

# Turntide® Smart Motor System™: V01 (1, 1.5, 2, 3 HP)

Turntide’s breakthrough sustainability technology is a complete platform for energy optimization that drives down energy consumption and operating costs in buildings, agriculture and electric transport. With Turntide’s Smart Motor System and Platform for Sustainable Operations™, organizations can attack energy waste at every level, through optimal device physics, intelligent automation, and seamless integration with other systems.



## Turntide V01 Motor: Key Benefits

ATTACKS ENERGY WASTE AT EVERY LEVEL	CONTINUOUS IMPROVEMENTS	TRANSFORMATIVE IMPACT
V01 offers up to 91% peak system efficiency, which dramatically reduces HVAC energy consumption	V01 integrates with Turntide’s Platform for Sustainable Operations for simplified cloud-based building management that only gets better over time	V01 is engineered to provide unprecedented reliability and longevity thanks to its switched reluctance motor architecture, transforming HVAC systems for the long haul

With Turntide’s high rotor pole switched reluctance motor technology running with proprietary control algorithms, V01 offers an optimally efficient motor system perfectly suited to reduce energy consumption in RTU (packaged rooftop unit) HVAC systems. For commercial real estate built environments requiring motor systems at lower HP ranges, V01 provides a no-brainer sustainability solution that enables buildings to save energy for the long-term, immediately.

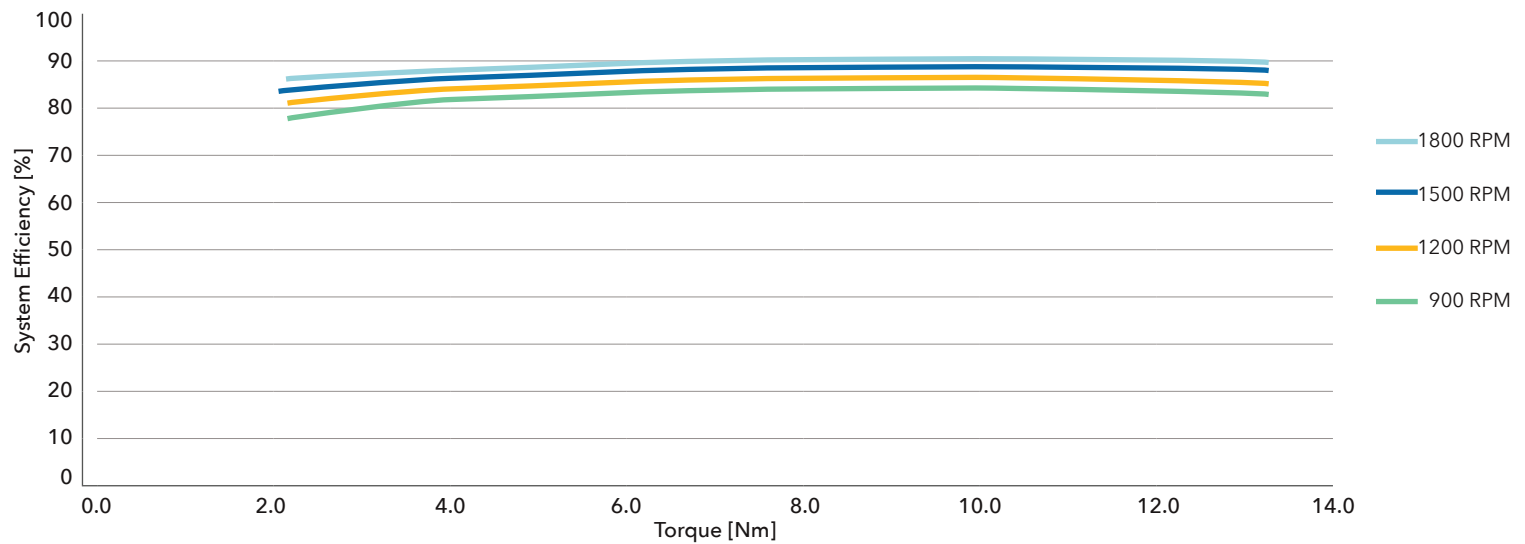
## Turntide Smart Motor System™ Features

FEATURE	CAPABILITIES
Dynamic Motor Sequence Control	Enables fully customizable motor control sequences for any HVAC application, using Turntide’s Cascade® controls-based programming tool
Remote Monitoring and Alerts	Provides monitoring and remote reporting capabilities via the Turntide Cloud, enabling extended data logging and alerts that optimally protect your equipment and assure the most efficient operation possible
Built-In Equipment Management	Reduces additional hardware needed to control HVAC and other equipment, via 18 integrated I/O points
Total Electrical Protection	Ensures internal voltages are rapidly discharged for safe maintenance after power down via safe DC bus discharge. Eliminates inadvertent circuit breaker trips via built-in soft start and brownout protection.

