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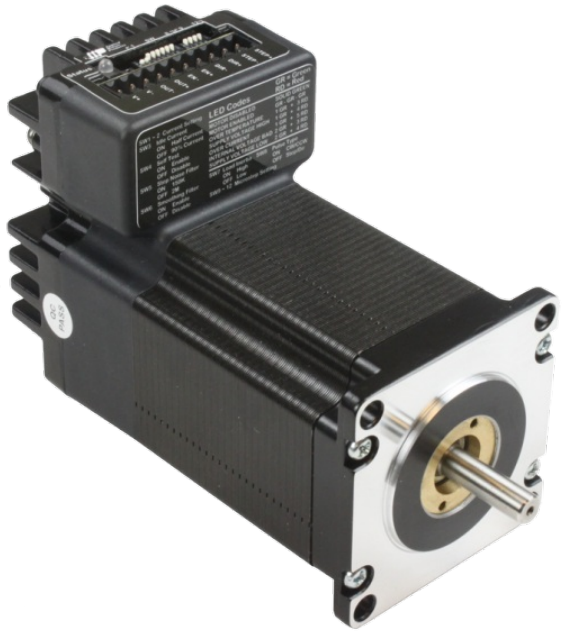
Product Datasheet

www.Applied-Motion.com

# STM23R-3NN

*NEMA 23 Integrated Drive+Motor*

*1pc. - 189.00*
*50pc. - 189.00*



## Product Features

- *Sophisticated current control*
- *Anti-resonance*
- *Torque ripple smoothing*
- *Microstep emulation*
- *NEMA 23 frame size*
- *Step & direction or CW/CCW pulse control modes*
- *Dip switch setup (no software required)*

## Description

The STM23R-3NN 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 STM23R-3NN is designed for step & direction control from an external controller. The external controller can be a motion controller, PLC, or other device that provides two digital outputs: one output for digital pulses to control position and velocity of the motor, and a second output to control the direction of the motor, CW and CCW. Some controllers provide two pulse outputs – referred to as CW/CCW pulse or pulse-pulse – instead of pulse & direction. The STM23R works with these controllers as well simply by changing one of the setup dip switches.

*Note that STM23R integrated steppers are not available with any communication options (such as Ethernet, RS-485, etc.) or additional control modes (such as velocity, streaming commands or Q programming). For these and other functions see other models in the STM23 integrated stepper family .*

The STM23R-3NN is a single-shaft version of the STM23R. A double-shaft version is also available, STM23R-3ND , as well as a version with a 1000-line, incremental encoder assembled to the rear shaft,STM23R-3NE .

Each STM23R integrated stepper comes with 3 digital inputs and 1 digital output. Two of the digital inputs (labeled STEP and DIR) accept signals of 5-24 VDC and are used for controlling position and velocity of the motor, either via pulse & direction or CW/CCW pulse outputs from an external controller. The third digital input (EN) accepts signals of 5-24 VDC and can be used to enable/disable power to the motor shaft. The digital output (OUT) can be used to indicate drive and motor faults by connecting it to an available digital input on the external controller.

To facilitate connecting I/O signals and DC power to the STM23R, a mating connector with 12-inch flying leads is included with each unit.

All STM23R integrated steppers are RoHS compliant.

