

# SMC Smart Motor System: 1, 1.5, 2, 3 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-1, SM-1.5, SM-2 and SM-3 motors are suitable for a range of new and retrofit HVAC, refrigeration, and pumping applications in both fixed and variable speed.

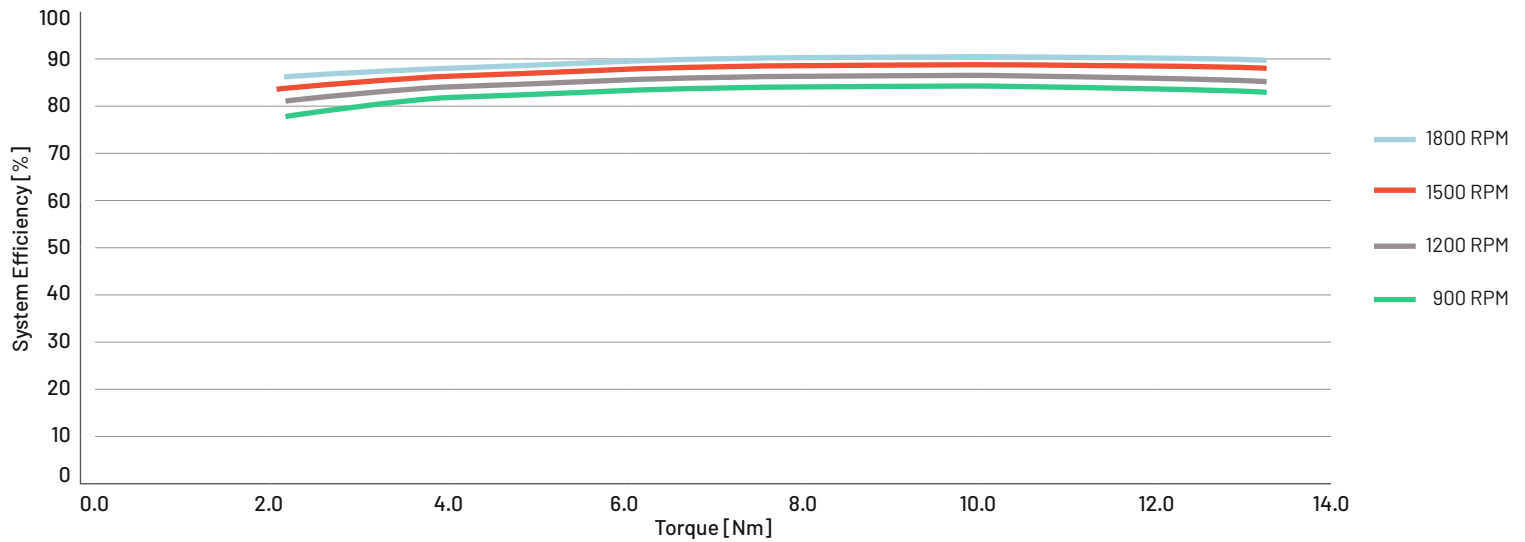


## SMC Smart Motor System

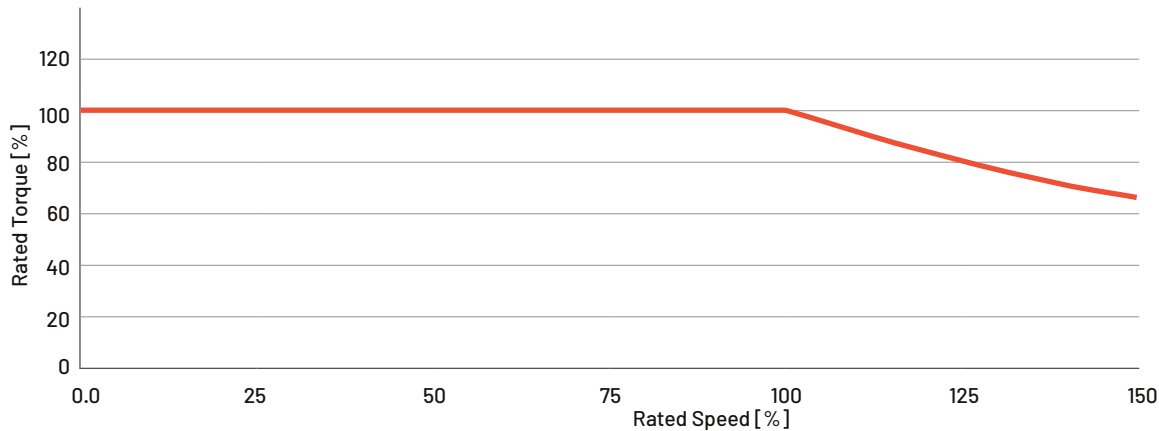
FEATURES	SMC SMART MOTOR SYSTEM BENEFITS
<b>SMC Cascade™</b> PC graphic-based programming tool, part of the SMC Controls Platform	Provides for customization to assure your motor control sequences can be accomplished for every application.
<b>Configurable sequence of operation based on internal and external sensor feedback using up to 13 integrated I/O points</b>	Reduces hardware needed to control HVAC and other equipment, reducing overall cost of system implementation.
<b>Safe DC bus discharge</b>	Ensures internal voltages of the SMC Motor Controller are rapidly discharged for safe service and maintenance immediately after power down
<b>“Fail Safe” mode</b>	Keeps the SMC Smart Motor running during phase loss, ensuring continuous operation and minimum downtime.
<b>SMC Cloud Services</b>	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.
<b>Built-in soft start and brownout protection</b>	Eliminates nuisance service calls and interruptions to building operation due to inadvertent circuit breaker trips, reducing maintenance costs.



