KE2 Evap-RE2 Contactor Panel

Rack Efficiency Controller with Advanced Performance Features
PN 21673 KE2 Evap-RE2 Contactor Panel
PN 21674 KE2 Evap-RE2 Contactor Panel with Valve Driver

Q.1.40 August 2022

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KE2 SmartAccess:
The easiest way to remotely monitor, control & receive alarms.

See page 29 for more details.

Introduction:

The KE2 Evap-RE2 can fine tune the control and efficiency of evaporators on rack and pumpdown systems, interface with existing building automation systems, and provide remote communication to your refrigeration systems.

With the KE2 Evap-RE2, KE2 Therm added a whole new set of advanced capabilities. These include current sensors, and the ability to add up to three optional Valve Drivers.

The Valve Drivers may be set to one of three control modes: superheat control with EEVs, pressure control with an EEPR, or temperature control with an EEPR. The Valve Drivers may also be used with mechanical valves to add additional sensors.

The KE2-Evap RE2 is integrated into a pre-wired control panel; on-site wiring is reduced to a minimum. The panel also provides consistent setup across multi-store locations, making return service visits more efficient, reducing installation time, and minimizing system downtime.

Table of Contents:

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Parts List - KE2 Evap-RE2 Contactor Panel

The following parts are included in the KE2 Evap-RE2 Contactor Panel kit:

A (1) **KE2 Evap-RE2 Contactor Panel**

B (1) **ethernet adaptor** (already installed in the Contactor panel)

C (4) **40' color temperature sensors**

D (1) **door switch**

E (1) **pressure transducer (0-150 psia)** and (1) **40' pressure transducer cable** (not shown)

F (1) **air sensor mount**

G (1) **KE2 Valve Driver** (PN 21674 only - already installed)

H (1) **current sensor board** (already installed)

I (2) **½" plastic knockout plugs**
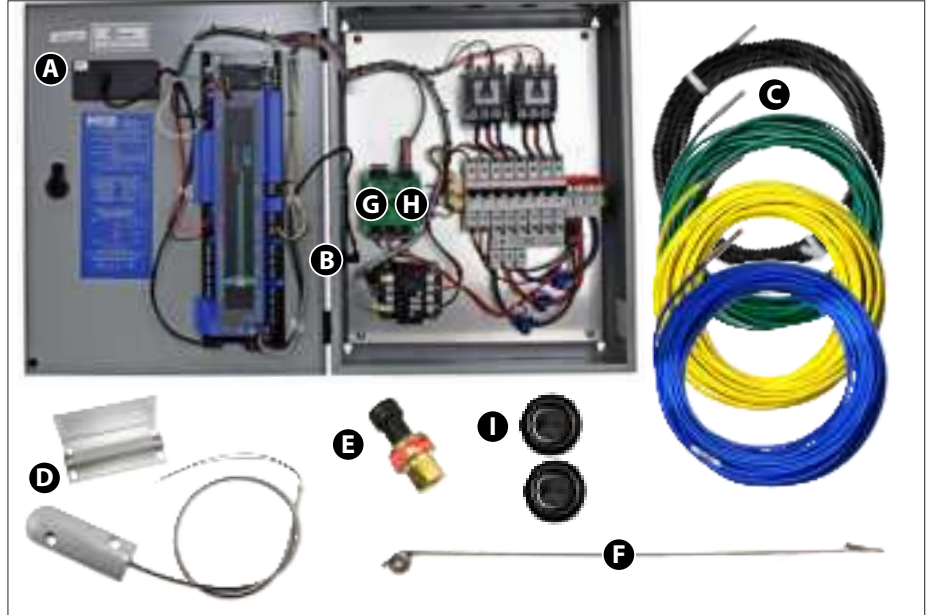
Auxiliary Boards & Accessories

Part Numbers & Description

Part #	Description
Auxiliary Boards	
21612	Valve Driver (up to a total of 3)
Pressure Transducers	
20204	Pressure Transducer – 0 to 150 psia, 40 ft. leads
Temp Sensors	
20200	Temp Sensor - black, 40 ft. leads
Replacement Parts	
21610	Replacement KE2 Evap-RE2 controller
21806	Replacement Display
21613	Replacement Current Sensor Board
21614	Replacement Current Sensor (pack of 3)

Table 1 - Specifications

Controller Specifications	
Input Voltage:	120 VAC or 208 - 240 VAC
Ambient Temp:	-40°F to 120°F (-40°C to 48°C)
Operating Temp:	-40°F to 120°F (-40°C to 48°C)
Display:	4-digit alphanumeric LED
Inputs:	(4) temperature sensors
	(1) pressure transducer
	(3) current sensors
Valve Types:	unipolar and bipolar stepper motors (L/R 12 VDC)
Panel Contactors:	40A resistive (defrost); 20A inductive (evaporator fan)
Relays:	(3) 3A relays (LLS, Aux 1, Aux 2)
Aux Input 1:	Disabled, Room Temp, Coil Temp, Monitor Temp, Dual Temp Switch, Door Switch, External Alarm, System Off, Interlock, Defrost Lockout , Defrost Lockout Quit Defrost, Light Switch, Leak Detect
Aux Input 2:	Disabled, Room Temp, Coil Temp, Monitor Temp, Dual Temp Switch, Door Switch, External Alarm, System Off, Interlock, Defrost Lockout , Defrost Lockout Quit Defrost, Light Switch, Leak Detect, Leak Level
Aux Input 3:	Disabled, Room Temp, Coil Temp, Monitor Temp, Dual Temp Switch, Door Switch, External Alarm, System Off, Interlock, Defrost Lockout , Defrost Lockout Quit Defrost, Light Switch, Leak Detect, Leak Level
Communication:	Standard TCP/IP, BACnet/MSTP, RESTful API, BACnet/IP (with KE2 Edge Manager)
Pressure Transducer - pn 20204 (40 ft lead)	
Pressure Range:	0 to 150 psia
Proof Pressure:	450 psi
Burst Pressure:	750 psi
Operating Temp:	-40°F to 248°F (-40°C to 120°C)
Temperature Sensor	
Sensor Specs:	-60°F to 150°F (-51°C to 65°C) moisture resistant package

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Understanding Frost

The air exiting side of the evaporator is often the coldest spot on the coil due to the load from the room warming the air entering side of the coil. As air travels through the fins of the evaporator, it cools and 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.

It is not uncommon to see a small amount of frost on the coils that have KE2 Evap-RE2 controllers installed. The KE2 Evap-RE2 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 KE2 Evap-RE2 will initiate a defrost.

IMPORTANT Preliminary Steps

A **Determine the coil sensor location**
To determine the most appropriate sensor location, after arriving on site put the system into defrost.

B Observe the defrost. The location where frost is last to disappear is where the coil sensor should be placed. 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 frost disappears 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

C KE2 Therm recommends locating the coil sensor as described above. Select the two spots that are the last to defrost, typically at each end of the evaporator on the air exiting side.

Often the ideal 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. Ice tends to grow from these edges towards the center. Therefore,the sensor location is usually best situated approximately 1 to 1-1/2" from the outer edges and typically near the bottom 1/3rd portion of the evaporator. Whenever possible, however, still verify ideal sensor location by placing the evaporator into defrost and observing where frost last disappears from the coil. The sensor needs to be as far away from defrost heat sources as possible.

Note: Insert plug (item ❶ from parts list) into evaporator housing when routing sensor cable to prevent damage to the cable from sharp edges. The plug provided should be inserted into the inner housing to allow the sensor to access the coil. Installer must puncture plug to insert sensor.

⚠ It is necessary to leave a service loop for each coil sensor. Enough wire should be left to move the sensor to the opposite end of the evaporator if necessary.

D **Make note of the locations you have determined for placement of the coil sensors.**
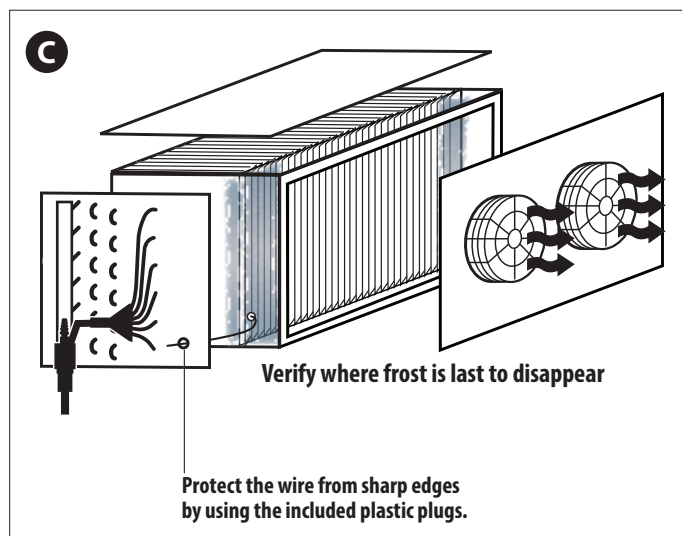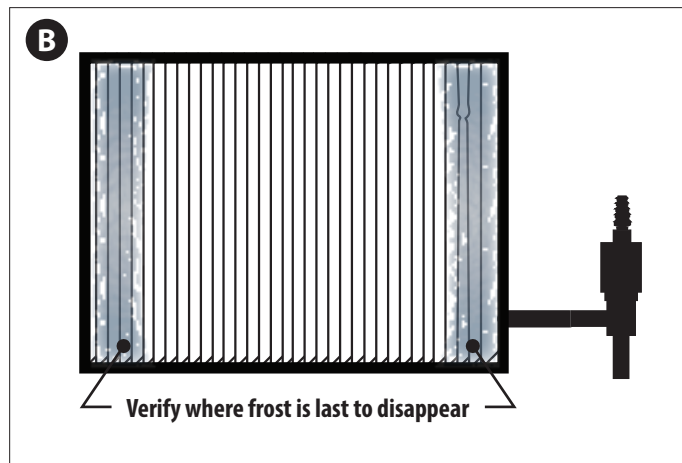
B

Verify where frost is last to disappear

C

Verify where frost is last to disappear

Protect the wire from sharp edges by using the included plastic plugs.

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Installation

1 ## Determining Controller Location
The installation location should be discussed with the end-user to determine if they have a preference. The contactor panel is designed to be installed outside of the controlled space.
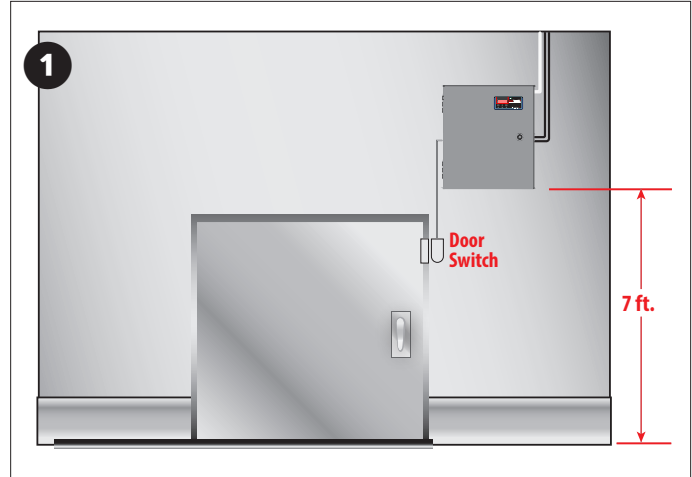
2 ## Cut a length of conduit to go from the controller to the evaporator
Measure the distance between the panel and evaporator; account for any extra length necessary to properly route conduit.
Determine the number of high voltage wires to go to the controller.

- Panel power (3 wires)
- Fan control (3 wires)
- Defrost (heater) control (3 wires)
- Liquid line solenoid (2 wires)

If the Aux Relay 1 or Aux Relay 2 is used, an additional pair or pairs of wires to the controller, for each relay, may be required.
- Aux Relay 1 (2 wires)
- Aux Relay 2 (2 wires)
NOTE: Install in accordance with all applicable electrical codes. KE2 Therm does not accept responsibility for incorrect or unsafe wiring.
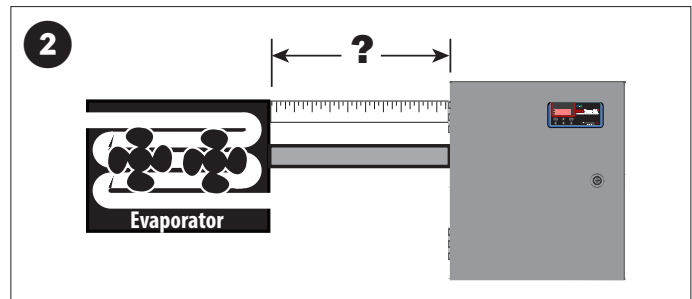
3 ## Cut wires to length
- Once the number of wires is determined, cut the wires to length.
- The wire should be long enough to account for the necessary connections in the panel and evaporator.

4 ## Determine the current draw of the unit.
- The KE2 Evap-RE2 Contactor Panel is designed for applications where 3-phase power is required, or the load exceeds the controller's on-board relay ratings. Care should be taken to ensure the controller is being properly applied. Failure to match the load to the contactor may result in damage.

