

SMC Smart Motor System: 5 HP

The SMC Smart Motor System delivers unprecedented energy efficiency in a highly reliable switched reluctance design. This software-driven motor solution includes the SMC Smart Motor and the SMC Motor Controller, complete with networking and connection capabilities to SMC Cloud Services. The patented SMC Motor System is proven to significantly reduce energy consumption, dramatically reducing energy costs and carbon footprint resulting from electric motor operation.

The SM-5 motor is suitable for a range of new and retrofit HVAC, refrigeration, and pumping applications in both fixed and variable speed.

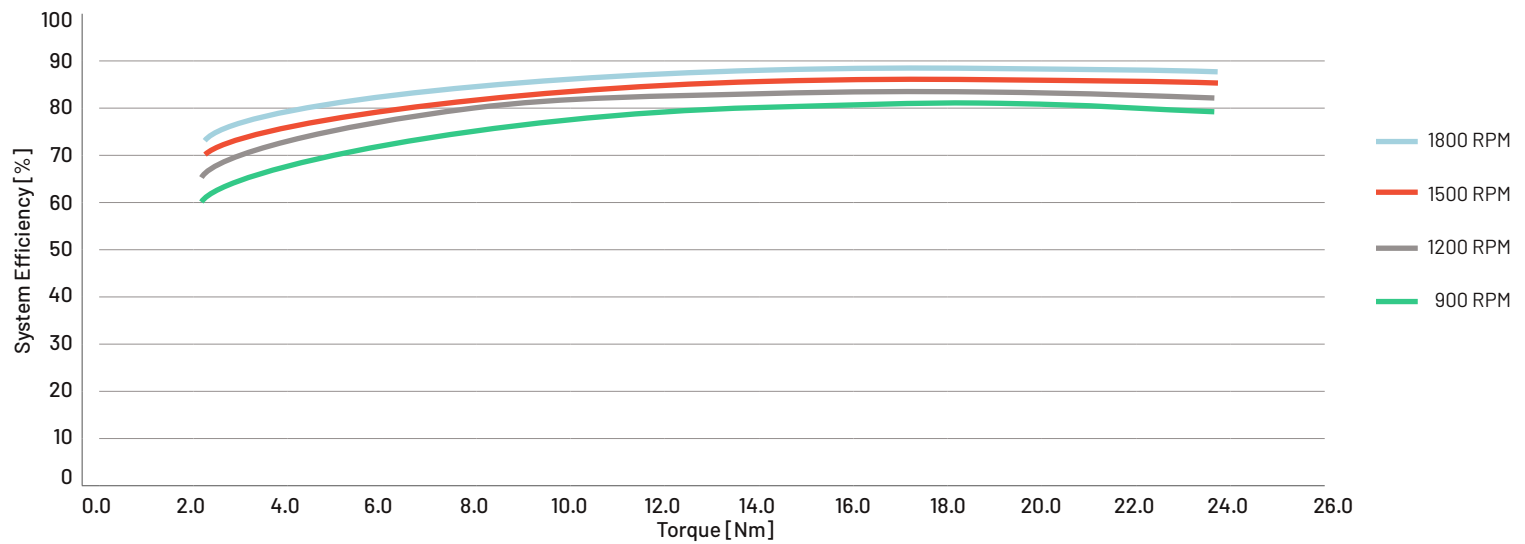


SMC Smart Motor System

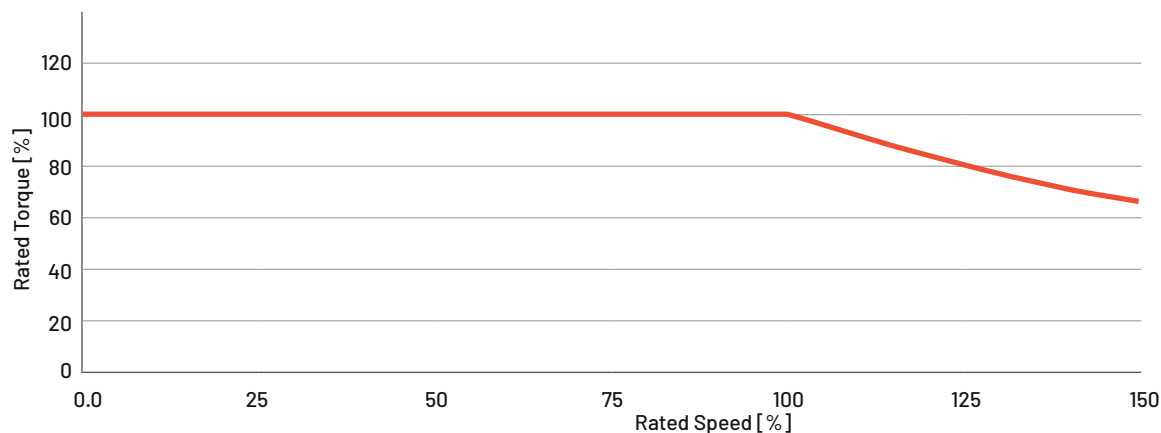
FEATURES	SMC SMART MOTOR SYSTEM BENEFITS
SMC Cascade™ PC graphic-based programming tool, part of the SMC Controls Platform	Provides for customization to assure your motor control sequences can be accomplished for every application.
Safe DC bus discharge	Ensures internal voltages of the SMC Motor Controller are rapidly discharged for safe service and maintenance immediately after power down.
Built-in brownout protection	Allows the SMC Smart Motor to continue to run in single-phase if phase loss occurs, ultimately providing less downtime, even with unstable power input.
"Fail Safe" mode	Keeps the SMC Smart Motor running continuously, even if two of the three motor phase windings are damaged.
SMC Cloud Services	Provides monitoring and remote reporting, enabling extended data logging and alerts and alarms based on selectable parameters, protecting equipment and assuring the most efficient operation.
Built-in soft start	Leverages the SMC Motor Controller to minimize nuisance circuit trips and high inrush currents, reducing maintenance costs.



