



# Stepping System Drives

SureStep Series – Microstepping Drives Features Comparison											
Drive Model	Standard Microstepping Drives						Advanced Microstepping Drives				
	STP-DRVAC-24025	STP-DRV-4830	STP-DRV-4845	STP-DRV-6575	STP-MTRD-x	STP-DRV-4035	STP-DRV-4850	STP-DRV-80100	STP-MTRD-xR		
<b>Price</b>	\$222.00	\$77.00	\$93.00	\$107.00	See Integrated Motor/Drives section	Retired	\$278.00	\$332.00	See Integrated Motor/Drives section		
<b>Drive Type</b>	Microstepping drive with pulse input				Integrated stepper motor/drive	Micro-stepping drive with pulse input	Advanced microstepping drive with pulse or analog input, serial communication; includes programming/communication cable STP-232RJ11-CBL		Advanced integrated stepper motor/drive with internal encoder		
	enclosed				enclosed	open-frame	enclosed		enclosed		
<b>Output Current</b>	0.6–2.5 A/phase	0.35–3.0 A/phase	0.8–4.5 A/phase	1.0–7.5 A/phase	–	0.4–3.5 A/phase	0.1–5 A/phase	0.1–10 A/phase	–		
<b>Input Voltage</b>	nominal: 120/240 VAC range: 90–240 VAC	nominal: 12–48 VDC range: 10–53 VDC	nominal: 24–48 VDC range: 20–60 VDC	nominal: 24–75 VDC range: 20–85 VDC	nominal: 12–48 VDC (NEMA 17) 12–70 VDC (NEMA 23) range: 10–55 VDC (NEMA 17) 11–74 VDC (NEMA 23)	nominal: 12–32 VDC range: 12–42 VDC	nominal: 24–48 VDC range: 18–53 VDC	nominal: 24–80 VDC range: 18–88 VDC	nominal: 12–48 VDC (NEMA 17) 12–70 VDC (NEMA 23, 24) range: 10–55 VDC (NEMA 17) 11–74 VDC (NEMA 23) 10–75 VDC (NEMA 24)		
<b>Configuration Method</b>	rotary dial, dip switches, jumpers				dip switches		SureMotion Pro software ( <a href="#">SM-PRO</a> : free download)				
<b>Amplifier Type</b>	MOSFET, dual H-bridge, 4-quadrant				Dual H-bridge, 4 quadrant	MOSFET, dual H-bridge, bipolar chopper	MOSFET, dual H-bridge, 4-quadrant		Dual H-bridge, 4 quadrant		
<b>Current Control</b>	4-state PWM @ 20 kHz	4-state PWM @ 16 kHz	4-state PWM @ 20 kHz		4-state PWM @ 16 kHz	4-state PWM @ 20 kHz					
<b>Microstep Resolution</b>	dipswitch selectable						software selectable				
	200 to 25,600 steps/rev		200 to 20,000 steps/rev		200 to 25,600 steps/rev	400 to 10,000 steps/rev	200 to 51200 steps/rev				
<b>Modes of Operation</b>	<b>Step &amp; Dir</b>	YES	YES	YES	YES	YES	YES	YES	YES	YES	
	<b>CW/CCW</b>	YES	YES	YES	YES	YES	n/a	YES	YES	YES	
	<b>A/B Quad</b>	n/a	n/a	n/a	n/a	n/a	n/a	YES	YES	YES	
	<b>Oscillator</b>	n/a	n/a	n/a	n/a	n/a	n/a	YES	YES	YES	
	<b>Serial Indexing</b>	n/a	n/a	n/a	n/a	n/a	n/a	YES	YES	YES	
<b>Digital Input Signals</b>	<b>Step/Pulse</b>	step & direction, CW/CCW step				step & direction, CW/CCW step	step & direction	step & direction, CW/CCW step, A/B quadrature, run/stop & direction, jog CW/CCW, CW/CCW limits			
	<b>Direction</b>										
	<b>Enable</b>	motor disable				motor enable	motor disable	motor enable, alarm reset, speed select (oscillator mode)			
<b>Analog Input</b>	n/a	n/a	n/a	n/a	n/a	n/a	speed control		signal range, offset, dead band, and filtering		
<b>Output Signal</b>	fault	n/a	fault	fault	fault	n/a	fault, motion, tach		brake, fault, motion, tach		
<b>Communication Interface</b>	n/a	n/a	n/a	n/a	n/a	n/a	YES (programming/communication cable included)				
<b>Non-volatile Memory Storage</b>	n/a	n/a	n/a	n/a	n/a	n/a	YES				
<b>Idle Current Reduction</b>	YES										
<b>Self Test</b>	YES										
<b>Additional Features</b>	Step pulse noise filter, accepts AC power input	Step pulse noise filter	Load inertia (anti-resonance & damping feature to improve motor performance)  Step pulse noise filter			n/a	Anti-resonance (Electronic Damping) Auto setup Microstep emulation Torque ripple smoothing (allows for fine adjustment of phase in the range 0.25 to 1.5 rps) Waveform (command signal) smoothing				

