Turntide™ Smart Motor System: V01 IEC (1.1 - 2.2 kW)

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

The Turntide V01 IEC motors are suitable for a range of new and retrofit HVAC, refrigeration, and pumping applications in both fixed and variable speed.

Turntide Smart Motor System

FEATURES	TURNTIDE SMART MOTOR SYSTEM BENEFITS
Turntide Cascade® - PC graphic-based programming tool, part of the Turntide Controls Platform	Provides for customization to assure your motor control sequences can be accomplished for every application.
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.
Safe DC bus discharge	Ensures internal voltages of the Turntide Motor Controller are rapidly discharged for safe service and maintenance immediately after power down
"Fail Safe" mode	Keeps the Turntide Smart Motor running during phase loss, ensuring continuous operation and minimum downtime.
Turntide Cloud	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 and brownout protection	Eliminates nuisance service calls and interruptions to building operation due to inadvertent circuit breaker trips, reducing maintenance costs.

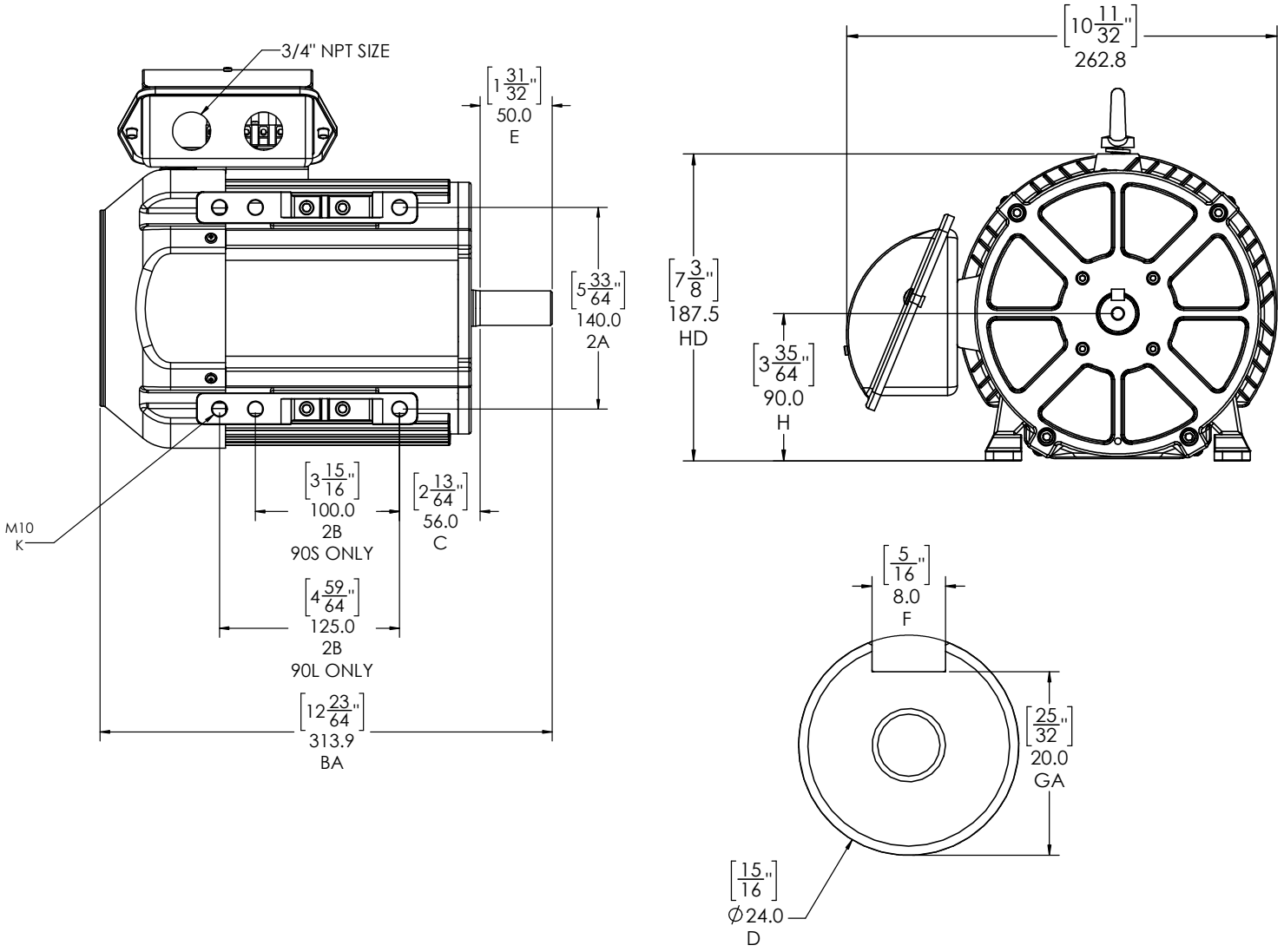
Motor System Characteristics

Motor Model SKU	V01-0150-2-ID000	V01-0200-2-ID000	V01-0300-2-IE000 V01-0300-2-IF000	Supply Voltage/Frequency	200-240VAC
	V01-0150-4-ID000	V01-0200-4-ID000	V01-0300-4-IE000 V01-0300-4-IF000		380-415VAC
Motor Controller Model	P04W			Supply Frequency	50 Hz
Rated Power	1.1 kW / 1.5 HP	1.5 kW / 2 HP	2.2 kW / 3 HP	Motor Duty Rating	Continuous
Rated RPM	1500 RPM			Motor Ingress Protection	IP20 Rating
Rated Service Factor	1.15		1.15 (-2) / 1.00 (-4)	Motor Controller Ingress Protec-	IP20 Rating
Operating RPM	300-3000 RPM			Rotor Inertia	0.100 lb-ft² (0.0042 kg-m²)
Peak System Efficiency	87.9%	89.1%	87.9%	Motor to Controller Power Wire	14 AWG
Peak Motor Efficiency	91.0%	91.4%	89.8%	Insulation Class	F
Supply Phase	3-Phase			Ambient Temperature Range	-10°C to +40°C
Power Factor	0.65-0.80 across operating range			Relative Humidity	95%, non-condensing
Motor Enclosure	TEFC			Motor Controller Weight	3.2 kg (7.0 lb)
IEC Motor Frame Sizes	90S / 90L	100L (-IE00) / 112S (-IF00)		Motor Weight	24.5 kg (54 lb)

