

Introduction:

The KE2 Evaporator Efficiency (KE2 Evap) has advanced communications and alarming features never before seen in the refrigeration industry. These alarms provide early indications of a poorly performing refrigeration system.

Text messages and/or email alerts provide notification of system issues immediately, whether on-site or remote, as long as there is an internet connection.

Advanced alarming, diagnostics, and troubleshooting are key features of the KE2 Evap, and help prevent catastrophic failures. This protects contractor, owner, product, and refrigeration equipment.

When using KE2 SmartAccess, the controllers can be viewed, setpoints changed, and defrosts initiated remotely; saving time and frustration. And, your home office or KE2 Therm technical support can login with you to diagnose the system in real time.

Alarm Notifications:

On the face of the controller, an alarm will be shown in descriptive scrolling text, while the yellow or red LED is illuminated.

The yellow LED indicates a non-critical alarm, and the controller will continue to function to the best extent possible given the system conditions, however, **the issue should be addressed as soon as possible**. The red LED indicates a critical alarm, and will close the electric expansion valve (EEV) to prevent compressor damage. **Critical alarms must be addressed immediately**.

If the auxiliary relay is configured as an alarm relay, it will energize when in alarm. This can be used in conjunction with an external light, buzzer, or other 3rd party devices to alert personnel.

On the controller's webpage:

Alarms can also be viewed as a yellow or red bell in the top-right of the KE2 Evap's webpages when connected to the controller via a smart device (smartphone, tablet, PC etc.), or remotely via KE2 SmartAccess. Clicking on the bell will show any alarms present. When not in alarm, no bell will be displayed.



If the controller is connected to the internet, the KE2 Evap can also send text messages and/or emails to immediately notify all necessary personnel of the alarm condition.

Alarm thresholds such as high temp and door alarm can be adjusted, and should be set so as not to trigger during normal loading and use.

All alarms will automatically clear once the alarm condition no longer exists. Alarms can be cleared manually via the display in the MANUAL MENU, or from the webpage. Power cycling the controller to clear alarms is not recommended. If the alarm is a sensor alarm and the sensor is still disconnected or shorted, the alarm will immediately reappear until resolved.

Clearing alarms before calling technical support will make diagnosis more difficult or impossible; please call technical support before clearing alarms if assistance is required.

Note: Many alarms are the result of incorrect wiring of the controller, sensors, or valve. Part of the corrective action for all alarms should be a wiring and installation check.

Alarm Severity:



Yellow LED: Non-critical Alarm – controller will continue to operate, however, system issues may be present.

Red LED: Critical Alarm – controller closes EEV to prevent damage to the compressor.



The following videos may also be relevant when troubleshooting your controller or for basic setup of the KE2 Evap.

Troubleshooting:

Video 034 - Iced Evaporator Coil on a Walk-in Freezer

Video 044 - Iced Evaporator Coil on a Walk-in Cooler

Video 045 - Arriving at the Jobsite and the KE2 Evap Display is Blank

Basic setup:

Video 012 - How to Navigate the KE2 Evap Controller

Video 030 - Setup the KE2 Evap Controller for Walk-in Freezers

Video 031 - Setup the KE2 Evap Controller for Walk-in Coolers

Video 032 - Initial Defrost Sequence KE2 Evap & KE2 Adaptive Control

Video 033 - How to Confirm the KE2 Evap is Wired Correctly

Video 046 - How to Wire the KE2 Evap Controller

Video 035 - Why Use the KE2 Wire Harness





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Alarms & Notifications List

Alarm Type	Scrolling Text	Webpage Alarm	Description
No display			No LEDs are illuminated on the display.
00.0		Intro Mode	Controller is in Intro mode waiting to be setup.
Communication	HELP	Panic Button Alarm	KE2 Combo Display panic button is active.
	COMMUNICATION ERROR	Network Comms Alarm	ONLY FOR BONDED CONTROLLERS: No communication between bonded controllers for one minute or more.
	TIME SERVER COMM	Time Server Comm Alarm	Controller cannot communicate with external time of day server (SNTP server).
Defrost	EXCESS DEFROST	Excess Defrost Alarm	Defrosts have been initiated at the minimum interval for 24 hours.
	DEFR TERM ON TIME	Defr Term on Time Alarm	Defrost terminated on time instead of temperature for two consecutive cycles.
Digital Inputs	EXT ALARM 1	External Alarm 1	If DIG IN 1 MODE = EXT ALARM: The digital input is in an active state.
	EXT ALARM 2	External Alarm 2	If DIG IN 2 MODE = EXT ALARM: The digital input is in an active state.
	EXT ALARM 3	External Alarm 3	If DIG IN 3 MODE = EXT ALARM: The digital input is in an active state.
Door Switch	DOOR SWITCH	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.
Email	EMAIL FAILURE	Email Failure Alarm	Email alert was not confirmed by email server provided after seven consecutive attempts.
Sensor Alarms	PRESSURE SENSOR	Pressure Sensor Alarm	Suction pressure sensor is shorted, open or pressure out of range.
	T1 SENSOR	T1 Sensor Alarm	T1 Suction Temp Sensor is shorted or open.
	T2 AIR SENSOR	T2 Air Sensor Alarm	T2 Return Air Temp Sensor is shorted or open.
	T3 COIL SENSOR	T3 Coil Sensor Alarm	T3 Coil Temp Sensor is shorted or open.
	T4 AUX SENSOR	T4 Aux Sensor Alarm	T4 Aux Temp Sensor is shorted or open.
Superheat	HIGH SUPERHEAT	High Superheat Alarm	System has been running with a higher than expected superheat.
	LOW SUPERHEAT	Low Superheat Alarm	System has been running with a lower than expected superheat.
Temperature	HIGH AIR TEMP	High Air Temp Alarm	Room temperature is above ROOM TEMP + AIR TEMP DIFF + HIGH TEMP ALARM OFFSET for longer than HIGH TEMP ALARM DELAY .
	LOW AIR TEMP	Low Air Temp Alarm	Room temperature is below ROOM TEMP - LOW TEMP ALARM OFFSET for longer than LOW TEMP ALARM DELAY .



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Troubleshooting Table

Alarm Name on Controller Display & Webpage	Alarm Description	Parameter in VARIABLES menu to check for more information	Corrective Action
No display	No lights on display are illuminating.	N/A	While not an alarm condition, the controller is not operational if no display is shown. Confirm incoming power is properly connected to the controller, voltage jumpers are correct for the incoming voltage, and there is no resistance across the controller fuse. Power injected into the controller's RJ45 Ethernet port can result in the display going blank. Power over Ethernet (PoE) switches used with the KE2 Therm's Ethernet equipped controllers should disable the power output feature.
00.0 / Intro	00.0 displayed and all LEDs illuminated.	N/A	Controller is not operational until the Intro Mode questions are answered. See Bulletin Q.1.64 or N.1.1.
NO ALARM / All Clear	Alarm was active, however, cleared automatically as the alarm conditions were no longer present.	Yellow and red LEDs are not illuminated.	An alarm condition has been corrected. "NO ALARM" will be shown on the display for approximately 10 minutes, or until the BACK button is pressed.
HELP / Panic Button Alarm	Panic Button Alarm.	N/A	KE2 Combo Display panic button has been pressed and held. Someone may need assistance in the refrigerated space, and refrigeration will stop until cleared. Press and hold panic button again to clear.
PRESSURE SENSOR / Pressure Sensor Alarm Only active when an Electric Expansion Valve (EEV) is selected.	Suction pressure sensor is shorted, open, out of range, or miswired. Only active when an Electric Expansion Valve (EEV) is selected.	Red LED is illuminated EEV will close as superheat cannot be correctly calculated, but will continue to call for refrigeration so that any bonded controllers can continue to refrigerate. SUCTION PRESSURE <ul style="list-style-type: none"> Suction pressure will read -14.6 if the green input (signal) is open or the black wire is wired to the green input. Suction pressure will read 150* or over if the green input (signal) is shorted, or if actual pressure is higher than the transducer is rated for. *150, 300, or 750 psig depending on refrigerant selected.	<ul style="list-style-type: none"> The majority of sensor alarms and inaccurate readings are caused by cut, burned, chaffed, or otherwise damaged sensor cables. Inspect the length of the cable for any burned, chaffed, or otherwise damaged sections. Repair or replace any damaged sections; take care not to swap colors when repairing. Check that the pressure transducer cable wires are inserted into the proper terminals on the KE2 Evap, and that the screw down terminals are screwed down. The bare stranded wire of the transducer cable should be inserted so that the wire is directly touching the gate of the connector. If the gate is contacting the insulation of the wire, it will not allow the controller to read the sensor. If wires have been extended, check that colors were not swapped when extended. Check for any bad splices, crimps, or solder joints where extended. Check that the pressure transducer cable is fully inserted into the pressure transducer. Confirm that the proper transducer is being used for the system. 0-150 psia for most common refrigerants, 0-300 psig for R-410A, and 0-750 psig for R-744. Confirm that the proper refrigerant is selected in the setpoints menu. To verify that the accuracy of the transducer, remove the transducer from the system. The controller should read suction pressure as approximately 0 psig when measuring atmosphere. <p>Note: If suction pressure reads -15 when transducer is measuring atmosphere, the wrong pressure transducer was used or refrigerant selected.</p> <ul style="list-style-type: none"> Verify the voltage between the black and red pressure transducer inputs on the controller is +5 VDC. Measure the voltage between the black and green inputs on the controller. Enter that number into the following formula: $\frac{(\text{voltage read} - 0.5V) \times 150^* \text{psia}}{4v} = \text{actual pressure read (verify with gauges)}$ <p>* 300 psig or 750 psig depending on pressure transducer range.</p>



