

SureStep[®] Stepping System Motors

Stepping Motors

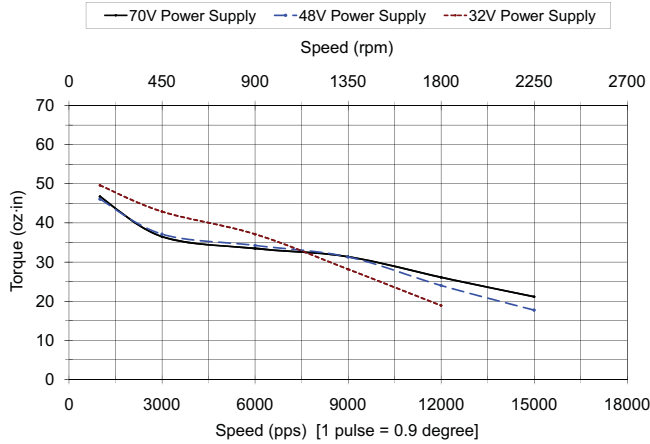
SureStep [®] Series Specifications – Connectorized Bipolar Stepping Motors										
Bipolar Stepping Motors		High Torque Motors					Higher Torque Motors			
		STP-MTR-17040	STP-MTR-17048	STP-MTR-23055	STP-MTR-23079	STP-MTR-34066	STP-MTRH-23079	STP-MTRH-34066	STP-MTRH-34097	STP-MTRH-34127
Price		<--->	<--->	<--->	<--->	<--->	<--->	<--->	<--->	<--->
NEMA Frame Size		17	17	23	23	34	23	34	34	34
Maximum Holding Torque	(lb-in)	3.84	5.19	10.37	17.25	27.1	17.926	26.738	50.159	80.7356
	(oz-in)	61.4	83	166	276	434	286.81	427.81	802.54	1291.77
	(N-m)	0.44	0.59	1.17	1.95	3.06	2.0253	3.0210	5.6671	9.121
Rotor Inertia	(oz-in ²)	0.28	0.45	1.483	2.596	7.66	2.60	7.66	14.80	21.90
	(kg-cm ²)	0.051	0.082	0.271	0.475	1.40	0.476	1.40	2.71	4.006
Rated Current (A/phase)		1.7	2.0	2.8	2.8	2.8	5.6	6.3	6.3	6.3
Resistance (Ω/phase)		1.6	1.40	0.75	1.10	1.11	0.40	0.25	0.30	0.49
Inductance (mH/phase)		3.03	2.65	2.36	3.82	7.70	1.18	1.52	2.07	4.14
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]	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]	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								
Weight (lb [kg])		0.7 [0.3]	1.5 [0.68]	2.2 [1.0]	3.9 [1.8]	2.3 [1.0]	3.8 [1.7]	6.1 [2.8]	8.8 [4.0]	8.8 [4.0]
Insulation Class		130°C [266°F] Class B								
Agency Approvals		CE (complies with EN55014-1 (1993) and EN60034-1.5.11)								
Design Tips		<p>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.</p>								
Accessory Extension Cable		STP-EXT-020					STP-EXTH-020			

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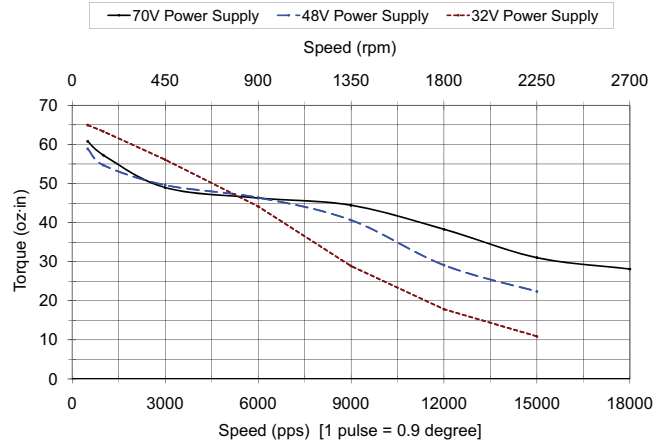
Motor Torque vs. Speed Charts

