

Evaporator Fan Controllers for Walk-In Refrigeration

Plug & Play Energy Saving Device

Potential 2-Year Payback • Significantly Reduces Energy Costs



- Easy installation
- Used in walk-in coolers and freezers
- Automatically reduces evaporator fan speed when compressor is off
- Can be used with 120 Vac or 240 Vac systems
- Automatically selects between 120 Vac or 240 Vac for ease of wiring
- Can be used with ECM or shaded pole motors
- Reduces heat load inside coolers
- Available in ECM only model

The **Evaporator Fan Controllers** are developed for use in walk-in coolers and freezers like the ones found in convenience stores, flower shops, schools, hospitals, cafeterias, etc. The fans in the evaporator boxes run at normal speed at all times, even if the thermostat is not calling for a cooling cycle. To save money, the Evaporator Fan Controllers monitor the temperature on both the intake and exhaust of the evaporator fan unit. When the temperature of the exhaust is lower than that of the intake, the fans will run at normal speed. When the temperature of the exhaust is equal to the intake temperature however, the Evaporator Fan Controllers will reduce the speed of the fans to save energy, significantly reducing energy costs. When the compressor turns back on to meet thermostat requirements, the Evaporator Fan Controllers will then once again return the fans to normal speed. This temperature monitoring and fan speed control allows for energy savings without an impact on the overall temperature of the cooler or freezer.



Functional Devices, Inc.
310 South Union Street
Russiaville, IN 46979

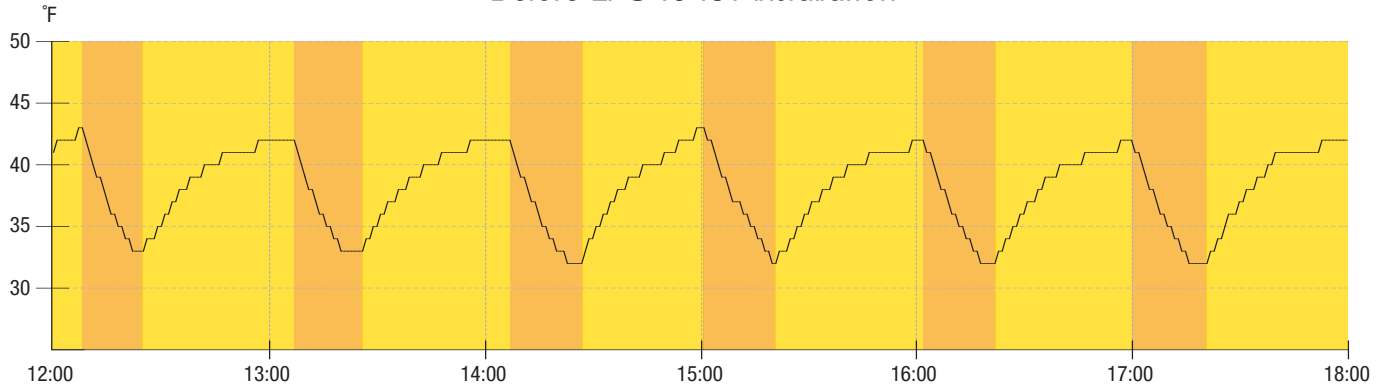
Office 765.883.5538
Sales 800.888.5538
Fax 765.883.7505

www.FunctionalDevices.com

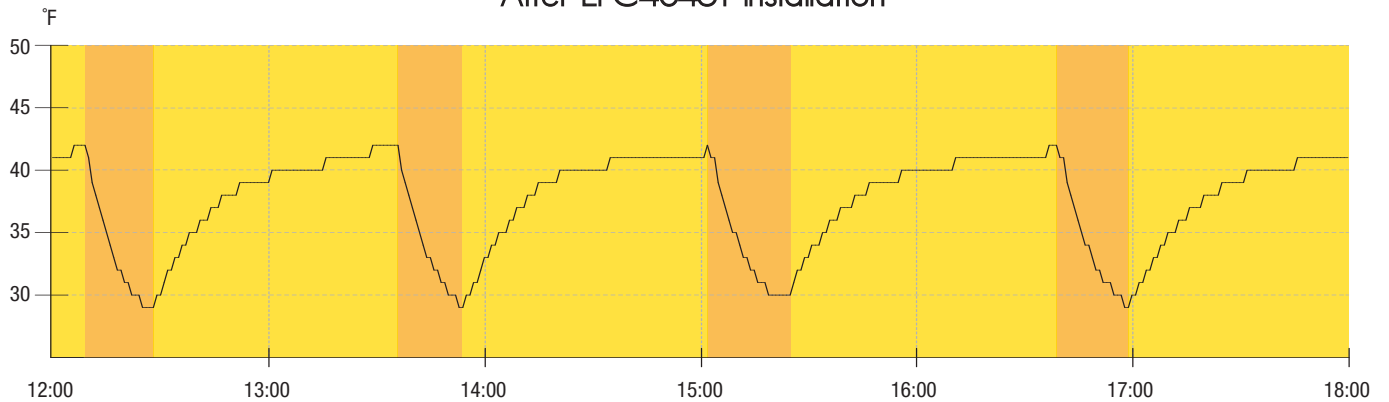
Evaporator Fan Controllers: Compressor Runtime Comparison



Evaporator Fan Controllers were installed in a walk-in cooler in the Midwestern United States. Recordings were gathered using temperature sensors over the course of six days. The graphs below show the temperature change over a six hour time span which indicate compressor cycles.

