

# Stepping System Motors

## SureStep® Stepping Motors

| SureStep Series Part Numbers – Bipolar Stepping Motors* |            |            |              |                  |                     |
|---------------------------------------------------------|------------|------------|--------------|------------------|---------------------|
| Bipolar Stepping Motors                                 | Price      | Shaft Type | Torque Level | Encoder Mounting | Drawing             |
| <a href="#">STP-MTRL-14026</a>                          | \$2e6h:    | single     | low          | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTRL-14026D</a>                         | \$-2e6j:   | dual       |              | optional         | <a href="#">PDF</a> |
| <a href="#">STP-MTRL-14026E**</a>                       | \$-02e6l:  | dual       |              | pre-installed    | <a href="#">PDF</a> |
| <a href="#">STP-MTRL-14034</a>                          | \$-2e6i:   | single     |              | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTRL-14034D</a>                         | \$2e6k:    | dual       |              | optional         | <a href="#">PDF</a> |
| <a href="#">STP-MTRL-14034E**</a>                       | \$02e6c:   | dual       |              | pre-installed    | <a href="#">PDF</a> |
| <a href="#">STP-MTR-17040</a>                           | \$0e04:    | single     | high         | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTR-17040D</a>                          | \$0e05:    | dual       |              | optional         | <a href="#">PDF</a> |
| <a href="#">STP-MTR-17040E**</a>                        | \$02e6d:   | dual       |              | pre-installed    | <a href="#">PDF</a> |
| <a href="#">STP-MTR-17040W***</a>                       | \$.03?j2:  | single     |              | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTR-17048</a>                           | \$0e06:    | single     |              | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTR-17048D</a>                          | \$0e07:    | dual       |              | optional         | <a href="#">PDF</a> |
| <a href="#">STP-MTR-17048E**</a>                        | \$02e6e:   | dual       |              | pre-installed    | <a href="#">PDF</a> |
| <a href="#">STP-MTR-17048W***</a>                       | \$.03?zj:  | single     |              | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTR-17060</a>                           | \$0e08:    | single     |              | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTR-17060D</a>                          | \$0e09:    | dual       |              | optional         | <a href="#">PDF</a> |
| <a href="#">STP-MTR-17060E**</a>                        | \$.02e6f:  | dual       |              | pre-installed    | <a href="#">PDF</a> |
| <a href="#">STP-MTR-17060W***</a>                       | \$.03?zj:  | single     |              | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTR-23055</a>                           | \$0e0a:    | single     |              | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTR-23055D</a>                          | \$0e0b:    | dual       |              | optional         | <a href="#">PDF</a> |
| <a href="#">STP-MTR-23055E**</a>                        | \$02e6g:   | dual       |              | pre-installed    | <a href="#">PDF</a> |
| <a href="#">STP-MTR-23055W***</a>                       | \$.03?z:   | single     |              | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTR-23079</a>                           | \$0e0c:    | single     |              | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTR-23079D</a>                          | \$0e0d:    | dual       |              | optional         | <a href="#">PDF</a> |
| <a href="#">STP-MTR-23079E**</a>                        | \$02e6n:   | dual       |              | pre-installed    | <a href="#">PDF</a> |
| <a href="#">STP-MTR-23079W***</a>                       | \$.03?z#:  | single     |              | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTR-34066</a>                           | \$00e0e:   | single     | higher       | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTR-34066D</a>                          | \$.00e0f:  | dual       |              | optional         | <a href="#">PDF</a> |
| <a href="#">STP-MTR-34066W***</a>                       | \$.03?z!:  | single     |              | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTRH-23079</a>                          | \$.0d, #:  | single     |              | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTRH-23079D</a>                         | \$.0d, !:  | dual       |              | optional         | <a href="#">PDF</a> |
| <a href="#">STP-MTRH-23079E**</a>                       | \$02e6p:   | dual       |              | pre-installed    | <a href="#">PDF</a> |
| <a href="#">STP-MTRH-23079W***</a>                      | \$.03?z?:  | single     |              | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTRH-34066</a>                          | \$.00d, ?: | single     |              | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTRH-34066D</a>                         | \$.00d, ,: | dual       |              | optional         | <a href="#">PDF</a> |
| <a href="#">STP-MTRH-34066W***</a>                      | \$.03?z,:: | single     |              | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTRH-34097</a>                          | \$00e00:   | single     |              | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTRH-34097D</a>                         | \$00e01:   | dual       |              | optional         | <a href="#">PDF</a> |
| <a href="#">STP-MTRH-34097W***</a>                      | \$.03?j0:  | single     |              | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTRH-34127</a>                          | \$00e02:   | single     |              | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTRH-34127D</a>                         | \$00e03:   | dual       |              | optional         | <a href="#">PDF</a> |
| <a href="#">STP-MTRH-34127W***</a>                      | \$.03?j1:  | single     |              | not available    | <a href="#">PDF</a> |

\* For integrated motor/drives part numbers and pricing, see the integrated motor/drives section.

\*\* E model motors come with an AMT112Q-V encoder pre-installed. Requires STP-CBL-EBxx for encoder wiring. To change from the default 400ppr, use AMT-PGRM-17C. See the SureStep Stepping System Encoders section for more details.

\*\*\* W models are IP65 washdown rated. All others are IP40.

