

# Stepping System Motors

## SureStep® Stepping Motors

| SureStep Series Part Numbers – Bipolar Stepping Motors, <i>continued</i> |          |            |                               |                  |                     |
|--------------------------------------------------------------------------|----------|------------|-------------------------------|------------------|---------------------|
| Bipolar Stepping Motors                                                  | Price    | Shaft Type | Torque Level                  | Encoder Mounting | Drawing             |
| <i>Motors listing continued from previous page</i>                       |          |            |                               |                  |                     |
| <a href="#">STP-MTRAC-23044</a>                                          | \$104.00 | single     | High voltage<br>High torque   | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTRAC-23044D</a>                                         | \$119.00 | dual       |                               | optional         | <a href="#">PDF</a> |
| <a href="#">STP-MTRAC-23055</a>                                          | \$125.00 | single     |                               | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTRAC-23055D</a>                                         | \$143.00 | dual       |                               | optional         | <a href="#">PDF</a> |
| <a href="#">STP-MTRAC-23078</a>                                          | \$146.00 | single     |                               | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTRAC-23078D</a>                                         | \$175.00 | dual       |                               | optional         | <a href="#">PDF</a> |
| <a href="#">STP-MTRAC-34075</a>                                          | \$266.00 | single     |                               | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTRAC-34075D</a>                                         | \$266.00 | dual       |                               | optional         | <a href="#">PDF</a> |
| <a href="#">STP-MTRAC-34115</a>                                          | \$275.00 | single     |                               | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTRAC-34115D</a>                                         | \$276.00 | dual       |                               | optional         | <a href="#">PDF</a> |
| <a href="#">STP-MTRAC-34156</a>                                          | \$296.00 | single*    | High voltage<br>Higher torque | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTRAC-34156D</a>                                         | \$280.00 | dual*      |                               | optional         | <a href="#">PDF</a> |
| <a href="#">STP-MTRAC-42100</a>                                          | \$268.00 | single     |                               | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTRAC-42100D</a>                                         | \$292.00 | dual       |                               | optional**       | <a href="#">PDF</a> |
| <a href="#">STP-MTRAC-42151</a>                                          | \$450.00 | single     |                               | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTRAC-42151D</a>                                         | \$473.00 | dual       |                               | optional**       | <a href="#">PDF</a> |
| <a href="#">STP-MTRAC-42202</a>                                          | \$551.00 | single     |                               | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTRAC-42202D</a>                                         | \$571.00 | dual       |                               | optional**       | <a href="#">PDF</a> |
| <a href="#">STP-MTRACH-42100</a>                                         | \$268.00 | single     |                               | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTRACH-42100D</a>                                        | \$292.00 | dual       |                               | optional**       | <a href="#">PDF</a> |
| <a href="#">STP-MTRACH-42151</a>                                         | \$450.00 | single     |                               | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTRACH-42151D</a>                                        | \$473.00 | dual       |                               | optional**       | <a href="#">PDF</a> |
| <a href="#">STP-MTRACH-42202</a>                                         | \$551.00 | single     |                               | not available    | <a href="#">PDF</a> |
| <a href="#">STP-MTRACH-42202D</a>                                        | \$571.00 | dual       |                               | optional**       | <a href="#">PDF</a> |

\* NOTE: STP-MTRAC-34156(x) motors have a 5/8" front shaft.

\*\* NOTE: NEMA 42 "D" motors require an [STP-MTRA-42ENC](#) adapter plate for AMT13/AMT33 encoder mounting.

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



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



**STP-MTRACH-42xxxD**  
(dual-shaft)



## SureStep® Stepping Motors Mounting Accessories

| Mounting Accessories – for NEMA 17 and NEMA 42 SureStep Stepping Motors |         |                                                                                                                                                                                                                                                           |                     |                         |
|-------------------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------------------|
| Part Number                                                             | Price   | Description                                                                                                                                                                                                                                               | Drawing Links       | Use With                |
| <a href="#">STP-MTRA-RB-85</a>                                          | \$9.25  | Reducer bushing, 8mm OD to 5mm ID, 16mm length, aluminum alloy. Connects NEMA size 17 stepper motors to Koyo TRD-NH and TRD-SH hollow shaft encoders.                                                                                                     | n/a                 | SureStep NEMA 17 motors |
| <a href="#">STP-MTRA-42ENC</a>                                          | \$10.00 | SureStep encoder mounting plate, metal body. For use with SureStep NEMA 42 stepper motors with dual shafts. Encoder mounting screws and mounting plate screws included. Mounting holes for CUI Devices AMT132/AMT332 encoders and US Digital E6 encoders. | <a href="#">PDF</a> | SureStep NEMA 42 motors |

**STP-MTRA-42ENC**





# Stepping System Motors

## SureStep® Stepping Motors

| SureStep Series Specifications – High Voltage Bipolar Stepping Motors |                         |                                            |                    |                    |                     |                    |                      |
|-----------------------------------------------------------------------|-------------------------|--------------------------------------------|--------------------|--------------------|---------------------|--------------------|----------------------|
| Bipolar Stepping Motors                                               |                         | High Voltage<br>High Torque                |                    |                    |                     |                    |                      |
|                                                                       |                         | STP-MTRAC-23044(x)                         | STP-MTRAC-23055(x) | STP-MTRAC-23078(x) | STP-MTRAC-34075(x)  | STP-MTRAC-34115(x) | STP-MTRAC-34156(x)** |
| NEMA Frame Size                                                       |                         | 23                                         | 23                 | 23                 | 34                  | 34                 | 34**                 |
| Maximum Holding Torque*                                               | (lb·in)                 | 4.69                                       | 9.31               | 14.19              | 51.31               | 69.48              | 115.06               |
|                                                                       | (oz·in)                 | 75                                         | 149                | 227                | 821                 | 1110               | 1841                 |
|                                                                       | (N·m)                   | 0.53                                       | 1.05               | 1.6                | 5.8                 | 7.84               | 13                   |
| Rotor Inertia                                                         | (oz·in2)                | 0.66                                       | 1.64               | 2.62               | 7.38                | 14.74              | 24.06                |
|                                                                       | (g·cm2)                 | 120                                        | 300                | 480                | 1350                | 2700               | 4400                 |
|                                                                       | Rated Current (A/phase) | Series                                     | 0.71               | 0.71               | 0.71                | 2.15               | 2.05                 |
| Parallel                                                              |                         | 1.41                                       | 1.41               | 1.41               | 4.3                 | 4.1                | 5.1                  |
| Resistance (Ω/ phase)                                                 | Series                  | 12.4                                       | 14.4               | 18                 | 4                   | 4.8                | 4.8                  |
|                                                                       | Parallel                | 3.1                                        | 3.6                | 4.5                | 1.0                 | 1.2                | 1.375                |
| Inductance (mH/phase)                                                 | Series                  | 30.4                                       | 51.2               | 60.8               | 32                  | 43.2               | 44.8                 |
|                                                                       | Parallel                | 7.6                                        | 12.8               | 15.2               | 8.0                 | 10.8               | 11.2                 |
| Insulation Class                                                      |                         | B                                          |                    |                    |                     |                    |                      |
| Steps per Revolution                                                  |                         | 200                                        |                    |                    |                     |                    |                      |
| Basic Step Angle                                                      |                         | 1.8°                                       |                    |                    |                     |                    |                      |
| Shaft Runout (in)                                                     |                         | 0.002 in 0.05 mm]                          |                    |                    |                     |                    |                      |
| Max Shaft Radial Play @ 1lb load                                      |                         | 0.02 in [0.51 mm]                          |                    |                    | 0.025 in [0.635 mm] |                    | 0.02 in [0.51 mm]    |
| Max End Play @ 2.2-lb Axial load                                      |                         | 0.08 in [2.03 mm]                          |                    |                    | 0.075 in [1.91 mm]  |                    | 0.08 in [2.03 mm]    |
| Connectors                                                            |                         | 8 leads, 24AWG                             |                    |                    | 8 leads, 22AWG      |                    |                      |
| Temperature Rise                                                      |                         | 80°C [176°F] max                           |                    |                    |                     |                    |                      |
| Storage Temperature Range                                             |                         | -40°C to 70°C [-40°F to 158°F]             |                    |                    |                     |                    |                      |
| Operating Temperature Range                                           |                         | -20°C to 50°C [-4°F to 122°F]              |                    |                    |                     |                    |                      |
| Operating Humidity Range                                              |                         | 5% to 95% non-condensing                   |                    |                    |                     |                    |                      |
| Product Material                                                      |                         | Steel motor case; stainless steel shaft(s) |                    |                    |                     |                    |                      |
| Environmental Rating                                                  |                         | IP40                                       |                    |                    |                     |                    |                      |
| Weight (lb [kg])                                                      |                         | 1.03 [0.47]                                | 1.54 [0.7]         | 2.2 [1.0]          | 4.2 [1.9]           | 8.4 [3.8]          | 11.46 [5.2]          |
| Agency Approvals                                                      |                         | None                                       |                    |                    | cURUS               |                    |                      |

\* For dual-shaft motors (STP-MTRAC-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.

