

This reference should remain on site with the installed KE2 Temp + Valve controller.

### What's in the Kit - Parts List

The following are included in the KE2 Temp + Valve kit, pn 21301:

- A** (1) KE2 Temp + Valve controller (pn21393 - controller only)
- B** (1) 10' pressure transducer
- C** (1) temperature sensor - 45"
- D** (1) temperature sensor - 10'
- E** (4) self-tapping mounting screws
- F** (1) sensor ziptie
- G** (1) screwdriver
- H** (2) screws for high voltage shield



### Supplies List

Standard truck stock items are required to install the controller. A list is provided below

- **conduit to go between the controller & evaporator**
- **(2) conduit connectors** (straight or elbow as required)
- **(4) high voltage wires matched to the load of the liquid line solenoid/compressor and the controller.**
- **wire labeling** (numbers, colors, etc.)
- **additional wire ties**
- **18 gauge twisted shielded pair** (if extending sensor wires/adding communication)
- **foam insulation** (if running wires outside the space)
- **silicone** (for sealing any box penetrations)

### Select Mounting Location

The KE2 Temp + Valve is designed for a wide range of applications, with many potential installation locations. Breaking down the installation location, by application, provides the most helpful reference.

Application	Locations
Under counter	Evaporator cabinet Outside controlled space
Walk-in	Evaporator cabinet Adjacent to entrance
Side-by-side	Above door

### Remote Monitoring, Control, Alarm Notifications

The Temp + Valve includes RS-485 Modbus communications, and can now be accessed remotely using the KE2 Local Area Dashboard and Alarms (KE2 LDA). See page 4 for additional details.

### Service Call Saver - Post Defrost Indicator

To eliminate unnecessary service calls, the KE2 Temp + Valve alerts the user when it is coming out of a defrost cycle using the onboard display. The display alternates between dEF and the actual temperature measured by the air sensor. This continues until the temperature has reached setpoint, or for the amount of time set by dFt (Defrost Time) whichever is shorter.





## KE2 Temp + Valve Control (pn 21301)

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### Wiring the Controller

The Temp + Valve was designed with functionality in mind. The controller accepts 120V / 208-240V to power the controller and 12V - 240V solenoid voltage via the liquid line solenoid relay through the lower conduit connection. The temperature sensor, pressure transducer, valve, and communication wires are attached via the upper conduit connector.

- A** When wiring the controller first remove the display by loosening the four corner screws. The display is connected to the lower board by a short ribbon cable.

**Caution:** The board may be damaged if excessive force is used when removing the cover.

- B** After the four screws have been detached from the lower section, the cover may be gently moved to the side.

- C** Next remove the high voltage protective cover. There are two screws holding it in place.



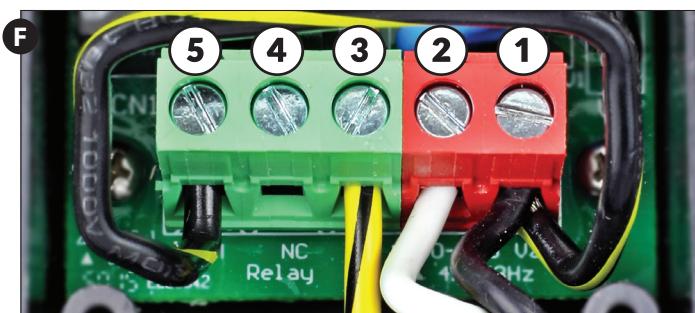
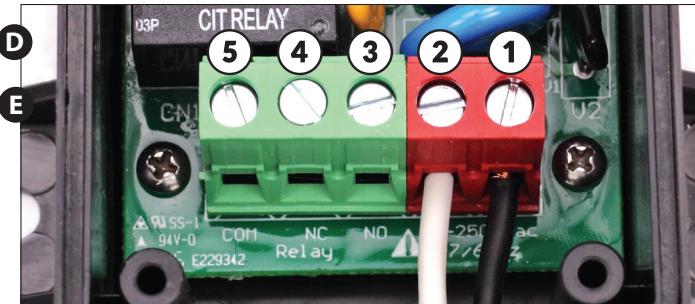
- D** With the high voltage cover removed, the two screw terminal connectors can be seen. The Red 2-position connector is the controller's power supply.

- E** Connect line (L1) ① to the right most terminal position and neutral (L2) ② to the terminal position.



- F** The liquid line solenoid/compressor relay accepts a variety of input voltages and is not required to match the controller's input. See table for relay ratings. The relay uses the 3-position screw terminal to make the connection on the board. This relay is designed to control smaller compressors directly. It may also control either the liquid line solenoid or as a pilot to the compressor contactor. When connecting the wires to the relay, the controller will be breaking one leg of the power.

One leg of incoming power (L1) ⑤ supply for the liquid line solenoid should be connected to the common terminal of the liquid line solenoid relay, the left most terminal connection. The other leg of the incoming power (L2) should be connected directly to the solenoid lead. The remaining lead from the solenoid should be connected to the NO (normally open) ③ terminal, the center terminal location.



- G** Proper wiring practices must be followed. Local wiring codes take precedence over any information in this bulletin.

- G** Replace high voltage shield after wiring is completed.

#### Relay Rating

Outputs: (1) Relay Single Pole Double Throw	Normally Open	
	120V	240V
FLA	5A	5A
LRA	30A	80A
Pilot Duty	5A	5A



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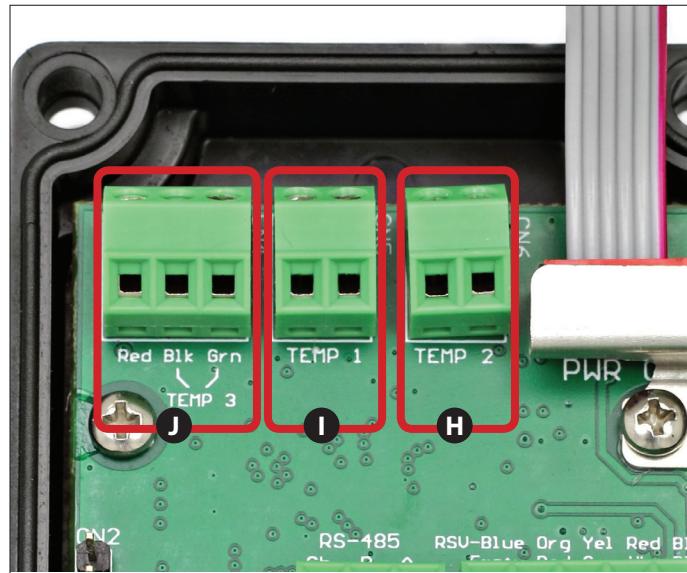
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### Low Voltage Connections

**H** **Air Temperature Sensor** - The air temperature sensor terminal is located on the cover's circuit board, and is permanently attached. The temperature sensor input consists of the right two terminal positions. The sensor is not polarized and may be connected in either orientation.

The sensor should be fed through the top conduit connection, before being attached to the board.

This terminal is also used for an External System Off signal in certain control modes. See the diagrams at the end of the bulletin for more detailed information.

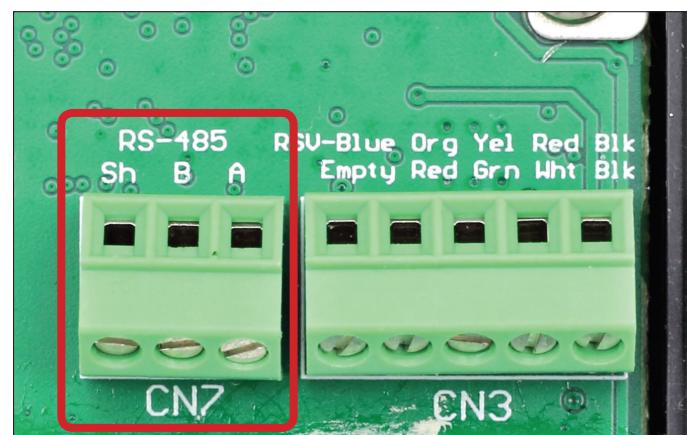


**I** **Suction Temperature Sensor** - The suction temperature sensor terminal is located on the cover's circuit board, and is permanently attached. The temperature sensor input consists of the middle two terminal positions. The sensor is not polarized and may be connected in either orientation.

The suction temperature sensor is required when applying the controller with an electronic expansion valve. The sensor's proximity to the evaporator outlet differs slightly for electronically controlled valves from the placement of a TEV bulb. Due to the more refined control from an electronically controlled valve, the sensor must be placed as close to the outlet of the coil as feasible.

Although the distance from the outlet is different, the nature of the refrigerant's flow through the tube remains unchanged, thus the orientation of the sensor remains at the 4 or 8 o'clock position. The sensor should be secured to the suction line using the included wire ties designed for low ambient operation.

This terminal is also used for an External System Off signal in certain control modes. See the diagrams at the end of the bulletin for more detailed information.



**J** **Pressure Transducer** - The pressure transducer terminal is located on the cover's circuit board, and is permanently attached. The pressure transducer input consists of the 3 terminal positions on the left-hand side of the board.

The pressure transducer can be attached to the suction service port on the evaporator's suction header. If a suction port is not available, mount the pressure tap on the top of a horizontal section of tube, approx. 3 inches downstream of the suction temperature sensor.

### Remote Monitoring, Control, Alarm Notifications

The KE2 Temp + Valve includes RS-485 Modbus communications, and can now be accessed remotely using the KE2 Local Area Dashboard and Alarms (KE2 LDA). See page 4 for further details.



