

SureStep[®] Stepping System Motors

SureStep[®] Stepping Motors

SureStep Series Part Numbers – Connectorized Bipolar Stepping Motors*																				
Bipolar Stepping Motors	High Torque Motors										Higher Torque Motors									
	STP-MTR-17040	STP-MTR-17040D	STP-MTR-17048	STP-MTR-17048D	STP-MTR-17060	STP-MTR-17060D	STP-MTR-23055	STP-MTR-23055D	STP-MTR-23079	STP-MTR-23079D	STP-MTR-34066	STP-MTR-34066D	STP-MTRH-23079	STP-MTRH-23079D	STP-MTRH-34066	STP-MTRH-34066D	STP-MTRH-34097	STP-MTRH-34097D	STP-MTRH-34127	STP-MTRH-34127D
Price	\$18.00	\$22.00	\$22.00	\$26.00	\$35.50	\$39.50	\$35.50	\$40.00	\$46.50	\$51.00	\$111.00	\$126.00	\$51.50	\$56.00	\$124.00	\$139.00	\$140.00	\$155.00	\$167.00	\$167.00
Shaft	single	dual	single	dual	single	dual	single	dual	single	dual	single	dual	single	dual	single	dual	single	dual	single	dual

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

SureStep Series Specifications – Connectorized Bipolar Stepping Motors											
Bipolar Stepping Motors	High Torque Motors						Higher Torque Motors				
	STP-MTR-17040(D)	STP-MTR-17048(D)	STP-MTR-17060(D)	STP-MTR-23055(D)	STP-MTR-23079(D)	STP-MTR-34066(D)	STP-MTRH-23079(D)	STP-MTRH-34066(D)	STP-MTRH-34097(D)	STP-MTRH-34127(D)	
NEMA Frame Size	17	17	17	23	23	34	23	34	34	34	
* Maximum Holding Torque	(lb-in)	3.81	5.19	7.19	10.37	17.25	27.12	17.87	27.12	50.00	80.50
	(oz-in)	61	83	115	166	276	434	286	434	800	1288
	(N-m)	0.43	0.59	0.81	1.17	1.95	3.06	2.02	3.06	5.65	9.12
Rotor Inertia	(oz-in ²)	0.28	0.37	0.56	1.46	2.60	7.66	2.60	7.66	14.80	21.90
	(kg-cm ²)	0.05	0.07	0.10	0.27	0.48	1.40	0.48	1.40	2.71	4.01
Rated Current (A/phase)	1.7	2.0	2.0	2.8	2.8	2.8	5.6	6.3	6.3	6.3	
Resistance (Ω/phase)	1.6	1.4	2.0	0.8	1.1	1.1	0.4	0.3	0.3	0.5	
Inductance (mH/phase)	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	0.002 in [0.051 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 100°C [212 °F])										
Operating Humidity Range	55% to 85% non-condensing										
Product Material	steel motor case; stainless steel shaft(s)										
Environmental Rating	IP40										
Weight (lb [kg])	0.6 [0.3]	0.7 [0.3]	0.9 [0.4]	1.5 [0.7]	2.2 [1.0]	3.9 [1.7]	2.4 [1.1]	3.9 [1.7]	5.9 [2.7]	8.4 [3.8]	
Agency Approvals	CE (complies with EN55014-1 (1993) and EN60034-1.5.11)										
Design Tips	Allow sufficient time to accelerate the load and size the step motor with a 100% torque safety factor. DO NOT disassemble step motors because motor performance will be reduced and the warranty will be voided. DO NOT connect or disconnect the step motor during operation. Mount the motor to a surface with good thermal conductivity, such as steel or aluminum, to allow heat dissipation. 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-EXT-020						STP-EXTH-020				

* For dual-shaft motors (STP-MTR-xxxxD):

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.

SureStep[®] Stepping Motors Mounting Accessory

Mounting Accessory – for NEMA 17 SureStep Series Bipolar Stepping Motors		
Part Number	Price	Description
STP-MTRA-RB-85	\$8.00	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.

