This reference should remain on site with the installed RDT EcoSmart controller.

Parts List
The following parts are included in the RDT EcoSmart controller kits:

- Kit #20178 with 120/208-240 VAC controller
- Kit #20844* with 120/208-240 VAC controller
- Kit #20631* with 120/208-240 VAC controller
- Kit #20222* Beacon® I & II replacement controller
  - A (1) RDT EcoSmart controller
  - B (1) high voltage safety shield
  - C (3) 15' colored temperature sensors
  - D (4) 90 degree quick disconnects
  - E (5) self-tapping screws
  - F (2) course thread screws (1) fine thread machine screw with lock washer
  - G (1) RDT Terminal Board with fuses
  - H (1) RDT Evap Navigation sticker
  - I (2) 1/2" plastic knockout plugs
  - J (4) wire ties (rated for low temp)
  - K (1) Air sensor mount
  - L (1) 5-position pluggable connector (for EEV)
  - M (4) 3-position pluggable connectors (for power in, transducer and 3A relay)
  - N (9) 2-position pluggable connectors (for sensors and digital input, analog output)
  - O (1) 120 Voltage jumper
  - P (1) 208-240V Voltage jumper (already installed on RDT Evap)

Supplies List
The RDT Evap is supplied with all of the accessories required for the controller to work, however, standard truck stock items will also be required to install the controller. To simplify the installation, a list of items has been provided.

- Conduit to go between the controller and the evaporator
- (2) Conduit connectors (straight or elbow as required)
- (11) High voltage wires matched to the load of the heaters, fans, liquid line solenoid, alarm (if used), and the controller.
- (8) Spade Connectors matched to gauge of high voltage wires
- Wire labeling (numbers, colors, etc.)
- Additional wire ties
- 18 gauge twisted shielded pair (if extending sensor wires)
- Foam insulation if running wires outside the space.
- Silicone (for sealing any box penetrations)

Accessories to Aid in Installation
The following parts are available separately:

- 10' Wire Harness pn 20736
- 25' Wire Harness pn 20670
- 40' Wire Harness pn 20737
- KE2 Evap Mounting Box pn 20687

Further information on the Wire Harness and Mounting Box can be found in literature Q-1-21.

* 20844 RDT Ultimate Install kit includes RDT Mounting Box pn 20687 and 40' colored temperature sensors
* 20631 kit does not include temperature sensors
* 20222 Beacon® kit includes an extra temperature sensor, and pressure transducer with cable.

NOTE: All sensors can be used for any purpose and are interchangeable, colors are for ease of identification only.

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Arriving at the Jobsite
When arriving at any jobsite, it is good practice to verify the correct operation of the system. Even systems running for a considerable amount of time without requiring a service call may not be running properly.

Inspect the coil to see the current frost pattern. If the unit has not recently performed a defrost, look for the heaviest area of frost. This will be used to locate the coil sensor.

Installers should account for a full system diagnostic in the installation estimate for the controller.

Although it may seem unnecessary, identifying system issues before the controller is installed will save time overall. It will also allow the controller to provide the highest energy savings.

Verify the system is running correctly. Taking several measurements will help determine the current health of the system.

Two of the most critical indicators of system health are the superheat and subcooling.

Superheat - Superheat is the most overlooked inefficiency in existing systems. Typically the superheat on a mechanical thermostatic expansion valve (TEV) is set when there is no product in the controlled space, if it is set at all.

When applying the controller to an existing system with a mechanical expansion valve, the superheat should be set to the manufacturer's recommendation. With an electronic expansion valve (EEV), lower superheat and improved efficiency can be maintained.

Subcooling - There should be a solid column of liquid at the inlet of the valve. This can be verified by looking at the sight glass, however, the proper method requires measuring the subcooling of the liquid entering the valve.

Verify Temperature Difference
A typical Temperature Difference (TD) between the coil temperature and the air temperature is between 5 and 15°F. An insufficient TD, between the coil and air temperature, indicates a system issue that needs to be addressed before installing the RDT Evap.

Understanding Frost
The air exiting side of the evaporator is often the coldest spot on the coil due to the load affecting the temperature. As air travels through the fins of the evaporator, the Relative Humidity will reach 100%. Moisture will begin to drop out of the air, and deposit on the coil surfaces to form frost. Although frost typically has a negative connotation when discussed in refrigeration, initial frost formation has a positive effect, due to increased surface area of the tubes, which increases air velocity through the fins. It is not uncommon to see a small amount of frost on the coils that have RDT Evap controllers installed.

The RDT Evap is continually measuring, monitoring, and managing the frost to assist in maximum energy efficiency. When the efficiency of the coil is reduced due to excessive frost, the RDT Evap will initiate a defrost.

Determining Controller Location

1. The controller is designed to be as versatile as possible, and can be installed inside or outside the controlled space. The location of the controller should be discussed with the end user to determine if they have a preference, and in a location convenient for installation by the service provider. Locating the controller at the entrance to the space typically does not increase the complexity of the wiring, merely the length of the wires.

2. The controller can also be located at the condenser, but should not be installed outdoors without an enclosure to protect it from sunlight and moisture (must be within operating range -40°F to 140°F (40°C to 60°C).
Cut a length of conduit to go from the controller to the evaporator
- Measure the distance between the controller and evaporator to account for the extra length necessary to properly route conduit.

Determine the number of wires to go to the controller.
- Controller power (3 wires)
- Fan control (2 wires)
- Defrost (heater) control (2 wires)
- Liquid line solenoid (2 wires)
If the Aux Relay is used, the installer will need to supply an additional pair of wires to the controller
- Aux relay (2 wires)
Note: Install in accordance with local wiring codes. RDT does not accept responsibility for incorrect or unsafe wiring.

Cut wires to length
- Once the number of wires is determined, cut the wires to length.
- The wire should be long enough to account for the necessary connections in the controller and evaporator.
- Use the optional RDT Wire Harness, or select different colored wires, (recommended colors: blue - fan, orange - heaters, yellow - solenoid, purple - alarm). This will simplify the installation and troubleshooting. If only a single color is available, both ends of the wires should be labeled with a matching number. This will save time when wiring the evaporator.

Determine the current draw of the unit.
- Use the nameplate to determine the Amp rating of the unit, and select the proper sized wire. Also, verify the unit does not exceed the relay rating on the RDT EcoSmart controller.
If the amp draw of the fans, heaters, compressor or aux relay exceeds the rating of the onboard relays, external contactors must be used. In that case, the onboard relays are used to switch the power to the contactor coils. RDT can provide ready made and tested contactor panels for various high amperage applications. See Page 9. Contact RDT for specific information.

Preparing conduit
- Feed the wires through the conduit.
- The conduit connectors can be added at this time. Determine if a straight or 90 degree connector is most appropriate for the installation, and attach to the conduit.
- Securely connect one end of the conduit to the controller, or mounting box, if used.

Wiring the controller
The controller is pre-configured for 208/230V incoming power by the installed four-position plug with a single jumper, as shown in Figure 6.
A second plug with two jumpers, as shown in Figure 6, is included in the kit to convert the controller to 120V incoming power. Simply replace the single jumper plug with the two jumper plug. See Back View of Controller, page 13.
- Power should not be connected to Voltage selector, it is a selector only.
- Power for the controller should be connected to the Power In location using a 3 position connector.

