

## STM23S-3AE

NEMA 23 Integrated Drive+Motor w/ Encoder

1pc. - 366.00  
50pc. - 274.50



### Product Features

- *Sophisticated current control*
- *Anti-resonance*
- *Torque ripple smoothing*
- *Microstep emulation*
- *Step & direction, CW/CCW pulse, and A/B quadrature control modes*
- *Oscillator (velocity) control mode*
- *Streaming serial commands*
- *SiNet™ Hub compatible*
- *RS-232 port for programming and communications*
- *Built-in incremental encoder*



### Description

The STM23S-3AE integrated stepper is a drive+motor unit, fusing a NEMA 23 step motor and a sophisticated 5.0 A/phase (peak-of-sine) stepper drive into a single device. Power to the drive, located at the rear of the motor, must be supplied by an external DC supply. See Related and Recommended Products below for compatible 24 and 48 volt DC [power supplies](#) .

The STM23S-3AE integrated stepper can operate in the following control modes: step (pulse) & direction, velocity (oscillator), streaming serial commands (SCL), and operation with an Applied Motion 4-axis or 8-axis SiNet Hub. All STM23 units are setup and configured using Applied Motion's [ST Configurator™](#) software.

An integral 1000-line (4000 count/rev) incremental encoder is housed inside the same enclosure as the drive electronics, providing protection from dust and debris. The integration of the encoder means the STM23S-3AE can perform special functions not available otherwise. Stall Detection notifies the system as soon as the required torque is too great for the motor, which results in a loss of synchronization between the rotor and stator, also known as stalling. Stall Prevention actually prevents stalling of the step motor by dynamically adjusting motor speed to maintain synchronization of the rotor to the stator under all conditions. This unique feature allows step motors to operate in a much broader range of applications than previously available to step motors, such as torque-control applications. The Stall Prevention feature also performs static position maintenance, which maintains the position of the motor shaft when at rest.













Each STM23 integrated stepper comes with 3 digital inputs, 1 digital output, and 1 analog input. The digital inputs accept signals of 5-24 VDC and can be used for connecting pulse & direction signals, end-of-travel limit switches, jog switches, quadrature encoder signals, PLC outputs, sensors, or many other signal types. The digital output can be connected to PLC inputs, counters, lights, relays, or other devices. The analog input accepts 0-5 VDC signals and can be used for velocity and position control.

The STM23S-3AE comes with an RS-232 port for programming and serial communications.

## Specifications

<b>Part Number:</b>	STM23S-3AE
<b>Supply Voltage:</b>	12-70 VDC
<b>Supply Voltage Type:</b>	DC
<b>Control Modes:</b>	Step & Direction Velocity (Oscillator) Streaming Commands SiNet Hub Compatible
<b>Communication Ports:</b>	RS-232
<b>Encoder Feedback:</b>	Yes
<b>Step Resolution:</b>	Full Half Microstepping Microstep Emulation
<b>Idle Current Reduction:</b>	0-90%
<b>Setup Method:</b>	Software setup
<b>Digital Inputs:</b>	3
<b>Digital Outputs:</b>	1
<b>Analog Inputs:</b>	1 single-ended
<b>Circuit Protection:</b>	Short circuit Over-voltage Under-voltage Over-temp
<b>Status LEDs:</b>	1 red, 1 green
<b>Frame Size:</b>	NEMA 23
<b>Holding Torque:</b>	210 oz-in
<b>Step Angle:</b>	1.8 deg
<b>Rotor Inertia:</b>	6.51E-03 oz-in-sec <sup>2</sup>
<b>Length:</b>	4.50 inches
<b>Weight:</b>	42 oz
<b>Operating Temperature Range:</b>	0 to 85 °C
<b>Ambient Temperature Range:</b>	0 to 40 °C
<b>Ambient Humidity:</b>	90% max, non-condensing
<b>Insulation Class:</b>	Class B (130 °C)