SureStep[®] Stepping System Motors

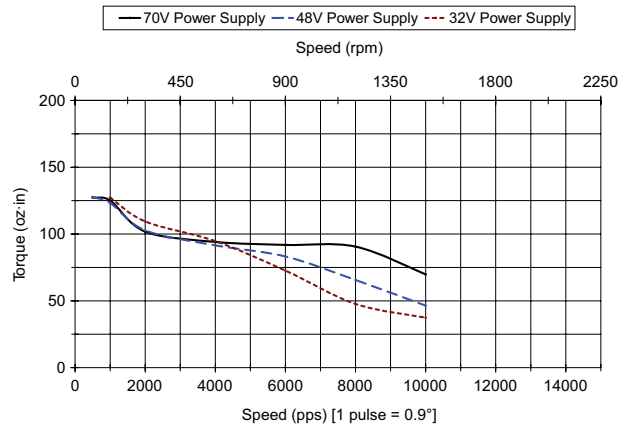
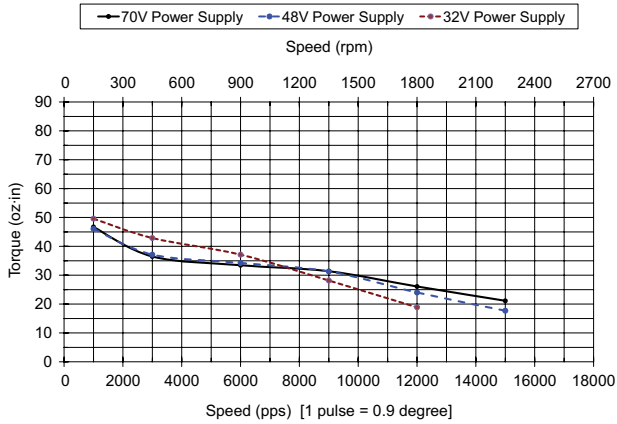
SureStep[®] Motor Torque vs. Speed Charts

STP-MTR-17xxx(D) NEMA 17 Step Motors

STP-MTR(H)-23xxx(D) NEMA 23 Step Motors

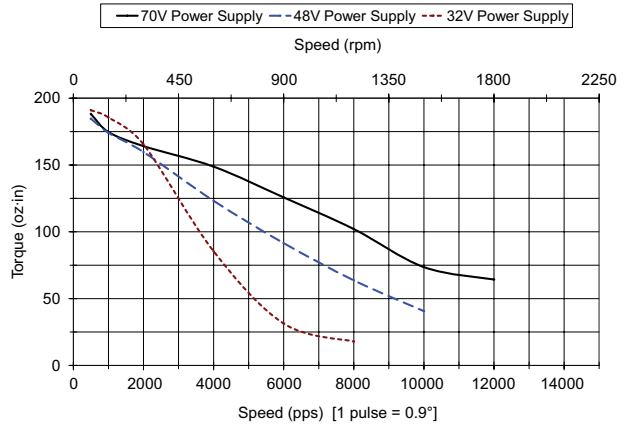
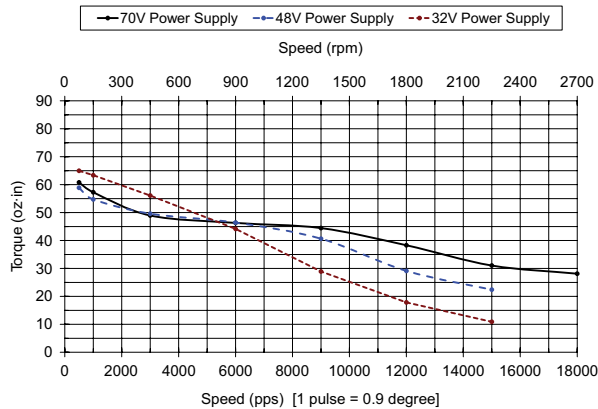
STP-MTR-17040(D) Torque vs Speed (1.8° step motor; 1/2 stepping)