KE2 Evap-RE2 Contactor Panel
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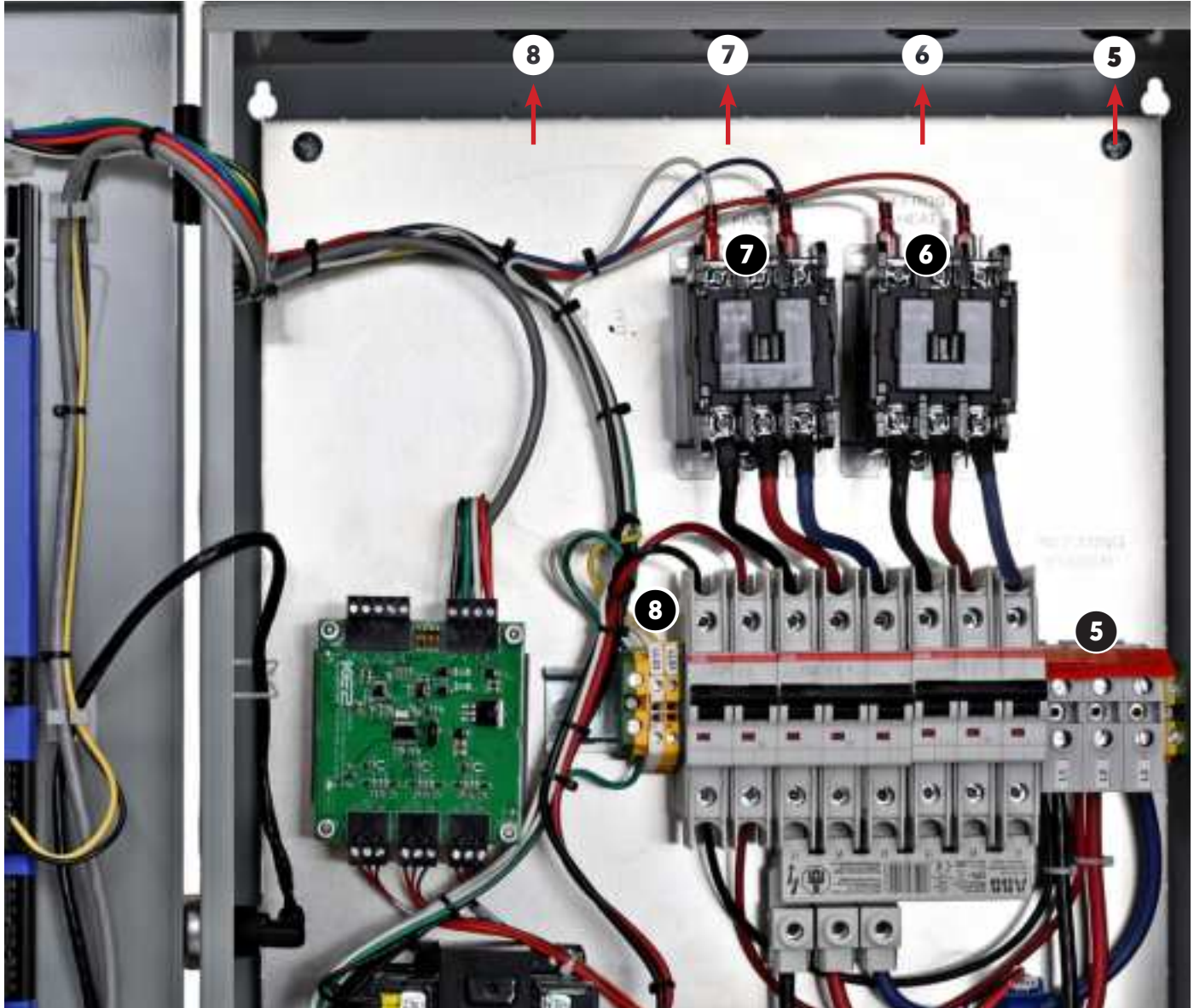
Panel Power
5
- The incoming power for the panel should utilize the right-hand conduit connection location.
- The leads will be connected to the lugs using the screw down terminals provided.

Defrost (Heater) Contactor
6
- The leads going to the defrost heaters will enter the panel through the second conduit connection from the right-hand side.
- The Defrost Heater Contactor is labeled Defrost Heat
- Connect leads using the screw down terminals on the heater contactor.

Fan Contactor
7
- The leads going to the fan will enter the panel through the third conduit connection from the right-hand side
- The Fan Contactor is labeled Evaporator Fans
- Connect leads using the screw down terminals on the fan contactor.

Liquid Line Solenoid (LLS)
8
- The leads going to the liquid line solenoid will enter the panel through the fourth conduit connection from the right-hand side.
- The leads should be connected using the screw down terminals labeled LLS1 and LLS2.
- Fasten one leg of the LLS to the terminal block position labeled LLS1.
- Fasten remaining leg of LLS to the terminal block position labeled LLS2.

NOTE: the controller and LLS supply power is 110V from an internal source. If the system has a 230V solenoid, it must be replaced with a 120V solenoid.

IMPORTANT: If drilling additional holes in the panel DO NOT allow metal shavings to fall into the panel. These can damage panel components.

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9 ### Auxiliary Relay 1 / Auxiliary Relay 2
■ If using the Aux Relay 1 or Aux Relay 2, supply an additional pair or pairs of wire to the controller.
■ Wiring will vary depending on the Aux Relay mode selected and function of the auxiliary device. Additional conduit may be required.
■ Strip approx. 1/4" of wire insulation from the end of the 2 wires for the auxiliary device. The Aux Relay will break the hot leg of the auxiliary component.
■ Fasten incoming power (L1) for the auxiliary component to the COM terminal of the Aux Relay.
■ Fasten one leg of the auxiliary device to the NO or NC terminal (selectable on the Setpoints webpage under "Outputs") of the Aux relay.
■ Connect the other leg of the auxiliary device lead to L2/Neutral to complete the circuit.
■ Route and secure the conduit to the location the controller is to be installed.
■ Wiring must follow local electrical codes.

⚠ WARNING! Max relay rating is 3A.

Auxiliary Relay 1 / Auxiliary Relay 2

*Buzzer, strobe, etc.
depending on application
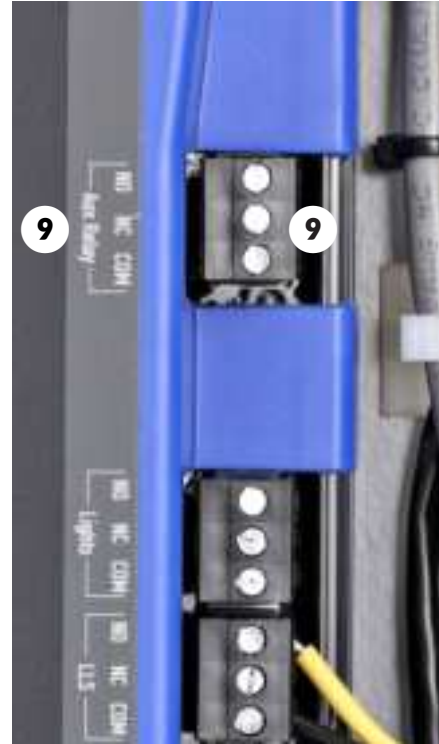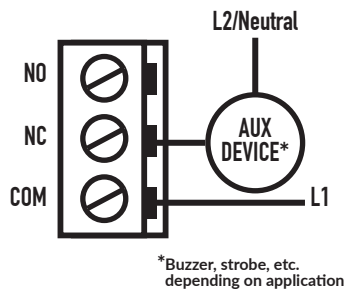
10 ### Preparing the Evaporator
■ The evaporator wiring will require access to the high voltage terminal block on the coil.
■ Turn off power to the system.
■ Verify power is no longer present using a multimeter.

11 ### Evaporator wiring
■ Locate the proper sized knockouts and carefully remove them.
■ Connect conduits to the evaporator and run wires.
■ Wire as necessary according to existing terminal board.

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Valve Driver Layout

EEV or
EEPR

Aux Board Dip Switches

Aux Board 1
Switches All OFF

Aux Board 2
Switch 3 ON

Aux Board 3
Switches 3 & 4 ON

BL   O   Y   R   BK
EMPTY   R   G   W   B
STEPPER MOTOR

GND   B−   A+   +12 V
MAIN / AUX BOARD

POWER

INPUT 1
+5V   SIG   GND

INPUT 2
+5V   SIG   GND

INPUT 3
+5V   SIG   GND

Temperature
Sensor

Temperature
Sensor

Temperature
Sensor / Pressure Transducer
(depends on control mode)
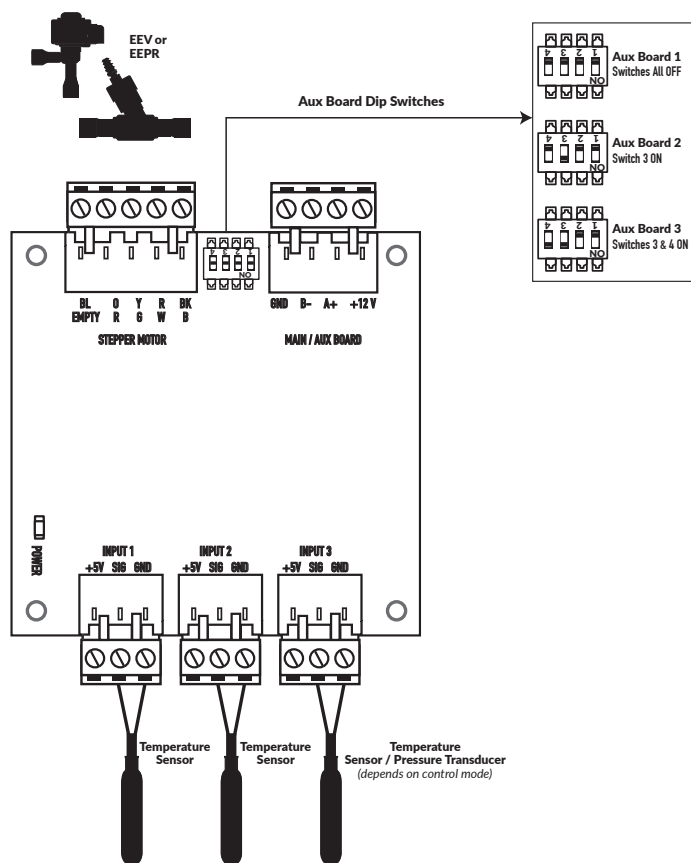
Current Sensor Board

DIP SWITCHES ARE SET AT THE FACTORY AND DO NOT NEED TO BE ADJUSTED, BELOW IS FOR REFERENCE ONLY:

* If current sensors are LEM HO-100-S, switch **4** must be ON.

* If current sensors are HASS 100-S, L31S100S05FS, or L37S100S05M, switch **1** and **4** must be ON.

* If current sensors are CR9549-80M, switch **2** and **4** must be ON.
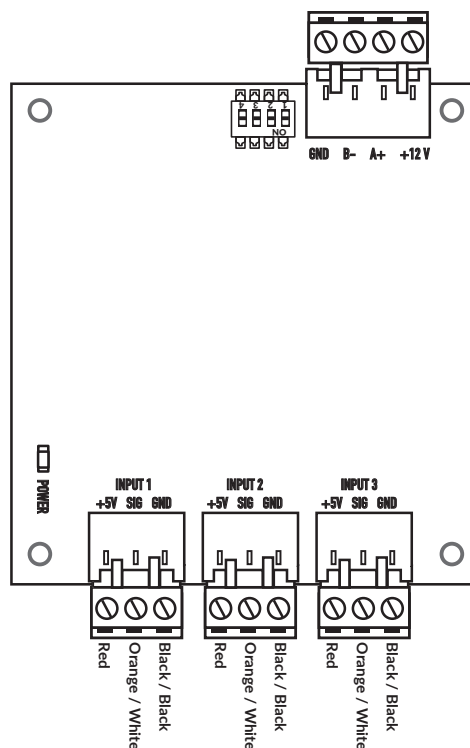
GND   B−   A+   +12 V

POWER

INPUT 1
+5V   SIG   GND

INPUT 2
+5V   SIG   GND

INPUT 3
+5V   SIG   GND

Red
Orange / White
Black / Black

Red
Orange / White
Black / Black

Red
Orange / White
Black / Black

![KE2 thermsolutions logo] **KE2 Evap-RE2** Contactor Panel
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Point to Point Wiring Diagram

PN 21673 KE2 Evap-RE2 Contactor Panel with Display
PN 21674 KE2 Evap-RE2 Contactor Panel with Display and Aux Valve Driver
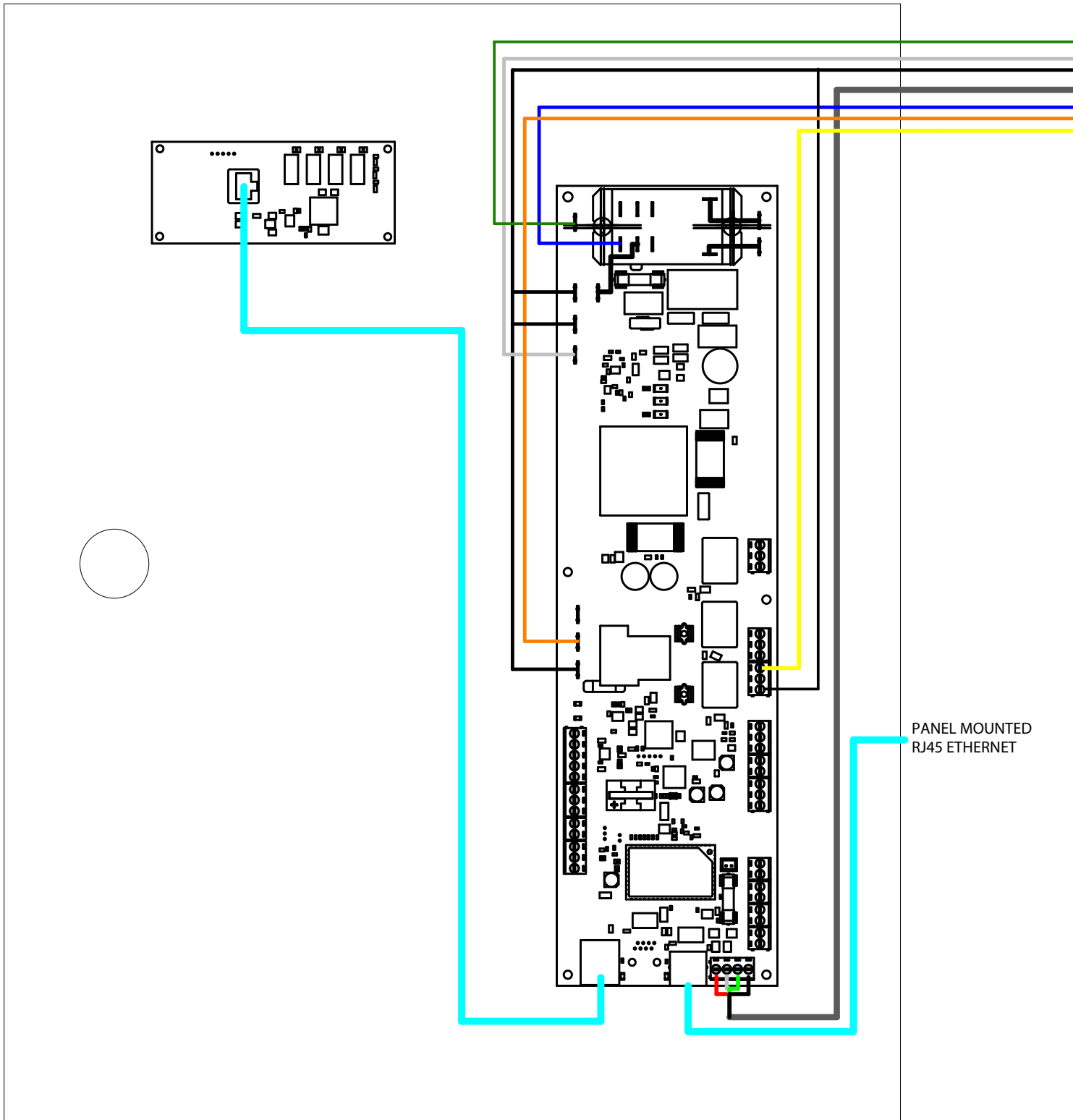
PANEL MOUNTED
RJ45 ETHERNET