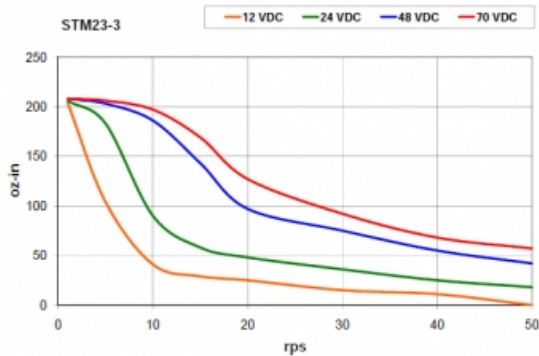
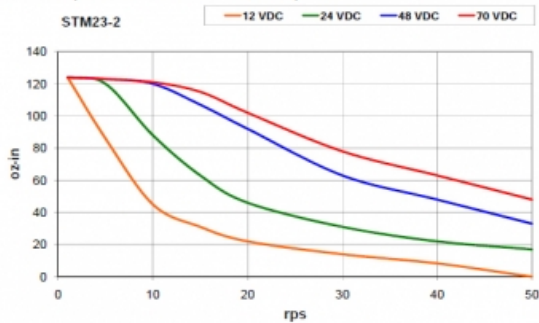
## Downloads

<b>Speed-Torque Curves:</b>	 <a href="#">STM23-speed-torque.pdf</a>
<b>Manuals:</b>	 <a href="#">STM23_Hardware_Manual_920-0021.pdf</a>  <a href="#">STM23_24_S_Q_QuickSetup_920-0020E.pdf</a>  <a href="#">Host Command Reference Rev I.pdf</a>
<b>Datasheet:</b>	<a href="http://s3.amazonaws.com/applied-motion-pdf/STM23S-3AE.pdf">http://s3.amazonaws.com/applied-motion-pdf/STM23S-3AE.pdf</a>
<b>Family Datasheet:</b>	 <a href="#">STM-Datasheet-925-0009.pdf</a>
<b>2D Drawing:</b>	 <a href="#">STM23S-3XX_RevC.pdf</a>  <a href="#">STM23X-3AX_3D.pdf</a>
<b>3D Drawing:</b>	 <a href="#">STM23S-3_5-14_igs</a>
<b>Agency Approvals:</b>	 <a href="#">STM17_23_24_CE_DOC.pdf</a>
<b>Application Notes:</b>	 <a href="#">APPN0021_5V-Keepalive-Circuit.pdf</a>  <a href="#">APPN0018_EZ-Series-Touchpanel-HMI.zip</a>  <a href="#">APPN0015_Make-a-serial-programming-cable.pdf</a>


## Torque Curves

### Torque-Speed Curves

Note: all torque curves were measured at 20,000 steps/rev.



## Software

<b>Software:</b>	<a href="#">SCL Utility</a> <a href="#">ST Configurator™</a>
<b>Sample Code:</b>	 <a href="#">scldemo.zip</a>

## Pricing

	<b>STM23S-3AE</b> Part No. STM23S-3AE
<b>1pc.</b>	\$366.00
<b>25pc.</b>	\$314.76
<b>50pc.</b>	\$274.50
<b>100pc.</b>	<a href="#">Contact us</a> for 100+ piece pricing.