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



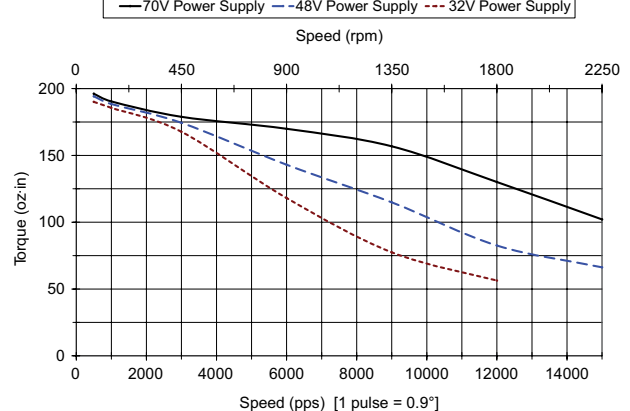
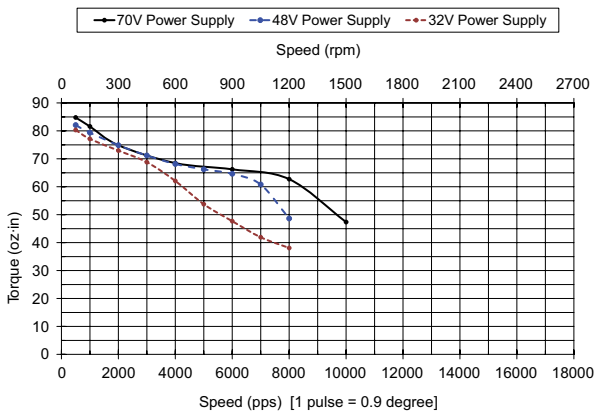
STP-MTR-17048(D) Torque vs Speed (1.8° step motor; 1/2 stepping)

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



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

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



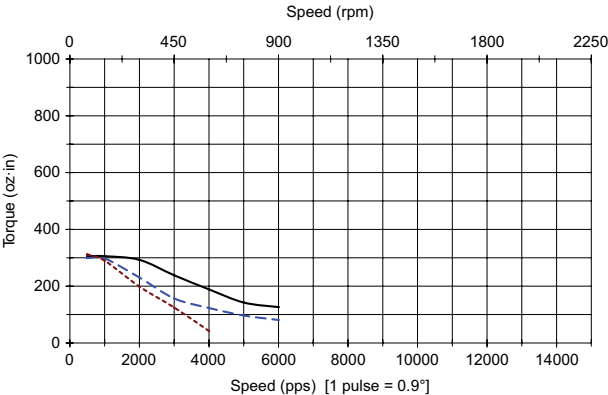
SureStep[®] Stepping System Motors

SureStep[®] Motor Torque vs. Speed Charts (continued)

STP-MTR(H)-34xxx(D) NEMA 34 Step Motors

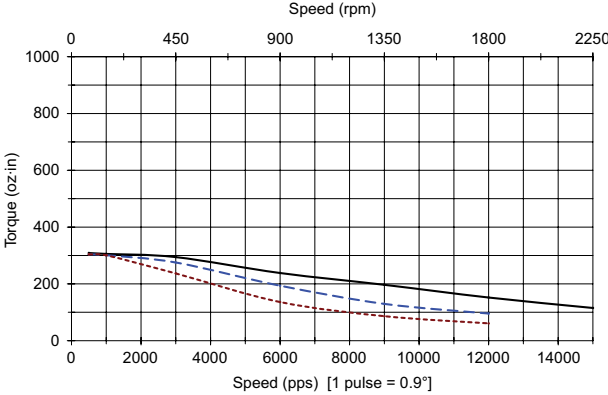
STP-MTR-34066(D) Torque vs Speed (1.8° step motor; 1/2 stepping)

— 70V Power Supply — 48V Power Supply - - 32V Power Supply



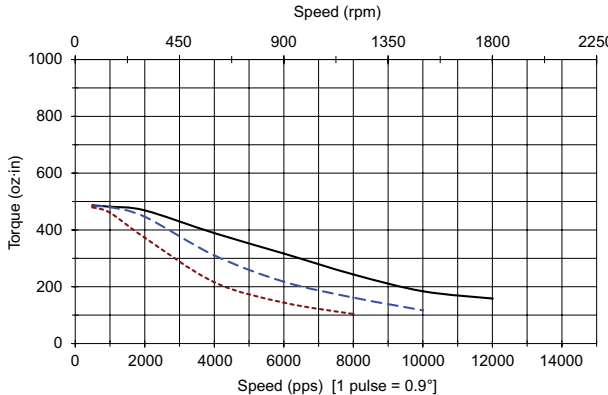
STP-MTRH-34066(D) Torque vs Speed (1.8° motor; 1/2 stepping)

