



Residential HVAC systems are typically 208/230V single phase power and range from 1.5 to 6 tons in capacity. SureStart is also rated for small light commercial systems. For these systems, follow the easy steps below to determine what SureStart model is best for your system.

Step #1:

Verify the HVAC system voltage and 50/60 Hz.
Use unit name-plate.

Step #2:

Verify the HVAC system uses a single or two stage scroll compressor. ①②

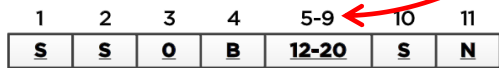
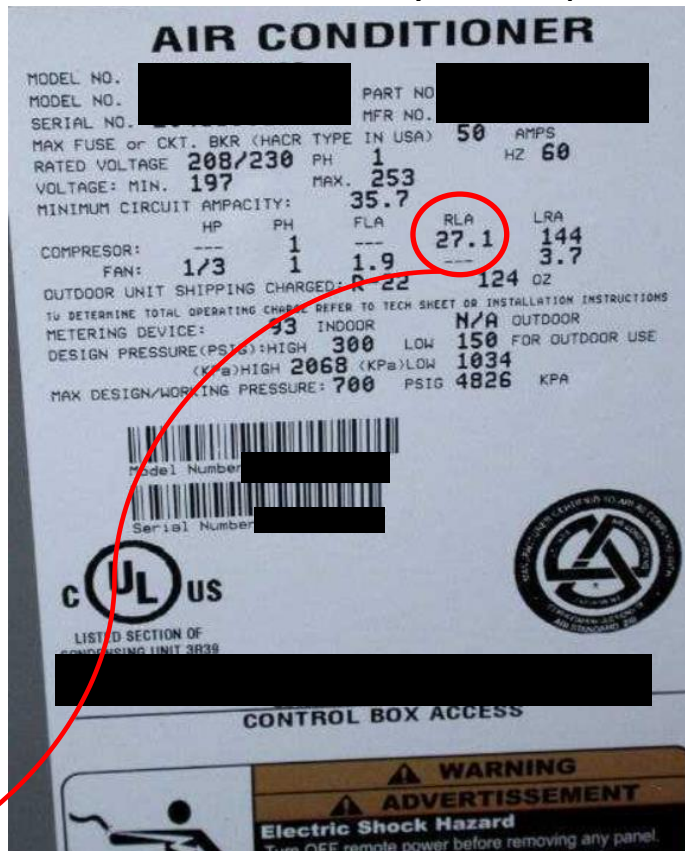


Scroll Compressor

Step #3:

Compare the Compressor RLA to SureStart model digits 5-9 to select proper model.

Residential 1-Phase HVAC System Nameplate



Type
S - SureStart

Contacting Function
P - Primary¹
S - Secondary²

Nominal Voltage Rating
0 - 115/60/1
1 - 208-230/50-60/1
2 - 208-230/50-60/3
3 - 380/50-60/3

5 - 460/60/3

Vintage
A - Current, Three-Phase
B - Current, Single-Phase

Auxiliary Alarm Relay
R - Aux Alarm Relay (Three Phase Only)
N - None

Standard
S - Standard

**Full Load Amps (FLA)
(Corresponds to Compressor Run Load Amps (RLA))**
12-20 - (115V Single Phase)
08-16 - (230V Single Phase)
16-32 - (230V Single Phase)
04-28 - (208-230 Three-Phase)
04-27 - (380V, 460V Three Phase)

① If compressor is a reciprocating or rotary type, verify the refrigerant system equalizes within 5 minutes after unit shutdown. If so, go to Step #3 to apply SureStart. Do not apply SureStart on reciprocating or rotary compressors if refrigerant system pressures do not equalize within 5 minutes after system shutdown.

② If compressor is a variable speed or inverter-driven compressor, do not apply SureStart. These compressor types do not experience high LRA conditions and are not compatible with SureStart.



Reciprocating Compressor



Rotary Compressor



Testing SureStart Results

When properly designing a backup generator application, you should expect **60% reduction** in single phase HVAC system compressor locked rotor amperage (LRA).

Compressor LRA duration is less than 1 second in duration (~300 milliseconds) and very difficult to measure. In laboratory testing, an oscilloscope is required to accurately measure LRA for compressor rating purposes.

To estimate LRA in HVAC system field applications, you will need a digital electrical service tool* capable of capturing "inrush current" directly to the compressor and displaying it for your review.

*The **FLUKE® 375 True RMS Clamp Meter, AC/DC, TRMS** includes this feature: "Proprietary inrush measurement technology to filter out noise and capture motor starting current..." This device is tested to be effective in measuring compressor LRA.

When SureStart is properly applied, you should expect 60% reduction in single phase HVAC system compressor locked rotor amperage (LRA).

To estimate reduced LRA, simply use 40% (.4 multiplier) of the HVAC system rated LRA.

Example:

LRA: 144 should reduce to LRA: 58 (144 x .4 = 58)



A SureStart device will offer 60% start current reduction provided:

1. Generator surge capacity exceeds 50% of the Locked Rotor Amperage of the compressor in use.
2. Adequate number of starts are allowed to let SureStart adjust to any new compressor/generator combination. Up to 10 starts may be required.
3. SureStart must be used on compressors equipped with means of pressure equalization before every start. Scroll compressors are exempt from this requirement.
4. Any cabling between the generator and compressor must be sized such that voltage at compressor terminals during start does not fall below 98V (for 115V systems), 177V (for 208V systems) and 190V (for 220V/230V systems) while using SureStart device.
5. Assessment of start current reduction must be performed using instrumentation capable of capturing and measuring rms current values during the start cycle. Ideally, an oscilloscope should be used.