Controller will illuminate display when 120V is applied with 208-240V selected, however, controller will not function properly.
Controller Power
- The RDT Wire Harness wires are pre-stripped (if not using the RDT Wire Harness, strip the end of the wires used to provide power to the controller).
- Fasten incoming power to the 3-position pluggable connector*.
- Plug the 3-position pluggable connector into board as indicated in Wiring Schematic.
- *All terminal screws should be tightened to 5 ft-lbs.

Fan Relay WITH the RDT Wire Harness
- The BLUE wires are used for FAN control.
  - Locate the blue wire with a black stripe, and the black wire with a blue stripe.
  - Plug the black wire with a blue stripe into the COM terminal of the Fan Relay
  - Plug the blue wire with a black stripe into the NO position of the Fan Relay

Fan Relay WITHOUT the RDT Wire Harness
- Strip the end of the 2 wires used for fan control.
- Locate 2 female spade connectors in the parts kit.
- Crimp on the female spade connectors.
- Plug the connectors into the COM and NO positions of the Fan Relay.

Confirm combined fan motor load is not over 10 amps

Defrost (Heater) Relay WITH the RDT Wire Harness
- The ORANGE wires are used for the HEATER control.
  - Locate the orange wire with black stripe, and black wire with orange stripe.
  - Plug the black wire with orange stripe into the COM terminal.
  - Plug the orange wire with black stripe into the NO position of Defrost Relay.

Defrost (Heater) Relay WITHOUT the RDT Wire Harness
- Strip the end of the 2 wires used for the defrost control.
- Locate the remaining 2 female spade connectors in parts kit.
- Crimp on the female connectors.
- Plug the connectors into COM and NO positions of the Defrost Relay.

Confirm combined heater load is not over 20 amps.
Liquid Line Solenoid (LLS)/Comp. Relay USING RDT Wire Harness
- The YELLOW wires are used for LIQUID LINE SOLENOID control.
  - Locate a 3-position pluggable connector from the parts kit.
  - Fasten the black wire with yellow stripe into the COM position of the LLS/Comp Relay.
  - Fasten the yellow wire with black stripe into the NO position of the LLS/Comp Relay.
  - Plug the 3-position pluggable connector into the location as indicated in the Wiring Schematic.

Liquid /Compressor Relay WITHOUT the RDT Wire Harness
- Strip the end of the 2 wires used for fan control.
- Locate a 3-position pluggable connector from the parts kit.
- Fasten the incoming power for the liquid line solenoid to COM position of the LLS/Comp Relay.
- Fasten the lead from the liquid line solenoid to the NO position of the LLS/Comp Relay.
- Plug the 3-position pluggable connector into the location as indicated in the Wiring Schematic.

Max relay rating is 3A.

Auxiliary Relay
- If using the Auxiliary Relay, the installer will need to supply an additional pair of wires to the controller.
  - Strip approx. 1/4” of wire insulation on end of the 2 wires, for the auxiliary device.
  - Locate a 3-position pluggable connector from the parts kit.
  - Plug the 3-position pluggable connector into the location as indicated in the Wiring Schematic.

Max relay rating is 3A.

Note: Before installing the safety cover, plug in any remaining connectors to store for future use.

Install Safety cover
- Once all of the high voltage wiring is complete, install the metal cover on the controller.
  - Locate the cover and 3 small screws from the accessories kit.
  - Position the cover over the 3 mounting posts.
  - Using the 2 coarse thread screws attach cover to the plastic posts.
  - Use the fine threaded machine screw with lock washer to fasten the cover to the metal post.

Set the controller in a safe place.

Preparing the Evaporator
- The evaporator wiring will require access to the high voltage terminal block on the coil.
  - Turn off power to the system.
  - Verify power is no longer present using a multimeter.

Evaporator wiring
- Now that the conduit is prepared, it can be connected to the evaporator.
  - Locate the proper sized knockout and carefully remove knockout.
  - Connect conduit to the evaporator.
Study the existing wiring.

Although the existing terminal board in the evaporator may be used, it is often poorly labeled and difficult to wire. RDT provides a fused terminal board (Item G in the parts list) that greatly simplifies wiring as well as provides additional protection for controller components. The instructions below are based on the use of this board.

Determine the location of the following: incoming power, fan leads, heater leads, defrost termination leads, and fan delay leads.

Evaporator wiring – Controller

- Bring uninterrupted power to L1 and L2/neutral on the terminal board. Connect ground to the terminal board.
- Strip the end of the wires used to power the controller.
- Attach to the line power to provide continuous power to the controller.
- Connect ground from terminal board to the controller.

Note: Ground is required for the internal safeties to operate properly.

Evaporator wiring – Fans

- Strip the ends of the wires (connected to the RDT Evap) used to control the evaporator fans.
- The fan wires can be attached to the terminal block using either screw down terminals or spade connectors.
- Attach one of the wires to the L1/Line. This wire should be connected to COM of the fan relay on the controller.
- Connect the wire connected to the NO terminal on the Fan Relay to one of the Fan Terminals on the supplied terminal board.
- Connect the remaining fan lead(s) to the L2/Neutral position(s) on the terminal board.
Evaporator wiring – Heater

- Strip the ends of the wires being used for heater control.
- The heater wires can be attached to the terminal block using either screw down terminals or spade connectors.

Remove defrost termination (Klixon®) from circuitry

- Attach the wire connected to the Heater Relay COM terminal on the controller to the L1 terminal on the board.
- Attach the wire connected to the NO terminal on the Heater Relay to the fused HEATERS terminal on the board as shown.
- Connect L2/NEUTRAL to the remaining HEATERS terminal as shown using the HEATER LIMIT SWITCH (or jumper).

The defrost safety should not be removed from the circuit. Its purpose is to prevent the heaters from over heating and causing damage.

Evaporator wiring – Liquid Line Solenoid /Compressor

- Strip the ends selected to control the liquid line solenoid.
- Attach the wire connected to the NO terminal on the LL Solenoid/Compressor relay on the controller, to the fused LL SOLENOID/COMP terminal on the board, as shown.
- Attach the wire from the COM on the LL Solenoid/Compressor relay on the controller, to the L1/Line Voltage on the board.
- Connect remaining LL Solenoid/Compressor lead to L2/NEUTRAL terminal on the board.
**Wiring Schematic - Controller with KE2 Contactor Box**

**Legend**
- **EFM** - Evaporator Fan Motor
- **DH** - Defrost Header
- **LLS** - Liquid Line Solenoid
- **AUX** - Auxiliary
- **PT** - Pressure Transducer
- **T1 SUCT** - Suction Temperature
- **T2 AIR** - Return Air Temperature
- **T3 COIL** - Evaporator Coil Temperature
- **T4 AUX** - Auxiliary Temperature
- **EEV** - Electric Expansion Valve
- **ECM** - Electronically Commutated Motor
- **D1** - Digital Input 1
- **D2** - Digital Input 2
- **D3** - Digital Input 3
- **- - -** - By others

All field wiring must conform to local codes.

Contactor ratings per UL508 CSA 22.2

<table>
<thead>
<tr>
<th>Evaporator Fan Motors Con1 Max HP &amp; Amp Ratings (Total All Fans)</th>
<th>Existing Defrost Heaters Max Current Ratings (Amps are Total All Heaters)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Voltage</strong></td>
<td><strong>Max HP</strong></td>
</tr>
<tr>
<td>230 3Ø</td>
<td>15</td>
</tr>
<tr>
<td>460 3Ø</td>
<td>30</td>
</tr>
<tr>
<td>575 3Ø</td>
<td>30</td>
</tr>
</tbody>
</table>
IMPORTANT
Determine the coil sensor location

To determine the most appropriate coil sensor location, put the system into defrost. The coil sensor location is easily determined by viewing the frost pattern during defrost. The last place frost disappears during the defrost cycle is the correct coil sensor location.