— 70V Power Supply — 48V Power Supply - - 32V Power Supply



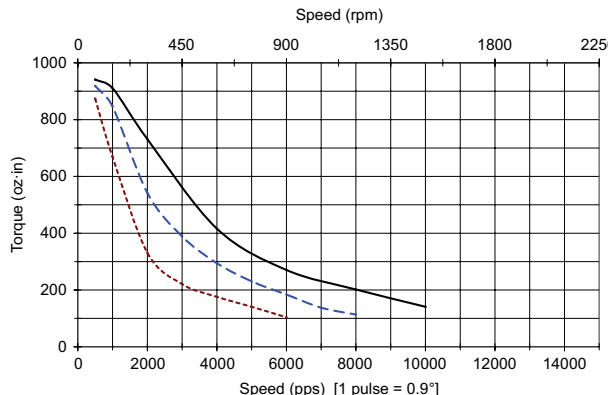
STP-MTRH-34097(D) Torque vs Speed (1.8° step motor; 1/2 stepping)

— 70V Power Supply — 48V Power Supply - - 32V Power Supply



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

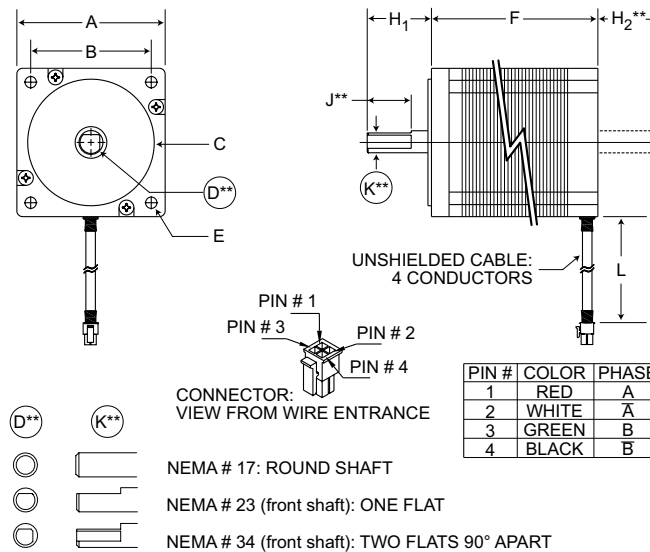
— 70V Power Supply — 48V Power Supply - - 32V Power Supply



SureStep[®] Stepping System Motors

SureStep[®] Motor Dimensions and Cabling

STP-MTR(H)-xxxx(D) Motors



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

SureStep Series Dimensions & Cabling – Connectorized Bipolar Stepping Motors

Dimen- sions* (in [mm]*)	High Torque Motors						Higher Torque Motors			
	STP-MTR -17040(D)	STP-MTR -17048(D)	STP-MTR -17060(D)	STP-MTR -23055(D)	STP-MTR -23079(D)	STP-MTR -34066(D)	STP-MTRH -23079(D)	STP-MTRH -34066(D)	STP-MTRH -34097(D)	STP-MTRH -34127(D)
A	1.67 [42.3]		2.25 [57.2]		3.39 [86.1]	2.25 [57.2]	3.39 [86.1]			
B	1.22 [31.0]		1.86 [47.2]		2.74 [69.6]	1.86 [47.2]	2.74 [69.6]			
C	Ø 0.87 [22.1]		Ø 1.50 [38.1]		Ø 2.88 [73.0]	Ø 1.50 [38.1]	Ø 2.88 [73.0]			
D**	Ø 0.20 [5.0]		Ø 0.25 [6.4]		Ø 0.50 [12.7]	Ø 0.25 [6.4]	Ø 0.50 [12.7]			
E	M3 x 0.5 thread 0.15 [3.8] min depth		Ø 0.20 [5.1] through		Ø 0.26 [6.6] through	Ø 0.20 [5.1] through	Ø 0.26 [6.6] through			
F	1.58 [40.1]	1.89 [48.0]	2.34 [59.5]	2.22 [56.4]	3.10 [78.7]	2.64 [67.1]	3.10 [78.7]	2.64 [67.1]	3.82 [97.0]	5.00 [127.0]
H ₁	0.94 [24.0]		0.81 [20.6]		1.46 [37.1]	0.81 [20.6]	1.46 [37.1]			
H ₂ **	0.39 [9.9]		0.63 [16.0]		1.13 [28.7]	0.63 [16.0]	1.13 [28.7]			
J**	n/a		0.59 [15.0]		0.98 [25.0]	0.59 [15.0]	0.98 [25.0]			
K**	n/a		0.23 [5.8]		0.45 [11.4]	0.23 [5.8]	0.45 [11.4]			
L	12.0 [305]						12 [305]			
Conductor	(4) #20 AWG						(4) #18 AWG			
Connector	Molex # 43025-0400						Molex # 39-01-3042			
Pin	Molex # 43030-0007						Molex # 39-00-0039			

