

SecureStart™ for Copeland™ Compressors

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Introduction

Single phase compressors typically have starting inrush currents that range from five to seven times their normal running current. The SecureStart™ module is designed to reduce inrush current to the compressor by up to 70%. Other benefits of SecureStart include a reduction in perceived light dimming/flicker, better starting during low voltage conditions, compressor low voltage protection, longer contactor life, and compliance with certain local utility requirements for reduced inrush current. SecureStart is designed for use with permanent split capacitor 1-phase compressors with Rated Load Amps (RLA) of 16-32A. **SecureStart does not provide over current protection.**

Operation

When the system control calls for compressor operation, the compressor contactor will energize. If the supply voltage to the module (module terminals L2 to compressor common - refer to wiring diagram on Page 2) is less than 195 volts the module will initiate a 50 second delay. At the end of the 50 second delay the module will attempt to start the compressor if the supply voltage is equal to or greater than 195 volts. SecureStart uses an optimized starting process that learns the starting characteristics of the compressor to further refine the starting cycle on each recurring start. If the compressor fails to start, the module will terminate the start attempt after 1 second and initiate a 3 minute lockout before attempting a restart. If the supply voltage falls below 190 volts for 2 seconds or below 130 volts for 0.1 seconds while the compressor is running the module will stop the compressor and

initiate a 3 minute lockout. A restart will be attempted after 3 minutes if the supply voltage is 195 volts or higher. This is done to protect the compressor against a sudden drop in supply voltage.

SecureStart is able to detect an interruption in power, when the interruption is 0.1 seconds or longer. When a power interrupt is detected, SecureStart will shut down the compressor for 3 minutes. SecureStart is also able to determine if the compressor is running backwards. If this condition is detected, SecureStart will stop the compressor for 3 minutes before a restart is attempted. A power interrupt that is shorter duration than 0.1 seconds may result in a compressor running backwards, which the SecureStart can detect and stop compressor operation.

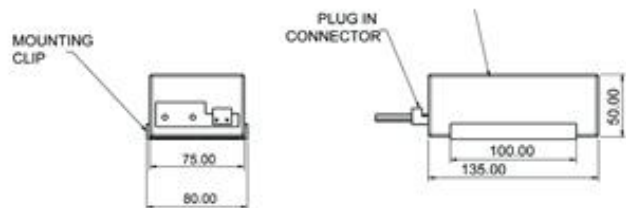
If the run capacitor is faulty or has failed, SecureStart will shutdown the compressor for 3 minutes before attempting a restart.

Agency Recognition

ETL File 4004190
 RoHS Compliant
 CE
 BS EN 60335-2-40

Module Dimensions

All dimensions are in millimeters.



Product Specifications

Operating Temperature: -4°F to 140°F (-20°C to 60°C)
 Storage Temperature: -40°F to 185°F (-40°C to 85°C)
 Frequency: 50 & 60 Hz
 Operating Voltage Range: 185-253 Volts AC
 Starting Voltage: 195 Volts AC Minimum
 Compressor Rated Load Amps (RLA): 32 Amps Max IP Rating: 207
 Duty Cycle: 10 Starts Per Hour
 Off Time Between Cycles: 3 Minutes

Ordering Information

OEM part number 543-0120-00 (50 pack)
 Service part number 943-0120-00 (individually packed)

Hardware Installation

SecureStart attaches to the mounting clip that is provided with the module. The mounting clip can be mounted to an electrical panel using two to four #8 or #10 screws. Maximum screw head height is 2.5 mm, therefore a pan head screw type is recommended.

The module connections for the run winding, run capacitor, and T2 will accept up to a #8 AWG wire. These connections will carry the compressor current so care must be taken to ensure a good connection. The screw terminal tightening torque is 10.5 inch-pounds (1.2 Nm) on the SecureStart module for these connections. The Start Winding and Compressor Common connections provide input to the SecureStart on the operation of the compressor. These connections should be tightened to 4.4 inch-pounds (0.5 Nm).

SecureStart Wiring Diagram

Refer to the wiring diagrams in **Figures 1 and 2**, which show how the SecureStart module should be wired into a new or existing system. The wiring diagrams illustrate SecureStart wired with a two pole contactor. SecureStart can be also be used with a one pole contactor with the contacts located in either the L1 or L2 lines. If the compressor is wired with a conventional start capacitor and relay, PTCR start device, or other type of hard start kit, those devices should be removed. The specified run capacitor for the compressor must be used. To determine the specified run capacitor value refer to the nameplate of the Copeland Scroll™ compressor. The compressor must be wired as a permanent split capacitor (PSC) with the SecureStart module. SecureStart is compatible with Comfort Alert™ and CoreSense Diagnostics™ technology. Conductor type shall be stranded copper with a 75°C minimum temperature rating. **The system must be grounded and all applicable codes adhered to.**

