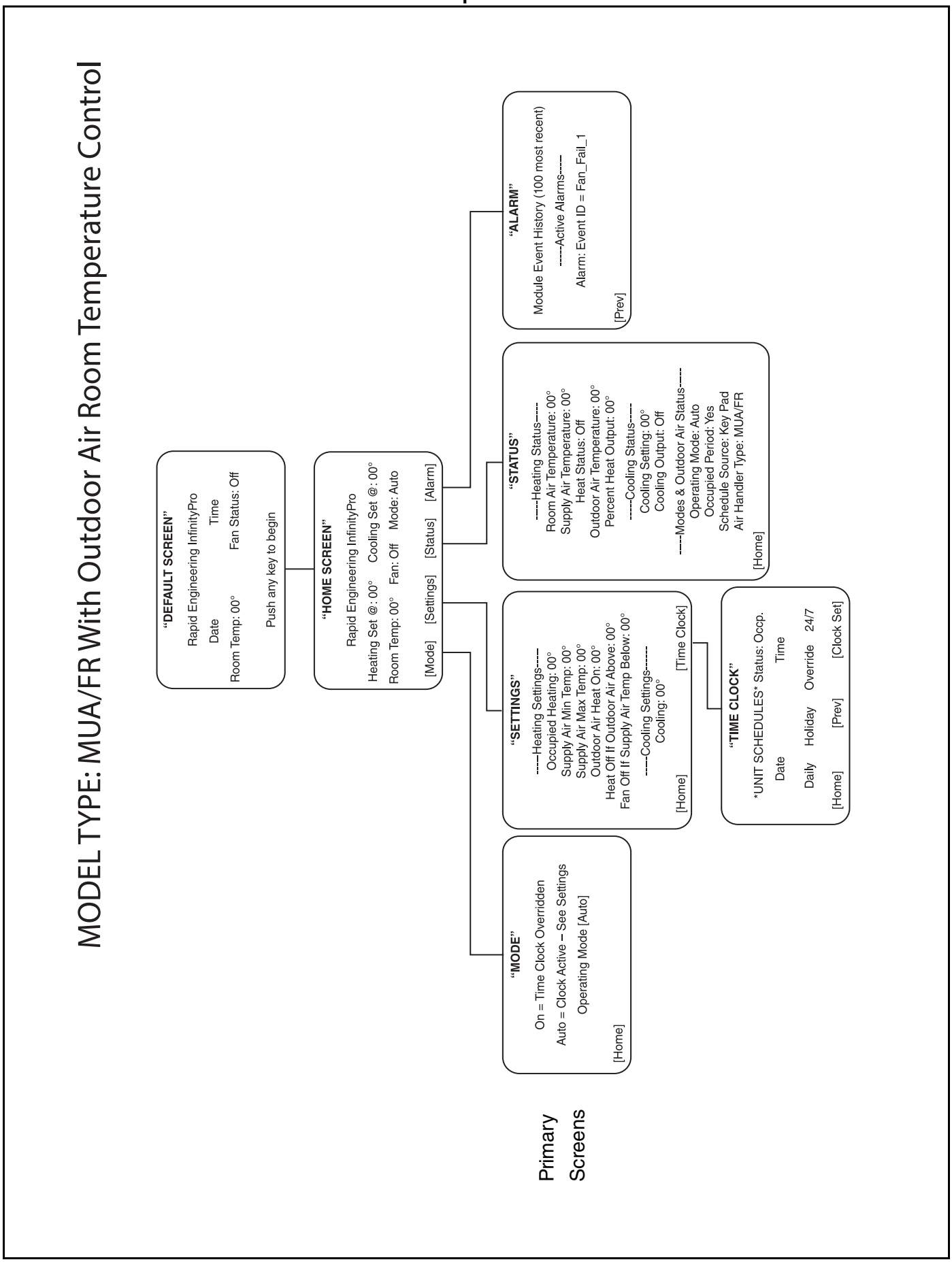


FIGURE 21: AM/VAV with Forced Supply Air Heating

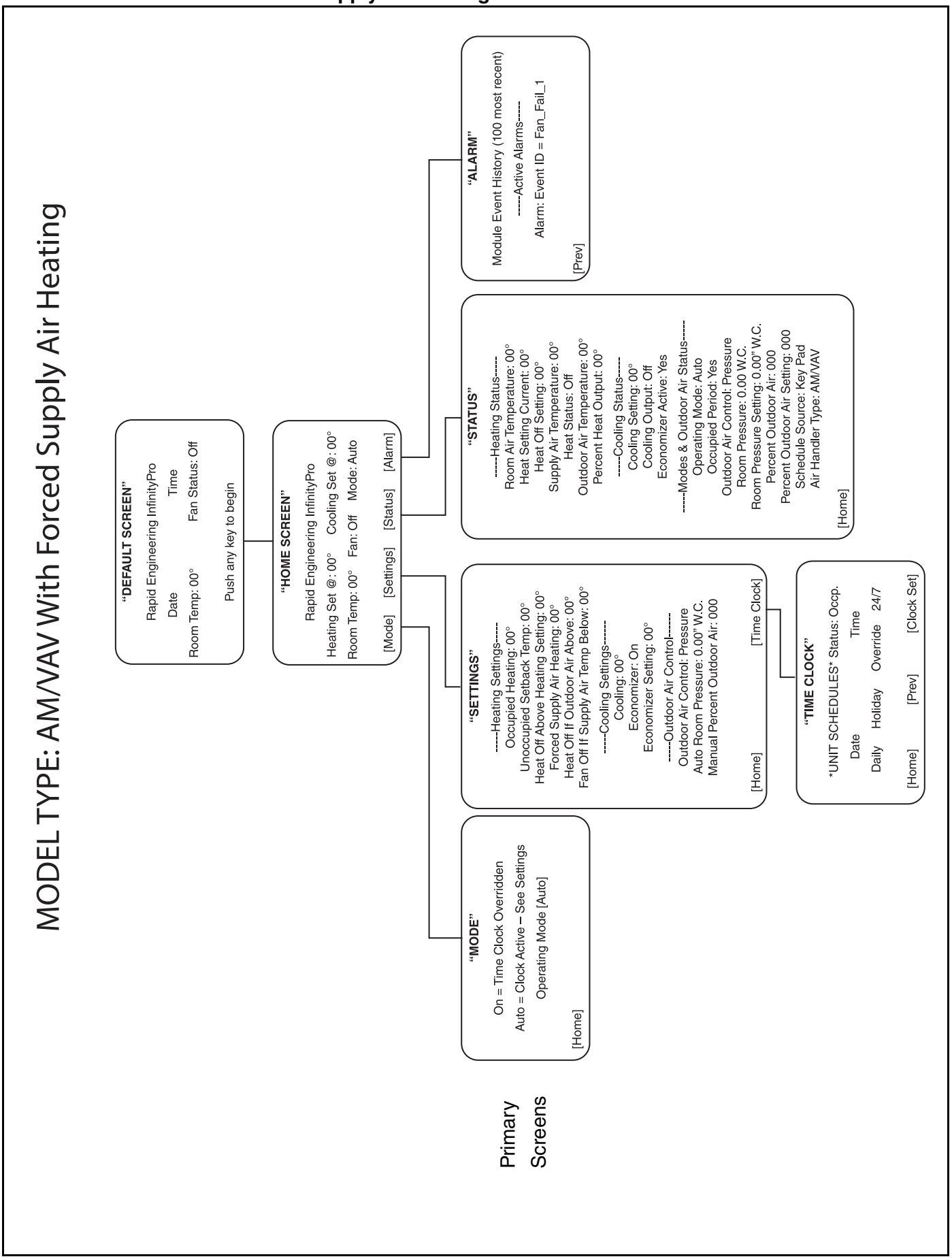


FIGURE 22: AM/VAV with Room Air Temperature Control

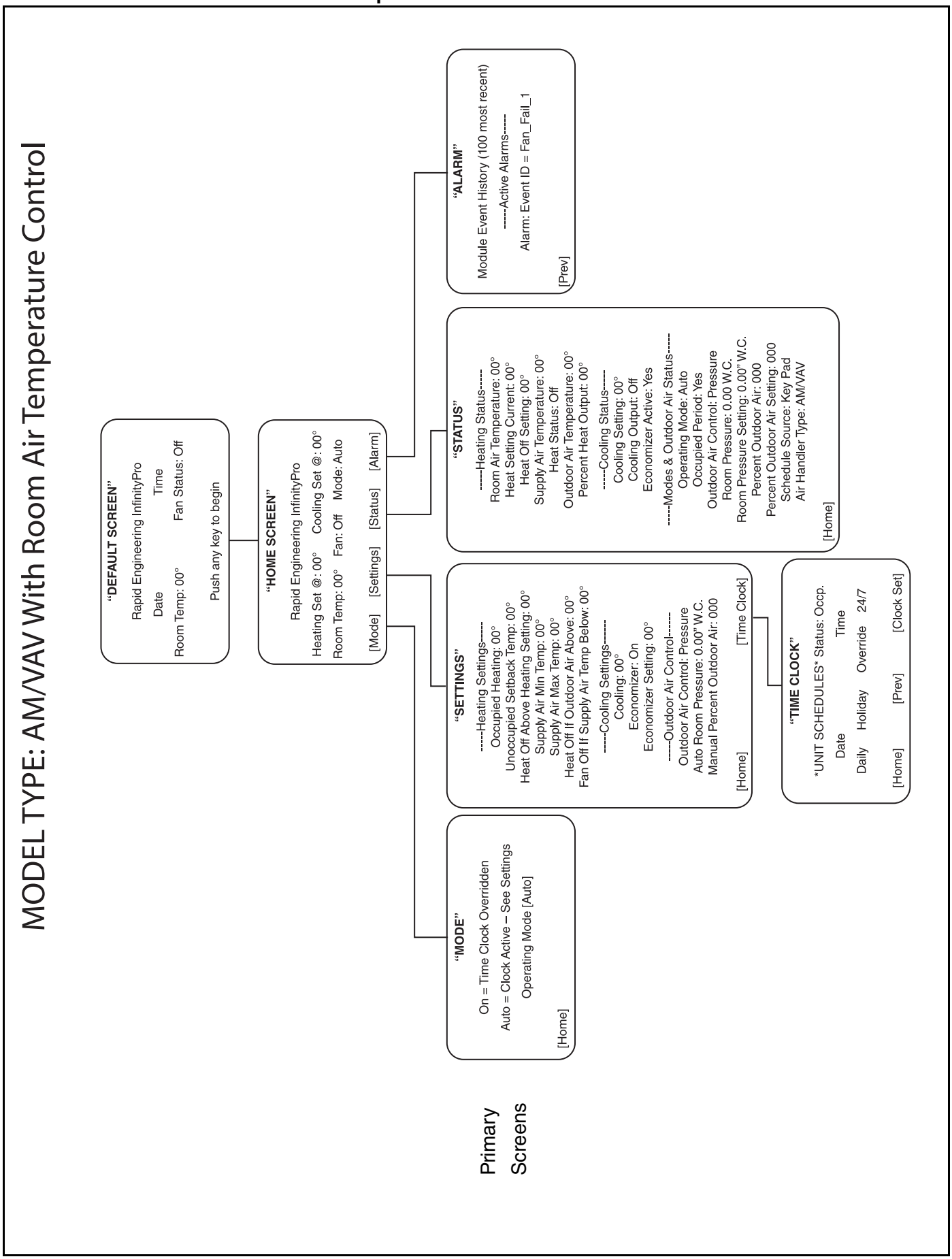
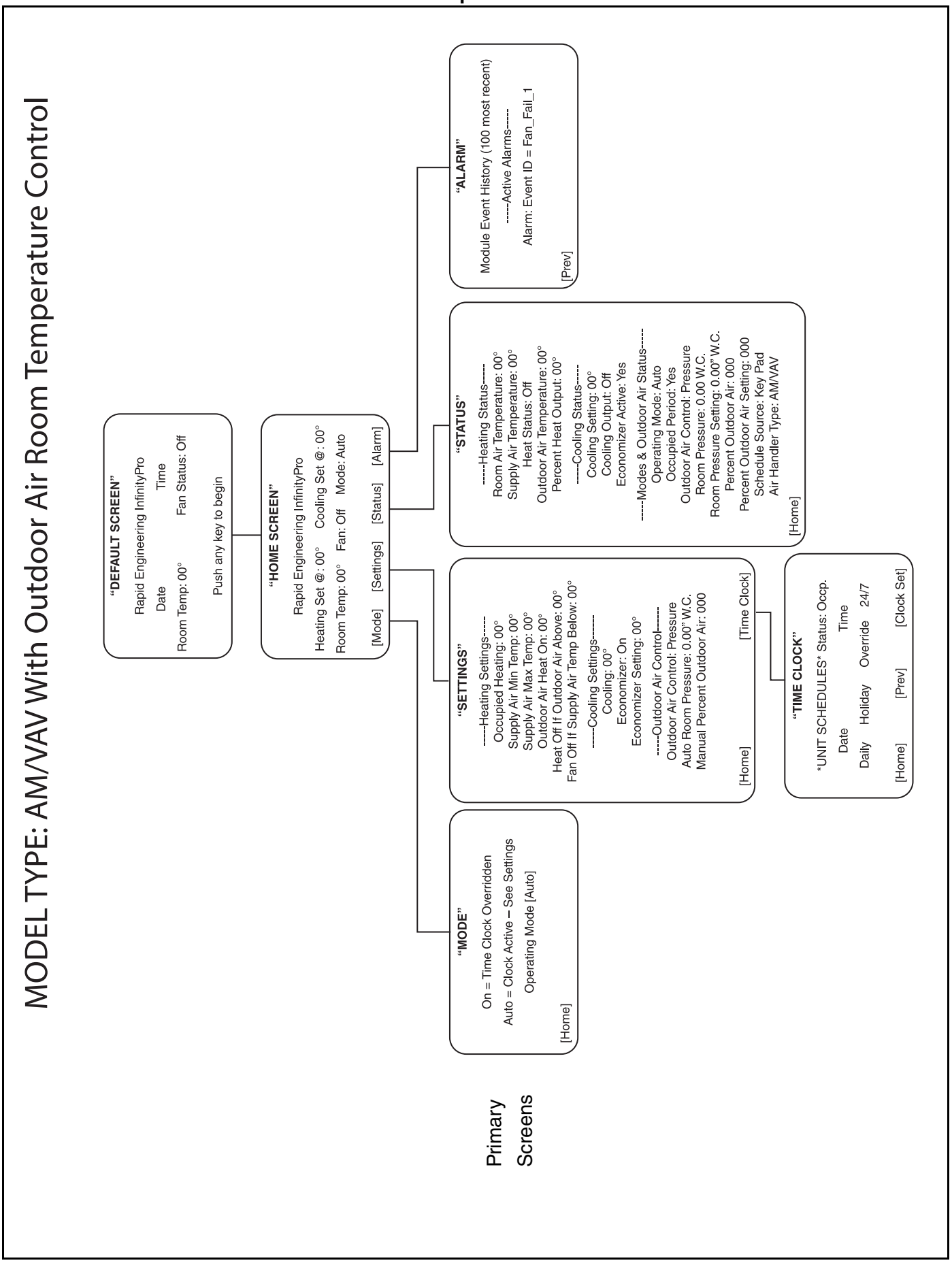