Monitor both the air entering side, as well as the air exiting side, of the evaporator coil. Don’t be surprised if the last place for frost to disappear is on the air exiting side. It is usually near the right or left end of the coil.

It is important to verify all heating elements are working properly.

Steps to Ensure Proper Coil Sensor Location

More often than not on coils, the location of the sensor is a short distance from the end, approximately 1 to 1-1/2” away from the right and left edges of the active coil surface. The ice tends to grow from these edges towards the center. Therefore, the sensor location is best situated approximately 1 to 1-1/2” from the outer edges and typically near the bottom 1/3rd portion of the evaporator. The sensor needs to be as far away from the defrost heat sources as possible. Be aware that the drain pan heater may affect coil sensor location.

This is easily located by viewing the frost pattern during defrost. The last place frost disappears during the defrost cycle is the correct coil sensor location.

Note: Insert plug (Item I from parts list) into coil housing when mounting sensor wire to prevent damage to the sensor from sharp edges. Two plugs are provided. One plug should be inserted into the inner housing to access the coil, and the other into the outer housing to exit the coil. Installer must puncture plug to insert sensor.

As with any wiring installation, it is appropriate to leave a service loop. Enough wire should be left to move the sensor to the opposite end of the evaporator.
Evaporator wiring – Auxiliary

- The auxiliary relay is optional and wiring will vary depending on the auxiliary relay method selected.
- Depending on auxiliary relay function, an additional conduit may be required.
- Strip the ends selected to control the auxiliary component.
- Break the hot leg of the auxiliary component.
- Attach the wire from the NO terminal on the auxiliary relay to one of the auxiliary component leads. Attach the wire from the COM on the auxiliary component relay to the L1/Line Voltage.
- Connect L2/Neutral to the remaining auxiliary component lead.
- Route and secure the conduit to the location the controller is to be installed.
- Wiring must follow local wiring codes.

Installing the sensors

- Sensors should be labeled with their function. Although not required, RDT suggests that the following sensor wiring colors be used for clarity, and consistency, on kits having color sensor wires.
  - Blue for Room Air Temp and connected to T2
  - Yellow for Coil Temp and connected to T3
  - Green for the 2nd Coil Temp (T4Aux), when used, and connected to T4
  - Black for Suction Temp sensor, when used, and connected to T1

Note: All sensors can be used for any purpose and are interchangeable, colors are for ease of identification only.

Air Sensor Bracket

- Install the Air Temperature Sensor using the Stainless Steel self-piercing screw and bracket from the parts kit.
- The end with the single loop is designed to be mounted with the screw included.
- The end with multiple loops is designed to hold the sensor.
- Locate the best place to install the sensor.
- The sensor should be located between 8 - 12 inches away from the face of the evaporator. This distance prevents the sensor from sensing heat from the heating elements during the defrost cycle, but close enough to accurately sense the return air temperature.
- The sensor bracket may be bent as necessary to locate the sensor in the proper position.
- The air sensor should be installed at a height 2/3 down from the top of the evaporator to accurately measure air going through the evaporator.

WARNING! Do not allow the metal portion of the air sensor to touch anything other than air. It should not touch the bracket, nylon cable tie, or any other solid surface.

Coil Sensor

- It is essential that the sensor is in the coldest location on the coil at the end of the defrost cycle, this will ensure a complete defrost each and every time. See steps 21-23 to determine correct coil sensor location.

Once you determine the proper sensor location, as described in preliminary steps 21-23, the coil sensor can be installed.

Installing the Sensor Properly

Note, the most active portion of the sensor is the first 1/2" of the 1-1/2' long stainless steel probe. Figures 28 and 29 show two methods for installing the sensor in the coil. The method shown in 28 will work in most applications, however in some cases inserting the sensor into the coil may position it too close to the defrost heat source. In these instances, the method shown in Figure 29 can be used.
The inset photo in Figure 28 shows that the sensor is positioned so that it is touching two circuit tubes, as shown in Figure 28 1 & 2. When inserting the sensor into the coil, the tip should touch one of the circuit tubes 2, and the probe should be inserted into the fins approximately 1/16” deeper than the stainless shielding. Pinch the fins gently together, securing the sensor in place. This provides thermal ballast to ensure a complete defrost.

Note: The sensor should not be located adjacent to the electric heating elements. It should be about half the distance between the heaters if possible.

Alternate method - As the defrost termination sensor, it is important to ensure the sensor does not terminate defrost before all frost is removed from the coil. In some installations, inserting the sensor into the coil may position it too close to the defrost heat source. An alternate method of positioning, Figure 29A, places the sensor vertically between the coil fins. Figure 29B shows the coil sensor properly secured.

Extending sensor wires

After the sensors are mounted, they are routed back to the controller. If the wires must be extended, use 18 gauge twisted shielded pair. Maximum length for 18 gauge: 100 ft.

If additional resistance affects the temperature or pressure reading of the controller, the temperature and pressure may be “offset” to read correctly. Use the OFFSET function, in the SETPOINTS menu, Page 18.

When running the wires back to the controller take care to avoid introducing electrical noise into the sensor wires. Electrical noise can be introduced when sensor wires are located near high voltage lines. High voltage is defined by Underwriter’s Laboratories as above 30V. The higher voltage, the more likely it is to introduce electrical noise.

If crossing a high voltage line is necessary, run sensor wiring at right angles to prevent noise.

Connecting sensor wires to controller

The temperature sensors are designed to be attached to the controller using 2-position screw terminals. Using a connector from the parts kit, attach the sensor to the screw terminal. The sensors are not polarized, so wire location does not affect sensor performance.

Connect all sensors to pluggable connectors.

Once connected, the sensors should be plugged into the proper location on the controller. The location can be determined from the label on the interior wall of the enclosure or from the Wiring Schematic.

Strain relief

The enclosure is designed with a strain relief bar to prevent the sensor wires from becoming unplugged from inadvertent contact.

Before securing the sensor wires, create a service loop. Figure 30.

Using a cable tie from the parts kit, securely fasten the sensor wires to the strain relief bar.

Note: Unused connectors should be placed (installed) in their respective location for future use.

Controller Mounting

Locate the 4 stainless steel mounting screws in the accessories kit

Install the 4 screws

Place the controller on the screws and tighten down the screws.

