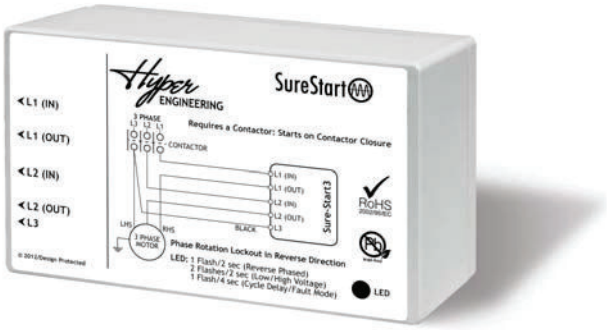


SureStart

Three-Phase Soft Starters

Submittal Data
English Language/IP Units
04/14

Hyper ENGINEERING

Contact Information:
Hyper Engineering, Pty. Ltd.
4 / 14 Ralph Black Dr
Wollongong Nth, NSW 2500
AUSTRALIA

www.hypereng.com
sales@hypereng.com
(+61) 2 4229 2069

CE ETL LISTED US RoHS 2002/95/EC Pb lead-free

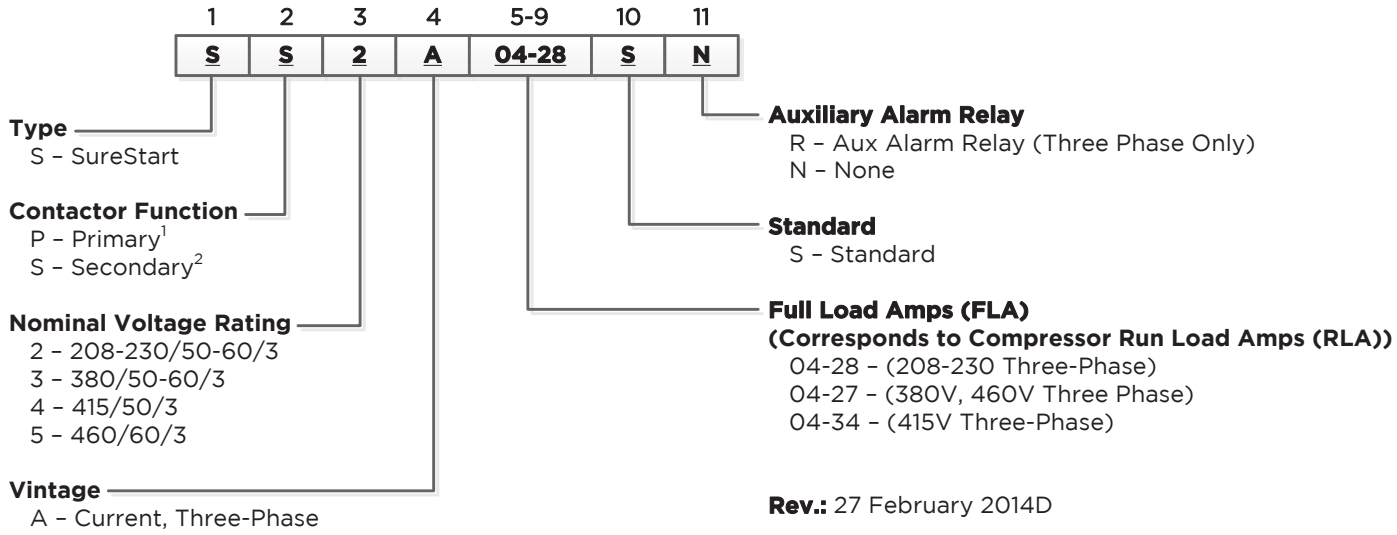
Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

SureStart
Three-Phase Soft Starters

Model Nomenclature



Rev.: 27 February 2014D

Notes:
1 – Not available in the United States.
2 – Primary includes a contactor. Secondary operates in series with contactor.