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EVAPORATOR
FANS

DEFROST
HEAT

INCOMING
POWER

1A   20A   40A

LLS1
LLS2

L1   L2/N   L3

1Ø TERMINAL

B100MBT13XX
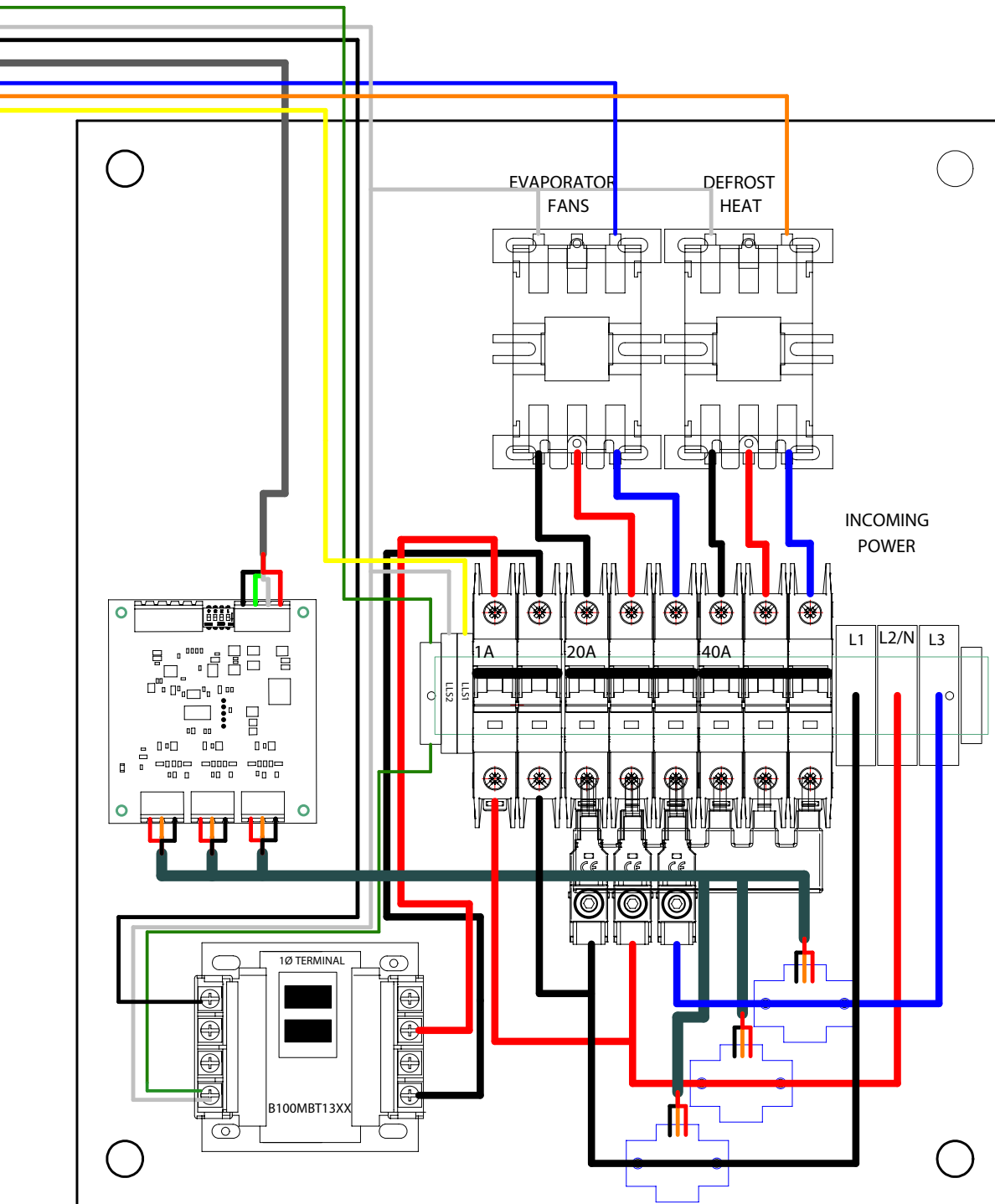
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12 Installing the sensors

■ Sensors should be labeled with their function. Although not required, KE2 Therm suggests that kits with color sensor wires use the following colors for clarity and consistency.

Blue for **Room Air Temp** and connected to the "Return Air" input
Yellow for **Coil Temp** and connected to the "Coil Temp" input
Green for **2nd Coil Temp (Aux Input 1)** and connected to the "Aux 1 Func" input
Black for **Suction Temp** and connected to the "Suct Temp" input

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

Green & **Yellow** for Coil Sensors

Blue for Air Sensor

13 Air Sensor Bracket

A Install the Room Temp/Return Air temp 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.

B The sensor should be located 8 - 12 inches away from the evaporator coil. 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.**
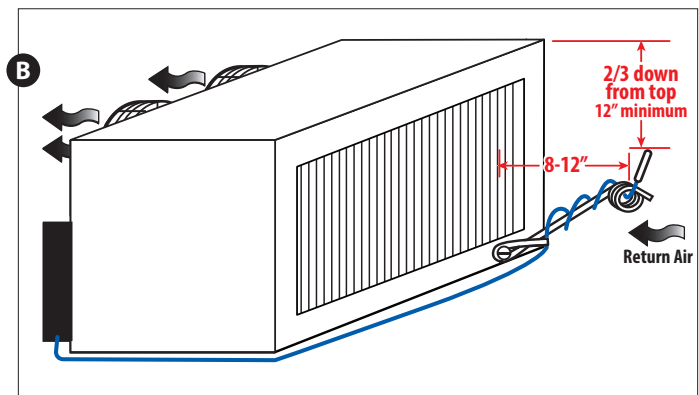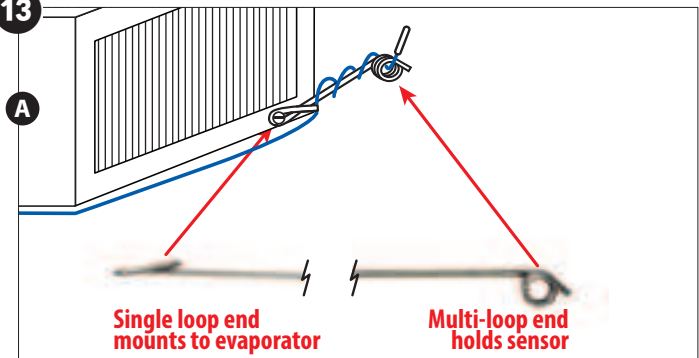
Single loop end mounts to evaporator   **Multi-loop end holds sensor**

2/3 down from top
12" minimum
8-12"
Return Air

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Coil Sensor

■ **The coil sensor location is of the utmost importance for the proper operation of the controller. It is essential that the sensor is in the last place frost disappears at the end of the defrost cycle. This ensures a clean coil after each defrost, and prevents ice buildup. See preliminary steps A-D on page 3 to determine the location frost last disappears from the coil.**

Once you determine the proper sensor location, as described in preliminary steps A-D on page 3, the sensor can be installed.

14 ### 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.

1.5"
.5"
Epoxy
Thermistor
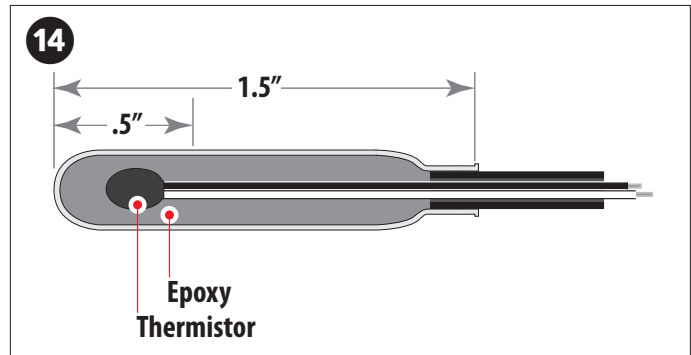
15 The inset photo in **Figure 15** shows that the sensor is positioned so that it is touching two circuit tubes, as shown in **Figure 15 ❶** & **❷**. When inserting the sensor into the coil, the tip should touch one of the circuit tubes **❷** , and the probe should be inserted into the fins leaving approximately 1/16" of the stainless probe outside of the fins. Pinch the fins gently together, securing the sensor in place. This provides thermal ballast to ensure a complete defrost. See step 16 for an alternative method of installing the coil sensor.

⚠ **Note: The sensor should not be located adjacent to the electric heating elements.**
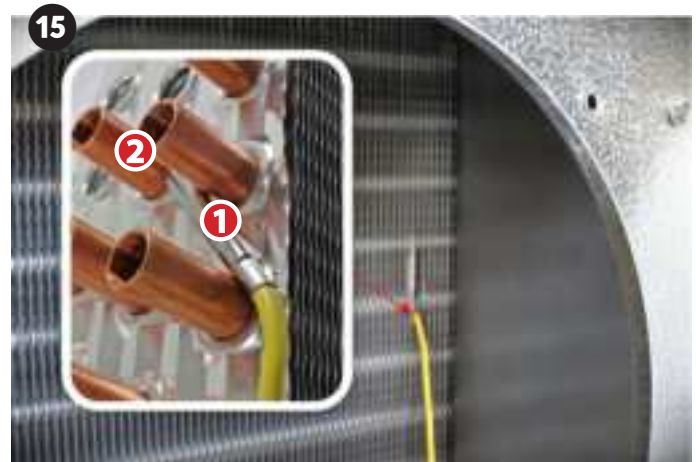
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16 **Alternate method -** As the defrost termination sensor, it is important to ensure the sensor does not terminate defrost before all frost is removed from the coil. In some installations, inserting the sensor into the coil may position it too close to the defrost heat source. An alternate method of positioning, **Figure 16A,** places the sensor vertically between the coil fins. **Figure 16B** 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** cables. The recommended maximum combined length when extending sensors is 100ft.

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

■ 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.
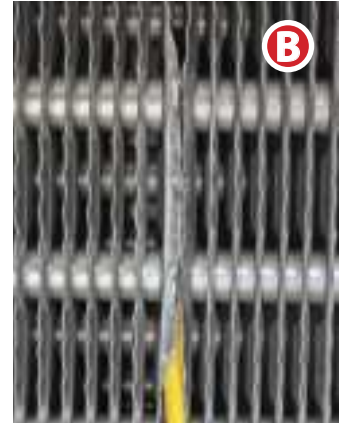
17 ### Connecting sensor wires to controller
■ The temperature sensors are designed to be attached to the controller using 2-position screw terminals. Using a connector from the controller, attach the sensor to the screw terminal. The temperature sensors are not polarized.
■ Connect all sensors to pluggable connectors.
■ Once connected, the sensors should be plugged into the proper location on the controller. The location can be determined from the text on the controller enclosure, or from the Wiring Schematic.

18 ### Final Step
■ Leave the installation instructions on site in a convenient location, where it can be easily located for future service.

![KE2 thermsolutions logo] **KE2 Evap-RE2** Contactor Panel
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17

EARTH GROUND

FAN RELAY

INCOMING POWER
- L1
- Neutral/L2

NO / NC / COM — **AUXLIARY RELAY 1**

NO / NC / COM — **AUXILIARY RELAY 2**

NO / NC / COM — **LIQUID LINE SOLENOID**

DEFROST RELAY

Ground / Signal / Not used — **AUXILIARY INPUT 3**

Not used / Not used

Ground / Signal / Not used — **AUXILIARY INPUT 2**

EEV
- Black
- White
- Green
- Red
- Empty

RSV
- Black
- Red
- Yellow
- Orange
- Blue

PRESSURE TRANSDUCER
- Red
- Black
- Green

0 - 10V OUTPUT
- Vout +
- Ground –

RS 485
- A +
- B –
- Shield

SUCTION TEMP

COIL TEMP

AUX1

RETURN AIR TEMP

REMOTE DISPLAY

ETHERNET PORT

COMM to AUX BRD
- +12V
- A +
- B –
- Ground

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User Interface

The KE2 Evap-RE2's onboard user interface uses a 6-button arrangement to simplify navigation through the controller's menus. The menus are grouped into columns to make navigation easier.

Use ◀ or ▶ to move between the menu column categories. If pressed while in a menu, the ◀ or ▶ arrows move to the main screen or the adjacent menu column.

Use ▼ or ▲ to move 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.

ENTER is used to save an input option when it has been changed. ENTER **must be held for at least 3 seconds to prevent accidental changes.** Changes may be discarded by waiting for the controller to time-out and return to default screen, or by pressing BACK . BACK is used to return to the previous screen. Pressing BACK several times will return the user to the default view. See Controller Navigation on pages 16 - 17.

Controller Setup

When first applying power to the controller, it will initialize, then automatically enter the **Introduction Mode**. The Introduction Mode consists of as little as two options that must be configured for the KE2 Evap-RE2 to begin controlling the system. See **Table 2.**

The first setpoint the user is asked to enter is the desired **MODE OF CONTROL**. Use ▼ or ▲ to select one of the five options. If one of the pre-programmed options is selected, then the only other step required is to select whether or not to enable **KE2 SmartAccess** to easily view the controller online.