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T1 SENSOR / T1 Sensor Alarm	<p>Controller is reading a short or open circuit on the temperature sensor input.</p>	<p>Yellow LED is illuminated Controller will continue to call for refrigeration.</p> <p>ROOM TEMP COIL TEMP T1 SUCTION TEMP T4 AUX TEMP</p> <ul style="list-style-type: none"> If the sensor reads -87 from the VARIABLES menu, the cable/sensor is open or not connected. If the sensor reads 180+ from the VARIABLES menu, the cable/sensor is shorted. 	<ul style="list-style-type: none"> The majority of sensor alarms and inaccurate readings are caused by cut, burned, chaffed, or otherwise damaged sensor cable. Inspect the length of the cable for any cut, burned, chaffed or otherwise damaged sections. Repair or replace any damaged cables/sensors. Check that the sensor is inserted into the proper position on the board. The sensor is not polarized; black and white wires can be inserted in either position on the connector: <ul style="list-style-type: none"> Suction Temp: T1 Suct Air Temp: T2 Air Coil Temp: T3 Coil T4 Aux Sensor: T4 Aux The bare stranded wire of the temperature sensor should be inserted so the wire is directly touching the gate of the connector. If the gate is contacting the insulation of the wire, it will not allow the controller to read the sensor. If wires have been extended, check for any bad splices, crimps, or solder joints where extended. Check the sensor probe. If the sensor cable has been pulled, the sensor probe may have been damaged, and needs to be replaced. To verify accuracy of the sensor, the preferred method is to place the sensor in a proper ice bath while connected to the controller. View the sensor reading in the variables menu. The temperature should read around 32.0°F. If adjustment is necessary, an offset of up to 5.0°F can be applied in the SETPOINTS MENU or controller webpage. Sensor accuracy can also be verified using a third party thermometer, however, it must be calibrated and rated to measure low temperatures. Unplug the connector and check that the resistance reading of the sensor matches the temperature vs. resistance table. <table border="1"> <thead> <tr> <th>Temperature °F</th> <th>Ohms</th> </tr> </thead> <tbody> <tr><td>-22</td><td>19480</td></tr> <tr><td>-4</td><td>12110</td></tr> <tr><td>14</td><td>7763</td></tr> <tr><td>32</td><td>5114</td></tr> <tr><td>50</td><td>3454</td></tr> <tr><td>68</td><td>2387</td></tr> <tr><td>77</td><td>2000</td></tr> <tr><td>86</td><td>1684</td></tr> <tr><td>104</td><td>1231</td></tr> <tr><td>122</td><td>885</td></tr> </tbody> </table>	Temperature °F	Ohms	-22	19480	-4	12110	14	7763	32	5114	50	3454	68	2387	77	2000	86	1684	104	1231	122	885
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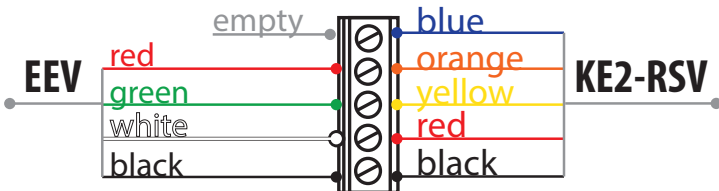
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Alarm Name on Controller Display & Webpage	Alarm Description	Parameter in VARIABLES menu to check for more information	Corrective Action																																										
HIGH SUPERHEAT / High Superheat Alarm	<p>High superheat with TEV (mechanical): Superheat has been above MAX SUPERHEAT setpoint for longer than 90 minutes of cumulative runtime.</p> <p>High superheat with EEV: Superheat has been 2 Fahrenheit degrees above setpoint, and EEV has been at least 90% open for 90 minutes of cumulative runtime.</p>	<p>Yellow LED is illuminated. Controller will continue to call for refrigeration.</p> <p>SUCTION PRESSURE T1 SUCTION TEMP VALVE % OPEN</p>	<p>There are a large number of system related causes for high or low superheat. After checking for proper refrigeration operation, the following can be checked from the controller.</p> <ul style="list-style-type: none"> • Check the system suction pressure using either the VARIABLES MENU (SUCTION PRESSURE) or the controller's webpage, validate the suction pressure is within the range of the system design. If a new install, confirm valve is properly sized for the system. • Check refrigerant type using either the SETPOINTS MENU (REFRIGERANT) or the controller's webpage, confirm the set refrigerant matches the actual system refrigerant. • Check valve type using either the SETPOINTS MENU (VALVE TYPE) or the controller's webpage, confirm the set EEV matches the actual expansion valve. Check table below for a list of EEV selections: <p>Valve Types</p> <table