CE RoHS COMPLIANT

Certified to IEC 60204-1, IEC 60034-1, IEC 61800-5-1, IEC 61800-5-2, IEC 61800-3, IEC 61508-1, and IEC 61508-2

Motor Dimensions

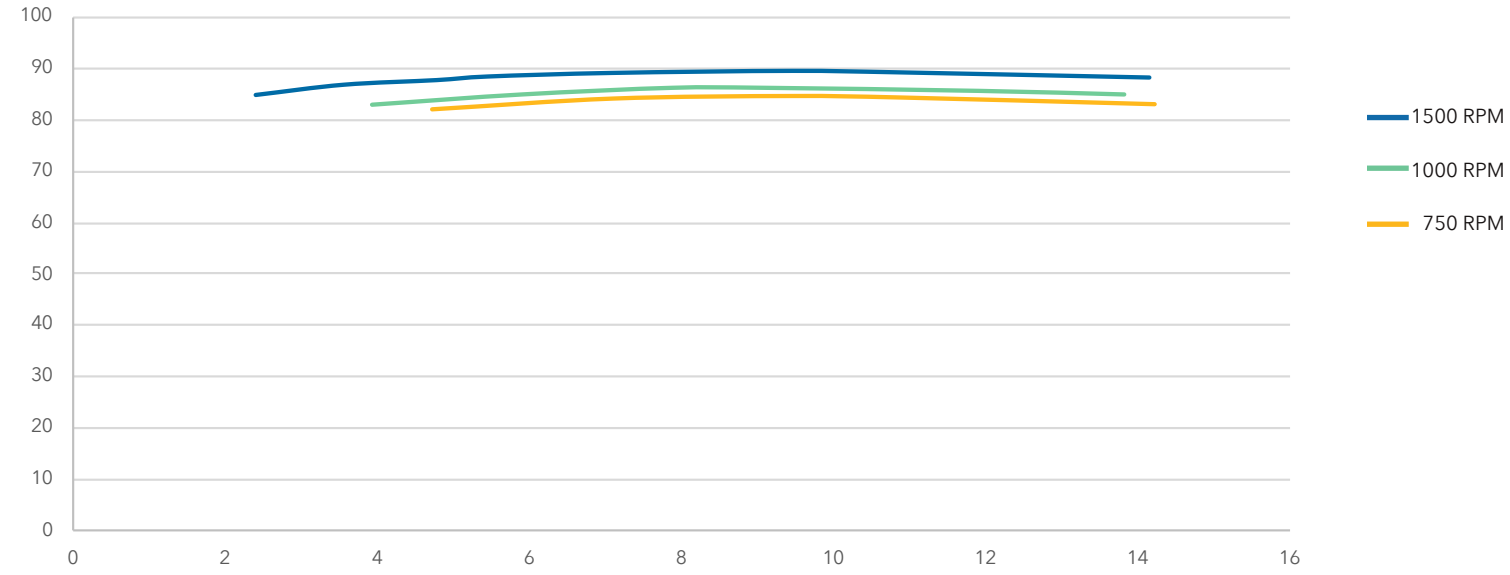


Dimension Table (in millimeters)

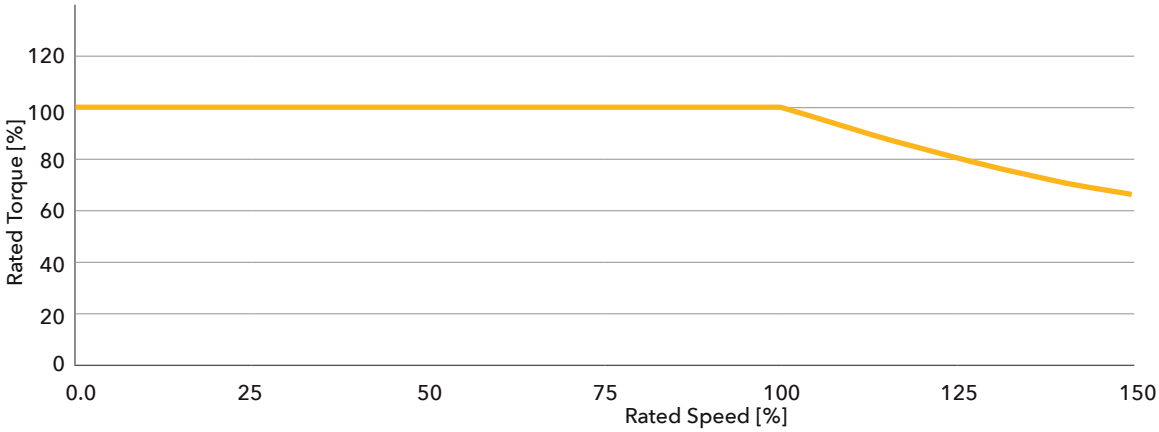
IEC Frame	2A	2B	H	K	D	E	C	BA
90S	140	100	90	M10	24	50	56	313.9
90L	140	125	90	M10	24	50	56	313.9
100L	160	140	100	M12	28	60	38	323.9
112S	190	140	112	M12	28	60	38	323.9

2A - distance between foot holes side-to-side
2B - distance between foot holes front to back
H - height of shaft
K - foot hole size
D - shaft diameter
E - shaft length
C - distance from front foot hole to back of shaft horizontally

System Efficiency vs Torque at Various Speeds



Torque-Speed Curve



Motor Nameplates

SMC SOFTWARE MOTOR COMPANY

SMC Smart Motor
HR-SRM Motors
www.softwaremotor.com

OUTPUT ..... 2.2kW/3.0hp at 1500 RPM

MODEL V01-0300-2-IE000
VOLTAGE ..... 280-340 VDC
SERVICE FACTOR 1.15
PEAK EFFICIENCY 91.0%
FRAME 100L
MAX AMB. ..... 40°C
INSULATION CLASS ..... F
DUTY.....Continuous

AMPS 10.5A
ENCLOSURE .....TEFC

Made in China

CE

This product is covered by U.S. Patent 7,230,360. Other patents pending.

WARNING: This motor may only be operated using supplied SMC Motor Controller.

AVERTISSEMENT: Ce moteur doit être utilisé avec le contrôleur de moteur SMC fourni. On Peut pas utilizer un autre contrôleur.