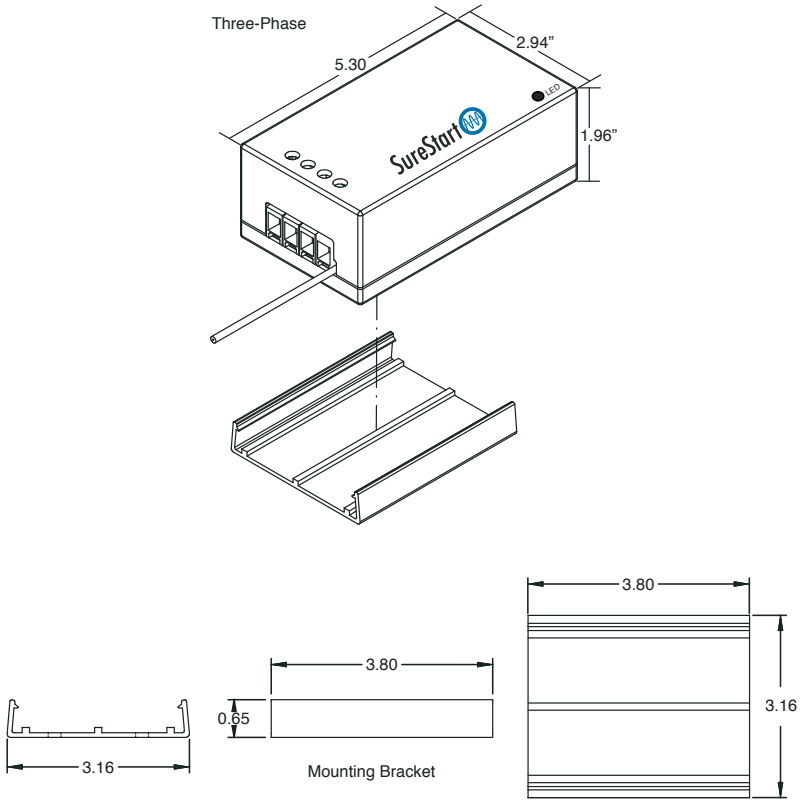
Contractor: _____ P.O.: _____

Engineer: _____

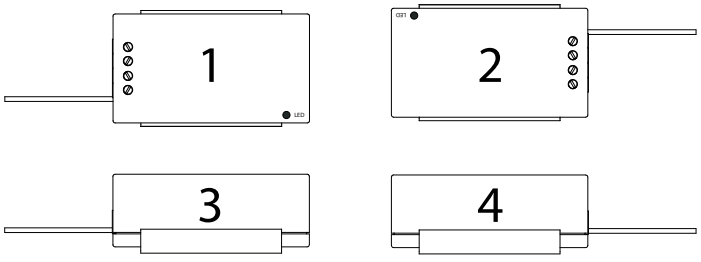
Project Name: _____ Unit Tag: _____

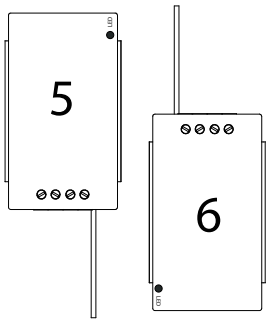
SureStart
Three-Phase Soft Starters

Dimensional Data

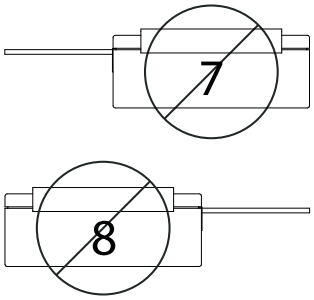


Approved Mounting Positions





Not Approved



Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

SureStart
Three-Phase Soft Starters

Physical Characteristics

SureStart Model	Three Phase		
	SS2A04-28	SS3A04-27	SS4A04-34 SS5A04-27
Storage Temperature, °F [°C]	-40 [-40] to 185 [85]		
Case Material	ABS Flameproof UL-94 V0		
IP Rating	IP207		
Line Conductor, AWG	14 - 6	14 - 6	14 - 6
Line Conductor Strip Length, in. [mm]	0.47 [12]	0.47 [12]	0.47 [12]
Minimum Line Conductor Length, in. [mm]	15.7 [400]	15.7 [400]	15.7 [400]
Line Terminal Tightening Torque, in-lbs [N-m]	10.5 [1.2]	10.5 [1.2]	10.5 [1.2]
T3 Wire Gauge, AWG	18	18	18
T3 Wire Lead Length, in. [mm]	24.4 [620]	24.4 [620]	24.4 [620]
T3 Wire Termination, in. [mm]	0.25 [6.35] insulated quick connect		

