

Introducing the Three-Phase Frigitek®

The Frigitek is an innovative product, designed to save energy used in industrial refrigerators and freezers. Tests in actual operating refrigerators show that it can save at least 30 percent, and as much as 70 percent of the operating cost of the evaporator fan motors in a typical industrial refrigerator.

The Frigitek functions by sensing the operational status of the cooling system, and controlling the speed of the evaporator fans. It has been determined that the evaporator fan motors contribute a significant amount of heat inside the refrigerated space. By operating the fans at a low speed when no cooling is called for, and at high speed only when the system is actively cooling the refrigerator, much less heat is introduced into the refrigerator. In three-phase systems, this also results in a significant saving in evaporator fan motor power, while the reduction in fan motor heat generated causes the refrigeration system to operate less, saving additional energy at the compressor.

The Three-Phase Frigitek operates over a wide range of input voltages, from 208 VAC to 460 VAC. It is factory-configured for the evaporator and no adjustments are necessary during the installation. It is **not** a variable-frequency drive (VFD).

The Three-Phase Frigitek is designed to be easily installed with new refrigerators or freezers, or to be retrofit onto existing units. Installation typically takes about two hours, and can be done by any competent electrician or refrigeration technician. The Power Unit assembly is usually mounted on the side wall or the ceiling of the refrigerator.



Controller Module

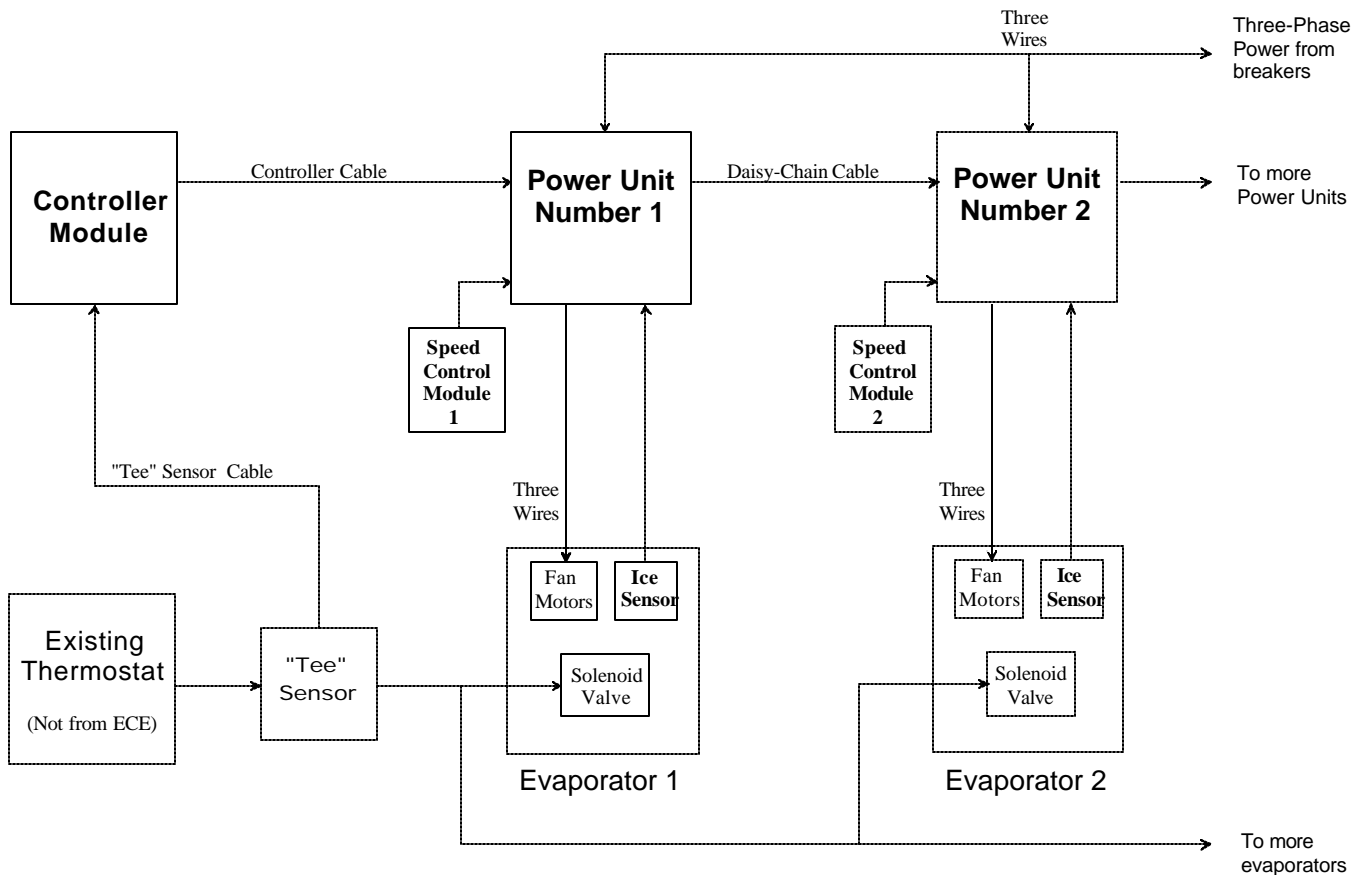
In addition to its energy saving qualities, the Frigitek also has some protection features. A phase-drop monitoring circuit protects the motors against single-phasing, and a “soft-start” feature always starts the motors in low-speed mode when power is first applied.

