

## SecureStart™ for Copeland Scroll® 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 75%. 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 32 or less. **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 190 volts the module will initiate a 30 second delay. At the end of the 30 second delay the module will attempt to start the compressor if the supply voltage is equal to or greater than 190 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 5 minute lockout before attempting a restart. If the supply voltage falls below 185 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 190 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.

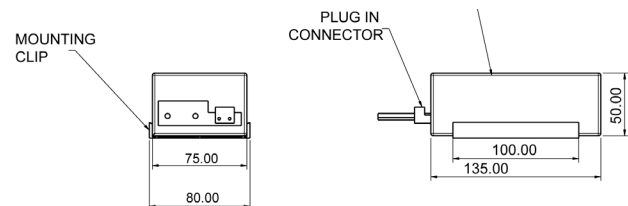
If the run capacitor is faulty or has failed, SecureStart will shutdown the compressor for 3 minutes before attempting a restart.

### Agency Recognition

U.L. File E322692 Volume 1  
RoHS Compliant  
CE

### Module Dimensions

All dimensions are in millimeters.



### Product Specifications

Operating Temperature: -4°F to 150°F (-20°C to 65°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: 190 Volts AC Minimum  
Compressor Rated Load Amps (RLA): 32 Amps Max  
IP Rating: 217  
Duty Cycle: 10 Starts Per Hour

### 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 cap, and L2 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).

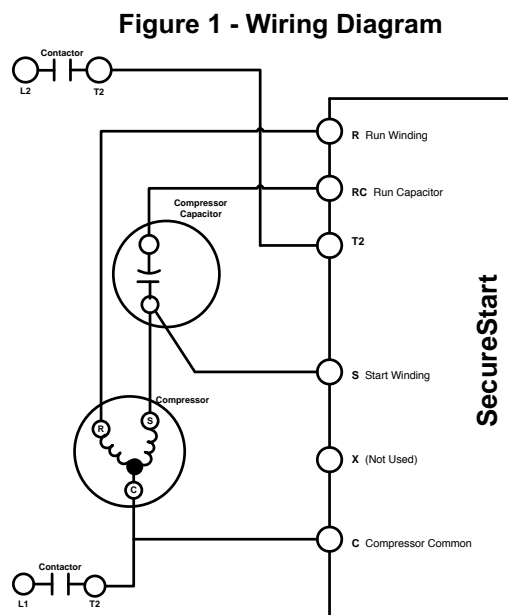
### SecureStart Wiring Diagram

Refer to the wiring diagram **Figure 1**, which shows how the SecureStart module should be wired into a new or existing system. The wiring diagram illustrates 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® 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.**

### 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.** SecureStart can be applied with the Copeland Scroll compressors listed below in **Table 1**.



**Table 1**  
**Copeland Scroll® Compressors Compatible with SecureStart™**

<b>R410A</b>	<b>R22</b>	<b>R407C</b>
ZP16 to ZP54K3E-PFV	ZR22 to ZR61K3-PFV	ZR16 to ZR54K5E-PFV
ZP16 to ZP54K5E-PFV	ZR16 to ZR54KA-PFV	ZR22 to ZR61K3E-PFV
ZPS20 to ZPS60K4E-PFV	ZR67 to ZR80KW-PFV	ZR48 to ZR68KCE-PFV

**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.**

**WARNINGS**

- 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.
- Allow two minutes to discharge run capacitor before disconnecting.