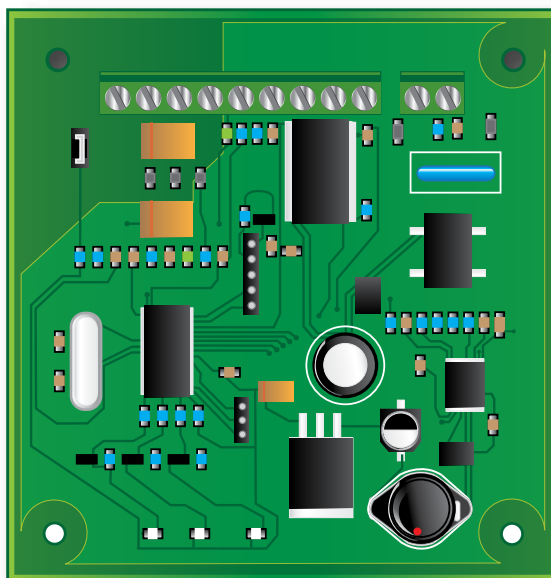




KE2 SimpleSuperheat

Installation Instructions





Parts List

The following parts are needed for installation of KE2 Therm Solutions Simple Superheat Board:

- (1) Simple Superheat Board
part # varies with customization
- (4) Non-metallic (nylon) standoffs
(height ¼" or greater)
- (1) Snaptrack (optional)
- (4) Mounting screws
- (1) Pressure transducer
0-150 psia part #20201
0-300 psig part #20208 (if programmed for R410A)
- (1) Temperature sensor (2K)
part #20199



Simple Superheat Board



Temperature Sensor



Pressure Transducer



Snaptrack

Precautions

The KE2 Simple Superheat (KE2 SS) is a microprocessor based Electronic Expansion Valve (EEV) controller. It has been designed to provide the best value in superheat control. As with any product utilizing a microprocessor, the silicon substrate used to make the chip must be protected from static electricity.

KE2 Therm Solutions ships products in anti-static packaging to provide protection to the board during shipment. When the board is removed from the anti-static bag, the user must be properly grounded to prevent damage to the board. A grounding strap or equivalent grounding equipment should be used when handling the board.

If it is necessary to handle the board without grounding, the board should be handled by touching the outer edges of the board and nonmetallic portion of the terminal strip. Handling the board without being properly grounded creates a higher potential for damage to the board. Damage to the board from static electricity is not covered under the warranty.

Mounting the Board

The KE2 Simple Superheat is conformal coated to protect the board against moisture. The coating allows the board to operate in the refrigerated space. While in operation, the board may temporarily come into contact with water, however, continuous contact may damage the board.

The KE2 SS boards have been designed for easy installation. The board's dimensions are set to mate with 3.25" snap track, available from KE2 Therm. The snap track should be securely mounted with two self-tapping screws. The board is then installed in

the snaptrack, by placing an edge of the board into the slot on one side of the snaptrack, **Figure 1a**. The second edge is then pressed into the snap track until it snaps into the opposite groove. **Figure 1b**.

Figure 1a- Inserting Simple Superheat in Snaptrack



Figure 1b



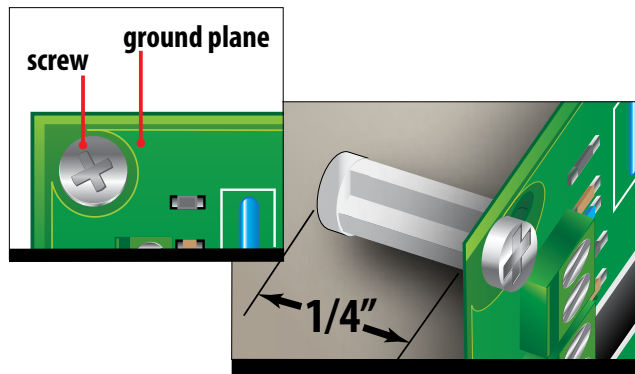
An alternate installation is available through the mounting holes in the four corners of the board. The board has (4) 1/8"



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holes. The holes are conveniently sized to mate with standard 1/8" stand offs. The stand offs should be constructed of a non-conductive material, such as nylon, with an minimum of 1/4" clearance. If screws are used to attach the board to the stand offs, the head should not overlap the ground plane of the board. The ground plane can be seen through the green printed circuit board coating. See **Figure 2**.