STP-MTR-17xxx NEMA 17 Step Motors

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

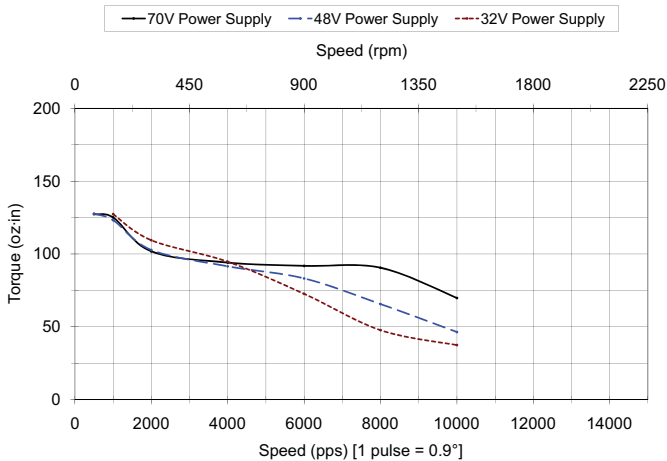


STP-MTR-17048 Torque vs Speed (1.8° step motor; 1/2 stepping)

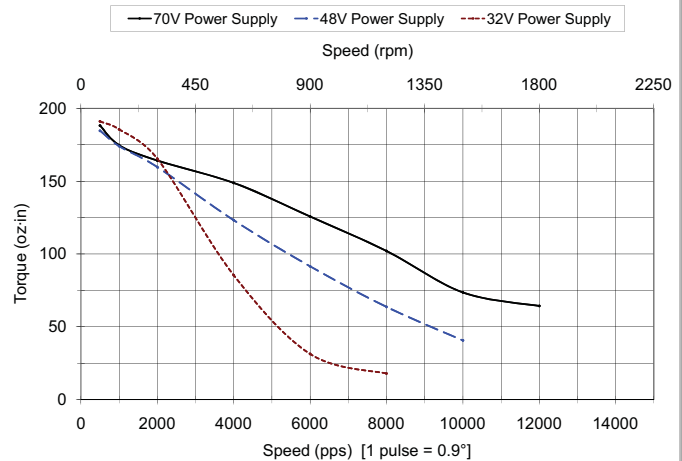


STP-MTR(H)-23xxx NEMA 23 Step Motors

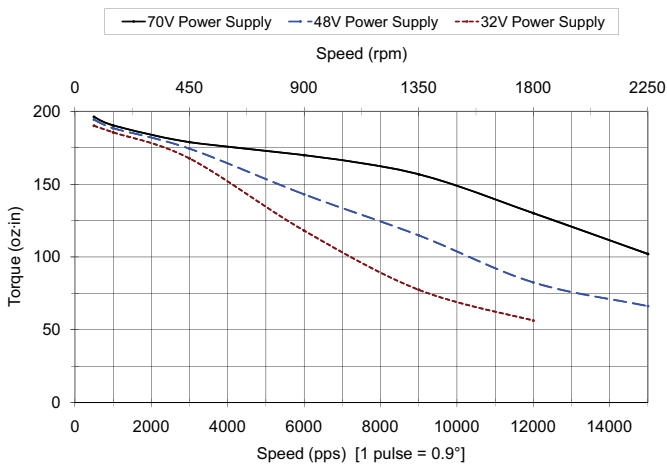
STP-MTR-23055 Torque vs Speed (1.8° step motor; 1/2 stepping)



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



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



Company Information

Systems Overview

Programmable Controllers

Field I/O

Software

C-more & other HMI

Drives

Soft Starters

Motors & Gearbox

Steppers/Servos

Motor Controls

Proximity Sensors

Photo Sensors

Limit Switches

Encoders

Current Sensors

Pressure Sensors

Temperature Sensors

Pushbuttons/Lights

Process

Relays/Timers

Comm.