The Three-Phase Frigitek has a patent application pending approval. For more information, please contact Energy Control Equipment, Inc, at 877-522-6924 (toll free), or visit our Web site, at www.frigitek.com. International customers, call +831-768-8848.

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Three-Phase Frigitek® Technical Description

The Three-Phase Frigitek consists of four major components: a Controller, a “Tee” sensor, a Power Unit, and a Speed Control Module. A typical system configuration is shown.



The **“Tee” Sensor** monitors current flow in the thermostat / solenoid valve circuit, and sends a low-voltage signal to the Controller whenever the valve is open (system cooling).

The **Controller Module** commands the Power Units into high or low speed, and indicates the status of the system and the Power Units. A “Bypass” switch allows the operator to temporarily lock the system into high speed mode, if desired.

The **Power Unit** switches the evaporator fans between high speed and low speed, and monitors the associated evaporator coil for ice. Detected ice causes the Power Unit to switch to high speed mode until the ice has dissipated.

The **Speed Control Module** sets the low speed RPM of the fan motor(s).

Multiple Power Units may be connected to one Controller via a “Daisy-Chain” system. The three-phase power for different Power Units may come from different breakers.

All system interconnect cables are low-voltage cables, and require no special conduit. The highest voltage in the interconnect cables is 24 volts.

The system includes a customer-selectable feature called “Circulation Enhancement”. When enabled, this feature causes the fans to run at high speed for one minute every ten minutes, if the system remains in low speed for extended periods of time.

Three-Phase Frigitek® Specifications

Power Unit / Speed Control Module

Voltage – 208-240, 460 VAC, Three-Phase

Horsepower – 1 to 20, standard; up to 50 Hp on special order

Size – The Power Unit and Speed Control Module are shipped from the factory mounted on a wooden plate 16” wide by 24” high. The assembly is approximately 6” deep.

Weight – Approximately 40 Lbs. (complete assembly)

Mounting – Wall or ceiling



Power Unit Assembly

Controller Module

Voltage – 24VDC (supplied by Power Unit)

Size – 7” wide, 4.5” high, 2.5” deep

Weight – 2.5 Lbs

Mounting – Wall



Controller Module

“Tee” Sensor

Sensor Input Voltage – 120 / 240 VAC

Sensor Input Current – .02A – 2.0A

Output Voltage – 300 mV, nominal

Size – 5.5” x 3” x 1.5”

Weight – 8 Oz

Mounting – Junction box, Solenoid Valve or Thermostat

Options

Ceiling Mount Bracket – allows suspending the Power Unit assembly from a ceiling.

System Monitor – A contact closure output from the Controller which allows a facility computer system to monitor the operation of the Frigitek.

Temperature Differential Sensor – for use where there is no solenoid-operated valve for the “Tee” Sensor.

Agency Approvals

ETL Testing Laboratories (ETL) (conforms to UL)
(with solenoid valve)

Canadian Standards Association (CSA)

Conformité Européene (CE)

Verband der Elektrotechnik, Elektronik und Informationstechnik (VDE)



“Tee” Sensor

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