FIGURE 23: AM/VAV with Outdoor Air Room Temperature Control



SECTION 4: WIRING

FIGURE 24: Basic Wiring Diagram Part One

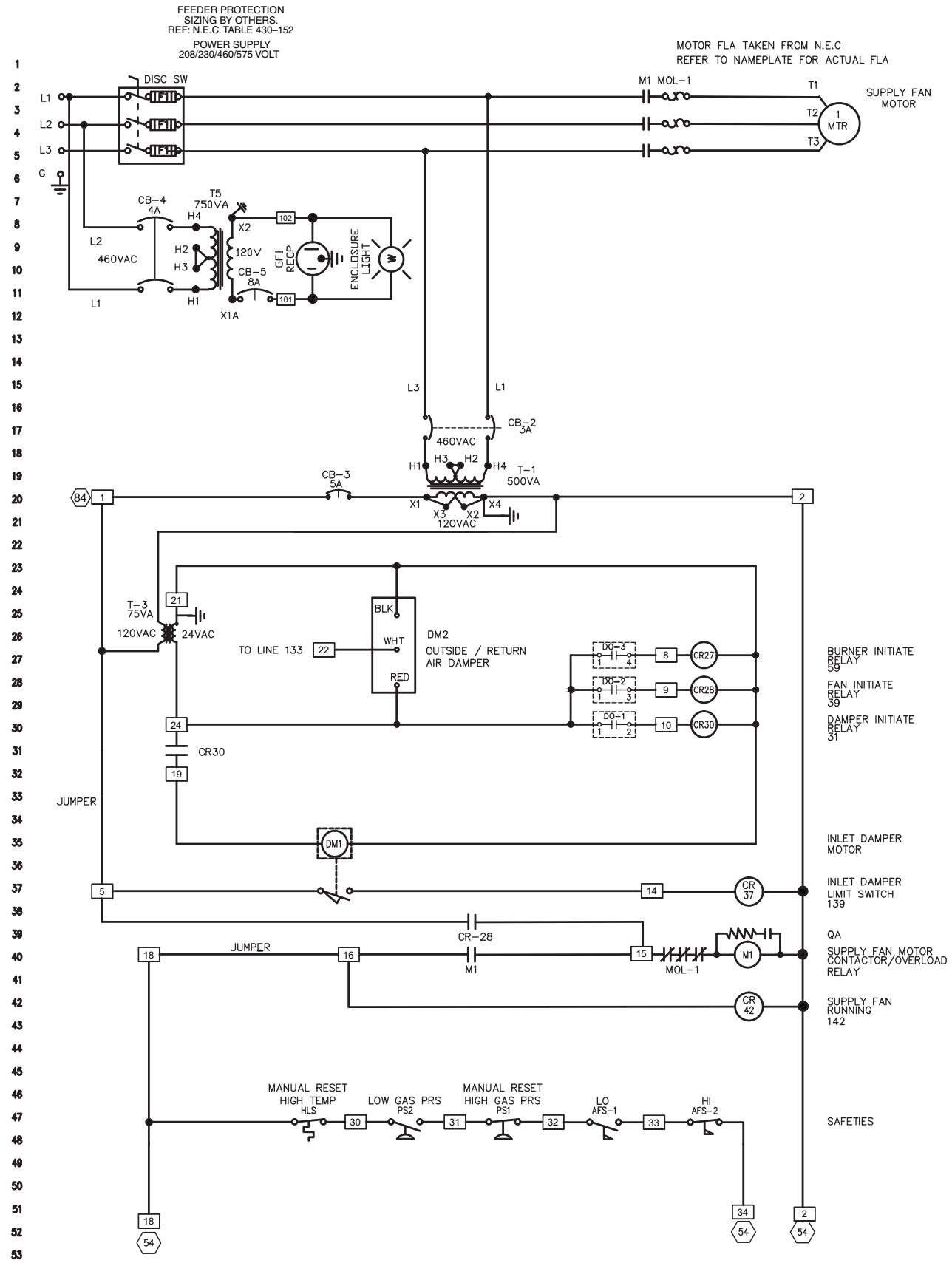


FIGURE 25: Basic Wiring Diagram Part Two

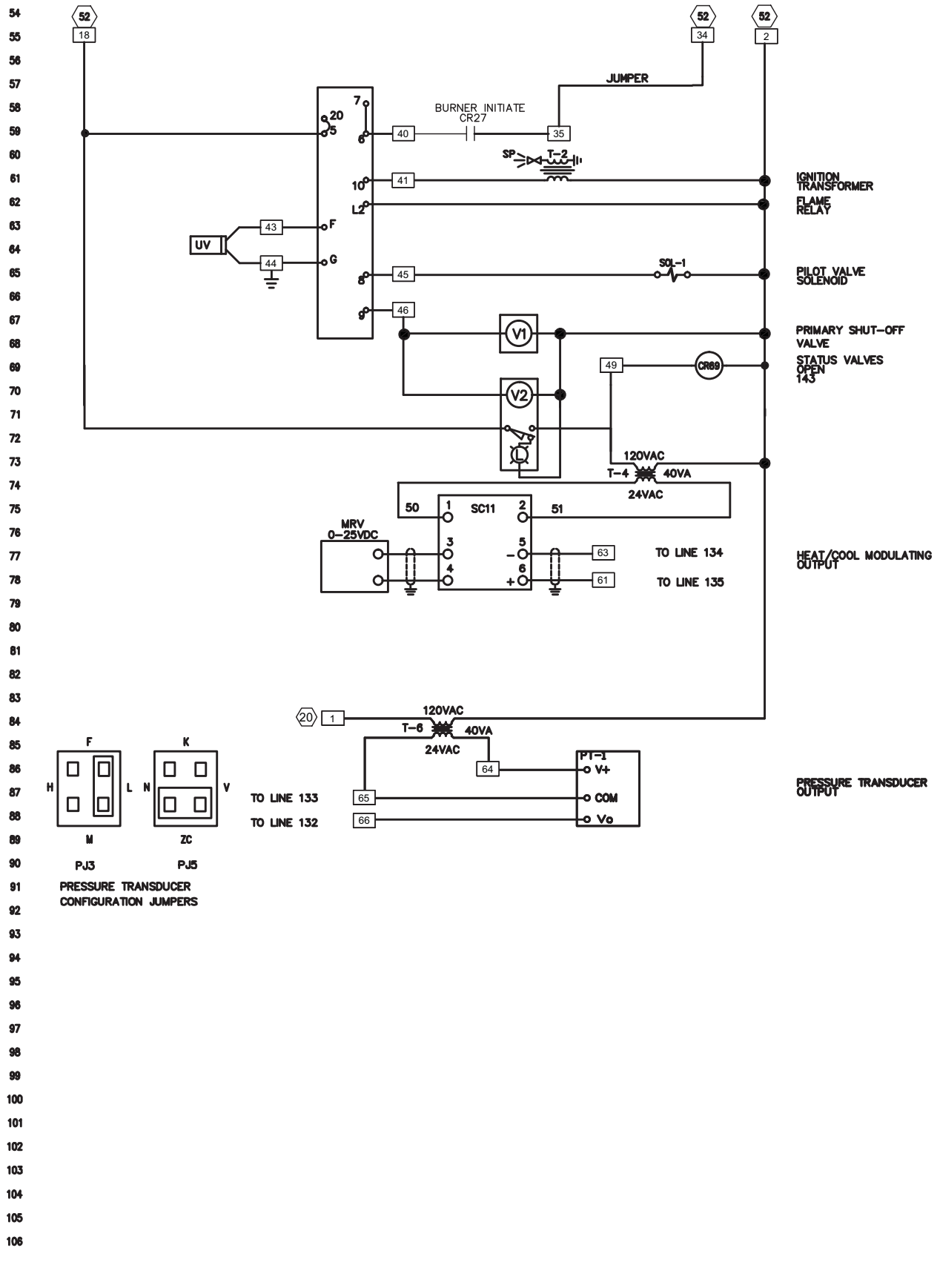
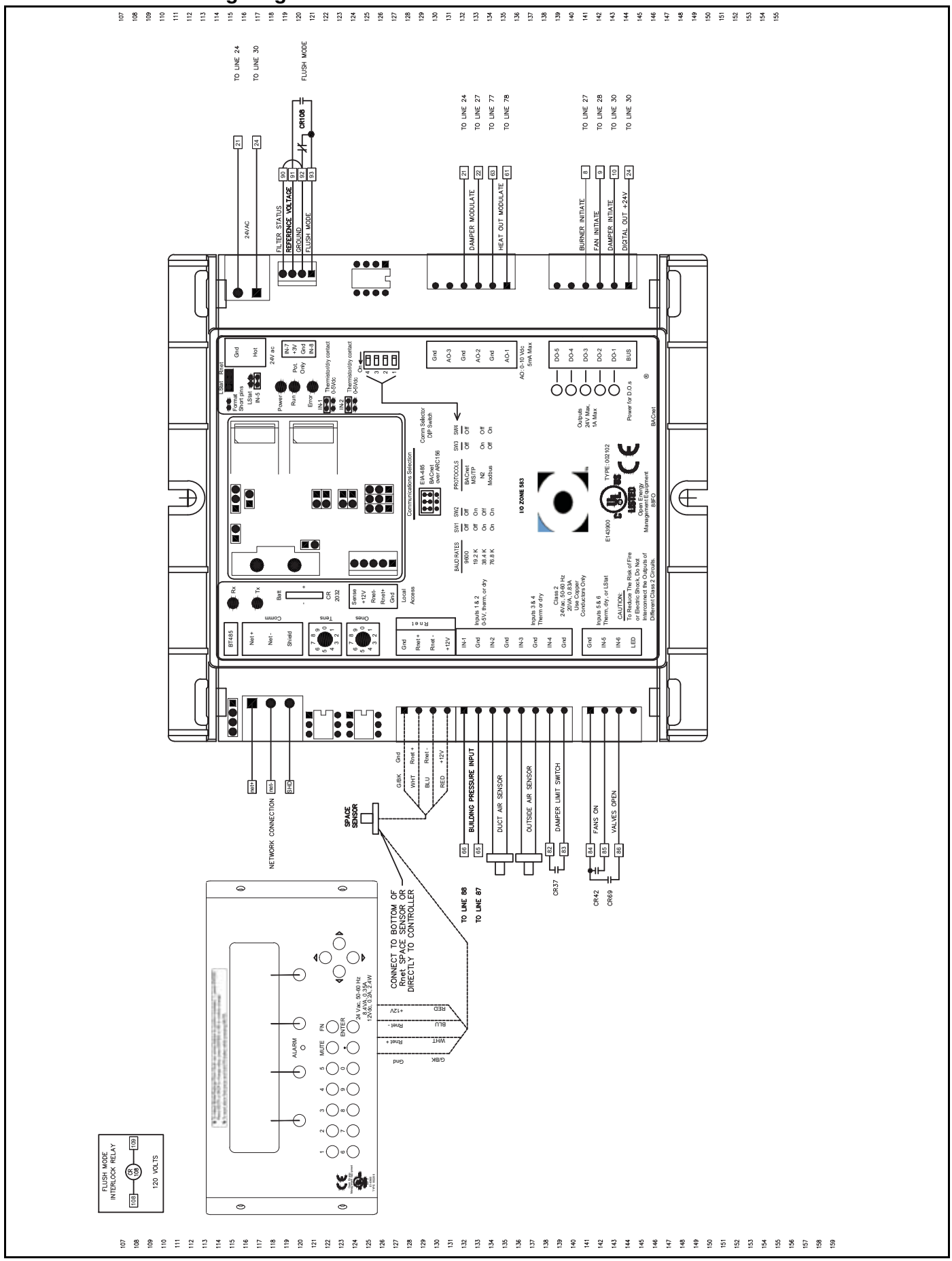