Terminal Blocks & Wiring

Power

Circuit Protection

Enclosures

Tools

Pneumatics

Safety

Appendix

Product Index

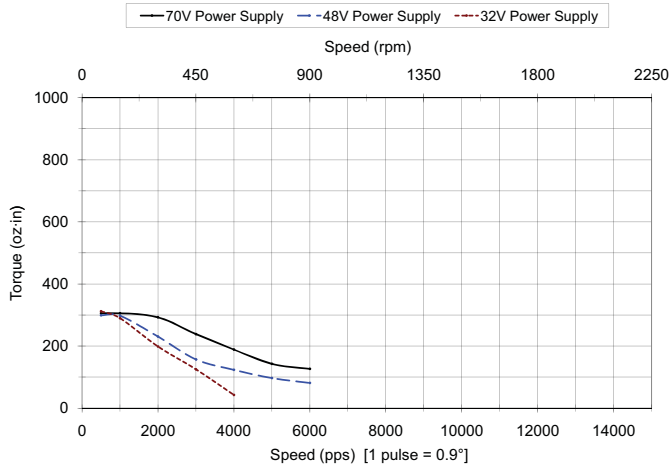
Part # Index

Surestep[®] Stepping System Motors

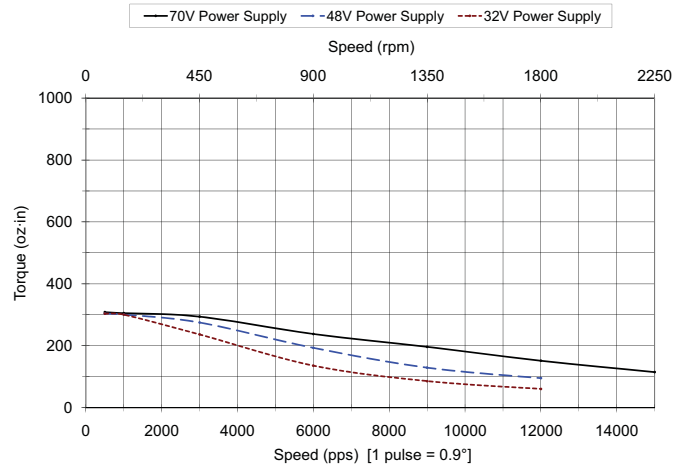
Motor Torque vs. Speed Charts (continued)

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

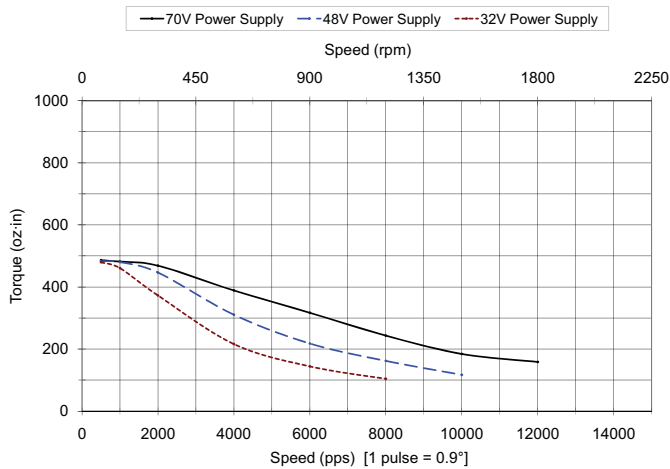
STP-MTR-34066 Torque vs Speed (1.8° step motor; 1/2 stepping)



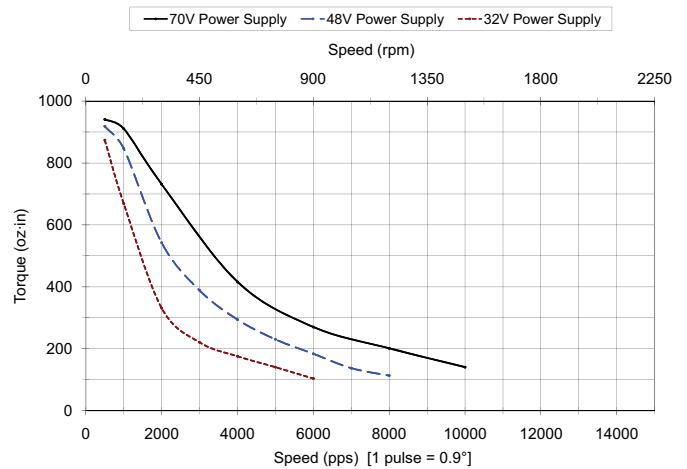
STP-MTRH-34066 Torque vs Speed (1.8° step motor; 1/2 stepping)