* mm dimensions are for reference purposes only.

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

SureStep[®] Stepping System Accessories

SureStep[®] Microstepping Drives Accessories

Braking Accessories

If you plan to use a regulated or switching power supply, you might encounter problems from regeneration. 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.

This can trip the overvoltage protection of a switching power supply or a drive, and cause it to shut down.

To solve this problem, AutomationDirect offers a regeneration clamp and a braking resistor as optional accessories. The regen clamp has a built-in 50W braking resistor. For additional braking power (larger overhauling loads), an optional 100W braking resistor is also available.

Regeneration Clamp Description

As with most stepper systems, a clamp circuit is often required to limit increased power supply bus voltage when the motor is decelerating under load. This is commonly referred to as “regeneration,” which is what happens when DC motors are driven by their load. During regeneration, the DC motor can produce enough voltage to actually exceed the input power supply voltage.

With a Regen Clamp, one or more stepper drives can be protected from “Over Voltage” conditions by placing the clamp module between the power supply and the drive. The clamp tracks the input power supply, and will operate from 24 to 80 volts. No adjustments are needed.

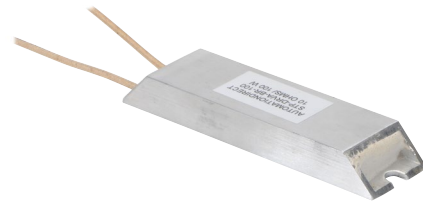
The Regen Clamp is designed to handle a wide range of conditions. The voltage input matches the needs of the SureStep stepper drives by providing 24 to 80 VDC capabilities, and external power resistors can be added for even greater continuous power requirements. The clamp modules are small and compact to minimize impact on the system design. More than one stepper drive can be connected to the clamp module with the potential to handle an entire multi-axis system.

Replacement Encoder

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. Installation tool and mounting hardware is included. For more information and details on how to wire the STP-MTRA-ENC1, please see the SureStep User Manual.



Regeneration Clamp



Braking Resistor

Regeneration Clamp Features

- Built-in 50W power resistor for more continuous current handling (optional 100W resistor is also available)
- Mounted on a heat sink
- Voltage range: 24–80 VDC; no user adjustments required
- Power: 50W continuous; 800W peak
- Wire connection: 6-pin screw terminal block; 12–18 AWG wire.
- 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.
- RoHS