**STP-MTR-xxxxx**  
(single-shaft)



**STP-MTR-xxxxxE**  
(encoder mount)



**STP-MTR-xxxxxD**  
(dual-shaft)



**STP-MTR-xxxxxW**  
(IP65)





# Stepping System Motors

## SureStep® Stepping Motors

| SureStep Series Specifications – Connectorized Bipolar Stepping Motors |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                            |                                               |                          |                          |                          |                          |                  |                                                |                   |                   |                   |
|------------------------------------------------------------------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----------------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|------------------|------------------------------------------------|-------------------|-------------------|-------------------|
| Bipolar Stepping Motors                                                |          | Low Voltage<br>Low Torque                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                            | Low Voltage<br>High Torque                    |                          |                          |                          |                          |                  | Low Voltage<br>Higher Torque                   |                   |                   |                   |
|                                                                        |          | STP-MTRL-14026(x)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | STP-MTRL-14034(x)          | STP-MTR-17040(x)                              | STP-MTR-17048(x)         | STP-MTR-17060(x)         | STP-MTR-23055(x)         | STP-MTR-23079(x)         | STP-MTR-34066(x) | STP-MTRH-23079(x)                              | STP-MTRH-34066(x) | STP-MTRH-34097(x) | STP-MTRH-34127(x) |
| NEMA Frame Size                                                        |          | 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 14                         | 17                                            | 17                       | 17                       | 23                       | 23                       | 34               | 23                                             | 34                | 34                | 34                |
| Maximum Holding Torque*                                                | (lb·in)  | 0.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1.25                       | 3.81                                          | 5.19                     | 7.19                     | 10.37                    | 17.25                    | 27.12            | 17.87                                          | 27.12             | 50.00             | 80.50             |
|                                                                        | (oz·in)  | 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 20                         | 61                                            | 83                       | 115                      | 166                      | 276                      | 434              | 286                                            | 434               | 800               | 1288              |
|                                                                        | (N·m)    | 0.06                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.14                       | 0.43                                          | 0.59                     | 0.81                     | 1.17                     | 1.95                     | 3.06             | 2.02                                           | 3.06              | 5.65              | 9.10              |
| Rotor Inertia                                                          | (oz·in2) | 0.06                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.08                       | 0.28                                          | 0.37                     | 0.56                     | 1.46                     | 2.60                     | 7.66             | 2.60                                           | 7.66              | 14.80             | 21.90             |
|                                                                        | (kg·cm2) | 0.0003                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.00035                    | 0.05                                          | 0.07                     | 0.10                     | 0.27                     | 0.48                     | 1.40             | 0.48                                           | 1.40              | 2.71              | 4.01              |
| Rated Current (A/phase)                                                |          | 0.35                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.8                        | 1.7                                           | 2.0                      | 2.0                      | 2.8                      | 2.8                      | 2.8              | 5.6                                            | 6.3               | 6.3               | 6.3               |
| Resistance (Ω/phase)                                                   |          | 8.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 7.66                       | 1.6                                           | 1.4                      | 2.0                      | 0.75                     | 1.1                      | 1.11             | 0.4                                            | 0.25              | 0.3               | 0.49              |
| Inductance (mH/phase)                                                  |          | 5.77                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 6.92                       | 3.0                                           | 2.7                      | 3.3                      | 2.4                      | 3.8                      | 6.6              | 1.2                                            | 1.5               | 2.1               | 4.1               |
| Insulation Class                                                       |          | 130°C [266°F] Class B; 300V rms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                            |                                               |                          |                          |                          |                          |                  |                                                |                   |                   |                   |
| Basic Step Angle                                                       |          | 1.8°                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                            |                                               |                          |                          |                          |                          |                  |                                                |                   |                   |                   |
| Shaft Runout (in)                                                      |          | 0.002 in [0.051 mm]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                               |                          |                          |                          |                          |                  |                                                |                   |                   |                   |
| Max Shaft Radial Play @ 1lb load                                       |          | 0.001 in [0.025 mm]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                               |                          |                          |                          |                          |                  |                                                |                   |                   |                   |
| Perpendicularity                                                       |          | 0.003 in [0.076 mm]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                               |                          |                          |                          |                          |                  |                                                |                   |                   |                   |
| Concentricity                                                          |          | 0.003 in [0.076 mm]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                               |                          |                          |                          |                          |                  |                                                |                   |                   |                   |
| Maximum Radial Load (lb [kg])*                                         |          | 6.0 [2.7]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                            |                                               |                          |                          | 15.0 [6.8]               |                          | 39.0 [17.7]      | 15.0 [6.8]                                     | 39.0 [17.7]       |                   |                   |
| Maximum Thrust Load (lb [kg])*                                         |          | 6.0 [2.7]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                            |                                               |                          |                          | 13.0 [5.9]               |                          | 25.0 [11.3]      | 13.0 [5.9]                                     | 25.0 [11.3]       |                   |                   |
| Storage Temperature Range                                              |          | -20°C to 100°C [-4°F to 212°F]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                                               |                          |                          |                          |                          |                  |                                                |                   |                   |                   |
| Operating Temperature Range                                            |          | -20°C to 50°C [-4°F to 122°F] (motor case temperature should be kept below 80°C [176°F])                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                                               |                          |                          |                          |                          |                  |                                                |                   |                   |                   |
| Operating Humidity Range                                               |          | 55% to 85% non-condensing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                            |                                               |                          |                          |                          |                          |                  |                                                |                   |                   |                   |
| Product Material                                                       |          | steel motor case; stainless steel shaft(s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                            |                                               |                          |                          |                          |                          |                  |                                                |                   |                   |                   |
| Environmental Rating                                                   |          | IP40 (IP65 for “W” motors)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                            |                                               |                          |                          |                          |                          |                  |                                                |                   |                   |                   |
| Weight (lb [kg])<br>(E models)                                         |          | 0.25 [0.11]<br>(0.3 [0.1])                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.35 [0.15]<br>(0.4 [0.2]) | 0.6 [0.3]<br>(0.7 [0.3])                      | 0.7 [0.3]<br>(0.8 [0.4]) | 0.9 [0.4]<br>(0.9 [0.4]) | 1.5 [0.7]<br>(1.5 [0.7]) | 2.2 [1.0]<br>(2.4 [1.1]) | 3.9 [1.7]        | 2.4 [1.1]<br>(2.4 [1.1])                       | 3.9 [1.7]         | 5.9 [2.7]         | 8.4 [3.8]         |
| Agency Approvals                                                       |          | CE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                            |                                               |                          |                          |                          |                          |                  |                                                |                   |                   |                   |
| Design Tips                                                            |          | Allow sufficient time to accelerate the load and size the step motor with a 100% torque safety factor.<br>DO NOT disassemble step motors because motor performance will be reduced and the warranty will be voided.<br>DO NOT connect or disconnect the step motor during operation.<br>Mount the motor to a surface with good thermal conductivity, such as steel or aluminum, to allow heat dissipation.<br>Use a flexible coupling with “clamp-on” connections to both the motor shaft and the load shaft to prevent radial and thrust loading on bearings from minor misalignment. |                            |                                               |                          |                          |                          |                          |                  |                                                |                   |                   |                   |
| Accessory Extension Cable                                              |          | STP-EXTL-0xx                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                            | STP-EXT-0xx<br>STP-EXTW-0xx ( for “W” motors) |                          |                          |                          |                          |                  | STP-EXTH-0xx<br>STP-EXTHW-0xx (for “W” motors) |                   |                   |                   |

\* For dual-shaft motors (STP-MTR-xxxxxD):

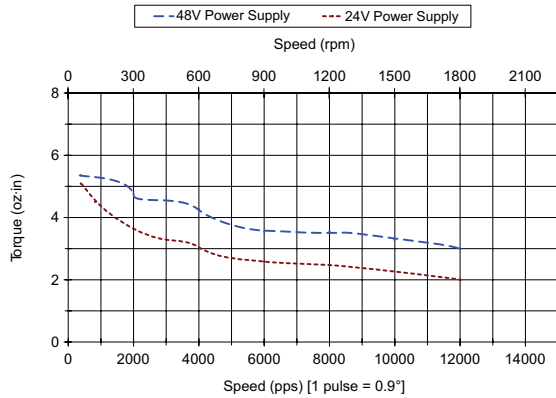
The sum of the front and rear Torque Loads, Radial Loads, and Thrust Loads must not exceed the applicable Torque, Radial, and Thrust load ratings of the motor.

