KE2 Low Temp + Defrost (pn 20903)
General Product Information

c**UL**us   **TITLE 24** Compliant

Quick & Easy Remote Communication, Control & Alarming when used with the KE2 LDA

Introduction

The KE2 Low Temp + Defrost controller simplifies refrigeration control by combining the functions of a thermostat and defrost timeclock, for medium and low temp applications. The KE2 Low Temp eliminates complexity, simplifying programming, and reducing unnecessary wiring.

The KE2 Low Temp's robust design provides versatility for a wide range of medium and low temperature applications. When applied to medium temperature applications with air defrost, the built-in defrost clock may be used to perform time-initiated and time-terminated defrost cycles, in addition to standard time-initiated and temperature-terminated defrost cycles.

In low temperature applications, the KE2 Low Temp provides an easy-to-understand thermostat that eliminates end user frustration with the overly complicated options available today. The KE2 Low Temp is set up to provide the best system operation and an intuitive user interface.

The controller's single-pole-double-throw relays control the refrigeration and defrost cycles.

Controls

Temperature   **Fans**   **Heaters**   **Compressor**

Remote Monitoring, Control, Alarm Notifications

The KE2 Low Temp includes RS-485 Modbus communications, and can now be accessed remotely using the KE2 Local Area Dashboard and Alarms (KE2 LDA). See page2 & 3 for further details.

Service Call Saver - Post Defrost Indicator

To eliminate unnecessary service calls, the KE2 Low Temp + Defrost 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.

Applications - Freezers & Coolers

Walk-in   **Commercial**   **Under Counter**   **Reach-In**

Features

- Digital thermostat
- Energy saving fan cycling per Title 24
- Regulates the amount of defrost heat to reduce steaming
- Optional Door Switch with all the necessary time delays
- Off time or electric defrost on pre-defined schedule or custom defrost interval
- Compressor protection - Maximum starts per hour
- Manual defrost
- 1st defrost 2 hrs after start up
- Visual and Audible Alarming - High temp/Low temp/Sensors/Door/Power Failure (PF)
- PC/tablet/smartphone interface, e-mail alarm alerts, remote access with KE2 LDA

Hardware

- 3 Relays for solenoid / compressor, heaters , fans
- 4 digit 7-segment display
- 4-button user interface
- Modbus terminals
- Audible "buzzer"

The **space & coil temperature sensors** are supplied with 10 ft. leads, and function to control the space temperature of the room, and defrost termination, respectively.