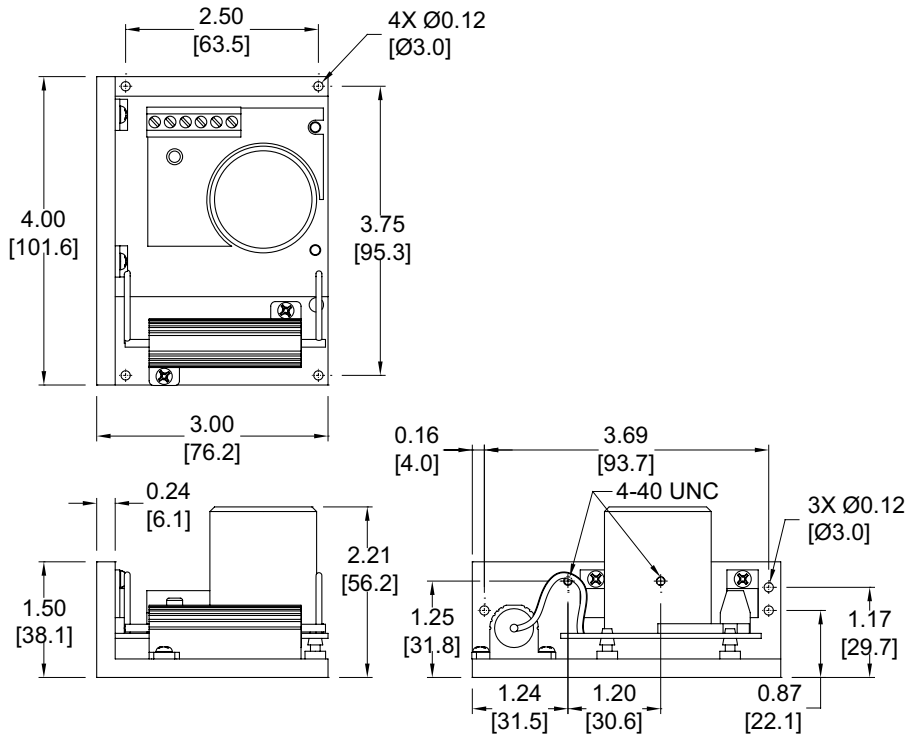
Sure Step Series Specifications – Microstepping Drives Optional Accessories		
Part Number	Price	Description
STP-DRVA-RC-050 *	\$89.00	Regen Clamp: use with DC-powered stepper & servo drives; 50W, 24–80 VDC
STP-DRVA-BR-100	\$64.00	Braking Resistor: use with STP-DRV-RC-050 regen clamp; 100W, 10Ω
STP-MTRA-ENC1	\$85.00	Replacement encoder: use with STP-MTRD-xxxxxE models, 5VDC, line driver (differential) output, 1000 ppr. Installation tool and mounting hardware included.
* Do not use the regeneration clamp in an atmosphere containing corrosive gases.		

SureStep[®] Stepping System Accessories

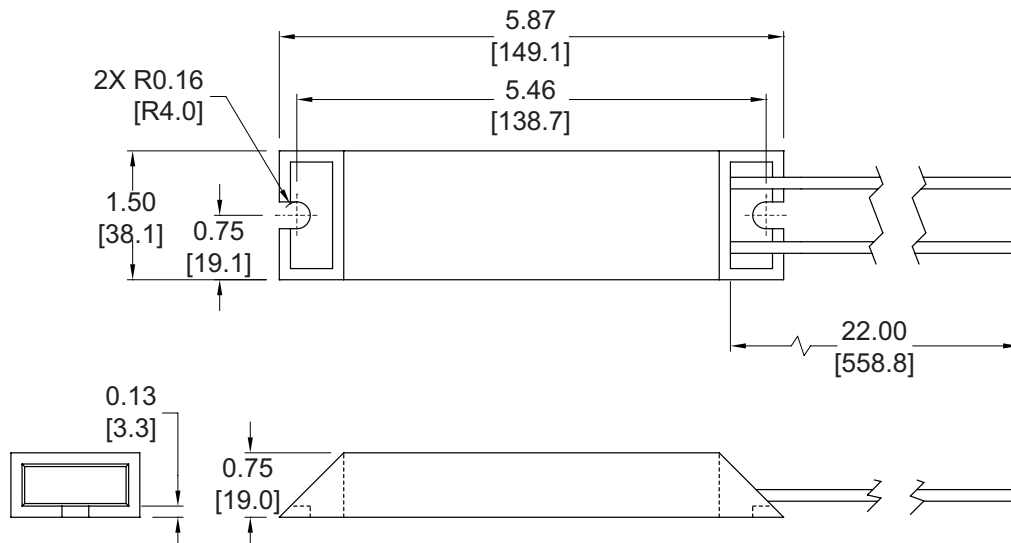
SureStep[®] Microstepping Drives Accessories

Dimensions = in [mm]