If **SINGLE COMP CUSTOM** is selected then the desired **ROOM TEMP** is asked. Use the arrows to input the desired **ROOM TEMP**, then press and hold ENTER . This is followed by the **DEFROST TYPE**. The controller is designed to work with electric, hot gas, and air (off-time) defrosts. The next setpoint will be the **VALVE TYPE**, followed by the **REFRIGERANT** if an electric valve is selected. The controller is defaulted to be used with a mechanical valve, but may be used with a variety of EEVs and EEPRs (rack mode only), including customer defined valves. The last setpoint before exiting **Introduction Mode** is whether to enable **KE2 SmartAccess**.

When custom EEV is selected, the user will be prompted to select **MOTOR TYPE**, **MOTOR STEP RATE**, and **MAX VALVE STEPS**. Once these have been set, the KE2 Evap-RE2 will begin controlling the EEV and the system.

Adjusting Controller Parameters

The controller has the ability to access an abundance of information from the 4-digit alphanumeric display.

Table 3 (Page 16) 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 ◀ or ▶ will move from the default display to the next menu column, shown in the Controller Navigation on pages 16 -17. The **VARIABLES** menu column consists of the current sensor readings, relay states, and other controller information.

The controller will prompt the user to **LOGIN** when the user attempts to access setpoints they do not have permission to change.

The **User Password (1111)** only provides access to the **ROOM TEMP** setpoint. For the protection of the system, access to **SETPOINTS** and **MANUAL MENU** requires the **Installer Password (2222).** A complete list of parameters is shown on pages 16-28**.**

Pressing BACK at any time will return the user to next level up the menu. A second/third press will either return to the room temperature reading, defrost, or an alarm - depending on the system state.

Table 2 - Introduction Mode

SELECT CONTROL MODE		
PRE-PROGRAMMED	**SINGLE COMP CUSTOM**	
Single Comp Electric **Single Comp Air** **Rack w. Electric** **Rack w. Air**	**Mechanical Valve** (TEV) **Defined EEV**	**Custom EEV**
KE2 SmartAccess	Room Temp	Room Temp
	Defrost Type	Defrost Type
	Valve Type	Valve Type
	Refrigerant	Refrigerant
	KE2 SmartAccess	Motor Type (Unipolar/Bipolar)
		Motor Step Rate
		Max Valve Steps
		KE2 SmartAccess

Accessing the Controller's Wi-Fi

The KE2 Evap-RE2 comes equipped with Wi-Fi onboard. The onboard Wi-Fi is the easiest way to connect to the controller's webpages. Internet access is not required to access the controller's webpages when at the controller.

Turning on Wi-Fi

Press and hold BACK and ▶ at the same time until "WIFI ON" scrolls across the display.

Connecting via Wi-Fi

Check your device's available Wi-Fi networks. There will be a network in the list, "re2-XXXXX-XXX". The X's will be the controller's serial number. No password is required to connect to the Wi-Fi network.

> **Note:** It may take 30 seconds or more for the KE2 Evap-RE2 Wi-Fi network to appear on the list of Wi-Fi networks, and may not be at the top of the list as it is an "Open" network.

Connect to the network. Most devices will automatically open to the KE2 Evap-RE2's webpage "re2.ke2.co". Follow the on-screen prompts to login to the Wi-Fi, until the home page of the controller appears, for security purposes only one user can access the wepages at the same time via Wi-Fi.

Turning off Wi-Fi

Press and hold BACK and ▶ at the same time until 'WIFI OFF' scrolls across the screen. Press any button to return the KE2 Evap-RE2 display to the normal view. Wi-Fi will also automatically deactivate after 16 minutes of inactivity.

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Controller Webpage Login

The controller Username and Password are required to make changes when using the webpage.

DEFAULTS ARE: **Username:** ke2admin **Password:** KE2-RESquared!

IMPORTANT: The password MUST be changed from the default for security purposes.

The password must be a minimum of 8 characters. Allowed characters for passwords are spaces, A-Z, a-z, 0-9 and the following special characters: -_.@!#():,[]+/? Invalid special characters are: (<>"`~) If invalid characters are entered for the password then an error will be displayed, and the password will not be saved.

Change Password   ✕

Old Password

••••••••••••••

New Password

••••••••••••••

Retype New Password

••••••••••••••

Password Reset Email

Change Password   Cancel

After changing the password, when logging in **use the default username "ke2admin" and the new password you just set**. You will now be logged in and able to make changes to the controller.

Table 3 - Controller Navigation - Menu Structure

Navigation

Select the Board

ENTER

NOTE: The menu items displayed may vary based on the Mode of Control & Type of Control selected, as well as how the setpoints are configured.

Main Board ◄ ►

Board Variables Main Board ◄ ►
▲
▼
Room Temp
Coil Temp
System Mode
Superheat
Suction Pressure
Suction Temp
Saturation Temp
Valve % Open
LLS Relay
Defrost Relay
Fan Relay
Auxiliary Relay
Auxiliary 2 Relay
Aux 1 Status
Aux 2 Status
Aux 3 Status
Fan Current
Defrost Current
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 Part No
Firmware Version

Alarms ◄ ►
▲
▼
No Alarms
Pressure Sensor
Suction Temp Sensor
Air Temp Sensor
Coil Temp Sensor
Aux1 Sensor
Aux2 Sensor
Aux3 Sensor
High Superheat
Low Superheat
High Air Temp
Low Air Temp
Excess Defrost
Defr Term on Time
Door Open Alarm
Communication Error
External Alarm 1
External Alarm 2
External Alarm 3
Fan Failure
Fan Sensor
Defrost Heater Failure
Defrost Heater Failure
Defrost Sensor
Leak Detected
Defrost Queue Error
Email Failure

Select Board for Setpoints Main Setpoints ◄ ►
Login
▲
▼

Low Room Temp
Medium Room Temp
Dual Temp Select
Defrost Type
Valve Type
EEPR Mode
Superheat
Max Operating Pres
EEPR Target Pressure
EEPR 2nd Pressure
Refrigerant
Aux Relay Type
Aux Relay 2 Type
Max Fan Speed
Fan Speed
Min Run Time
Min Off Time
Refrig Fan Mode
Defrost Mode
Defrosts / Day
1st Defrost of Day
Defrost Fan State
Defrost Term Temp
Defrost Parameter
Max Defrost Time
Defrost Queue
Drain Time
Comp Run Time
Elec Defrost Mode
Fan Delay Temp
Min Fan Switch Time

Main Setpoints continued

Max Fan Delay Time
Pump Down Time
Multi Air Temp Ctrl
Multi Evap Cool
Multi Evap Defrost
Multi Evap Sensor
Room Tmp Ind Def
High Temp Alarm Offset
High Temp Alarm Delay
Low Temp Alarm Offset
Low Temp Alarm Delay
Door Alarm Delay
Aux In 1 Mode
Aux In 1 State
Aux In 2 Mode
Aux In 2 State
Aux In 3 Mode
Aux In 3 State
Pressure Transducer Type
Suct Pres Offset
Suct Temp Offset
Air Temp Offset
Coil Temp Offset
Aux 1 Offset
Aux 2 Offset
Aux 3 Offset
Temp Units
Air Temp Diff
Extreme Temp Diff
Proportional
Integral

Derivative
Min Defr Interval
Min Valve Position
Max Valve Position
Display Brightness
BACnet MAC
BACnet ID 1
BACnet ID 2
BACnet Baud Rate

Login ◄ ►

Manual Menu ◄ ►
Login
▲
▼
Manual Control
Manual Main Valve
Valve Driver (1, 2, 3) Valve
Clear Alarms
Manual LLS Relay
Manual Defrost Relay
Manual Fan Relay
Manual Aux Relay
Manual Aux Relay 2
System Off
Detect Current
Factory Reset
Web Password Reset
KE2 Smart Access
DHCP Mode
DOD Init

Valve Driver 1 Board
-OR-
Valve Driver 2 Board
-OR-
Valve Driver 3 Board

ENTER

Valve Driver (1,2,or 3) Setpoints
Login

Control Mode ◄ ►

Temperature /EEPR ◄ ►
(Rack Mode)

Pressure / EEPR ◄ ►
(Rack Mode)

Superheat/ EEV
(Single Comp or Rack Mode)

Valve Driver 1, 2,3 Variables ◄ ►
▲
▼
Valve Driver (1,2,or 3) Inp1 Sc Tmp
Valve Driver (1,2,or 3) Inp2
(Disabled, Rm Tmp, or Cl Tmp)
Valve Driver 1,2,or 3) Inp3
(Disabled, Rm Tmp, Cl Tmp, or Sc Prs)
Valve Driver (1,2,or 3) Saturation
Valve Driver (1,2,or 3) Superheat
Valve Driver (1,2,or 3) Valve % Open

Valve Driver 1,2,3 Setpoints ◄ ►
Login
▲
▼
Input 1 Function
Input 2 Function
Input 3 Function
Input 1 Offset
Input 2 Offset
Input 3 Offset
Valve Type
Motor Type
Max Valve Steps
Motor Step Rate

Setpoints continued

Proportional
Integral
Derivative
Refrigerant
Max Operating Pres
Main Evap Sensors

Alarms ◄ ►
▲
▼
Valve Driver (1, 2, or 3) Comms Loss
Valve Driver (1,2,or 3) Inp 1 Fault
Valve Driver (1,2,or 3) Inp 2 Fault
Valve Driver (1,2,or 3) Inp 3 Fault
Valve Driver (1,2,or 3) Low SH
Valve Driver (1,2,or 3) High SH

Valve Driver 1, 2,3 Variables ◄ ►
▲
▼
Valve Driver (1,2,or 3) Inp1
        (Disabled, Rm Tmp, or Cl Tmp)
Valve Driver (1,2,or 3) Inp2
        (Disabled, Rm Tmp, or Cl Tmp)
Valve Driver (1,2,or 3) Inp3 Sc
        (Disabled, Rm Tmp, Cl Tmp, or Sc Prs)
Valve Driver (1,2,or 3) Valve % Open

Valve Driver 1,2,3 Setpoints ◄ ►
Login
▲
▼
Input 1 Function
Input 2 Function
Input 3 Function
Input 1 Offset
Input 2 Offset
Input 3 Offset
Valve Type
Motor Type
Max Valve Steps
Motor Step Rate
Proportional
Integral
Derivative
Main Evap Sensors
Min Valve Position
Max Valve Position

Alarms ◄ ►
▲
▼
Valve Driver (1, 2, or 3) Comms Loss
Valve Driver (1,2,or 3) Inp 1 Fault
Valve Driver (1,2,or 3) Inp 2 Fault
Valve Driver (1,2,or 3) Inp 3 Fault

Valve Driver 1, 2,3 Variables ◄ ►
▲
▼
Valve Driver (1,2,or 3) Inp1
        (Disabled, Rm Tmp, or Cl Tmp)
Valve Driver (1,2,or 3) Inp2
        (Disabled, Rm Tmp, or Cl Tmp)
Valve Driver (1,2,or 3) Inp3 Sc
        (Disabled, Rm Tmp, Cl Tmp, or Sc Prs)
Valve Driver (1,2,or 3) Valve % Open

Valve Driver 1,2,3 Setpoints ◄ ►
Login
▲
▼
Input 1 Function
Input 2 Function
Input 3 Function
Input 1 Offset
Input 2 Offset
Input 3 Offset
Valve Type
Motor Type
Max Valve Steps
Motor Step Rate
Proportional
Integral
Derivative
Main Evap Sensors
Min Valve Position
Max Valve Position

Alarms ◄ ►
▲
▼
Valve Driver (1, 2, or 3) Comms Loss
Valve Driver (1,2,or 3) Inp 1 Fault
Valve Driver (1,2,or 3) Inp 2 Fault
Valve Driver (1,2,or 3) Inp 3 Fault

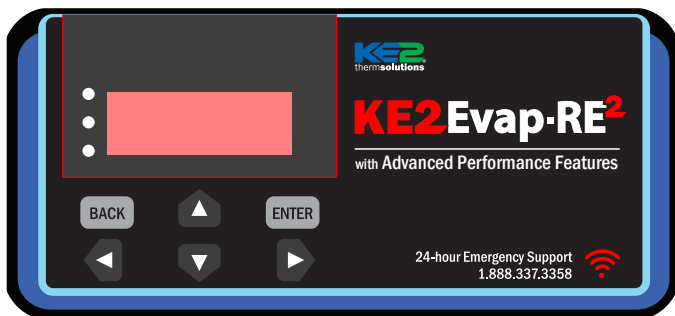**Current Sensor Board**

ENTER

Variables ◄ ►
▲
▼
Current Inp1 Status
Current Inp2 Status
Current Inp3 Status

Setpoints ◄ ►
Login
▲
▼
Input 1 Offset
Input 2 Offset
Input 3 Offset

Alarms ◄ ►
▲
▼
Current Sensor Comms Loss
Current Sensor Inp 1 Fault
Current Sensor Inp 2 Fault
Current Sensor Inp 3 Fault

KE2 Evap-RE2 Contactor Panel
Rack Efficiency Controller with Advanced Performance Features

Main Board (KE2 Evap-RE2)

Setpoints

① SELECT BOARD FOR SETPOINTS Use ▽ or △ to scroll through the list of boards. Press ENTER when Main Board Setpoints is displayed. A login prompt will appear. Press ENTER to display ⬚⬚⬚⬚. Enter the password (2222) using use ▽ or △ to change the value of the digit and use ◁ or ▷ to move to the next digit. Once 2222 is displayed, press and hold ENTER for 3 seconds.

MAIN SETPOINTS, VALVE DRIVER 1 SETPOINTS , VALVE DRIVER 2 SETPOINTS, VALVE DRIVER 3 SETPOINTS, CURRENT SENSOR SETPOINTS
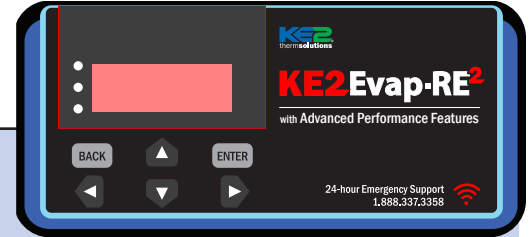
② SET BOARD SETPOINTS Use ▽ or △ to scroll through the Setpoint options. When desired Setpoint is displayed, press ENTER . Then use the ▽ or △ to move through the options for that Setpoint, or if entering a number, use ▽ or △ to change the value of the digit and ◁ or ▷ to move to the next digit. Press and hold ENTER for 3 seconds to save the change.