03/06/14

Operating Characteristics

SureStart Model	Three Phase			
	SS2A04-28	SS3A04-27	SS4A04-34	SS5A04-27
Rated Voltage, VAC	208-230	380	415	460
Rated Phase	3	3	3	3
Rated Frequency, Hz	50/60	50/60	50	60
Maximum Load Current, Amps	38	38	38	38
Maximum Starting Current, Amps	150	150	150	150
Number of Starts/Hour (Evenly Distributed)	20	20	20	20
Short Circuit Current Rating (SCCR), kA	5	5	5	5
Shutdown on Low Voltage	176	323	353	391
Minimum Startup Voltage	187	342	373	414
Maximum High Voltage	253	422	460	510
Operating Ambient, °F [°C]	-4 [-20] to 140 [60]			
Life Expectancy (At Maximum Rated Load)	Minimum 100,000 Operations			

03/06/14

Software Characteristics

SureStart Model	Three Phase		
	SS2A04-28	SS3A04-27	SS4A04-34 SS5A04-27
Software Fault Delay, seconds	180	180	180
Initial Power on Delay, seconds, 60 Hz [50Hz]	1 [1]	1 [1]	1 [1]
Power Loss Reset, milliseconds	100	100	100
Contactor Chatter Protection	Yes	Yes	Yes
Reverse Phase Protection	Yes	Yes	Yes
Software Optimization	Auto tune		

10/01/13

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

SureStart
Three-Phase Soft Starters

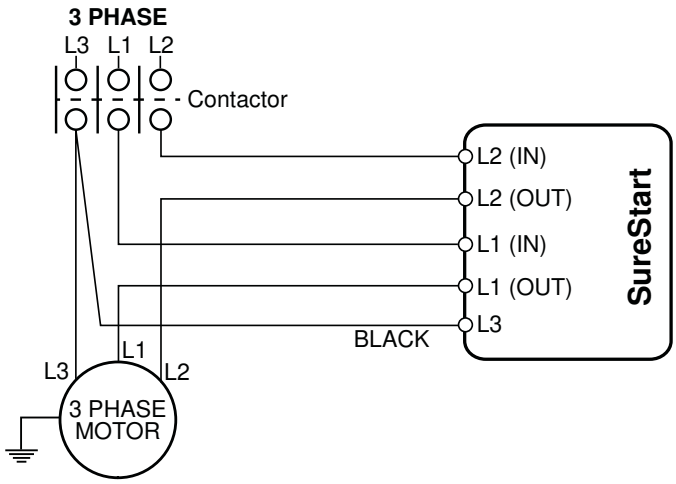
SureStart Compatibility Guide

Nominal Supply Voltage*	Three Phase			
	SS2A04-28	SS3A04-27	SS4A04-34	SS5A04-27
208-230/50-60/3	•			
380/50-60/3		•		
415/50/3			•	
460/60/3				•
Full Load Amperage, FLA (Typical)	04-28	04-27	04-34	04-27

* - Voltage/Hz/Phase

11/21/13

Wiring Schematics



CAUTION: SureStart must be installed in a location that ensures that the external heat from a hot gas line, compressor discharge piping, or similar heat source will not cause damage. Minimum 3" [76mm] clearance is recommended.