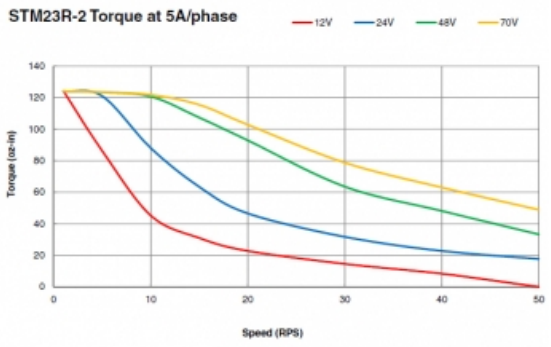
## Specifications

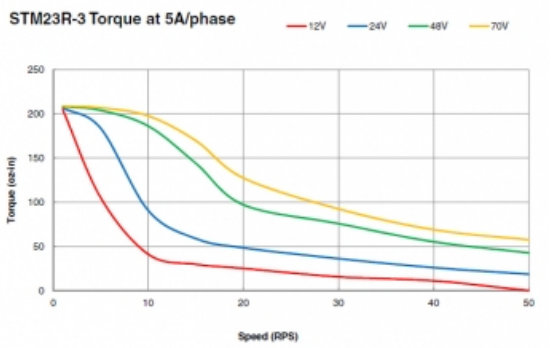
| | |
|---|---|
| **Part Number:** | STM23R-3NN |
| **Supply Voltage:** | 12-70 VDC |
| **Supply Voltage Type:** | DC |
| **Control Modes:** | Step & Direction |
| **Encoder Feedback:** | No |
| **Step Resolution:** | Full<br>Half<br>Microstepping<br>Microstep Emulation |
| **Idle Current Reduction:** | 50% or 90% of running current, switch selectable |
| **Setup Method:** | Switch / potentiometer |
| **Digital Inputs:** | 3 |
| **Digital Outputs:** | 1 |
| **Circuit Protection:** | Short circuit<br>Over-voltage<br>Under-voltage<br>Over-temp |
| **Status LEDs:** | 1 red/green |
| **Frame Size:** | NEMA 23 |
| **Holding Torque:** | 210 oz-in |
| **Step Angle:** | 1.8 deg |
| **Rotor Inertia:** | 6.51E-03 oz-in-sec$^2$ |
| **Length:** | 4.21 inches |
| **Weight:** | 42 oz |
| **Operating Temperature Range:** | 0 to 85 °C |
| **Ambient Temperature Range:** | 0 to 40 °C |
| **Ambient Humidity:** | 90% max, non-condensing |
| **Insulation Class:** | Class B (130 ºC) |

## Downloads

| | |
|---|---|
| **Speed-Torque Curves:** | STM23R-speed-torque.pdf |
| **Manuals:** | STM23R Hardware Manual 920-0056C.pdf<br>STM23R_Quicksetup_Guide_920-0057B.pdf |
| **Datasheet:** | http://s3.amazonaws.com/applied-motion-pdf/STM23R-3NN.pdf |
| **Family Datasheet:** | STM-Datasheet-925-0009.pdf |
| **2D Drawing:** | STM23R-3NN_WEB_RevB.pdf |
| **3D Drawing:** | STM23R-3NN_10-22-13.igs |

## Torque Curves




## Pricing

| | **STM23R-3NN**<br>Part No. STM23R-3NN |
|---|---|
| **1pc.** | $189.00 |
| **25pc.** | $189.00 |
| **50pc.** | $189.00 |
| **100pc.** | Contact us for 100+ piece pricing. |

## Products in the Series *STM-R Integrated Steppers*

| Part Number | Frame Size | Supply Voltage | Control Modes | Holding Torque | Communication Ports | Encoder Feedback | 1pc./50pc. |
|---|---|---|---|---|---|---|---|
| STM17R-3ND | NEMA 17 | 12-48 VDC | Step & Direction | 68 | NA | No | $118.00 / $118.00 |
| STM17R-3NE | NEMA 17 | 12-48 VDC | Step & Direction | 68 | NA | Yes | $192.00 / $192.00 |
| STM17R-3NN | NEMA 17 | 12-48 VDC | Step & Direction | 68 | NA | No | $117.00 / $117.00 |
| STM23R-2ND | NEMA 23 | 12-70 VDC | Step & Direction | 125 | NA | No | $172.00 / $172.00 |
| STM23R-2NE | NEMA 23 | 12-70 VDC | Step & Direction | 125 | NA | Yes | $219.00 / $219.00 |
| STM23R-2NN | NEMA 23 | 12-70 VDC | Step & Direction | 125 | NA | No | $172.00 / $172.00 |
| STM23R-3ND | NEMA 23 | 12-70 VDC | Step & Direction | 210 | NA | No | $189.00 / $189.00 |
| STM23R-3NE | NEMA 23 | 12-70 VDC | Step & Direction | 210 | NA | Yes | $230.00 / $230.00 |
| STM23R-3NN | NEMA 23 | 12-70 VDC | Step & Direction | 210 | NA | No | $189.00 / $189.00 |