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KE2 Low Temp Navigation

KE2®
thermsolutions

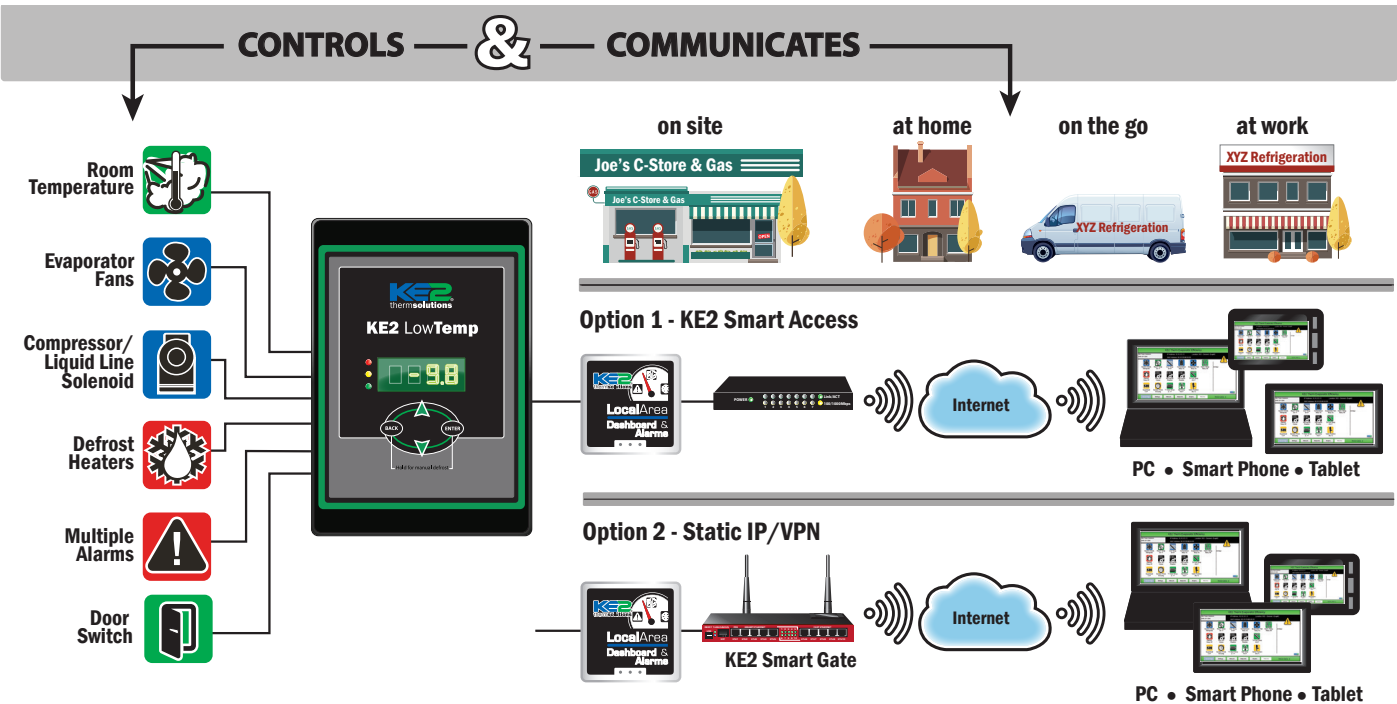**KE2** Low**Temp**

0-9.8

BACK   ENTER

Hold for manual defrost

Indicator lights
- **Red light** - Not used
- **Yellow light** - non-critical alarm (system running)
- **Green light** - compressor on
- **Green flashing** - compressor waiting on timer to start/stop

- **Access Setpoint mode by pressing and holding the** ENTER **button until tS (temperature setpoint) displays on the screen**
- **Use the ▲ up and ▼ down arrows to scroll through the available setpoints.**
- **Press** ENTER **to view the current setting.**
- **Use the ▲ up and ▼ to change the setpoint**
  Press ENTER **to move between the digits to accelerate the changes.**
- **Press** ENTER **and hold to confirm each setpoint change**
- **Press** BACK **to escape.**

Connecting to the KE2 Low Temp with the KE2 LDA

The KE2 LDA is a simple, multi-functional, communication device designed for smaller installations, of up to 10 controllers. For KE2 Therm's Ethernet or Serial-ModBus devices, the KE2 LDA provides the ability to:

- Serve as a Permanent WiFi Service Tool
- Display a Local Area Dashboard showing controllers connected to the customer's network

- Connect controllers to KE2 SmartAccess customer portal without requiring controller upgrades
- Send Email Alarms for all connected controllers to multiple email recipients
- View Serial devices in a webpage, make changes to setpoints, and receive alerts via email or text message