## KE2 Temp + Valve Control (pn 21301)

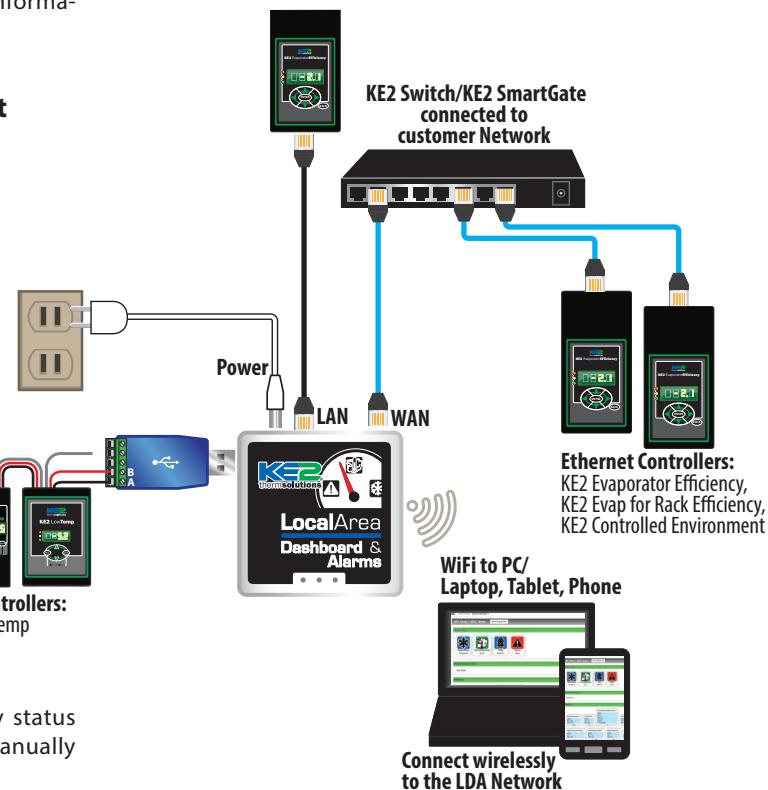
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### Accessing the KE2 Temp + Valve on a Local Area Network

When the KE2 Temp is connected to the KE2 LDA communication device's serial USB adapter, the device will find the controller, and provide immediate local network communication. More information on the KE2 LDA is found in bulletin Q.5.42.

### Accessing the KE2 Temp + Valve on the Internet

When used with the KE2 LDA, the KE2 Temp + Valve can be accessed remotely through the KE2 Smart Access portal, anywhere Internet service is available. So, there's no need to worry about your refrigerated products overnight, during holidays, or vacations. Just go online and see, or setup the email/text alarm alerts feature, for instant notification of system issues. More information on KE2 Smart Access is found in bulletin Q.1.34 and A.1.76.



### Webpage View

From the Webpage you can monitor temperatures, relay status and alarms, as well as make changes to setpoints, and manually control the system.

(Set device\_name) (Ke2 Temp Plus Valve Control) Show Simple View

**System State**

- Alarms: High Temperature Alarm
- SuctionPressure: 9.1 psig
- Relay: Relay On
- RoomTemperature: 180 F
- SaturationTemperature: -30.6 F
- SuctionTemperature: -23.3 F
- SH: Superheat 7.3 F
- SystemMode: Cool
- ValvePosition: 0 %

**Manual System Control**

- Next Mode
- Turn System Off

**Setpoints**

Room Temperature	AirTempDiff	Compressor Starts Per Hour	Control Type	Defrost Time	DefrostsPerDay	Derivative	HiAlarmOffset	HighAndLowAlarmC
35 F	2 F	6	Superheat Control Plus	45	4	3	5 F	90
Input Control Type	Integral	LPCO Differential	LPCO Pressure	LowAlarmOffset	Max Operating Pressure	Max Time for LPCO	Max Valve Steps	ModbusAddress
Pressure	5	N/A	N/A	3 F	150 psig	Disabled	500	1
Motor Type	Pressure SP	Proportional	Refrigerant	Superheat	Temperature Units	Valve Type		
Unipolar	N/A	3	R404A	8 F	Fahrenheit	Rsv		

**Device Info**

actual_version	address	commTimeouts	device_name	firmware_id	name
1.1	1	0	None	21292	Ke2 Temp Plus Valve Control



Visit our YouTube channel for videos on the KE2 LDA and KE2 Smart Access.

- Video 053 The KE2 LDA: Communication Device for KE2 Therm Serial-ModBus and Ethernet Controllers
- Video 059 The KE2 LDA: Connecting the KE2 LDA to KE2 Smart Access
- Video 061 What information is on the KE2 LDA's Dashboard and Management Console
- Video 062 Communication Made Easy with KE2 Smart Access



[youtube.com/ke2therm](https://youtube.com/ke2therm)



# KE2 Temp + Valve Control (pn 21301)

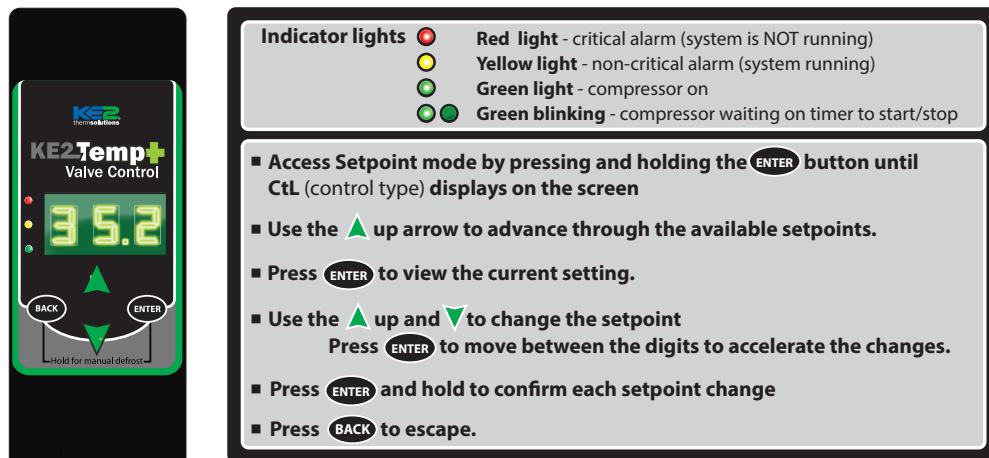
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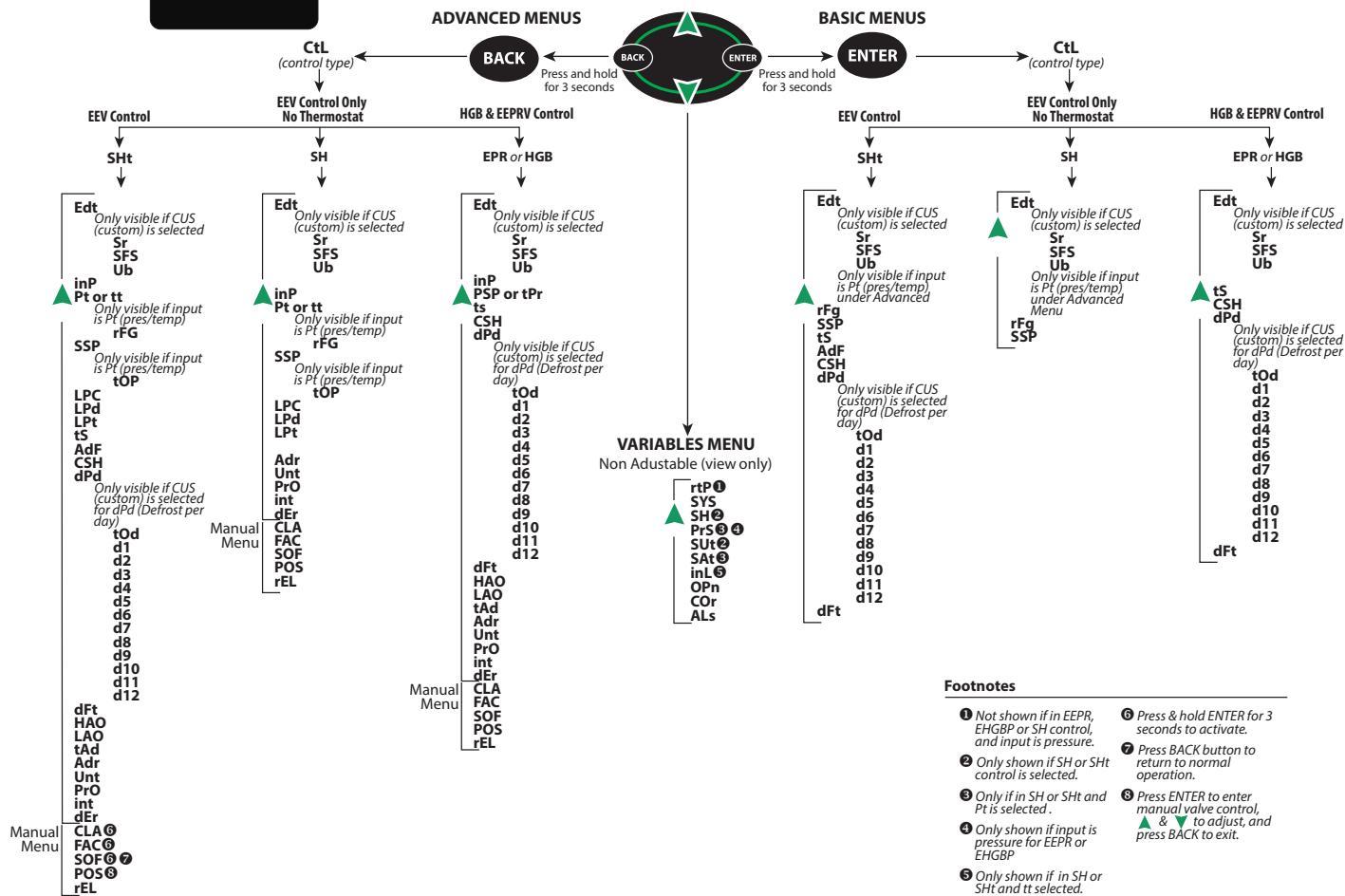
## Programming the Controller

Many applications can use the controller's preset defrosts per day. This automatically spaces the defrosts throughout the day, based on the number of defrost cycles selected. The user can change the number of defrost cycles performed by changing the Defrost per Day setpoint, ranging from 0 to 12. Or, if required, each individual defrost can be scheduled for a specific time of day.

**Figure 1**



## Accessing the Menus





# KE2 Temp + Valve (pn 21301)

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## Service Call Saver - Post Defrost Indicator

To eliminate unnecessary/unwarranted service calls, the KE2 Temp + Valve alerts the user when it is coming out of a defrost cycle using the onboard display. The display alternates between dEF and the

actual temperature measured by the air sensor. This continues until the temperature has reached setpoint, or for the amount of time set by dFt (Defrost Time) whichever is shorter.