\*\* STP-MTRAC-34156(x) motors have a 5/8" front shaft



# Stepping System Motors

## SureStep® Stepping Motors

| SureStep Series Specifications – Connectorized Stepping Motors |                  |                                            |                    |                    |                     |                     |
|----------------------------------------------------------------|------------------|--------------------------------------------|--------------------|--------------------|---------------------|---------------------|
| Stepping Motors                                                |                  | Higher voltage<br>High torque              |                    |                    |                     |                     |
|                                                                |                  | STP-MTRAC-42100(x)                         | STP-MTRAC-42151(x) | STP-MTRAC-42202(x) | STP-MTRACH-42100(x) | STP-MTRACH-42202(x) |
| NEMA Frame Size                                                |                  | 42                                         | 42                 | 42                 | 42                  | 42                  |
| Optional Encoder <sup>1</sup>                                  |                  | Y                                          | Y                  | Y                  | Y                   | Y                   |
| Max Holding Torque (N·m)                                       | Unipolar Series  | 9.7                                        | 19.0               | 26.0               | 9.7                 | 26.0                |
|                                                                | Bipolar Series   | 12.2                                       | 22.0               | 31.0               | 12.3                | 32.0                |
|                                                                | Bipolar Parallel | 12.2                                       | 22.0               | 31.0               | 12.3                | 32.0                |
| Rotor Inertia (g·cm <sup>2</sup> )                             |                  | 5500                                       | 10900              | 16200              | 5500                | 16200               |
| Rated RMS Current (A/phase)                                    | Unipolar Series  | 6                                          | 9.4                | 9                  | 8.5                 | 11.5                |
|                                                                | Bipolar Series   | 4.2                                        | 6                  | 6                  | 6                   | 8                   |
|                                                                | Bipolar Parallel | 8.4                                        | 12                 | 12                 | 12                  | 16                  |
| Resistance (Ω/phase)                                           | Unipolar Series  | 0.6                                        | 0.34               | 0.46               | 0.32                | 0.215               |
|                                                                | Bipolar Series   | 1.19                                       | 0.68               | 0.91               | 0.64                | 0.58                |
|                                                                | Bipolar Parallel | 0.3                                        | 0.17               | 0.23               | 0.159               | 0.144               |
| Inductance (mH/phase)                                          | Unipolar Series  | 5                                          | 3.6                | 5.5                | 2.5                 | 1.9                 |
|                                                                | Bipolar Series   | 19.8                                       | 14.5               | 22                 | 10.1                | 7.6                 |
|                                                                | Bipolar Parallel | 5                                          | 3.6                | 5.5                | 2.5                 | 3.2                 |
| Insulation Class                                               |                  | B                                          |                    |                    |                     |                     |
| Steps per Revolution                                           |                  | 200                                        |                    |                    |                     |                     |
| Basic Step Angle                                               |                  | 1.8°                                       |                    |                    |                     |                     |
| Shaft Runout                                                   |                  | 0.05 mm                                    |                    |                    |                     |                     |
| Max Shaft Radial Play @ 1lb load                               |                  | 1.1 in                                     |                    |                    |                     |                     |
| Connectors                                                     |                  | 8 leads, 18AWG                             |                    |                    |                     |                     |
| Temperature Rise                                               |                  | 80°C max                                   |                    |                    |                     |                     |
| Storage Temp.                                                  |                  | -30°C to 70°C [-22°F to 158°F]             |                    |                    |                     |                     |
| Operating Temperature                                          |                  | -20°C to 40°C [-4°F to 104°F]              |                    |                    |                     |                     |
| Operating Humidity                                             |                  | 5% to 95% non-condensing                   |                    |                    |                     |                     |
| Product Material                                               |                  | Steel motor case, stainless steel shaft(s) |                    |                    |                     |                     |
| Environmental Rating                                           |                  | IP40                                       |                    |                    |                     |                     |
| Weight (lb [kg])                                               |                  | 10.6 [4.8]                                 | 17.6 [8]           | 25.6 [11.6]        | 10.6 [4.8]          | 25.6 [11.6]         |
| Agency Approval                                                |                  | cURus                                      |                    |                    |                     |                     |

<sup>1</sup> - Dual-shaft versions only. For US Digital E6 or CUI Devices AMT13/AMT33 encoder mounting, the [STP-MTRA-42ENC](#) encoder adapter plate is required.



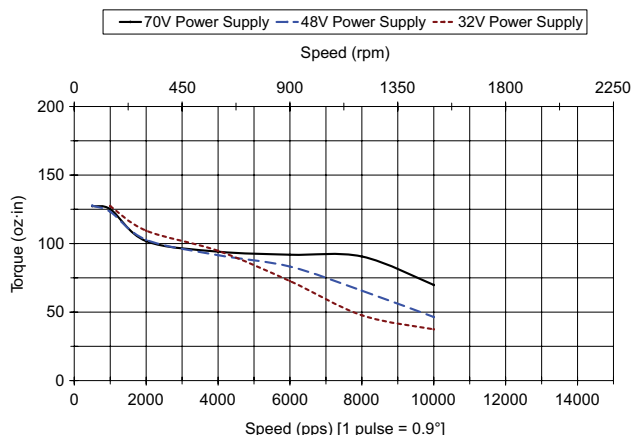
# Stepping System Motors

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

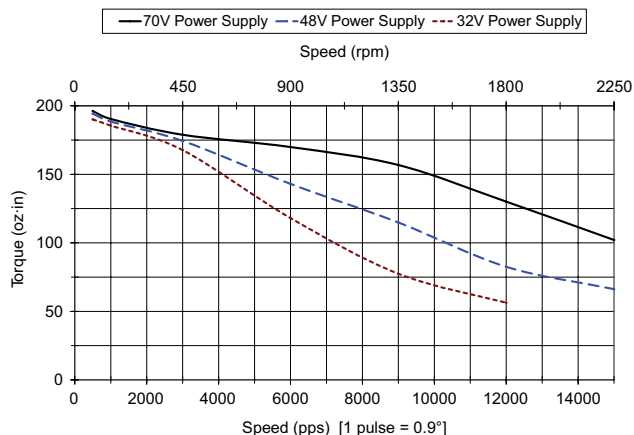
### STP-MTR(H)-23xxx(x) NEMA 23 Step Motors

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

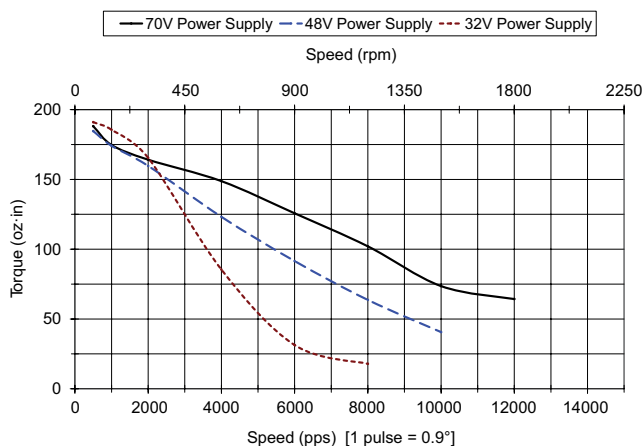
STP-MTR-23055(x) Torque vs Speed (1.8° step motor; 1/2 stepping)



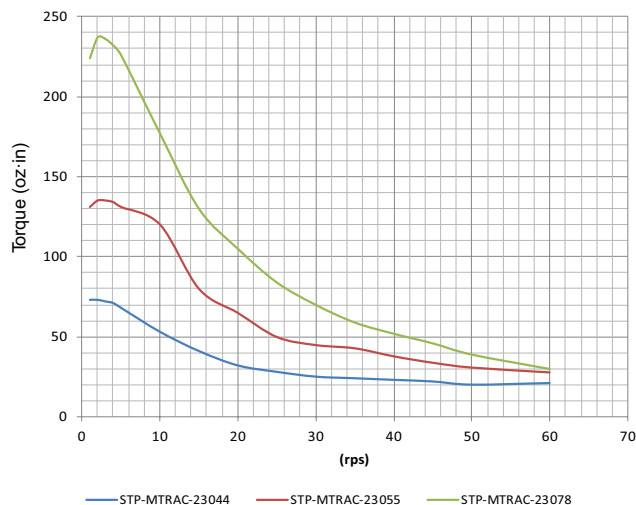
STP-MTRH-23079(x) Torque vs Speed (1.8° step motor; 1/2 stepping)



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)