## System Efficiency vs Torque at Various Speeds



## Torque-Speed Curve

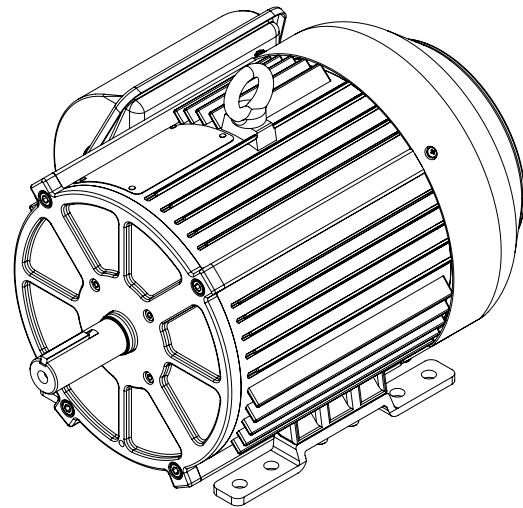
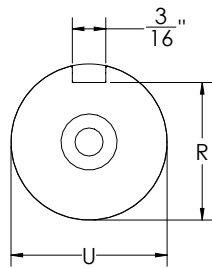
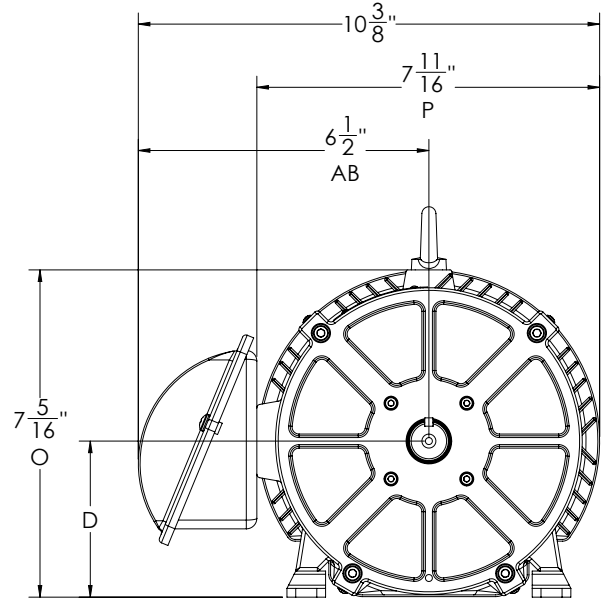
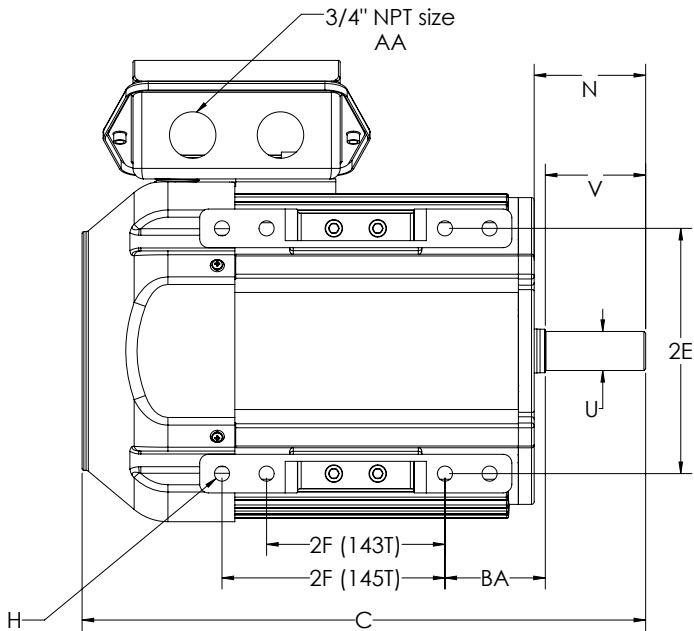