border="1"> <thead> <tr> <th>Scrolling Text</th> <th>Webpage</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>MECHANICAL</td> <td>Mechanical</td> <td>Thermostatic Expansion Valve (TEV)</td> </tr> <tr> <td>KE2 RSV</td> <td>KE2 RSV</td> <td>KE2 Therm Refrigeration Stepper Valve</td> </tr> <tr> <td>SER/SEI 1 TO 20</td> <td>SER/SEI 1-20</td> <td>Sporlan 12VDC bipolar valve with 1600 steps</td> </tr> <tr> <td>SER AA TO L</td> <td>SER AA to L</td> <td>Sporlan 12VDC bipolar valve with 2500 steps</td> </tr> <tr> <td>SEI 30</td> <td>SEI 30</td> <td>Sporlan 12VDC bipolar valve with 3200 steps</td> </tr> <tr> <td>SEI 50</td> <td>SEI 50</td> <td>Sporlan 12VDC bipolar valve with 6400 steps</td> </tr> <tr> <td>SEH</td> <td>SEH</td> <td>Sporlan 12VDC bipolar valve with 6400 steps</td> </tr> <tr> <td>ETS12 TO 50</td> <td>ETS12 TO 50</td> <td>Danfoss 12VDC bipolar valve with 2625 steps</td> </tr> <tr> <td>ETS100</td> <td>ETS100</td> <td>Danfoss 12VDC bipolar valve with 3530 steps</td> </tr> <tr> <td>ETS250/400</td> <td>ETS250 TO 400</td> <td>Danfoss 12VDC bipolar valve with 3810 steps.</td> </tr> <tr> <td>CAREL</td> <td>Carel</td> <td>Carel 12VDC bipolar valve with 480 steps</td> </tr> <tr> <td>PULSE VALVE</td> <td>Pulse Valve</td> <td>Pulse Width Modulation (PWM) Valve.</td> </tr> <tr> <td>CUSTOM</td> <td>Custom</td> <td></td> </tr> </tbody> </table> <ul style="list-style-type: none"> • Re-initialize valve by power cycling controller or using the Reboot button on the webpages (under Setpoints → General Information). • Manually Open and Close the Valve. Verify the valve is operating properly by manually operating the valve from the controller display. Press to navigate to MANUAL MENU and press . If LOGIN appears press again, then use to input the display password (2222), then press and hold . Press to navigate to MANUAL VALVE and press . <p>The display will show the current valve position with the rightmost number blinking; you are now in manual control of the valve. Press to open the valve and press to close the valve. Press to change the digit being modified in order to open/close the valve by 1% or 10% per button press. The controller will show the expected valve position in real time.</p> <p>As the valve is closed suction pressure should decrease, and as the valve is opened suction pressure should increase. Closing the valve to 0% should cause the system to pumpdown (if multiple evaporators are piped to the same condensing unit, close all valves). If there is no change in suction pressure, proceed to further steps. If suction pressure responds appropriately, the valve is likely operating correctly and there is a system issue causing the high or low superheat outside of the controller and valve.</p> <p style="text-align: right;"><i>Cont'd on Next page...</i></p>	Scrolling Text	Webpage	Description	MECHANICAL	Mechanical	Thermostatic Expansion Valve (TEV)	KE2 RSV	KE2 RSV	KE2 Therm Refrigeration Stepper Valve	SER/SEI 1 TO 20	SER/SEI 1-20	Sporlan 12VDC bipolar valve with 1600 steps	SER AA TO L	SER AA to L	Sporlan 12VDC bipolar valve with 2500 steps	SEI 30	SEI 30	Sporlan 12VDC bipolar valve with 3200 steps	SEI 50	SEI 50	Sporlan 12VDC bipolar valve with 6400 steps	SEH	SEH	Sporlan 12VDC bipolar valve with 6400 steps	ETS12 TO 50	ETS12 TO 50	Danfoss 12VDC bipolar valve with 2625 steps	ETS100	ETS100	Danfoss 12VDC bipolar valve with 3530 steps	ETS250/400	ETS250 TO 400	Danfoss 12VDC bipolar valve with 3810 steps.	CAREL	Carel	Carel 12VDC bipolar valve with 480 steps	PULSE VALVE	Pulse Valve	Pulse Width Modulation (PWM) Valve.	CUSTOM	Custom	
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Alarm Name on Controller Display & Webpage	Alarm Description	Parameter in VARIABLES menu to check for more information	Corrective Action															