Final Step

Leave installation instructions onsite for future service.
Specifications

**Controller:**
- **Input Voltage:** 120V or 208 - 240V
- **Ambient Temp:** 0° to 140°F (-40°C to 60°C)
- **Operating Temp:** 0° to 140°F (-40°C to 60°C)
- **Display:** 4-digit alphanumeric LED
- **IP Rating:** IP65
- **Inputs:** 4 temperature sensors, 1 pressure transducer
- **Valve Types:** unipolar and bipolar stepper motors (12V) (Beacon® is 21V)
- **Relays:** 20A resistive (defrost) 10A inductive (evaporator fan) 2 (3A inductive rated cycles)

**Digital Input 1:**
- Door contact, use 2nd air temp setpoint, disabled, system off, external alarm notification

**Digital Input 2:**
- Door switch, use 2nd air temp setpoint, disabled, system off, external alarm notification, defrost lockout, defrost interlock

**Digital Input 3:**
- Door switch, use 2nd air temp setpoint, disabled, system off, external alarm notification, light switch

**Communication:** Standard TCP/IP

**Pressure Transducer - pn 20201 (10 ft lead) or pn 20204 (40 ft lead)**
- **Pressure Range:** 0 to 150 psia
- **Proof Pressure:** 450 psi
- **Burst Pressure:** 1500 psi
- **Operating Temp:** 0° to 275°F (-40°C to 135°C)

**Temperature Sensor - 3 pack pn 21151 (15 ft leads) or pn 21066 (40 ft leads)**
- **Sensor Specs:** -60° to 150°F (-51°C to 65°C) moisture resistant package

Back View of Controller - General Layout
For wiring schematics see pages 7-10
Table 1 - Controller Navigation - Menu Structure

<table>
<thead>
<tr>
<th>Indicator lights</th>
<th>Red light - critical alarm (system is not running)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yellow light - non-critical alarm (system running)</td>
</tr>
<tr>
<td></td>
<td>Green light - compressor on</td>
</tr>
<tr>
<td></td>
<td>Green flashing - compressor waiting on timer to start/stop</td>
</tr>
</tbody>
</table>

To move through controller menus:
- **Left and Right Arrows** Use to move between Menus
- **Up and Down Arrows** Scroll through Menu Parameters

To return to Main Menu:
- Press **BACK** to return to the previous view.

To toggle between description and value:
- Press and hold **ENTER** to go from parameter to value.

To change settings:
- Press and hold **ENTER** for 3 seconds, when display begins blinking changes can be made

To save setting changes:
- Press and hold **ENTER** for 3 seconds to save change

Non-adjustable Variables (view only):
- ROOM TEMP
- COIL TEMP
- SYSTEM MODE
- SUPERHEAT SUCTION PRESSURE
- T1 SUCTION TEMP
- SATURATION TEMP
- Valve: % OPEN
- T4 AUX TEMP
- COMPRESSOR RELAY
- DEFROST RELAY
- FAN RELAY
- AUX RELAY
- DIG 1 STATUS
- DIG 2 STATUS
- DIG 3 STATUS
- IP OCTET 1
- IP OCTET 2
- IP OCTET 3
- IP OCTET 4
- SUBNET MASK OCTET 1
- SUBNET MASK OCTET 2
- SUBNET MASK OCTET 3
- SUBNET MASK OCTET 4
- Firmware Version

Alarms (view only):
- NO ALARM PRESSURE SENSOR
- SUCTION TEMP SENSOR
- AIR TEMP SENSOR
- COIL TEMP SENSOR
- AUX TEMP SENSOR
- HIGH SUPERHEAT
- LOW SUPERHEAT
- HIGH AIR TEMP
- LOW AIR TEMP
- EXCESS DEFROST
- DEFRT TERN ON TIME
- DOOR SWITCH
- COMMUNICATION ERROR
- EXT ALARM EMAIL FAILURE
- FTP
- SNTP

Setpoints:
- ROOM TEMP
- DEFROST TYPE
- VALVE TYPE
- MOTOR TYPE
- MOTOR STEP RATE
- MAX VALVE STEPS
- SUPERHEAT
- MAX OPERATING PRESS
- REFRIGERANT
- AUX TEMP 1 MODE
- AUX TEMP 2 MODE
- AUX RELAY MODE
- FAN SPEED
- MIN COMP RUN TIME
- MIN COMP OFF TIME
- DESCRIP FAN MODE
- DEFROST MODE
- DEFROST / DAY
- 1ST DEFROST DELAY
- DEFROST FAN STATE
- DEFROST TERM TEMP
- DEFROST PARAMETER
- MAX DEFROST TIME
- DEFROST DRAIN TIME
- MIN COMP RUN TIME
- ELEC DEFROST MODE
- FAN DELAY TEMP
- MAX FAN DELAY TIME
- PUMP DOWNTIME
- MULTI AIR TEMP CTRL
- MULTI EVAP COOL
- MULTI EVAP DEFROST
- MULTI EVAP SENSOR
- HIGH TEMP ALARM OFFSET
- TEMP ALARM DELAY
- LOW TEMP ALARM OFFSET
- LOW TEMP ALARM DELAY
- DOOR ALARM DELAY
- DIG IN 1 STATE
- DIG IN 2 STATE
- DIG IN 3 STATE
- DIG IN 4 STATE
- 2ND ROOM TEMP
- SUCT PRES OFFSET
- SUCT TEMP OFFSET
- AIR TEMP OFFSET
- COIL TEMP OFFSET
- AUX TEMP OFFSET
- TEMP UNITS
- AIR TEMP DIFF
- EXTREME TEMP DIFF
- PROPORTIONAL
- INTEGRAL
- DERIVATIVE

Options for DIG IN STATUS:
- **DISABLED**
- **2ND (ROOM) TEMP**
- **DOOR SWITCH**
- **EXT ALARM**
- **SYSTEM OFF**
- **LIGHT SWITCH**
- **DEFROST LOCKOUT**
- **DEFROST INTERLOCK**

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User Interface
The RDT Evap's onboard user interface uses a familiar 6-button arrangement to simplify navigation through the controller’s menus. The menus are grouped in columns. The user is not required to scroll though unrelated setpoints.

The ▲ and ▼ arrows move between the menu column categories. If pressed while in a menu, the ■ and ▼ arrows move to the main screen or the adjacent menu column.

The ▲ and ▼ arrows move the user through the available options for each menu column. All users are allowed access to the variables and alarms menu columns. All other information is password protected to prevent unauthorized access to the controller’s functionality.

The ■ button is used to save an input option when it has been changed. The ■ button must be held for 3 seconds, to prevent accidental changes. Changes may be discarded by waiting, to allow the controller to time-out and return to default screen, or by pressing the ▼ button. The ■ button is used to return to the previous screen. Pressing the ▼ several times will return the user to the default view. See Controller Navigation on page 14.

Controller Setup: Four Step Intro Mode
Upon initially applying power to the controller, the controller will initialize, then automatically enter the Introduction Mode. The Introduction Mode consists of as little as 4 setpoints that must be configured for the RDT Evap to begin controlling the system. See Table 2.

Step 1 - The first setpoint the user is asked to enter is the desired ROOM TEMP. The default value is -10.0°F, and the right most 0 will be flashing. Use the ▲ and ▼ arrows to change the digit being modified. If you want the room temperature warmer, press the ▲ arrow, and if you want it colder, press the ▼ arrow. Once you have the proper room temp for your system, press and hold ENTER for three seconds.

Step 2 - Next, the controller will display DEFROST TYPE, and then display ELECTRIC, for electric defrost. The controller is designed to work with electric, hot gas, and air defrosts. Change this value by pressing the ▲ or ▼ arrow. Once you have the correct value, press and hold ENTER for three seconds.

Step 3 - The controller now prompts for the expansion valve type, and displays MECHANICAL as the default. If you have a mechanical valve, press and hold ENTER for three seconds. If you have an electric valve, use the ▲ or ▼ arrow to move to the correct valve. With the correct electric valve displayed, press and hold ENTER for three seconds. NOTE: If you select an electric valve, you will then be prompted to specify the REFRIGERANT.

The RDT Evap may also be applied to user defined CUSTOM electric valves. When CUSTOM is selected, the user is prompted to select MOTOR TYPE, MOTOR STEP RATE, and MAX VALVE STEPS.