## Motor System Characteristics

Rated HP	1, 1.5, 2, 3 HP	Motor Enclosure	TEFC
Rated RPM	1800 RPM	Duty Rating	Continuous
Operating RPM	100-3600 RPM	Rated Service Factor	1.15
Supply Voltage	208-230VAC, 460VAC	Motor to Controller Power Wire	14 AWG
Supply Phase	Single (1HP) or Three-Phase (1-3HP)	Insulation Class	F
Supply Frequency	60 Hz	Ambient Temperature Range	-10°C to +40°C
Peak System Efficiency	91%	Relative Humidity	95%, non-condensing
Power Factor over Operating Range	0.65-0.80	Rotor Inertia	0.100 lb-ft <sup>2</sup>
Motor Frame Sizes	56, 143T/145T	Motor Weight	54 lb



## Motor Dimensions



## Dimension Table (in inches)

NEMA	D	E	2F	H	BA	U	V	C
56	3 1/2	2 7/16	3	11/32 SLOT	2 3/4	5/8	1 7/8 or 4 1/2	12 1/4
143T	3 1/2	2 3/4	4	11/32	2 1/4	7/8	2 1/4	12 5/8
145T	3 1/2	2 3/4	5	11/32	2 1/4	7/8	2 1/4	12 5/8

### 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



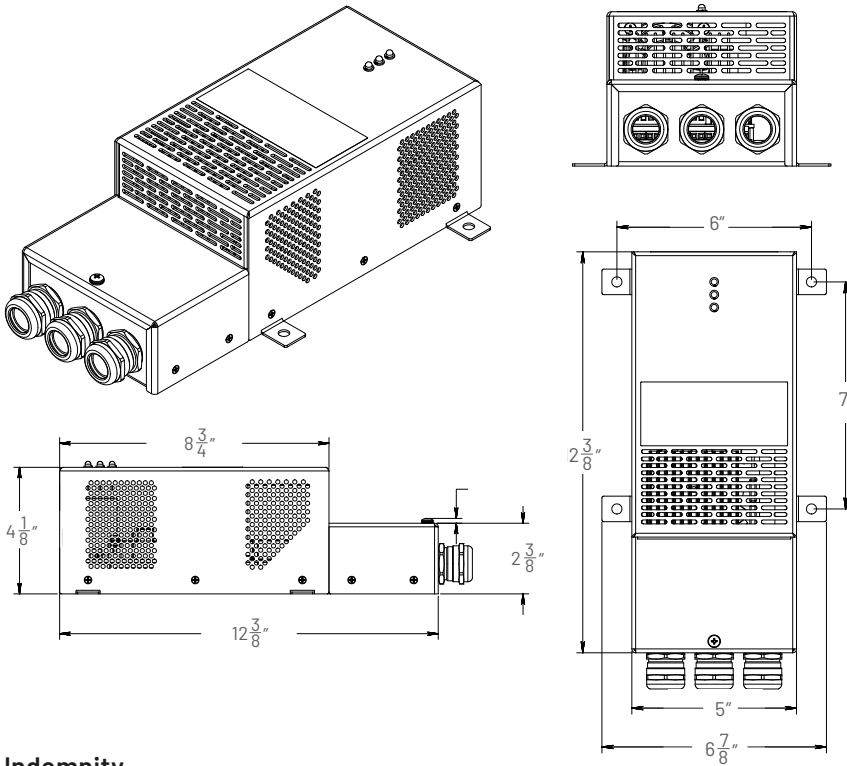
## SMC Motor Controller

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

 <b>SMC</b> <sup>®</sup> SOFTWARE MOTOR COMPANY	Smart Motor System HR-SRM Motors <a href="http://www.softwaremotor.com">www.softwaremotor.com</a>
<b>Model #</b>	SMC-P04
<b>Motor</b>	SM-1, SM-1.5, SM-2, SM-3
<b>Input</b>	3PH 208/230VAC 60Hz / 3.2A - 9.8A 3PH 460VAC 60Hz / 3.8A - 5.7A
<b>Output</b>	3PH 280-680VDC MAX HP 3.0

## Motor Controller Dimensions (in inches)



## Motor Controller I/O

QTY	Description
7	Programmable digital inputs
1	Programmable voltage output: 0-10, 20mA limit
4	Relay outputs: 1A, 125VAC limit
4	Universal inputs, individually selectable as: <ul style="list-style-type: none"> <li>Voltage Mode: 0-10V</li> <li>Current Mode: 0-20mA; or 4-20mA</li> <li>Resistive Mode</li> <li>External Logic Mode</li> </ul>

## 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.