Parameter Name	Description
LOW ROOM TEMP	Cut-out or target room temperature for low temp applications.
MEDIUM ROOM TEMP	Cut-out or target room temperature for medium temp applications.
DUAL TEMP SELECT	Determines whether to use the low temp or medium temp room temperature setpoint for control.
DEFROST TYPE	Method of defrost used on the evaporator coil: Electric, Air, Hot Gas with Liquid Line Solenoid/Compressor Contactor relay off, Hot Gas with Liquid Line Solenoid/Compressor Contactor relay on.
VALVE TYPE	Type of valve used on the system: mechanical, pre-configured electronic valve, or custom electronic valve configuration.
Only when EEV/EEPR Selected	
EEPR MODE	Control mode for EEPR (only applicable if an EEPR is selected for **VALVE TYPE**).
SUPERHEAT	Target superheat value (not applicable if **VALVE TYPE** = MECHANICAL).
MAX OPERATING PRES	Maximum operating pressure (psi) - EEV will ignore superheat and close to attempt to prevent suction pressure from rising above this value (not applicable if **VALVE TYPE** = MECHANICAL).
EEPR TARGET PRESSURE	Target suction pressure (only applicable if an EEPR is selected for **VALVE TYPE** and **EEPR MODE** = PRESSURE).
EEPR 2ND PRESSURE	Target suction pressure (only applicable if an EEPR is selected for **VALVE TYPE** and **EEPR MODE** = PRESSURE).
REFRIGERANT	The type of refrigerant used in the refrigeration system.
AUX RELAY TYPE	Select function of the Aux Relay.
AUX RELAY 2 TYPE	Select function of the Aux Relay 2..
MAX FAN SPEED	Maximum allowed fan speed when using the 0-10VDC output for variable evaporator fan speed control.
FAN SPEED	When set to value other than 0.0 %, provides 0 to 10 VDC signal to control variable speed evaporator fans. Setting to a negative value reverses the VDC output (0 VDC will be full speed, 10 VDC will be off).
MIN RUN TIME	Minimum amount of time the liquid line solenoid/compressor contactor relay must remain on after it is energized.
MIN OFF TIME	Minimum amount of time the liquid line solenoid/compressor contactor relay must remain off before it can be energized again.
REFRIG FAN MODE	Fan operation while in refrigeration mode.
DEFROST MODE	The method the controller uses to determine when to initiate a defrost.
DEFROSTS / DAY	If **DEFROST MODE** = SCHEDULED: The number of evenly spaced defrosts per day the controller will initiate.
1ST DEFROST OF DAY	If **DEFROST MOD**E = SCHEDULED: Time of day first defrost is performed. No defrost will be performed between midnight and this time.
DEFROST FAN STATE	Selects whether or not to run the evaporator fans during defrost, and whether or not to perform the "defrost delay" before the defrost mode.
DEFROST TERM TEMP	The temperature the coil sensor(s) must exceed in order to terminate defrost.
DEFROST PARAMETER	If **DEFROST MODE** = DEMAND: Do not adjust unless directed to by KE2 Therm tech support.
MAX DEFROST TIME	If **DEFROST MODE** = SCHEDULE or RUNTIME: The maximum amount of time the defrost relay will be energized.
MIN DEFROST TIME	If **DEFROST MODE** = SCHEDULE. Minimum time that the controller must be in defrost.
DEFROST QUEUE	Enables defrost prioritization to limit amount of defrost load.
DRAIN TIME	Time to be in drain mode (drip time) after defrost is complete.
COMP RUN TIME	If **DEFROST MODE** = RUN TIME: The amount of time liquid line solenoid/compressor relay is energized before the next defrost is initiated.
ELECTRIC DEFROST MODE	If **DEFROST TYPE** = ELEC: Whether to leave the defrost relay energized during the defrost cycle or to utilize advanced defrost algorithm.
FAN DELAY TEMP	After defrost, the coil sensor reading must fall below this temperature in order for the controller to resume normal fan operation.
MIN FAN SWITCH TIME	Minimum time before fans can turn on again once turned off.
MAX FAN DELAY TIME	Maximum amount of time after defrost to resume normal fan operation.
PUMP DOWN TIME	Minimum amount of time between de-energizing the liquid line solenoid/compressor contactor relay and energizing the defrost relay.
MULTI AIR TEMP CTRL	Select control method to use when multiple room temperature sensors are used or controllers are bonded.

KE2 Evap-RE2 Contactor Panel
Rack Efficiency Controller with Advanced Performance Features

Min/Max or Range	Defaults					Parameter Name
	Rack Electric	Rack Air	Single Comp Electric	Single Comp Air	Single Comp Custom	
-50.0°F to 90.0°F	-5.0°F	0.0°F	0°F	0.0°F	0°F	LOW ROOM TEMP
-50.0°F to 90.0°F	37.8°F	37.8°F	37.8°F	37.8°F	37.8°F	MEDIUM ROOM TEMP
LOW TEMP, MEDIUM TEMP	LOW TEMP	MEDIUM TEMP	LOW TEMP	MEDIUM TEMP	LOW TEMP	DUAL TEMP SELECT
ELEC (ELECTRIC), AIR, HG LLS/EEV ON, HG LLS/EEV OFF	ELEC (ELECTRIC)	AIR	ELEC (ELECTRIC)	AIR	ELEC (ELECTRIC)	DEFROST TYPE
MECHANICAL, KE2 RSV, SER/SEI 1 TO 20, SER AA TO L, CAREL, PULSE, CUSTOM EEV, CDS 2 to 7, CDS 9 to 17, KVS 15, KVS 42, CUSTOM EEPR, SDR 3(X), SDR 4 to 5, CUSTOM EHGBP	CDS 2 TO 7	CDS 2 TO 7	MECHANICAL	MECHANICAL	MECHANICAL	VALVE TYPE
TEMPERATURE, PRESSURE.	TEMPERATURE	TEMPERATURE	NA	NA	NA	EEPR MODE
5.0°F to 30.0°F	8.0°F	8.0°F	8.0°F	8.0°F	8.0°F	SUPERHEAT
10.0 to 750.0 psig if R-744, 10.0 to 300.0 psig if R-410A, 10.0 to 150.0 psig for all other refrigerants.	150.0 psig	150.0 psig	150.0 psig	150.0 psig	150.0 psig	MAX OPERATING PRES
0.0 to 150.0 psig	21.0 psig	21.0 psig	NA	NA	NA	EEPR TARGET PRESSURE
0.0 to 150.0 psig	48.0 psig	48.0 psig	NA	NA	NA	EEPR 2ND PRESSURE
404A, 422C,427A, 513A, 450A, 449A, 448A, R744, 410A, 407F, 409A, 408A, 438A, R717, R22, 134A, 422D, 422A, 407C, 407A, R507	404A	404A	404A	404A	404A	REFRIGERANT
2nd DEFROST, 2ND FAN, 2ND LLS, DISABLED, PERMANENT DEFROST, LIGHTS, TWO SPEED FAN, LEAK ALARM, DOOR ALARM, ALARM	DOOR ALARM	DOOR ALARM	DOOR ALARM	DOOR ALARM	DOOR ALARM	AUX RELAY TYPE
2ND DEFROST, 2ND FAN, 2ND LLS, DISABLED, PERMANENT DEFROST, LIGHTS, TWO SPEED FAN, LEAK ALARM, DOOR ALARM, ALARM	LIGHTS	LIGHTS	LIGHTS	LIGHTS	LIGHTS	AUX RELAY 2 TYPE
0.0 to 100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	MAX FAN SPEED
-100 to 100.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	FAN SPEED
0 to 15 minutes	0 min	0 min	2 min	2 min	2 min	MIN RUN TIME
0 to 15 minutes	0 min	0 min	5 min	5 min	5 min	MIN OFF TIME
MANAGED, PERMANENT, ON W/ COMPRESSOR, TITLE 24	PERMANENT	PERMANENT	ON W/ COMPRESSOR	ON W/ COMPRESSOR	ON W/ COMPRESSOR	REFRIG FAN MODE
DEMAND, SCHEDULE, RUN TIME	DEMAND	DEMAND	DEMAND	DEMAND	DEMAND	DEFROST MODE
0 to 8	5	5	5	5	5	DEFROSTS / DAY
0 (12:00 AM) to 23.59 (11:59 PM)	2.00 (2:00 AM)	2.00 (2:00 AM)	2.00 (2:00 AM)	2.00 (2:00 AM)	2.00 (2:00 AM)	1ST DEFROST OF DAY
FAN ON, FAN OFF, FAN ON NO DEF DEL, FAN OFF NO DEF DEL	FAN OFF	FAN ON	FAN OFF	FAN ON	FAN OFF	DEFROST FAN STATE
35.0°F to 90.0°F	50.0°F	39.8°F	50.0°F	39.8°F	50.0°F	DEFROST TERM TEMP
0 to 90	30	40	30	40	30	DEFROST PARAMETER
0 to 90 minutes	45 min	40 min	45 min	40 min	45 min	MAX DEFROST TIME
1 to 20 minutes	1 min	1 min	1 min	1 min	1 min	MIN DEFROST TIME
DISABLED, ENABLED	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED	DEFROST QUEUE
0 to 15 minutes	5 min	0 min	2 min	0 min	2 min	DRAIN TIME
0 to 24 hours	6 hours	6 hours	6 hours	6 hours	6 hours	COMP RUN TIME
PULSE, PERMANENT	PULSE	PERMANENT	PULSE	PERMANENT	PULSE	ELECTRIC DEFROST MODE
-40.0°F to 35.0°F	20.0°F	20.0°F	20.0°F	20.0°F	20.0°F	FAN DELAY TEMP
10 to 240 sec	10 sec	10 sec	10 sec	10 sec	10 sec	MIN FAN SWITCH TIME
0 to 20 minutes	2 min	0 min	2 min	0 min	2 min	MAX FAN DELAY TIME
0 to 5,400 sec	60 sec	60 sec	0 sec	0 sec	0 sec	PUMP DOWN TIME
AVERAGE AIR, WARMEST AIR	WARMEST AIR	WARMEST AIR	WARMEST AIR	WARMEST AIR	WARMEST AIR	MULTI AIR TEMP CTRL

KE2 Evap-RE2 Contactor Panel
Rack Efficiency Controller with Advanced Performance Features

Main Board (KE2 Evap-RE2)

Parameter Name	Description
Only when controllers are bonded	
MULTI EVAP COOL	Select whether bonded controllers will refrigerate at the same time (synchronized), or individually (independent).
MULTI EVAP DEFROST	Select whether bonded controllers will initiate and exit defrost mode at the same time (synchronized), or individually (independent) .
MULTI EVAP SENSOR	Select whether or not to share room temperature, coil temperature, and suction pressure sensor data with bonded controllers.
ROOM TMP IND DEF	If **MULTI EVAP DEFROST** = Independent. This setpoint becomes the room temperature cut-out or target while any bonded controller is in defrost.
HIGH TEMP ALARM OFFSET	The number of degrees above **ROOM TEMP** for a **HIGH TEMP ALARM** condition.
HIGH TEMP ALARM DELAY	Number of minutes the room temperature must remain above **ROOM TEMP + HIGH TEMP ALARM OFFSET** before issuing a **HIGH TEMP ALARM**.
LOW TEMP ALARM OFFSET	The number of degrees below **ROOM TEMP** for a **LOW TEMP ALARM** condition.
LOW TEMP ALARM DELAY	Number of minutes the room temperature must remain below **ROOM TEMP - LOW TEMP ALARM OFFSET** before issuing a **LOW TEMP ALARM**.
DOOR ALARM DELAY	If **AUX IN (1, 2** and/or **3**) **MODE** = DOOR SWITCH: The number of minutes, before an alarm condition is initiated if door is open and room temperature is 0.5°F degrees above **ROOM TEMP + AIR TEMP DIFF**.
AUX IN 1 MODE	Options for Auxiliary Input 1: Door Switch, Dual Temp Switch, Monitor Temp, Coil Temp, Room Temp, Disabled, Leak Detect, Leak Level, Light Switch, Defrost Lock Quit Defrost, Defrost Lock, Defrost Interlock, System Off, External Alarm.
AUX IN 1 STATE	If **AUX IN 1 MODE** = Digital Input. Open = active if input is an open circuit / Closed =active if input is shorted
AUX IN 2 MODE	Options for Auxiliary Input 2 - Door Switch, 2nd Temp Switch, Monitor Temp, Coil Temp, Room Temp, Disabled, Leak Detect, Leak Level, Light Switch, Defrost Lock Quit Defrost, Defrost Lock, Defrost Interlock, System Off, External Alarm.
AUX IN 2 STATE	If AUX IN 2 MODE = Digital Input. Open = active if input is an open circuit / Closed =active if input is shorted
AUX IN 3 MODE	Options for Auxiliary Input 3 - Door Switch, 2nd Temp Switch, Monitor Temp, Coil Temp, Room Temp, Disabled, Leak Detect, Leak Level, Light Switch, Defrost Lock Quit Defrost, Defrost Lock, Defrost Interlock, System Off, External Alarm.
AUX IN 3 STATE	If **AUX IN 3 MODE** = Digital Input. Open = active if input is an open circuit / Closed =active if input is shorted
PRESSURE TRANSDUCER TYPE	Select pressure transducer connected to main board. Note: If R-410A is selected, default is 300 PSIG. If R-744, default is 750 PSIG.
SUCT PRES OFFSET	An offset added or subtracted from the suction line pressure transducer reading, if needed.
SUCT TEMP OFFSET	An offset added or subtracted from the suction temperature sensor reading, if needed.
AIR TEMP OFFSET	An offset added or subtracted from the room temperature sensor reading, if needed.
COIL TEMP OFFSET	An offset added or subtracted from the coil temperature sensor reading, if needed.
AUX1 OFFSET	An offset added or subtracted from the Auxiliary Input 1 temperature sensor reading, if needed.
AUX2 OFFSET	An offset added or subtracted from the Auxiliary Input 2 temperature sensor reading, if needed.
AUX3 OFFSET	An offset added or subtracted from the Auxiliary Input 3 temperature sensor reading, if needed.
TEMP UNITS	Unit used for temperature - FAHRENHEIT or CELSIUS.
AIR TEMP DIFF	IF **CONTROL MODE** = SINGLE COMP: The number of degrees above **ROOM TEMP** before the controller will go into **REFRIGERATION** mode.
EXTREME TEMP DIFF	Do not adjust unless directed to by KE2 Therm tech support.
PROPORTIONAL	Do not adjust unless directed to by KE2 Therm tech support.
INTEGRAL	Do not adjust unless directed to by KE2 Therm tech support.
DERIVATIVE	Do not adjust unless directed to by KE2 Therm tech support.
MIN DEFR INTERVAL	If RACK CONTROL SELECTED: The minimum amount of time between the end of the previous defrost cycle, and the beginning of the next defrost cycle.
MIN VALVE POSITION	When in refrigeration mode, minimum position valve can close.
MAX VALVE POSITION	When in refrigeration mode, maximum position valve can open.
DISPLAY BRIGHTNESS	Increase or decrease the LED display's illumination. 1 = dimmest, 10 = brightest.
BACNET MAC	Hardware address assigned by BAS. The local address per rack.
BACNET ID 1	First three digits of the BACnet device ID.
BACNET ID 2	Last 4 digits of the BACnet device ID.
BACNET BAUD RATE	Sets the communication speed.