CONTROLS — & — COMMUNICATES

Room Temperature

Evaporator Fans

Compressor/ Liquid Line Solenoid

Defrost Heaters

Multiple Alarms

Door Switch

KE2 Low**Temp**

0-9.8

BACK   ENTER

on site
Joe's C-Store & Gas

at home

on the go
XYZ Refrigeration

at work
XYZ Refrigeration

Option 1 - KE2 Smart Access

LocalArea Dashboard & Alarms

Internet

PC • Smart Phone • Tablet

Option 2 - Static IP/VPN

LocalArea Dashboard & Alarms

KE2 Smart Gate

Internet

PC • Smart Phone • Tablet

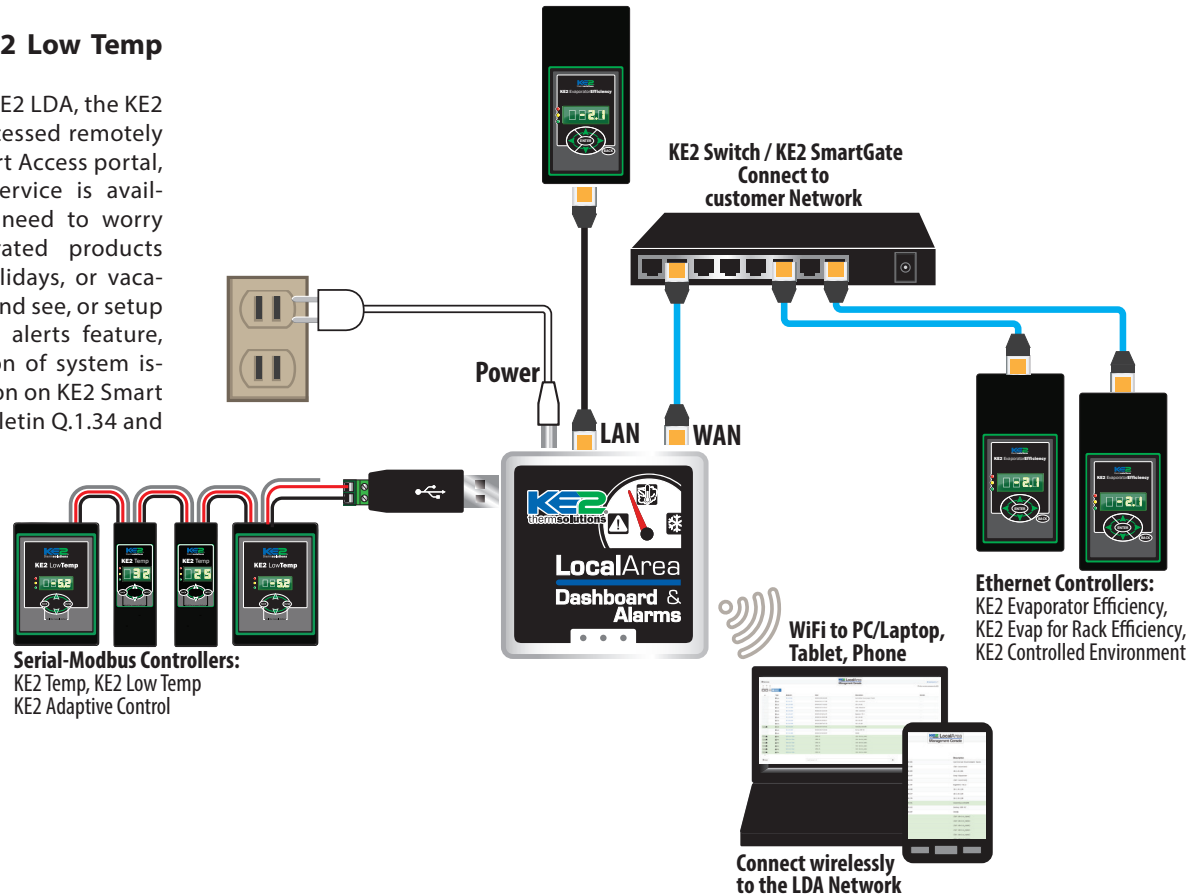**KE2 Low Temp** + Defrost (pn 20903)
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Accessing the KE2 Low Temp on a Local Area Network

When the KE2 Low Temp is connected to the same network as the KE2 LDA communication device, 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 Low Temp on the Internet

When used with the KE2 LDA, the KE2 Low Temp 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.

