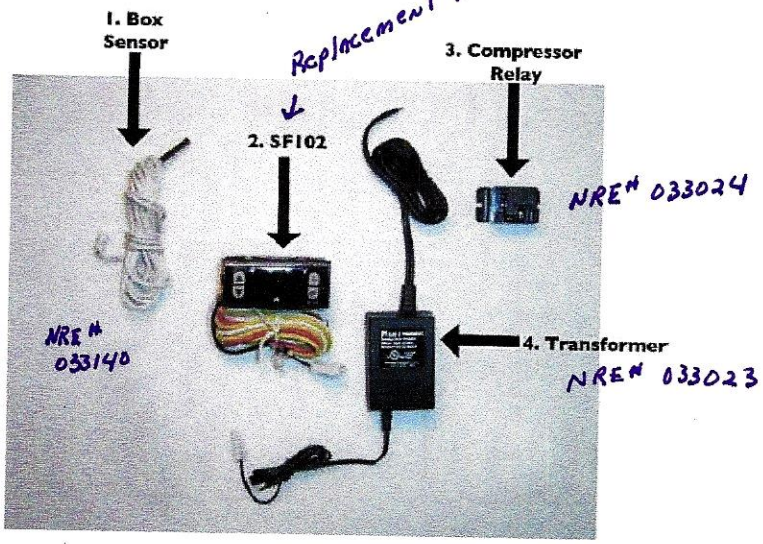
3. Electronic Control, SF-102 - Coolers

3-1. Components

The components of the electronic control for Ascend coolers consist of:

(1) Box Sensor
(2) SF-102, micro temp control
(3) Compressor Relay
(4) Transformer



3-2. Electrical Set up

- The electronic control runs off of 12 volts AC, and sends out 12 volts DC.
- 120 V AC is converted to 12 V AC by the transformer before entering the control. The output for the compressor (terminal 1 out the back of the control) is 12 V DC. At the compressor relay it is changed to 120 V AC, which powers the compressor.

3-3. Basic Operation

***The** electronic control in Ascend coolers is preset for optimal performance from the factory. In most cases the only adjustment that may be desired is changing the set point.*

Changing the set point:

- To change the set point, press and release the "SET" button. A number will now be flashing on the screen; this number is the set point.
- To change the desired set point, simply press the up or the down arrow until the flashing number reads the desired set point.
- When the desired set point is flashing on the screen there is no need to do anything further. In a few seconds the flashing set point will be replaced with the solid readout of the current box temperature, and the new set point will be stored in the controller's memory.
- The box will now cycle on and off between the value of the set point and the value of the set point plus the differential. See Section ***3-4*** for more information.
- Allow up to two hours, depending on product loading and ambient temperatures for the unit to reach the new set point.

Initiating a manual defrost:

- The default settings for the cooler will automatically initiate an off cycle defrost every 12 hours. However, if at any time a one-time manual defrost is desired, simply press and hold the manual defrost button for six seconds. There will be an audible beep and the LED indicator for "defrost" will activate.
- At default settings the defrost will last for 30 minutes. At this point the defrost LED indicator will change from solid to indicate "in defrost" to a blinking indicator to indicate that the unit has just come out of defrost. This blinking will continue for 15 minutes.

3-4. Changing Settings

*The electronic control in Ascend coolers is preset for optimal performance from the factory, however **if you are installing a replacement control**, or **wish to change defrost settings** the default settings will need to be adjusted.*

- Press and hold the "SET" button for five seconds, until the control emits an audible beep - release the "SET" button. The display will now show a blinking "E1." This is the first of the adjustable settings.
- To make a change to any setting, press and release either the up or the down arrow until the desired setting is reached.
- To move to the next setting press and release the "SET" button. If more than ten seconds go by without any buttons being pressed, the control will save all settings, exit the parameter set-up mode, and go back to reading the box temperature.
- To either lock or unlock the parameter set-up mode, press and hold the down arrow while the display is reading box temperature. After ten seconds the control will emit an audible beep and

the display will read "ON," indicating that settings E1 through C1 can be changed, or "OFF," indicating that E1 through C1 cannot be modified.