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



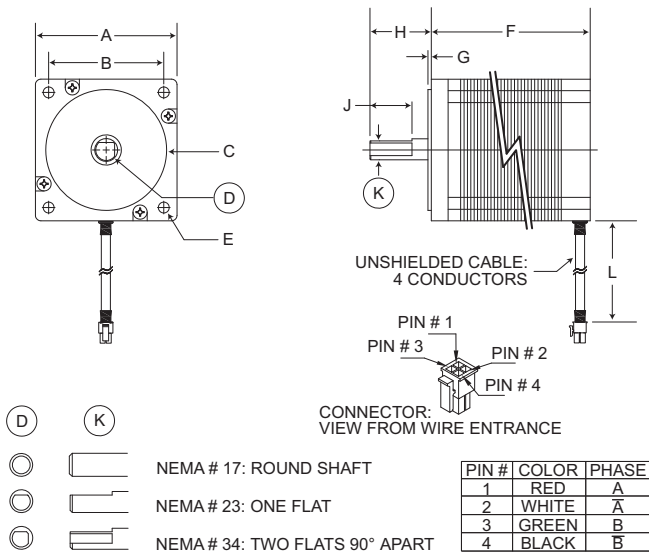
STP-MTRH-34127 Torque vs Speed (1.8° step motor; 1/2 stepping)



SureStep® Stepping System Motors

Motor Dimensions and Cabling

STP-MTR(H)-xxxx Motors



- (D) NEMA # 17: ROUND SHAFT
- (K) NEMA # 23: ONE FLAT
- NEMA # 34: TWO FLATS 90° APART

SureStep® Series Dimensions & Cabling – Connectorized Bipolar Stepping Motors

Dimen- sions* (in [mm])**	High Torque Motors					Higher Torque Motors			
	STP-MTR -17040	STP-MTR -17048	STP-MTR -23055	STP-MTR -23079	STP-MTR -34066	STP-MTRH -23079	STP-MTRH -34066	STP-MTRH -34097	STP-MTRH -34127
A	1.67 [42.42]	1.66 [42.16]	2.25 [57.15]	2.25 [57.15]	3.37 [85.60]	2.25 [57.15]	3.39 [86.11]		
B	1.22 [30.99]	1.22 [30.99]	1.86 [47.24]	1.86 [47.24]	2.74 [69.60]	1.86 [47.24]	2.74 [69.60]		
C	∅ 0.866 [22.00] +0.000/-0.002	∅ 0.866 [22.00] +0.000/-0.002	∅ 1.500 [38.10] ±0.001	∅ 1.500 [38.10] ±0.001	∅ 2.875 [73.03] ±0.001	∅ 1.500 [38.10] ±0.001	∅ 2.875 [73.03] ±0.001		
D	∅ 0.1968 [5.00] +0.0000/-0.0005	∅ 0.1968 [5.00] +0.0000/-0.0005	∅ 0.2500 [6.35] +0.0000/-0.0005	∅ 0.2500 [6.35] +0.0000/-0.0005	∅ 0.5000 [12.70] +0.0000/-0.0005	∅ 0.2500 [6.35] +0.0000/-0.0005	∅ 0.5000 [12.70] +0.0000/-0.0005		
E	M3 x 0.5 thread 0.15 [3.81] min depth	M3 x 0.5 thread 0.15 [3.81] min depth	∅ 0.20 [5.08] through	∅ 0.20 [5.08] through	∅ 0.26 [6.60] through	∅ 0.20 [5.08] through	∅ 0.26 [6.60] through		
F	1.58 [40.13]	1.89 [48.00]	2.17 [55.12]	3.10 [78.74]	2.60 [66.04]	3.10 [78.74]	2.64 [67.06]	3.82 [97.03]	5.0 [127.0]
G	0.08 [2.03]	0.08 [2.03]	0.06 [1.52]	0.06 [1.52]	0.08 [2.03]	0.06 [1.52]	0.08 [2.03]		
H	0.94 [23.88] ±0.02	0.94 [23.88] ±0.02	0.81 [20.57] ±0.02	0.81 [20.57] ±0.02	1.46 [37.08] ±0.04	0.81 [20.57] ±0.02	1.46 [37.08] ±0.04		
J	n/a	n/a	0.59 [14.99]	0.59 [14.99]	1.00 [25.40]	0.59 [14.99]	0.984 [24.99] ±0.010		
K	n/a	n/a	0.230 [5.84]	0.230 [5.84]	0.450 [11.43] ±0.006	0.230 [5.84]	0.453 [11.51] ±0.006		
L	12 [305] +0.5/-0.0	12.0 [305]	12.0 [305]	12.0 [305]	12.0 [305]	12 [305] +0.5/-0.0			
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.