KE2 Switch / KE2 SmartGate
Connect to customer Network

Power

LAN   WAN

Serial-Modbus Controllers:
KE2 Temp, KE2 Low Temp
KE2 Adaptive Control

Ethernet Controllers:
KE2 Evaporator Efficiency,
KE2 Evap for Rack Efficiency,
KE2 Controlled Environment

WiFi to PC/Laptop, Tablet, Phone

Connect wirelessly to the LDA Network

Service View Webpage

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

KE2 Low Temp + Defrost
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TITLE **24** Compliant

Basic Menu

	Setpoint	Description	Minimum	Default	Maximum
	tS	Temperature Setpoint	-50°F	-10°F	100°F
	diF	Differential	1°	5°	30°
	CSH	Maximum Compressor Starts/Hour	5 (Off)*	6	10
▲	dtYP	Type of Defrost, Air or Electric	Air	Elec	Elec
	dPd	Defrost Per Day	0	4	12, CUS**
	dtSP	Defrost Term Temperature Setpoint	35	50 if Elec diS*** if Air	90
▼	dFt	Defrost Time	0 min	30 min	720 min
	drnt	Drain Time	0 min	2 min	15 min
	FndF	Fan State During Defrost	OFF	OFF if Elec On if Air	On
	HAO	High Alarm Offset	1°	10°	50°
	LAO	Low Alarm Offset	1°	4°	10°
	tAd	Temp Alarm Delay	1 min	90 min	180 min

*Selecting fewer than 5 compressor starts per hour results in the starts per hour feature turning off (0 or Off is displayed).
 The compressor then functions on temperature only.
**Selecting CUS (custom) unlocks additional Setpoints. See Q.1.29 for details.
***diS = disabled.

Alarm Codes

When the KE2 Low Temp is in alarm, it notifies the user by illuminating the amber LED, displaying the appropriate Alarm Code, and sending an e-mail alert to multiple addresses (when used with the KE2 LDA):

nOAL	No Alarm
AtSA	Air Sensor
CLSA	Coil Sensor
AU1A	Auxiliary Input 1 Alarm
AU2A	Auxiliary Input 2 Alarm
HtA	High Temperature Alarm
LtA	Low Temperature Alarm
d00r	Door Open
PF	Power Failure

Specifications

Controller

Input Voltage:	120V / 208-240V			
Storage Temp:	-40° to 120°F (-40° to 49°C)			
Operating Temp:	-40° to 120°F (-40° to 49°C)			
Display:	4 digit 7-segment LED			
IP Rating:	IP65			
Inputs (4):	2 temperature sensors (KE2 SKU 20199)			
	2 dual purpose temperature or digital inputs			

Outputs: (3) Relays Single Pole Double Throw		Normally Open		Normally Closed	
		120V	240V	120V	240V
	FLA	30A	30A	N/A	12A
	LRA	98A	80A	N/A	24A
	Resistive	N/A	30A	N/A	30A
	Horsepower	1 hp	2 hp	1/4 hp	1/2 hp
	Pilot Duty	800VA	720VA	290VA	360VA

Communication:	RS-485 (Modbus)

Temperature Sensor

Sensor Specs:	-60° to 150°F (-51°C to 66°C) moisture resistant package

Dimensions - inches
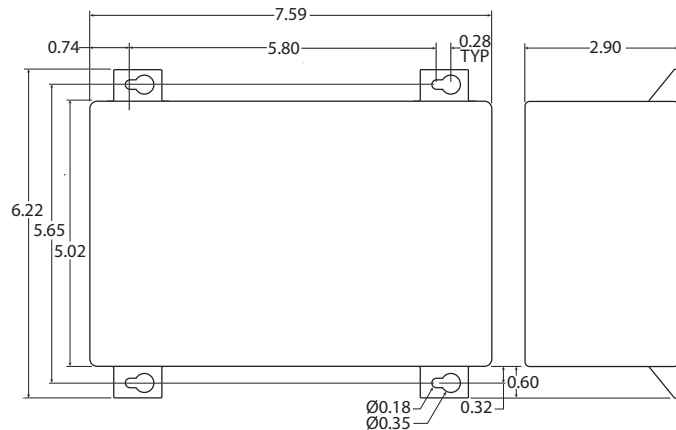
TITLE **24** Compliant

What is Title 24 Compliant?

Title 24 Compliant insures that evaporator fans, served by a single compressor, and operating without variable capacity controls, will reduce their airflow 40% for at least 75% of the time when compressor is not running.

To set the controller for Title 24 compliance see bulletin Q.1.29.