# Stepping System Motors

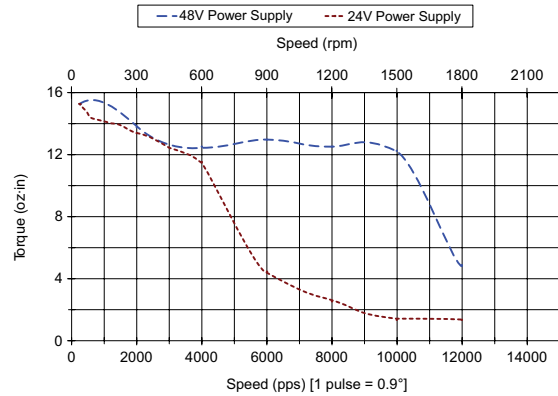
## SureStep® Motor Running Torque vs. Speed Charts

### STP-MTRL-14xxx(x) NEMA 14 Step Motors

STP-MTRL-14026(x) Torque vs Speed (1.8° step motor; 1/2 stepping, RMS phase current)



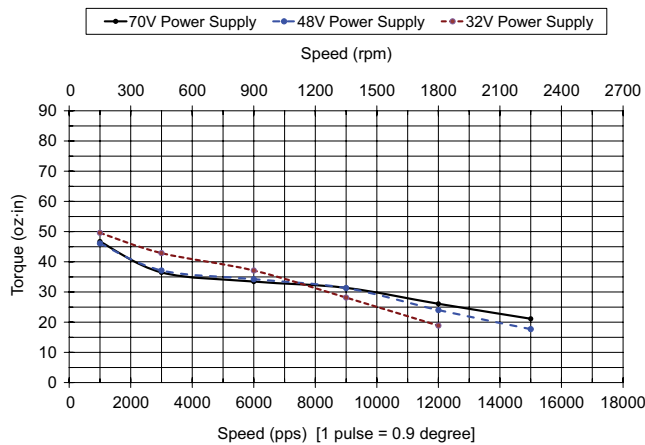
STP-MTRL-14034(x) Torque vs Speed (1.8° step motor; 1/2 stepping, RMS phase current)



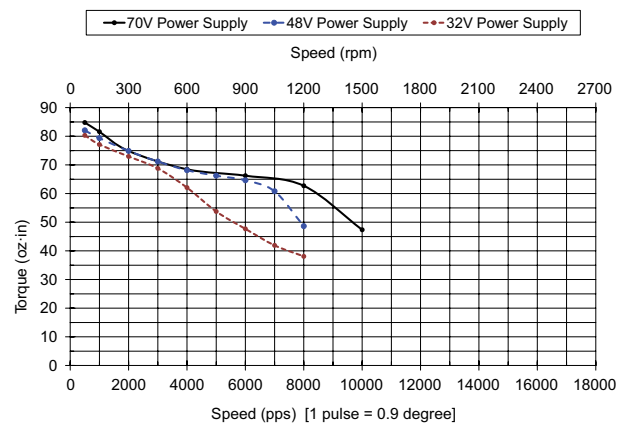
### STP-MTR-17xxx(x) NEMA 17 Step Motors

Note: "W" series motors have 5% less running torque than other models

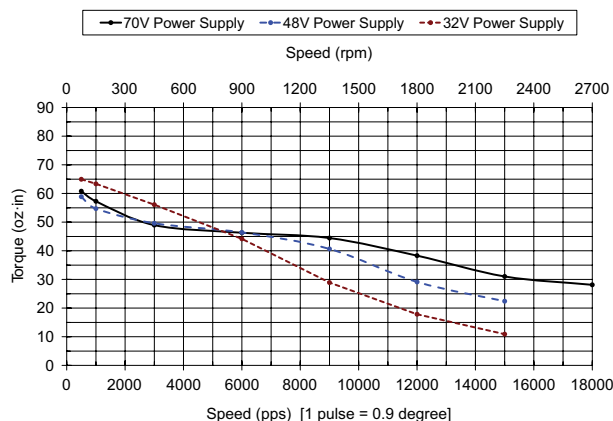
STP-MTR-17040(x) Torque vs Speed (1.8° step motor; 1/2 stepping)



STP-MTR-17060(x) Torque vs Speed (1.8° step motor; 1/2 stepping)



STP-MTR-17048(x) Torque vs Speed (1.8° step motor; 1/2 stepping)



Note: Motor torque vs speed charts for STP-MTRD series integrated motor/drives can be found in the integrated motor/drives section of the full catalog



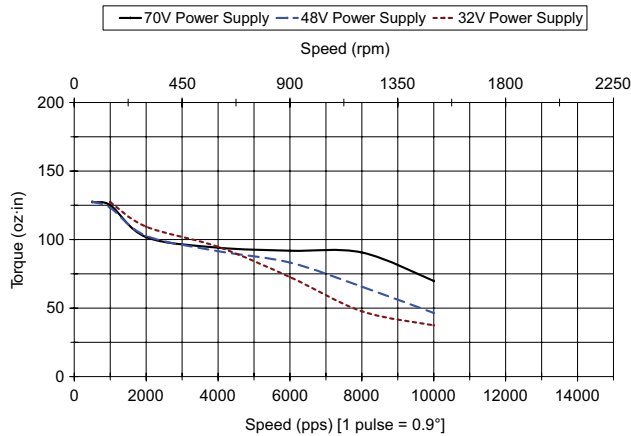
# Stepping System Motors

## SureStep® Motor Torque vs. Speed Charts (continued)

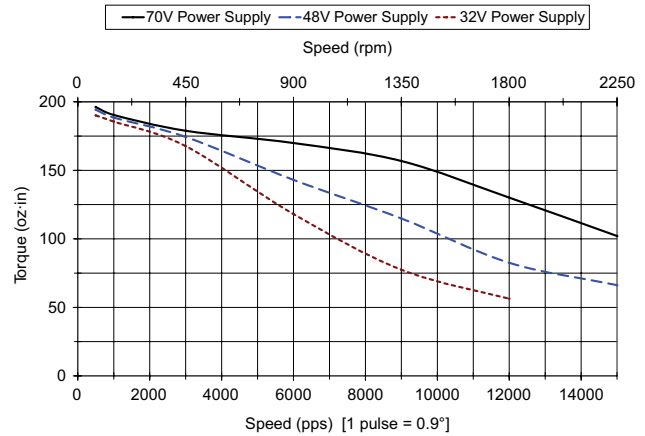
### STP-MTR(H)-23xxx(x) NEMA 23 Step Motors

Note: "W" series motors have 5% less running torque than other models

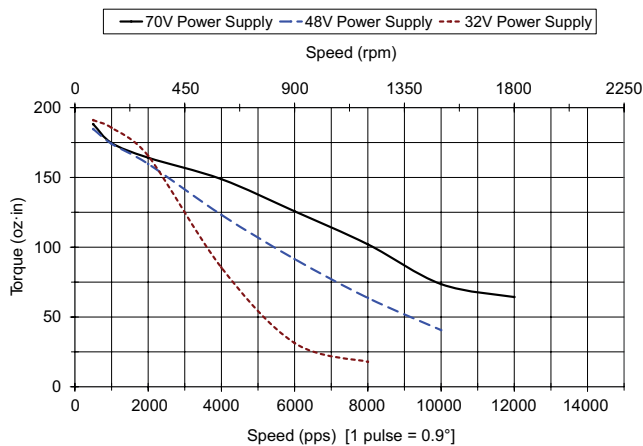
STP-MTR-23055(x) Torque vs Speed (1.8° step motor; 1/2 stepping)