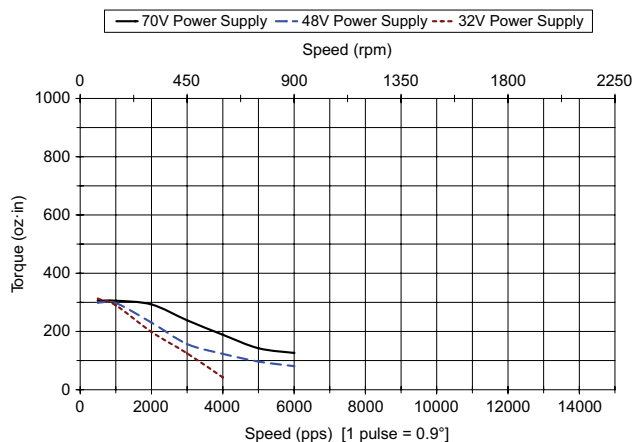
# Stepping System Motors

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

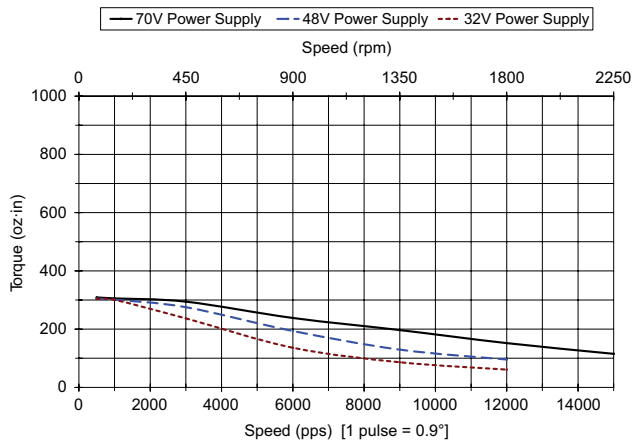
### STP-MTR(H)-34xxx(x) NEMA 34 Step Motors

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

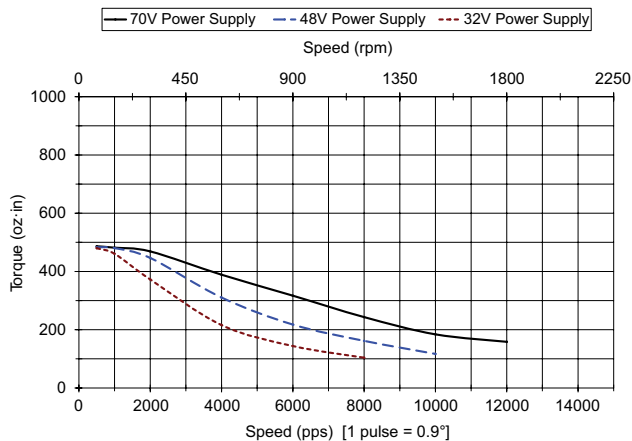
**STP-MTR-34066(x)** Torque vs Speed (1.8° step motor; 1/2 stepping)



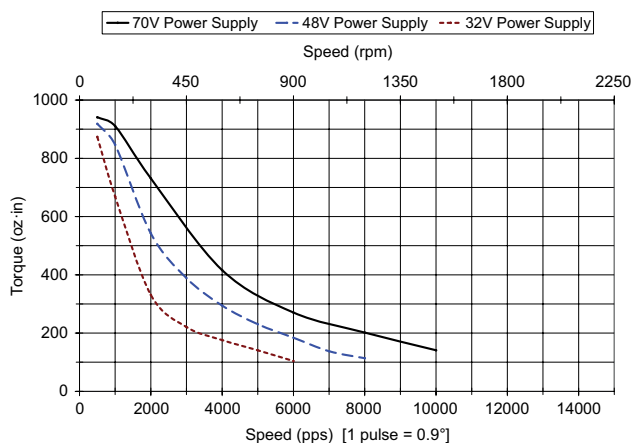
**STP-MTRH-34066(x)** Torque vs Speed (1.8° motor; 1/2 stepping)



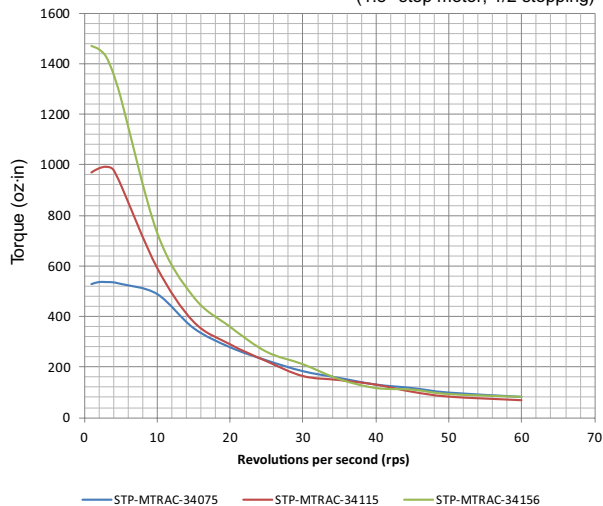
**STP-MTRH-34097(x)** Torque vs Speed (1.8° step motor; 1/2 stepping)



**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)

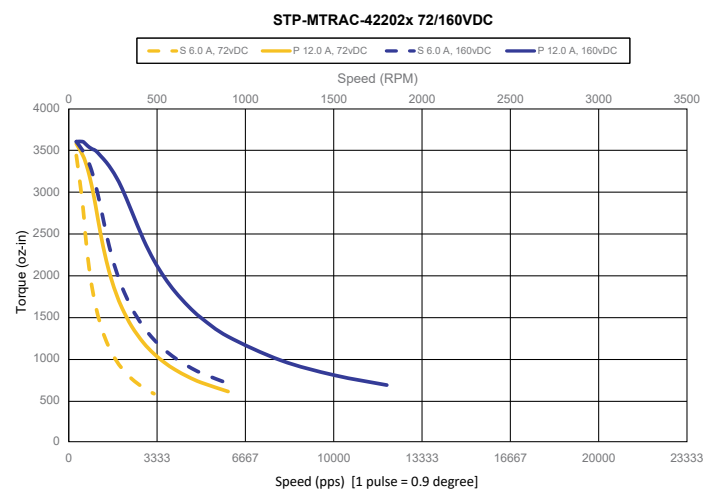
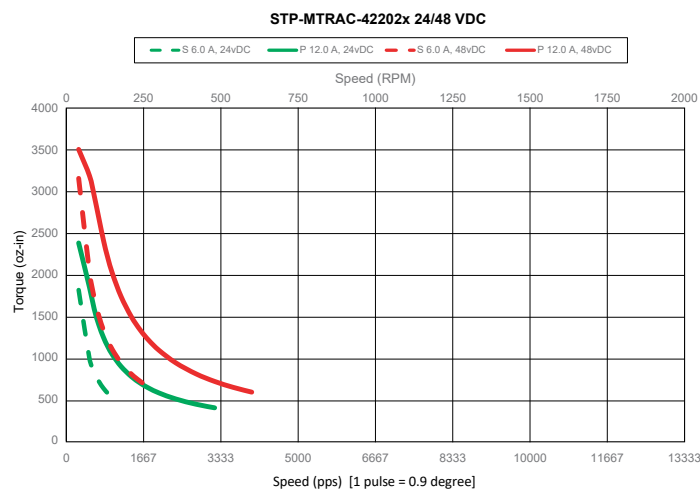
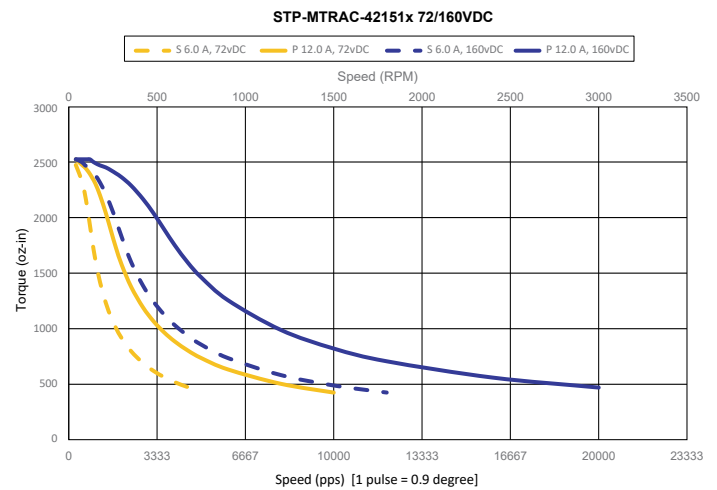
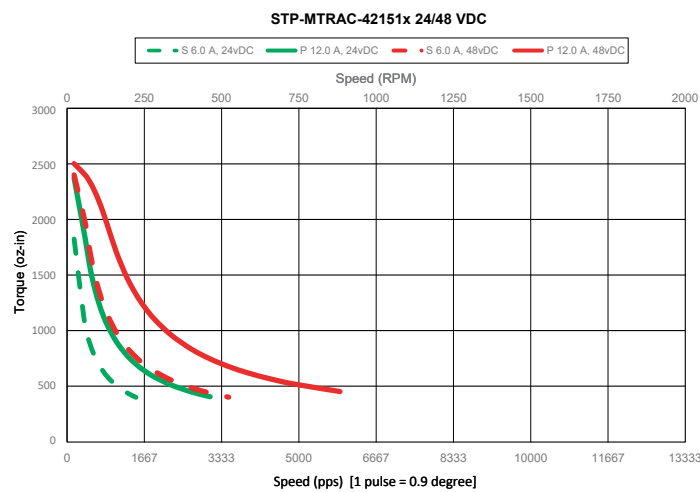
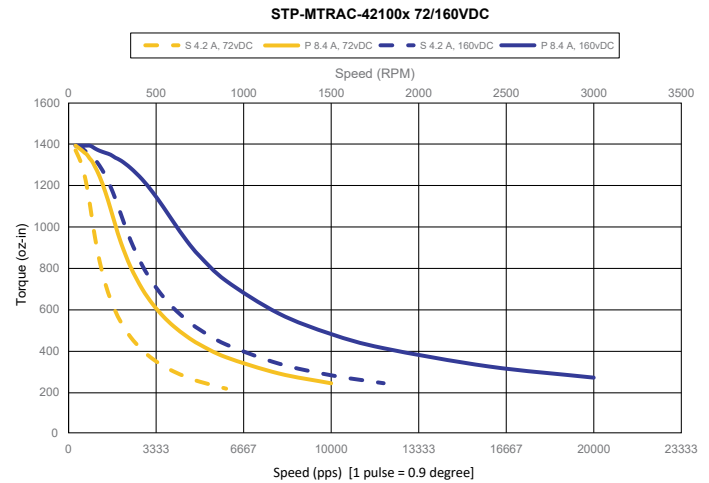
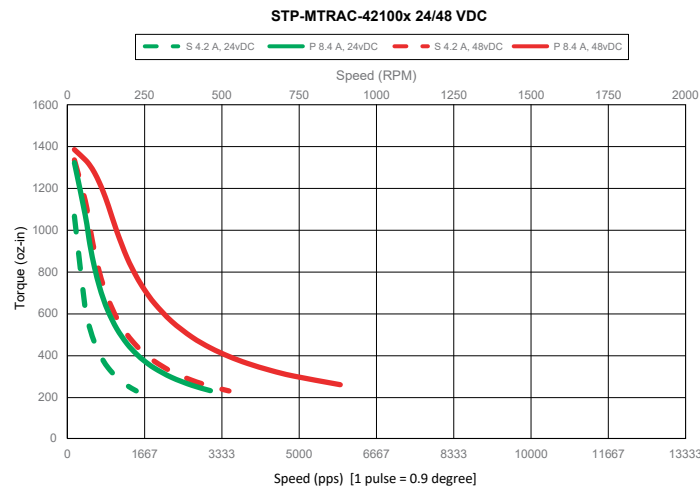