## Products in the Series *STM23 Integrated Steppers*

Part Number	Frame Size	Supply Voltage	Control Modes	Holding Torque	Communication Ports	Encoder Feedback	1pc./50pc.
<a href="#">STM23C-3CE</a>	NEMA 23	12-70 VDC	CANopen	210	RS-232, CANopen	Yes	\$535.00 / \$401.25
<a href="#">STM23C-3CN</a>	NEMA 23	12-70 VDC	CANopen	210	RS-232, CANopen	No	\$460.00 / \$345.00
<a href="#">STM23IP-2EE</a>	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	125	Ethernet, EtherNet/IP	Yes	\$525.00 / \$393.75
<a href="#">STM23IP-2EN</a>	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	125	Ethernet, EtherNet/IP	No	\$450.00 / \$337.50
<a href="#">STM23IP-3EE</a>	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	210	Ethernet, EtherNet/IP	Yes	\$535.00 / \$401.25
<a href="#">STM23IP-3EN</a>	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	210	Ethernet, EtherNet/IP	No	\$460.00 / \$345.00
<a href="#">STM23Q-2AE</a>	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Modbus	125	RS-232	Yes	\$440.00 / \$330.00
<a href="#">STM23Q-2AN</a>	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Modbus	125	RS-232	No	\$365.00 / \$273.75
<a href="#">STM23Q-2EE</a>	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming	125	Ethernet	Yes	\$452.00 / \$339.00
<a href="#">STM23Q-2EN</a>	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming	125	Ethernet	No	\$377.00 / \$282.75
<a href="#">STM23Q-2RE</a>	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus	125	RS-485	Yes	\$447.00 / \$335.25
<a href="#">STM23Q-2RN</a>	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus	125	RS-485	No	\$372.00 / \$279.00
<a href="#">STM23Q-3AE</a>	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Modbus	210	RS-232	Yes	\$456.00 / \$342.00
<a href="#">STM23Q-3AN</a>	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Modbus	210	RS-232	No	\$381.00 / \$285.75
<a href="#">STM23Q-3EE</a>	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming	210	Ethernet	Yes	\$468.00 / \$351.00
<a href="#">STM23Q-3EN</a>	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming	210	Ethernet	No	\$393.00 / \$294.75
<a href="#">STM23Q-3RE</a>	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus	210	RS-485	Yes	\$463.00 / \$347.25
<a href="#">STM23Q-3RN</a>	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus	210	RS-485	No	\$388.00 / \$291.00
<a href="#">STM23R-2ND</a>	NEMA 23	12-70 VDC	Step & Direction	125	NA	No	\$172.00 / \$172.00
<a href="#">STM23R-2NE</a>	NEMA 23	12-70 VDC	Step & Direction	125	NA	Yes	\$219.00 / \$219.00
<a href="#">STM23R-2NN</a>	NEMA 23	12-70 VDC	Step & Direction	125	NA	No	\$172.00 / \$172.00
<a href="#">STM23R-3ND</a>	NEMA 23	12-70 VDC	Step & Direction	210	NA	No	\$189.00 / \$189.00
<a href="#">STM23R-3NE</a>	NEMA 23	12-70 VDC	Step & Direction	210	NA	Yes	\$230.00 / \$230.00
<a href="#">STM23R-3NN</a>	NEMA 23	12-70 VDC	Step & Direction	210	NA	No	\$189.00 / \$189.00
<a href="#">STM23S-2AE</a>	NEMA 23	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, SiNet Hub Compatible	125	RS-232	Yes	\$350.00 / \$262.50

<a href="#">STM23S-2AN</a>	NEMA 23	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, SiNet Hub Compatible	125	RS-232	No	\$275.00 / \$206.25
<a href="#">STM23S-2EE</a>	NEMA 23	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands	125	Ethernet	Yes	\$362.00 / \$271.50
<a href="#">STM23S-2EN</a>	NEMA 23	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands	125	Ethernet	No	\$287.00 / \$215.25
<a href="#">STM23S-2RE</a>	NEMA 23	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands	125	RS-485	Yes	\$357.00 / \$267.75
<a href="#">STM23S-2RN</a>	NEMA 23	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands	125	RS-485	No	\$282.00 / \$211.50
<a href="#">STM23S-3AE</a>	NEMA 23	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, SiNet Hub Compatible	210	RS-232	Yes	\$366.00 / \$274.50
<a href="#">STM23S-3AN</a>	NEMA 23	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, SiNet Hub Compatible	210	RS-232	No	\$291.00 / \$218.25
<a href="#">STM23S-3EE</a>	NEMA 23	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands	210	Ethernet	Yes	\$378.00 / \$283.50
<a href="#">STM23S-3EN</a>	NEMA 23	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands	210	Ethernet	No	\$303.00 / \$227.25
<a href="#">STM23S-3RE</a>	NEMA 23	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands	210	RS-485	Yes	\$373.00 / \$279.75
<a href="#">STM23S-3RN</a>	NEMA 23	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands	210	RS-485	No	\$298.00 / \$223.50
<a href="#">STM24IP-3EE</a>	NEMA 24	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	340	Ethernet, EtherNet/IP	Yes	\$626.00 / \$469.50
<a href="#">STM24IP-3EN</a>	NEMA 24	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	340	Ethernet, EtherNet/IP	No	\$551.00 / \$413.25
<a href="#">STM24Q-3EE</a>	NEMA 24	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming	340	Ethernet	Yes	\$576.00 / \$432.00
<a href="#">STM24Q-3EN</a>	NEMA 24	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming	340	Ethernet	No	\$501.00 / \$375.75
<a href="#">STM24S-3EE</a>	NEMA 24	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands	340	Ethernet	Yes	\$486.00 / \$364.50
<a href="#">STM24S-3EN</a>	NEMA 24	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands	340	Ethernet	No	\$411.00 / \$308.25