



**Bulletin 150 — Smart Motor Controllers — SMC-3™ Smart Motor Controller**

The SMC-3™ is a compact, simple to use, solid-state motor controller designed to operate 3-phase motors. It features a built-in overload relay and a built-in SCR bypass contactor on all three phases, allowing a smaller footprint than other soft starters on the market. This product is designed for many applications, including compressors, chillers, pumps, conveyors, and crushers.

- Modes of operation for the controller are as follows:
- Soft Start
  - Current Limit Start
  - Kick Start
  - Soft Stop
  - Coast-to-Rest

The controllers are available in twelve sizes: 3, 9, 16, 19, 25, 30, 37, 43, 60, 85, 108, and 135 A. They offer two voltage ranges: 200...480V AC and 200...600V AC. All voltage ranges will operate at either 50 or 60 Hz.

- 1...135 A Range
- Built-In Electronic Motor Overload Protection
- Built-In SCR/Run Bypass
- Delta Connections for 108 A and 135 A Devices

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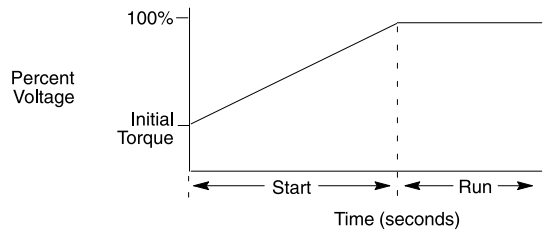
**Standards Compliance/Approvals**

- UL 508
- CSA C22.2 No. 14
- EN/IEC 60947-4-2
- cULus Listed (Open Type) (File No. E96956)
- CE Marked (Open Type) per EMC Directive and Low Voltage Directive

**Modes of Operation**

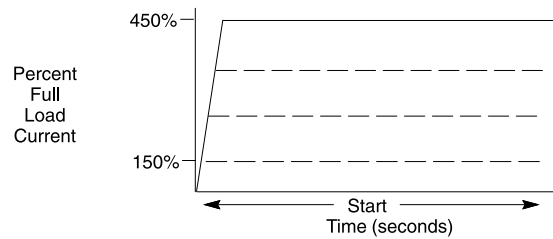
**Soft Start**

This method has the most general application. The motor is raised from an initial torque value to full voltage. This initial torque can be adjusted to 15%, 25%, 35%, or 65% of locked rotor torque. The motor voltage is gradually increased during the acceleration ramp time, which can be adjusted from 2, 5, 10, 15, 20, 25, or 30 s. (3...37 A, 2...15 s only)



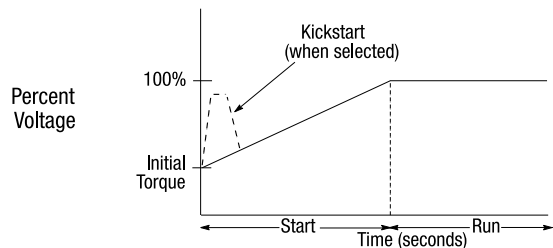
**Current Limit Start**

This starting mode is used when it is necessary to limit the maximum starting current. It can be adjusted to 150%, 250%, 350%, or 450% of full load amps. Start times are selectable from 2, 5, 10, 15, 20, 25, or 30 s. (3...37 A, 2...15 s only)



**Selectable Kick Start**

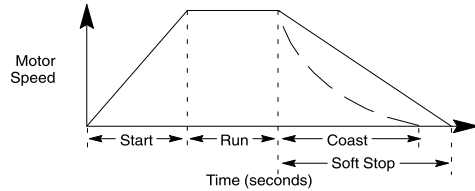
A kickstart, or boost, at the beginning of the start mode is intended to provide a current pulse of 450% of full load current. The kickstart time is adjustable from 0.5...1.5 seconds. This allows the motor to develop additional torque during starting for loads which may need a boost to get initial shaft rotation.



## Modes of Operation, Continued

### Soft Stop

The Soft Stop function can be used with applications that require an extended stop time. When enabled, the voltage ramp down time can be selected to one, two, or three times the starting time. The motor will stop when the motor voltage drops to a point where the load torque is greater than the motor torque.



## Description of Features

### Electronic Motor Overload Protection

The SMC-3 controller incorporates, as standard, electronic motor overload protection. This motor overload protection is accomplished electronically with the use of current transformers on each of the three phases. The controller's overload protection is programmable, providing the user with flexibility. The overload trip class selection consists of either OFF, 10, 15, or 20. The trip current is easily selected by adjusting the rotary potentiometer to the motor full load current rating. Trip reset is selectable to either automatic or manual mode.

**Note:** Trip rating is 120% of dial setting.

### Over-temperature

The SMC-3 monitors the SCR temperature by means of internal thermistors. When the power poles maximum rated temperature is reached, the microcomputer switches off the SMC, a TEMP fault is indicated via LED, and the 97/98 fault contact closes.

### Phase Reversal Protection

When enabled via a DIP switch, 3-phase input power will be verified before starting. If input power phasing is detected to be incorrect, the start will be aborted and a fault indicated.

### Phase Loss/Open Load

The unit will not attempt a start if there is a single-phase condition on the line. This protects from motor burnout during single-phase starting.

### Phase Imbalance

The unit monitors for imbalance between phase currents. To prevent motor damage, the unit will trip if the phase imbalance exceeds 50% current imbalance for 3 seconds, and a fault will be indicated.

### Shorted SCR

Prior to every start and during starting, the unit will check all SCRs for shorts and unit load connections to the motor. If there is a shorted SCR in the SMC-3 and/or open load, the start will be aborted and a shorted SCR or open load fault will be indicated. This prevents damage from phase imbalance.

### Push to Test

The unit with control wiring can be tested for fault conditions by using the Push to Test function. Hold down the Reset button for 5 seconds to activate the fault Aux (97, 98) and shut down the SMC-3. To clear, either push the Reset button or cycle control power to the device.

### LED Description (Number of Flashes)

1. Overload
2. Overtemperature
3. Phase Reversal
4. Phase Loss/Open Load
5. Phase Imbalance
6. Shorted SCR
7. Test