SMC SOFTWARE MOTOR COMPANY

SMC Smart Motor
HR-SRM Motors
www.softwaremotor.com

OUTPUT ..... 2.2kW/3.0hp at 1500 RPM

MODEL V01-0300-4-IE000
VOLTAGE ..... 535-565 VDC
SERVICE FACTOR 1.00
PEAK EFFICIENCY 91.4%
FRAME 100L
MAX AMB. ..... 40°C
INSULATION CLASS ..... F
DUTY.....Continuous

AMPS 5.5A
ENCLOSURE .....TEFC

Made in China

CE

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Turntide Motor Controller

The Turntide Motor Controller controls all operations of the Turntide 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 Turntide Cascade software to operate under an infinite number of control scenarios. When connected with the Turntide Supervisor, remote configuration, updates, alerts, alarms, and system data logging can be delivered through Turntide Cloud or a BMS system.

Motor Controller Nameplate

SMC
SOFTWARE MOTOR COMPANY

SMC Motor Controller
HR-SRM Motors
www.softwaremotor.com

Made in China

MODEL SMC-P04W **TYPE** IP20

MOTOR SMC-V01

INPUT

VOLTS 3PH	Current (A) 60HZ	50HZ
208-230V	3.2-9.8	
460V	3.8-5.7	
200-240V		5.2-11.8
380-415V		3.0-5.2

OUTPUT 3PH 280-680VDC
MAX HP 3.0

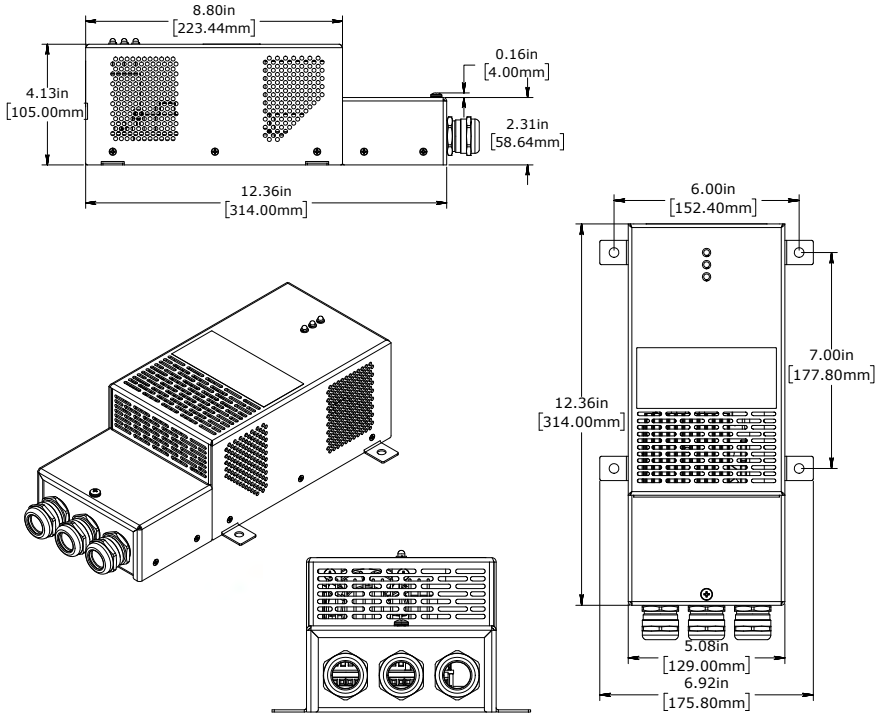
Conforms to UL STD 508C
Certified to CSA STD C22.2#274

WARNING: This SMC Motor Controller will only operate stated SMC Smart Motor.

AVERTISSEMENT: Ce contrôleur de moteur SMC doit etre utilisé qu'avec moteur de la série de intelligent SMC.

LISTED
Intertek
5003619

Motor Controller Dimensions



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: • Voltage Mode: 0-10V • Current Mode: 0-20mA; or 4-20mA • Resistive Mode • External Logic Mode

Indemnity

The information in this document is subject to change without notice and should not be construed as a commitment by Turntide Technologies or Software Motor Company. Turntide Technologies assumes no responsibility for any errors that may appear in this document. In no event shall Turntide Technologies be liable for incidental or consequential damages arising from use of this document or the software and hardware described in this document.

TURNTIDE

1295 Forgewood Avenue, Sunnyvale, CA 94089

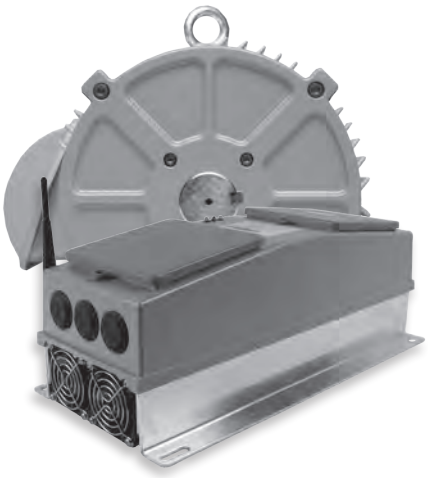
sales@turntide.com

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.

POWER IS VALUABLE. USE IT INTELLIGENTLY.

Turntide™ Smart Motor System: V02 IEC (4 kW)

The Turntide Smart Motor System delivers unprecedented energy efficiency in a highly reliable switched reluctance design. This software-driven motor solution includes the Turntide Smart Motor and the Turntide Motor Controller, complete with networking and connection capabilities to Turntide Cloud. The patented Turntide Motor System is proven to significantly reduce energy consumption, dramatically reducing energy costs and carbon footprint resulting from electric motor operation. The Turntide V02 IEC motors are suitable for a range of new and retrofit HVAC, refrigeration, and pumping applications in both fixed and variable speed.



Turntide Smart Motor System

FEATURES	TURNTIDE SMART MOTOR SYSTEM BENEFITS
Turntide Cascade® - PC graphic-based programming tool, part of the Turntide Controls Platform	Provides for customization to assure your motor control sequences can be accomplished for every application.
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.
Safe DC bus discharge	Ensures internal voltages of the Turntide Motor Controller are rapidly discharged for safe service and maintenance immediately after power down
Turntide Cloud	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 and brownout protection	Eliminates nuisance service calls and interruptions to building operation due to inadvertent circuit breaker trips, reducing maintenance costs.