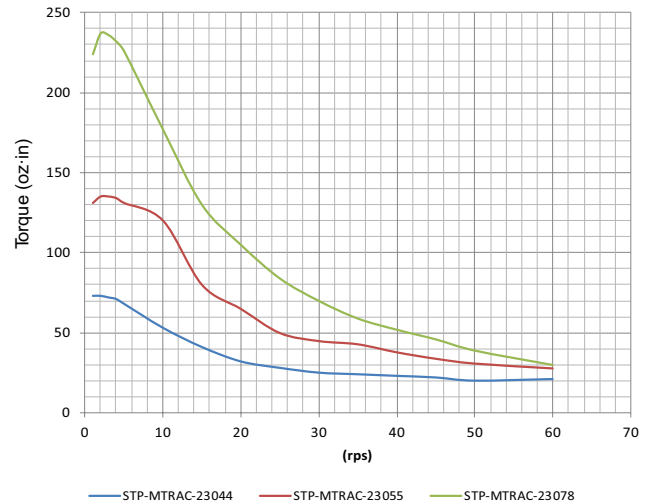
STP-MTRH-23079(x) Torque vs Speed (1.8° step motor; 1/2 stepping)



STP-MTR-23079(x) Torque vs Speed (1.8° step motor; 1/2 stepping)



STP-MTRAC-23xxxx Torque vs Speed @ 340VDC bus  
(1.8° step motor; 1/2 stepping)





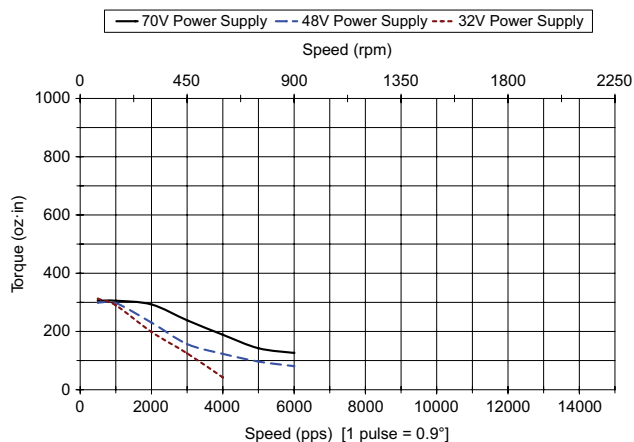
# Stepping System Motors

## SureStep® Motor Torque vs. Speed Charts (continued)

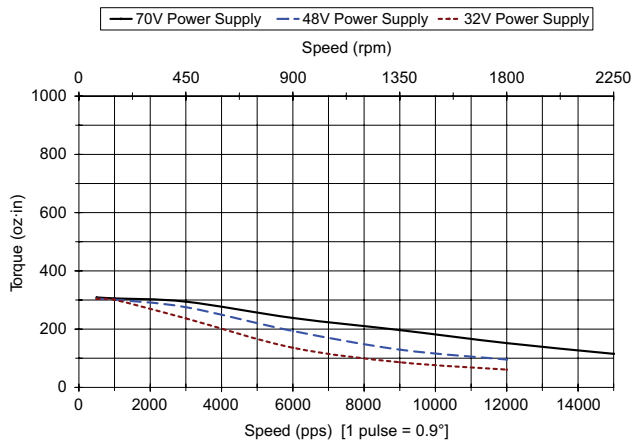
### STP-MTR(H)-34xxx(x) NEMA 34 Step Motors

Note: "W" series motors have 5% less running torque than other models

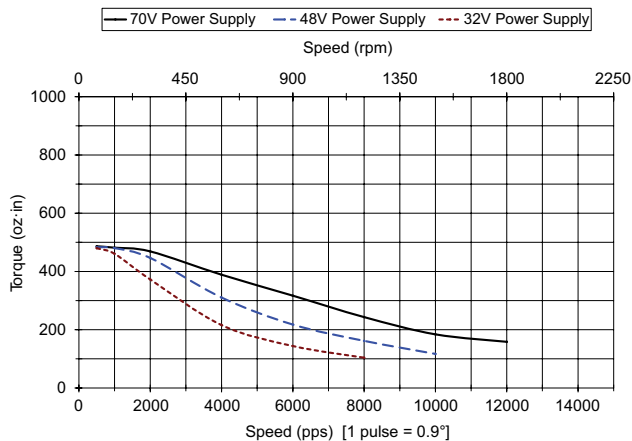
**STP-MTR-34066(x)** Torque vs Speed (1.8° step motor; 1/2 stepping)



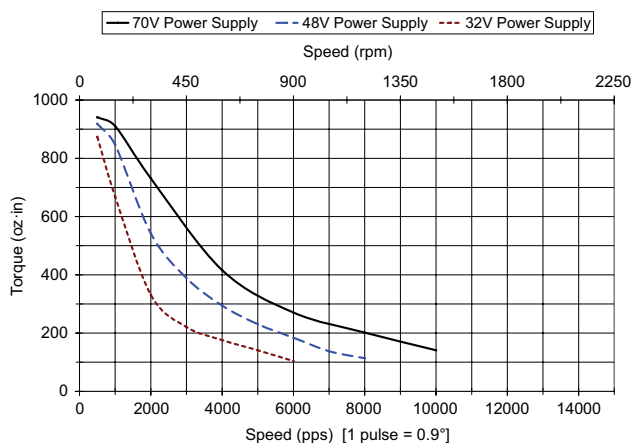
**STP-MTRH-34066(x)** Torque vs Speed (1.8° motor; 1/2 stepping)



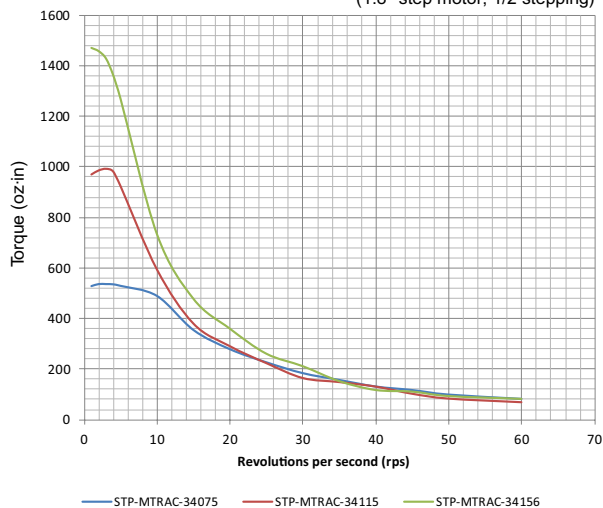
**STP-MTRH-34097(x)** Torque vs Speed (1.8° step motor; 1/2 stepping)