KE2 Evap-RE2 Contactor Panel
Rack Efficiency Controller with Advanced Performance Features

Min/Max or Range	Defaults					Parameter Name
	Rack Electric	Rack Air	Single Comp Electric	Single Comp Air	Single Comp Custom	
SYNCHRONIZED, INDEPENDENT	SYNCHRONIZED	SYNCHRONIZED	SYNCHRONIZED	SYNCHRONIZED	SYNCHRONIZED	**MULTI EVAP COOL**
SYNCHRONIZED, INDEPENDENT	SYNCHRONIZED	SYNCHRONIZED	SYNCHRONIZED	SYNCHRONIZED	SYNCHRONIZED	**MULTI EVAP DE-FROST**
SHARED, NOT SHARED	SHARED	SHARED	SHARED	SHARED	SHARED	**MULTI EVAP SENSOR**
-50.0°F to 90.0°F	-5.0°F	37.8°F	0.0°F	37.8°F	0.0°F	**ROOM TEMP IND DEF**
0.0°F to 99.9°F	10.0°F	1.2°F	10.0°F	1.2°F	10.0°F	**HIGH TEMP ALARM OFFSET**
0 to 120 minutes	60 min	60 min	60 min	60 min	60 min	**HIGH TEMP ALARM DELAY**
0.0°F to 20.0°F	4.0°F	4.0°F	4.0°F	4.0°F	4.0°F	**LOW TEMP ALARM OFFSET**
0 to 30 minutes	10 min	10 min	10 min	10 min	10 min	**LOW TEMP ALARM DELAY**
0 to 180 minutes	30 min	30 min	30 min	30 min	30 min	**DOOR ALARM DELAY**
DOOR SWITCH, DUAL TEMP, MONITOR, COIL TEMP, ROOM TEMP, DISABLED, LEAK DETECT, LIGHT SWITCH, DFR LOCK QUIT DFR, DFR LOCK, DFR INTERLOCK, SYS OFF, EXT ALARM	DOOR SWITCH	DOOR SWITCH	DOOR SWITCH	DOOR SWITCH	DOOR SWITCH	**AUX IN 1 MODE**
OPEN, CLOSED	OPEN	OPEN	OPEN	OPEN	OPEN	**AUX IN 1 STATE**
DOOR SWITCH, DUAL TEMP, MONITOR, COIL TEMP, ROOM TEMP, DISABLED, LEAK LEVEL, LEAK DETECT, LIGHT SWITCH, DFR LOCK QUIT DFR, DFR LOCK, DFR INTERLOCK, SYS OFF, EXT ALARM	LEAK DETECT	LEAK DETECT	LEAK DETECT	LEAK DETECT	LEAK DETECT	**AUX IN 2 MODE**
OPEN, CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	**AUX IN 2 STATE**
DOOR SWITCH, DUAL TEMP, MONITOR, COIL TEMP, ROOM TEMP, DISABLED, LEAK LEVEL, LEAK DETECT, LIGHT SWITCH, DFR LOCK QUIT DFR, DFR LOCK, DFR INTERLOCK, SYS OFF, EXT ALARM	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED	**AUX IN 3 MODE**
OPEN, CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	**AUX IN 3 STATE**
100 PSIG, 150 PSIG, 200 PSIG. 300 PSIG, 500 PSIG, 750 PSIG	150 PSIG	150 PSIG	150 PSIG	150 PSIG	150 PSIG	**PRESSURE TRANS-DUCER TYPE**
-5.0 to 5.0 psi	0.0 psi	0.0 psi	0.0 psi	0.0 psi	0.0 psi	**SUCT PRES OFFSET**
-5.0°F to 5.0°F	0.0°F	0.0°F	0.0°F	0.0°F	0.0°F	**SUCT TEMP OFFSET**
-5.0°F to 5.0°F	0.0°F	0.0°F	0.0°F	0.0°F	0.0°F	**AIR TEMP OFFSET**
-5.0°F to 5.0°F	0.0°F	0.0°F	0.0°F	0.0°F	0.0°F	**COIL TEMP OFFSET**
-5.0°F to 5.0°F	0.0°F	0.0°F	0.0°F	0.0°F	0.0°F	**AUX1 TEMP OFFSET**
-5.0°F to 5.0°F	0.0°F	0.0°F	0.0°F	0.0°F	0.0°F	**AUX2 TEMP OFFSET**
-5.0°F to 5.0°F	0.0°F	0.0°F	0.0°F	0.0°F	0.0°F	**AUX3 TEMP OFFSET**
FAHRENHEIT, CELSIUS	FAHRENHEIT	FAHRENHEIT	FAHRENHEIT	FAHRENHEIT	FAHRENHEIT	**TEMP UNIT**
0.1°F to 5°F	NA	NA	1.0°F	1.0°F	1.0°F	**AIR TEMP DIFF**
0 to 200	30.0°F	30.0°F	20.0°F	20.0°F	20.0°F	**EXTREME TEMP DIFF**
0 to 255	3	3	3	3	3	**PROPORTIONAL EEV**
0 to 255	5	5	5	5	5	**INTEGRAL EEV**
0 to 255	3	3	3	3	3	**DERIVATIVE EEV**
0 to 255 minutes	120 min	120 min	NA	NA	NA	**MIN DEFR INTERVAL**
0.0 to 99.9%	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	**MIN VALVE POSITION**
0.1 to 100%	100 %	100 %	100 %	100 %	100 %	**MAX VALVE POSITION**
1 to 10	6	6	6	6	6	**DISPLAY BRIGHTNESS**
0 to 127	-1	-1	-1	-1	-1	**BACNET MAC**
0 to 419	0	0	0	0	0	**BACNET ID 1**
-1 to 9999	-1	-1	-1	-1	-1	**BACNET ID 2**
9600, 1920(0), 3840(0)	3840(0)	3840(0)	3840(0)	3840(0)	3840(0)	**BACNET BAUD RATE**

KE2 Evap-RE2 Contactor Panel
Rack Efficiency Controller with Advanced Performance Features

Main Board (KE2 Evap-RE2)

Variables *(Non-adjustable, View only)*

① MOVE TO VARIABLES MENUS Use ◀ or ▶ to move to the board Variables Menus. Press `ENTER` when Variables is displayed.

MAIN SETPOINTS, **VARIABLES,** MANUAL MENU, LOGIN, ALARMS

② SELECT BOARD TO VIEW Use ▼ or ▲ to scroll through the list of boards. Press `ENTER` when Main Board is displayed.

MAIN BOARD, VALVE DRIVER 1 VARIABLES , VALVE DRIVER 2 VARIABLES, VALVE DRIVER 3 VARIABLES, CURRENT SENSOR VARIABLES

**③ VIEW BOARD VARIABLES** Use ▼ or ▲ to scroll through the Variables.

Parameter Name	Description
ROOM TEMP	Walk-in freezer or cooler room temperature as measured by the controller.
COIL TEMP	Coil temperature as measured by the controller.
SYSTEM MODE	Current operating status.
Only displayed when certain configurations are selected.	
SUPERHEAT	Superheat as calculated by the controller (requires suction pressure transducer and suction temperature sensor).
SUCTION PRESSURE	Suction pressure as measured by the controller (only available if suction pressure transducer installed).
SUCTION TEMP	Suction temperature as measured by the controller.
SATURATION TEMP	Saturation temperature as calculated by the controller (requires pressure transducer and suction temperature sensor).
VALVE % OPEN	Percentage the EEV or EEPR is open (only available if EEV or EEPR is selected in the setpoints menu).
LLS RELAY	Current state of liquid line solenoid (LLS)/compressor contactor relay.
DEFROST RELAY	Current state of the defrost relay.
FAN RELAY	Current state of the evaporator fan relay; -100 % to 100 % is displayed when evaporator fan variable speed control enabled (Fan Speed).
AUXILIARY RELAY	Current state of the auxiliary relay.
AUXILIARY 2 RELAY	Current state of the auxiliary 2 relay.
AUX 1 STATUS AUX 2 STATUS AUX 3 STATUS	Current status or temperature as measured by controller at Aux Input 1. Current status or temperature as measured by controller at Aux Input 2. Current status or temperature as measured by controller at Aux Input 3. Display will vary based on the auxiliary input mode selected.
FAN CURRENT	Fan current as read by the controller.
DEFROST CURRENT	Defrost (heater) current as read by the controller.
IP OCTET 1	The first three digits of the IP address.
IP OCTET 2	The second three digits of the IP address.
IP OCTET 3	The third three digits of the IP address.
IP OCTET 4	The fourth three digits of the IP address.
SUBNET MASK OCTET 1	The first three digits of the subnet mask.
SUBNET MASK OCTET 2	The second three digits of the subnet mask.
SUBNET MASK OCTET 3	The third three digits of the subnet mask.
SUBNET MASK OCTET 4	The fourth three digits of the subnet mask.
FIRMWARE PART NO	Identifies the firmware on the controller.
FIRMWARE VERSION	Current version of the firmware on the controller.

KE2 Evap-RE2 Contactor Panel
Rack Efficiency Controller with Advanced Performance Features

Manual Menu
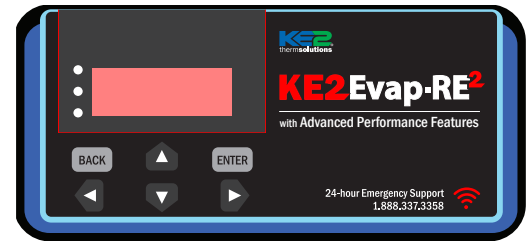
❶ Press ENTER when MANUAL MENU is displayed. A login prompt will appear. Press ENTER to display ⬜⬜⬜⬜ . Enter the password (2222) using ▼ or ▲ to change the value of the digit and use ◄ or ► to move to the next digit. Once 2222 is displayed, press and hold ENTER for 3 seconds.

MANUAL MENU, BOARDS, VARIABLES, ALARMS,

❷ **SELECT PARAMETER TO ADJUST** Use ▼ or ▲ to scroll through the Manual Menu. When desired Parameter Name is displayed, press ENTER . Then use ▼ or ▲ to move through the options for that Parameter, or if entering a number, use ▼ or ▲ to change the value of the digit, use ◄ or ► to move to the next digit. Press and hold ENTER for 3 seconds to save the change.

Parameter Name	Description	Range	Default
MANUAL CONTROL	Force the controller into the next operating mode. Press and hold ENTER when the current mode is displayed to skip to the next mode.	REFRIGERATE/OFF, DEFROST, DRAIN TIME, FAN DELAY	NA
MANUAL MAIN VALVE	Manually open or close the main board's EEV/EEPR in percentage increments.	0% to 100% in 0.1% increments	NA
VALVE DRIVER (1, 2 and/or 3) VALVE	Manually open or close the Valve Driver board's EEV/EEPR in percentage increments.	0% to 100% in 0.1% increments.	
CLEAR ALARMS	Press and hold ENTER for 5 seconds to clear all alarms	CLEAR ALL	NA
MANUAL LLS RELAY	Manually energize or de-energize liquid line solenoid/compressor contactor relay	AUTO (ON/OFF), MANUAL OFF, MANUAL ON	AUTO
MANUAL DEFROST RELAY	Manually energize or de-energize defrost relay	AUTO (ON/OFF), MANUAL OFF, MANUAL ON	AUTO
MANUAL FAN RELAY	Manually energize or de-energize fan relay	AUTO (ON/OFF), MANUAL OFF, MANUAL ON	AUTO
MANUAL AUX RELAY	Manually energize or de-energize auxiliary relay	AUTO (ON/OFF), MANUAL OFF, MANUAL ON	AUTO
MANUAL AUX RELAY 2	Manually energize or de-energize auxiliary 2 relay	AUTO (ON/OFF), MANUAL OFF, MANUAL ON	AUTO
SYSTEM OFF	Select SYSTEM OFF or SYSTEM ON, then press and hold ENTER for 5 seconds.	SYSTEM OFF, SYSTEM ON	NA
DETECT CURRENT	Press and hold ENTER to automatically detect fan/heater current.	DETECT	NA
FACTORY RESET	Press and hold ENTER for 5 seconds to return the controller to Intro mode and reset setpoints to default.	RESET	NA
WEB PASSWORD RESET	Reset the web password to the factory default	RESET	NA
KE2 SMARTACCESS MODE	Turn KE2 SmartAccess on or off	DISABLE, ENABLE	DISABLE
DHCP MODE	Turn DHCP Mode on or off	DISABLE, ENABLE	DISABLE
DOD INIT	Re-initialize KE2 defrost algorithm	RESET	NA

KE2 Evap-RE2 Contactor Panel
Rack Efficiency Controller with Advanced Performance Features

Alarms Menu *(Non-adjustable, View only)*

① ACCESS ALARMS LIST Use ◀ or ▶ to move through the list of Menus.

BOARDS, VARIABLES, **ALARMS,** SETPOINTS, LOGIN, MANUAL

② SCROLL ALARMS LIST When Alarms is displayed, use ▼ or ▲ to scroll through list.