Before EFC4045T Installation



After EFC4045T Installation



Compressor Running 
Compressor Off 

As shown above:

Cooling cycle is greatly reduced when the EFC sets the evaporator fan unit into low. When fans speeds are reduced, warm air does not mix as quickly with cold air in the walk-in cooler. This results in a slower gradual warming cycle. Energy savings can be realized two fold:

1. Evaporator fan speed is reduced
2. Cooling or compressor "runtime" is reduced.



Thermistors Included



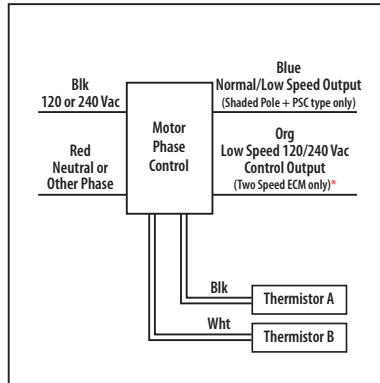
Made in USA
Meets "Buy American" of ARRA 2009



Evaporator Fan Controller for Use in Walk-In Coolers

EFC4045T

Enclosed Two Speed ECM / Shaded Pole Motor Phase Controller with Temperature Differential Input, 120 Vac or 240 Vac Input for Use in Walk-In Coolers



Temperature Differential Input

When Thermistor A (located on exhaust of evaporator box) senses lower temperature than Thermistor B (located on the intake), the compressor will be running and outputs will be set to Normal Speed. When Thermistor A senses equal temperature to Thermistor B (compressor off), outputs will be set to Low Speed.

*Use with Two Speed ECM Motors

62% Average Savings

Example Calculation of Energy Savings

Compressor Off Cycle: 75%
Hours per year: 8760 hours

Compressor Off Time per year: 6570 hours
Typical Cost of Power: **\$0.10/kWh¹**

Power Consumption @ Low Speed: 0.036 kW
Power Consumption @ Normal Speed: 0.209 kW

Measured Values for Two Shaded Pole Motors in One Unit¹

Savings =

$$\begin{aligned} & (\text{Power Consumption @ Normal Speed} - \text{Power Consumption @ Low Speed}) \times (\text{Compressor Off Time per year}) \times (\text{Typical Cost of Power}) = \\ & (0.209 \text{ kW} - 0.036 \text{ kW}) \times (6570 \text{ hours/year}) \times (\$0.10/\text{kWh}) = \mathbf{\$113.66/\text{year per Evaporator Fan Unit (2 motors)}} \end{aligned}$$

¹ = Average U.S. price of electricity as reported by the U.S. Energy Information Administration, July 2010.

SPECIFICATIONS

Operating Temperature: -30 to 80° F

LED Status: Red LED=Normal Speed
Green LED=Low Speed

Dimensions: 4.22" x 6.00" x 2.57"

Wires: 600V Rated

Approvals: UL Listed, UL916, C-UL, CE Approved, RoHS

Housing Rating: Plenum, NEMA 1

Override Switch: No

Output Ratings:

Blue - 7 FLA max @ 120 Vac (Normal Speed)
5 FLA max @ 240 Vac (Normal Speed)

Org - 1/3 HP @ 120/240 Vac

10 A General Purpose @ 120/240 Vac
B300 Pilot Duty

Blue Wire Output Voltage:

Normal Speed (Compressor Running) - 120/240 Vac

Low Speed (Compressor Off) - 40/80 Vac*

*Low speed voltage can be increased on a 120 Vac system by putting white switch in 45V (max low speed) position.

This will increase fan speed for compressor off cycle but reduces energy savings.

Input Voltage:

120 or 240 Vac

Notes:

- » Thermistors are included.
- » Recommended for ball bearing motors only.
- » 3-5° F Temperature Differential required to switch to high speed.

Energy Savings for Shaded Pole & PSC Motors

Switch in 45V position:

Approx. 77.8% energy savings when in Low Speed.

Switch in 40V position:

Approx. 82.8% energy savings when in Low Speed.

Energy Savings for Two Speed ECM Motors

Approx. 83.3% energy savings when in Low Speed.