System Efficiency vs Torque at Various Speeds



Torque-Speed Curve

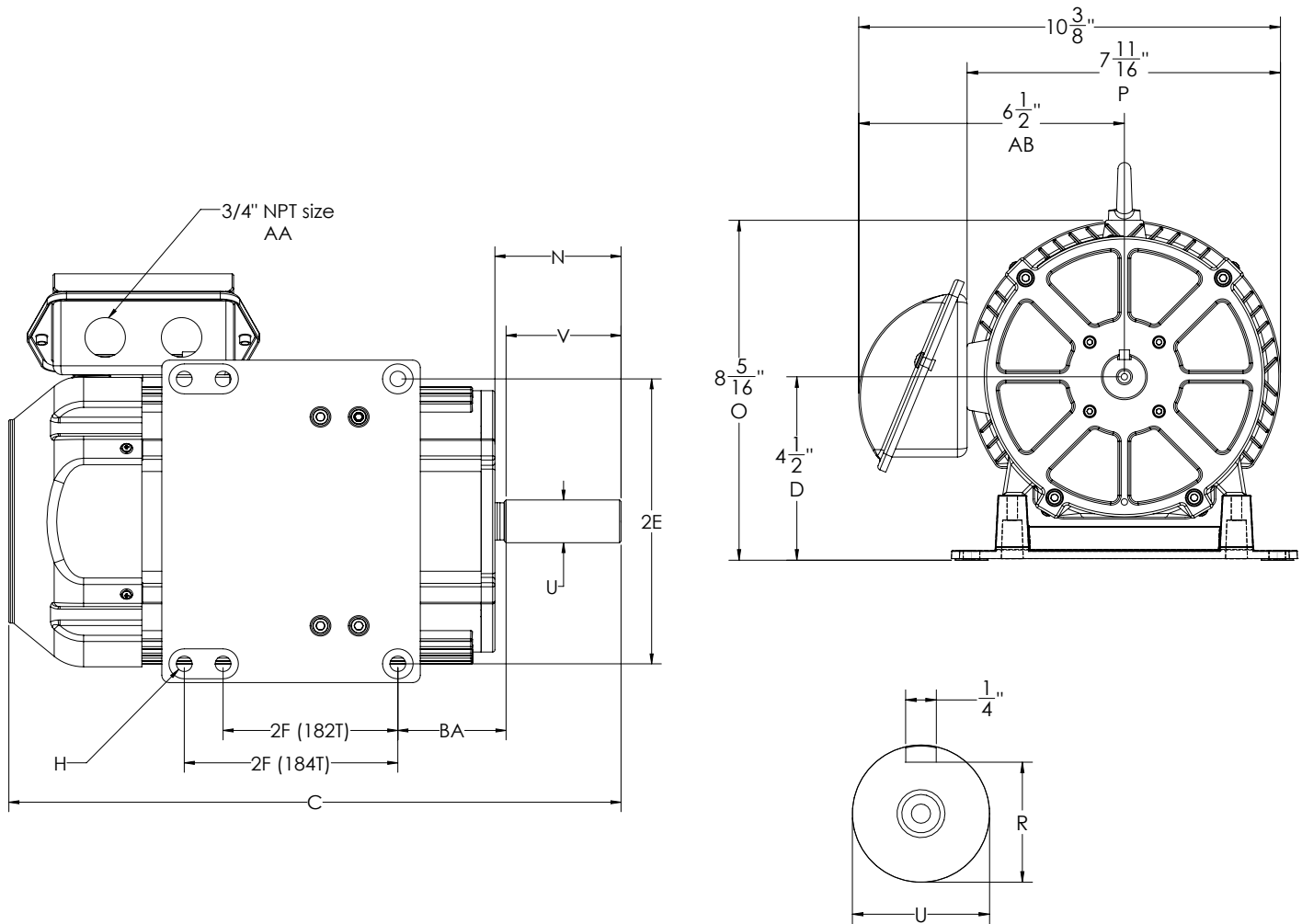


Motor System Characteristics

Rated HP	5 HP	Motor Enclosure	TEFC
Rated RPM	1800 RPM	Duty Rating	Continuous
Operating RPM	300-2400 RPM	Rated Service Factor	1.15
Supply Voltage	208-230VAC, 460VAC	Motor to Controller Power Wire	12AWG
Supply Phase	Three-Phase	Insulation Class	F
Supply Frequency	60 Hz	Ambient Temperature Range	-10°C to +40°C
Peak System Efficiency	88 %	Relative Humidity	95%, non-condensing
Power Factor over Operating Range	0.55-0.72	Rotor Inertia	0.164 lb-FT ²
Motor Frame Sizes	182T/184T	Motor Weight	72 lb



Motor Dimensions



Dimension Table (in inches)

NEMA	D	E	2F	H	BA	U	V	C
182T	4 1/2	3 3/4	4 1/2	13/32	2 3/4	1 1/8	2 3/4	15 3/4
184T	4 1/2	3 3/4	5 1/2	11/32	2 3/4	1 1/8	2 3/4	15 3/4

Definitions:


- D - height of shaft
- E - 1/2 distance between foot holes side-to-side
- 2F - distance between foot holes front to back
- H - foot hole size
- BA - distance from front foot hole to back of shaft horizontally
- U - shaft diameter
- V - shaft length



SMC Motor Controller

The SMC Motor Controller controls all operations of the SMC Smart Motor and is required for motor operation. Its internal program assures that the motor is operating at the highest efficiency at any speed in any application. It does this by monitoring the internal sensors and feedback from the Smart motor and adjusting control signals for optimization. The Motor Controller provides physical connection for 13 sensors and relay output connections for control and monitoring of associated equipment such as RTUs, AHUs and pumps. The Motor Controller can be configured with SMC Cascade software to operate under an infinite number of control scenarios. When connected with the SMC supervisor, remote configuration, updates, alerts, alarms, and system data logging can be delivered through SMC Cloud services or a BMS system.

Motor Controller Name Plate

	Smart Motor System HR-SRM Motors www.softwaremotor.com