## Variables Menu

Name	Description	Range
rtP <b>rTP</b>	Room Temperature (not shown if in EEPR or EHGBP control, and input is pressure)	-50°F to 100°F
SYS <b>SYS</b>	System Mode: Refrigerate, Defrost, Off, System Off (manually)	rEF, dEF, OFF, SOF, ESO
SH <b>SH</b>	Superheat (only shown if SH or SHt control selected)	0°F to 200°F
PrS <b>PrS</b>	Pressure (only if input control type is pressure)	-14.6 to 150 psig
SUt <b>SUt</b>	Suction Temperature (only if in SH or SHt control selected)	-50°F to 150°F
SAt <b>SAt</b>	Saturation Temperature (only if in SH or SHt control selected, and Pt is selected as input)	-87°F to 150°F
inL <b>inL</b>	Inlet Temperature (only if in SH or SHt control selected, and tt selected as input)	-50°F to 150°F
OPn <b>OPn</b>	Valve Percent Open	0 to 100%
COr <b>COr</b>	Compressor Relay	OFF - On <b>OFF ON</b>
ALS <b>ALS</b>	Alarm Status: See table below for alarm descriptions.	nOA <b>nOA</b> (no alarm), PSA, SSA, iSA, ASA, HSH, LSH, LPA, Pdt, SCC, HtA, HPA, LtA, LPA, PF

## Alarm List

Alarms	Description	LED
CRITICAL  System is off.	ISA <b>iSA</b> <b>Inlet Sensor Alarm:</b> Valve closes and turns system off.	Red
	PSA <b>PSA</b> <b>Pressure Sensor Alarm:</b> Valve closes and turns system off.	Red
	SSA <b>SSA</b> <b>Suction Temperature Sensor Alarm:</b> Valve closes and turns system off.	Red
NON-CRITICAL  System is still running, and trying to maintain cooling	ASA <b>ASA</b> <b>Room (Air )Sensor Alarm:</b> Alarm occurs when the room temperature sensor input is open or shorted.	Amber
	HPA <b>HPA</b> <b>High Pressure Alarm:</b> occurs when the temperature reading is above the Pressure set point + High Alarm Offset setpoint for the amount of time in setpoint High/Low Alarm Delay; High Temperature or pressure alarm is suppressed while in defrost.	Amber
	HSH <b>HSH</b> <b>High Superheat Alarm:</b> Occurs when superheat is 2 or more degrees above setpoint and valve is 100% open for 90 minutes; Clears when superheat is within 2 degrees of setpoint	Amber
	HtA <b>HtA</b> <b>High Temperature Alarm:</b> occurs when the temperature reading is above the Temperature set point + Temperature differential set point + High Alarm Offset set point for the amount of time in setpoint High/Low Alarm Delay; High Temperature or pressure alarm is cleared and disabled while in defrost	Amber
	LPA <b>LPA</b> <b>Low Pressure Alarm:</b> When LPC (Low Pressure Cut Out) is enabled while in refrigeration mode, if compressor is shut off 3 times for pressure going below LPC set point without being satisfied on temperature, set alarm; Alarm is cleared when temperature is satisfied	Amber
	LSH <b>LSH</b> <b>Low Superheat Alarm:</b> Occurs when superheat is less than 3 degrees for 5 minutes; Clears when superheat is above 3 Fahrenheit degrees	Amber
	LtA <b>LtA</b> <b>Low Temperature Alarm:</b> occurs when the temperature reading is below the Temperature setpoint - Low Alarm Offset setpoint for the amount of time in setpoint High & Low Temperature Alarm Delay; Low temperature or pressure is cleared and disabled when in defrost	Amber
	Pdt <b>Pdt</b> <b>Pump Down Timeout Alarm:</b> Occurs when call for pumping system down and the compressor is turned off due to time out instead of pressure reaching LPC setpoint for 2 consecutive times; Alarm is cleared when pressure reaches LPC setpoint instead of timing out.	Amber
	PF <b>PF</b> <b>Power Failure:</b> occurs when the controller has lost power at some point, and controller had CUS (custom defrost schedule) selected under Defrosts Per Day	Amber
	SCC <b>SCC</b> <b>Short Cycle Compressor Alarm:</b> Occurs when the compressor has to come back on because of pressure going above LPC set point without satisfying minimum off time. If this occurs 4 times while in Off mode, can be over multiple cycles, set alarm; Clear alarm if pressure does not go above LPC setpoint through minimum off time.	Amber

## Refrigerant List

Refrigerant	Abbreviation
R-22	R22
R-134a	134
R-404A	404
R-407A	40A
R-407C	40C
R410A	410
R-717	717
R-422A	42A
R-422D	42d
R-507	507
R-448A	448
R-449A	449
R-450A	450
R-438A	438
R-408A	408
R-409A	409
R407F	407
R-744	744
R-513A	513
R-458A	458



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**Basic Menu:** "Out of Box" or if Superheat (SHt)

Setpoint	Description	Range	Default	
Ctl <b>CTL</b>	Control Type - EEV+Temp, EEV Only, EEPR, EHGBP	SHt, SH, EPr, HGb <b>SHE SH EPr HGb</b>	SHt	
Edt <b>EDT</b> (expansion device type)	Valve Type: Mechanical (tHr), KE2-HSV (HS), KE2-RSV (rS), SEI, SER, Carel (CrL), Custom (CUS)	tHr, HS, rS, SEI, SER CrL, CUS** <b>tHr HS PS SEI SER CrL CUS</b>	rS	
Only if CUS <b>CUS</b> is used for Edt <b>EDT</b> (valve type)	Sr <b>Sr</b> SFS <b>SFS</b> Ub <b>Ub</b>	Step Rate Steps Full Stroke Motor Type	30 - 400 200 - 6400 Uni-(unipolar), bi (bipolar) <b>Uni Bi</b>	30 500 Unipolar
Only if inP <b>InP</b> (input) is Pt PE under Advanced Menu	rFg <b>rFg</b>	Refrigerant Type	See Refrigerant List on Page 6	404
SSP <b>SSP</b>	Superheat Setpoint	5°F (2.8K) to 50°F (28K)	8°F (4.4K)	
tS <b>TS</b>	Temperature Setpoint	-50°F (-45°C) to 100°F (38°C)	35°F (9.7°C)	
AdF <b>ADF</b>	Air Differential	1°F (0.5K) to 30°F (17K)	2°F (1.1K)	
CSH <b>CSH</b>	Maximum Compressor Starts/Hour	5 (Off)* to 10	6	
dPd <b>dPd</b>	Defrost Per Day	0 to 12, CUS**	4	
Only if dPd (Defrosts per Day) is CUS	tOd <b>TOD</b>	Time of Day	00:00 to 23:59	
	d1 <b>D1</b>	Start time of Defrost #1	00 - 23	
	d2 <b>D2</b>	Start time of Defrost #2	00 - 23	
	d3 <b>D3</b>	Start time of Defrost #3	00 - 23	
	d4 <b>D4</b>	Start time of Defrost #4	00 - 23	
	d5 <b>D5</b>	Start time of Defrost #5	00 - 23	
	d6 <b>D6</b>	Start time of Defrost #6	00 - 23	
	d7 <b>D7</b>	Start time of Defrost #7	00 - 23	
	d8 <b>D8</b>	Start time of Defrost #8	00 - 23	
	d9 <b>D9</b>	Start time of Defrost #9	00 - 23	
	d10 <b>D10</b>	Start time of Defrost #10	00 - 23	
	d11 <b>D11</b>	Start time of Defrost #11	00 - 23	
	d12 <b>D12</b>	Start time of Defrost #12	00 - 23	
dFt <b>DFt</b>	Defrost Time	6 min to 720 min	45 min	

\*Selecting fewer than 5 compressor starts per hour results in the starts per hour feature being turned off. The compressor will then function on temperature only.

\*\* Selecting CUS (custom) unlocks additional Setpoints.



# KE2 Temp + Valve Control (pn 21301)

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**Advanced Menu:** "Out of Box" or if Superheat (SHt)

Setpoint	Description	Range	Default	
Ctl <b>CtL</b>	Control Type - EEV+Temp, EEV Only, EEPR, EHGBP	SHt, SH, EPr, HGb <b>SHt</b> <b>SH</b> <b>EPr</b> <b>HGb</b>	SHt	
Edt <b>Edt</b> (expansion device type)	Valve Type: Mechanical (tHr), KE2-HSV (HS), KE2-RSV (rS), SEI, SER, Carel (Crl), Custom (CUS)	tHr, HS, rS, SEI, SER, Crl, CUS** <b>tHr</b> <b>HS</b> <b>rS</b> <b>SEI</b> <b>SER</b> <b>Crl</b> <b>CUS</b>	rS	
Only if <b>CUS</b> is used for <b>Edt</b> (valve type)	Sr <b>Sr</b> SFS <b>SFS</b> Ub <b>Ub</b>	Step Rate Steps Full Stroke Motor Type	30 - 400 200- 6400 Uni-(unipolar), bi (bipolar) <b>Uni</b> <b>bi</b>	30 500 Unipolar
inP <b>inP</b>	Input type when CtL is SH: pressure/temp (Pt) or temperature/temperature (tt)	Pt, tt <b>Pt</b> <b>tt</b>	Pt	
Only if <b>inP</b> (input) is <b>Pt</b>	rFG <b>rFG</b>	Refrigerant Type	See Refrigerant List on Page 6	
	SSP <b>SSP</b>	Superheat Setpoint	5°F (2.8K) to 50°F (28K) <b>Standard:</b> 10 psig to 150 psig <b>R-410A</b> 10psig to 300 psig <b>R-744</b> 10 psig to 500 psig	8°F (4.4K) 150 psig
Only if <b>inP</b> (input) is <b>Pt</b>	tOP	Maximum (Top) Operating Pressure setpoint	-5 psig to 138 psig <b>LPC</b> <b>LPC</b> <b>LPd</b> <b>LPd</b> <b>Lpt</b> <b>Lpt</b> <b>tS</b> <b>tS</b> <b>AdF</b> <b>AdF</b> <b>CSH</b> <b>CSH</b> <b>dPd</b> <b>dPd</b>	8 psig 15 psig 0 min -50°F (-45°C) to 100°F (38°C) 1°F (0.5K) to 30°F (17K) 5 (Off)* to 10 0 to 12, CUS**
Only if <b>dPd</b> (Defrosts per Day) is <b>CUS</b>	t0d <b>t0d</b>	Time of Day	00:00 to 23:59	
	d1 <b>d1</b>	Start time of Defrost #1	00 - 23	
	d2 <b>d2</b>	Start time of Defrost #2	00 - 23	
	d3 <b>d3</b>	Start time of Defrost #3	00 - 23	
	d4 <b>d4</b>	Start time of Defrost #4	00 - 23	
	d5 <b>d5</b>	Start time of Defrost #5	00 - 23	
	d6 <b>d6</b>	Start time of Defrost #6	00 - 23	
	d7 <b>d7</b>	Start time of Defrost #7	00 - 23	
	d8 <b>d8</b>	Start time of Defrost #8	00 - 23	
	d9 <b>d9</b>	Start time of Defrost #9	00 - 23	
	d10 <b>d10</b>	Start time of Defrost #10	00 - 23	
	d11 <b>d11</b>	Start time of Defrost #11	00 - 23	
	d12 <b>d12</b>	Start time of Defrost #12	00 - 23	
	dFt <b>dFt</b>	Defrost Time	6 min to 720 min	
	HAO <b>HAO</b>	High Alarm Offset	1°F (1K) to 10°F (6K)	
	LAO <b>LAO</b>	Low Alarm Offset	1°F (1K) to 10°F (6K)	
	tAd <b>tAd</b>	Temp Alarm Delay	1 min to 180 min	
	Adr <b>Adr</b>	Mod Bus Address	1 to 247	
	Unt <b>Unt</b>	Units for temperature display	FAH or CEL	
	Pro <b>Pro</b>	Proportional	0 to 255	
	int <b>int</b>	Integral	0 to 255	
	dEr <b>dEr</b>	Derivative	0 to 255	
MANUAL CONTROL OPTIONS	CLA <b>CLA</b>	Manually Clear Alarms		
	FAC <b>FAC</b>	Return Controller to Factory Default Settings		
	SOF <b>SOF</b>	Manually Enter System Off Mode		
	POS <b>POS</b>	Manually Adjust Valve Position	0 to 100%	
	rEL <b>rEL</b>	Manually Control Relay		

\*Selecting fewer than 5 compressor starts per hour results in the starts per hour feature being turned off. The compressor will then function on temperature only.