STP-DRVA-RC-050



STP-DRVA-BR-100





Stepping System Cables

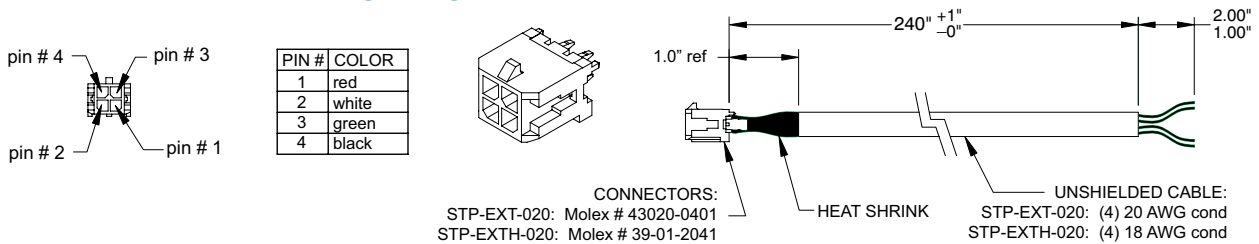
SureStep® Cables

SureStep Series – Stepping System Cables					
Cable	Price	Purpose	Length	Use With	Cable End Connectors
STP-EXT-020	\$15.00	motor to drive extension	20 ft	STP-MTR-xxxx(D)	pigtail / Molex 43020-0401 connector
STP-EXTH-020	\$30.00	motor to drive extension	20 ft	STP-MTR H -xxxx(D)	pigtail / Molex 39-01-2041 connector
STP-232RJ11-CBL *	\$9.00	programming/communication	10 ft	STP-DRV-4850 STP-DRV-80100	DB9 female / RJ11(6P4C)
STP-232HD15-CBL-2 **	\$10.50	communication	6.6 ft	STP-DRV-4850 STP-DRV-80100 DL06, D2-250-1, D2-260	HD 15-pin male / RJ12 6-pin plug
STP-232RJ12-CBL-2 **	\$6.00	communication	6.6 ft	STP-DRV-4850 STP-DRV-80100 DL05, CLICK	RJ12 6-pin plug / RJ12 6-pin plug
STP-CBL-EA6	\$16.00	encoder cable	6 ft	STP-MTRD-17038E STP-MTRD-23042E STP-MTRD-23065E	10-pin / pigtail
STP-CBL-EA10	\$19.00	encoder cable	10 ft		10-pin / pigtail
STP-CBL-EA20	\$28.00	encoder cable	20 ft		10-pin / pigtail
STP-CBL-CA6	\$16.00	control cable	6 ft	Standard STP-MTRD-x integrated motor/drives	11-pin / pigtail
STP-CBL-CA10	\$19.00	control cable	10 ft		11-pin / pigtail
STP-CBL-CA20	\$28.00	control cable	20 ft		11-pin / pigtail
STP-CON-1	\$15.00	replacement connector kit	n/a	STP-DRV-6575	-
STP-CON-2	\$15.00	replacement connector kit	n/a	STP-DRV-4850 & 80100	-
STP-CON-3	\$30.00	replacement connector kit	n/a	STP-MTRD-xxxxR	-
STP-485DB9-CBL-2	\$35.00	4-wire programming cable	6.5 ft	STP-MTRD-xxxxR	DB9 / Phoenix 5-conductor plug

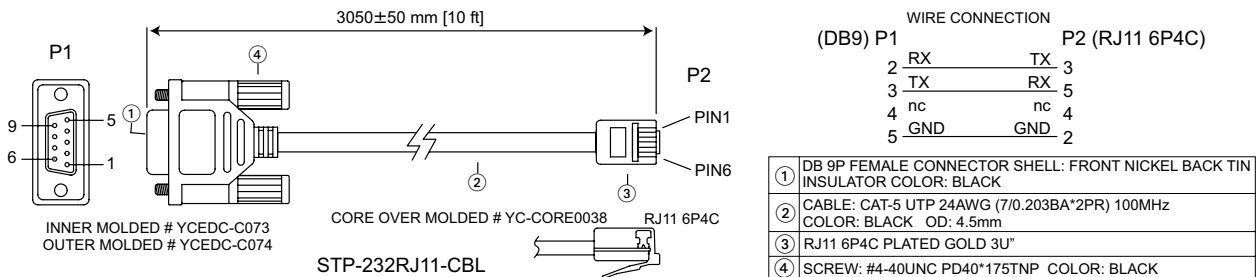
* Programming/communication cable **STP-232RJ11-CBL** is available for spare or replacement purposes. (One cable is included with each software programmable drive.)