Model #	SMC-P05
Motor	SM-5, SM-7.5, SM-10
Input	3PH 208/230VAC 60Hz / 16A 3PH 460VAC 60Hz / 16A
Output	3PH 280-680VDC MAX HP 10.0 / 460VAC, 5.0 / 230VAC

FEATURE	BENEFIT
Configurable sequence of operation based on internal and external sensor feedback using up to 13 integrated I/O points	Reduces hardware needed to control HVAC and other equipment, reducing overall cost of system implementation. Minimizes downtime due to power supply issues providing continuity of operation. Eliminates motor damage due to poor incoming power quality, lowering total cost of ownership.
Safe DC bus discharge	Provides for safer maintenance after power-down by ensuring internal voltages of the SMC Motor Controller are rapidly discharged for safe service and maintenance immediately after power down.
Built-in soft start	Eliminates nuisance service calls and interruptions to building operation due to inadvertent circuit breaker trips.
“Fail Safe” mode	Keeps the SMC Smart Motor running during phase loss, ensuring continuous operation and minimum downtime.

Motor Controller I/O

- Seven programmable digital inputs
- One programmable voltage output: 0-10V, 20mA limit
- Four relay outputs: 1A, 125VAC limit
- Four universal inputs, individually selectable as:
 - Voltage Mode: 0-10V
 - Current Mode: 0-20mA; or 4-20mA
 - Resistive Mode
 - External Logic Mode

Indemnity

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The Silicon Valley based Software Motor Company is setting a new standard of efficiency, reliability, and intelligence with the SMC Smart Motor System. SMC combines modern computing and software control with the proven reliability of switched reluctance motor technology to achieve an unprecedented optimal efficiency. The patented SMC Smart Motor System only uses energy when it is needed, thereby significantly reducing space conditioning and refrigeration energy costs. A fully programmable IoT controls package facilitates maintenance savings and easy integration with existing building systems.