FIGURE 26: Basic Wiring Diagram Part Three



SECTION 5: WEB CONTROL SOFTWARE FRONT-END COMMUNICATION

5.1 General Information

Rapid Engineering LLC supplied optional networking software is available to allow the user to visually connect with and operate each air handler for proper operation and troubleshooting.

5.2 System Requirements

Web Control desktop computers should have at least a dual core processor, 1.5 GB RAM and a communication link of 10 Mbps or higher. It will work on slower computer with slower links, but results may vary. For desktop browser requirements, see *Page 38, Table 9*. For tablet requirements, consult factory.

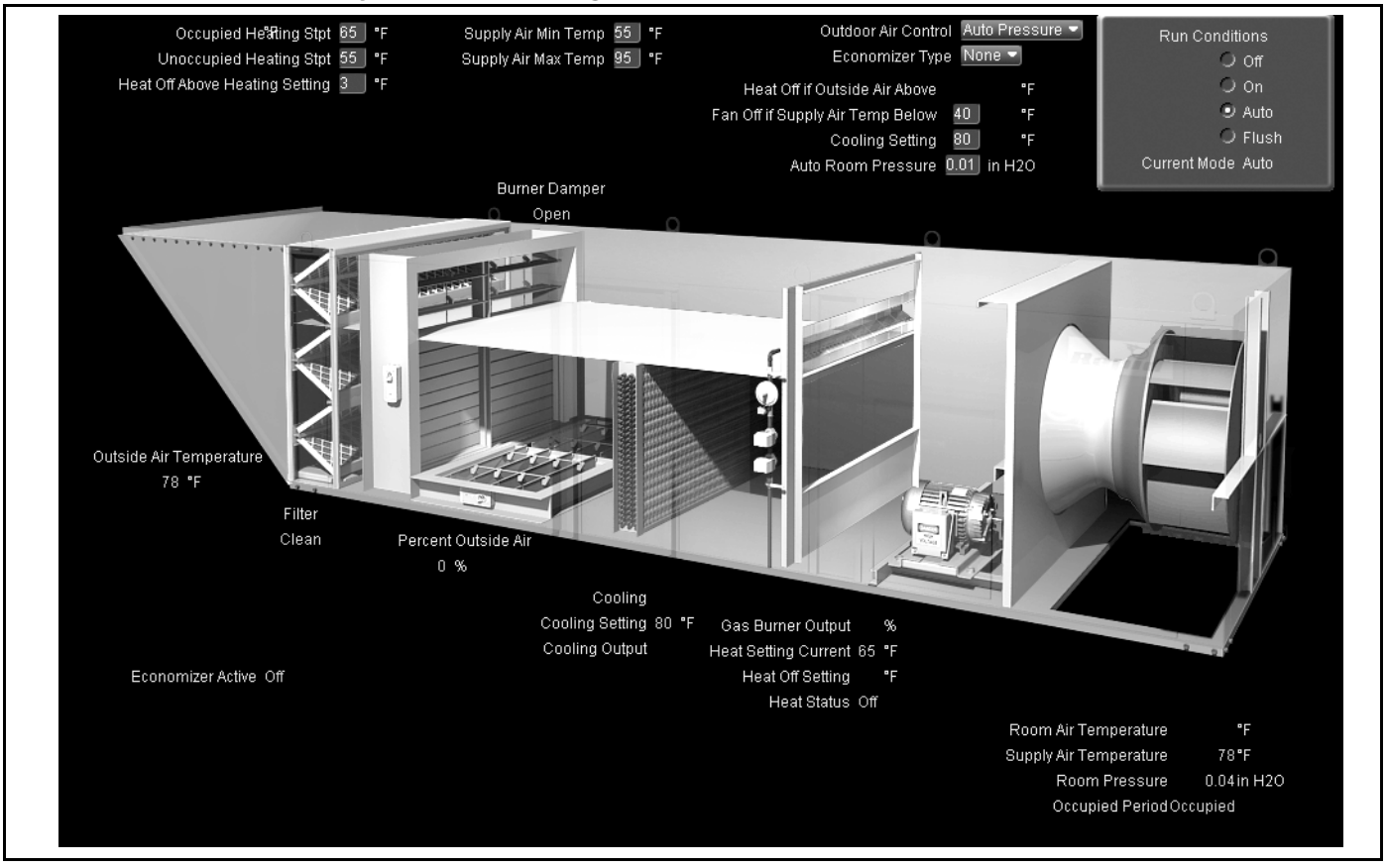
Table 9: Desktop Computer Requirements

Computer with this operating system	Web Browser
Windows®	Google™ Chrome™ v23.0 or later Internet Explorer® v8, v9, v10, or v11 Desktop Mozilla® Firefox® v21.0 or later
Linux®	Google™ Chrome™ v23.0 or later Mozilla® Firefox® v21.0 or later
Mac® OS X® (Apple® Mac only)	Safari® v6 or later Google™ Chrome™ v23.0 or later Mozilla® Firefox® v21.0 or later

5.3 Graphics

Visual graphic screens help the user to change parameters with ease. An example of the main graphics screen is shown *on Page 38, Figure 27* below. *See Page 43, Figure 33* for sensor / network cabling and *Page 45, Figure 35* for networking specifics.

FIGURE 27: RAPID® InfinityPro™ Networking Software



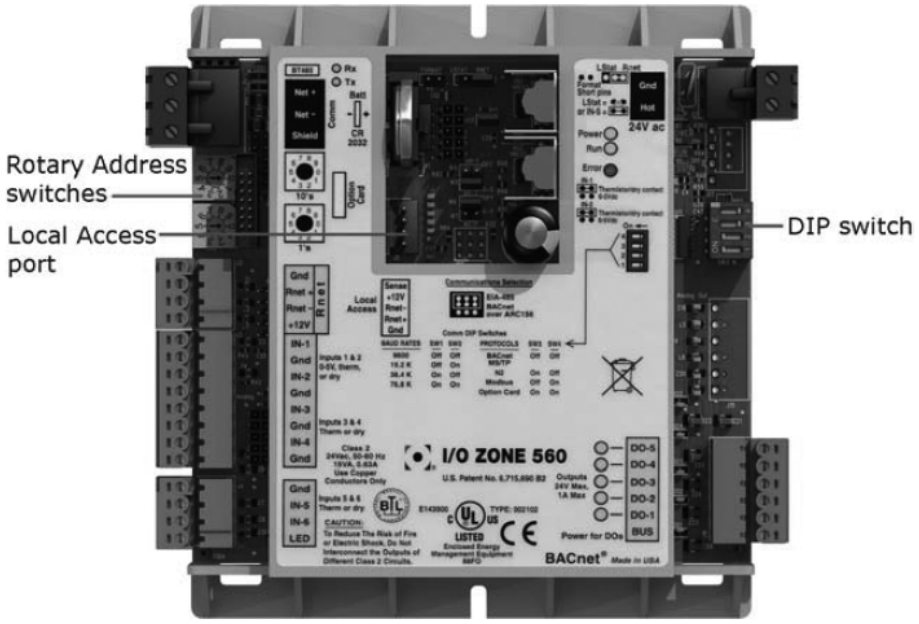
5.4 Setting Up Communication

a. Install the specified network cable to each air handler and router in the network. Connect the router and computer as shown in drawings *on Page 43, Figure 33 through Page 45, Figure 35*.

b. Set the address on the controllers using the rotary address switches. Address can be set from 1-99 and must be different for each controller on each network. Cycle power if address is changed while the controller is powered. *See Page 39, Figure 28*.

c. Set the baud rate to 76.8 and communication protocol to BACnet MS/TP using the dip switches. Cycle power if dip switches are changed during normal operation.

FIGURE 28: Control Board



d. Ensure router is powered with power supply provided. The router was downloaded with the IP address provided by the customer prior to shipping.