# Stepping System Motors

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

STP-MTRAC(H)-42xxx(x) NEMA 42 Step Motors

For all NEMA 42 charts: "S" = Series Bipolar Wiring  
"P" = Parallel Bipolar Wiring

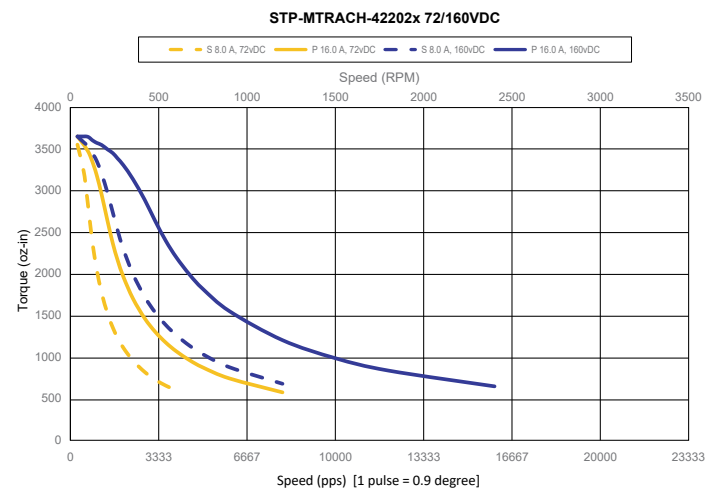
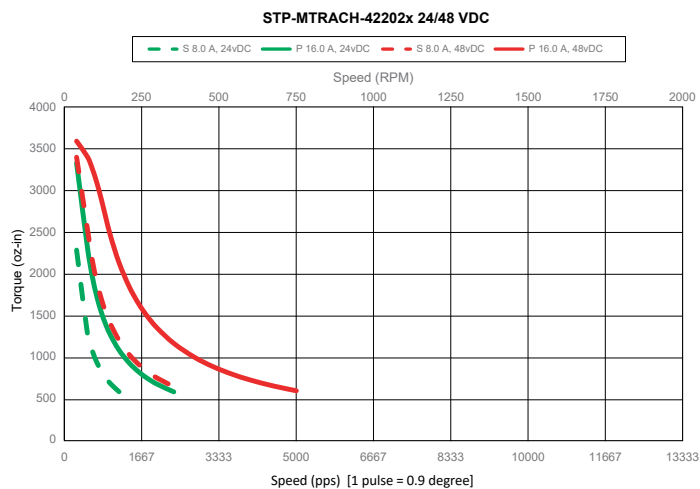
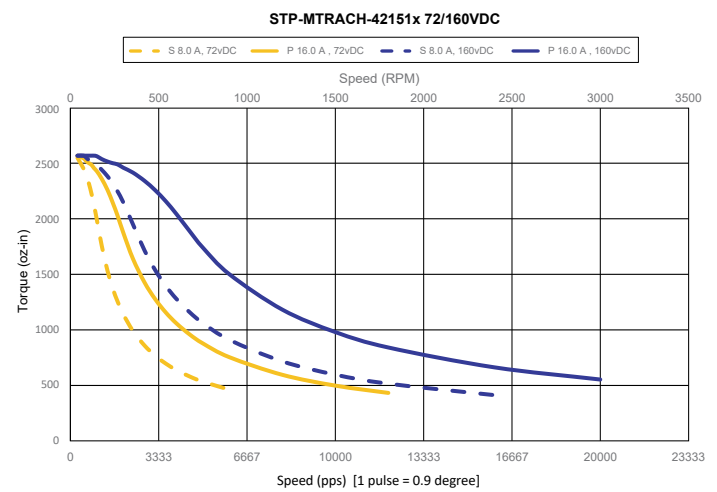
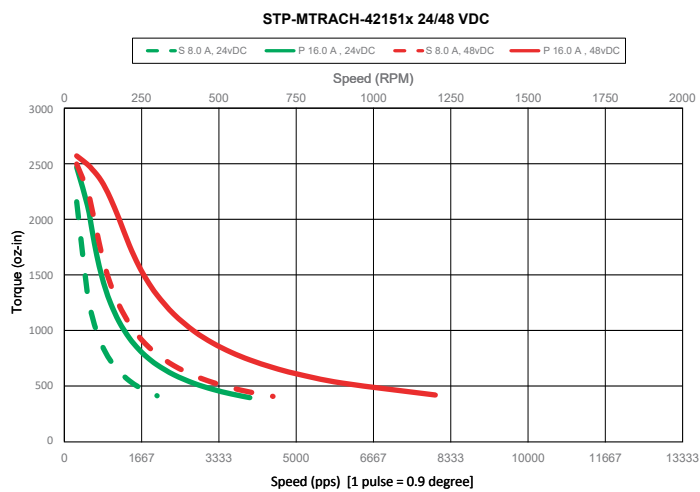
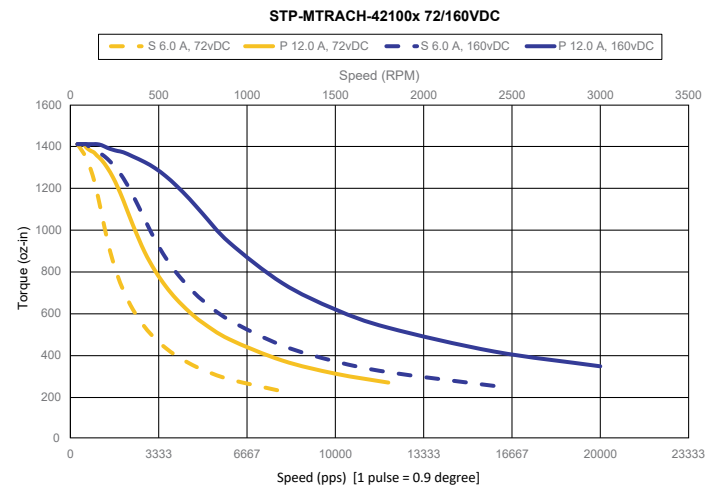
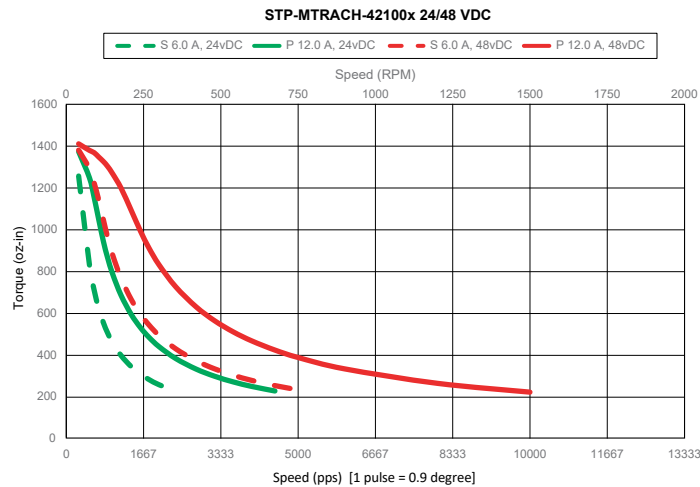