\*\* Selecting CUS (custom) unlocks additional Setpoints.



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For Medium Temperature Applications with Air Defrost

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## Basic Menu: EEV Control Only - No Thermostat (SH)

Setpoint	Description	Range	Default
CtL <b>EEV</b>	Control Type - EEV+Temp, EEV Only, EEPR, EHGBP	SHt, SH, EPr, HGb <b>SHE SH EPr HGB</b>	SH
Edt <b>Edt</b> (expansion device type)	Valve Type: Mechanical (tHr), KE2-HSV (HS), KE2-RSV (rS), SEI, SER, Carel (CrL), Custom (CUS)	tHr, HS, rS, SEI, SER CrL, CUS** <b>tHr HS PS SEI SER CrL CUS</b>	rS
Only if CUS <b>HS</b> is used for Edt <b>Edt</b> (valve type)	Sr <b>Sr</b>	Step Rate	30 - 400
	SFS <b>SFS</b>	Steps Full Stroke	200 - 6400
	Ub <b>Ub</b>	Motor Type	Uni-(unipolar), bi (bipolar) <b>Uni Bi</b>
Only if inP (input) is Pt	rFG <b>rFG</b>	Refrigerant Type	See Refrigerant List on Page 6
SSP <b>SSP</b>	Superheat Setpoint	5°F (2.8K) to 50°F (28K)	8°F (4.4K)

\*Selecting fewer than 5 compressor starts per hour results in the starts per hour feature being turned off. The compressor will then function on temperature only.

\*\* Selecting CUS (custom) unlocks additional Setpoints.



# KE2 Temp + Valve Control (pn 21301)

For Medium Temperature Applications with Air Defrost  
Installation Manual

## Advanced Menu: EEV Control Only - No Thermostat (SH)

Setpoint	Description	Range	Default	
CtL <b>CtL</b>	Control Type - EEV+Temp, EEV Only, EEPR, EHGBP	SHt, SH, EPr, HGb <b>SHt</b> <b>SH</b> <b>EPr</b> <b>HGb</b>	SH	
Edt <b>Edt</b> (expansion device type)	Valve Type: Mechanical (tHr), KE2-HSV (HS), KE2-RSV (rS), SEI, SER, Carel (Crl), Custom (CUS)	tHr, HS, rS, SEI, SER CrL, CUS** <b>tHr</b> <b>HS</b> <b>rS</b> <b>SEI</b> <b>SER</b> <b>CrL</b> <b>CUS</b>	rS	
Only if CUS <b>rS</b> is used for Edt <b>Edt</b> (valve type)	Sr <b>Sr</b> SFS <b>SFS</b> Ub <b>Ub</b>	Step Rate Steps Full Stroke Motor Type	30 - 400 200- 6400 Uni (unipolar), bi (bipolar) <b>Uni</b> <b>bi</b>	30 500 Unipolar
inP <b>inP</b>	Input type when CtL is SH: pressure/temp (Pt) or temperature/temperature (tt)	Pt, tt <b>Pt</b> <b>tt</b>	Pt	
Only if inP (input) is Pt	rFG <b>rFG</b>	Refrigerant Type	See Refrigerant List on Page 6	
SSP <b>SSP</b>	Superheat Setpoint	5°F (2.8K) to 50°F (28K)	8°F (4.4K)	
Only if inP (input) is Pt	tOP	Maximum (Top) Operating Pressure setpoint	<b>Standard:</b> 10 psig to 150 psig <b>R-410A</b> 10psig to 300 psig <b>R-744</b> 10 psig to 500 psig	150 psig
	LPC <b>LPC</b>	Low Pressure Cut Out Setpoint	-5 psig to 138 psig	8 psig
	LPd <b>LPd</b>	Low Pressure Cut Out Differential	1 to 50 psig	15 psig
	Lpt <b>Lpt</b>	Low Pressure Cut Out Delay	0 to 15 min	0 min
Not shown if SH (Superheat) is selected	tAd <b>tAd</b>	Temp Alarm Delay	1 min to 180 min	90 min
	Adr <b>Adr</b>	Mod Bus Address	1 to 247	1
	Unt <b>Unt</b>	Units for temperature display	FAH or CEL	FAH
	PrO <b>PrO</b>	Proportional	0 to 255	3
	int <b>int</b>	Integral	0 to 255	5
	dEr <b>dEr</b>	Derivative	0 to 255	3
MANUAL CONTROL OPTIONS	CLA <b>CLA</b>	Manually Clear Alarms		
	FAC <b>FAC</b>	Return Controller to Factory Default Settings		
	SOF <b>SOF</b>	Manually Enter System Off Mode		
	POS <b>POS</b>	Manually Adjust Valve Position	0 to 100%	
	rEL <b>rEL</b>	Manually Control Relay		

\*Selecting fewer than 5 compressor starts per hour results in the starts per hour feature being turned off. The compressor will then function on temperature only.

\*\* Selecting CUS (custom) unlocks additional Setpoints.



**KE2 Temp + Valve** (pn 21301)  
For Medium Temperature Applications with **Air Defrost**  
Installation Manual

**Basic Menu:** Hot Gas Bypass (HGB) or EEPRV (EPR)

Setpoint	Description	Range	Default
Ctl <b>EEL</b>	Control Type - EEV+Temp, EEV Only, EEPR, EHGBP	SHt, SH, EPr, HGb <b>SHt SH EPr HGb</b>	SH
Edt <b>Edt</b> (expansion device type)	Hot Gas Bypass Valve Options	SDR-3(Sd3), SDR-4 (Sd4), Custom (CUS)	Sd3, Sd4, CUS** <b>Sd3 Sd4 CUS</b>
	Electronic Pressure Regulating Valve Options	CDS 2-7 (Cd2), CDS 9-17 (Cd9), ESR12 (ES1), ESR20 (ES2), KVS15 (dS1), KVS42 (dS4), Custom (CUS)	Cd2, Cd9, ES1, ES2, dS1, dS4, CUS <b>Cd2 Cd9 ES1 ES2 dS1 dS4 CUS</b>
Only if CUS <b>CUS</b> is used for Edt <b>Edt</b> (valve type)	St <b>St</b>	Step Rate	30 - 400
	SFS <b>SFS</b>	Steps Full Stroke	200- 6400
	Ub <b>Ub</b>	Motor Type	Uni-(unipolar), bi (bipolar) <b>Uni bi</b>
Only if inP (input) is PrS under Advanced Menu	PSP <b>PSP</b>	Pressure Setpoint	0 psig to 138 psig
Only if inP <b>InP</b> (input) is tPr <b>EPr</b>	tS <b>ES</b>	Temperature Setpoint	-50°F (-45°C) to 100°F (38°C)
CSH <b>CSH</b>	Maximum Compressor Starts/Hour	5 (Off)* to 10	6
dPd <b>dPd</b>	Defrost Per Day	0 to 12, CUS**	4
Only if dPd (Defrosts per Day) is CUS	t0d <b>EDD</b>	Time of Day	00:00 to 23:59
	d1 <b>d1</b>	Start time of Defrost #1	00 - 23
	d2 <b>d2</b>	Start time of Defrost #2	00 - 23
	d3 <b>d3</b>	Start time of Defrost #3	00 - 23
	d4 <b>d4</b>	Start time of Defrost #4	00 - 23
	d5 <b>d5</b>	Start time of Defrost #5	00 - 23
	d6 <b>d6</b>	Start time of Defrost #6	00 - 23
	d7 <b>d7</b>	Start time of Defrost #7	00 - 23
	d8 <b>d8</b>	Start time of Defrost #8	00 - 23
	d9 <b>d9</b>	Start time of Defrost #9	00 - 23
	d10 <b>d10</b>	Start time of Defrost #10	00 - 23
	d11 <b>d11</b>	Start time of Defrost #11	00 - 23
	d12 <b>d12</b>	Start time of Defrost #12	00 - 23
dFt <b>dFt</b>	Defrost Time	6 min to 720 min	45 min

\*Selecting fewer than 5 compressor starts per hour results in the starts per hour feature being turned off. The compressor will then function on temperature only.

\*\* Selecting CUS (custom) unlocks additional Setpoints.