**STP-MTRH-34127(x)** Torque vs Speed (1.8° step motor; 1/2 stepping)



**STP-MTRAC-34xxxx** Torque vs Speed @ 340VDC bus  
(1.8° step motor; 1/2 stepping)

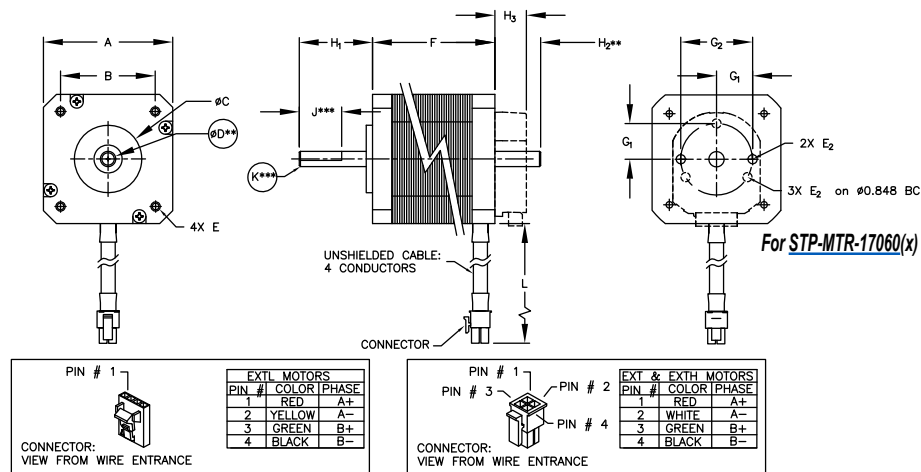




# Stepping System Motors

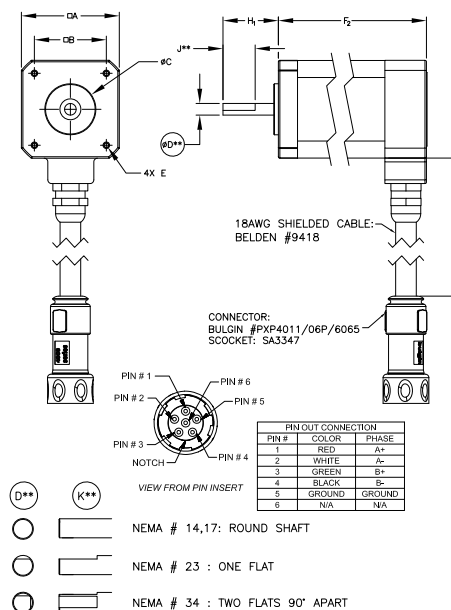
## SureStep® Motor Dimensions and Cabling

### STP-MTR(x)-14,17,23xxx(X) Motors



\*\* Dimension H2 applies only to dual-shaft (D) and encoder (E) motors.  
Dimension D is the same for both front and rear shafts of dual-shaft and encoder motors.  
Dimensions J & K do NOT apply to rear shafts of dual-shaft and encoder motors (all rear shafts are round style).

### STP-MTR-xxxxxW Motors



| SureStep Series Dimensions & Cabling – NEMA 14, 17, and 23 Connectorized Bipolar Stepping Motors |                                  |                    |                                                     |                  |                  |                      |                  |                                                     |
|--------------------------------------------------------------------------------------------------|----------------------------------|--------------------|-----------------------------------------------------|------------------|------------------|----------------------|------------------|-----------------------------------------------------|
| Dimensions*<br>(in [mm]*)                                                                        | Low Torque Motors                |                    | High Torque Motors                                  |                  |                  |                      |                  | Higher Torque Motors                                |
|                                                                                                  | STP-MTRL-14026(x)                | STP-MTRL-14034(x)  | STP-MTR-17040(x)                                    | STP-MTR-17048(x) | STP-MTR-17060(x) | STP-MTR-23055(x)     | STP-MTR-23079(x) | STP-MTRH-23079(x)                                   |
| A                                                                                                | 1.39 [35.3]                      | 1.39 [35.3]        | 1.67 [42.3]                                         |                  |                  | 2.25 [57.2]          |                  | 2.25 [57.2]                                         |
| B                                                                                                | 1.02 [25.9]                      | 1.02 [25.9]        | 1.22 [31.0]                                         |                  |                  | 1.86 [47.2]          |                  | 1.86 [47.2]                                         |
| C                                                                                                | Ø 0.87 [22.1]                    |                    |                                                     |                  |                  | Ø 1.50 [38.1]        |                  | Ø 1.50 [38.1]                                       |
| D**                                                                                              | Ø 0.20 [5.0]                     |                    |                                                     |                  |                  | Ø 0.25 [6.4]         |                  | Ø 0.25 [6.4]                                        |
| E                                                                                                | 4-40 thread 0.15 [3.8] min depth |                    | M3 x 0.5 thread 0.15 [3.8] min depth                |                  |                  | Ø 0.20 [5.1] through |                  | Ø 0.20 [5.1] through                                |
| E2                                                                                               | M2.5 x 0.45 thread               | M2.5 x 0.45 thread | M2.5 x 0.45 thread                                  |                  | M2 x 0.4 thread  | 4-40                 |                  | 4-40                                                |
| F**                                                                                              | 1.02 [25.9]                      | 1.34 [34.0]        | 1.58 [40.1]                                         | 1.89 [48.0]      | 2.34 [59.5]      | 2.22 [56.4]          | 3.10 [78.7]      | 3.10 [78.7]                                         |
| F2**                                                                                             | n/a                              |                    | 1.90 [48.3]                                         | 2.24 [56.9]      | 2.67 [67.8]      | 2.33 [59.1]          | 3.19 [81.0]      | 3.19 [81.0]                                         |
| G1                                                                                               | 0.375                            | 0.375              | 0.375                                               | 0.375            | 0.411            | 0.906                | 0.906            | 0.906                                               |
| G2                                                                                               | 0.75                             | 0.75               | 0.75                                                | 0.75             | n/a              | 1.812                | 1.812            | 1.812                                               |
| H1                                                                                               | 0.60 [15.2]                      | 0.60 [15.2]        | 0.94 [24.0]                                         |                  |                  | 0.81 [20.6]          |                  | 0.81 [20.6]                                         |
| H2**                                                                                             | 0.51 [13.0]                      |                    |                                                     |                  |                  |                      |                  |                                                     |
| H3***                                                                                            | 0.40                             |                    |                                                     |                  |                  |                      |                  |                                                     |
| J**                                                                                              | n/a                              |                    |                                                     |                  |                  | 0.59 [15.0]          |                  |                                                     |
| K**                                                                                              | n/a                              |                    |                                                     |                  |                  | 0.23 [5.8]           |                  |                                                     |
| L                                                                                                | 12 [305]                         |                    |                                                     |                  |                  |                      |                  |                                                     |
| Conductor                                                                                        | (4) #26 AWG                      |                    | (4) #20 AWG, (5) #18 AWG (for W motors)             |                  |                  |                      |                  | (4) #18 AWG, (5) #18 AWG (for W motors)             |
| Connector                                                                                        | TE # 103653-3                    |                    | Molex # 43025-0400, PXP4010/06S/6065 (for W motors) |                  |                  |                      |                  | Molex # 39-01-3042, PXP4010/06S/6065 (for W motors) |
| Pin                                                                                              | TE # 1-104505-3 (LOOSE)          |                    | Molex # 43030-0007, Socket: SA3347 (for W motors)   |                  |                  |                      |                  | Molex # 39-00-0039, Socket: SA3347 (for W motors)   |

\* mm dimensions are for reference purposes only.

\*\* Dimension H2 applies only to dual-shaft (D) and encoder (E) motors.

Dimension D (shaft diameter) is the same for both front and rear shafts of dual-shaft (D) and encoder (E) motors.

Dimensions J & K do NOT apply to rear shafts of dual-shaft (D) and encoder (E) motors (all rear shafts are round style).