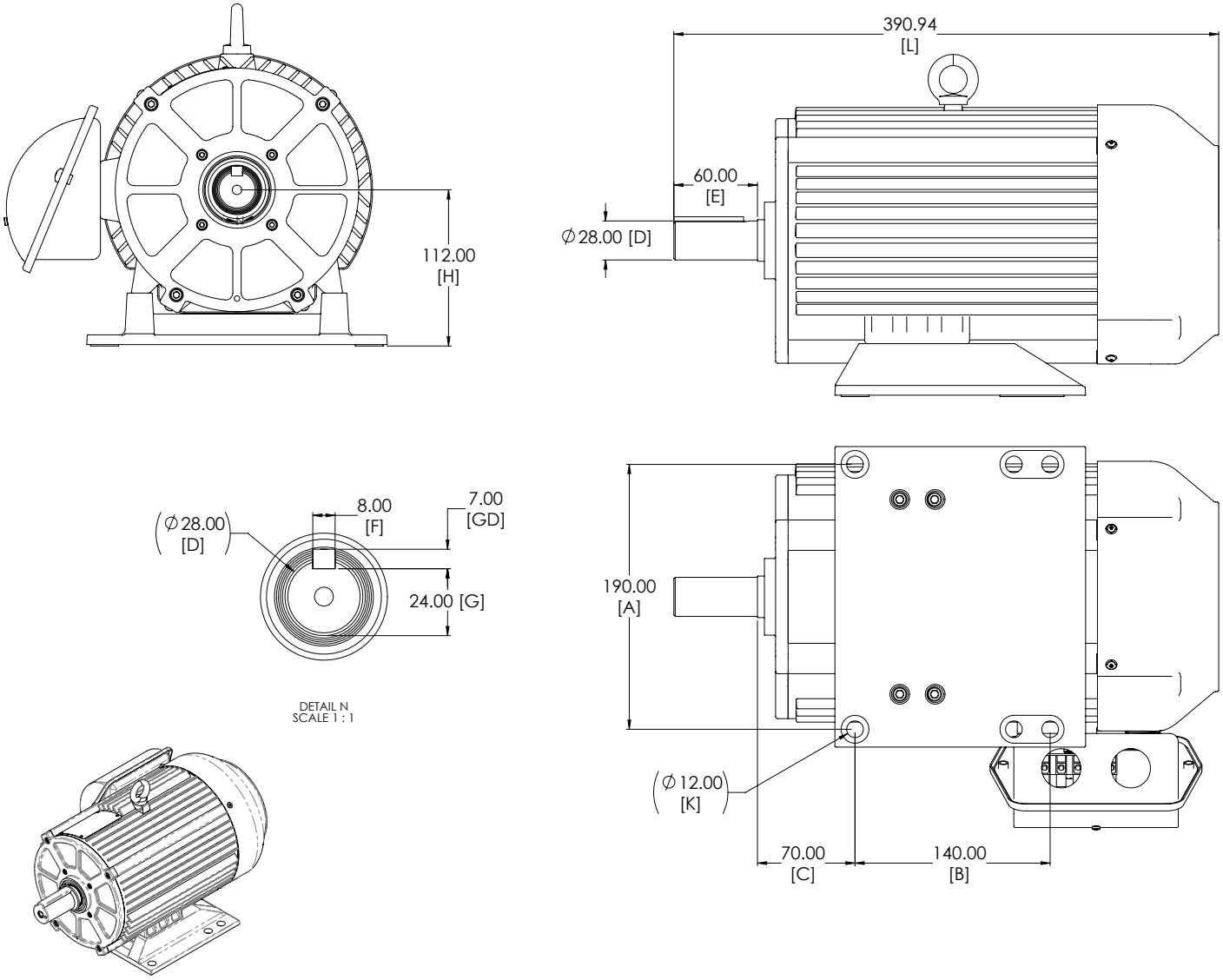
Motor System Characteristics

Motor Model SKU	V02-0500-2-IG000	Supply Voltage/Frequency	200-240VAC
	V02-0500-4-IG000		380-415VAC
Motor Controller Model	P05	Supply Frequency	50 Hz
Rated Power	4.0 kW / 5.4 HP	Motor Duty Rating	Continuous
Rated RPM	1500 RPM	Motor Ingress Protection	IP20 Rating
Rated Service Factor	1.00	Motor Controller Ingress Protection	IP55 Rating
Operating RPM	300-3000 RPM	Rotor Inertia	0.164 lb-ft² (0.0068 kg-m²)
Peak System Efficiency	88.0%	Motor to Controller Power Wire	12 AWG
Peak Motor Efficiency	91.3%	Insulation Class	F
Supply Phase	3-Phase	Ambient Temperature Range	-10°C to +40°C
Power Factor	0.55-0.72 across operating range	Relative Humidity	95%, non-condensing
Motor Enclosure	TEFC	Motor Controller Weight	4.8 kg (10.5 lb)
IEC Motor Frame Sizes	112M	Motor Weight	32.7 kg (72 lb)

CE RoHS COMPLIANT

Certified to IEC 60204-1, IEC 60034-1, IEC 61800-5-1, IEC 61800-5-2, IEC 61800-3, IEC 61508-1, and IEC 61508-2