# KE2 Temp + Valve Control (pn 21301)

For Medium Temperature Applications with Air Defrost  
Installation Manual

## Advanced Menu: Hot Gas Bypass (HGB) or EEPRV (ERP)

Setpoint	Description	Range	Default
Ctl <b>CtL</b>	Control Type - EEV+Temp, EEV Only, EEPR, EHGB	SHT, SH, EPr, HGb <b>SHE SH EPr HGb</b>	SH
Edt <b>Edt</b> (expansion device type)	Hot Gas Bypass Valve Options	SDR-3(Sd3), SDR-4 (Sd4), Custom (CUS)	Sd3, Sd4, CUS** <b>Sd3 Sd4 CUS</b>
	Electronic Pressure Regulating Valve Options	CDS 2-7 (Cd2), CDS 9-17 (Cd9), ESR12 (ES1), ESR20 (ES2), KVS15 (dS1), KVS42 (dS4), Custom (CUS)	Cd2, Cd9, ES1, ES2, dS1, dS4, CUS <b>Cd2 Cd9 ES1 ES2 dS1 dS4 CUS</b>
Only if <b>CUS</b> is used for <b>Edt</b> (valve type)	Sr <b>Sr</b>	Step Rate	30 - 400
	SFS <b>SFS</b>	Steps Full Stroke	200- 6400
	Ub <b>Ub</b>	Motor Type	Uni-(unipolar), bi (bipolar) <b>Un bi</b>
inP <b>inP</b>	Input type when CtL is HgB: pressure (PrS) or temperature (tPr)	PrS, tPr <b>PrS tPr</b>	tPr
Only if <b>inP</b> (input) is <b>PrS</b> under Advanced Menu	PSP <b>PSP</b>	Pressure Setpoint	0 psig to 138 psig
Only if <b>inP</b> ( <b>inP</b> ) is <b>tPr</b>	tS <b>tS</b>	Temperature Setpoint	-50°F (-45°C) to 100°F (38°C)
CSH <b>CSH</b>	Maximum Compressor Starts/Hour	5 (Off)* to 10	6
dPd <b>dPd</b>	Defrost Per Day	0 to 12, CUS**	4
Only if <b>dPd</b> (Defrosts per Day) is <b>CUS</b>	tOd <b>tOd</b>	Time of Day	00:00 to 23:59
	d12 <b>d12</b>	Start time of Defrost #12	00 - 23
	d11 <b>d11</b>	Start time of Defrost #11	00 - 23
	d10 <b>d10</b>	Start time of Defrost #10	00 - 23
	d9 <b>d9</b>	Start time of Defrost #9	00 - 23
	d8 <b>d8</b>	Start time of Defrost #8	00 - 23
	d7 <b>d7</b>	Start time of Defrost #7	00 - 23
	d6 <b>d6</b>	Start time of Defrost #6	00 - 23
	d5 <b>d5</b>	Start time of Defrost #5	00 - 23
	d4 <b>d4</b>	Start time of Defrost #4	00 - 23
	d3 <b>d3</b>	Start time of Defrost #3	00 - 23
	d2 <b>d2</b>	Start time of Defrost #2	00 - 23
	d1 <b>d1</b>	Start time of Defrost #1	00 - 23
dFt <b>dFt</b>	Defrost Time	6 min to 720 min	45 min
HAO <b>HAO</b>	High Alarm Offset	1°F (1K) to 10°F (1K)	5°F
LAO <b>LAO</b>	Low Alarm Offset	1°F (1K) to 10°F (1K)	3°F
tAd <b>tAd</b>	High & Low Temp or Pressure Alarm Delay	1 min to 180 min	90 min
Adr <b>Adr</b>	Mod Bus Address	1 to 247	1
Unt <b>Unt</b>	Units for temperature display	FAH or CEL <b>FAH CEL</b>	FAH
Pr0 <b>Pr0</b>	Proportional	0 to 255	3
int <b>int</b>	Integral	0 to 255	5
dEr <b>dEr</b>	Derivative	0 to 255	3
MANUAL CONTROL OPTIONS	CLA <b>CLA</b>	Manually Clear Alarms	
	FAC <b>FAC</b>	Return Controller to Factory Default Settings	
	SOF <b>SOF</b>	Manually Enter System Off Mode	
	POS <b>POS</b>	Manually Adjust Valve Position	0 to 100%
	rEL <b>rEL</b>	Manually Control Relay	

\*Selecting fewer than 5 compressor starts per hour results in the starts per hour feature being turned off. The compressor will then function on temperature only.

\*\* Selecting CUS (custom) unlocks additional Setpoints.



# KE2 Temp + Valve Control (pn 21301)

For Medium Temperature Applications with Air Defrost

Installation Manual

## Abbreviations - Alphabetical Listing

Abbreviation	Name	Type	Description
<b>AdF</b> <b>A<small>d</small>F</b>	Air Differential	Setpoint	Number of degrees air temp must be above room temp setpoint (tS) to return system to refrigeration mode
<b>Adr</b> <b>A<small>d</small>r</b>	Modbus Address	Setpoint	Controller's address for communications
<b>ALS</b> <b>A<small>l</small>S</b>	Alarm Status	Variable	Pressing ENTER from ALS will show active alarm list; scroll through list using up or down arrow.
<b>ASA</b> <b>A<small>s</small>A</b>	Room/Air Sensor Alarm	Alarm	Alarm occurs when the room temperature sensor input is open or shorted
<b>bi</b> <b>b<small>i</small></b>	Bipolar	Setpoint	Option under (Ub) Motor Type when using a CUS (custom) valve
<b>Cd2</b> <b>C<small>d</small>2</b>	CDS 2-7 Valve	Setpoint	Option under EDt valve selection for pressure regulating valves
<b>Cd9</b> <b>C<small>d</small>9</b>	CDS 9 Valve	Setpoint	Option under EDt valve selection for pressure regulating valves
<b>CEL</b> <b>C<small>e</small>L</b>	Celsius	Setpoint	Option for temperature units
<b>CLA</b> <b>C<small>l</small>A</b>	Clear Alarms Manually	Manual	Allows user to manually clear alarms
<b>Cor</b> <b>C<small>o</small>r</b>	Compressor Relay	Variables	Current state of liquid line solenoid/compressor relay
<b>CrL</b> <b>C<small>r</small>L</b>	Carel Valve	Setpoint	Option under EDt (Expansion Device Type) when SH (Superheat) is selected
<b>CtL</b> <b>C<small>t</small>L</b>	Control Type	Setpoint	Select the type of control: SH (Electronic Expansion Valve), SHT (Electronic Expansion Valve with Thermostat) EPR (Electronic Pressure Regulating Valve), HGB (Electronic Hot Gas Bypass Valve),
<b>CUS</b> <b>C<small>u</small>S</b>	Custom	Setpoint	Used for Custom defrost schedule or Custom valve option
<b>d1</b> <b>d<small>1</small></b>	Defrost #1	Setpoint	Start time of Defrost #1 when in defrosts per day (dPd) is custom (CUS); based on 24-hour clock
<b>d2</b> <b>d<small>2</small></b>	Defrost #2	Setpoint	Start time of Defrost #2 when in defrosts per day (dPd) is custom (CUS); based on 24-hour clock
<b>d3</b> <b>d<small>3</small></b>	Defrost #3	Setpoint	Start time of Defrost #3 when in defrosts per day (dPd) is custom (CUS); based on 24-hour clock
<b>d4</b> <b>d<small>4</small></b>	Defrost #4	Setpoint	Start time of Defrost #4 when in defrosts per day (dPd) is custom (CUS); based on 24-hour clock
<b>d5</b> <b>d<small>5</small></b>	Defrost #5	Setpoint	Start time of Defrost #5 when in defrosts per day (dPd) is custom (CUS); based on 24-hour clock
<b>d6</b> <b>d<small>6</small></b>	Defrost #6	Setpoint	Start time of Defrost #6 when in defrosts per day (dPd) is custom (CUS); based on 24-hour clock
<b>d7</b> <b>d<small>7</small></b>	Defrost #7	Setpoint	Start time of Defrost #7 when in defrosts per day (dPd) is custom (CUS); based on 24-hour clock
<b>d8</b> <b>d<small>8</small></b>	Defrost #8	Setpoint	Start time of Defrost #8 when in defrosts per day (dPd) is custom (CUS); based on 24-hour clock
<b>d9</b> <b>d<small>9</small></b>	Defrost #9	Setpoint	Start time of Defrost #9 when in defrosts per day (dPd) is custom (CUS); based on 24-hour clock
<b>d10</b> <b>d<small>10</small></b>	Defrost #10	Setpoint	Start time of Defrost #10 when in defrosts per day (dPd) is custom (CUS); based on 24-hour clock
<b>d11</b> <b>d<small>11</small></b>	Defrost #11	Setpoint	Start time of Defrost #11 when in defrosts per day (dPd) is custom (CUS); based on 24-hour clock
<b>d12</b> <b>d<small>12</small></b>	Defrost #12	Setpoint	Start time of Defrost #12 when in defrosts per day (dPd) is custom (CUS); based on 24-hour clock
<b>dEr</b> <b>d<small>E</small>R</b>	Derivative	Setpoint	Should not be adjusted unless instructed by KE2 Therm technical support
<b>dFt</b> <b>d<small>F</small>t</b>	Defrost Time	Setpoint	Maximum time system is allowed in defrost
<b>diS</b> <b>d<small>i</small>S</b>	Disabled	Setpoint	Choice under Start time when setting CUS (custom) dPd (defrosts per day)
<b>dPd</b> <b>d<small>P</small>d</b>	Defrost Per Day	Setpoint	Number of defrosts per day 0-12, CUS (custom)
<b>ds1</b> <b>d<small>s</small>1</b>	Danfoss KVS 15 Valve	Setpoint	Option under EDt (valve selection) for pressure regulating valves
<b>ds4</b> <b>d<small>s</small>4</b>	Danfoss KVS 42 Valve	Setpoint	Option under EDt (valve selection) for pressure regulating valves
<b>Edt</b> <b>E<small>d</small>t</b>	Expansion Device Type	Setpoint	Valve Selection
<b>EPr</b> <b>E<small>P</small>r</b>	Electronic Pressure Regulating	Setpoint	Type of control option under CtL (control type)
<b>ES1</b> <b>E<small>S</small>1</b>	ESR 12 Valve	Setpoint	Option under EDt valve selection for pressure regulating valves
<b>ES2</b> <b>E<small>S</small>2</b>	ESR 20 Valve	Setpoint	Option under EDt valve selection for pressure regulating valves
<b>ESO</b> <b>E<small>S</small>O</b>	External System Off	Setpoint	When 3rd party signal present valve closes
<b>FAH</b> <b>F<small>A</small>H</b>	Fahrenheit	Setpoint	Default for all temperatures displayed
<b>FAC</b> <b>F<small>A</small>C</b>	Factory Default	Manual	Manual option to return controller to Factory Default settings
<b>HAO</b> <b>H<small>A</small>O</b>	High Alarm Offset	Setpoint	Number of degrees above the Temperature Setpoint (tS) for a High Temp Alarm (HtA) condition.
<b>HGb</b> <b>H<small>G</small>b</b>	Hot Gas Bypass Valve	Setpoint	Option under CtL (Control Type)
<b>HPA</b> <b>H<small>P</small>A</b>	High Pressure Alarm	Alarm	Occurs when the temperature reading is above the Pressure setpoint + High Alarm Offset setpoint for the amount of time in setpoint High Low Alarm Delay.; High Temperature or pressure alarm is cleared and disabled while in defrost.
<b>HS</b> <b>H<small>S</small></b>	KE2-HSV Valve	Setpoint	Electronic expansion valve option under EDt (valve selection)
<b>HSH</b> <b>H<small>S</small>H</b>	High Superheat Alarm	Alarm	Occurs when superheat is 2 or more degrees above set point and valve is 100% open for 90 minutes; Clears when superheat is within 2 degrees of setpoint
<b>HtA</b> <b>H<small>t</small>A</b>	High Temperature Alarm	Alarm	occurs when the temperature reading is above the Temperature set point + Temperature differential set point + High Alarm Offset set point for the amount of time in set point High & Low Alarm Delay; High Temperature or pressure alarm is cleared and disabled while in defrost
<b>inL</b> <b>I<small>n</small>L</b>	Inlet Temperature	Variable	Temperature measured at the evaporator inlet. Only if SH and tt are selected as the input
<b>inP</b> <b>I<small>n</small>P</b>	Input Type	Setpoint	Select type of control: EPR & HGb - PrS (pressure) or tPr (temp); EEV - Pt (pressure/temp) or tt (temp/temp)
<b>int</b> <b>I<small>n</small>t</b>	Integral	Setpoint	A coefficient to the valve control algorithm that increases valve responsiveness
<b>iSA</b> <b>I<small>S</small>A</b>	Inlet Sensor Alarm	Alarm	Valve closes and turns system off.
<b>LAO</b> <b>L<small>A</small>O</b>	Low Alarm Offset	Setpoint	Number of degrees below the Temperature Setpoint (tS) for a Low Temp Alarm (LtA) condition.
<b>LPA</b> <b>L<small>P</small>A</b>	Low Pressure Alarm	Alarm	Pressure is below Low Pressure Cutout (LPC) after 3 consecutive attempts to start the system
<b>LPC</b> <b>L<small>P</small>C</b>	Low Pressure Cut Out	Setpoint	Pressure at which controller de-energizes the Compressor/Liquid Line Solenoid relay (Cor)