Step 4 - The fourth prompt is whether RDT ECOSMART ACCESS is ENABLED or DISABLED. RDT ECOSMART ACCESS allows you to easily view your controller online. (See pages 16 & 17 for more information.) Make your selection by using the ▲ or ▼ arrow, and then press and hold ENTER for three seconds.

These are the only setpoints required to begin controlling the system. For setup with multi-evaporator applications see bulletins Q.5.10 and Q.1.32.

Adjusting Controller Parameters
The controller has the ability to access an abundance of information from the 4-digit alphanumeric display. However, the controller requires a password, adding a degree of protection from unwanted modifications. The controller will prompt the user for a PASSWORD when the user attempts to access setpoints they do not have permission to change.

Table 1 shows the menu structure of the controller. The default display of the controller always shows the actual room temperature, defrost, or any alarm condition. Pressing the ▲ or ▼ arrow will move from the default display to the next menu column, shown in the Controller Navigation on page 14. The VARIABLES menu column consists of the current sensor readings, and the relays’ state.

The User Password (1111) only provides access to the ROOM TEMP setpoint. For the protection of the system, access to the SETPOINT and MANUAL control requires an Installer Password (2222). A complete list of parameters is shown in Table 3.

Pressing the ▼ button at any time will return the user to next level up the menu. A second/third press will either return to the Main Menu, or to the room temperature reading.

Web Login
The User Name and Password are required when accessing the controller using the webpage.

The defaults are: User Name: ke2admin Password: ke2admin

IMPORTANT: The User Name and Password should be changed from the default for security purposes.
Introduction to RDT EcoSmart Access

RDT EcoSmart Access provides quick and easy, real time access to your refrigeration systems, 24/7.

The RDT Evap has always been internet accessible, but now it’s easier than ever to monitor and adjust your RDT Evap remotely. With the launch of version 4.0 firmware, RDT EcoSmart Access is available.

While the RDT Evap's free connectivity is still available, RDT recognizes that some customers prefer the simplicity and convenience of RDT EcoSmart Access to provide the benefits of the controller’s communication capability.

For a nominal monthly fee, KE2 Smart Access provides easy, real time access to your refrigeration system 24/7. No port forwarding. No VPN.

All the KE2 Evap needs is a physical connection to the network router with a cat 5 cable. Once enabled, KE2 Smart Access quickly connects to your personal web portal, hosted by KE2 Therm, and provides a “customized” dashboard of all the controllers you setup with KE2 Smart Access.

Benefits of RDT EcoSmart Access

- RDT EcoSmart Access auto launches, and can eliminate the need for costly IT support
- Doesn’t require port forwarding or a vpn
- Customized dashboard lets you remotely view all the controllers on one page
- It’s easier than ever to set up every controller you service to provide alarm notifications via text or email
- Easy setup of remote monitoring & system control

Screen shot of a single RDT Evap connected through RDT EcoSmart Access.

Screen shots of RDT EcoSmart Access dashboard. Controller and system information is displayed for all of the controllers on the portal.

Preliminary

Connect the RDT Evap to the customer’s network.

Screen shot of a single RDT Evap connected through RDT EcoSmart Access.
RDT EcoSmart Access - Online Access In 3 Easy Steps

**Step 1**
Enable RDT EcoSmart Access in the Introduction Mode menu
- After setting the Room Temp, Defrost Type and Valve Type, set RDT EcoSmart Access to Enabled.
- Use the or arrow to change RDT EcoSmart Access to Enabled. Press and hold the button for 3 seconds to save the change.

**Note:** RDT EcoSmart Access may be enabled during introduction Mode Menu, or anytime thereafter through the Manual Menu. See Table 1, Controller Navigation on Page 14.

**Step 2**
Go to smartaccess.ke2therm.net
- Using your PC, tablet or smartphone, enter http://smartaccess.ke2therm.net in the web browser’s address bar.

**Step 3**
Enter default information
- Enter default information, and click Log In button.
  Site: installer
  Password: controllers MAC Address (from sticker on back of controller)

For additional information on KE2 Smart Access, visit http://ke2therm.com/productliteratureevap4.html, and see bulletins A.1.76 The KE2 Evap v4.0 with KE2 Smart Access and Q.1.34 KE2 Smart Access Setup and Customizing.
### Setpoints Menu