# Stepping System Motors

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

STP-MTRACH(H)-42xxx(x) NEMA 42 Step Motors

For all NEMA 42 charts: "S" = Series Bipolar Wiring  
"P" = Parallel Bipolar Wiring

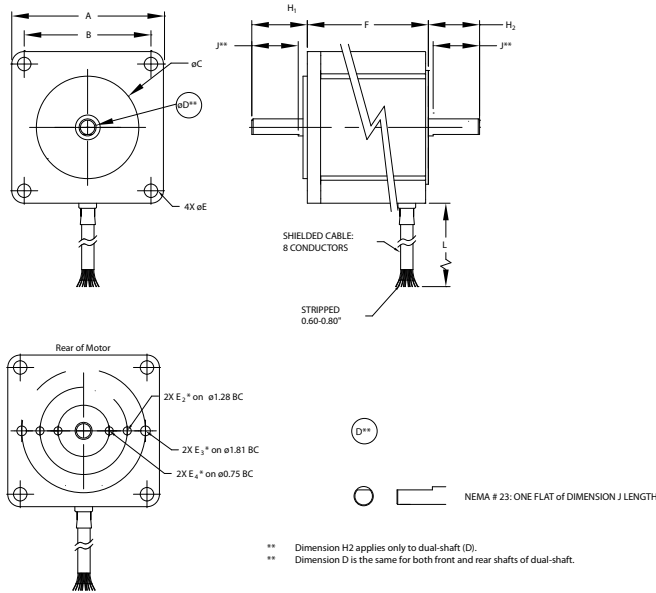




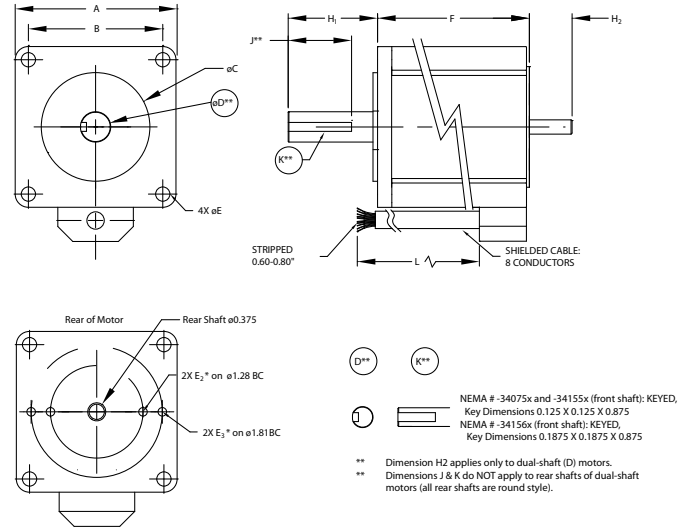
# Stepping System Motors

## SureStep® Motor Dimensions and Cabling

### STP-MTRAC-23xxx Motors



### STP-MTRAC-34xxx Motors



\*\* Dimension H2 applies only to dual-shaft (D) motors.  
\*\* Dimension D is the same for both front and rear shafts of dual-shaft.

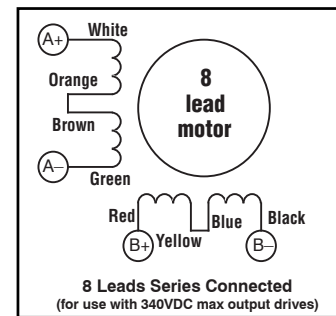
## SureStep Series Dimensions & Cabling – High Voltage Bipolar Stepping Motors

| Dimensions*<br>(in [mm])* | High Voltage<br>High Torque |                          |                          |                          |                          |                          |
|---------------------------|-----------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|                           | STP-MTRAC-<br>23044(x)      | STP-MTRAC-<br>23055(x)   | STP-MTRAC-<br>23078(x)   | STP-MTRAC-<br>34075(x)   | STP-MTRAC-<br>34115(x)   | STP-MTRAC-<br>34156(x)   |
| <b>A</b>                  | 2.25 [57.15]                | 2.25 [57.15]             | 2.25 [57.15]             | 3.39 [86.1]              | 3.39 [86.1]              | 3.39 [86.1]              |
| <b>B</b>                  | 1.86 [47.24]                | 1.86 [47.24]             | 1.86 [47.24]             | 2.74 [69.6]              | 2.74 [69.6]              | 2.74 [69.6]              |
| <b>C</b>                  | 1.50 [38.1]                 | 1.50 [38.1]              | 1.50 [38.1]              | 2.87 [72.9]              | 2.87 [72.9]              | 2.87 [72.9]              |
| <b>D**</b>                | 0.25 [6.35]                 | 0.25 [6.35]              | 0.25 [6.35]              | 0.5 [12.7]               | 0.5 [12.7]               | 0.625 [15.9]             |
| <b>E</b>                  | 0.2 [5.08]                  | 0.2 [5.08]               | 0.2 [5.08]               | 0.22 [5.59]              | 0.26 [6.6]               | 0.22 [5.59]              |
| <b>E2***</b>              | 2-56 thru                   | 2-56 thru                | 2-56 thru                | 2-56 UNC Tap<br>0.2 Deep | 2-56 UNC Tap<br>0.2 Deep | 2-56 UNC Tap<br>0.2 Deep |
| <b>E3***</b>              | 4-40 UNC x 0.2<br>Deep      | 4-40 UNC x 0.2<br>Deep   | 4-40 UNC x 0.2<br>Deep   | 4-40 UNC Tap<br>0.2 Deep | 4-40 UNC Tap<br>0.2 Deep | 4-40 UNC Tap<br>0.2 Deep |
| <b>E4***</b>              | 2-56 UNC Tap<br>0.2 Deep    | 2-56 UNC Tap<br>0.2 Deep | 2-56 UNC Tap<br>0.2 Deep | –                        | –                        | –                        |
| <b>F</b>                  | 1.71 [43.43]                | 2.16 [54.86]             | 3.05 [77.47]             | 2.95 [74.93]             | 4.52 [114.81]            | 6.14 [155.96]            |
| <b>H1</b>                 | 0.81 [20.57]                | 0.81 [20.57]             | 0.81 [20.57]             | 1.25 [31.75]             | 1.25 [31.75]             | 1.25 [31.75]             |
| <b>H2***</b>              | 0.63 [16.0]                 | 0.63 [16.0]              | 0.63 [16.0]              | 1.12 [28.45]             | 1.12 [28.45]             | 1.12 [28.45]             |
| <b>J</b>                  | 0.60 [15.24]                | 0.60 [15.24]             | 0.60 [15.24]             | 0.87 [22.1]              | 0.87 [22.1]              | 0.87 [22.1]              |
| <b>L</b>                  | 120 [3048]                  | 120 [3048]               | 120 [3048]               | 120 [3048]               | 120 [3048]               | 120 [3048]               |

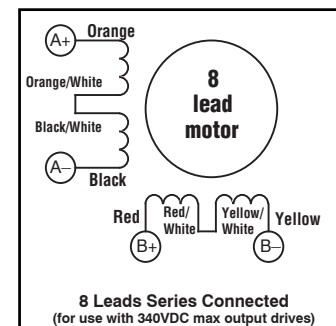
\* mm dimensions are for reference purposes only.

\*\* Dimension D (shaft diameter) is the same for both front and rear shafts of NEMA 23 dual-shaft motors. See diagrams for NEMA 34.