# KE2 Temp + Valve Control (pn 21301)

For Medium Temperature Applications with Air Defrost  
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## Abbreviations - Alphabetical Listing (continued)

Abbreviation	Name	Type	Description
LPd <b>LpD</b>	Low Pressure Cut Out Differential	Setpoint	Psi above Low Pressure Cutout (LPC) at which Compressor/Liquid Line Solenoid relay (COr) is energized
LPt <b>Lpt</b>	Low Pressure Cut Out Delay	Setpoint	Time delay before Low Pressure Alarm (LPA) is activated. 0 = Disabled.
LSH <b>Lsh</b>	Low Superheat Alarm	Alarm	Ocurs when superheat is 2 or more degrees above set point and valve is 100% open for 90 minutes; Clears when superheat is above 3 deg F
LtA <b>Lta</b>	Low Temperature Alarm	Alarm	Average temperature is below the Temperature Setpoint (tS) - Low Alarm Offset (LAO) for the amount of time in the High & Low Alarm Delay (tAd)
nOA <b>nOa</b>	No Alarm	Variable	Indicates system is clear of alarm conditions
OFF <b>Off</b>	Compressor Relay OFF	Variable	Status of Compressor Relay - OFF
On <b>On</b>	Compressor Relay On	Variable	Status of Compressor Relay - On
OPn <b>Opn</b>	Valve Percent Open	Variables	The percentage the valve is open from 0 to 100%
Pdt <b>Pdt</b>	Pump down Timeout Alarm	Alarm	Ocurs when call for pumping system down and the compressor is turned off due to time out instead of pressure reaching LPC setpoint for 2 consecutive times; Alarm is cleared when pressure reaches LPC setpoint instead of timing out.
PF <b>PF</b>	Power Failure	Alarm	Ocurs when the controller has lost power at some point, and controller had CUS (custom defrost schedule) selected, under Defrosts Per Day (dPd)
POS <b>Pos</b>	Manually Adjust Valve Position	Manual	Manually open or close the electronic valve in percentage increments (1%, 10%, or 100% increments)
PrO <b>PrO</b>	Proportional	Setpoint	A coefficient to the valve control algorithm that increases valve responsiveness
PrS <b>Prs</b>	Pressure	Setpoint	Option for InP (input type) when HGB or EPR are selected for Ctl (control type)
PSA <b>PSA</b>	Pressure Sensor Alarm	Alarm	Suction pressure sensor is shorted, open or pressure out of range.
PSP <b>PSP</b>	Pressure Setpoint	Setpoint	Available when HGB or EEPR control is selected. Target pressure for control algorithm.
Pt <b>Pt</b>	Pressure/Temperature	Setpoint	Option for InP (input type) when SH (EEV) is selected for Ctl (control type)
rEL <b>rEl</b>	Relay Control	Manual	Manually control the relay
rFG <b>rFg</b>	Refrigerant	Setpoint	Type of refrigerant used in the system
rS <b>rs</b>	KE2-RSV	Setpoint	Electronic Expansion Valve Option under EDt (Expansion Device Type)
rtP <b>rtP</b>	Room Temp	Variable	Temperature of the refrigerated space; Not shown if in EEPR or EHGBP control and input is pressure.
SAt <b>SAt</b>	Saturation Temperature	Variable	Saturation temperature as calculated by the controller, Displayed if SH is selected for Ctl (control type), and Pt (pressure/temp) is selected as InP (input type), (requires pressure transducer and T1 sensor)
SCC <b>ScC</b>	Short Cycle Compressor	Alarm	Ocurs when the compressor has to come back on because of pressure going above LPC setpoint without satisfying minimum off time. If this occurs 4 times while in Off mode, can be over multiple cycles, set alarm; Clear alarm if pressure does not go above LPC setpoint through minimum off time.
SD3 <b>sd3</b>	SDR-3 Valve	Setpoint	Electronic Hot Gas Bypass Valve under EDt (Expansion Device Type)
SD4 <b>sd4</b>	SDR-4 Valve	Setpoint	Electronic Hot Gas Bypass Valve under EDt (Expansion Device Type)
SFS <b>sfs</b>	Steps Full Stroke	Setpoint	When CUS (custom) valve is selected, the number of steps to fully open or close the valve
SH <b>Sh</b>	Superheat Control	Setpoint	Control type under Ctl when EEV Only is used.
SH <b>Sh</b>	Superheat	Variable	Displayed if SHt is selected for Ctl (Control Type)
Sht <b>ShT</b>	Superheat + Temperature Control	Setpoint	Control type under Ctl when EEV+ Temperature is used.
SOF <b>Sof</b>	System Off	Manual	Manually enter system off mode
Sr <b>sr</b>	Step Rate	Setpoint	When CUS (custom) valve is selected, the steps per second in opening or closing the valve (provided by the valve manufacturer)
SSA <b>SSA</b>	Suction Temperature Sensor	Alarm	Valve closes and turns system off.
SSP <b>ssp</b>	Superheat Setpoint	Setpoint	The superheat value that the controller will maintain, not applicable if Edt (Expansion Device Type) = THR (mechanical)
SUt <b>sut</b>	Suction Temperature	Variable	Only if in SH (EEV) control
SYS <b>Sys</b>	System Mode	Variable	Displays mode of system operation: rEF (refrigerate), dEF (defrost), OFF, SOF (system manually shut off)
tAd <b>tad</b>	Temperature Alarm Delay	Setpoint	High / Low Temperature Alarm Delay Amount of time to delay a high temp or low temp alarm
tHr <b>tHr</b>	Mechanical Valve	Setpoint	Mechanical Valve selection under EDt (Expansion Device Type)
tOd <b>tod</b>	Time of Day	Setpoint	Used to set the time of day on the controller; Only displayed when dPd (defrosts per day) is CUS (custom)
tOP <b>tOp</b>	Maximum (Top) Operating Pressure	Setpoint	The maximum allowable suction pressure, not applicable if Edt (Expansion Device Type) = tHR (mechanical)
tS <b>ts</b>	Temperature Setpoint	Setpoint	Room temperature to be maintained
tt <b>tt</b>	Temperature/Temperature	Setpoint	Option for InP (input type) when HS (EEV) is selected for Ctl (control type)
tPr <b>tPr</b>	Temperature	Setpoint	Option for InP (input type) when HGB or EPR are selected for Ctl (control type)
Ub <b>ub</b>	Motor Type	Setpoint	When CUS (custom) valve is selected, the type of valve motor: Uni (unipolar), bi (bipolar)
Unt <b>unt</b>	Temp Units	Setpoint	Fahrenheit (FAH) or Celsius (CEL)



## KE2 Temp + Valve Control (pn 21301)

For Medium Temperature Applications with Air Defrost

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### Custom Defrost Setup

The following steps will guide you through the setup of the KE2 Temp's custom defrost feature.

Please note, the KE2 Temp + Valve Control does not have a on-board battery backup. If the controller loses power, the defrost schedule may be offset by the amount of time the controllers is without power.

#### Abbreviations:

CUS = custom

d1 = custom defrost 1

diS = disabled

dpd = defrosts per day

ts = temperature setpoint

tod = time of day



### STEP 1

Press and hold the **ENTER** button, **ts** is displayed on the LEDs

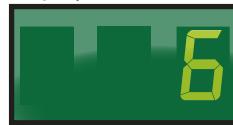


### STEP 2

Press the **▲** up arrow until **dpd** is displayed,



then press **ENTER**, 6 (default) will be displayed.

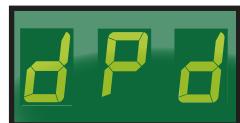


### STEP 3

Press the **▲** up arrow until **CUS** is displayed.



Press and hold the **ENTER** button for 3 seconds until the **dpd** is displayed.



### STEP 4

Press the **▲** up arrow until **tod** (time of day) is displayed,



then press **ENTER**

Use the **▲** up arrow and **▼** down arrow to set the time.

**Note:** The time is displayed in military time (24-hr clock). The 1st 2 digits are the hour. The minutes are after the decimal. Since there are only 3 digits, the time will be set to the nearest 10 minutes. See examples below.

#### Examples:

8:10 am would be 8.1 on the controller's display



4:32 pm would be 16.3 on the controller's display.



After the time is set, press and hold the **ENTER** button for 3 seconds, until **tOd** is displayed



### STEP 5

Press the **▲** up arrow to display Defrost 1 (**d1**).



To set the first defrost, press **ENTER** button.

**diS** (disabled) will be displayed.



Use the **▼** down arrow to set the defrost time.

**Note:** Defrost times may only be set on the hour.

#### Example:

2:00 am would be 2

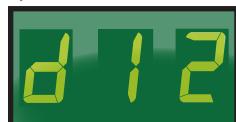


Once the correct time is displayed, press and hold the **ENTER** button until **d1** is displayed.



### STEP 6

Repeat steps as necessary for **d2** to **d12**.