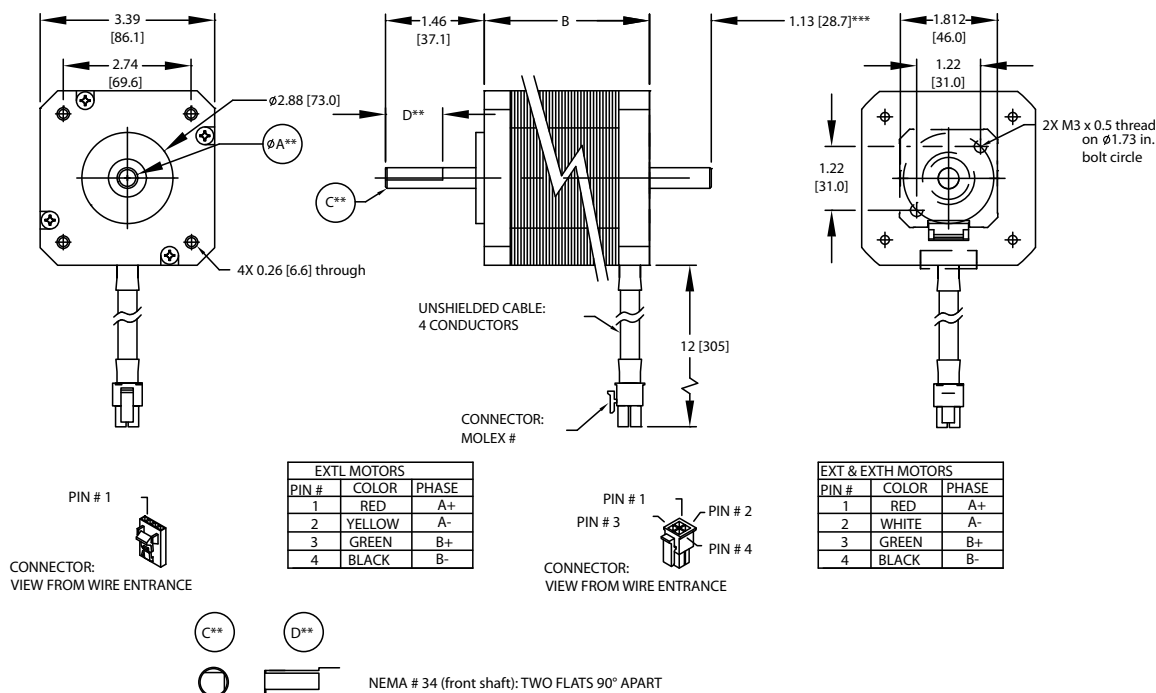
Dimension F2 applies to IP65 (W) motors only.

\*\*\* Dimension H3 applies only to "E" models with the encoder pre-mounted.

# Stepping System Motors

## SureStep<sup>®</sup> Motor Dimensions and Cabling

## STP-MTR(x)-34xxx(X) Motors



※ Dimension A is the same for both front and rear shafts of dual-shaft motors.

\*\* Dimensions C & D do NOT apply to rear shafts of dual-shaft motors (all rear shafts are round style).

\*\*\* Dimension applies only to dual-shaft (D) motors.

| SureStep Series Dimensions & Cabling – NEMA 34 Connectorized Bipolar Stepping Motors |                                                     |                                                     |                   |                   |
|--------------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|-------------------|-------------------|
| Dimensions<br>(in [mm]*)                                                             | High Torque Motors                                  | Higher Torque Motors                                |                   |                   |
|                                                                                      | STP-MTR-34066(x)                                    | STP-MTRH-34066(x)                                   | STP-MTRH-34097(x) | STP-MTRH-34127(x) |
| A**                                                                                  | Ø 0.50 [12.7]                                       |                                                     |                   |                   |
| B                                                                                    | 2.64 [67.1]                                         | 2.64 [67.1]                                         | 3.82 [97.0]       | 5.00 [127.0]      |
| C**                                                                                  | 0.98 [25.0]                                         |                                                     |                   |                   |
| D**                                                                                  | 0.45 [11.4]                                         |                                                     |                   |                   |
| Conductor                                                                            | (4) #20 AWG, (5) #18 AWG (for W motors)             | (4) #18 AWG, (5) #18 AWG (for W motors)             |                   |                   |
| Connector                                                                            | Molex # 43025-0400, PXP4010/06S/6065 (for W motors) | Molex # 39-01-3042, PXP4010/06S/6065 (for W motors) |                   |                   |
| Pin                                                                                  | Molex # 43030-0007, Socket: SA3347 (for W motors)   | Molex # 39-00-0039, Socket: SA3347 (for W motors)   |                   |                   |

\* mm dimensions are for reference purposes only.

\*\* Dimension A (shaft diameter) is the same for both front and rear shafts of dual-shaft (D series) motors. Dimensions C & D do NOT apply to rear shafts of dual-shaft (D series) motors (all rear shafts are round style).

\*\*\* This dimension only applies to dual-shaft (D series) motors.



# Stepping System Accessories

## SureStep® Microstepping Drives Accessories

### Braking Accessories

As a load rapidly decelerates from a high speed, much of the kinetic energy of that load is transferred back to the motor. This energy is then pushed back to the drive and power supply, resulting in increased system voltage. If there is enough overhauling load on the motor, the DC voltage will go above the drive and/or power supply limits. In general, the more torque the motor is capable of producing then the more energy it can push back into the drive.

When using a regulated/switching power supply, this can trip the overvoltage protection of the power supply or drive, and cause it to shut down.

To solve this problem, AutomationDirect offers a regeneration clamp as an optional accessory. The regen clamp has a built-in 50W braking resistor. The STP-DRVA-RC-050A does not have the ability to use an external resistor.



**Regeneration Clamp [STP-DRVA-RC-050A](#)**

### Regeneration Clamp Features

#### [STP-DRVA-RC-050A](#)

- Built-in 50W power resistor for more continuous current handling
- Mounted on a heat sink
- Voltage range: 24–80 VDC; no user adjustments required
- Power: 50W continuous; 800W peak
- Indicators (LED):  
Green = power supply voltage is present  
Red = clamp is operating (usually when stepper is decelerating)
- Protection: The external power supply is internally connected to an "Input Diode" in the regen clamp that protects the power supply from high regeneration voltages. This diode protects the system from connecting the power supply in reverse. If the clamp circuit fails, the diode will continue to protect the power supply from over-voltage.
- Three drive connections, 7A max per channel, 15A total output current
- Removable terminal blocks (replacement kit STP-CON-4)
- Uses 18-20 AWG wire for connections

### SureStep Damper

A step motor inertia damper can smooth out steps in a typical step motor resulting in a quieter and smoother motion when rotating between steps. Reducing the resonance and possible micro oscillations when moving from step to step is the main purpose of a "hockey puck" style damper, but it can also be used as a hand wheel to directly rotate the position of the rotor when power is removed from the motor. The damper is a properly sized machined piece of aluminum encased in plastic. It is sized and weighted for general damping of the respective frame size motor.