<p>HIGH SUPERHEAT / High Superheat Alarm</p>	<p>High superheat with TEV (mechanical): Superheat has been above MAX SUPERHEAT setpoint for longer than 90 minutes of cumulative runtime.</p> <p>High superheat with EEV: Superheat has been 2 Fahrenheit degrees above setpoint, and EEV has been at least 90% open for 90 minutes of cumulative runtime.</p>	<p>Yellow LED is illuminated. Controller will continue to call for refrigeration.</p> <p>SUCTION PRESSURE T1 SUCTION TEMP VALVE % OPEN</p>	<ul style="list-style-type: none"> Check the wiring to the EEV terminal on the KE2 Evap controller. Refer below for proper wiring of the KE2-RSV and other common EEVs.  <ul style="list-style-type: none"> The bare stranded wire of the EEV cable should be inserted so that the wire is directly touching the gate of the connector. If the gate is contacting the insulation of the wire, it will not allow the controller to correctly operate the valve. If wires have been extended, check that colors have not been swapped. Measure resistance across the EEV leads. This will measure the resistance of the entire length of the lead wire, through the windings of the EEV and back through the other lead. Remove the EEV leads from the terminals, and for KE2 RSV measure: <table border="1" data-bbox="828 892 1477 1092"> <thead> <tr> <th>Wire Color</th> <th>RSV-100 to 320</th> <th>RSV-400 to 550</th> </tr> </thead> <tbody> <tr> <td>Blue - Orange</td> <td>36 or 46 ohms</td> <td>32 ohms</td> </tr> <tr> <td>Blue - Yellow</td> <td>36 or 46 ohms</td> <td>32 ohms</td> </tr> <tr> <td>Blue - Red</td> <td>36 or 46 ohms</td> <td>32 ohms</td> </tr> <tr> <td>Blue - Black</td> <td>36 or 46 ohms</td> <td>32 ohms</td> </tr> </tbody> </table> <p>All values should be within 10% of stated values, otherwise indicating a wiring issue. If absolutely sure of no wiring issue, the external coil may need to be replaced. For valves with internal windings, the valve may need to be replaced.</p>	Wire Color	RSV-100 to 320	RSV-400 to 550	Blue - Orange	36 or 46 ohms	32 ohms	Blue - Yellow	36 or 46 ohms	32 ohms	Blue - Red	36 or 46 ohms	32 ohms	Blue - Black	36 or 46 ohms	32 ohms
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<p>LOW SUPERHEAT / Low Superheat Alarm</p>	<p>Superheat has been below 3 Fahrenheit degrees for 5 minutes and valve is < 10% open.</p>	<p>Yellow LED is illuminated Controller will continue to call for refrigeration.</p> <p>SUCTION PRESSURE T1 SUCTION TEMP VALVE % OPEN</p>	<p>Follow corrective actions for High Superheat Alarm on the previous pages. The additional corrective actions below only apply to Low Superheat Alarm.</p> <p>The Low Superheat Alarm is most commonly caused by the compressor failing to start compressor not running. There is a common misconception in the industry that the low pressure switch cut-in and cut-out pressure control on the condensing unit is set correctly for the application from the factory.</p> <p>The equipment manufacturer's installation instructions recommend that the installing contractor adjust the low pressure cut-in and cut-out to recommended settings for the application. The low pressure cut-in and cut-out set point should be set to either the coldest ambient the system will experience or space temperature, whichever is lower.</p> <p>When the controller calls for refrigeration, if suction pressure is not able to rise to the cut-in pressure before the EEV closes due to low superheat, the system will not start, and a Low Superheat Alarm triggered.</p> <p>Our technical support team typically sees an increase of these alarms in the fall when the ambient temperatures begins to decrease. If the low superheat alarm is intermittent, this is the most likely source of the alarm.</p> <p>Check the following:</p> <ul style="list-style-type: none"> • Low Pressure Control Pressure Switch. Reduce the cut-out pressure to meet the equipment manufacturer's specification for the coldest ambient or box temperature, whichever is lower. • Measure continuity across the low pressure control, if it indicates a closed circuit, next check the compressor start components and continue diagnosis at the condensing unit. • Verify all fans are moving. Check if there is a mechanical service switch for the fans in the space being used inappropriately. If only one fan is not moving, verify whether the fan is operational. Replace the motor if necessary. • Check fan motor rotational direction and fan blade pitch to ensure air is flowing in the proper direction. • Check for diminished load due to low air movement across the coil. This can be caused by excessive frost build-up on the coil on the air entering and/or air exiting sides of the coil. The fans should be turned off while checking for frost buildup to allow a clear view of the coil. Product that is stacked too close to the coil and impedes airflow through the coil can also be a source of diminished load. • Check EEV and EEV wiring/cables – Please see previous corrective actions for High Superheat.



