Smart Motor Controllers – SMC™-3, SMC™ Flex and SMC™-50 Soft Starters Family

Size for Size, the Best Value in the Industry
Soft Starters

Reap the benefits of high productivity on your plant floor with the SMC family of soft starters. Our soft starters are designed for flexibility and scalability with integrated features and functionality to help reduce your energy costs and maximize your investments.

- **Simple starting and stopping**
- **Limited control at various speeds**
- **Reduced torque and current starting**
- **Simple to adjust and set up**
Starting Solutions

Modular design features advanced intelligence, performance and diagnostics; communications flexibility; removable control module, power modules and fan assembly in a cost-effective package for your demanding production applications.

- Modular for installation and maintenance
- Built-in LCD and keypad
- Integrated bypass

SMC-50 Scalable

Provides a cost-effective basic torque-limiting solution for low horsepower single and three-phase squirrel cage induction motors. Models are available to work with single-phase motors, as well as one or two control phase versions for three-phase motors.

- Simple commissioning with only two adjustments:
  - Initial Torque Setting (10...80%)
  - Duration of Ramp (0.5...5sec)
- Reliable proven technology with solid state power poles

Compact design provides true three-phase control, increased intelligence and unmatched performance. Motor and system diagnostics and an electronic overload with adjustable trip class reduce downtime and protect valuable assets.

- Compact footprint
- Easy and secure setup
- Integrated bypass
- Five Start/Stop modes

Designed for customer flexibility – advanced monitoring and protection, superior communications capabilities and Energy Saver mode help increase efficiency and reduce downtime.

- Application scalability
  - Normal and Heavy-duty ratings
  - Expandable I/O and sensor capability
  - Network integration capabilities
- Switch, LCD or PC software setup
- Available with solid-state only or combination solid-state/internal bypass power structures
- 17 Start/Stop modes and three slow-speed modes

Variable Frequency Drives

- Continuous control at any speed
- Full torque at any speed
- More complex

Solid-State

http://www.rockwellautomation.com/go/lvstarter
SMC-3
Compact, true three-phase control in a cost-effective package with overload protection, integral bypass, and motor and system diagnostics.

Integral Bypass
- The bypass automatically closes when the motor reaches its nominal speed, minimizing heat generation.
  - Reduced enclosure size
  - Reduced total cost

Hold to Test/Push to Reset Button
- Used to quickly test for fault conditions or reset the unit.
  - Reduces downtime
  - Assists during setup

LED Display
- Status information provided including RUN, Fault type and OFF.
  - Instant status display
  - Assists during troubleshooting

Ultra-Compact Size
- 1 to 37 A units are only 45 mm wide.
  - Reduced panel space
  - Higher-density installations

Problem:
A remote pump station needs to replace existing full-voltage motor starters to reduce mechanical stress on check valves and pump impellers and to reduce total operating costs.

Ideal Applications:
- Conveyors
- Fans
- Pumps
- Chillers
- Mixers
- Lifts
**Build a Modular Control System (MCS)**
- With widths of 45, 72, or 200 mm, the SMCs fit perfectly within the MCS product line.
- The MCS system allows you to build more starters in less panel space, providing enhanced performance in a minimal area.

**Easy and Secure Setup**
DIP switches allow setting of the START/STOP profile, built-in overload, connection type, trip class and auxiliary contact characteristics.
- Process optimization
- Setup efficiency

**Simplified Motor FLA Setup**
Rotary switch allows quick and easy setup of motor FLA.
- Setup efficiency
- Protects motor assets

**Current Ranges**

<table>
<thead>
<tr>
<th>Size</th>
<th>Line-connected Motor Current (Amps)</th>
<th>Delta-connected Motor Current (Amps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame 1</td>
<td>3…37</td>
<td>5…64</td>
</tr>
<tr>
<td>Frame 2</td>
<td>43…85</td>
<td>74…147</td>
</tr>
<tr>
<td>Frame 3</td>
<td>108…135</td>
<td>187…234</td>
</tr>
<tr>
<td>Frame 4</td>
<td>201…251</td>
<td>348…435</td>
</tr>
<tr>
<td>Frame 5</td>
<td>317…480</td>
<td>549…831</td>
</tr>
</tbody>
</table>