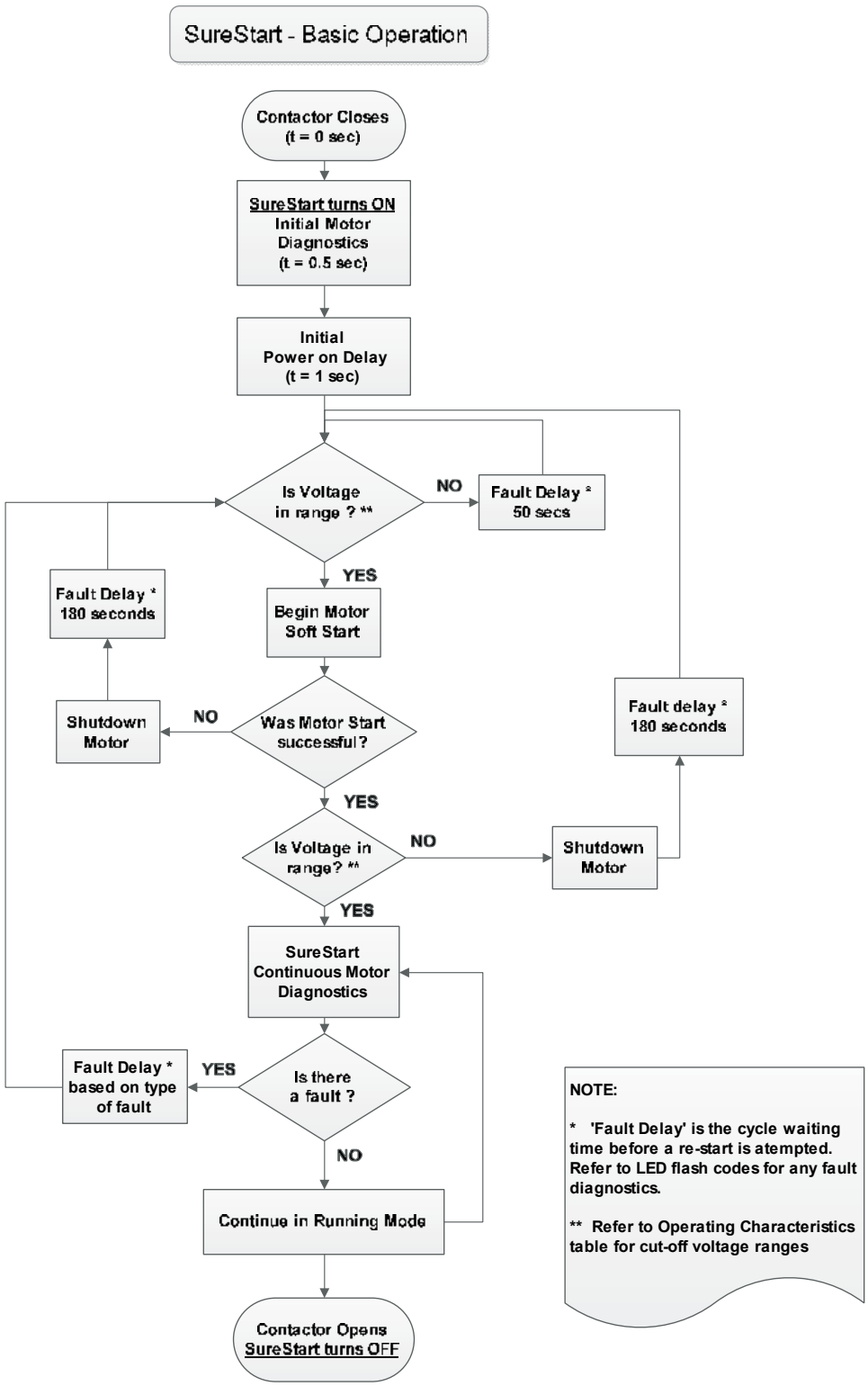
Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

SureStart
Three-Phase Soft Starters

SureStart Mode of Operation



Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

SureStart
Three-Phase Soft Starters

SureStart Three-Phase LED Flash Codes

A Red LED indicator will flash under the following conditions.

[NOTE: LED fault indicator is turned off in normal running mode.]

a) Reverse Phase: (1 / 2 secs)
b) Fault Mode/Cycle Delay: (1 / 4 secs)
c) Low Voltage/ Over Voltage: (2 / 2 secs)

Flash Code (Reverse Phase: (1 / 2 secs))

- Displayed if the supply "Phase Sequence" gets reversed before or after a start.
- Re-start is attempted after 3 minutes.

Flash Code (Fault Mode / Cycle Delay: (1 / 4 secs))

- Displayed for "Cycle delay" between two consecutive softstarts or other faults mentioned below.
- Re-start is attempted after a default period of 3 minutes.
- Other possible reasons for this Fault mode indicator can be due to
  - a failed Softstart attempt,
  - intermittent power loss (duration longer than 100ms), or
  - frequency out of range

Flash Code (Low Voltage / Over Voltage: 2 / 2 secs)

- Displayed for "Low supply voltage" or "High supply voltage" before or after a softstart.
- If voltage is out of range before a start, a re-start is attempted after 50 seconds.
- If voltage is out of range after a start, a re-start is attempted after 3 minutes.

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

SureStart
Three-Phase Soft Starters

Declaration of Conformity

SureStart technology has been tested and certified under the following standards that apply.