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



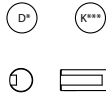
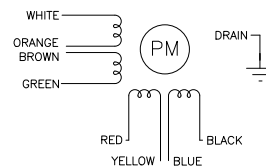
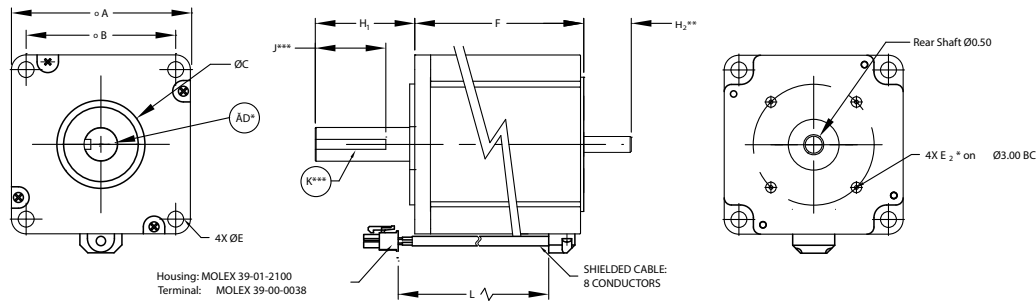
**STP-MTRAC-230xx(x),  
34156(x) Motor Wiring**



**STP-MTRAC-34075(x),  
34115(x) Motor Wiring**

# Stepping System Motors

## STP-MTRAC-42xxx Motors

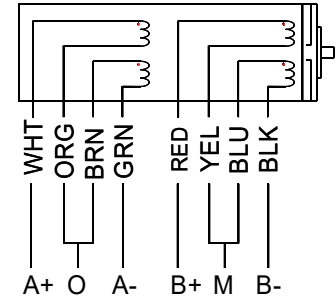


NEMA # 42 (front shaft): KEYED, Key Dimensions 0.188 X 0.188 X 1.377

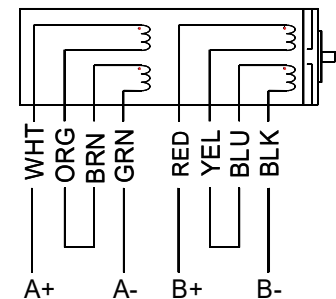
- \* Dimension D applies only to the front shaft.
- \*\* Dimension H2 applies only to dual-shaft (D) motors.
- \*\*\* Dimensions J & Key do NOT apply to rear shafts of dual-shaft motors

(all rear shafts are round style).

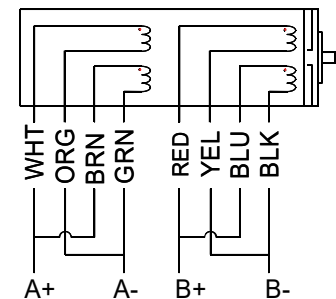
### Uni-polar



### Bi-polar series



### Bi-polar parallel



| SureStep Series Dimensions & Cabling – Higher Voltage Bipolar Stepping Motors |                               |                  |                 |                  |                 |                  |                       |                       |                       |                       |                       |
|-------------------------------------------------------------------------------|-------------------------------|------------------|-----------------|------------------|-----------------|------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Dimensions*<br>(in [mm]*)                                                     | Higher Voltage<br>High Torque |                  |                 |                  |                 |                  |                       |                       |                       |                       |                       |
|                                                                               | STP-MTRAC-42100               | STP-MTRACH-42100 | STP-MTRAC-42151 | STP-MTRACH-42151 | STP-MTRAC-42202 | STP-MTRACH-42202 | STP-MTRAC-42100D      | STP-MTRACH-42100D     | STP-MTRAC-42151D      | STP-MTRACH-42151D     | STP-MTRAC-42202D      |
| A                                                                             | 4.33 [110]                    | 4.33 [110]       | 4.33 [110]      | 4.33 [110]       | 4.33 [110]      | 4.33 [110]       | 4.33 [110]            | 4.33 [110]            | 4.33 [110]            | 4.33 [110]            | 4.33 [110]            |
| B                                                                             | 3.50 [88.9]                   | 3.50 [88.9]      | 3.50 [88.9]     | 3.50 [88.9]      | 3.50 [88.9]     | 3.50 [88.9]      | 3.50 [88.9]           | 3.50 [88.9]           | 3.50 [88.9]           | 3.50 [88.9]           | 3.50 [88.9]           |
| C                                                                             | 2.19 [55.6]                   | 2.19 [55.6]      | 2.19 [55.6]     | 2.19 [55.6]      | 2.19 [55.6]     | 2.19 [55.6]      | 2.19 [55.6]           | 2.19 [55.6]           | 2.19 [55.6]           | 2.19 [55.6]           | 2.19 [55.6]           |
| D**                                                                           | 0.75 [19.05]                  | 0.75 [19.05]     | 0.75 [19.05]    | 0.75 [19.05]     | 0.75 [19.05]    | 0.75 [19.05]     | 0.75 [19.05]          | 0.75 [19.05]          | 0.75 [19.05]          | 0.75 [19.05]          | 0.75 [19.05]          |
| E                                                                             | 0.327 [8.31]                  | 0.327 [8.31]     | 0.327 [8.31]    | 0.327 [8.31]     | 0.327 [8.31]    | 0.327 [8.31]     | 0.327 [8.31]          | 0.327 [8.31]          | 0.327 [8.31]          | 0.327 [8.31]          | 0.327 [8.31]          |
| E2                                                                            | n/a                           | n/a              | n/a             | n/a              | n/a             | n/a              | 4-40 UNC Tap 0.2 Deep | 4-40 UNC Tap 0.2 Deep | 4-40 UNC Tap 0.2 Deep | 4-40 UNC Tap 0.2 Deep | 4-40 UNC Tap 0.2 Deep |
| F                                                                             | 3.88                          | 5.94             | 7.91            | 3.88***          | 5.94***         | 7.91***          |                       |                       |                       |                       |                       |
| H1                                                                            | 2.19 [55.6]                   | 2.19 [55.6]      | 2.19 [55.6]     | 2.19 [55.6]      | 2.19 [55.6]     | 2.19 [55.6]      | 2.19 [55.6]           | 2.19 [55.6]           | 2.19 [55.6]           | 2.19 [55.6]           | 2.19 [55.6]           |
| H2                                                                            | n/a                           | n/a              | n/a             | n/a              | n/a             | n/a              | 1.12 [28.4]           | 1.12 [28.4]           | 1.12 [28.4]           | 1.12 [28.4]           | 1.12 [28.4]           |
| J**                                                                           | 1.37 [34.8]                   | 1.37 [34.8]      | 1.37 [34.8]     | 1.37 [34.8]      | 1.37 [34.8]     | 1.37 [34.8]      | 1.37 [34.8]           | 1.37 [34.8]           | 1.37 [34.8]           | 1.37 [34.8]           | 1.37 [34.8]           |
| L                                                                             | 12 [305]                      |                  |                 |                  |                 |                  |                       |                       |                       |                       |                       |

\* mm dimensions are for reference purposes only.

\*\* Dimension D (shaft diameter), J, and Key do not apply to rear shafts of dual-shaft motors.

\*\*\* For encoder mounting the required STP-MTRA-42ENC bracket will add 0.13 inches [3.2 mm] to the length of the motor.



# 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             |
| <u><a href="#">STP-DRVA-RC-050A*</a></u>                                    | \$76.00 | Regen Clamp: 50W, for DC input stepper and servo drives, enclosed                                                   | <a href="#">PDF</a> |
| <u><a href="#">STP-MTRA-17DMP</a></u>                                       | \$15.00 | SureStep damper, metal body. For use with NEMA 17 stepper motors with 5mm shafts. Mounting set screw included.      | <a href="#">PDF</a> |
| <u><a href="#">STP-MTRA-23DMP</a></u>                                       | \$34.50 | 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.

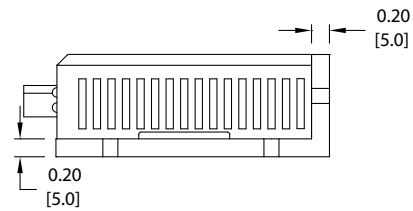
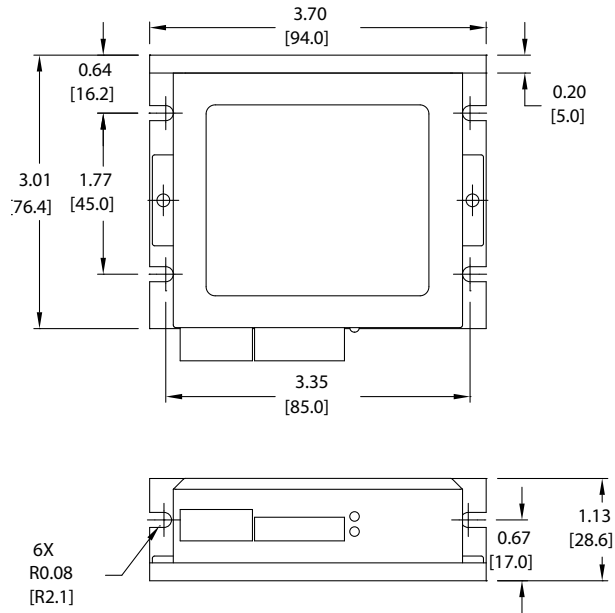


# Stepping System Accessories

## SureStep® Microstepping Drives Accessories

**Dimensions = in [mm]**

### STP-DRVA-RC-050A





# Stepping System Accessories

## SureStep® Microstepping Drives Accessories

### USB to RS-485 Adapter

The STP-USB485-4W is a USB to RS-232/RS-485 converter that can be used in 2-wire or 4-wire serial networks. Serial communication can be wired up via the 9-pin D-sub connector or through the 6-screw terminals.

The STP-USB485-4W can be set for several different configurations. These modes are set up by the 4 DIP switches on the outside of the case (RS-232/RS-485, full/half duplex) and by the 7 jumpers located inside the case (termination/bias resistors).