**Voltage Ranges and Operating Modes**

<table>
<thead>
<tr>
<th>Voltage Range</th>
<th>Operating Modes</th>
</tr>
</thead>
<tbody>
<tr>
<td>200…600V AC, 50/60 Hz</td>
<td>5 Start/Stop Modes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control Voltage</th>
<th>Control Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>100…240V AC or 24V AC/DC</td>
<td>Standard</td>
</tr>
</tbody>
</table>

**Product Selection Attributes**

- Performance and Operating Modes
- Usability
- Protection and Diagnostics
- Scalability

**Solution:**
The SMC-3 and its compact design is an ideal alternative.
- Decreased startup torque translates to less shock/stress on mechanical components
- Simple user interface reduces installation time
- Line and motor diagnostics detect single-phase conditions, protecting against motor damage
- Lower peak currents during starting reduces system maintenance, driving operating costs down
SMC Flex

Modular by design for installation and commissioning. Features built-in LCD display and flexible communications providing advanced performance, diagnostics and protection.

Integral Bypass
The bypass automatically closes when the motor reaches its nominal speed, minimizing heat generation.
- Reduced enclosure size
- Reduced total cost

Feed-through Wiring

Power Pole

Communications
Optional communication modules allow the SMC Flex to be connected to multiple networks.
- Common DPI modules reduce inventory
- EtherNet/IP™, DeviceNet™, ControlNet™ and other networks available

Application Spotlight

Ideal Applications:
- Compressors
- Pumps
- Fans
- Conveyors
- Bandsaws
- Chillers
- Centrifuges

Problem:
A lumber mill is updating starting methods for their saws. In addition to space constraints, the main focus is on improving operating efficiencies while staying within the limitations of the current transformer and distribution system.
Control module

**Ease of Maintenance**

Product Modularity
- Modular power structure
- Removable control module
- Changeable fan assembly

**Advanced Monitoring and Diagnostics**

Built-in current and voltage protection provide enhanced power monitoring and diagnostic capabilities.
- No additional monitoring equipment required
- PTC input
- Ground fault detection

**Simplified Application Setup**

Built-in multilingual, backlit LCD display for programming and monitoring.
- Setup efficiency
- Process optimization

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**Current Ranges**

<table>
<thead>
<tr>
<th>Size</th>
<th>Line-connected Motor Current (Amps)</th>
<th>Delta-connected Motor Current (Amps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame 2</td>
<td>5…85</td>
<td>9…147</td>
</tr>
<tr>
<td>Frame 3</td>
<td>108…135</td>
<td>187…234</td>
</tr>
<tr>
<td>Frame 4</td>
<td>201…251</td>
<td>348…435</td>
</tr>
<tr>
<td>Frame 5</td>
<td>317…480</td>
<td>549…831</td>
</tr>
<tr>
<td>Frame 6</td>
<td>625…780</td>
<td>850…900</td>
</tr>
<tr>
<td>Frame 7</td>
<td>970…1250</td>
<td>1200…1600</td>
</tr>
</tbody>
</table>

**Voltage Ranges and Operating Modes**

**Voltage Range**
200…690V AC, 50/60 Hz

**Operating Modes**
9 Start/Stop Modes
Up to 3 Slow-speed Modes

**Control Voltage**
- 100…240V AC (5…480 A) or 24V AC/DC (5…480 A)
- 110…120V AC (625…1250 A)
- 230…240V AC (625…1250 A)

**Control Options**
- Standard
- Pump Control
- Braking Control

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**Product Selection Attributes**

- Performance and Operating Modes
- Usability
- Protection and Diagnostics
- Scalability

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**Solution:**

The SMC Flex and its modular design is an ideal fit for the existing system.
- Minimizes starting peak current and torque shock to the system
- Smart Motor Braking option stops the motor in 2 minutes versus the coast-down time of 15 minutes
- Slow Speed operation enables inspection of saw blade tracking before the motor is brought to full speed
- Current, Voltage, and Power diagnostics displayed via a door-mounted HIM interface
- Built-in programmable overload protection accommodates characteristics of a high-inertia load
- Diagnostics detect jam, stall, or single phasing and shut off the motor, helping to prevent damage
SMC-50 Internal Bypass or Solid-State

Scalable design for customer flexibility satisfying a wide variety of control needs.