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<p>HIGH AIR TEMP / High Air Temp Alarm</p>	<p>High Air Temp is caused by the room temperature being above Room Temp setpoint + Air Temp Diff + High Temp Alarm Offset for longer than High Temp Alarm Delay.</p> <p>Example</p> <table border="1"> <tr> <td>Room Temp setpoint</td> <td>20°F</td> </tr> <tr> <td>Air Temp Diff</td> <td>1°F</td> </tr> <tr> <td>High Temp Alarm Offset</td> <td>10°F</td> </tr> <tr> <td>Alarm threshold temp</td> <td>31°F</td> </tr> </table> <p>These are setpoints that can be adjusted by the user. The High Temp Alarm Offset factory default is 10.0°F for electric defrost and 3.0°F for air defrost.</p>	Room Temp setpoint	20°F	Air Temp Diff	1°F	High Temp Alarm Offset	10°F	Alarm threshold temp	31°F	<p>Yellow LED is illuminated Controller will continue to call for refrigeration.</p> <p>ROOM TEMP COIL TEMP SUPERHEAT (if available) VALVE % OPEN (if available)</p>	<p>Investigate condition. The majority of high temperature alarms are not related to the controller. To resolve the High Air Temp Alarm will require basic refrigeration troubleshooting.</p> <ul style="list-style-type: none"> Ask staff if the door has been propped open for an extended period of time due to loading, unloading, inventory, etc. If this is not the case, begin to troubleshoot the system. Check air sensor. Air sensor should be installed 8-12" away from the coil, level with the bottom third of the coil, in the return air of the evaporator using the installation rod provided in the installation kit. Check the evaporator coil to verify the coil is free from excessive frost. Check the fans to ensure all fans are rotating properly. Check compressor operation. Check for proper refrigerant charge. Make sure the system has sufficient system capacity. If pressure transducer and suction temperature sensor are installed, check superheat and investigate if superheat is abnormally high. Troubleshoot TEV or EEV (if installed, see high superheat corrective action on the previous pages). <p>Note: High Temp Alarm is not triggered during defrost.</p>
Room Temp setpoint	20°F										
Air Temp Diff	1°F										
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Alarm threshold temp	31°F										
<p>LOW AIR TEMP / Low Air Temp Alarm</p>	<p>Room temperature is below Room Temp setpoint - Low Temp Alarm Offset for longer than Low Temp Alarm Delay.</p> <p>The default from the factory is 4 Fahrenheit degrees below the setpoint for 10 minutes.</p> <p>Both of these setpoints can be adjusted by the user.</p>	<p>Yellow LED is illuminated Controller will continue to call for refrigeration.</p> <p>ROOM TEMP COIL TEMP SUPERHEAT (if available) VALVE % OPEN (if available)</p>	<ul style="list-style-type: none"> Verify the system will pumpdown. If the green LED is not illuminated, refrigeration should be stopped, and the Liquid Line Solenoid (LLS) should be closed. If not, troubleshoot the LLS and wiring. The LLS should shut tightly and not allow liquid refrigerant through. If the system only has an EEV, the EEV should also shut tightly when not in refrigeration. Check that the low pressure control is set, and operating properly. Check the Room Temp, Low Temp Alarm Offset, and Low Temp Alarm Delay setpoints. If there are multiple systems in the room, check the Room Temp setpoint of the other systems. Check for outside air infiltration. Example: Infiltration from freezer into cooler. Confirm Air Temp sensor is not too close to, or in discharge air of the evaporator. 								
<p>EXCESS DEFROST / Excess Defrost Alarm</p>	<p>Defrosts have been initiated at the minimum interval for 24 hours (demand defrost only).</p>	<p>Yellow LED is illuminated Controller will continue to call for refrigeration.</p> <p>ROOM TEMP COIL TEMP T4 COIL TEMP</p> <p>View Graphs and datalog to confirm that Coil Temp (and T4 Coil Temp) reaches termination temperature.</p>	<ul style="list-style-type: none"> Verify room setpoint is not lower than 36°F for air defrost. Verify coil sensor location. Most often an excessive number of defrosts is due to coil sensor location. The coil sensor(s) serve as defrost termination sensors, and must be installed where frost is last to disappear from the coil during defrost. If the coil sensor is installed too close to a heater, the defrost will terminate too soon and leave frost. The controller will respond to the remaining ice by initiating another defrost shortly. This cycle will continue until the excess defrost alarm is shown. Conversely, the coil sensor falling out due to being improperly secured, or the sensor installed in an inappropriate location can also lead to an excess defrost alarm. Check solenoid valve to ensure there is no flow of refrigerant through the evaporator during defrost. Verify heaters are working properly. For electric and hot gas defrost, confirm fans are turning off when defrost heat is active. For multi-evap applications, consider bonding or using the controller's Aux Relays & Digital Inputs to prevent controllers from interfering with each others' defrosts. See Q.5.10 Multi Evap Applications and Q.1.32 Commissioning with the KE2 Evap. 								