### STEP 7

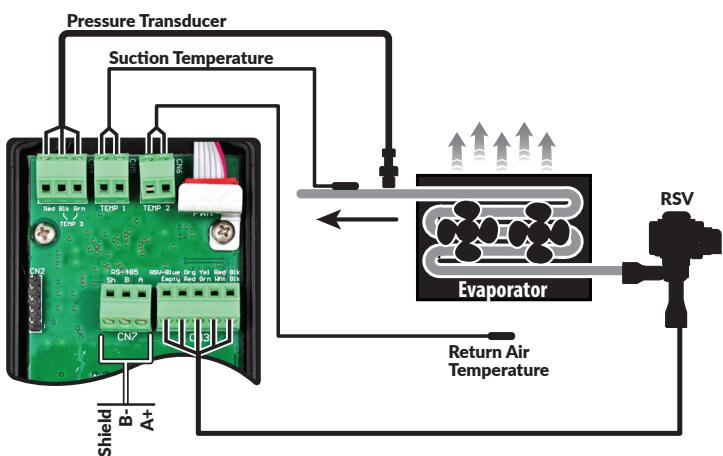
Press the **BACK** button to save settings, and return to the main screen (room temp will be displayed).



## KE2 Temp + Valve Control (pn 21301)

For Medium Temperature Applications with Air Defrost  
Installation Manual

### CONTROL TYPE: Superheat and Temperature w. Air Defrost

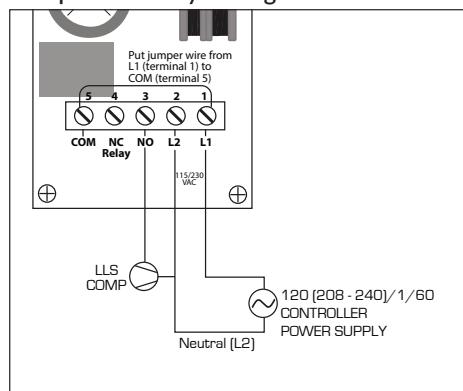


#### Communication

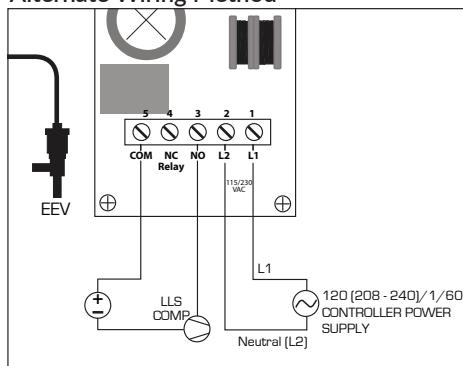
ModBus communication can be connected to existing Building Management System (BMS) or to KE2 Therm's The KE2 LDA Communication device.

Using the KE2 LDA allows quick & easy access to monitor & control the KE2 Temp + Valve, as well as receive alarm notifications via text or email. For more information see Bulletin B.5.7.

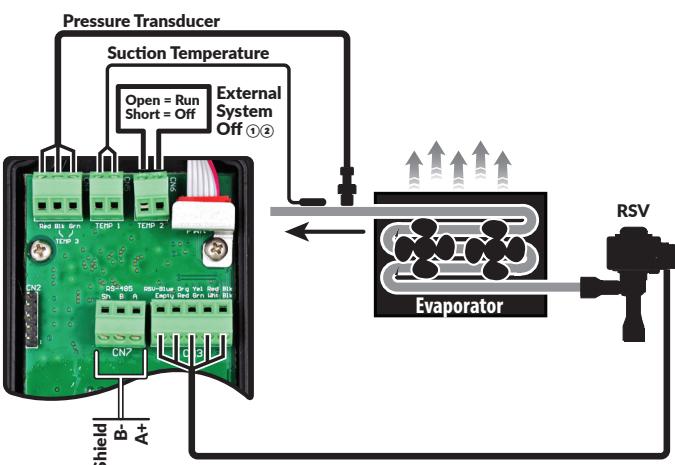
#### Compressor Relay Wiring



#### Alternate Wiring Method



### CONTROL TYPE: Superheat Only



<sup>(1)</sup>KE2 Temp + Valve should be supplied with signal from 3rd party to close valve when function not desired.  
<sup>(2)</sup>The controller relay will switch with 3rd party signal. The relay will be energized while the system is running.

#### Communication

ModBus communication can be connected to existing Building Management System (BMS) or to KE2 Therm's The KE2 LDA Communication device.

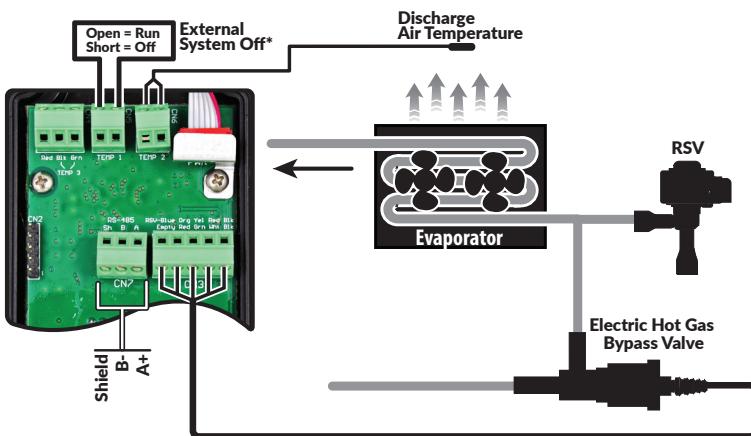
Using the KE2 LDA allows quick & easy access to monitor & control the KE2 Temp + Valve, as well as receive alarm notifications via text or email. For more information see Bulletin B.5.7.



## KE2 Temp + Valve Control (pn 21301)

For Medium Temperature Applications with Air Defrost  
Installation Manual

### CONTROL TYPE: Hot Gas Bypass: Temperature Control



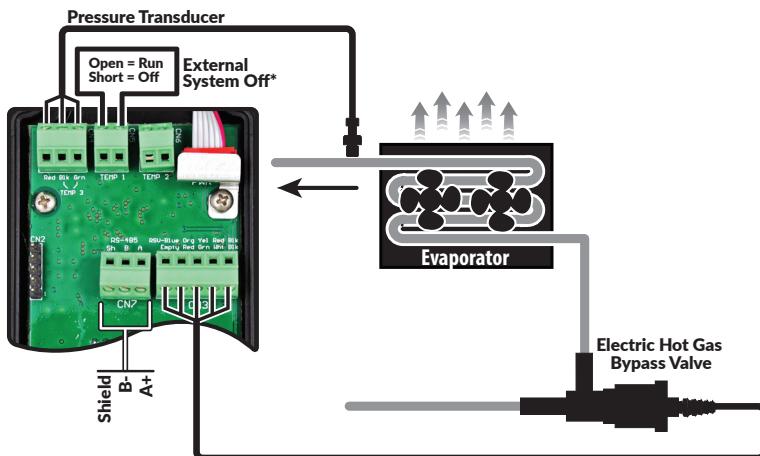
\* KE2 Temp + Valve should be supplied with signal from 3rd party to close valve when function not desired.

#### Communication

ModBus communication can be connected to existing Building Management System (BMS) or to KE2 Therm's The KE2 LDA Communication device.

Using the KE2 LDA allows quick & easy access to monitor & control the KE2 Temp + Valve, as well as receive alarm notifications via text or email. For more information see Bulletin B.5.7.

### CONTROL TYPE: Hot Gas Bypass: Pressure for Capacity Control



\* KE2 Temp + Valve should be supplied with signal from 3rd party to close valve when function not desired.

#### Communication

ModBus communication can be connected to existing Building Management System (BMS) or to KE2 Therm's The KE2 LDA Communication device.

Using the KE2 LDA allows quick & easy access to monitor & control the KE2 Temp + Valve, as well as receive alarm notifications via text or email. For more information see Bulletin B.5.7.



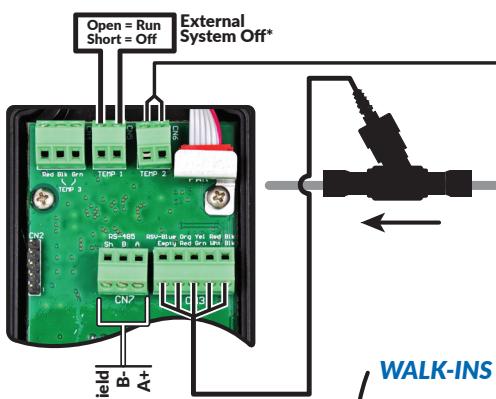
## KE2 Temp + Valve Control (pn 21301)

For Medium Temperature Applications with Air Defrost  
Installation Manual

### CONTROL TYPE: Electronic Evaporator Pressure Regulator: Discharge or Return Air Temperature



#### CASES

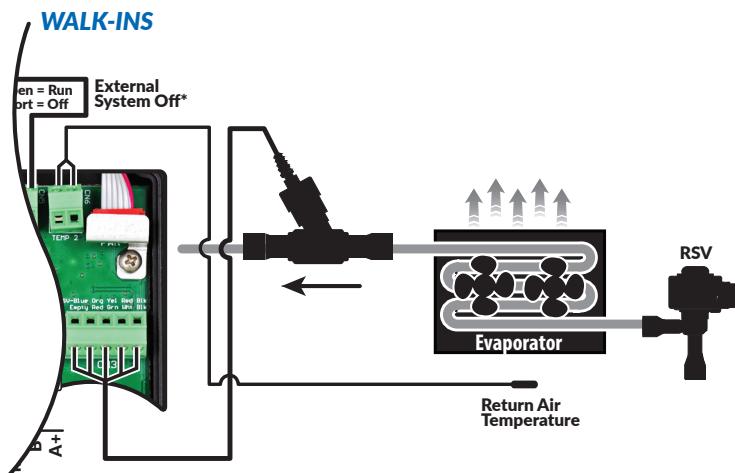


\*KE2 Temp + Valve should be supplied with signal from 3rd party to close valve when function not desired.

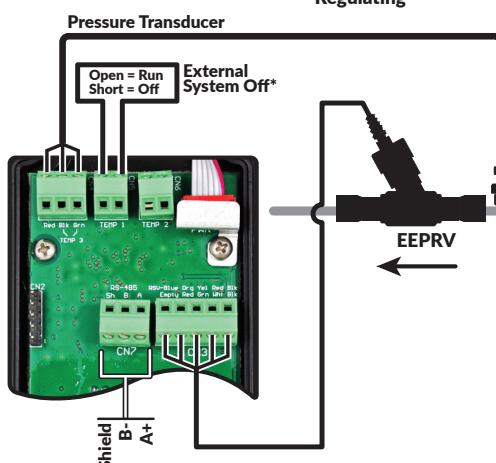
#### Communication

ModBus communication can be connected to existing Building Management System (BMS) or to KE2 Therm's The KE2 LDA Communication device.