**Internal Bypass Power Structure**
Combines the power structure of the SMC-Flex with the application flexibility of the SMC-50. The bypass automatically closes when the motor reaches its nominal speed minimizing heat generation.
- Reduced enclosure size
- Reduced total cost

**Solid-State Power Structure**
State-of-the-art solid-state SCR power structure.
- Ideal for harsh environments
- Higher operations per hour
- Scalable thermal ratings
- Higher SCCR ratings

**Hardware Expansion Ports**
Three hardware expansion ports accept optional digital and analog I/O expansion modules as well as a protection module (PTC, Ground Fault, Current Feedback).
- Process scalability & optimization
- Application flexibility (simple to complex)

**Application Spotlight**

**Ideal Applications:**
- Pumps
- Compressors
- Fans
- Conveyors
- Bandsaws
- Mills
- Crushers
- Grinders
- Shredders
- Centrifuges

**Problem:**
A rock quarry is looking for a soft starter solution to replace the existing starters on their large motors due to power system limitations and to increase operating efficiencies while maximizing uptime.
**Simplified, Scalable Application Setup**
Optional Parameter Configuration Module, Human Interface Module or PC-based software for programming and monitoring simplifies setup.
- Setup efficiency
- Process optimization

**Hold to Test/Push to Reset Button**
Used to quickly test for fault conditions or reset the unit.
- Reduces downtime
- Assist during setup

**LED Display**
Multi-colored LED provides both diagnostics and controller status information.
- Instant status display
- Assists during troubleshooting

**Common Control Module**
All features/functions are included in standard control module including linear acceleration/deceleration, torque control, Pump control, Smart Motor Braking (SMB) and Energy Saver mode.
- Reduced inventory
- Increased efficiency

**Communications**
Optional communication modules allow the SMC-50 to be connected to multiple networks.
- Common DPI modules reduce inventory
- EtherNet/IP, DeviceNet, ControlNet and other networks available

### Current Ranges
Standard squirrel cage or star-delta induction motors

<table>
<thead>
<tr>
<th>Power Structure Type</th>
<th>Size</th>
<th>Line-connected Motor Current (Amps)</th>
<th>Delta-connected Motor Current (Amps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Bypass</td>
<td>Frame 3</td>
<td>108…135</td>
<td>187…234</td>
</tr>
<tr>
<td></td>
<td>Frame 4</td>
<td>201…251</td>
<td>348…435</td>
</tr>
<tr>
<td></td>
<td>Frame 5</td>
<td>317…480</td>
<td>549…831</td>
</tr>
<tr>
<td>Solid-State</td>
<td>Frame B</td>
<td>90…180</td>
<td>155…311</td>
</tr>
<tr>
<td></td>
<td>Frame C</td>
<td>210…320</td>
<td>363…554</td>
</tr>
<tr>
<td></td>
<td>Frame D</td>
<td>361…520</td>
<td>625…900</td>
</tr>
</tbody>
</table>

### Voltage Ranges and Operating Modes

<table>
<thead>
<tr>
<th>Voltage Range</th>
<th>200…690V AC, 50/60 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Modes</td>
<td>17 Start/Stop Modes (including linear acceleration, linear deceleration and torque control)</td>
</tr>
<tr>
<td></td>
<td>4 Special Operating Modes Including Energy Saver mode</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control Voltage</th>
<th>100…240V AC or 24V DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Options</td>
<td>Standard (all features/functions in one module)</td>
</tr>
</tbody>
</table>

### Product Selection Attributes

<table>
<thead>
<tr>
<th>Performance and Operating Modes</th>
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</thead>
<tbody>
<tr>
<td>Usability</td>
</tr>
<tr>
<td>Protection and Diagnostics</td>
</tr>
<tr>
<td>Scalability</td>
</tr>
</tbody>
</table>