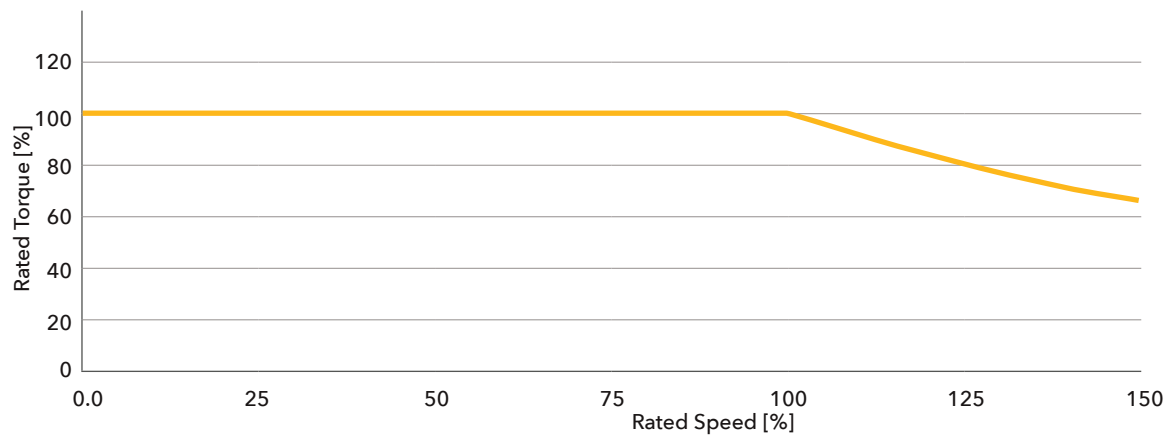




## System Efficiency vs Torque at Various Speeds



## Torque-Speed Curve

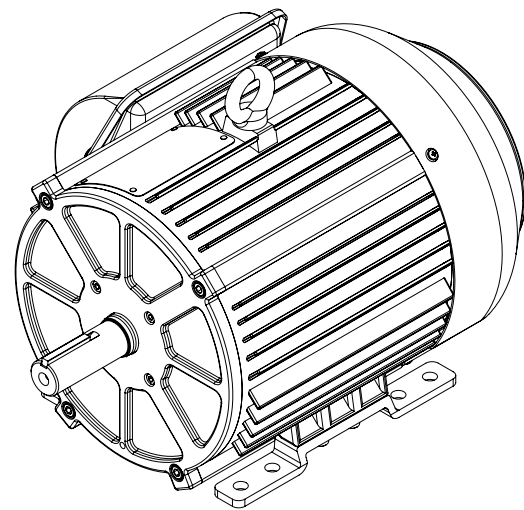
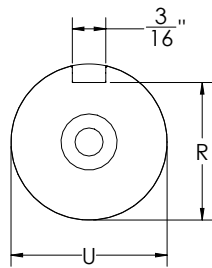
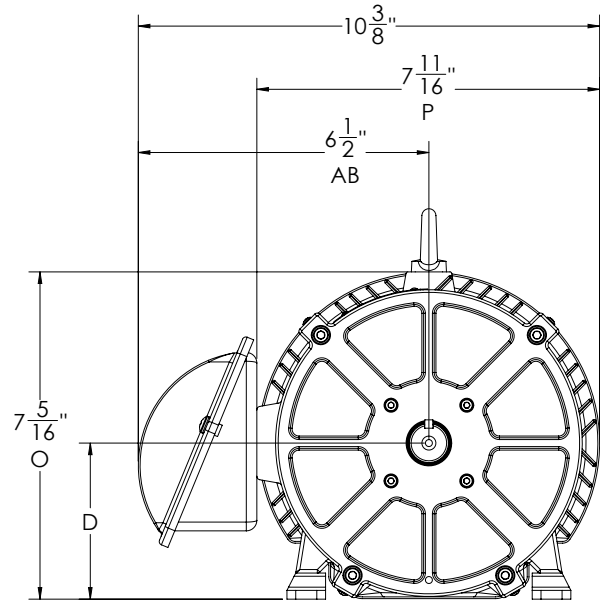
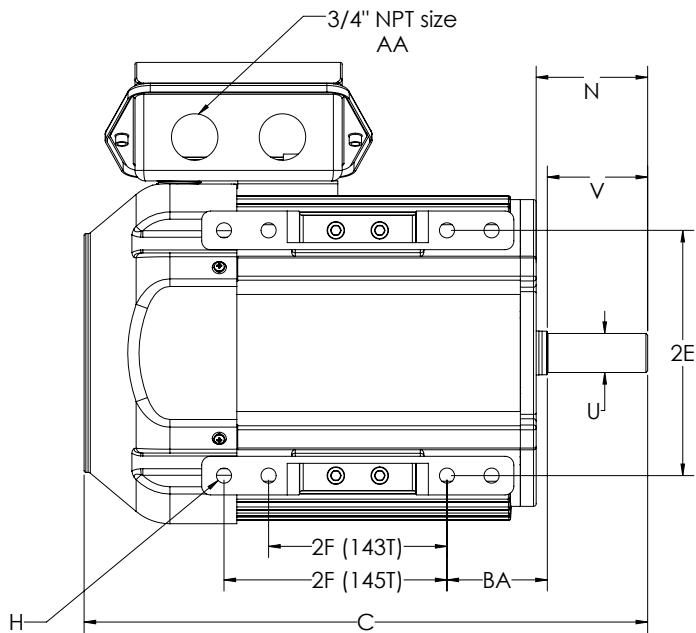