**Damper**

| Sure Step Series Specifications – Microstepping Drives Optional Accessories |         |                                                                                                                     |                     |
|-----------------------------------------------------------------------------|---------|---------------------------------------------------------------------------------------------------------------------|---------------------|
| Part Number                                                                 | Price   | Description                                                                                                         | Drawing             |
| <a href="#">STP-DRVA-RC-050A*</a>                                           | \$4327: | Regen Clamp: 50W, for DC input stepper and servo drives, enclosed                                                   | <a href="#">PDF</a> |
| <a href="#">STP-MTRA-17DMP</a>                                              | \$2e9y: | SureStep damper, metal body. For use with NEMA 17 stepper motors with 5mm shafts. Mounting set screw included.      | <a href="#">PDF</a> |
| <a href="#">STP-MTRA-23DMP</a>                                              | \$2e9z: | SureStep damper, metal body. For use with NEMA 23 stepper motors with 1/4 inch shafts. Mounting set screw included. | <a href="#">PDF</a> |

\* Do not use the regeneration clamp in an atmosphere containing corrosive gases.

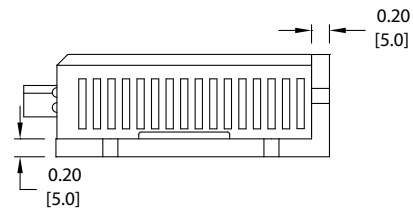
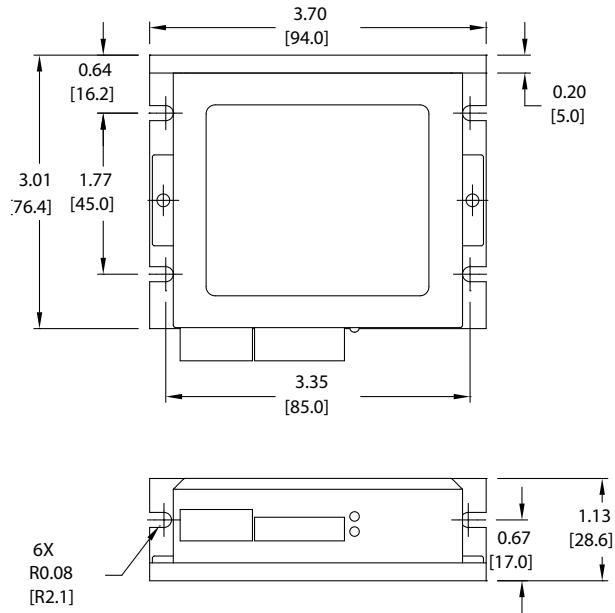


# Stepping System Accessories

## SureStep® Microstepping Drives Accessories

**Dimensions = in [mm]**

### STP-DRVA-RC-050A





# Stepping System Cables

## SureStep® Cables

| SureStep Series – Stepping System Cables |            |                               |        |                                                                                                                                                 |                                        |                     |
|------------------------------------------|------------|-------------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|---------------------|
| Cable                                    | Price      | Purpose                       | Length | Use With                                                                                                                                        | Cable End Connectors                   | Drawing             |
| <a href="#">STP-EXT-006</a>              | \$-2e9i:   | motor to drive extension      | 6 ft   | STP-MTR-xxxxx(x)                                                                                                                                | pigtail / Molex 43020-0401 connector   | <a href="#">PDF</a> |
| <a href="#">STP-EXT-010</a>              | \$-2e9j:   |                               | 10 ft  |                                                                                                                                                 |                                        | <a href="#">PDF</a> |
| <a href="#">STP-EXT-020</a>              | \$04vd:    |                               | 20 ft  |                                                                                                                                                 |                                        | <a href="#">PDF</a> |
| <a href="#">STP-EXTH-006</a>             | \$2e9k:    |                               | 6 ft   | STP-MTRH-xxxxx(x)                                                                                                                               | pigtail / Molex 39-01-2041 connector   | <a href="#">PDF</a> |
| <a href="#">STP-EXTH-010</a>             | \$-2e9l:   |                               | 10 ft  |                                                                                                                                                 |                                        | <a href="#">PDF</a> |
| <a href="#">STP-EXTH-020</a>             | \$04ve:    |                               | 20 ft  |                                                                                                                                                 |                                        | <a href="#">PDF</a> |
| <a href="#">STP-EXTHW-006</a>            | \$.3?j8:   |                               | 6 ft   | STP-MTRHW-xxxxx(x)                                                                                                                              | Bulgin # PXP4011/06P/6065              | <a href="#">PDF</a> |
| <a href="#">STP-EXTHW-010</a>            | \$.3?j3:   |                               | 10 ft  |                                                                                                                                                 |                                        | <a href="#">PDF</a> |
| <a href="#">STP-EXTHW-020</a>            | \$.03?j5:  |                               | 20 ft  |                                                                                                                                                 |                                        | <a href="#">PDF</a> |
| <a href="#">STP-EXTL-006</a>             | \$2e9n:    |                               | 6 ft   | STP-MTRL-xxxxx(x)                                                                                                                               | pigtail / Molex 105308-22004 connector | <a href="#">PDF</a> |
| <a href="#">STP-EXTL-010</a>             | \$2e9d:    |                               | 10 ft  |                                                                                                                                                 |                                        | <a href="#">PDF</a> |
| <a href="#">STP-EXTL-020</a>             | \$2e9e:    |                               | 20 ft  |                                                                                                                                                 |                                        | <a href="#">PDF</a> |
| <a href="#">STP-EXTW-006</a>             | \$.3?j6:   |                               | 6 ft   | STP-MTRW-xxxxx(x)                                                                                                                               | Bulgin # PXP4011/06P/6065              | <a href="#">PDF</a> |
| <a href="#">STP-EXTW-010</a>             | \$.3?j7:   |                               | 10 ft  |                                                                                                                                                 |                                        | <a href="#">PDF</a> |
| <a href="#">STP-EXTW-020</a>             | \$.03?j4:  |                               | 20 ft  |                                                                                                                                                 |                                        | <a href="#">PDF</a> |
| <a href="#">STP-EXT42-006</a>            | \$.4!qb:   | motor to drive extension      | 6 ft   | STP-MTRAC-42xxxx                                                                                                                                | 10-pin / pigtail                       | <a href="#">PDF</a> |
| <a href="#">STP-EXT42-010</a>            | \$.4!qc:   |                               | 10 ft  |                                                                                                                                                 |                                        | <a href="#">PDF</a> |
| <a href="#">STP-EXT42-020</a>            | \$.4!qd:   |                               | 20 ft  |                                                                                                                                                 |                                        | <a href="#">PDF</a> |
| <a href="#">STP-EXT42H-006</a>           | \$.4!qe:   |                               | 6 ft   | STP-MTRACH-42xxxxx                                                                                                                              |                                        | <a href="#">PDF</a> |
| <a href="#">STP-EXT42H-010</a>           | \$.;4!qf:  |                               | 10 ft  |                                                                                                                                                 |                                        | <a href="#">PDF</a> |
| <a href="#">STP-EXT42H-020</a>           | \$.4!qa:   |                               | 20 ft  |                                                                                                                                                 |                                        | <a href="#">PDF</a> |
| <a href="#">STP-232RJ11-CBL *</a>        | \$04yx:    | programming/<br>communication | 10 ft  | STP-DRV-4850, STP-DRV-80100                                                                                                                     | DB9 female / RJ11(6P4C)                | <a href="#">PDF</a> |
| <a href="#">STP-232HD15-CBL-2**</a>      | \$04yf:    | communication                 | 6.6 ft | STP-DRV-4850, STP-DRV-80100<br>DL06, D2-250-1, D2-260                                                                                           | HD 15-pin male / RJ12 6-pin<br>plug    | n/a                 |
| <a href="#">STP-232RJ12-CBL-2**</a>      | \$04yg:    | communication                 | 6.6 ft | STP-DRV-4850, STP-DRV-80100<br>DL05, CLICK                                                                                                      | RJ11 (6P4C) plug / RJ12<br>6-pin plug  | n/a                 |
| <a href="#">STP-CBL-CA6</a>              | \$.2b[y:   | control cable                 | 6 ft   | STP-MTRD-17038<br>STP-MTRD-17038E                                                                                                               | 11-pin / pigtail                       | <a href="#">PDF</a> |
| <a href="#">STP-CBL-CA10</a>             | \$.2b[z:   | control cable                 | 10 ft  |                                                                                                                                                 | 11-pin / pigtail                       | <a href="#">PDF</a> |
| <a href="#">STP-CBL-CA20</a>             | \$.;02b[]: | control cable                 | 20 ft  |                                                                                                                                                 | 11-pin / pigtail                       | <a href="#">PDF</a> |
| <a href="#">STP-CBL-EA6</a>              | \$.2b[u:   | encoder cable                 | 6 ft   | STP-MTRD-xxxxxE<br>STP-MTRA-ENC1, STP-MTRA-ENC3<br>STP-MTRA-ENC5, STP-MTRA-ENC7<br>STP-MTRA-ENC11, STP-MTRA-ENC13<br>(for line driver encoders) | 10-pin / pigtail                       | <a href="#">PDF</a> |
| <a href="#">STP-CBL-EA10</a>             | \$.2b[v:   | encoder cable                 | 10 ft  |                                                                                                                                                 | 10-pin / pigtail                       | <a href="#">PDF</a> |
| <a href="#">STP-CBL-EA20</a>             | \$.2b[x:   | encoder cable                 | 20 ft  |                                                                                                                                                 | 10-pin / pigtail                       | <a href="#">PDF</a> |
| <a href="#">STP-CBL-EB3</a>              | \$3?8z:    | encoder cable                 | 3 ft   | AMT112Q-V<br>AMT112S-V<br>(for both line driver and push-pull (totem)<br>encoders)                                                              | 17-pin / pigtail                       | <a href="#">PDF</a> |
| <a href="#">STP-CBL-EB6</a>              | \$.2e9f:   | encoder cable                 | 6 ft   |                                                                                                                                                 | 17-pin / pigtail                       | <a href="#">PDF</a> |
| <a href="#">STP-CBL-EB10</a>             | \$02e9g:   | encoder cable                 | 10 ft  |                                                                                                                                                 | 17-pin / pigtail                       | <a href="#">PDF</a> |
| <a href="#">STP-CBL-EB20</a>             | \$02e9h:   | encoder cable                 | 20 ft  |                                                                                                                                                 | 17-pin / pigtail                       | <a href="#">PDF</a> |
| <a href="#">STP-CBL-ED6</a>              | \$2e9s:    | encoder cable                 | 6 ft   | STP-MTRA-ENC2, STP-MTRA-ENC4<br>STP-MTRA-ENC6, STP-MTRA-ENC8<br>STP-MTRA-ENC12, STP-MTRA-ENC14<br>(for push-pull (totem) encoders)              | 5-pin / pigtail                        | <a href="#">PDF</a> |
| <a href="#">STP-CBL-ED10</a>             | \$.2e9t:   | encoder cable                 | 10 ft  |                                                                                                                                                 | 5-pin / pigtail                        | <a href="#">PDF</a> |
| <a href="#">STP-CBL-ED20</a>             | \$2e9u:    | encoder cable                 | 20 ft  |                                                                                                                                                 | 5-pin / pigtail                        | <a href="#">PDF</a> |
| <a href="#">STP-CON-1</a>                | \$.2b[#:   | replacement connector kit     | n/a    | STP-DRV-4845 & -6575                                                                                                                            | -                                      | n/a                 |
| <a href="#">STP-CON-2</a>                | \$.;2b[!:  | replacement connector kit     | n/a    | STP-DRV-4850 & 80100                                                                                                                            | -                                      | n/a                 |