	Alarm Name	Description
	NO ALARM	No alarms active.
Main Board	PRESSURE SENSOR	Suction pressure sensor is shorted, open or pressure out of range.
	SUCTION TEMP SENSOR	Suction temp sensor is shorted or open.
	AIR TEMP SENSOR	Return air temp sensor is shorted or open.
	COIL TEMP SENSOR	Coil temp sensor is shorted or open.
	AUX1 SENSOR	Auxiliary Input 1 Mode is set to Room Temp, Coil Temp, or Monitor Temp, and the input is shorted or open.
	AUX2 SENSOR	Auxiliary Input 2 Mode is set to Room Temp, Coil Temp, or Monitor Temp, and the input is shorted or open.
	AUX3 SENSOR	Auxiliary Input 3 Mode is set to Room Temp, Coil Temp, or Monitor Temp, and the input is shorted or open.
	HIGH SUPERHEAT	Superheat 2°F above setpoint, and valve open more than 95% for 90 minutes.
	LOW SUPERHEAT	Superheat below 3°F, and valve open less than 10% for 5 minutes.
	HIGH AIR TEMP	Room temperature is above **ROOM TEMP + AIR TEMP DIFF + HIGH TEMP ALARM OFFSET** for longer than **HIGH TEMP ALARM DELAY**
	LOW AIR TEMP	Room temperature is below **ROOM TEMP - LOW TEMP ALARM OFFSET** for longer than **LOW TEMP ALARM DELAY**
	EXCESS DEFROST	**Single Comp Mode:** More than 32 defrosts in 48 hour period. **Rack Mode:** Time between defrosts at Min. Defrost Interval for 24 hours.
	DEFR TERM ON TIME	Defrost terminated on time instead of temperature for two consecutive cycles
	DOOR OPEN ALARM	Door is open and room temperature is 0.5°F above **ROOM TEMP + AIR TEMP DIFF** for longer than **DOOR ALARM DELAY** time
	COMMUNICATION ERROR	Controllers are bonded and there has been no communication between bonded controllers for one minute or more.
	COMPSEQ COMMS	Cannot communicate with KE2 Compressor Sequencer controller.
	EXTERNAL ALARM 1	Aux Input 1 Mode is set to external alarm, and the input is active.
	EXTERNAL ALARM 2	Aux Input 2 Mode is set to external alarm, and the input is active.
	EXTERNAL ALARM 3	Aux Input 3 Mode is set to external alarm, and the input is active.
	FAN FAILURE	Fans drawing more or less amperage than expected. Determined by nominal current and acceptable range setting.
	FAN SENSOR	Unable to detect fan current during automatic current detection phase.
	DEFROST HEATER FAILURE	Defrost heaters are drawing more or less amperage than expected.
	DEFROST SENSOR	Unable to detect heater current during automatic current detection phase.
	DEFROST QUEUE COMM LOSS	Defrost Queue is enabled and could not communicate with other Defrost Queue enabled controllers.
	LEAK DETECTED	Aux Input 1, 2, or 3 is set to Leak Detect, and the input is active.
	DEFROST QUEUE ERROR	Defrost Queue is enabled and an error processing data from other Defrost Queue enabled controllers occurred.
	EMAIL FAILURE	E-mail not confirmed by e-mail server after seven consecutive tries.
Auxiliary Boards — 1	VALVE DRIVER 1 COMMS LOSS	Controller lost communication with Valve Driver 1.
	VALVE DRIVER 1 INP1 FAULT	Valve Driver 1 Input 1 is shorted or open.
	VALVE DRIVER 1 INP2 FAULT	Valve Driver 1 Input 2 is shorted or open.
	VALVE DRIVER 1 INP3 FAULT	Valve Driver 1 Input 3 is shorted, open, or pressure is reading out of range.
	VALVE DRIVER 1 LOW SH	Valve Driver 1 superheat is below 3°F, and valve open less than 10% for 5 minutes.
	VALVE DRIVER 1 HIGH SH	Valve Driver 1 superheat is 2°F above setpoint, and valve open more than 95% for 90 minutes.
2	VALVE DRIVER 2 COMMS LOSS	Controller lost communication with Valve Driver 2.
	VALVE DRIVER 2 INP1 FAULT	Valve Driver 2 Input 1 is shorted or open.
	VALVE DRIVER 2 INP2 FAULT	Valve Driver 2 Input 2 is shorted or open.
	VALVE DRIVER 2 INP3 FAULT	Valve Driver 2 Input 3 is shorted, open, or pressure is reading out of range.
	VALVE DRIVER 2 LOW SH	Valve Driver 2 superheat is below 3°F, and valve open less than 10% for 5 minutes.
	VALVE DRIVER 2 HIGH SH	Valve Driver 2 superheat is 2°F above setpoint, and valve open more than 95% for 90 minutes.
3	VALVE DRIVER 3 COMMS LOSS	Controller lost communication with Valve Driver 3.
	VALVE DRIVER 3 INP1 FAULT	Valve Driver 3 Input 1 is shorted or open.
	VALVE DRIVER 3 INP2 FAULT	Valve Driver 3 Input 2 is shorted or open.
	VALVE DRIVER 3 INP3 FAULT	Valve Driver 3 Input 3 is shorted, open, or pressure is reading out of range.
	VALVE DRIVER 3 LOW SH	Valve Driver 3 superheat is below 3°F, and valve open less than 10% for 5 minutes.
	VALVE DRIVER 3 HIGH SH	Valve Driver 3 superheat is 2°F above setpoint, and valve open more than 95% for 90 minutes.
Current Sensor Board	CURRENT SENSOR COMMS LOSS	Controller lost communication with the Current Sensor board.
	CURRENT SENSOR INP1 FAULT	Current Sensor Board Input 1 is shorted or open.
	CURRENT SENSOR INP2 FAULT	Current Sensor Board Input 2 is shorted or open.
	CURRENT SENSOR INP3 FAULT	Current Sensor Board Input 3 is shorted or open.

KE2 Evap-RE2 Contactor Panel
Rack Efficiency Controller with Advanced Performance Features

Valve Driver 1

Mode of Control: Temperature/EEPR   Type of Control: Rack

Setpoints Menu

❶ SELECT BOARD SETPOINTS Use ◀ or ▶ to move to Select Board for Setpoints. Then use ▼ or ▲ to scroll through the list of boards. Press ENTER when desired Auxiliary Board is displayed. A login prompt will appear. Press ENTER to display ⬛⬛⬛⬛. Enter the password (2222) using ▼ or ▲ to change the value of the digit and use ◀ or ▶ to move to the next digit. Once 2222 is displayed, press and hold ENTER for 3 seconds.

MAIN SETPOINTS, **VALVE DRIVER 1 SETPOINTS** - OR - **VALVE DRIVER 2 SETPOINTS** - OR - **VALVE DRIVER 3 SETPOINTS**, CURRENT SENSOR SETPOINTS

❷ SELECT CONTROL MODE Control Mode is the first Setpoint. Press ENTER then use ▼ or ▲ to scroll through Control Mode options. Press and hold ENTER for 3 seconds to select desired Control Mode. Setpoints will vary based on Control Mode selected. (NOTE: in Single Comp Mode the only option is Superheat EEV and Select Control Mode will not display. Input 1 Function is fixed in Superheat EEV Mode and will not display)

(SUPERHEAT/EEV, **TEMPERATURE/EEPR,** PRESSURE/EEPR)

❸ SET BOARD SETPOINTS Use ▼ or ▲ to scroll through the Setpoint options. When desired Setpoint is displayed, press ENTER . Then use ▼ or ▲ to move through the options for the Setpoint, or if entering a number, use ▼ or ▲ to change the value of the digit, use ◀ or ▶ to move to the next digit. Press and hold ENTER for 3 seconds to save the change, or press BACK if current Setpoint is correct.

Parameter Name	Description	Min	Max	Defaults
INPUT 1 FUNCTION	DISABLED, ROOM TEMP, COIL TEMP	NA	NA	ROOM TEMP
INPUT 2 FUNCTION	DISABLED, ROOM TEMP, COIL TEMP	NA	NA	DISABLED
INPUT 3 FUNCTION	DISABLED, ROOM TEMP, COIL TEMP	NA	NA	DISABLED
INPUT 1 OFFSET	An offset in F° added or subtracted from Input 1, if needed.	-5.0	5.0	0.0
INPUT 2 OFFSET	An offset in F° added or subtracted from Input 2, if needed.	-5.0	5.0	0.0
INPUT 3 OFFSET	An offset in F° or psi added or subtracted from Input 3, if needed.	-5.0	5.0	0.0
VALVE TYPE	CDS 2-7; CDS 9-17; KVS 15; KVS 42; CUSTOM EEPR	NA	NA	CDS 2-7
When CUSTOM EEPR Selected				
MOTOR TYPE	The motor type used in the valve - UNIPOLAR; BIPOLAR	NA	NA	UNIPOLAR
MAX VALVE STEPS	The total number of steps required to move the valve from closed to fully open	200	6400	500
MOTOR / VALVE STEP RATE	Motor step speed setting, in number of steps per second, for custom valve	30	400	30
PROPORTIONAL		0	255	3
INTEGRAL	Do not adjust unless directed to by KE2 Therm tech support.	0	255	5
DERIVATIVE		0	255	3
MAIN EVAP SENSORS	USE MAIN CONTROL SENSORS; USE ONLY AUX SENSORS	NA	NA	USE MAIN CONTROL SENSORS
MIN VALVE POSITION	Min Valve Position is the minimum percentage the EEPR is allowed to close. 0% the valve is fully closed, 100% the valve is fully open.	0.0 %	99.9 %	0.0 %
MAX VALVE POSITION	Max Valve Position is the maximum percentage the EEPR is allowed to open. 0% the valve is fully closed, 100% the valve is fully open.	0.1 %	100.0 %	100.0 %

Variables *(Non-adjustable, View only)*

❶ MOVE TO VARIABLES MENUS Use ◀ or ▶ to move to Board Variables. Press ENTER when Board Variables is displayed.

MAIN SETPOINTS, BOARD, **BOARD VARIABLES,** MANUAL MENU, LOGIN, ALARMS

❷ SELECT BOARD TO VIEW Use ▼ or ▲ to scroll through the list of boards. Press ENTER when desired Auxiliary Board is displayed.

MAIN BOARD, **VALVE DRIVER 1** - OR - **VALVE DRIVER 2** - OR - **VALVE DRIVER 3**, CURRENT SENSOR

❸ VIEW BOARD VARIABLES Use ▼ or ▲ to scroll through the Variables.

DIG IN Setting	Status Displayed on Controller
VALVE DRIVER(1,2 or 3) INP1 (DISABLED, RM TMP, OR CL TMP)	Room or Coil Temp as measured by the Valve Driver
VALVE DRIVER(1,2 or 3) INP2 (DISABLED, RM TMP, OR CL TMP)	Room or Coil Temp as measured by the Valve Driver
VALVE DRIVER(1,2 or 3) INP3 (DISABLED, RM TMP, CL TMP, OR SC PRS)	Suction Pressure, Room Temp, or Coil Temp as measured by the Valve Driver
VALVE DRIVER(1,2 or 3) VALVE % OPEN	Percent EEPR is open

KE2 Evap-RE2 Contactor Panel
Rack Efficiency Controller with Advanced Performance Features

Valve Driver 1

Mode of Control: **Pressure/EEPR** Type of Control: **Rack**

Setpoints Menu

1 **SELECT BOARD SETPOINTS** Use ◄ or ► to move to Select Board for Setpoints. Then use ▼ or ▲ to scroll through the list of boards. Press `ENTER` when desired Auxiliary Board is displayed. A login prompt will appear. Press `ENTER` to display ⊓⊓⊓⊓ . Enter the password (2222) using ▼ or ▲ to change the value of the digit and use ◄ or ► to move to the next digit. Once 2222 is displayed, press and hold `ENTER` for 3 seconds.

MAIN SETPOINTS, **VALVE DRIVER 1 SETPOINTS** - or - **VALVE DRIVER 2 SETPOINTS** - or - **VALVE DRIVER 3 SETPOINTS,** CURRENT SENSOR SETPOINTS

2 **SELECT CONTROL MODE** Control Mode is the first Setpoint. Press `ENTER` then use ▼ or ▲ to scroll through Control Mode options. Press and hold `ENTER` for 3 seconds to save desired Control Mode. Other setpoints will vary based on Control Mode selected. (NOTE: in Single Comp Mode the only option is Superheat EEV and Select Control Mode will not display. Input 1 Function is fixed in Superheat EEV Mode and will not display)

SUPERHEAT/EEV, TEMPERATURE/EEPR, **PRESSURE/EEPR**

3 **SET BOARD SETPOINTS** Use ▼ or ▲ to scroll through the Setpoint options. When desired Setpoint is displayed, press `ENTER` . Then use the ▼ or ▲ to move through the options for the Setpoint, or if entering a number, use ▼ or ▲ to change the value of the digit, use ◄ or ► to move to the next digit. Press and hold `ENTER` for 3 seconds to save the change, or press `BACK` if current Setpoint is correct.

Parameter Name	Description	Min	Max	Defaults
INPUT 1 FUNCTION	DISABLED; ROOM TEMP; COIL TEMP	NA	NA	DISABLED
INPUT 2 FUNCTION	DISABLED; ROOM TEMP; COIL TEMP	NA	NA	DISABLED
INPUT 3 FUNCTION	DISABLED; SUCTION PRESSURE; ROOM TEMP; COIL TEMP	NA	NA	DISABLED
INPUT 1 OFFSET	An offset in F° added or subtracted from Input 1, if needed.	-5.0	5.0	0.0
INPUT 2 OFFSET	An offset in F° added or subtracted from Input 2, if needed.	-5.0	5.0	0.0
INPUT 3 OFFSET	An offset in F° or psi added or subtracted from Input 3, if needed.	-5.0	5.0	0.0
VALVE TYPE	CDS 2-7; CDS 9-17; KVS 15; KVS 42; CUSTOM EEPR	NA	NA	CDS 2-7
When CUSTOM EEPR Selected				
MOTOR TYPE	The motor type used in the valve - UNIPOLAR; BIPOLAR	NA	NA	UNIPOLAR
MAX VALVE STEPS	The total number of steps required to move the valve from closed to fully open	200	6400	500
MOTOR STEP RATE	Motor step speed setting, in number of steps per second, for custom valve	30	400	30
PROPORTIONAL		0	255	3
INTEGRAL	Do not adjust unless directed to by KE2 Therm tech support.	0	255	5
DERIVATIVE		0	255	3
MAIN EVAP SENSORS	USE MAIN CONTROL SENSORS; USE ONLY AUX SENSORS	NA	NA	USE MAIN CONTROL SENSORS
MIN VALVE POSITION	Min Valve Position is the smallest percentage the EEPR is allowed to be open. 0% the valve is fully closed, 100% the valve is fully open.	0.0 %	99.9 %	0.0 %
MAX VALVE POSITION	Max Valve Position is the maximum percentage the EEPR is allowed to open. 0% the valve is fully closed, 100% the valve is fully open.	0.1 %	100.0 %	100.0 %
EEPR PRES TARGET	Suction pressure that EEPR will try to maintain.	0.0 psig	300.0 psig	21.0 psig

Variables *(Non-adjustable, View only)*

1 **MOVE TO VARIABLES MENUS** Use ◄ or ► to move to Board Variables. Press `ENTER` when Board Variables is displayed.

