thermsolutions

B.1.5
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KE2 Low Temp + Defrost (pn 20903)

General Product Information

TITLE 24 Compliant

Introduction

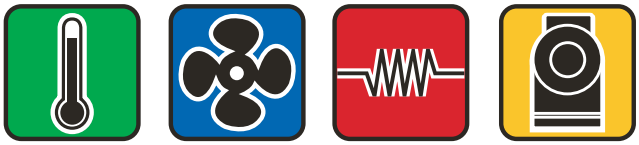
The KE2 Low Temp + Defrost controller simplifies refrigeration control by combining the functions of a thermostat and defrost timeclock, for medium and low temp applications. The KE2 Low Temp eliminates complexity, simplifying programming, and reducing unnecessary wiring.

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



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)

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.

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.

Applications - Freezers & Coolers

Communications

The KE2 Low Temp includes RS-485 Modbus communication.

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			

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Programming the Controller

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.**

Alarm Codes

When the KE2 Low Temp is in alarm, it notifies the user by illuminating the amber LED, and displays the appropriate Alarm Code:

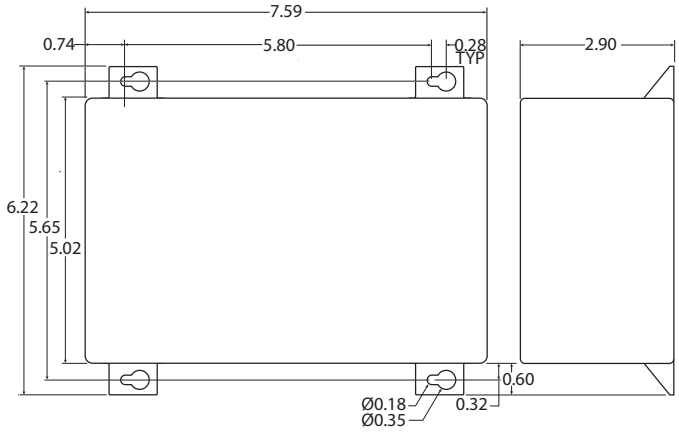
nOAL	No Alarm
AtSA	Air Sensor
CLSA	Coil Sensor
AU1A	Auxiliary Input 1 Alarm
AU2A	Auxiliary Input 2 Alarm
HtA	High Temperature Alarm
LtA	Low Temperature Alarm
dOOr	Door Open
PF	Power Failure

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 diSA*** 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.
***diSA = disabled.

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.

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