KE2 Evaporator Efficiency

Alarm Troubleshooting Guide

Alarm Name on Controller Display & Webpage	Alarm Description	Parameter in VARIABLES menu to check for more information	Corrective Action
DEFR TERM ON TIME / Defr Term on Time Alarm	<p>Defrost Termination on Time alarm is triggered when the system has not reached termination temperature during 2 consecutive defrost cycles.</p> <p>Termination time is set by Defrost Parameter when in Demand mode or Max Defrost Time when in Schedule mode.</p>	<p>Yellow LED is illuminated Controller will continue to call for refrigeration.</p> <p>COIL TEMP T4 COIL TEMP</p> <p>View Graphs and datalog to confirm that Coil Temp (and T4 Coil Temp) reaches termination temperature. How long the system was in defrost may be estimated from the graph or the datalog from the File Download</p>	<ul style="list-style-type: none"> • Verify heaters are working properly. • Check coil for ice. • Verify coil sensor location. • Verify door has not been left open for an extended period by viewing graphs page. • Check solenoid valve to ensure there is no flow of refrigerant through the evaporator during defrost. • In multi-evaporator applications with electric defrost, Pulse in Electric Defrost Mode may not allow evaporators to retain enough heat to reach termination temperature. Changing the Electric Defrost Mode setpoint to Permanent may help. • For multi-evaporator applications, cold air from a refrigerating evaporator may prevent a defrosting coil from reaching termination temperature within the time specified. Consider bonding or using the controller's Aux Relays & Digital Inputs to prevent controllers from interfering with each others' defrosts. See Q.5.10 Multi Evap Applications and Q.1.32 Commissioning with the KE2 Evap. • On coolers, there may not be enough heat admitted to the space to meet termination temperature. In that instance, adjust Room Temp and Defrost Term Temp appropriately, or set Defrost Mode to Schedule, and modify Defrost Per Day and Max Defrost Time to desired values. • Verify room setpoint is not lower than 36°F for air defrost.
DOOR SWITCH / Door Open Alarm	<p>The Door Switch alarm is activated when the room temperature is 0.5 Fahrenheit degrees above setpoint + air temp differential, and the door has been open longer than the time set in the Door Alarm Delay parameter.</p>	<p>Yellow LED is illuminated. Controller will continue to call for refrigeration.</p> <p>DIG 1 STATUS DIG 2 STATUS DIG 3 STATUS</p> <p>This will identify the Digital Input (DI) being used for the door switch.</p>	<ul style="list-style-type: none"> • Verify that the door is closed. • Verify which Digital Input is being used for the door switch (DI1, DI2 or DI3). Press or to VARIABLES MENU. Press several times to DIG 1 STATUS. Press to view what the Digital Input is currently set to and its status (DOOR OPEN or DOOR CLOSED). Press then to check DI2 and DI3. Verify the leads of the door switch are connected to the correct Digital Input, and that the bare stranded wire of door switch lead is inserted so that the wire is directly touching the gate of the connector. If the gate is contacting the insulation of the wire, it will not allow the controller to read the door switch. Inspect the length of the cable for any cut, burned, chaffed or otherwise damaged wire. Repair if there is damage and verify operation. • Verify that the door switch is in proper working order. Door switches provided by KE2 Therm are normally closed switches. To test them, move the two pieces of the switch close together, remove the leads from the connector on the board and check that the circuit is continuous using a multimeter. Move the two pieces of the switch apart more than 6 inches. Check continuity again; it should be open. If the door switch is operating in an opposite manner, the switch is an open switch and the controller should be reconfigured appropriately: select the correct input, Dig In 1 State, Dig In 2 State, or Dig In 3 State (Digital Input 1, 2, or 3 state) from the setpoints menu on the or webpage, and set it to Closed to reverse the logic. If the switch is verified to be inoperable, replace the switch. • Confirm proper door switch operation by opening the door. Fans should turn off and refrigeration should stop shortly after. Close door, the controller should resume refrigeration and fans. If there is a blinking green light on the controller, it has not cleared the minimum time for short cycle protection and should resume refrigeration in a few minutes.