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROOM TEMP</td>
<td>Walk-in freezer or cooler room temperature to be maintained</td>
</tr>
<tr>
<td>DEFROST TYPE</td>
<td>Method of defrost used on the evaporator coil: Electric, Air, Hot Gas with Liquid Line Solenoid/Compressor relay off, Hot Gas with Liquid Line Solenoid/compressor relay on</td>
</tr>
<tr>
<td>VALVE TYPE</td>
<td>Type of valve used on the system: mechanical, pre-configured electric, custom EEV configuration</td>
</tr>
<tr>
<td>MOTOR TYPE</td>
<td>If VALVE TYPE = CUSTOM: The motor type used in the valve</td>
</tr>
<tr>
<td>MOTOR STEP RATE</td>
<td>If VALVE TYPE = CUSTOM: The motor speed setting in number of steps per second</td>
</tr>
<tr>
<td>MAX VALVE STEPS</td>
<td>If VALVE TYPE = CUSTOM: The total number of steps required to move the valve from closed to fully open</td>
</tr>
<tr>
<td>SUPERHEAT</td>
<td>The superheat value that the controller will maintain, (not applicable if VALVE TYPE = MECHANICAL)</td>
</tr>
<tr>
<td>MAX OPERATING PRES</td>
<td>The maximum allowable suction pressure, (not applicable if VALVE TYPE = MECHANICAL)</td>
</tr>
<tr>
<td>REFRIGERANT</td>
<td>The type of refrigerant used in the refrigeration system</td>
</tr>
<tr>
<td>AUX TEMP 4 MODE</td>
<td>Configuration mode of the auxiliary temperature sensor</td>
</tr>
<tr>
<td>AUX TEMP 1 MODE</td>
<td>Configuration mode of the auxiliary temperature sensor (Not available if EEV is selected)</td>
</tr>
<tr>
<td>AUX RELAY MODE</td>
<td>Configuration mode of the auxiliary relay.</td>
</tr>
<tr>
<td>FAN SPEED</td>
<td>Provides 0-10V DC signal to control variable speed</td>
</tr>
<tr>
<td>MIN COMP RUN TIME</td>
<td>Minimum amount of time the liquid line solenoid/compressor relay must remain on after it is energized</td>
</tr>
<tr>
<td>MIN COMP OFF TIME</td>
<td>Minimum amount of time the liquid line solenoid/compressor relay must remain off before it can be energized again.</td>
</tr>
<tr>
<td>REFIRG FAN MODE</td>
<td>Fan operation while in refrigeration mode</td>
</tr>
<tr>
<td>DEFROST MODE</td>
<td>The method the controller uses to determine when to initiate a defrost.</td>
</tr>
<tr>
<td>DEFROST PARAMETER</td>
<td>If DEFROST MODE = DEMAND: Coefficient to KE2 Defrost algorithm</td>
</tr>
<tr>
<td>MAX DEFROST TIME</td>
<td>If DEFROST MODE = SCHEDULE or RUNTIME: The maximum amount of time the defrost relay will be energized. (Not available if DEFROST MODE = DEMAND)</td>
</tr>
<tr>
<td>DRAIN TIME</td>
<td>Time to be in drain mode (drip time)</td>
</tr>
<tr>
<td>COMP RUN TIME</td>
<td>If DEFROST MODE = RUN TIME: The amount of time liquid line solenoid/compressor relay is energized before the next defrost is initiated.</td>
</tr>
<tr>
<td>ELEC DEFROST MODE</td>
<td>If DEFROST TYPE = ELEC: Whether to leave the defrost relay energized during the defrost cycle or to utilize advanced defrost algorithm.</td>
</tr>
<tr>
<td>FAN DELAY TEMP</td>
<td>After defrost, the coil sensor reading must fall below this temperature set point in auxiliary relay</td>
</tr>
<tr>
<td>MAX FAN DELAY TIME</td>
<td>Maximum amount of time after defrost to resume normal fan operation.</td>
</tr>
<tr>
<td>PUMP DOWN TIME</td>
<td>Minimum amount of time between de-energizing the liquid line solenoid/compressor relay and energizing the defrost relay.</td>
</tr>
<tr>
<td>MULTI AIR TEMP CTRL</td>
<td>Select control method to use with multiple room temperature sensors</td>
</tr>
<tr>
<td>MULTI EVAP COOL</td>
<td>Select type of multi evaporator control - options are synchronous or independent</td>
</tr>
<tr>
<td>MULTI EVAP DEFROST</td>
<td>Select whether to have all bonded controllers initiate defrost mode at the same time or independently.</td>
</tr>
<tr>
<td>MULTI EVAP SENSOR</td>
<td>Select whether or not to share room temperature, coil temperature and suction pressure sensor data with bonded controllers.</td>
</tr>
<tr>
<td>HIGH TEMP ALARM OFFSET</td>
<td>The number of degrees above ROOM TEMP for a HIGH TEMP ALARM condition.</td>
</tr>
<tr>
<td>HIGH TEMP ALARM DELAY</td>
<td>Minutes the room temperature must remain above ROOM TEMP + HIGH TEMP ALARM OFFSET before issuing a HIGH TEMP ALARM</td>
</tr>
<tr>
<td>LOW TEMP ALARM OFFSET</td>
<td>The number of degrees below ROOM TEMP for a LOW TEMP ALARM condition.</td>
</tr>
<tr>
<td>LOW TEMP ALARM DELAY</td>
<td>Minutes the room temperature must remain below ROOM TEMP - LOW TEMP ALARM OFFSET before issuing a LOW TEMP ALARM</td>
</tr>
<tr>
<td>DOOR ALARM DELAY</td>
<td>If DIG IN (1, 2 and/or 3) Mode = DOOR SWITCH: The amount of time, in minutes, before an alarm condition is initiated if door is open and room temperature is 5 degrees above ROOM TEMP + AIR TEMP DIFF</td>
</tr>
<tr>
<td>DIG IN 1 MODE</td>
<td>Sets the function of the digital input</td>
</tr>
<tr>
<td>DIG IN 1 STATE</td>
<td>Sets whether the switch activates when opened or closed</td>
</tr>
<tr>
<td>DIG IN 2 MODE</td>
<td>Sets the function of the digital input</td>
</tr>
<tr>
<td>DIG IN 2 STATE</td>
<td>Sets whether the switch activates when opened or closed</td>
</tr>
<tr>
<td>DIG IN 3 MODE</td>
<td>Sets the function of the digital input</td>
</tr>
<tr>
<td>DIG IN 3 STATE</td>
<td>Sets the function of the digital input</td>
</tr>
<tr>
<td>2ND ROOM TEMP</td>
<td>If DIG IN (1, 2 and/or 3) Mode = 2ND ROOM TEMP: This value becomes the ROOM TEMP setpoint when the digital input is active</td>
</tr>
<tr>
<td>SUCT PRES OFFSET</td>
<td>An offset added or subtracted from the suction line pressure transducer reading, if needed</td>
</tr>
<tr>
<td>SUCT TEMP OFFSET</td>
<td>An offset added or subtracted from the suction temperature sensor reading, if needed</td>
</tr>
<tr>
<td>AIR TEMP OFFSET</td>
<td>An offset added or subtracted from the room temperature sensor reading, if needed</td>
</tr>
<tr>
<td>COIL TEMP OFFSET</td>
<td>An offset added or subtracted from the coil temperature sensor reading, if needed</td>
</tr>
<tr>
<td>AUX TEMP OFFSET</td>
<td>An offset added or subtracted from the auxiliary temperature sensor reading, if needed</td>
</tr>
<tr>
<td>TEMP UNITS</td>
<td>Units for temperature's display in °F or °C</td>
</tr>
<tr>
<td>AIR TEMP DIFF</td>
<td>The number of degrees above ROOM TEMP before the controller will go into REFRIGERATION mode</td>
</tr>
<tr>
<td>EXTREME TEMP DIFF</td>
<td>ADVANCED TOPIC-Call KE2 Therm for assistance</td>
</tr>
<tr>
<td>PROPORATIONAL</td>
<td>A coefficient to the valve control algorithm that increases valve responsiveness</td>
</tr>
<tr>
<td>INTEGRAL</td>
<td>A coefficient to the valve control algorithm that increases valve responsiveness</td>
</tr>
<tr>
<td>DERIVATIVE</td>
<td>Should not be adjusted unless instructed by KE2 Therm technical support</td>
</tr>
<tr>
<td>Range</td>
<td>Default</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>-50°F to 90°F</td>
<td>-10°F</td>
</tr>
<tr>
<td>ELEC, AIR, HOT GAS COMP ON, HOT GAS COMP OFF</td>
<td>ELEC</td>
</tr>
<tr>
<td>MECHANICAL, KE2 RSV, KE2 HSV, SER/SEI 1 TO 20, SER 8 TO L, SEI 30, SEI 50, SEH, ETS12 TO 50, ETS100, ETS250/400, CAREL, CUSTOM</td>
<td>MECHANICAL</td>
</tr>
<tr>
<td>BIPOLAR, UNIPOLAR</td>
<td>BIPOLAR</td>
</tr>
<tr>
<td>30 to 400 steps/second</td>
<td>200 steps</td>
</tr>
<tr>
<td>200 to 6400 steps</td>
<td>1600 steps</td>
</tr>
<tr>
<td>5°F to 30°F</td>
<td>8°F</td>
</tr>
<tr>
<td>10-500 psig if R-744 selected, 10-300psig if R-410A selected, 10-150 psig all other refrigerants</td>
<td>404A</td>
</tr>
<tr>
<td>DISABLED, MONITOR, T4 ROOM TEMP, T4 COIL TEMP</td>
<td>DISABLED</td>
</tr>
<tr>
<td>T1 SUCTION TEMP, MONITOR, T1 ROOM TEMP, 2ND COIL TEMP</td>
<td>T1 SUCTION</td>
</tr>
<tr>
<td>ALARM RELAY, 2ND COMP RELAY, 2ND FAN RELAY, 2ND DEFR RELAY, 2 SPEED FAN CTL, LIGHT RELAY, PERM DEFROST RELAY</td>
<td>ALARM RELAY</td>
</tr>
<tr>
<td>-100% to 100%</td>
<td>0.000 (OFF)</td>
</tr>
<tr>
<td>0 to 15 minutes</td>
<td>2 minutes</td>
</tr>
<tr>
<td>0 to 15 minutes</td>
<td>5 minutes</td>
</tr>
<tr>
<td>ON WITH COMPRESSOR, PERMANENT, MANAGED, CONTROL FOR TITLE 24</td>
<td>ON WITH COMPRESSOR</td>
</tr>
<tr>
<td>DEMAND, SCHEDULED, RUN TIME</td>
<td>5</td>
</tr>
<tr>
<td>0 to 8</td>
<td>OFF</td>
</tr>
<tr>
<td>0 to 240 minutes</td>
<td>120 minutes</td>
</tr>
<tr>
<td>ON/OFF</td>
<td>OFF if DEFROST TYPE = ELEC, HOT GAS COMP ON, HOT GAS COMP OFF</td>
</tr>
<tr>
<td>35°F to 90°F</td>
<td>50°F if DEFROST TYPE = ELEC, HOT GAS COMP ON, HOT GAS COMP OFF</td>
</tr>
<tr>
<td>40°F if DEFROST TYPE = AIR</td>
<td>50°F if DEFROST TYPE = AIR</td>
</tr>
<tr>
<td>0 to 90</td>
<td>30 if DEFROST TYPE = ELEC</td>
</tr>
<tr>
<td>40 if DEFROST TYPE = AIR</td>
<td>40 if DEFROST TYPE = AIR</td>
</tr>
<tr>
<td>0 to 90 minutes</td>
<td>45 minutes if DEFROST TYPE = ELEC</td>
</tr>
<tr>
<td>10 if DEFROST TYPE = HOT GAS COMP ON, HOT GAS COMP OFF</td>
<td>10 minutes if DEFROST TYPE = HOT GAS COMP OFF</td>
</tr>
<tr>
<td>40 minutes if DEFROST TYPE = AIR</td>
<td>40 minutes if DEFROST TYPE = AIR</td>
</tr>
<tr>
<td>0 to 15 minutes</td>
<td>2 minutes</td>
</tr>
<tr>
<td>0 to 24 hours</td>
<td>6 hours</td>
</tr>
<tr>
<td>PULSE, PERMANENT</td>
<td>PULSE</td>
</tr>
<tr>
<td>-40°F to 35°F</td>
<td>20°F</td>
</tr>
<tr>
<td>0 to 20 minutes</td>
<td>2 minutes</td>
</tr>
<tr>
<td>0 to 90 minutes</td>
<td>0 minutes if DEFROST TYPE = ELEC or AIR</td>
</tr>
<tr>
<td>2 if DEFROST TYPE = HOT GAS COMP OFF</td>
<td>2 minutes if DEFROST TYPE = HOT GAS COMP OFF</td>
</tr>
<tr>
<td>AVERAGE, WARMEST</td>
<td>WARMEST</td>
</tr>
<tr>
<td>SYNC, INDEPENDENT</td>
<td>SYNC</td>
</tr>
<tr>
<td>SYNC, INDEPENDENT</td>
<td>SHARED</td>
</tr>
<tr>
<td>SHARED, NOT SHARED</td>
<td>SHARED</td>
</tr>
<tr>
<td>0°F to 99.9°F</td>
<td>10°F</td>
</tr>
<tr>
<td>0 to 120 minutes</td>
<td>60 minutes</td>
</tr>
<tr>
<td>0 to 30 minutes</td>
<td>1°F</td>
</tr>
<tr>
<td>0 to 180 minutes</td>
<td>30 minutes</td>
</tr>
<tr>
<td>DISABLED, 2ND ROOM TEMP, DOOR SWITCH, EXT ALARM, SYSTEM OFF</td>
<td>DOOR SWITCH</td>
</tr>
<tr>
<td>OPEN, CLOSED</td>
<td>CLOSED</td>
</tr>
<tr>
<td>DISABLED, 2ND ROOM TEMP, DOOR SWITCH, EXT ALARM, SYSTEM OFF, DEFR INTERLOCK, DEFR LOCKOUT</td>
<td>DISABLED</td>
</tr>
<tr>
<td>OPEN, CLOSED</td>
<td>CLOSED</td>
</tr>
<tr>
<td>DISABLED, 2ND ROOM TEMP, DOOR SWITCH, EXT ALARM, SYSTEM OFF, LIGHT SWITCH</td>
<td>SYSTEM OFF</td>
</tr>
<tr>
<td>OPEN, CLOSED</td>
<td>CLOSED</td>
</tr>
<tr>
<td>-50°F to 90°F</td>
<td>-50°F</td>
</tr>
<tr>
<td>-5.0°F to 5.0°F</td>
<td>0.0 psig</td>
</tr>
<tr>
<td>-5.0°F to 5.0°F</td>
<td>0.0°F</td>
</tr>
<tr>
<td>-5.0°F to 5.0°F</td>
<td>0.0°F</td>
</tr>
<tr>
<td>-5.0°F to 5.0°F</td>
<td>0.0°F</td>
</tr>
<tr>
<td>FAHRENHEIT/CELSIUS</td>
<td>FAHRENHEIT</td>
</tr>
<tr>
<td>0.1°F to 5°F</td>
<td>1°F</td>
</tr>
<tr>
<td>0 to 255</td>
<td>3</td>
</tr>
<tr>
<td>0 to 255</td>
<td>3</td>
</tr>
<tr>
<td>0 to 255</td>
<td>3</td>
</tr>
<tr>
<td>0 to 255</td>
<td>3</td>
</tr>
</tbody>
</table>
## Manual Menu