Figure 2



Wiring

All terminal blocks should be tightened to 5 in-lbs.

Power Supply

24VAC

Input voltage not polarized.
Use DC voltage if desired.

Valve

- 1a** – KE2 / Sporlan – Black wire
Danfoss – White wire
- 1b** – KE2 / Sporlan – Red
Danfoss – Red
- 2a** – KE2 / Sporlan – White
Danfoss – Black
- 2b** – KE2 / Sporlan –Green
Danfoss – Green

Sensor

Temp(-) (+)

Temperature inputs are not polarized. Each wire may be in either location.

Pressure Transducer

PRES(sig)– Green wire

GND(-) – Black wire

+5VDC – Red wire



Specifications

Power input: 24V AC/DC, 20VA

Range: 20 to 26.4 volts

The board is designed to be powered by 24 volts AC or 24 volts DC. The board uses a full bridge rectifier, requiring each board to be powered by a dedicated, floating ground, transformer.

Analog Inputs

Temperature Sensor: -60 to 150°F

Pressure Transducer: 0-5VDC (0.5 – 4.5 output)
0-150 psia most refrigerants
0-300 psia R-410A

The temperature sensor and pressure transducer may be extended to 100' using 18 gage twisted shielded pair.

Digital Inputs

CN4: This is a jumper input that may be used to select customer specified setpoints.

CN3: This is a jumper input that may be used in combination with CN4 to select customer specified inputs

Temp(-) (+): Using a dry contact, this analog input may be used as a pumpdown terminal. This simulates a sensor fault that causes the valve to go closed.

Valve Driver

The controller is able to drive a 12VDC unipolar or bipolar valve using a L/R drive method at 30 to 400 steps per second. The controller may be used to power 2 valves when simultaneous operation is required.

Troubleshooting

Alarms

The KE2 SS has 3 onboard Light Emitting Diodes (LEDs) to assist troubleshooting the board. **Table 1** shows the status indicators.

Table 1 - Status Indicators / Alarms

Alarm	Green LED	Amber LED	Red LED
None (Normal Operation)	●	○	○
Pressure Sensor Fault	○	○	●
Temperature Sensor Fault	○	●	○
High Superheat Alarm	●	●	○
Low Superheat Alarm	●	○	●

Toubleshooting the Simple Superheat Board

If the KE2 SS is not functioning properly, there are a series of tests that should be completed before calling technical support.

You will need a digital multimeter to complete the tests.

1. Remove all wires from the board.
2. Connect power to the 24VAC terminals on the board.
3. Using a digital multimeter, set to AC volts, immediately measure the output from 1a and 2a.
4. The reading should be 12 – 14V.



5. Next repeat Steps 1- 4 measuring the output from 1b and 2b in place of 1a and 2a.

If 12 – 14V are read from both locations, the controller is functioning.

Troubleshooting the Temperature Sensor

After testing the board, next test the sensors.

1. Visually inspect the sensor for any damage to the black jacket and stainless steel housing.
2. To test the sensor, the multimeter should be set to read Ohms.
3. Measure the resistance between the temperature sensor leads and compare to **Table 2**.

Table 2 - Temperature vs. Resistance

Temperature °F	Ohms
-22	19480
-4	12110
14	7763
32	5114
50	3454
68	2387
77	2000
86	1684
104	1211
122	885

Troubleshooting the Pressure Transducer

1. Connect the pressure transducer to the controller.
2. Set the multimeter to DC volts.
3. Measure the voltage from the +5VDC to the GND(-).
4. Verify the reading is 5VDC
5. Measure the voltage between PRES (green wire) and GND(-) (black wire)
6. Insert the voltage measured in Step 5 into Equation 1
7. If the pressure transducer is attached to the system, verify the calculated pressure to the actual pressure using a gage set.

Equation 1

$$\text{Pressure} = \frac{(\text{Voltage } -0.5V) \times \text{Range}}{4V}$$

(measured in Step 5) (150 or 300 psi)

Troubleshooting the Valve

To verify the functionality of the valve, refer to the valve manufacturer's troubleshooting instructions.

For additional assistance contact KE2 Therm Solutions by phone at (636) 266-0140, or e-mail: techsupport@ke2therm.com.

Figure 3 - General Schematic with KE2 Simple Superheat and Accessory Components