3-5. Factory Settings

E1 The lowest value the end user can choose as the set point.
E2 The highest value the end user can choose as the set point.
E3 The differential. With a set point of 36° and a differential of 7°, the unit will cool until it reaches 36°. At this point, the compressor will then shut off and not come back on until the unit reaches 43° (36 + 7). The unit will cycle on and off between these two temperatures, maintaining an average box temperature half way between.
E4 The compressor start delay is the shortest amount of time between the compressor cycling off and coming back on. It also will delay the compressor from starting when the unit is plugged in.
E5 and **E6** will offset the temperatures read by the box and evaporator sensors. This setting is rarely used.
F1 The maximum amount of time that a defrost *can* last. A defrost will last for the value set in F1 ***or*** until the evaporator sensor reads the value set in **F3**.
F2 The defrost interval controls how often the unit goes into defrost. A setting of six corresponds to every six hours, or four times a day. In addition, the first defrost will start an **F2** number of hours after the unit is first plugged in.
F3 The defrost termination temperature value will bring the unit out of defrost before the full amount of time set in **F1** has been reached if the evaporator sensor ever reaches the value set in **F3**.
F4 The display during defrost. A setting of "00" will show the current box temperature as it rises during a defrost, while a setting of "01" will lock in the last temperature value before the defrost began.
F5, F6, F7, F8 and F9 are advanced settings and are advised not to be changed.
C1 The temperature display units. "00" for Celsius, "01" for Fahrenheit.

SF-102 Solid Door Cooler
Factory Settings

	Description	Setting
E1	Low set limit, °	36
E2	High set limit, °	45
E3	Differential, °	7
E4	Comp. start delay, minutes	3
E5	Box temp. offset, °	0
E6	Evap temp. offset, °	0
F1	Max. defrost duration, minutes	30
F2	Defrost interval, hours	12
F3	Defrost termination, °	68
F4	Display during defrost	1
F5	Fan operation function	1
F6	Draining time	4
F7	Fan restart after defrost	0
F8	When F7=00	6
F9	When F7=01	0
C1	Temperature units	1

3-6. Troubleshooting the SF-102

If the unit is not cooling:

Is the compressor LED indicator on?

- If the set point is higher than the box temperature, the compressor will not come on.

If the compressor LED indicator is on, but the compressor is not:

- If the box was just plugged in, there will be a compressor start delay (setting **E4**).
- Check for voltage out of terminal one on the back of the control. The voltage should be 12V DC.
- Check for voltage at the compressor relay. There should be 120V AC to the compressor.

If the compressor LED indicator is on, and there is 120V AC out of the compressor relay:

- Check operation of compressor.

Is the temperature the box sensor reading the true box temperature?

- Ohm out the sensor. The sensor should read 28,000Ω at 32°F and 10,000Ω at 77°F.

If the unit is too cold:

Is the compressor LED indicator on?

- If the set point is lower than the current box temperature, the compressor will stay on until it reaches the set point.

If the compressor LED indicator is not on:

- Check for voltage out of terminal one on the back of the control. There should not be voltage if the compressor LED indicator is not lit.
- Check for voltage out of the compressor relay. There should not be voltage out of the relay when the compressor LED is not lit.

Is the temperature the box sensor reading the true box temperature?

- Ohm out the sensor. The sensor should read 28,000Ω at 32°F and 10,000Ω at 77°F.

If the unit is building up ice:

Are the defrost settings (F1-F9) set to factory settings?

- Check the settings (see ***3-3*** and ***3-4***) and reset to factory values if needed.

If defrost settings are at factory recommendations:

- Verify gasket seals, and product moisture levels.
- If needed, change the frequency or duration of the defrost cycle. Settings **F1 - F3** can be changed, call factory for recommendations.