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Description</th>
<th>Range</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>MANUAL CONTROL</td>
<td>Force the controller into the next operating mode</td>
<td>REFRIGERATE/OFF, DEFROST, DRAIN TIME, FAN DELAY</td>
<td></td>
</tr>
<tr>
<td>MANUAL VALVE</td>
<td>Manually open or close the EEV in percentage increments</td>
<td>0.1%, 1%, or 10% increments</td>
<td></td>
</tr>
<tr>
<td>CLEAR ALARMS</td>
<td>Clear all active alarms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MANUAL COMPRESSOR RELAY</td>
<td>Manually energize or de-energize liquid line solenoid/compressor relay</td>
<td>AUTO (ON/OFF), MANUAL OFF, MANUAL ON, AUTO</td>
<td></td>
</tr>
<tr>
<td>MANUAL DEFROST RELAY</td>
<td>Manually energize or de-energize defrost relay</td>
<td>AUTO (ON/OFF), MANUAL OFF, MANUAL ON, AUTO</td>
<td></td>
</tr>
<tr>
<td>MANUAL FAN RELAY</td>
<td>Manually energize or de-energize evaporator fan relay</td>
<td>AUTO (ON/OFF), MANUAL OFF, MANUAL ON, AUTO</td>
<td></td>
</tr>
<tr>
<td>MANUAL AUX RELAY</td>
<td>Manually energize or de-energize auxiliary relay</td>
<td>AUTO (ON/OFF), MANUAL OFF, MANUAL ON, AUTO</td>
<td></td>
</tr>
<tr>
<td>FACTORY RESET</td>
<td>Reset the controller to the factory default setpoints</td>
<td>RESET</td>
<td></td>
</tr>
<tr>
<td>WEB PASSWORD RESET</td>
<td>Reset the web password to the factory default</td>
<td>RESET</td>
<td></td>
</tr>
<tr>
<td>KE2 SMART ACCESS</td>
<td>Turn KE2 Smart Access on or off</td>
<td>DISABLE, ENABLE</td>
<td>DISABLE</td>
</tr>
<tr>
<td>DHCP</td>
<td>Turn DHCP mode on or off</td>
<td>DISABLE, ENABLE</td>
<td>DISABLE</td>
</tr>
<tr>
<td>DOD INIT</td>
<td>Re-initialize KE2 defrost algorithm</td>
<td>RESET</td>
<td></td>
</tr>
<tr>
<td>CLEAR MD</td>
<td>NO LONGER USED</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Variables Menu - Non Adjustable (view only)