## Motor System Characteristics

Rated HP	1, 1.5, 2, 3 HP (208/230VAC) 1, 1.5, 2, 3 HP (460VAC)	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	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

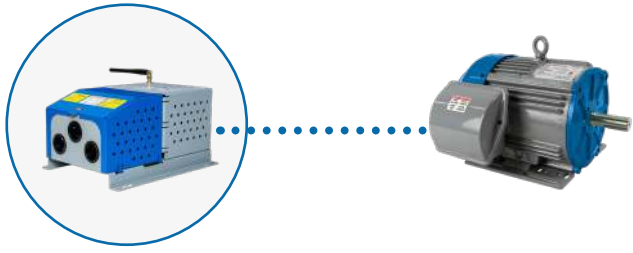


## Dimension Table (in inches)

NEMA	D	E	2F	H	BA	U	V	C
56	3 1/2	2 7/16	3	11/32 SLOT	2 3/4	58	1 7/8 or 4 1/2	12 5/8
143T	3 1/2	2 3/4	4	11/32	2 1/4	78	2 1/4	12 5/8
145T	3 1/2	2 3/4	5	11/32	2 1/4	78	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
- C - overall length



The Turntide **SL120 motor controller** provides the intelligence behind the V01 motor, and is the gateway to unlocking all the benefits of the Turntide Smart Motor System and the Turntide Platform for Sustainable Operations.

## SL120 Motor Controller: Key Benefits

**Built-In Intelligence:** SL120 runs a proprietary control algorithm that monitors motor feedback to optimize for efficiency at any speed

**Seamless Connectivity:** With up to 18 sensors and relay output connections available for monitoring and control, SL120 integrates easily with associated equipment, and can be configured with Turntide’s Cascade software to run various control scenarios

**Built for Remote Monitoring:** Connected to a Turntide Supervisor, SL120 provides remote configuration, updates, alerts, alarms, and system data logging through the Turntide Cloud or any BMS system

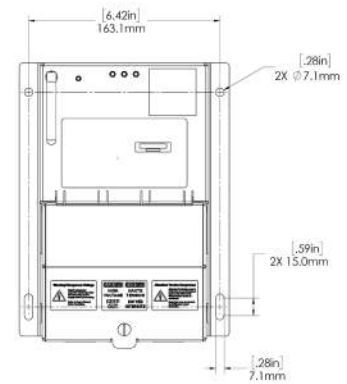
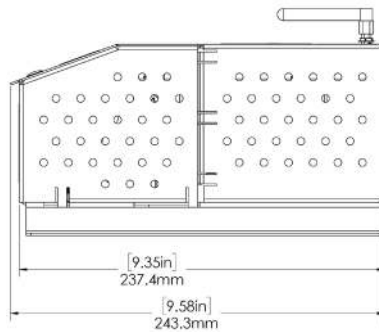
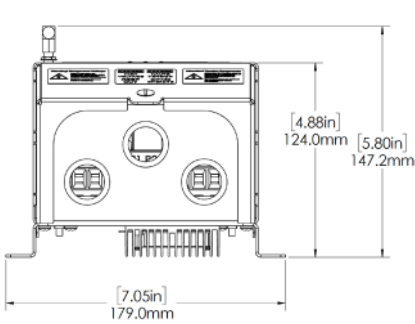
## Motor Controller I/O

QTY	Description
7	Programmable digital inputs
1	Programmable voltage output: 0-10V, 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>
2	24VDC Aux Power Outputs (up to 500mA)

## Motor Controller Mounting

Securely install the motor controller to a solid mounting surface with a 1/4 inch or M7 fastener using the four screw tabs on the base.

## Motor Controller Dimensions



## Indemnity

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Turntide Technologies (formerly Software Motor Company) has developed the world’s most efficient and intelligent electric motor system. The revolutionary Smart Motor System is based on proven switched reluctance technology, now managed with advanced cloud software and connected to precise controls via IoT. Turntide’s vision is to eliminate the 25% of global electricity consumption that is wasted by legacy motors, thus accelerating the world’s transition from fossil fuels. Turntide is based in Sunnyvale, Calif., with offices in San Francisco; Arlington, Wash.; and Kennesaw, Ga. Turntide has installed Smart Motor Systems with dozens of customers, reducing their motor electricity consumption by an average of 64%, and is powering the systems of leading OEMs. For further information, visit [www.turntide.com](http://www.turntide.com).