5.5 Installing Web Control Software

a. Load CD labeled "Data Base / License" and copy license on to desktop. Once completed, remove CD from driver and set aside.

b. Load CD labeled WebCTRL and start to run software.

c. Follow instructions on screen during installation

I. Welcome

II. Accept License Agreement

III. Product License
NOTE: Browse for license as saved on desktop and select appropriate file.

IV. Select Destination Directory
NOTE: Default: C://WebCTRL_for_OEMs_6.0

V. WebApps

VI. Network Diagnostic Utility

VII. Select Start Menu Folder

VIII. Installation Summary

5.6 Software Installation Complete (Run)

a. Once the software is loaded, a folder is created on the hard drive named "WebCTRL for OEMs." Within this folder, locate the "webroot" folder.

b. Re-insert the CD labeled "Data Base / License" and copy the database (job specific labeled) into the "webroot" folder.

c. Go to the START menu on the PC and view all programs. Select and open program "WebCTRL OEM Server" to initialize server. After the server has initialized, it will disappear into an icon on the tool bar. This is normal.

d. Open Internet Explorer and type in the address bar the IP address for the local host, 127.0.0.1 NOTE: Running Internet Explorer 10.0 or higher, you must use compatibility mode. You must also disable pop up blockers in Internet Explorer for WebCTRL to function properly.

e. Log into WebCTRL.

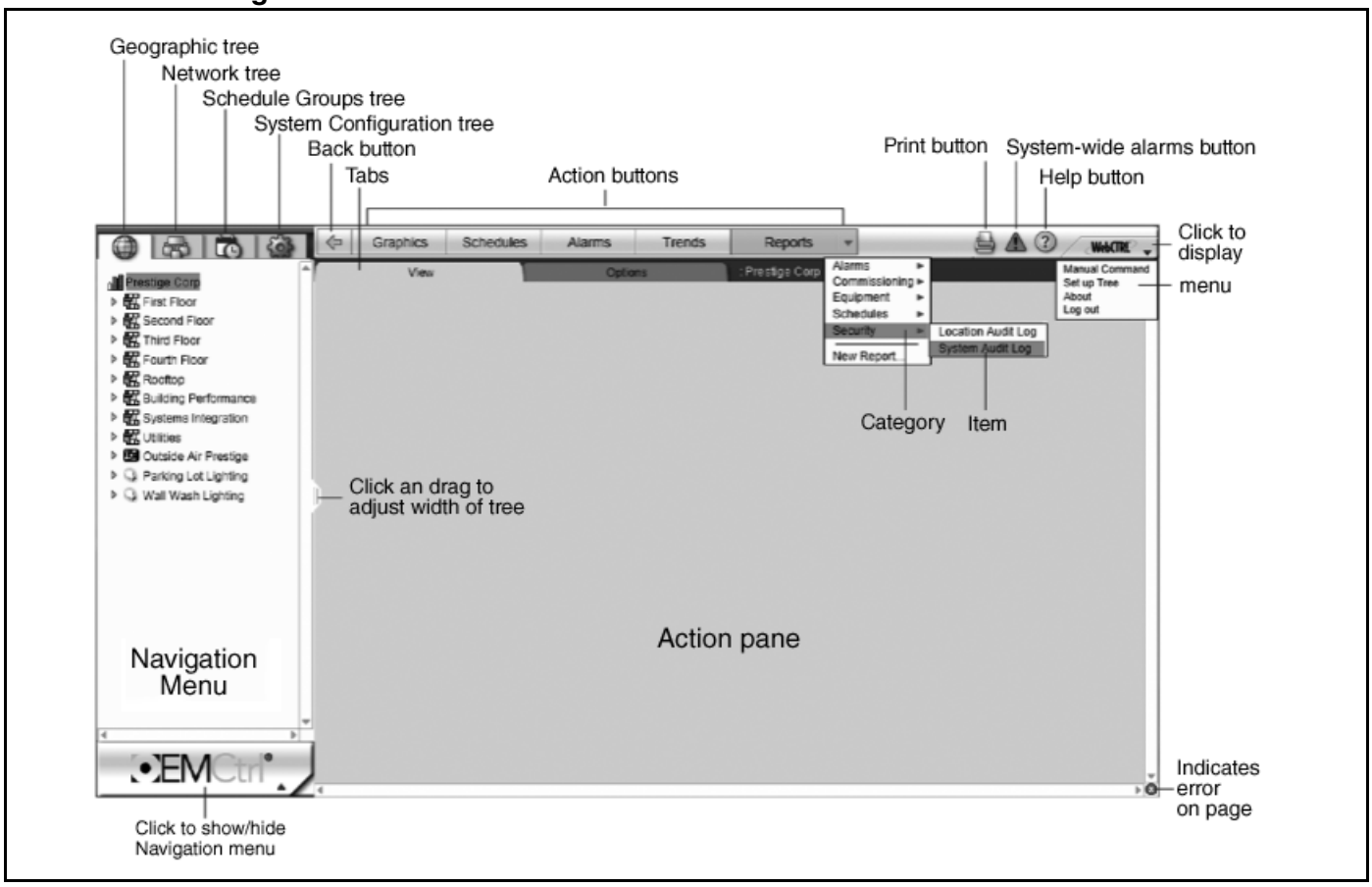
User Name	Password	Privileges
Operator	1100	Full
User	7831	Basic/Read Only

The operator names and passwords listed above have been created by Rapid Engineering LLC. The 'operator' has full privileges with complete access to the software. This includes the ability to change passwords and create new users. The 'user' has basic privileges that includes read only capabilities. Users are able to view information, but not change anything.
NOTE: Use caution when changing user names and passwords. Once changed, Rapid Engineering LLC is unable to reset the password to factory default. Additionally, lost or forgotten passwords (other than unchanged factory default) are unable to be retrieved.

5.7 Establishing a Connection

a. Once logged in, a connection will need to be established with the air handler(s). See *Page 41, Figure 29* to help navigate around the screen.

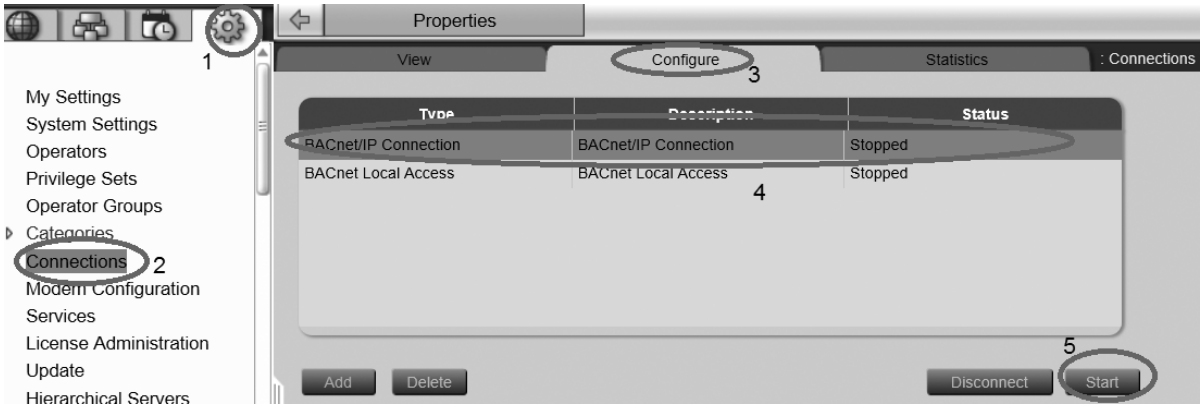
FIGURE 29: Getting to Know the Interface



b. To establish a connection, click on the "System Configuration Tree" located on the top of the Navigation Menu.

c. Within System Configuration Tree, select "Connections." Select "Configure" Tab and at the top of the screen. Select "BACnet/IP Connection." Once highlighted green, click the "Start" button to begin. *See Page 41, Figure 30*.

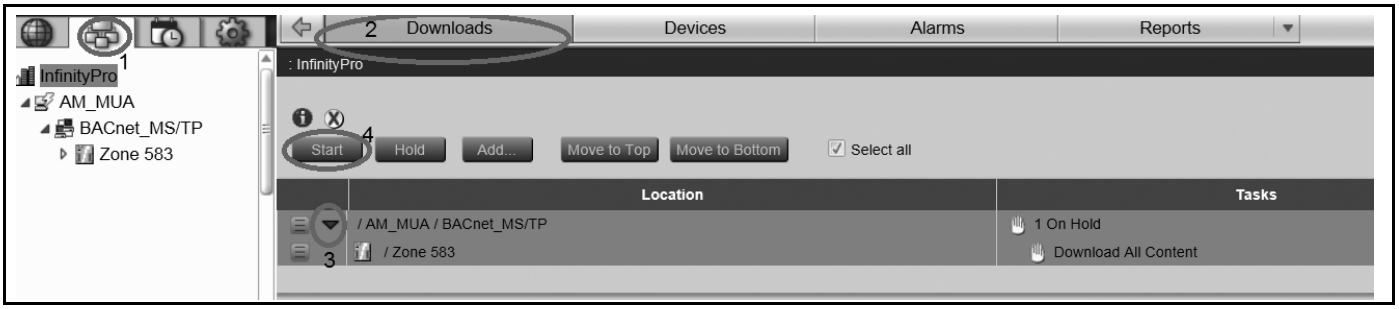
FIGURE 30: Configure



d. Switch to "Network Tree" (*See Page 41, Figure 29*) in the Navigation Menu to download air handler(s). *See Page 42, Figure 31*. Within the action buttons, click "Downloads" if not already selected.

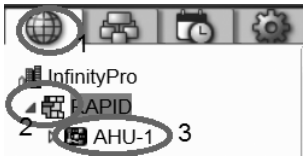
e. Expand the network to reveal air handler(s) available. Click "Start" button to begin downloading.

FIGURE 31: Download



f. Once download is complete, switch to "Geographic Tree" (*See Page 41, Figure 29*) in the Navigation Menu. *See Page 42, Figure 32*. Select the site to list all air handlers on the network. Within the action buttons, verify "Graphics" is selected.

FIGURE 32: Air Handler Network Tree

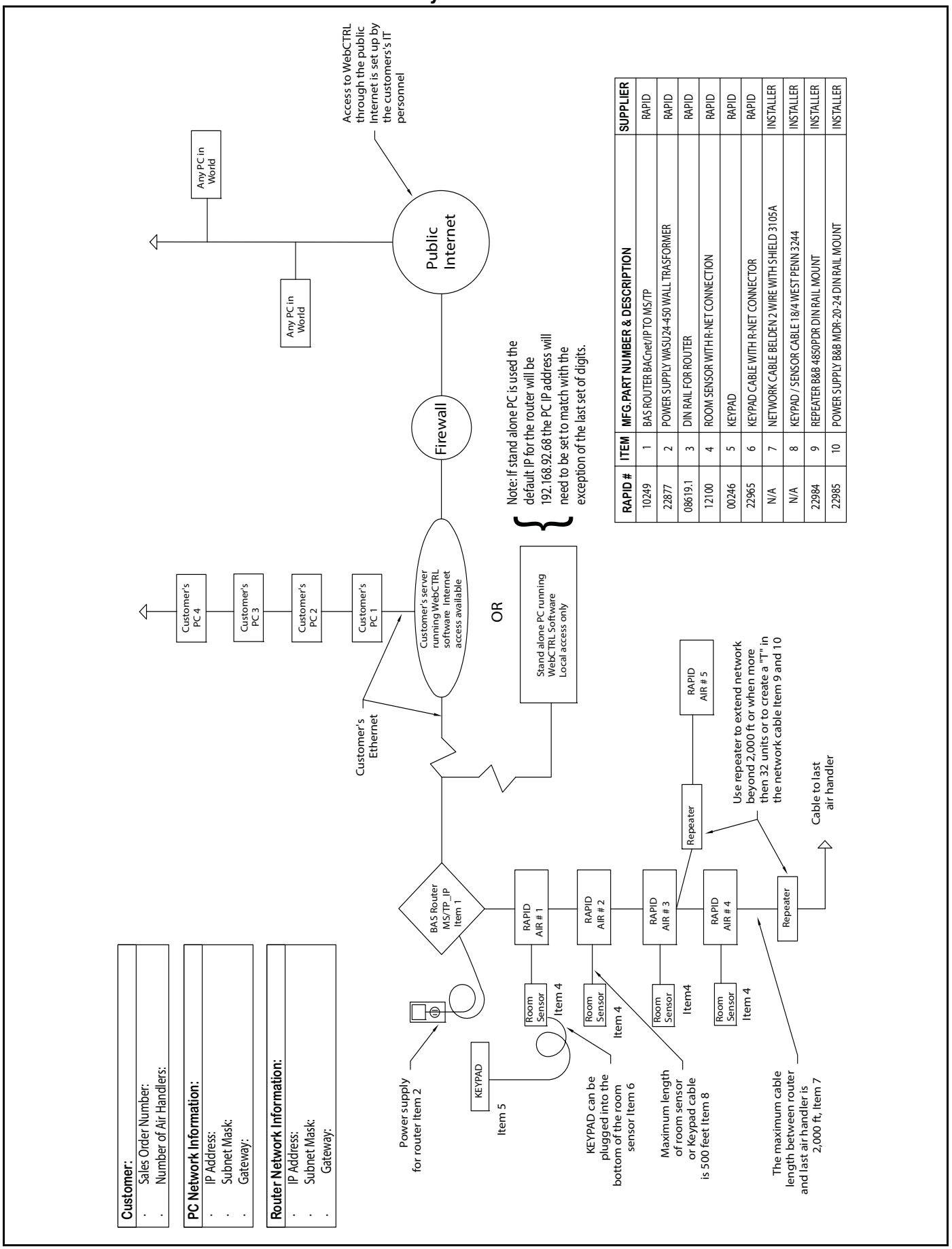


g. Select specific air handler (AHU) to receive/view graphics.

h. Navigate within the interface to complete actions, reference Help menu if needed.