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROOM TEMP</td>
<td>Walk-in freezer or cooler room temperature (T2 Air Sensor) as measured by the controller</td>
</tr>
<tr>
<td>COIL TEMP</td>
<td>Coil temperature (T3 Coil Sensor) as measured by the controller</td>
</tr>
<tr>
<td>SYSTEM MODE</td>
<td>Current operating status</td>
</tr>
<tr>
<td>SUPERHEAT</td>
<td>Superheat as calculated by the controller (requires suction pressure transducer and T1 set as suction temperature sensor)</td>
</tr>
<tr>
<td>SUCTION PRESSURE</td>
<td>Suction pressure as measured by the controller (only available if suction pressure transducer installed)</td>
</tr>
<tr>
<td>T1 SUCTION TEMP</td>
<td>Suction temperature as measured by the controller</td>
</tr>
<tr>
<td>SATURATION TEMP</td>
<td>Saturation temperature as calculated by the controller (requires pressure transducer and T1 sensor)</td>
</tr>
<tr>
<td>VALVE % OPEN</td>
<td>Percentage the EEV is open (only available if EEV is selected)</td>
</tr>
<tr>
<td>T4 AUX TEMP</td>
<td>Auxiliary Temperature (Taux) sensor reading as measured by the controller (Not available if T4 set to DISABLED)</td>
</tr>
<tr>
<td>COMPRESSOR RELAY</td>
<td>Current state of liquid line solenoid/compressor relay</td>
</tr>
<tr>
<td>DEFROST RELAY</td>
<td>Current state of the defrost relay</td>
</tr>
<tr>
<td>FAN RELAY</td>
<td>Current state of the evaporator fan relay</td>
</tr>
<tr>
<td>AUX RELAY</td>
<td>Current state of the auxiliary relay</td>
</tr>
<tr>
<td>DIG 1 STATUS</td>
<td>Current status of the Digital Input #1</td>
</tr>
<tr>
<td>DIG 2 STATUS</td>
<td>Current status of the Digital Input #2</td>
</tr>
<tr>
<td>DIG 3 STATUS</td>
<td>Current status of the Digital Input #3</td>
</tr>
<tr>
<td>IP OCTET 1</td>
<td>The first three digits of the IP address</td>
</tr>
<tr>
<td>IP OCTET 2</td>
<td>The second three digits of the IP address</td>
</tr>
<tr>
<td>IP OCTET 3</td>
<td>The third three digits of the IP address</td>
</tr>
<tr>
<td>IP OCTET 4</td>
<td>The fourth three digits of the IP address</td>
</tr>
<tr>
<td>SUBNET MASK OCTET 1</td>
<td>The first three digits of the subnet mask</td>
</tr>
<tr>
<td>SUBNET MASK OCTET 2</td>
<td>The second three digits of the subnet mask</td>
</tr>
<tr>
<td>SUBNET MASK OCTET 3</td>
<td>The third three digits of the subnet mask</td>
</tr>
<tr>
<td>SUBNET MASK OCTET 4</td>
<td>The fourth three digits of the subnet mask</td>
</tr>
<tr>
<td>Firmware Version</td>
<td>Current version of the firmware on the controller</td>
</tr>
</tbody>
</table>

## Variables Menu Options for DIG IN 1,2,3 STATUS

<table>
<thead>
<tr>
<th>DIG IN Setting</th>
<th>Status Displayed on Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIG IN STATUS</td>
<td>DISABLE</td>
</tr>
<tr>
<td>DIG IN STATUS = DISABLE</td>
<td>DISABLE</td>
</tr>
<tr>
<td>DIG IN STATUS = DOOR SWITCH</td>
<td>inactive = DOOR CLOSED; active = DOOR OPEN</td>
</tr>
<tr>
<td>DIG IN STATUS = EXT ALARM</td>
<td>inactive = NO ALARM; active = EXT ALARM (x)</td>
</tr>
<tr>
<td>DIG IN STATUS = SYSTEM OFF</td>
<td>inactive = SYSTEM ON; active = SYSTEM OFF</td>
</tr>
<tr>
<td>DIG IN STATUS = LIGHT SWITCH</td>
<td>inactive = LIGHTS OFF; active = LIGHTS ON</td>
</tr>
<tr>
<td>DIG IN STATUS = DEFROST LOCKOUT</td>
<td>inactive = DEFROST RELAY AUTO; active = DEFROST LOCKED OUT</td>
</tr>
<tr>
<td>DIG IN STATUS = DEFROST INTERLOCK</td>
<td>inactive = DEFROST RELAY AUTO; active = DEFROST RELAY OFF</td>
</tr>
</tbody>
</table>

## Alarms Status Menu - Non Adjustable (view only)

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO ALARM</td>
<td>No alarms active, everything is running correctly</td>
</tr>
<tr>
<td>PRESSURE SENSOR</td>
<td>Suction pressure sensor is shorted, open or pressure out of range</td>
</tr>
<tr>
<td>T1 SUCTION SENSOR</td>
<td>Suction temperature sensor is shorted or open</td>
</tr>
<tr>
<td>T2 AIR SENSOR</td>
<td>Return air temperature sensor is shorted or open</td>
</tr>
<tr>
<td>T3 COIL SENSOR</td>
<td>Coil temperature sensor is shorted or open</td>
</tr>
<tr>
<td>T4 AUX SENSOR</td>
<td>Auxiliary temperature sensor is shorted or open</td>
</tr>
<tr>
<td>HIGH SUPERHEAT</td>
<td>Superheat above upper limit</td>
</tr>
<tr>
<td>LOW SUPERHEAT</td>
<td>Superheat below lower limit</td>
</tr>
<tr>
<td>HIGH AIR TEM</td>
<td>Room temperature is above ROOM TEMP + AIR TEMP DIFF + HIGH TEMP ALARM OFFSET for longer than HIGH TEMP ALARM DELAY</td>
</tr>
<tr>
<td>LOW AIR TEM</td>
<td>Room temperature is below ROOM TEMP - LOW TEMP ALARM OFFSET for longer than LOW TEMP ALARM DELAY</td>
</tr>
<tr>
<td>EXCESS TEMPERATURE</td>
<td>Defrost terminated on time instead of temperature for two consecutive cycles</td>
</tr>
<tr>
<td>DOOR SWITCH</td>
<td>If door is open and room temperature is 5 degrees above ROOM TEMP + AIR TEMP DIFF for DOOR ALARM DELAY time</td>
</tr>
<tr>
<td>COMMUNICATION ERROR</td>
<td>ONLY FOR BONDED CONTROLLERS: No communication between controllers for one minute or more</td>
</tr>
<tr>
<td>EXT ALARM</td>
<td>If the controller initiates 32 defrosts within 48 hours</td>
</tr>
<tr>
<td>EMAIL FAILURE</td>
<td>Email alert was not confirmed by email server provided after seven consecutive attempts</td>
</tr>
<tr>
<td>FTP COMMUNICATION ALARM</td>
<td>ONLY FOR SITEVIEW MANAGER: No communication to the FTP server defined in Settings/Logging Options</td>
</tr>
<tr>
<td>SNTP COMMUNICATION ALARM</td>
<td>ONLY FOR SITEVIEW MANAGER: No communication to the SNTP server defined in Settings/Siteview Options</td>
</tr>
</tbody>
</table>