## Products in the Series *STM23 Integrated Steppers*

| Part Number | Frame Size | Supply Voltage | Control Modes | Holding Torque | Communication Ports | Encoder Feedback | 1pc./50pc. |
|---|---|---|---|---|---|---|---|
| STM23C-3CE | NEMA 23 | 12-70 VDC | CANopen | 210 | RS-232, CANopen | Yes | $535.00 / $401.25 |
| STM23C-3CN | NEMA 23 | 12-70 VDC | CANopen | 210 | RS-232, CANopen | No | $460.00 / $345.00 |
| STM23IP-2EE | NEMA 23 | 12-70 VDC | Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP | 125 | Ethernet, EtherNet/IP | Yes | $525.00 / $393.75 |
| STM23IP-2EN | NEMA 23 | 12-70 VDC | Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP | 125 | Ethernet, EtherNet/IP | No | $450.00 / $337.50 |
| STM23IP-3EE | NEMA 23 | 12-70 VDC | Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP | 210 | Ethernet, EtherNet/IP | Yes | $535.00 / $401.25 |
| STM23IP-3EN | NEMA 23 | 12-70 VDC | Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP | 210 | Ethernet, EtherNet/IP | No | $460.00 / $345.00 |
| STM23Q-2AE | 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 |
| STM23Q-2AN | 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 |
| STM23Q-2EE | NEMA 23 | 12-70 VDC | Streaming Commands, Analog Positioning, Encoder Following, Q Programming | 125 | Ethernet | Yes | $452.00 / $339.00 |
| STM23Q-2EN | NEMA 23 | 12-70 VDC | Streaming Commands, Analog Positioning, Encoder Following, Q Programming | 125 | Ethernet | No | $377.00 / $282.75 |
| STM23Q-2RE | NEMA 23 | 12-70 VDC | Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus | 125 | RS-485 | Yes | $447.00 / $335.25 |
| STM23Q-2RN | NEMA 23 | 12-70 VDC | Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus | 125 | RS-485 | No | $372.00 / $279.00 |
| STM23Q-3AE | 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 |
| STM23Q-3AN | 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 |
| STM23Q-3EE | NEMA 23 | 12-70 VDC | Streaming Commands, Analog Positioning, Encoder Following, Q Programming | 210 | Ethernet | Yes | $468.00 / $351.00 |
| STM23Q-3EN | NEMA 23 | 12-70 VDC | Streaming Commands, Analog Positioning, Encoder Following, Q Programming | 210 | Ethernet | No | $393.00 / $294.75 |
| STM23Q-3RE | NEMA 23 | 12-70 VDC | Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus | 210 | RS-485 | Yes | $463.00 / $347.25 |
| STM23Q-3RN | NEMA 23 | 12-70 VDC | Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus | 210 | RS-485 | No | $388.00 / $291.00 |
| STM23R-2ND | NEMA 23 | 12-70 VDC | Step & Direction | 125 | NA | No | $172.00 / $172.00 |
| STM23R-2NE | NEMA 23 | 12-70 VDC | Step & Direction | 125 | NA | Yes | $219.00 / $219.00 |
| STM23R-2NN | NEMA 23 | 12-70 VDC | Step & Direction | 125 | NA | No | $172.00 / $172.00 |
| STM23R-3ND | NEMA 23 | 12-70 VDC | Step & Direction | 210 | NA | No | $189.00 / $189.00 |
| STM23R-3NE | NEMA 23 | 12-70 VDC | Step & Direction | 210 | NA | Yes | $230.00 / $230.00 |
| STM23R-3NN | NEMA 23 | 12-70 VDC | Step & Direction | 210 | NA | No | $189.00 / $189.00 |
| STM23S-2AE | NEMA 23 | 12-70 VDC | Step & Direction, Velocity (Oscillator), Streaming Commands, SiNet Hub Compatible | 125 | RS-232 | Yes | $350.00 / $262.50 |
| STM23S-2AN | NEMA 23 | 12-70 VDC | Step & Direction, Velocity (Oscillator), Streaming Commands, SiNet Hub | 125 | RS-232 | No | $275.00 / |

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