Contact Rapid Engineering LLC with any additional questions at 800.968.0500.

FIGURE 33: Sensor / Network Cable for InfinityPro



RAPID #	ITEM	MFG.PART NUMBER & DESCRIPTION	SUPPLIER
10249	1	BAS ROUTER BACnet/IP TO MS/TP	RAPID
22877	2	POWER SUPPLY WASU24-450 WALL TRASFORMER	RAPID
08619.1	3	DIN RAIL FOR ROUTER	RAPID
12100	4	ROOM SENSOR WITH R-NET CONNECTION	RAPID
00246	5	KEYPAD	RAPID
22965	6	KEYPAD CABLE WITH R-NET CONNECTOR	RAPID
N/A	7	NETWORK CABLE BELDEN 2 WIRE WITH SHIELD 3105A	INSTALLER
N/A	8	KEYPAD / SENSOR CABLE 18/4 WEST PENN 3244	INSTALLER
22984	9	REPEATER B&B 4850PDR DIN RAIL MOUNT	INSTALLER
22985	10	POWER SUPPLY B&B MDR-20-24 DIN RAIL MOUNT	INSTALLER

FIGURE 34: Cabling and Network Specifics for Use with One Handler

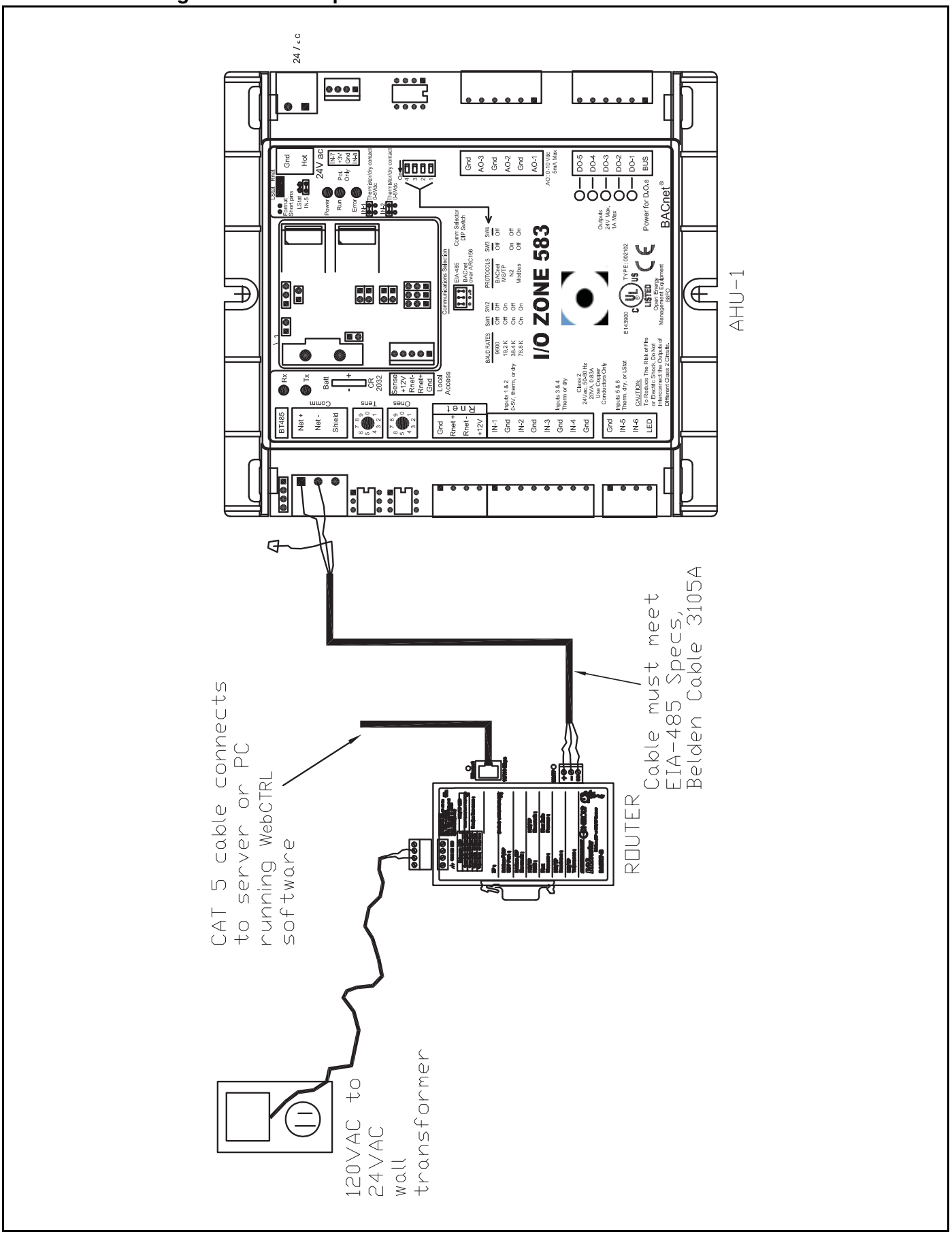
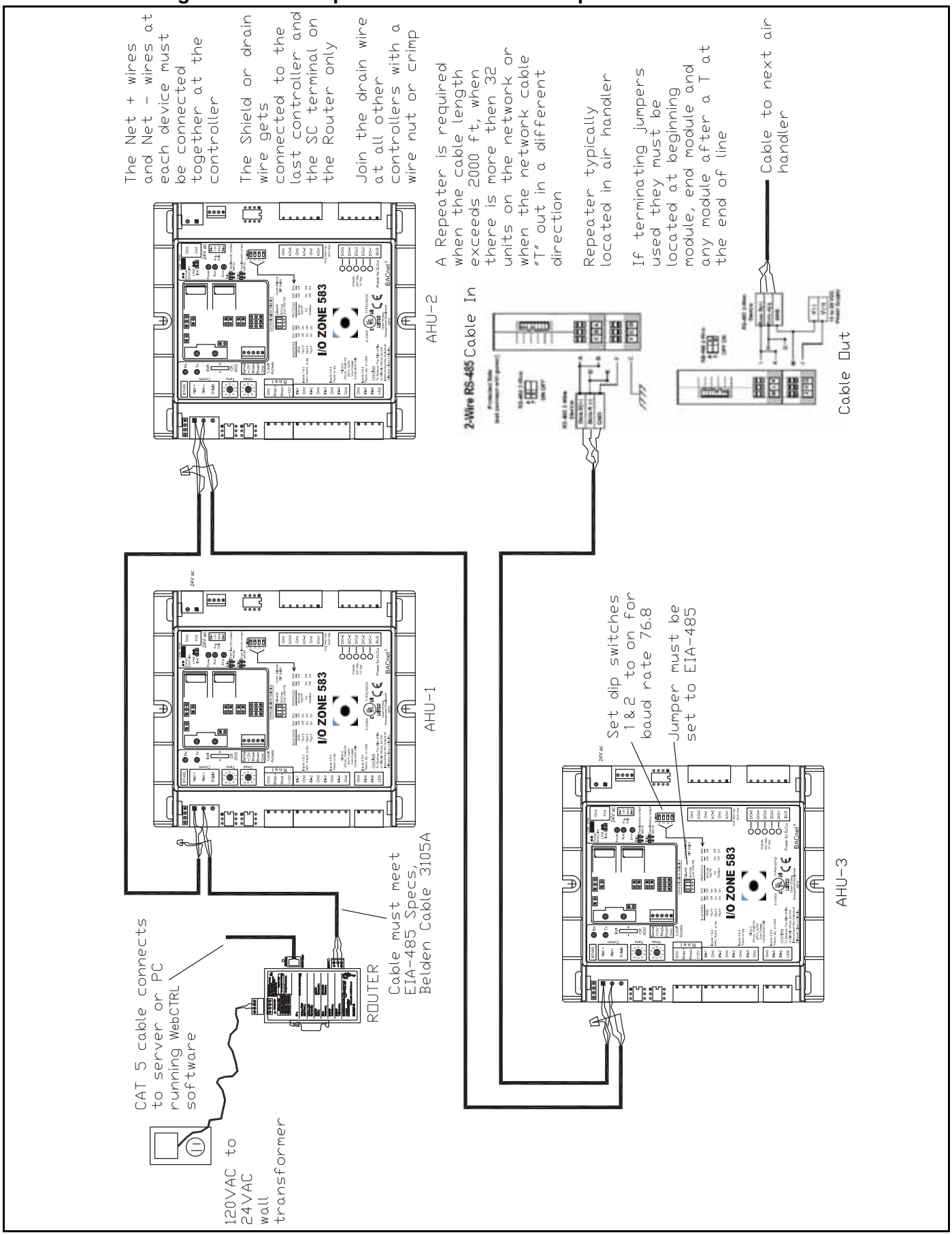


FIGURE 35: Cabling and Network Specifics for Use with Multiple Air Handlers



SECTION 6: USER INTEGRATION POINTS

6.1 User Integration Points

6.1.1 Operating Types

NOTE: Default values are represented in bold.