MAIN SETPOINTS, **VARIABLES,** MANUAL MENU, LOGIN, ALARMS

2 **SELECT BOARD TO VIEW** Use ▼ or ▲ to scroll through the list of boards. Press `ENTER` when desired Auxiliary Board is displayed.

MAIN BOARD, **VALVE DRIVER 1** - OR - **VALVE DRIVER 2** - OR - **VALVE DRIVER 3**, CURRENT SENSOR

3 **VIEW BOARD VARIABLES** Use ▼ or ▲ to scroll through the Variables.

DIG IN Setting	Status Displayed on Controller
VALVE DRIVER(1,2,or 3) INP1 (DISABLED, RM TMP, OR CL TMP)	Room or Coil Temp as measured by the Valve Driver
VALVE DRIVER(1,2,or 3) INP2 (DISABLED, RM TMP, OR CL TMP)	Room or Coil Temp as measured by the Valve Driver
VALVE DRIVER(1,2,or 3) INP3 (DISABLED, RM TMP, CL TMP, OR SC PRS)	Suction Pressure, Room Temp, or Coil Temp as measured by the Valve Driver
VALVE DRIVER(1,2,or 3) VALVE % OPEN	Percent EEPR is open

KE2 Evap-RE2 Contactor Panel
Rack Efficiency Controller with Advanced Performance Features

Valve Driver 1, 2, or 3

Mode of Control: Superheat/EEV   Type of Control: Single Comp - or - Rack

❶ SELECT BOARD SETPOINTS Use ◀ or ▶ to move to Select Board for Setpoints. Then use ▼ or ▲ to scroll through the list of boards. Press ENTER when desired Auxiliary Board is displayed. A login prompt will appear. Press ENTER to display ⊡⊡⊡⊡ . Enter the password (2222) using ▼ or ▲ to change the value of the digit and use ◀ or ▶ to move to the next digit. Once 2222 is displayed, press and hold ENTER for 3 seconds.

MAIN SETPOINTS, **VALVE DRIVER 1 SETPOINTS** - or - **VALVE DRIVER 2 SETPOINTS** - or - **VALVE DRIVER 3 SETPOINTS,** CURRENT SENSOR SETPOINTS

❷ SELECT CONTROL MODE Control Mode is the first Setpoint. Press ENTER then use ▼ or ▲ to scroll through Control Mode options. Press press and hold ENTER for 3 seconds to save desired Control Mode . Other setpoints will vary based on Control Mode selected. (NOTE: in Single Comp Mode the only option is Superheat EEV and Select Control Mode will not display. Input 1 Function is fixed in Superheat EEV Mode and will not display)

SUPERHEAT/EEV, TEMPERATURE/EEPR, PRESSURE/EEPR

❸ SET BOARD SETPOINTS Use ▼ or ▲ to scroll through the Setpoint options. When desired Setpoint is displayed, press ENTER . Then use ▼ or ▲ to move through the options for the Setpoint, or if entering a number, use ▼ or ▲ to change the value of the digit, use ◀ or ▶ to move to the next digit. Press and hold ENTER for 3 seconds to save the change, or press BACK if current Setpoint is correct.

Parameter Name	Description	Min	Max	Defaults
INPUT 1 FUNCTION	SUCTION TEMP; Note: In Superheat/EEV mode Input 1 is fixed and will not display.	NA	NA	SUCTION TEMP
INPUT 2 FUNCTION	DISABLED; ROOM TEMP, COIL TEMP	NA	NA	COIL TEMP
INPUT 3 FUNCTION	DISABLED; SUCTION PRESSURE; ROOM TEMP; COIL TEMP	NA	NA	DISABLED
INPUT 1 OFFSET	An offset in F° added or subtracted from Input 1, if needed.	-5.0	5.0	0.0
INPUT 2 OFFSET	An offset in F° added or subtracted from Input 2, if needed.	-5.0	5.0	0.0
INPUT 3 OFFSET	An offset in F° or psi added or subtracted from Input 3, if needed.	-5.0	5.0	0.0
VALVE TYPE	KE2 RSV, SER/SEI 1-20, SER AA-L, CAREL, PULSE, CUSTOM EEV, MECHANICAL	NA	NA	MECHANICAL
When CUSTOM EEV Selected				
MOTOR TYPE	The motor type used in the valve - UNIPOLAR; BIPOLAR	NA	NA	UNIPOLAR
MAX VALVE STEPS	The total number of steps required to move the valve from closed to fully open	200	6400	500
MOTOR / VALVE STEP RATE	Motor step speed setting, in number of steps per second, for custom valve	30	400	30
PROPORTIONAL		0	255	3
INTEGRAL	Do not adjust unless directed to by KE2 Therm tech support.	0	255	5
DERIVATIVE		0	255	3
REFRIGERANT	404A, R507, 407A, 407C, 422A, 422D, 134A, R22, R717, 438A, 408A, 409A, 407F, 410A, R744, 448A, 449A, 450A, 513A, 427A, 422C	NA	NA	404A
MAX OPERATING PRES	Maximum operating pressure (psi) - EEV will ignore superheat and close to attempt to prevent suction pressure from rising above this value (not applicable if **VALVE TYPE** = MECHANICAL).	10.0	150.0 psi* *R410A = 300.0 psi *R744 = 750.0 psi	150.0 psi* *R410A = 300.0 psi *R744 = 750.0 psi
MAIN EVAP SENSORS	USE MAIN CONTROL SENSORS; USE ONLY AUX SENSORS			USE MAIN CONTROL SENSORS

Variables (Non-adjustable, View only)

❶ MOVE TO VARIABLES MENUS Use ◀ or ▶ to move to Board Variables. Press ENTER when Board Variables is displayed.

MAIN SETPOINTS, **VARIABLES,** MANUAL MENU, LOGIN, ALARMS

❷ SELECT BOARD TO VIEW Use ▼ or ▲ to scroll through the list of boards. Press ENTER when desired Auxiliary Board is displayed.

MAIN BOARD, **VALVE DRIVER 1** - OR - **VALVE DRIVER 2** - OR - **VALVE DRIVER 3**, CURRENT SENSOR

❸ VIEW BOARD VARIABLES Use ▼ or ▲ to scroll through the Variables.

DIG IN Setting	Status Displayed on Controller
VALVE DRIVER(1,2,or 3) INP1 SC TMP	Suction Temp as measured by the Valve Driver
VALVE DRIVER(1,2,or 3) INP2 (DISABLED, RM TMP, OR CL TMP)	Room or Coil Temp as measured by the Valve Driver
VALVE DRIVER(1,2,or 3) INP3 (DISABLED, RM TMP, CL TMP, OR SC PRS)	Suction Pressure, Room Temp, or Coil Temp as measured by the Valve Driver
VALVE DRIVER(1,2,or 3) SATURATION TEMP	Saturation Temp as calculated by the Valve Driver
VALVE DRIVER(1,2,or 3) SUPERHEAT	Superheat as calculated by the Valve Driver
VALVE DRIVER(1,2,or 3) VALVE % OPEN	Percent EEV is open

KE2 Evap-RE2 Contactor Panel
Rack Efficiency Controller with Advanced Performance Features

Current Sensor Board

Setpoints Menu

1 **SELECT BOARD SETPOINTS** Use ◄ or ► to move to Select Board for Setpoints. Then use ▼ or ▲ to scroll through the list of boards. Press ENTER when desired Auxiliary Board is displayed. A login prompt will appear. Press ENTER to display ⊟⊟⊟⊟ . Enter the password (2222) using ▼ or ▲ to change the value of the digit and use ◄ or ► to move to the next digit. Once 2222 is displayed, press and hold ENTER for 3 seconds.

MAIN SETPOINTS, VALVE DRIVER 1 SETPOINTS, VALVE DRIVER 2 SETPOINTS, VALVE DRIVER 3 SETPOINTS, **CURRENT SENSOR SETPOINTS**

3 **SET BOARD SETPOINTS** Use ▼ or ▲ to scroll through the Setpoint options. When desired Setpoint is displayed, press ENTER . When entering a number, use ▼ or ▲ to change the value of the digit, use ◄ or ► to move to the next digit. Press and hold ENTER for 3 seconds to save the change, or press BACK if the current Setpoint is correct.

Parameter Name	Description	Min	Max	Defaults
INPUT 1 OFFSET	An offset in amps, added or subtracted from Input 1	-5.00 amps	5.00 amps	0.00
INPUT 2 OFFSET	An offset in amps, added or subtracted from Input 2	-5.00 amps	5.00 amps	0.00
INPUT 3 OFFSET	An offset in amps, added or subtracted from Input 3	-5.00 amps	5.00 amps	0.00

Variables *(Non-adjustable, View only)*

1 **MOVE TO VARIABLES MENUS** Use ◄ or ► to move to the Board Variables Menus. Press ENTER when Board Variables is displayed.

MAIN SETPOINTS, **VARIABLES,** MANUAL MENU, LOGIN, ALARMS

2 **SELECT BOARD TO VIEW** Use ▼ or ▲ to scroll through the list of boards. Press ENTER when desired Auxiliary Board is displayed.

MAIN BOARD, VALVE DRIVER 1, VALVE DRIVER 2, VALVE DRIVER 3, **CURRENT SENSOR**

3 **VIEW BOARD VARIABLES** Use ▼ or ▲ to scroll through the Variables.

DIG IN Setting	Status Displayed on Controller
CURRENT INP1 STATUS	Displays the reading for Input 1 in amps.
CURRENT INP2 STATUS	Displays the reading for Input 2 in amps.
CURRENT INP3 STATUS	Displays the reading for Input 3 in amps.

Introduction to KE2 SmartAccess

KE2 SmartAccess provides quick and easy, real time access to your refrigeration systems, 24 / 7 / 365.

Now it's easier than ever to remotely monitor and adjust your KE2 Evap-RE2 – from anyplace with internet access.

The KE2 Evap-RE2 is free to connect locally or using traditional networking techniques, however, KE2 Therm recognizes that many customers prefer the simplicity and convenience of KE2 SmartAccess.

KE2 SmartAccess lets you quickly and easily take advantage of the benefits of the controller's communication capability. For a nominal monthly fee KE2 SmartAccess provides real-time access to your refrigeration system. No port forwarding. No VPN.

Connect the KE2 Evap-RE2 to the internet, typically provided by a physical connection to the network router with a Cat 5e or Cat 6 Ethernet cable. Once enabled, KE2 SmartAccess quickly connects to your personal web portal, hosted by KE2 Therm, and provides a "customized" dashboard of all the controllers you setup with KE2 SmartAccess.

Benefits of KE2 SmartAccess

- Quickly setup remote monitoring & system control

- Customized dashboard provides remote access to all your controllers on one page

- It's easier than ever to set up alarm notifications via text or e-mail

- Doesn't require special network configuration, like port forwarding or VPN

- Increased diagnostic ability - Use graphing / data logging feature to identify system performance issues

- Remotely troubleshoot difficult problems

- Improve service call efficiency - review system issues, and prepare, before arriving on site
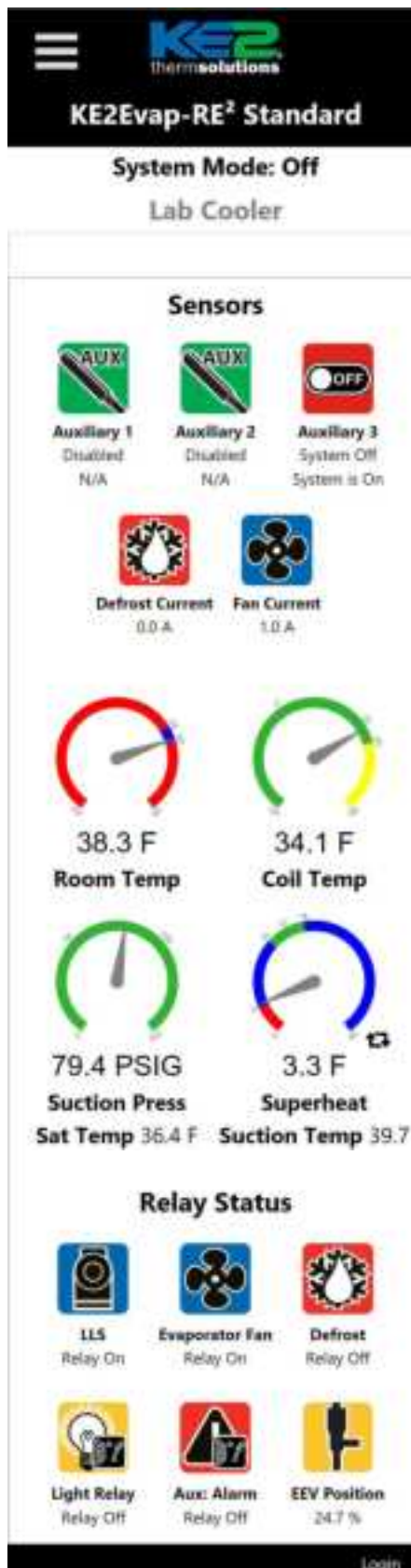
KE2 Evap-RE2 Contactor Panel
Rack Efficiency Controller with Advanced Performance Features

**Visit our YouTube channel for videos
on KE2 SmartAccess and other related topics.**

KE2 SMARTACCESS

Video 062 Communication Made Easy with KE2 SmartAccess

COIL SENSOR

Video 068 How to Determine Proper Coil Sensor Location

Video 069 How to Properly Install a Coil Sensor

DOOR SWITCH

Video 038 How to Install and Wire a KE2 Door Switch

Video 037 Why Should I Install a Door Switch

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