SureStep Advanced Drives communicate via RS-232 (for control and for configuration via SureMotion Pro).

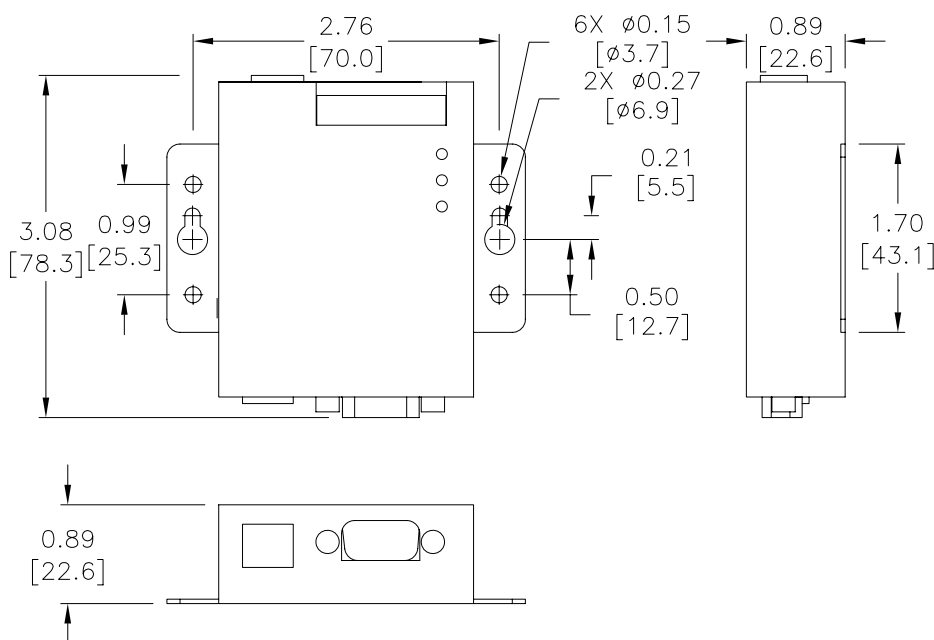
The Advanced Integrated motor/drives use RS-485. While the Advanced Integrated motor/drives can be wired for either 2- or 4-wire networks, 4-wire is required for use with SureMotion Pro due to the Firmware Download utility and the Status Monitor Screen.

Depending on the host controller's RS-485 implementation, either 2- or 4-wire RS-485 can be used for control. All RS-485 PLCs that have 2-wire capability (Productivity, BRX, Click, DirectLogic, etc.) can control the Advanced Integrated steppers.



| SureStep PC Adapter - STP-USB485-4W |                                            |
|-------------------------------------|--------------------------------------------|
| Price                               | \$129.00                                   |
| Drawing                             | PDF                                        |
| Communications                      | 2-wire RS-232<br>2- or 4-wire RS-485       |
| Configure With                      | Internal jumpers and external DIP switches |
| Compatible Cables                   | STP-232RJ11-CBL<br>STP-485DB9-CBL-2<br>USB |

### Dimensions = in [mm]





# Stepping System Accessories

## SureStep® Stepping System Encoders

### Replacement Encoders

The [STP-MTRA-ENC1](#) is a replacement for the encoder that comes standard with the STP-MTRD-17038E, STP-MTRD-23042E, and STP-MTRD-23065E integrated motor/drives. Note that the encoder included with (E) model advanced integrated motor/drives is internal and cannot be replaced.

The [AMT112Q-V](#) is a replacement for the encoder that comes standard with the STP-MTR(x)-xxxxE stand alone step motors.

Installation tool and mounting hardware is included with all replacement encoders. For more information and details on how to wire the replacement encoders, please see the SureStep User Manual.

### Optional Encoders

Optional encoders can be purchased separately for standard integrated motor/drives and standalone dual-shaft motors in all NEMA 14, 17, and 23 sizes, and also for STP-MTRAC-34xxxD motors (currently not available for STP-MTRx-34xxxD motors). All (D) model (dual-shaft) step motors come with pre-drilled holes in the rear end cap for easy encoder mounting. Pre-installed encoders on standalone dual-shaft motors and standard integrated motor/drives can be retrofitted with an appropriate optional encoder if desired. Please see the chart on the following page for encoder compatibility.

#### Features:

- Fixed resolutions include 400ppr or 1000ppr
- Configurable models have up to 4096ppr (default = 400ppr)
- Choose line driver or push-pull (totem) output signals



**STP-MTRA-ENC2**



**AMT112Q-V**



**STP-MTRA-ENC11**

| Sure Step Series Specifications – Encoders |         |                                                                                                                                                                                                                                 |                     |
|--------------------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Part Number                                | Price   | Description                                                                                                                                                                                                                     | Drawing             |
| <a href="#">STP-MTRA-ENC1</a>              | \$91.00 | SureStep incremental (quadrature) modular encoder, 5VDC, line driver (differential) output, 1000 ppr. For use with SureStep stepper motors with 5mm rear shaft. Installation tool and mounting hardware included.               | <a href="#">PDF</a> |
| <a href="#">STP-MTRA-ENC2</a>              | \$79.00 | SureStep incremental (quadrature) modular encoder, 5VDC, Push-pull (totem) output, 1000 ppr. For use with SureStep stepper motors with 5mm rear shaft. Installation tool and mounting hardware included.                        | <a href="#">PDF</a> |
| <a href="#">STP-MTRA-ENC3</a>              | \$89.00 | SureStep incremental (quadrature) modular encoder, 5VDC, line driver (differential) output, 400 ppr. For use with SureStep stepper motors with 5mm rear shaft. Installation tool and mounting hardware included.                | <a href="#">PDF</a> |
| <a href="#">STP-MTRA-ENC4</a>              | \$76.00 | SureStep incremental (quadrature) modular encoder, 5VDC, Push-pull (totem) output, 400 ppr. For use with SureStep stepper motors with 5mm rear shaft. Installation tool and mounting hardware included.                         | <a href="#">PDF</a> |
| <a href="#">STP-MTRA-ENC5</a>              | \$91.00 | SureStep incremental (quadrature) modular encoder, 5VDC, line driver (differential) output, 1000 ppr. For use with SureStep stepper motors with 1/4 inch rear shaft. Installation tool and mounting hardware included.          | <a href="#">PDF</a> |
| <a href="#">STP-MTRA-ENC6</a>              | \$79.00 | SureStep incremental (quadrature) modular encoder, 5VDC, Push-pull (totem) output, 1000 ppr. For use with SureStep stepper motors with 1/4 inch rear shaft. Installation tool and mounting hardware included.                   | <a href="#">PDF</a> |
| <a href="#">STP-MTRA-ENC7</a>              | \$89.00 | SureStep incremental (quadrature) modular encoder, 5VDC, line driver (differential) output, 400 ppr. For use with SureStep stepper motors with 1/4 inch rear shaft. Installation tool and mounting hardware included.           | <a href="#">PDF</a> |
| <a href="#">STP-MTRA-ENC8</a>              | \$76.00 | SureStep incremental (quadrature) modular encoder, 5VDC, Push-pull (totem) output, 400 ppr. For use with SureStep stepper motors with 1/4 inch rear shaft. Installation tool and mounting hardware included.                    | <a href="#">PDF</a> |
| <a href="#">STP-MTRA-ENC11</a>             | \$72.00 | SureStep incremental (quadrature) modular encoder, 5 VDC, line driver (differential) output, 1000 ppr. For use with SureStep stepper motors with 3/8in rear shaft. Installation hardware included. Requires STP-CBL-EAxx cable. | <a href="#">PDF</a> |
| <a href="#">STP-MTRA-ENC12</a>             | \$60.00 | SureStep incremental (quadrature) modular encoder, 5 VDC, push-pull (totem) output, 1000 ppr. For use with SureStep stepper motors with 3/8in rear shaft. Installation hardware included. Requires STP-CBL-EDxx cable.          | <a href="#">PDF</a> |
| <a href="#">STP-MTRA-ENC13</a>             | \$61.00 | SureStep incremental (quadrature) modular encoder, 5 VDC, line driver (differential) output, 400 ppr. For use with SureStep stepper motors with 3/8in rear shaft. Installation hardware included. Requires STP-CBL-EAxx cable.  | <a href="#">PDF</a> |
| <a href="#">STP-MTRA-ENC14</a>             | \$52.00 | SureStep incremental (quadrature) modular encoder, 5 VDC, push-pull (totem) output, 400 ppr. For use with SureStep stepper motors with 3/8in rear shaft. Installation hardware included. Requires STP-CBL-EDxx cable.           | <a href="#">PDF</a> |