Point Name	Description	Point Type/ID	Read/ Write
Select Operating Mode	**0 = Off** 1 = On 2 = Auto	AV:7	R/W
Select Damper Control	**1 = Manual** - manually set the damper position 2 = Pressure - dampers modulate to maintain Auto Room Pressure	MSV:2	R/W
Select Schedule Source	**1 = Handheld Keypad** 2 = Building Management (Automation) System 3 = WebCTRL	AV:5	R/W
Select Occ/Unocc Peri od On/Off	This point is used by the controls integrator to put the air handler into the occupied period when the schedule source is via the building management system. **0 = Unoccupied** 1 = Occupied	BV:1	R/W
Select Economizer Type	Use this point to enable the economizer control **1 = No Economizer** 2 = Economizer	MSV:1	R/W

6.1.2 Operating Status

Point Name	Description	Point Type/ID	Read/ Write
Status Operating Mode	Report the status of the current operation: On, Off, Auto or Flush.	AV:17	R
Status Damper Control	Reports the status of the dampers: Auto or Manual	AV:14	R
Status Schedule Cntrl Source	Reports the status of the Schedule Source: Handheld key-pad, Building Management (BAS) System or WebCTRL	AV:19	R
Status Occ / Unoccu-pied	Reports current status of operation: Occupied or Unoccu-pied	BV:2	R
Status Economizer On/ Off	Reports status of Economizer: On or Off	BV:3	R

6.1.3 Heat Settings

Point Name	Description	Point Type/ID	Read/ Write
Stpt Occupied Htg	During the occupied period, burner starts based on desired room temperature when heating control type selected is Room Air Temperature Control or Forced Supply Air Heating. Default value is 70 °F.	AV:2	R/W
Stpt Unoccupied Htg	During the unoccupied period, the fan and burner will start if the room temperature drops below this setting and the temperature select type is Room Air Temperature Control or Forced Supply Air Heating. Default value is 55 °F.	AV:1	R/W
Stpt Heat Off range 2-20 degrees	During the occupied and unoccupied period, the heat shuts off when the room temperature reaches the Heat Off Setting when operating in the Room Air Temperature Control and Forced Supply Air Heating. The Heat Off Setting is defined by entered value which is then added to Heat Setting Current. Default value is 3 °F.	AV:26	R/W
Stpt Min Supply Air Temp	Limits the minimum supply air temperature to this setting when the heat is on. Applies to Room Air Temperature Control and Outdoor Air Room Control. Default value is 60 °F.	AV:30	R/W
Stpt Max Supply Air Temp	Limits the maximum supply air temperature to this setting when the heat is on. Applies to Room Air Temperature Control and Outdoor Air Room Control. Default value is 95 °F.	AV:29	R/W
Stpt Forced Supply Air Temp	Applies when the Forced Supply Air Heating is selected. The heat modulates to control the supply air at this setting regardless of the room temperature. Default value is 70 °F.	AV:25	R/W
Stpt OA Heat Disable	Applies to all heating types. When the outside air temperature reaches this set point, the burner will shut off regardless of room temperature. Default value is 95 °F.	AV:32	R/W
Stpt OA Heat Enable	Applies when the Outdoor Air Room Control is selected. The burner will turn on when the outside air temperature falls below this set point. Default value is 50 °F.	AV:31	R/W
Stpt Low Temp Shutdown	If in the heating mode and the supply air temperature is below this set point for more than 5 minutes, the operating mode is switched to Off. Default value is 40 °F.	AV:27	R/W
Status Burn Output	Value is 0% to 100%. Output from the controller to the modulating heat source.	AV:13	R
Status Active Heating Set Point	The Heat Setting Current is determined by the time clock and occupied / unoccupied heat settings.	AV:11	R
Status Fan On	Reports the status of fan: On or Off	BV:7	R
Status Heat On_Off	Reports the status of the heat source: On or Off. Heat Source options (Direct-Fired Burner, Electric, Steam or Hot Water)	BV:8	R
Status Heat Off Stpt	Reports the setpoint at which the heat source turns off	AV:12	R
Status OA Temperature	Reports current outside air temperature	AV:8	R
Status DA Temp	Reports current discharge air temperature	AV:20	R
Status Room Temperature	Reports current temperature in the building	AV:22	R
Status Output to VFD	Reports current percentage output to variable frequency drive based on unit operation	AV:18	R

6.1.4 Cooling Settings

Point Name	Description	Point Type/ID	Read/ Write
Stpt Cooling	When the room temperature reaches the Cooling setting, the first stage of cooling is enabled. The Cooling set point cannot be set below the Heating Off Setting plus one. Default value is 74 °F.	AV:4	R/W
Stpt OA Limit	Defines the setting for Economizer cooling. Default Valve is 65 °F.	AV:24	R/W
Status Cooling Stpt	Reports current cooling setpoint	AV:10	R
Status Cooling Stage	Reports current condition of cooling: On or Off	BV:4	R

6.1.5 Damper Control

Point Name	Description	Point Type/ID	Read/ Write
Stpt Manual Damper Position	When in the Manual Percent Outdoor Air setting, the dampers will bring in the amount of outside air defined by this setting.	AV:28	R/W
Stpt Building Static Pressure	When in the Auto Room Pressure setting, the dampers will modulate open and closed to control the room pressure to this setting.	AV:23	R/W
Status Total OA Percent	For AM and VAV models with inlet dampers. Reports mixing damper position plus the burner supply air damper position to give you the total outside air in a percentage.	AV:21	R
Status Manual Damper Position	Reports current setpoint (percentage) for manual outside air setting	AV:15	R
Status Building Pressure	Reports current building pressure (differential pressure)	AV:9	R

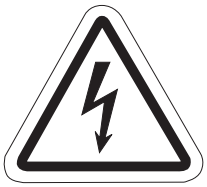
6.1.6 Alarms

Point Name	Description	Point Type/ID	Read/ Write
Fan Contactor Not On	*See Page 52, Section 7.3.1*	BV:9	R
Fan Contactor On When Should Be Off	*See Page 52, Section 7.3.2*	BV:10	R
Damper for Heat Air Not Open	*See Page 52, Section 7.3.3*	BV:11	R
Damper for Heat Air Not Closed	*See Page 53, Section 7.3.4*	BV:12	R
Burner Lockout or Safety SW Not Made	*See Page 53, Section 7.3.5*	BV:13	R
Low Supply Air Temp Shutdown	*See Page 56, Section 7.3.6*	BV:14	R
Dirty Filters	*See Page 57, Section 7.3.7*	BV:15	R
Low Building Pressure	*See Page 58, Section 7.3.8*	BV:16	R

6.1.7 Auto Discovery

Display Name	Read/ Write	Units	Default Value	Reference Name	Object Type	Object ID
Select Schedule Source	R/W	no units	1	sched_source	AV	5
Select Occ/Unocc Period On/Off	R/W		Inactive (0)	enable_bas	BV	1
Select Operating Mode	R/W	no units	0	op_mode_select	AV	7
Select Damper Control	R/W		1	set_damp_ctrl	MSV	2
Select Economizer Type	R/W		1	econ_type	MSV	1
Status Schedule Cntrl Source	R	no units		status_sch_Cntr_Source	AV	19
Status Occ / Unoccupied	R			occ_status	BV	2
Status Operating Mode	R	no units		status_op_mode	AV	17
Status Fan On	R			status_fan_on	BV	7
Status Output to VFD	R	%		vfd_spd	AV	18
Status Active Heating Setpt	R	°F		eff_htg_stpt	AV	11
Status Heat Off Stpt	R	no units		status_heat_off_sp	AV	12
Status DA Temp	R	°F		status_da_temp	AV	20
Status Cooling Stpt	R	°F		eff_clg_stpt	AV	10
Status Room Temperature	R	no units		status_room_temp	AV	22
Status OA Temperature	R	°F		status_oa_temp	AV	8
Status Heat On_Off	R			heat_enable	BV	8
Status Heat Output	R	%		status_burn_output	AV	13
Status Damper Control	R	no units		status_damp_ctrl	AV	14
Status Manual Damper Position SP	R	%		status_man_damp_sp	AV	15
Status Total OA Percent	R	%		status_oa_total	AV	21
Status Building Pressure	R	in H2O		eff_bldg_pres	AV	9
Status Economizer On/Off	R			status_econ_active	BV	3
Status Cooling Stage	R			status_clg_stg	BV	4
Stpt Occupied Htg	R/W	°F	70	occ_htg_stp	AV	2
Stpt Unoccupied Htg	R/W	°F	55	unocc_htg_stp	AV	1
Stpt Heat Off range 2 - 20 degrees	R/W	°F	3	burn_off-delta	AV	26
Stpt Cooling	R/W	°F	74	occ_clg_stp	AV	4
Stpt Bldg Static Pressure	R/W	in H2O	0.01	bldg_press_stpt	AV	23
Stpt Manual Damper Position	R/W	%	50	fxd_dmpr_pos	AV	28
Stpt Max Supply Air Temp	R/W	°F	95	max_dat_stpt	AV	29
Stpt Min Supply Air Temp	R/W	°F	60	min_dat_stpt	AV	30
Stpt Forced Supply Air Temp	R/W	°F	70	DA_Temp_Sp	AV	25
Stpt OA Heat Disable	R/W	°F	95	oa_heat_disable	AV	32
Stpt OA Heat Enable	R/W	°F	50	oa_heat_en_sp	AV	31
Stpt Low Temp Shutdown	R/W	°F	40	Low_Temp_Shutdown	AV	27
Stpt OA Limit	R/W	°F	65	OA_Econ_Limit_Stpt	AV	24
Alarm Burner Supply Damper LS Did Not Make	R			heat_damp	BV	9
Alarm Energy Alert	R			low_pressure	BV	10
Alarm Fan Contactor Hand Mode	R			fan_forced	BV	11
Alarm Filters Dirty	R			filters_dirty	BV	12
Alarm Gas Valve LS Did Not Make	R			gas_valve	BV	13
Alarm Low Temp Shutdown	R			low_temp	BV	14
Alarm Supply Damper LS Did Not Open	R			heat_damp_force	BV	15
Alarm Supply Fan Fail	R			fan_fail	BV	16
Keypad Schedule Enable	R/W		Inactive (0)	enable_keypad	BV	17

SECTION 7: TROUBLESHOOTING

⚠ DANGER	
	
Electrical Shock Hazard	**Severe Injury Hazard**
Disconnect electric before service. **More than one disconnect switch may be required to disconnect electric from equipment.** **Equipment must be properly grounded.**	**Do not enter equipment while in operation.** **Equipment may start automatically.** **Do not operate with door open.** **Installation, operation and service must be done by a trained technician only.**
Failure to follow these instructions can result in death, electrical shock or injury.	

⚠ WARNING				
				
Explosion Hazard	**Fire Hazard**	**Falling Hazard**	**Burn Hazard**	**Cut/Pinch Hazard**
Turn off gas supply to equipment before service.	**Keep all flammable objects, liquids and vapors the minimum required clearances to combustibles away from equipment.** **Some objects will catch fire or explode when placed close to equipment.**	**Use proper safety equipment and practices to avoid falling.** **Do not use any part of equipment as support.**	**Allow equipment to cool before service.** **Internal components of equipment may still be hot after operation.**	**Wear protective gear during installation, operation and service.** **Edges are sharp.**
Failure to follow these instructions can result in death, injury or property damage.				

7.1 Initial Checks

When encountering any abnormal operation or fault conditions of the equipment, all the troubleshooting should start with the following initial checks. If a problem is discovered in these initial checks, it must be corrected before moving on in the troubleshooting.

1. The air handler may have any number of possible heat sources (electric, gas, hot water or steam) or none at all. Several cooling options are also available (evaporative, DX, chilled water).

2. If the air handler does not include a feature as described in this Troubleshooting Guide, disregard information provided for that feature. (As indicated above in item #1, some features are optional and not included with every air handler.)
3. The following voltages are used for the control circuitry: 120 volts AC, 24 volts AC, 5 volts DC, 0-20 VDC and 0-10 VDC.
4. Refer to the air handler wiring diagram for aid in locating the error.
5. The Maxitrol modulating / regulating valve (direct-fired models) and its associated circuitry is powered by a 0-20 VDC signal. The RAPID® InfinityPro™ controller provides a 0-10 VDC signal to a signal conditioner, which then converts the signal to 0-20 VDC.

7.2 General Troubleshooting

1. Compare voltage and phase of power supply on site with rating plate information.
2. Review wiring diagram. Do the electrical connections match the supplied wiring diagram?
3. Compare the gas type and supply pressure on site with rating plate information.
4. Check for proper blower rotation on air handler.
   - Blowers paired with a three phase motor can be reversed by swapping any two incoming power legs. For blowers powered by a single phase motor, refer to the motor rating plate for reversing instructions.
5. For additional information on supplemental temperature sensor information, *See Page 58, Section 7.3.9*.