Motor Dimensions

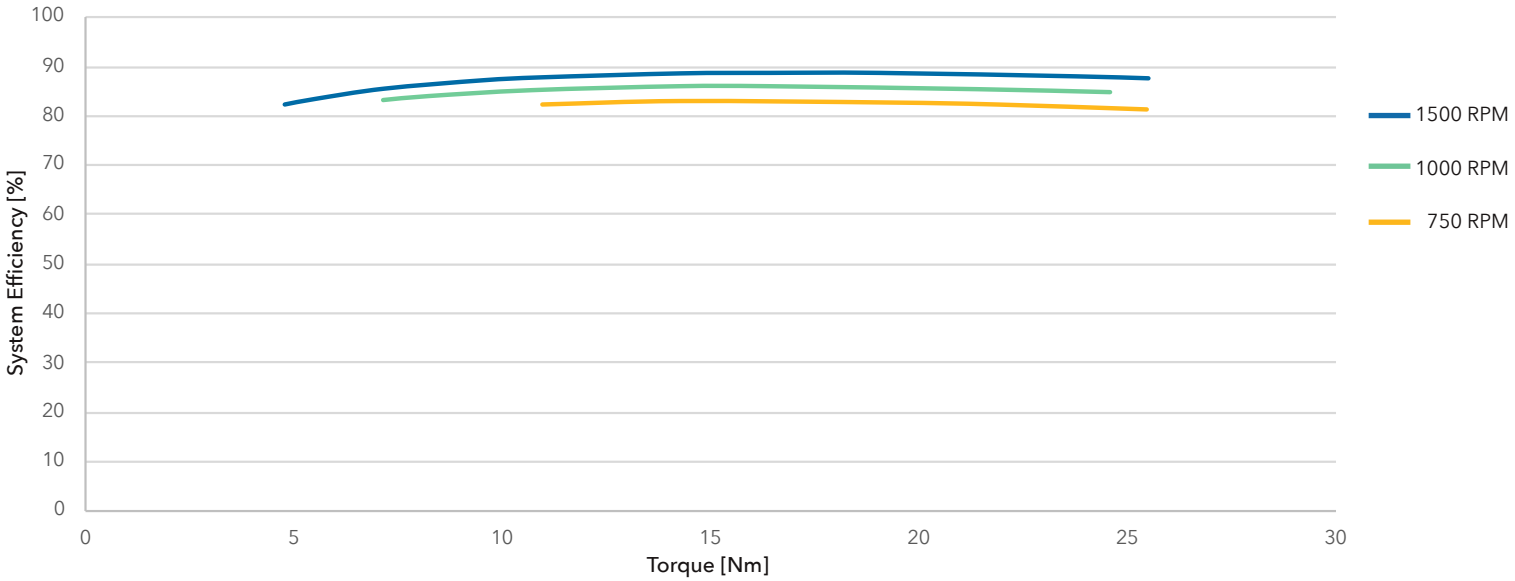


Dimension Table (in millimeters)

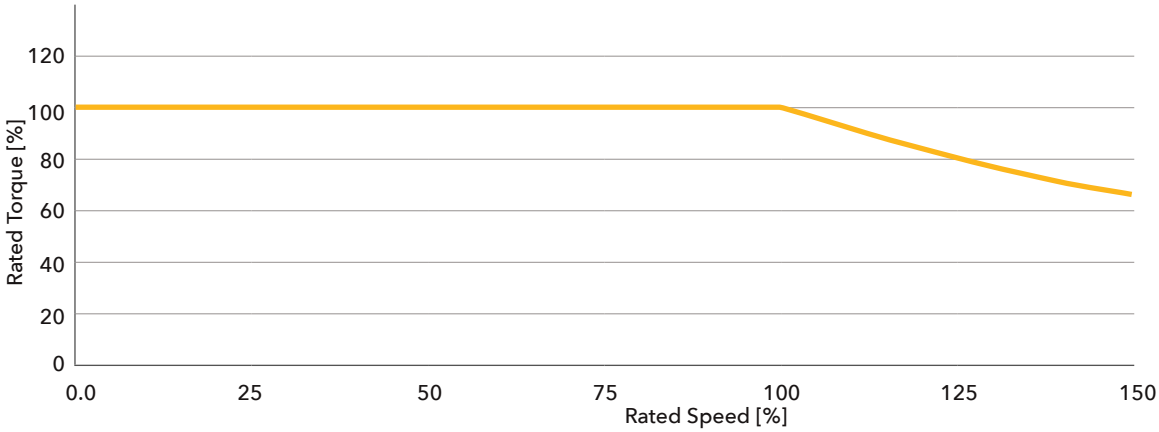
IEC Frame	A	B	H	K	D	E	C	L
112M	190	140	112	M12	28	60	70	390.94

A - distance between foot holes side-to-side
B - distance between foot holes front to back
H - height of shaft
K - foot hole size
D - shaft diameter
E - shaft length
C - distance from front foot hole to back of shaft horizontally

System Efficiency vs Torque at Various Speeds



Torque-Speed Curve



Motor Nameplates

SMC SOFTWARE MOTOR COMPANY

SMC Smart Motor
HR-SRM Motors
www.softwaremotor.com

OUTPUT ..... 4.0kW/5.4hp at 1500 RPM
MODEL V02-0500-2-IG000
VOLTAGE ..... 280-340 VDC
SERVICE FACTOR 1.00
PEAK EFFICIENCY 91.0%
FRAME 112M
MAX AMB. ..... 40°C
INSULATION CLASS ..... F
DUTY ..... Continuous

AMPS 24.5A
ENCLOSURE ..... TEFC

Made in China

CE

This product is covered by U.S. Patent 7,230,360. Other patents pending.

WARNING: This motor may only be operated using supplied SMC Motor Controller.

AVERTISSEMENT: Ce moteur doit être utilisé avec le contrôleur de moteur SMC fourni. On Peut pas utilizer un autre contrôleur.

SMC SOFTWARE MOTOR COMPANY

SMC Smart Motor
HR-SRM Motors
www.softwaremotor.com

OUTPUT ..... 4.0kW/5.4hp at 1500 RPM
MODEL V02-0500-4-IG000
VOLTAGE ..... 535-565 VDC
SERVICE FACTOR 1.00
PEAK EFFICIENCY 91.3%
FRAME 112M
MAX AMB. ..... 40°C
INSULATION CLASS ..... F
DUTY ..... Continuous

AMPS 18.0A
ENCLOSURE ..... TEFC

Made in China

CE

This product is covered by U.S. Patent 7,230,360. Other patents pending.

WARNING: This motor may only be operated using supplied SMC Motor Controller.

AVERTISSEMENT: Ce moteur doit être utilisé avec le contrôleur de moteur SMC fourni. On Peut pas utilizer un autre contrôleur.