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- Steppers/ Servos**
- Motor Controls
- Proximity Sensors
- Photo Sensors
- Limit Switches
- Encoders
- Current Sensors
- Pressure Sensors
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SureStep® Stepping System Cables

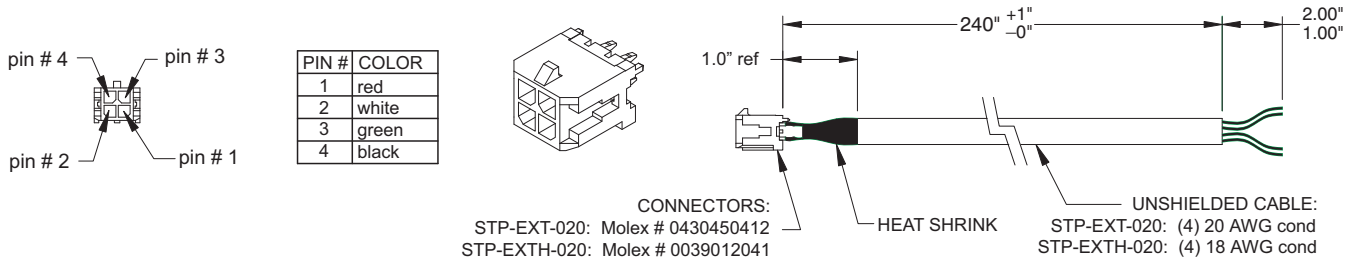
Cables

SureStep® Series – Stepping System Cables					
Cable	Price	Purpose	Length	Use With	Cable End Connectors
STP-EXT-020	<--->	motor to drive extension	20 ft	STP-MTR-xxxxx	pigtail / Molex 430450412 connector
STP-EXTH-020	<--->	motor to drive extension	20 ft	STP-MTRH-xxxxx	pigtail / Molex 0039012041 connector
STP-232RJ11-CBL *	<--->	programming/communication	10 ft	STP-DRV-4850 STP-DRV-80100	DB9 female / RJ11(6P4C)
STP-232HD15-CBL-2 **	<--->	communication	6.6 ft	STP-DRV-4850 STP-DRV-80100	HD 15-pin male / RJ12 6-pin plug
STP-232RJ12-CBL-2 **	<--->	communication	6.6 ft	STP-DRV-4850 STP-DRV-80100	RJ12 6-pin plug / RJ12 6-pin plug

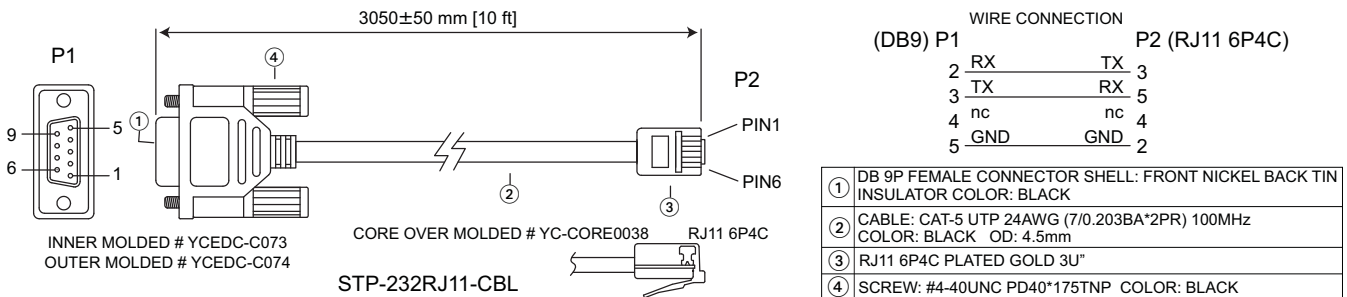
*** Programming/communication cable STP-232RJ11-CBL is available for spare or replacement purposes. (One cable is included with each software programmable drive.)**