7.2.1 Fuses / Overloads Tripping

Frequent tripping of the electrical safety devices often indicate an electrical or duct design problem.

Investigate carefully to determine the underlying cause, consulting the National Electrical Code as necessary. Possible causes for tripping include:

1. The voltage supply to the air handler is too low. Check the transformer taps. Check wire size and length for excessive voltage drop.
2. The feeder breaker or fuses are undersized. Correct the improper component.
3. Air handler CFM is too high, causing excessive current draw. This occurs when the actual static pressure is significantly less than expected and specified. Consult Rapid Engineering LLC if additional assistance is required.

7.2.2 Flame Relay

The Honeywell flame relay RM7897C 1000 is equipped with an interrupted pilot. The pilot is extinguished after the main flame is established. A "Test/Run" switch is provided on these relays. The relay remains in the original mode before it was placed in the "Test" position. If the flame relay appears to be "stuck", it may be attempting to operate in the "Test" position. For normal operation, the "Test/Run" switch should always be in the "Run" position.

7.3 Alarm Description

There are a number of safety features included with the air handler. If a problem occurs during normal operation, a red alarm light on the handheld keypad will illuminate and an alarm description will appear. This is an indication to the user there is an alarm condition.

To reset the alarm light, push and hold the FN button, then press MUTE. To permanently clear an alarm light, the fault must be corrected. Based on information below, fault can properly be corrected.

7.3.1 Alarm Description: Fan Contactor Not On

This alarm occurs if input number 5 on the controller fails to activate while the fan is commanded to start and the unit is in the occupied period.

a. Reset the overloads. If the overloads continue to trip, check motor running amperage against motor name plate full load amperage. If greater than full load rating, determine cause of over amperage. (e.g., low service voltage, excessive voltage drop.)

4. The auxiliary contact is defective.

   a. Replace the fan contactor (built in)

5. Check for loose wiring between terminals
6. Defective contactor (M1).

   a. Check for voltage (120 volts) at the contactor coil. If there is voltage and the contactor does not pull in, the energizing coil is defective. If the contactor pulls in but does not start the fan, the contacts are defective. Replace the contactor.

7. An interlock (smoke detector or access door limit switch) is open and power to the control circuit has been interrupted.

   a. Check appropriate interlock.

7.3.2 Alarm Description: Fan Contactor On When It Should Be Off

This alarm occurs when input 5 at the controller is on when it should be off. It indicates the supply fan contactor has been activated before the fan has been commanded on or after the fan has been commanded off. Since this contactor should not be powered when the fan is not commanded to be on, an alarm is reported.

1. The auxiliary contact to the starter is jumped and/or shorted.

   a. Remove jumper or replace auxiliary contact on starter.

2. The M1 motor contactor has failed closed.

   a. Replace the contactor.

3. The fan motor initiate relay is wired incorrectly or defective.

   a. Verify the wiring is connected to the relay coil and contacts as is illustrated on the wiring diagram. Rewire relay if necessary.

   b. If the normally open contacts on the relay have failed closed, replace the fan motor initiate relay.

4. The fan relay on output relay is wired incorrectly or has failed closed.

   a. Verify the wiring is connected to the relay coil and contacts as is illustrated in air handler wiring diagram. Rewire relay if necessary.

   b. If the normally open contacts on the relay have failed closed, replace the fan relay on output relay.

7.3.3 Alarm Description: Damper for Heat Air Not Open

This alarm occurs when the end switch in the heat air damper fails to close on input number 4 at the controller.

1. A mechanical problem is preventing the damper from opening.

   a. Check for and remove any obstructions (ice formations) that may be preventing the damper from opening when powered.

   b. Disconnect the linkage and manually operate the damper to determine the cause of binding. Clean, lubricate, adjust, and repair as necessary.

2. The wiring for the heat air damper or the limit switch is loose or defective.

   a. Trace the voltage from the output relay to the motor and back to the input relay and repair the problem.

3. The heat air damper limit switch is defective or needs adjustment.
    a. Observe the limit switch response to successively energizing and de-energizing the damper motor. Adjust the limit switch for appropriate response to operation of the motor. If the switch is unable to be adjusted properly, replace the motor.
4. The heat air damper output relay or limit switch input relay are defective.
    a. Verify wiring is connected to the relay coil and contacts as is illustrated in air handler wiring diagram.
    b. Check proper contact operation as damper should open and close when relay is energized and de-energized. Replace relay if necessary.
5. The heat air damper motor is defective.
    a. If the motor fails to open when power is applied, (and the damper operation is not restricted) replace the motor.
6. An interlock (smoke detector or access door) is open and power to the control circuit has been interrupted.
    a. Check appropriate interlock.

7.3.4 Alarm Description: Damper for Heat Air Not Closed

This alarm occurs when input number 4 on the controller remains open and the heat air inlet damper should be closed. The damper for the heat inlet air fails to close when the fan is shut off. The damper remains open when fan is off. The heat air damper actuator is a power open spring return actuator.

1. A mechanical problem is preventing the damper from closing.
    a. Check for and remove any obstructions (ice formations) that may be preventing the damper from opening when powered.
    b. Disconnect the linkage and manually operate the damper to determine the cause of binding. Clean, lubricate, adjust, and repair as necessary.
2. The heat air damper limit switch is defective or needs adjustment.
    a. The damper is closed but the limit switch in the actuator is still made.
    b. Adjust the switch or replace the actuator as needed.
3. The heat air damper output relay has failed
    a. Check proper contact operation as damper should open and close when relay is energized and de-energized. Replace relay if necessary.

7.3.5 Alarm Description: Burner Lockout Or Safety SW Not Made

This alarm occurs when input number 6 on the controller drops out or is not made when there is a call for heat. Prior to generating this alarm, the normal start-up sequence includes a time delay of 120 seconds from the time the heat start relay, output 3, is energized. There are a number of safety devices wired in series with each other, if any of them open during a call for heat, the burner is de-energized and this alarm is generated. See below for possible causes.

1. Possible Cause of Burner Lockout or Safety SW Not Made: Airflow

An airflow switch on the air handler measures the pressure drop across the burner to ensure proper air velocity for combustion. The switch is pre-set to open if the airflow is low and the pressure drops fall below 0.2" w.c.. The switch additionally includes a pre-set to open if the airflow is too high and the pressure drop across the burner exceeds 1.35" w.c.. The target standard operating pressure drop is 0.9" w.c.. This can be measured by connecting a monometer to airflow switch pitot tubes.

1. Belts are loose, sheaves are worn.
    a. Tighten or replace belts per Rapid Engineering LLC specifications and belt manufacturer's recommendations. NOTE: Never replace only one belt in a set, as belts will elongate. Replace entire set if necessary.
    b. Check for worn drive sheaves and replace as needed.
2. Filters are dirty, preventing adequate airflow.
    a. Replace the filters.
3. Airflow switch tubing is plugged, preventing it from closing.
    a. Clear the tubing.
4. Fan rotation is reversed.
    a. Turn off disconnect switch and reverse two power wires, preferably at the line side of the disconnect. (High importance for pony motor drives or two speed motors) The wires on the load side of the disconnect may be reversed for single speed, single motor air handlers NOTE: The wide edge of the fan blades should be the leading edge.
5. Airflow switch is defective and has failed to close.
    a. Measure the pressure drop across the burner and compare it to the set point of the airflow switch to determine if the switch is bad. Replace switch if necessary.
6. Supply or discharge damper is not open.
    a. Check linkage and repair.
7. Access door is open.
    a. Close the door.
8. Fan is overloaded.
    a. Verify and compare the actual external static installed (ductwork) to design external static (ESP) to make sure the fan is not overloaded.
    b. Consult Rapid Engineering LLC for additional information.

2. Possible Cause of Burner Lockout or Safety SW Not Made: High Gas Pressure Switch

The high gas pressure switch is a normally closed switch that opens on a pressure rise to protect the equipment from over firing. The factory set point is 1.5" w.c above the high fire gas pressure set point. FM manifolds are manual reset type, XL and ANSI manifolds are automatic reset type.

1. The burner high fire gas pressure is set to high.
    a. Compare the actual high fire gas pressure to the rating plate on the air handler. Adjust the actual gas pressure as needed.
2. The utility gas pressure exceeded 5psig, overpowering the modulating / regulating valve's pressure regulator.
    a. Install an additional pressure regulator to reduce the incoming pressure to below 5psig.
3. The modulating / regulating valve's pressure regulator has failed.
    a. Replace the regulator.
4. The high gas pressure switch is set too low.
    a. Adjust the gas pressure switch setting to 1.5" w.c above the high fire setting.
5. The high gas pressure switch is defective.
    a. Measure gas pressure at switch. Determine if gas pressure is actually lower than the high gas pressure switch set point. Replace the switch if necessary.

3. Possible Cause of Lockout or Safety SW Not Made: Low Gas Pressure Switch

The low gas pressure switch is a normally closed switch that opens on a pressure fall to protect equipment from under firing and potentially deliver unburned fuel to the conditioned space. Consult the equipment data plate for the proper setting. FM manifolds are manual reset type, XL and ANSI manifolds are automatic reset type.

1. The manual gas valve is closed.
    a. Open manual gas valve
2. The utility inlet gas pressure dropped lower than the minimum inlet supply gas pressure required for the air handler.
    a. Investigate causes for low supply gas pressure. Possible causes could be a valve closed down-stream or insufficient pipe sizing to air handler.
    b. Close manual gas valve and remove any obstructions found in gas line.
3. The switch is not set properly.
    a. The switch should be set to the minimum inlet gas pressure setting as indicated on the air handler rating plate.
4. The low gas pressure switch is defective
    a. Verify the supply inlet gas pressure is higher than switch set point. If switch will not close, replace it.

4. Possible Cause of Lockout or Safety SW Not Made: High Temperature Limit Switch Tripped

The supply air high temperature limit switch is a normally closed switch factory set at 150 degrees Fahrenheit. The switch opens when the supply air exceeds the set point of the switch. The high temperature limit switch is a manual reset. The purpose of the high temperature limit switch is to prevent damage to the air handler fan motor and drive.

1. The maximum discharge temperature set point is set to high.
    a. Set the maximum discharge air temperature set point to 95 degrees Fahrenheit.
2. The modulating regulating valve high fire gas pressure regulator is set to high.
    a. Setup the modulating regulating valve to meet the factory specifications for the air handler.
3. The high temperature limit switch is set too low.
    a. Set the switch for 150 degrees Fahrenheit.
4. The high temperature limit switch is defective.
    a. Replace the switch.

5. Possible Cause of Lockout or Safety SW Not Made: Burner Control Safety Lockout

The Honeywell 7800-Series burner control defaults into safety lockout during certain conditions. The Honeywell 7897 burner control features an LED blink pattern when in lockout condition. The fast blinks identify the tens portion of the fault code (3 fast blinks is 30) while the slow blinks identify the units portion of the fault code (2 slow blinks is 2). For a complete list of fault codes refer to the Honeywell burner control literature.

1. No flame signal present during the trial for ignition period.
    a. Check that the supply gas pressure meets that air handler specifications.
    b. Make sure all of the manual shut off valves are open.
    c. Check the pilot line gas pressure at the "T" in the pilot line down stream of the pilot valve solenoid and the pilot regulator. Typical pilot line gas pressure is approximately 2" w.c differential resulting in a pilot flame about the size of a baseball. If no pressure is present either the pilot regulator or pilot solenoid valve may be defective.

d. Check the igniter, clean or replace if needed.

e. Remove and clean the lens of the UV scanner with a soft cloth.

f. Check the UV scanner by holding a flame in front of the UV scanner lens. Look for the flame LED light on the burner control to come on. If it does not come on, the UV scanner has most likely failed.

g. Check the ignition transformer; make sure the wiring to the igniter is good and not grounded out.