\* Programming/communication cable STP-232RJ11-CBL is available for spare or replacement purposes.

(One cable is included with each software programmable drive.)

\*\* Refer to the ZIPLinks Wiring Solutions section for complete information regarding cables STP-232HD15-CBL-2 and STP-232RJ12-CBL-2.

## SureStep® Cables, *continued*

| SureStep Series – Stepping System Cables |           |                           |        |                  |                                |                     |
|------------------------------------------|-----------|---------------------------|--------|------------------|--------------------------------|---------------------|
| Cable                                    | Price     | Purpose                   | Length | Use With         | Cable End Connectors           | Drawing             |
| <b>STP-CON-3</b>                         | \$;2b[?:  | replacement connector kit | n/a    | STP-MTRD-xxxxxR  | -                              | n/a                 |
| <b>STP-CON-4</b>                         | \$432s:   | replacement connector kit | n/a    | STP-DRVA-RC-050A | -                              | n/a                 |
| <b>STP-CON-5</b>                         | \$;432t:  | replacement connector kit | n/a    | STP-DRV-4830     | -                              | <a href="#">PDF</a> |
| <b>STP-CON-6</b>                         | \$432u:   | replacement connector kit | n/a    | STP-DRVAC-24025  | -                              | n/a                 |
| <b>STP-485DB9-CBL-2</b>                  | \$;:2b[[: | 4-wire programming cable  | 6.5 ft | STP-MTRD-xxxxxR  | DB9 / Phoenix 5-conductor plug | <a href="#">PDF</a> |

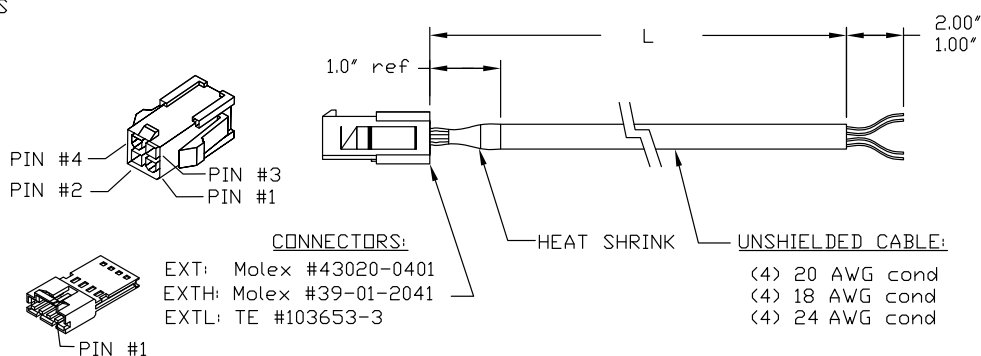
### STP-EXT(x)-0xx Extension Cable Wiring Diagram

EXT &amp; EXTH CABLES

| PIN# | COLOR |
|------|-------|
| 1    | RED   |
| 2    | WHITE |
| 3    | GREEN |
| 4    | BLACK |

EXTL CABLES

| PIN# | COLOR |
|------|-------|
| 1    | RED   |
| 2    | WHITE |
| 3    | GREEN |
| 4    | BLACK |



### STP-EXTW-0xx and STP-EXTHW-0xx Extension Cable Wiring Diagram