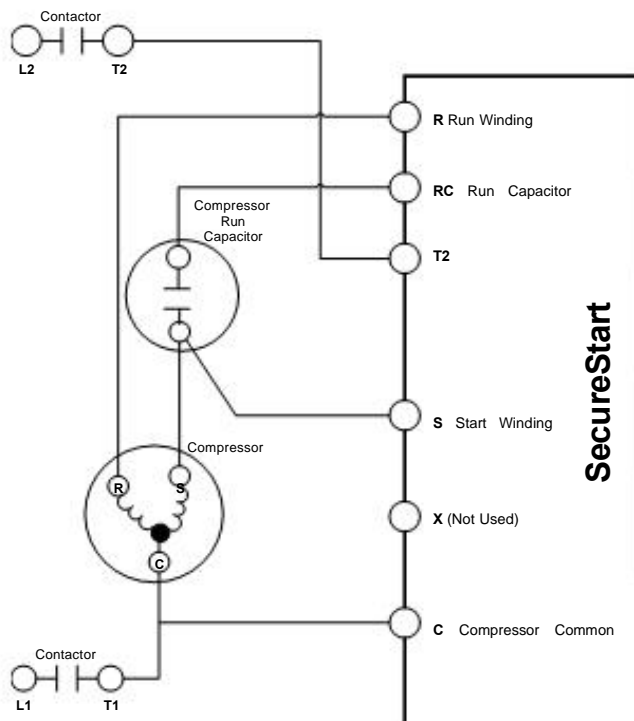


Figure 1 - Wiring Diagram with Run Capacitor

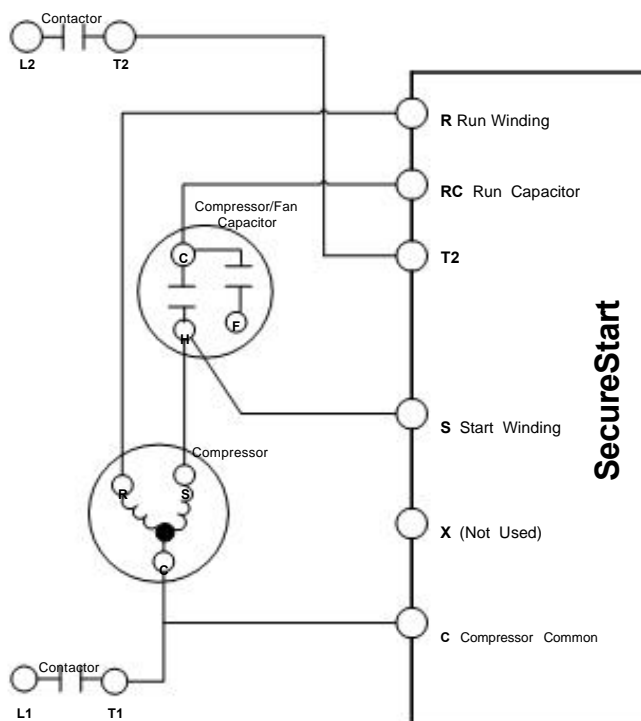


Figure 2 - Wiring Diagram with Dual Run Capacitor

Note:

Wire gage:

- 6 to 8 AWG for terminal (Run Winding (R) and Active (T2))
- 12 to 16 AWG for terminals (Run Capacitor (RC), Start Winding (S) and Motor Common (C))

Torque values:

- Large terminals 10.5 lbs-in
- Small terminals 4.5 lbs-in

Application

Use of SecureStart with compressors that have nameplate RLA values above 32 amps must be tested by the system designer to ensure that the application of the compressor does not exceed the current limitations of the SecureStart module.

Suitable for use on a circuit capable of delivering not more than 5000rms symmetrical amperes, 240 volts maximum, when protector by a non time delay RK5 fuse or circuit breaker rated 80A, or time delay fuse rated 70A. Device does not provide current limiting control.

Service

SecureStart has no serviceable internal parts. If the SecureStart module is non-functioning, it should be replaced or bypassed.

Unauthorized opening of the SecureStart module will void the warranty.



Warranty Information

Emerson Climate Technologies, Inc. warrants SecureStart to be free from defects in materials and workmanship under normal use for a period of one year from the date of purchase or twenty months from manufacture, whichever comes first. During this period, Emerson will replace any defective SecureStart without charge.

For more information on product warranty please visit www.EmersonClimate.com.

Support

For more information visit www.EmersonClimate.com or contact Emerson Climate Technlologies, Inc. at 1-888-EMR-9950.

WARNINGS	
	<p>Remove all other starters (e.g. PTC, hardstarters). Do not swap the run and start windings. The module shall not be installed into an enclosure smaller than 10x8x6 inches.</p>
	<p>Allow two minutes to discharge run capacitor before disconnecting.</p>

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