Turntide Motor Controller

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Motor Controller Nameplate

SMC
SOFTWARE MOTOR COMPANY

SMC Motor Controller
HR-SRM Motors
www.softwaremotor.com

Made in China

MODEL SMC-P05

MOTOR SMC-V01 / V02 / V03

INPUT

VOLTS 3PH	Current (A) 60HZ	50HZ
208-230V	3.2-16	
460V	3.8-16	
200-240V		13.9-17.9
380-415V		7.8-16.7

OUTPUT 3PH 280-680VDC
MAX HP 10.0

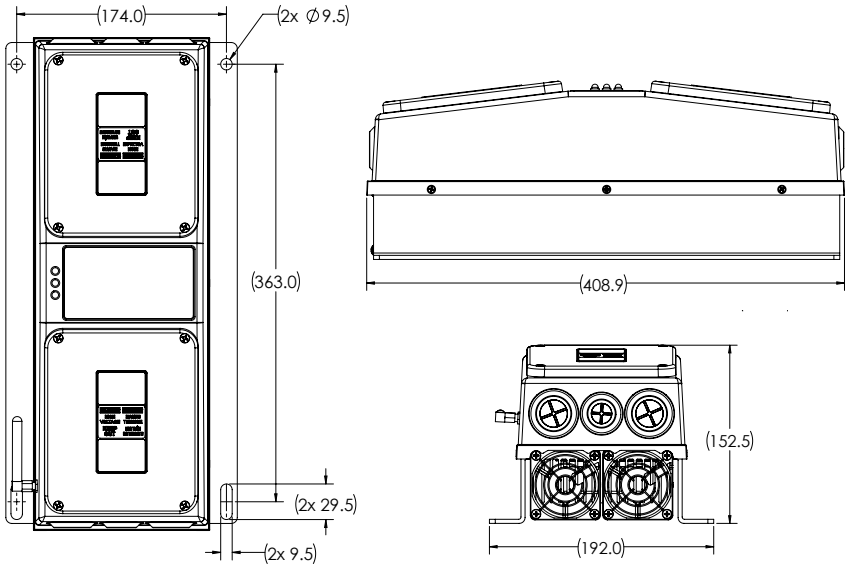
Conforms to UL STD 508C
Certified to CSA STD C22.2#274

WARNING: This SMC Motor Controller will only operate stated SMC Smart Motor.

AVERTISSEMENT: Ce contrôleur de moteur SMC doit etre utilisé qu'avec moteur de la série de intelligent SMC.

LISTED
Intertek
5003619

Motor Controller Dimensions (in millimeters)



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: • Voltage Mode: 0-10V • Current Mode: 0-20mA; or 4-20mA • Resistive Mode • External Logic Mode

Indemnity

TURNTIDE

1295 Forgewood Avenue, Sunnyvale, CA 94089

sales@turntide.com

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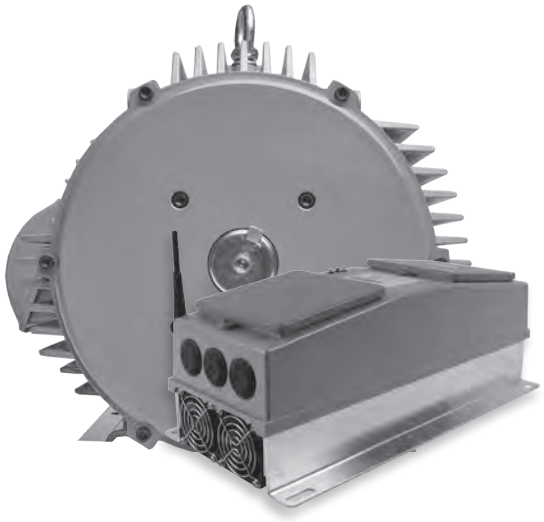
POWER IS VALUABLE. USE IT INTELLIGENTLY.

Turntide™ Smart Motor System: V03 IEC (5.6-7.46 kW)

The Turntide Smart Motor System delivers unprecedented energy efficiency in a highly reliable switched reluctance design. This software-driven motor solution includes the Turntide Smart Motor and the Turntide Motor Controller, complete with networking and connection capabilities to Turntide Cloud. The patented Turntide Motor System is proven to significantly reduce energy consumption, dramatically reducing energy costs and carbon footprint resulting from electric motor operation. The Turntide V03 IEC motors are suitable for a range of new and retrofit HVAC, refrigeration, and pumping applications in both fixed and variable speed.



Turntide Smart Motor System

FEATURES	TURNTIDE SMART MOTOR SYSTEM BENEFITS
Turntide Cascade® - PC graphic-based programming tool, part of the Turntide Controls Platform	Provides for customization to assure your motor control sequences can be accomplished for every application.
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.
Safe DC bus discharge	Ensures internal voltages of the Turntide Motor Controller are rapidly discharged for safe service and maintenance immediately after power down
Turntide Cloud	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 and brownout protection	Eliminates nuisance service calls and interruptions to building operation due to inadvertent circuit breaker trips, reducing maintenance costs.