2. The flame signal is lost during the main flame establishing period or during the run period.

   a. Make sure the burner orifices are clean. See RAPID® 4000-Series Industrial Air Handler Installation, Operation and Service Manual (RP140000NA) Maintenance Section and drill burner orifices out with the correct size drill bit.

   b. Remove and clean the lens of the UV scanner with a soft cloth.

   c. Check the burner low fire setting. The flame length at a minimum firing rate must be long enough for the UV scanner to see the flame.

   d. Make sure the primary and block gas valves are opening during the main flame establishing period.Optimum low-fire flame length setting is 1" - 2". Ensure that there is a continuous ribbon of flame with no gaps. Gaps are most likely to occur at "T" intersections on the burner.

7.3.6 Alarm Description: Low Supply Air Temp Shutdown

This alarm occurs when the supply air temperature drops below the Fan Off If Supply Air Temp Below setting for more than 5 minutes and there is a call for heat.

1. Heat system failure.

   a. The control module detects problems with other areas of operation, it will not allow the burner to light. This, in turn, may allow the supply air to fall below the low temperature set point for 5 minutes.

   b. Check the Alarms log to see if another code has preceded it by 5 minutes and follow that alarm code's explanation of possible trouble.

2. The burner requires maintenance.

   a. See RAPID® 4000-Series Industrial Air Handler Installation, Operation and Service Manual (RP140000NA) Maintenance Section and drill burner orifices out with the correct size drill bit.

   b. Check burner gas pressure and compare it to the unit rating tag, adjust if needed.

3. The manual gas valve is closed or there is a blockage in the gas line.

   a. Open the valve or open the dirt leg cap and remove any blockage.

4. The discharge sensor, its cable or its connection to the control module is off or defective.

   a. Verify proper discharge sensor operation and cable connections and repair as necessary.

5. The connection from the control module to the modulating valve is defective or off.

   a. Repair the connector or cable as necessary.

6. Low limit set point is set too high. (Factory default is 40 degrees Fahrenheit.)

   a. Adjust the low limit set point to an appropriate value.

7. The modulating gas valve does not open to allow high fire. The valve should modulate progressively more open as the voltage from the controller rises above 5 volts DC, and continue opening until the voltage exceeds 15-19 volts DC.

   a. Repair or replace the valve and adjust high and low-fire flames as needed.

8. Ignition did not occur.

a. The igniter (spark plug) is defective, fouled or shorting against the burner end plate. Check that it is properly installed, has a clean (no carbon) gap of about 3/32" (2.5mm) and no cracks in the ceramic. Clean the electrode with a wire brush if necessary.

b. The ignition transformer is not receiving power or putting out the proper (6000V) voltage. Determine the cause and repair.

c. If spark is present in the test above, air may be present in the gas line. Purging of air in a new line may be required. An LP system may need purging if the tank ran out of gas before refilling.

9. The flame verification signal (ultraviolet light) is not present. Possible causes include:

a. Dirty UV scanner. Clean the scanner with a soft cloth.

b. Plugged UV scanner sight tube. Remove the obstructions.

c. UV scanner not secured firmly to the sight tube. Screw the scanner on firmly, but only finger tight.

d. Defective UV scanner. Replace the scanner.

e. Loose or defective UV scanner wiring. Determine the location of the problem and repair.

f. A defective flame relay or UV amplifier. Replace the defective component.

10. Pilot manual valve is closed.

a. Open valve.

11. Pilot solenoid valve is defective.

a. Replace solenoid

12. Low pilot flame.

a. Increase pilot gas pressure by adjusting pilot regulator. The outlet pressure at the pilot regulator should be about 2" w.c, resulting in a pilot flame about the size of a baseball.

13. The airflow switch setting is too low, causing frequent flame relay power cycling.

a. Set the switch properly per the Service Technician Manual.

14. Wires on flame relay terminals are disconnected or loose

a. Remove the relay from its base and check.

15. Ignition wire is broken or grounded against unit.

a. Repair the wire or isolate from ground.

16. The primary, block or vent valve actuator is defective.

a. Replace the faulty actuator.

NOTE: Honeywell 7800 flame relays are designed to allow remote resetting. The burner is reset every time the air handler is turned off and then returned to the On or Auto mode.

7.3.7 Alarm Description: Dirty Filters

1. The filters are dirty or the belts are loose.

a. Change the filters

b. Check the fan belts replace or tighten per the maintenance manual.

2. Motor or fan sheaves are worn

a. Replace the worn sheaves with new. Confirm replacement sheaves are the correct size consult factory if necessary.

3. The clogged filter switch has failed.

a. Verify the pressure drop across the filters and compare it to the set point of the clogged filter switch to determine if the switch is working correctly.

7.3.8 Alarm Description: Low Building Pressure

This alarm occurs when there is a call for heat and the air handler is operating in the Occupied Heating setting with Auto Room Pressure heating type. The air handler has been unable to maintain a positive building pressure within .01" w.c. of the pressure set point for 10 consecutive minutes. As a result, the program has placed the outside air dampers in the minimum outside air position and the air handler in the Unoccupied Setback Temp setting. This setting will be maintained until the situation causing the lack of building pressure has been corrected or after a maximum of 20 minutes. Once either of these conditions has occurred, the program will then return the air handler to the Occupied Heating setting with Auto Room Pressure heating type. The cycle will restart again in 10 minutes if the situation that caused the building pressure drop has not been corrected. This alarm occurs only if the heating control type has been configured for the Low Building Pressure option. This alarm is a report of the Low Building Pressure condition, there is no problem with the software or hardware.

1. Determine why the building pressure is less then set point.
    a. Most common cause is open over head garage doors
    b. Close the doors

7.3.9 Supplemental Temperature Sensor Information

The thermistor temperature sensors change resistance to the Control Module proportionally to the temperature, with 10,000 ohms representing 77 °F. Each 1 °F drop in temperature causes an approximately 250 ohm increase. The simplest way to check their performance is by using the temperature / resistance chart on *Page 59, Table 10*. The display may indicate that a temperature sensor is "seeing" a very cold temperature that is much colder than the actual temperature.

1. The sensor wiring is damaged or connected improperly.
    a. Inspect all cabling for the sensor and repair as necessary.
    b. Inspect all terminations and plug connections; make sure that they are making good electrical contact.
2. The sensor is defective.
    a. Replace the sensor.

For burner equipped direct-fired air handlers which circulate room air, if the room or discharge air temperature sensors are defective, the RAPID® InfinityPro™ logic for temperature rise control will allow the burner to light, but it will remain at low fire. Replace the defective sensor in order to restore proper operation.

Table 10: Thermistor Performance

Temperature Fahrenheit	Ohms	Temperature Celsius	Ohms
0	85,350	-17.5	84,106
5	72,910	-15.0	72,910
10	62,480	-12.5	62,523
15	53,640	-10.0	55,408
20	46,230	-7.5	48,453
25	39,910	-5.0	42,438
30	34,560	-2.5	37,235
35	30,000	0.0	32,736
40	26,100	2.5	28,830
45	22,760	5.0	25,432
50	19,900	7.5	22,474
55	17,440	10.0	19,900
60	15,310	12.5	17,686
65	13,480	15.0	15,736
70	11,880	17.5	14,029
75	10,500	20.0	12,520
80	9,298	22.5	11,190
85	8,250	25.0	10,019
90	7,331	27.5	8,984
95	6,532	30.0	8,066
100	5,826	32.5	7,251
105	5,209	35.0	6,532
110	4,663	37.5	5,897
115	4,182	40.0	5,332
120	3,757	42.5	4,827
125	3,381	45.0	4,374

NOTE: This table is applicable for the standard RAPID® temperature sensor, which is a thermistor. The purpose of this table is to assist a service technician in diagnosing sensor related problems. Without precision temperature measurement and a clear understanding of the accuracy specifications for these sensors, it will be impossible to exactly duplicate the table data. Normal service test equipment, however, used in conjunction with the table should indicate whether the sensor is operating properly.

SECTION 8: THE RAPID® INFINITYPRO™ WARRANTY

RAPID ENGINEERING LLC WILL PAY FOR:

Within 24 months from date of purchase by buyer or 27 months from date of shipment by Rapid Engineering LLC (whichever occurs first), replacement parts will be provided free of charge for any part of the product which fails due to a manufacturing or material defect.

Rapid Engineering LLC will require the part in question to be returned to the factory. Rapid Engineering LLC will, at its sole discretion, repair or replace after determining the nature of the defect and disposition of part in question.

RAPID® Replacement Parts are warranted for the later of 12 months from date of shipment from Roberts-Gordon LLC or the remaining RAPID® InfinityPro™ warranty.

RAPID ENGINEERING LLC WILL NOT PAY FOR:

Service trips, service calls and labor charges.

Shipment of replacement parts.

Claims where the total price of the goods have not been paid.

Damage due to:

- Improper installation, operation or maintenance.
- Misuse, abuse, neglect, or modification of the RAPID® InfinityPro™ in any way.
- Use of the RAPID® InfinityPro™ for other than its intended purpose.
- Incorrect gas or electrical supply, accident, fire, floods, acts of God, war, terrorism, or other casualty.
- Improper service, use of replacement parts or accessories not specified by Rapid Engineering LLC.
- Failure to install or maintain the RAPID® InfinityPro™ as directed in the User, Operation and Troubleshooting Manual.
- Relocation of the RAPID® InfinityPro™ after initial installation
- Use of the RAPID® InfinityPro™ in a corrosive atmosphere containing contaminants.
- Use of the RAPID® InfinityPro™ in the vicinity of a combustible or explosive material.
- Any defect in the RAPID® InfinityPro™ arising from a drawing, design, or specification supplied by or on behalf of the consumer.
- Damage incurred during shipment. Claim must be filed with carrier.

WARRANTY IS VOID IF:

The RAPID® InfinityPro™ is not installed by an contractor qualified in the installation and service of gas fired heating equipment.

You cannot prove original purchase date and required annual maintenance history.

The data plate and/or serial number are removed, defaced, modified or altered in any way.

The ownership of the RAPID® InfinityPro™ is moved or transferred. This warranty is non-transferable.

Rapid Engineering LLC is not permitted to inspect the damaged equipment and/or component parts.

READ YOUR USER, OPERATION AND TROUBLESHOOTING MANUAL.

If you have questions about your equipment, contact your installing professional. Should you need Replacement Parts or have additional questions, call or write:

Rapid Engineering LLC
1100 Seven Mile Road NW
Comstock Park, MI 49321
Telephone: +1.616.784.0500
Fax: +1.616.784.1910
Toll Free: 800.536.3461
www.rapidengineering.com

Rapid Engineering LLC's liability, and your exclusive remedy, under this warranty or any implied warranty (including the implied warranties of merchantability and fitness for a particular purpose) is limited to providing replacement parts during the term of this warranty. Some jurisdictions do not allow limitations on how long an implied warranty lasts, so this limitation may not apply to you. There are no rights, warranties or conditions, expressed or implied, statutory or otherwise, other than those contained in this warranty.

Rapid Engineering LLC shall in no event be responsible for incidental or consequential damages or incur liability for damages in excess of the amount paid by you for the RAPID® InfinityPro™. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so this limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from jurisdiction to jurisdiction.

Rapid Engineering LLC shall not be responsible for failure to perform under the terms of this warranty if caused by circumstances out of its control, including but not limited to war, fire, flood, strike, government or court orders, acts of God, terrorism, unavailability of supplies, parts or power. No person is authorized to assume for Roberts-Gordon LLC any other warranty, obligation or liability.

LIMITATIONS ON AUTHORITY OF REPRESENTATIVES:

No representative of Rapid Engineering LLC, other than an Executive Officer, has authority to change or extend these provisions. Changes or extensions shall be binding only if confirmed in writing by Rapid Engineering LLC's duly authorized Executive Officer.