**Solution:**
The SMC-50 provides a scalable solution addressing power company requirements and distribution limitations.
- Advanced linear starting technology yields consistent starting performance and limits peak current and torque shock
- Advanced control and monitoring maximizes uptime with reduced need for system maintenance
- Solid State power structure with optional external bypass provides operating redundancy
- Optional communications allow monitoring and control over the existing EtherNet/IP backbone
- Advanced diagnostics and condition monitoring support customizable protection
- The Energy Saver mode helps reduce total power consumption during periods of light production
Product Selection Attributes

**Scalability**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>SMC-3</th>
<th>SMC Flex</th>
<th>SMC-50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan Module</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Range</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modularity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Network Capabilities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LCD, Multilingual Display</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced Control Modes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal and Heavy-duty Ratings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option Modules</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Patented Control Modes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple Setup Options</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All Operating Modes in One Control Module</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Usability**

**SMC-3**
- Easy Setup
- LED Display
- Built-in Test/Reset Button

**SMC Flex**
- Built-in LCD, Multi-lingual Display
- Advanced Performance and Diagnostics
- Network Capabilities
- Modularity

**SMC-50**
- Setup Wizards
- Auto Connection and Fan Control
- Motor Auto Tuning
- Removable Terminal Blocks
- Multiple Programming Methods
- Network Capabilities

**Performance and Operating Modes**

- Starting Modes
- Stopping Modes
- Braking Modes
- Slow Speed Modes
- Special Running Modes

**Protection and Diagnostics**

<table>
<thead>
<tr>
<th></th>
<th>SMC-3</th>
<th>SMC Flex</th>
<th>SMC-50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor Overload</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Temperature Protection</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Current Protection</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Voltage Protection</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Power Protection</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Frequency Protection</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Preventive Maintenance</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Real-time Clock</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Snapshot Data Capture</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Start Performance Tracking</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>
Enclosed Soft Starting Solutions

With the available options, functionality, and application capabilities, Allen-Bradley Enclosed SMCs are virtually unmatched in the industry.

Enclosed SMC Family

Enclosed SMCs encompass all the starting, stopping, protection and diagnostics benefits of our open soft starters, in a customizable, pre-engineered solution.

- Available as non-combination or with fusible or circuit breaker disconnect
- Broad size offering:
  - SMC-3 up to 480 A
  - SMC Flex up to 1250 A
  - SMC-50 up to 520 A
- Standard options include pilot devices, isolation and bypass contactors, protective modules, HIM and communication modules
- Solutions with specialized options or third-party devices are available through our Modified Standards program
- Quick factory lead times!

Motor Control Centers

Combination soft starter units are available globally in our CENTERLINE® motor control centers. These units contain a microprocessor-controlled motor controller, control circuit transformer and either a fusible or circuit breaker disconnect.

Pump Panels

SMC-3 pump panels are a robust solution for pumping applications. Perfect for crop irrigation, oil & gas pumping, golf courses, marina slip power hook-ups and wastewater treatment.
Rockwell Automation offers a breadth of quality Allen-Bradley® components to fit your specific needs. In order to assist you with your component selection, we offer a variety of configuration and selection tools.

**Local Distributor**
Call 1.800.223.3354 to contact your local Distributor today.
http://www.rockwellautomation.com/distributor/

**On-Line Product Directory**
Our extensive product portfolio is designed to improve your processes through every stage of your manufacturing cycle.
http://www.rockwellautomation.com/products/

**Product Selection Toolbox**
Our powerful range of product selection and system configuration tools assist you in choosing and applying our products.

**Catalogs**
Within our catalogs you’ll find an extensive selection of essential Allen-Bradley component products.
http://www.ab.com/catalogs/

The Connected Component Workbench™ Software
Connected Components Workbench software offers device configuration and helps minimize your initial machine development with free software download.

Wizards
The SMC Wizards assist in product selections for short circuit protection devices, thermal analysis and system analysis for the SMC family.

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Rockwell Automation, Inc. (NYSE:ROK), the world’s largest company dedicated to industrial automation, makes its customers more productive and the world more sustainable. Throughout the world, our flagship Allen-Bradley® and Rockwell Software® product brands are recognized for innovation and excellence.

Connect with us.

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www.rockwellautomation.com

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