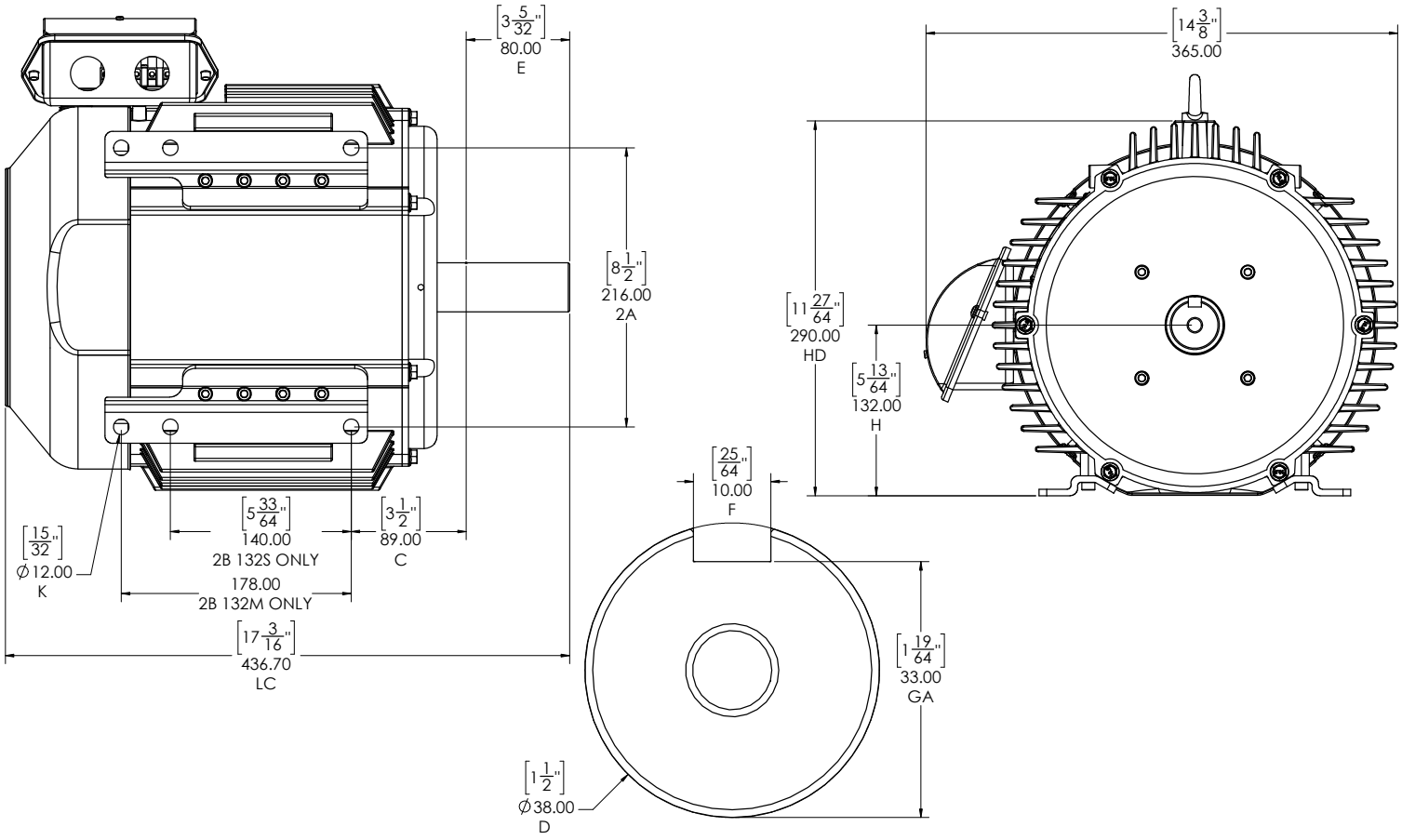
Motor System Characteristics

Motor Model SKU	V03-0750-4-IH000	V03-1000-4-IJ000	Supply Voltage/Frequency	380-415VAC
Motor Controller Model	P05		Supply Frequency	50 Hz
Rated Power	5.6 kW / 7.5 HP	7.46 kW / 10 HP	Motor Duty Rating	Continuous
Rated RPM	1500 RPM		Motor Ingress Protection	IP20 Rating
Rated Service Factor	1.15		Motor Controller Ingress Protection	IP55 Rating
Operating RPM	300-3000 RPM		Rotor Inertia	0.100 lb-ft^2 (0.0042 kg-m^2)
Peak System Efficiency	92.4%		Motor to Controller Power Wire	10 AWG
Peak Motor Efficiency	94.3%		Insulation Class	F
Supply Phase	3-Phase		Ambient Temperature Range	-10°C to +40°C
Power Factor	0.51-0.75 across operating range		Relative Humidity	95%, non-condensing
Motor Enclosure	TEFC		Motor Controller Weight	4.8 kg (10.5 lb)
IEC Motor Frame Sizes	132S	132M	Motor Weight	68.5 kg (151 lb)

CE RoHS COMPLIANT

Certified to IEC 60204-1, IEC 60034-1, IEC 61800-5-1, IEC 61800-5-2, IEC 61800-3, IEC 61508-1, and IEC 61508-2

Motor Dimensions

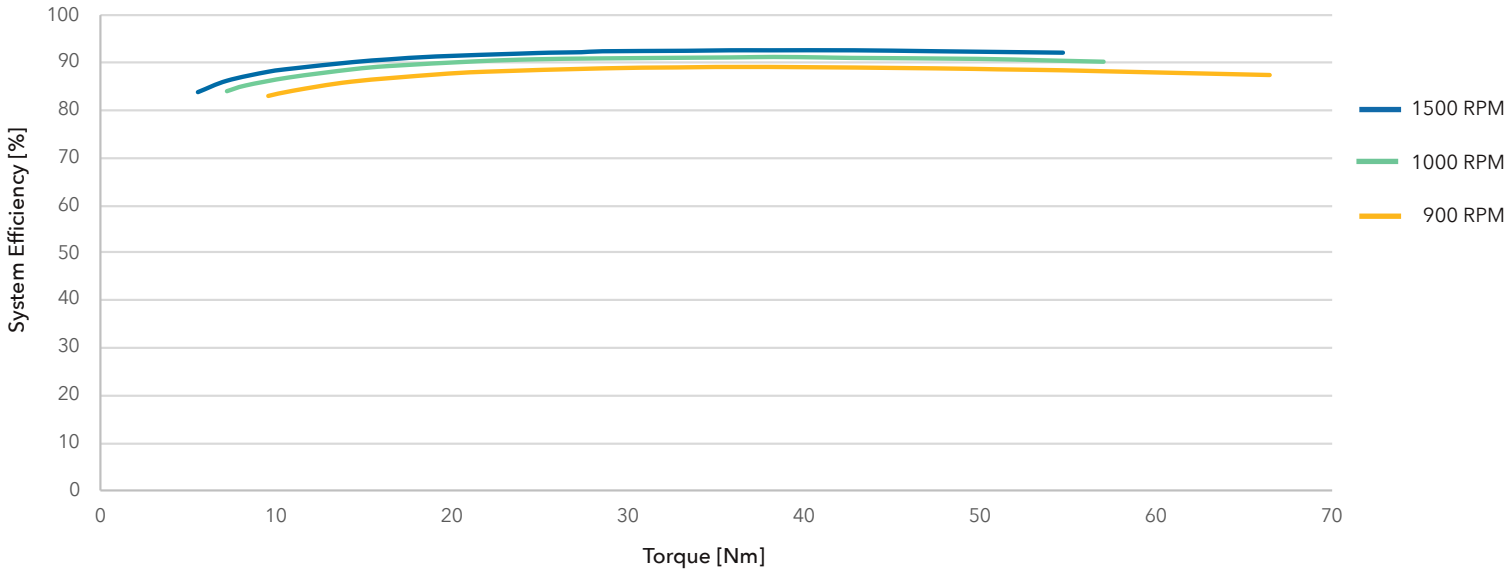


Dimension Table (in millimeters)