Using the KE2 LDA allows quick & easy access to monitor & control the KE2 Temp + Valve, as well as receive alarm notifications via text or email. For more information see Bulletin B.5.7.



### CONTROL TYPE: Electronic Evaporator Pressure Regulator: Pressure Control



\*KE2 Temp + Valve should be supplied with signal from 3rd party to close valve when function not desired.

#### Communication

ModBus communication can be connected to existing Building Management System (BMS) or to KE2 Therm's The KE2 LDA Communication device.

Using the KE2 LDA allows quick & easy access to monitor & control the KE2 Temp + Valve, as well as receive alarm notifications via text or email. For more information see Bulletin B.5.7.

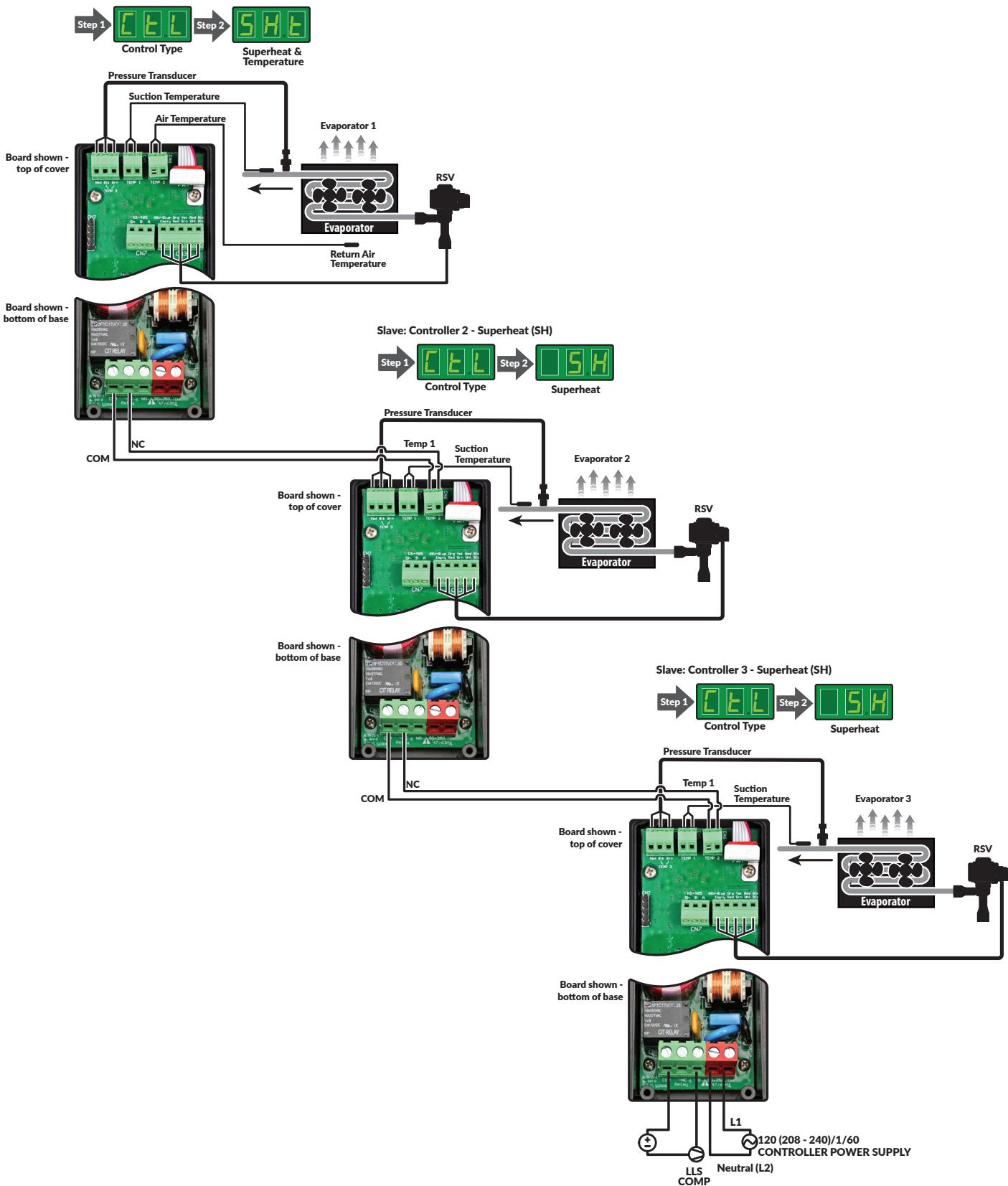


# KE2 Temp + Valve Control (pn 21301)

For Medium Temperature Applications with Air Defrost  
Installation Manual

## MULTI-EVAPORATOR SETUP

**Master: Controller 1 - Superheat & Temperature (SHT)**  
because it also controls temperature

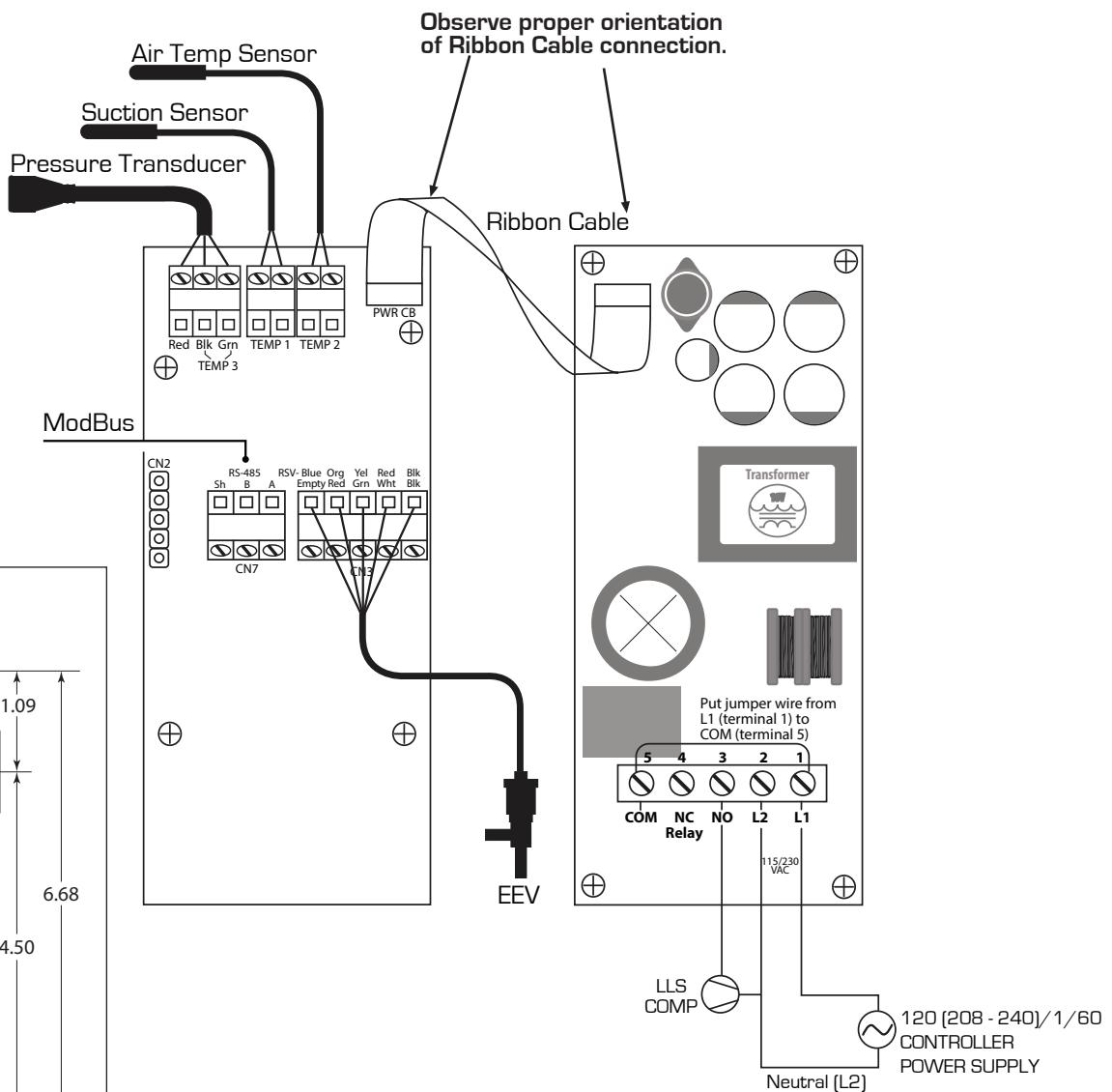




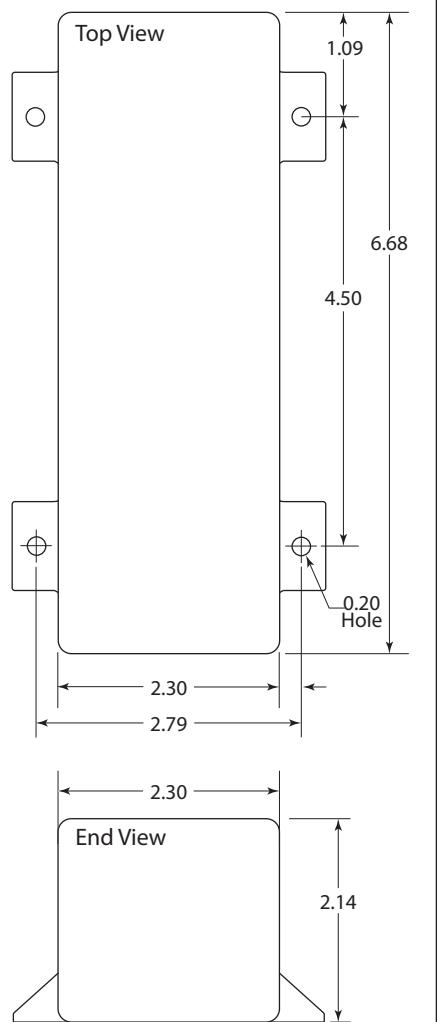
## KE2 Temp + Valve Control (pn 21301)

For Medium Temperature Applications with Air Defrost  
Installation Manual

### Wiring Diagram



### Dimensions - Inches



### Alternate Wiring Method