For United States, Canada, & Mexico

UL 508/ CSA 22.2 # 14 (ETL control # 4004190)

For European Union, Australia, and other countries accepting CE Marking

Low Voltage Directive (LVD)
IEC/ EN 60947-4-2: Low Voltage switchgear and control gear: contactors and motor-starters
IEC/ EN 60335-1 & IEC/ EN 60335-2-40: Safety requirements for electrical heat pumps, air conditioners, dehumidifiers.

Electromagnetic Compliance (EMC)

IEC/ EN 55014-1	Conducted & radiated emissions
IEC/ EN 61000-3-11	Flicker
IEC/ EN 61000-3-12	Harmonics emissions
IEC/ EN 61000-3-2	Harmonic current emissions
IEC/ EN 55014-2	Conducted & radiated immunity
IEC/ EN 61000-6-1	Immunity for residential, light commercial, and light industrial
IEC EN 61000-3-3	Voltage fluctuations
IEC/ EN 61000-4-2	Electrostatic discharge (ESD) immunity test
IEC/ EN 61000-4-3	Radiated, radio-frequency, electromagnetic field immunity test
IEC/ EN 61000-4-4	Electrical fast transient/burst immunity test
IEC/ EN 61000-4-5	Surge Immunity Test
IEC/ EN 61000-4-6	Conducted radio-frequency immunity
IEC/ EN 61000-4-11	Voltage dips, short interruptions, and voltage variations immunity tests

EMC compliance tested in accordance with:
ANSI C63.4
EN55022 + A1:2000 + A2:2003
CISPR16 and CISPR22
VCCI V-3/2007.04

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

SureStart
Three-Phase Soft Starters

Definitions

Case Material – SureStart enclosure material

Line conductor – Wiring that connects to the “run winding” and “active” terminations on single phase SureStart. The wiring for “IN” and “OUT” for T1/T2 connections on three phase SureStart..

Line Conductor Strip Length – This is the length of insulation stripped away in order to properly insert into the SureStart.

Line Terminal Tightening Torque – The necessary torque needed to secure line conductors to the SureStart.

Rated Voltage – This is the nominal supply voltage to the SureStart.

Rated Frequency – This is the nominal frequency, Hz, of the power supply to the SureStart.

Maximum Starting Current – The maximum current at motor startup for the largest motor that can be applied to the SureStart.

Control Input – Any AC/DC voltage that needs to be applied in addition to active supply to SureStart.

Short Circuit Current Rating – This is the maximum fault current that can be applied without damaging the SureStart.

Shutdown on Low Voltage – SureStart will shutdown motor if the supply voltage falls below this threshold.

Maximum High Voltage – The maximum voltage that can be applied to SureStart.

Maximum Operating Ambient – The maximum temperature the SureStart can properly operate.

Maximum Load Current – This is the maximum current the SureStart is capable of handling.

Minimum Startup Voltage – SureStart will not attempt a motor start if the supply voltage is below this limit.

Software Fault Delay – This is the time delay that will initiate if the SureStart encounters a problem during motor operation.

Initial Power Delay – The time delay from when the SureStart receives power and motor start occurs.

Power Loss Reset – SureStart is designed to turn motor off in the event power is lost for more than this time period.

Contactor Chatter Protection – SureStart can detect faulty contactor conditions and shut the motor off.

Reverse Phase Protection – SureStart will prevent a three-phase motor from reverse rotation.

Software Optimization – The maximum number of starts required to achieve optimized motor starting.

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

Notes

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

SureStart
Three-Phase Soft Starters

Revision Guide

Pages:	Description:	Date:	By:
3	Updated Nomenclature for New Revision	22 Apr 2014	DS
5	Updated Physical and Operational Characteristics	22 Apr 2014	DS
7	Updated Operation Flow Chart	22 Apr 2014	DS
8	Added LED Flash Code Description	22 Apr 2014	DS
9	Updated Declaration of Conformity	22 Apr 2014	DS
10	Updated Definitions	22 Apr 2014	DS
5	Updated Physical and Operational Characteristics	21 Nov 2013	DS
6	Updated SureStart Compatibility Guide	21 Nov 2013	DS
All	Updated Model Nomenclature	10 Oct 2013	DS
All	First Published	26 Jun 2013	DS

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