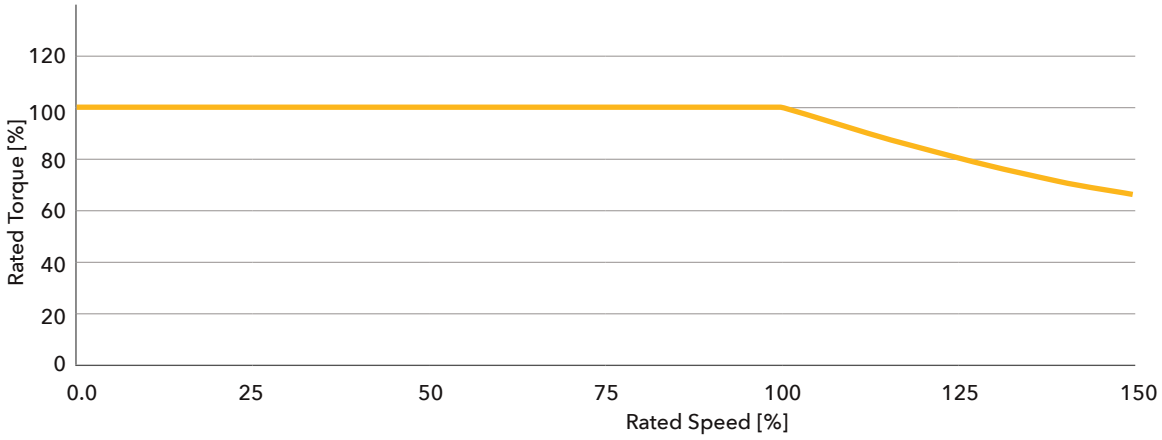
IEC Frame	2A	2B	H	K	D	E	C	BA
132S	216	140	132	M12	38	80	89	436.7
132M		178						

2A - distance between foot holes side-to-side
2B - distance between foot holes front to back
H - height of shaft
K - foot hole size
D - shaft diameter
E - shaft length
C - distance from front foot hole to back of shaft horizontally

System Efficiency vs Torque at Various Speeds



Torque-Speed Curve



Motor Nameplates

SMC SOFTWARE MOTOR COMPANY

SMC Smart Motor
HR-SRM Motors
www.softwaremotor.com

OUTPUT ..... 5.60kW/7.5hp at 1500 RPM
MODEL V03-0750-4-IH000
VOLTAGE ..... 535-565 VDC
SERVICE FACTOR 1.15
PEAK EFFICIENCY 94.5%
FRAME 132S
MAX AMB. ..... 40°C
INSULATION CLASS ..... F
DUTY ..... Continuous
AMPS 25.0A
ENCLOSURE ..... TEFC

Made in China

This product is covered by U.S. Patent 7,230,360. Other patents pending.

WARNING: This motor may only be operated using supplied SMC Motor Controller.

AVERTISSEMENT: Ce moteur doit être utilisé avec le contrôleur de moteur SMC fourni. On Peut pas utilizer un autre contrôleur.

SMC SOFTWARE MOTOR COMPANY

SMC Smart Motor
HR-SRM Motors
www.softwaremotor.com

OUTPUT ..... 7.46kW/10.0hp at 1500 RPM
MODEL V03-1000-4-IJ000
VOLTAGE ..... 535-565 VDC
SERVICE FACTOR 1.15
PEAK EFFICIENCY 94.5%
FRAME 132M
MAX AMB. ..... 40°C
INSULATION CLASS ..... F
DUTY ..... Continuous
AMPS 25.0A
ENCLOSURE ..... TEFC

Made in China

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Motor Controller Name Plate

SMC
SOFTWARE MOTOR COMPANY

SMC Motor Controller
HR-SRM Motors
www.softwaremotor.com

Made in China

MODEL SMC-P05

MOTOR SMC-V01 / V02 / V03

INPUT

VOLTS 3PH	Current (A) 60HZ	50HZ
208-230V	3.2-16	
460V	3.8-16	
200-240V		13.9-17.9
380-415V		7.8-16.7

OUTPUT 3PH 280-680VDC
MAX HP 10.0

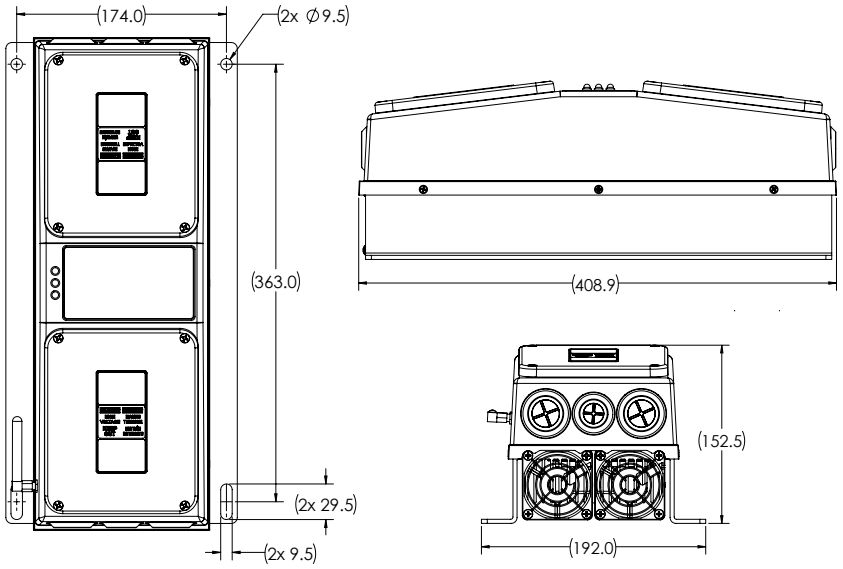
Conforms to UL STD 508C
Certified to CSA STD C22.2#274

WARNING: This SMC Motor Controller will only operate stated SMC Smart Motor.

AVERTISSEMENT: Ce contrôleur de moteur SMC doit etre utilisé qu'avec moteur de la série de intelligent SMC.

LISTED
Intertek
5003619

Motor Controller Dimensions (in millimeters)



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: • Voltage Mode: 0-10V • Current Mode: 0-20mA; or 4-20mA • Resistive Mode • External Logic Mode

Indemnity

TURNTIDE

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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.

POWER IS VALUABLE. USE IT INTELLIGENTLY.