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

Extension Cable Wiring Diagram



STP-232RJ11-CBL Programming Cable Wiring Diagram



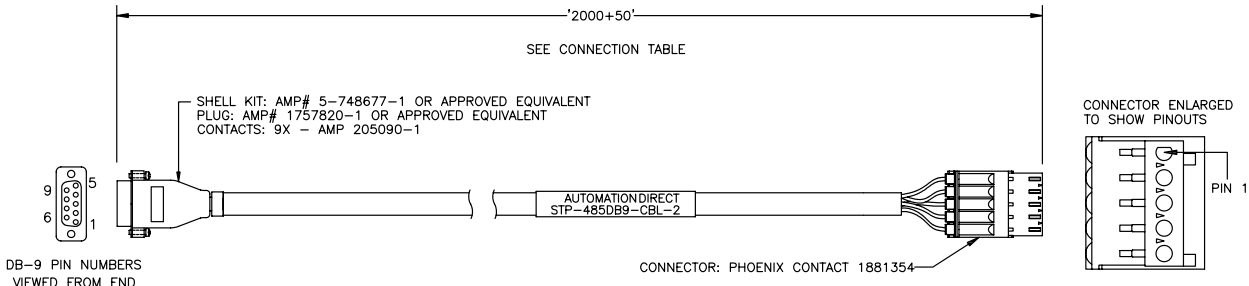


Stepping System Cables

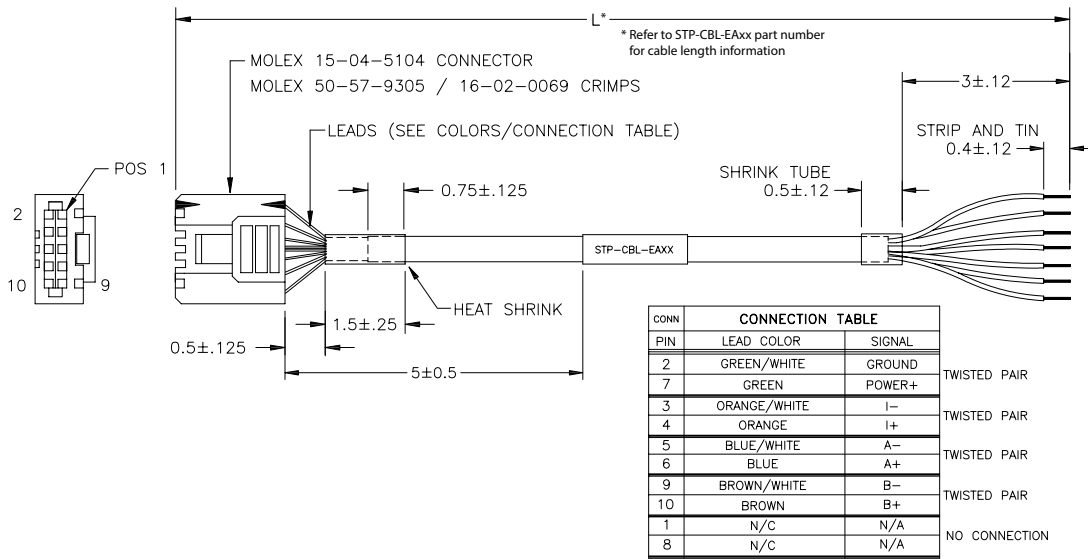
SureStep® Cables

STP-485DB9-CBL-2 4-wire Programming Cable Wiring Diagram

CONNECTION CHART				
DB-9 CONN PIN	DB9 SIGNAL	WIRE COLOR	PHOENIX PIN	PHOENIX SIGNAL
2	TX+	RED	5	RX+
1	TX-	ORANGE	4	RX-
3	RX+	BLACK	3	TX+
4	RX-	BROWN	2	TX-
5	GND	YELLOW	1	GND
METAL HOUSING	SHIELD	SHIELD	N/C	N/C



STP-CBL-EAxx Encoder Cable Wiring Diagram



STP-CBL-CAxx Control Cable Wiring Diagram