**** 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



Programming Cable Wiring Diagram



SureStep® Stepping Systems

System Overview



**SureStep®
Step Motor Power Supply**

**SureStep®
Microstepping Drive**

**SureStep®
Extension Cable**

**SureStep®
Connectorized Step Motor**

The SureStep® stepping system series includes:

- Four step motor power supplies
- One DIP-switch configurable microstepping drive
- Two software configurable advanced microstepping drives
- Two motor extension cables
- Nine step motors (NEMA 17, 23, 34 frame sizes)

Standard stepper drive features

- Max 3.5A, 40V
- DIP switch configurable
- Selectable microstepping: x2, x5, x10, x50 steps/revolution
- Self test feature
- Idle current reduction

SureStep Part Number Explanation

STP- MTR H - 23079

Component Capacity

- For DRV: 2-digit max nominal voltage followed by max current with 1 implied decimal place
4035: 40V, 3.5A
4850: 48V, 5.0A
80100: 80V, 10.0A
- For EXT(H): cable length in feet
- For MTR(H): 2-digit NEMA frame size followed by approximate length in mm
- For PWR: 2-digit output voltage followed by output current

Component Type

- DRV: stepper drive
- EXT: motor extension cable
- EXTH: high-power motor extension cable
- MTR: stepper motor
- MTRH: high-power stepper motor
- PWR: power supply

SureStep Series Designation: STP

Advanced stepper drive features

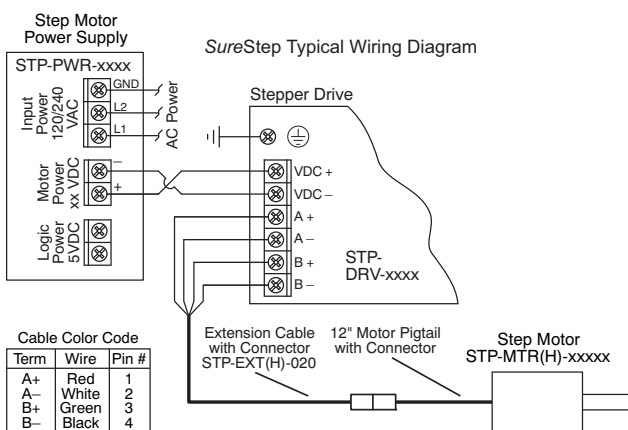
- Max 5A, 48V and max 10A, 80V models available
- Software configurable
- Programmable microsteps
- Internal indexer (via ASCII commands)
- Self test feature
- Idle current reduction
- Anti-resonance
- Torque ripple smoothing
- Step, analog, & serial communication inputs
- Serial communications allow point-to-point positioning

Motor features

- High torque, 2-phase, bipolar, 1.8° per step, 4-lead
- (2) NEMA 17 motors
- (3) NEMA 23 motors
- (4) NEMA 34 motors

Power supply features

- Linear, unregulated DC power supplies
- 120/240 VAC selectable input
- 32V, 48V, 70V DC output models available
- All models have additional 5VDC, 500 mA regulated logic supply
- Fusing included for both incoming AC and outgoing DC
- 5V supply has electronic overload protection



SureStep® System Recommended Component Compatibility			
Drives (1)	Power Supplies (1)	Motors & Extension Cables (2,3)	
STP-DRV-4035	-	-	STP-MTR-xxxxx & STP-EXT-020
STP-DRV-4850	-	STP-PWR-4805	
STP-DRV-80100	STP-PWR-7005	STP-PWR-3204	STP-MTRH-xxxxx & STP-EXTH-020
		STP-PWR-4810	

1) Caution: Do not use a power supply that exceeds the drive input voltage range. Using a lower voltage power supply with a higher voltage drive is acceptable, but will not provide full system performance.

2) MTR motors have connectors compatible with the EXT extension cables.

3) MTRH motors have connectors compatible with the EXTH extension cables.