KE2 Evaporator Efficiency

Alarm Troubleshooting Guide

Alarm Name on Controller Display & Webpage	Alarm Description	Parameter in VARIABLES menu to check for more information	Corrective Action
COMMUNICATION ERROR / Network Comms Alarm	ONLY FOR BONDED CONTROLLERS: The Communication Error is generated when the KE2 Evap fails to communicate with bonded controllers.	<p>Yellow LED is illuminated Controller will continue to call for refrigeration.</p> <p>IP OCTET 1 IP OCTET 2 IP OCTET 3 IP OCTET 4</p> <p>The system router or network may have changed the IP address of the controller. The actual IP address will be needed for checking the bond or re-bonding.</p>	<ul style="list-style-type: none"> • Communication Error is most commonly caused by local network issues. • Verify all network switches are connected and functioning properly. Check that all controllers in the bonded group are powered up. • Verify communication to each individual controller using whatever method is usually used to communicate to the controllers in question (locally via the IP address, remotely via KE2 SmartAccess etc.). If one or more are unreachable, investigate those controllers and their network cabling further. • Ensure all cables are inserted fully into their respective jacks. Check for any damaged cable. • On new installations, where the cables are built in the field, check network cables for proper wire color code (Ethernet standard A or B, see Q.5.5 Making Ethernet Cable for more information). Also make sure copper for each wire goes fully into the clip. If one or more wires is out of order or doesn't fully insert into the clip, it needs to be fixed before it can be used to communicate. • Attempt to unbind and re-bond the controllers. If any of the controllers are not discoverable from the Network page, investigate those controllers further.
EXT ALARM 1, 2, 3 / External Alarm 1, 2, 3	<p>The external alarm input is triggered by a 3rd party device.</p> <p>The controller can be used to pass through an alarm from a third party device, e.g. pan overflow float switch.</p> <p>The alarm will be shown on the controller display, web page, and email/text if email/text alerts are setup.</p> <p>The control will not be affected and continue to run normally.</p>	<p>Yellow LED is illuminated Controller will continue to call for refrigeration.</p> <p>DIG 1 STATUS DIG 2 STATUS DIG 3 STATUS</p> <p>This will identify the Digital Input (DI) being used for the external alarm.</p>	<p>Troubleshoot the device connected to the digital input to discover why it is in alarm, and resolve the issue.</p> <ul style="list-style-type: none"> • If the device is not in alarm, check to make sure the device is connected to the appropriate position (DI1, DI2 or DI3). • Verify the Digital Input Mode matches the input physically used. Digital Input 1, 2 or 3 Mode should be set to Ext Alarm. • Verify the Digital Input State is appropriately set to Open or Closed to match the input's functionality. If the controller is displaying the opposite of what is expected (i.e. alarm active when 3rd party device is not in alarm, or vice versa), changing the state will reverse the logic.
EMAIL FAILURE / Email Failure Alarm	Email alert was not confirmed by email server provided after seven consecutive attempts.	<p>Yellow LED is illuminated. Controller will continue to call for refrigeration.</p>	<p>Email Failure Alarm is a function of the controller attempting to send out an email alert using the information entered in the Alert Notifications section of the Setpoints page (under the Alarms tab), and failing to communicate successfully with the email server provided.</p> <ul style="list-style-type: none"> • Servers requiring authentication should provide User Name and Password, and ensure it is correctly entered. • Servers without authentication requirements should not enter information in the User Name or Password field. If unsure of server requirements and alarm occurs, ensure both User Name and Password are blank and retry. • Gmail as a mail server is no longer supported due to changes in their service. • If setting up a custom SMTP server, ensure the correct port is selected (25 or 587).
TIME SERVER COMM / Time Server Comm Alarm	Date & Time reference is set to Internet or Custom, and controller has not been able to communicate with the external time of day server (SNTP server) for at least 15 minutes.	<p>Yellow LED is illuminated. Controller will continue to call for refrigeration.</p>	<ul style="list-style-type: none"> • Check network connection to controller. If controller cannot access the internet, it cannot access the external time server. • If controller is under a KE2-EM, and DHCP is not enabled, the gateway and DNS setting of the controller must be set to 10.10.255.250.