# Stepping System Accessories

## SureStep® Stepping System Encoders

| Sure Step Series Encoder Compatibility |      |               |                   |               |                                         |                                                                                                      |
|----------------------------------------|------|---------------|-------------------|---------------|-----------------------------------------|------------------------------------------------------------------------------------------------------|
| Part Number                            | PPR  | Bore Diameter | Output Type       | Encoder Cable | PLC Compatibility                       | Motor Compatibility                                                                                  |
| <a href="#"><u>STP-MTRA-ENC1</u></a>   | 1000 | 5mm           | Line Driver       | STP-CBL-EAxx  | P2-HSI, P3-HSI, BRX*, CLICK C0-1xDxE-D* | STP-MTRx-14xxxD<br>STP-MTRx-14xxxE<br>STP-MTRx-17xxxD<br>STP-MTRx-17xxxE<br>Standard STP-MTRD-xxxxxE |
| <a href="#"><u>STP-MTRA-ENC2</u></a>   |      |               | Push-pull (totem) | STP-CBL-EDxx  | BRX*, CLICK C0-1xDxE-D*                 |                                                                                                      |
| <a href="#"><u>STP-MTRA-ENC3</u></a>   | 400  |               | Line Driver       | STP-CBL-EAxx  | P2-HSI, P3-HSI, BRX*, CLICK C0-1xDxE-D* |                                                                                                      |
| <a href="#"><u>STP-MTRA-ENC4</u></a>   |      |               | Push-pull (totem) | STP-CBL-EDxx  | BRX*, CLICK C0-1xDxE-D*                 |                                                                                                      |
| <a href="#"><u>STP-MTRA-ENC5</u></a>   | 1000 | 0.25 inch     | Line Driver       | STP-CBL-EAxx  | P2-HSI, P3-HSI, BRX*, CLICK C0-1xDxE-D* | STP-MTRx-23xxxD<br>STP-MTRx-23xxxE<br>STP-MTRAC-23xxxD                                               |
| <a href="#"><u>STP-MTRA-ENC6</u></a>   |      |               | Push-pull (totem) | STP-CBL-EDxx  | BRX*, CLICK C0-1xDxE-D*                 |                                                                                                      |
| <a href="#"><u>STP-MTRA-ENC7</u></a>   | 400  |               | Line Driver       | STP-CBL-EAxx  | P2-HSI, P3-HSI, BRX*, CLICK C0-1xDxE-D* |                                                                                                      |
| <a href="#"><u>STP-MTRA-ENC8</u></a>   |      |               | Push-pull (totem) | STP-CBL-EDxx  | BRX*, CLICK C0-1xDxE-D*                 |                                                                                                      |
| <a href="#"><u>STP-MTRA-ENC11</u></a>  | 1000 | 0.375 inch    | Line Driver       | STP-CBL-EAxx  | P2-HSI, P3-HSI, BRX*, CLICK C0-1xDxE-D* | STP-MTRAC-34xxxD                                                                                     |
| <a href="#"><u>STP-MTRA-ENC12</u></a>  |      |               | Push-pull (totem) | STP-CBL-EDxx  | BRX*, CLICK C0-1xDxE-D*                 |                                                                                                      |
| <a href="#"><u>STP-MTRA-ENC13</u></a>  | 400  |               | Line Driver       | STP-CBL-EAxx  | P2-HSI, P3-HSI, BRX*, CLICK C0-1xDxE-D* |                                                                                                      |
| <a href="#"><u>STP-MTRA-ENC14</u></a>  |      |               | Push-pull (totem) | STP-CBL-EDxx  | BRX*, CLICK C0-1xDxE-D*                 |                                                                                                      |

\* Requires [FC-ISO-C](#)

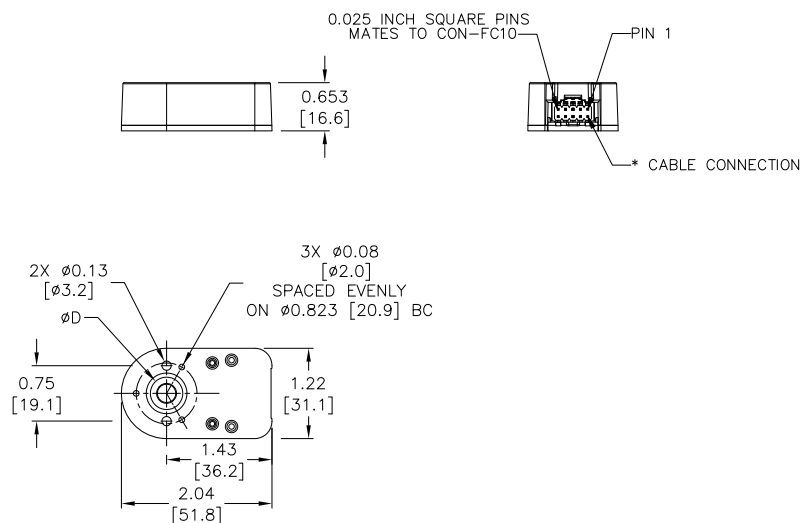


# Stepping System Accessories

## SureStep® Stepping System Encoders

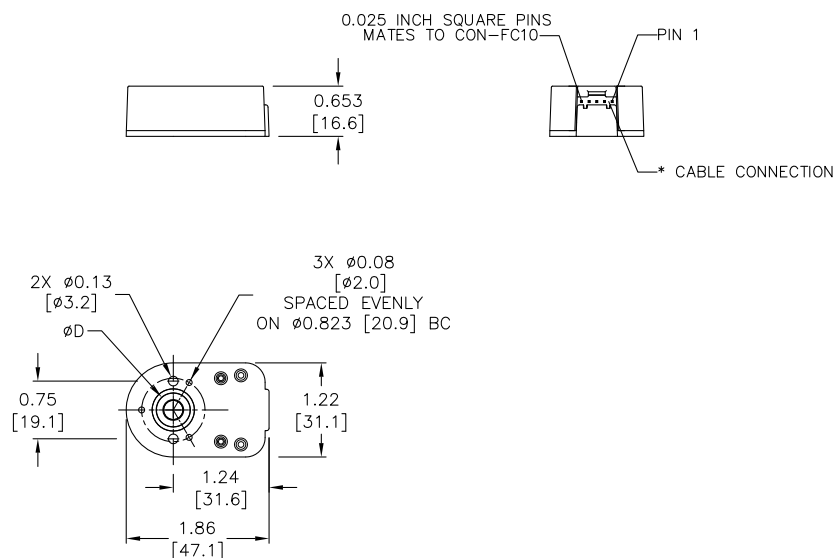
Dimensions = in [mm]

### STP-MTRA-ENC1, 3, 5, 7



| Bolt Hole Circles for Mounting                          |                                                      |
|---------------------------------------------------------|------------------------------------------------------|
| Encoder                                                 | Holes                                                |
| ENC1, ENC2,<br>ENC3, ENC4,<br>ENC5, ENC6,<br>ENC7, ENC8 | 2 holes @ 19.05mm (.75")<br>3 holes @ 20.9mm (.823") |

### STP-MTRA-ENC2, 4, 6, 8



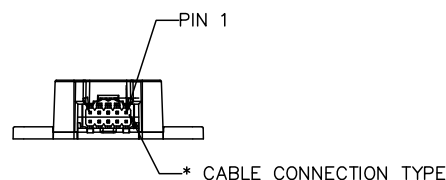
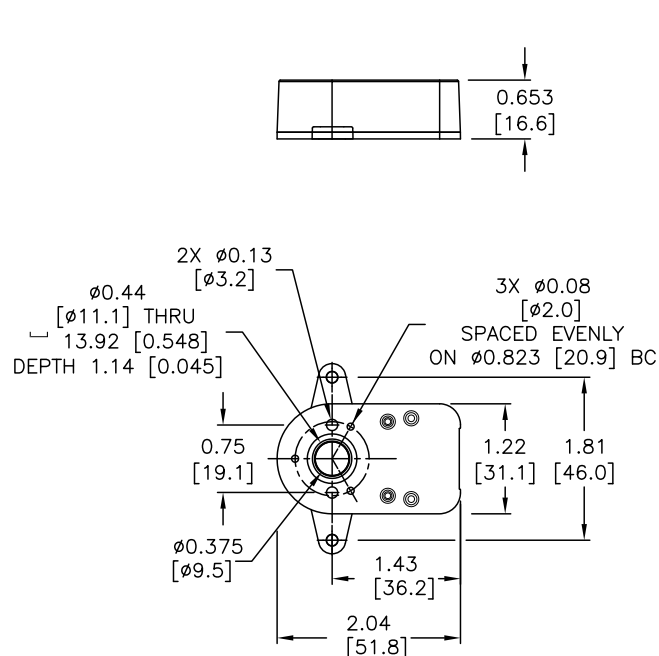


# Stepping System Accessories

## SureStep® Stepping System Encoders

**Dimensions = in [mm]**

### STP-MTRA-ENC11, 13



### Bolt Hole Circles for Mounting

| Encoder                    | Holes                                                                              |
|----------------------------|------------------------------------------------------------------------------------|
| ENC11, ENC12, ENC13, ENC14 | 2 holes @ 19.05mm (.75")<br>3 holes @ 20.9mm (.823")<br>2 holes @ 46.02mm (1.812") |

### STP-MTRA-ENC12, 14