Refer to Specifications Tables for detailed specifications.



# Stepping System Drives

## SureStep<sup>®</sup> High Bus Voltage Microstepping Drives



SureStep Series Specifications – Standard Microstepping Drives		
<b>Microstepping Drive</b>	<b>STP-DRVAC-24025</b>	
<b>Price</b>	\$222.00	
<b>Drawing</b>	<a href="#">PDF</a>	
<b>Drive Type</b>	Microstepping drive with pulse input	
<b>Output Current</b>	Selectable from 0.6–2.5 A/phase (peak of sine)	
<b>Input Voltage</b>	90–240 VAC	
<b>Configuration Method</b>	Rotary dial, DIP switches, jumpers	
<b>Amplifier Type</b>	MOSFET, dual H-bridge, 4-quadrant	
<b>Current Control</b>	4-state PWM @ 20 kHz	
<b>Protection</b>	Over temp, over voltage, under voltage, over current, excess regen, open circuit	
<b>Recommended Input Fusing</b>	Fuse: 4A fast-acting; ADC #AGC4; Holder: ADC # DN-F6L110	
<b>Input Signals</b>	<b>Input Circuit</b>	5–24 VDC nominal (range: 4–28 VDC); optically isolated, differential.
	<b>Step/Pulse</b>	Minimum pulse width = 1µs. Maximum pulse frequency = 150kHz or 2MHz (user selectable). FUNCTIONS: step & direction, CW/CCW step
	<b>Direction</b>	
	<b>Enable</b>	FUNCTION: disable motor when closed
<b>Analog</b>	n/a	
<b>Output Signal</b>	30 VDC / 100 mA max, optically isolated photodarlington, sinking or sourcing. Function = closes on drive fault.	
<b>Features</b>	<b>Current Reduction</b>	n/a
	<b>Idle Current Reduction</b>	90% or 50% of running current. (Holding torque is reduced by the same %.)
	<b>Microstep Resolution</b>	200, 400, 800, 1000, 1600, 2000, 3200, 4000, 5000, 6000, 6400, 8000, 10000, 12800, 20000, 25600
	<b>Phase Current Setting</b>	0.6–2.5 Amps RMS
	<b>Self Test</b>	Automatically rotates the motor back and forth two turns in each direction in order to confirm that the motor is operational.
	<b>Step Pulse Noise Filter</b>	Select 150kHz or 2MHz
<b>Load Inertia</b>	Set motor and load inertia range to 0–4x or 5–10x.	
<b>Connectors</b>	DEGSON 2EDGK-7.62-02P-14-00A(H) 2-pin power connector DEGSON 2EDGK-5.08-04P-14-00A(H) 4-pin motor connector DEGSON 15EDGK-3.81-08P-14-00A(H) 8-pin I/O connector ADC part STP-CON-6 contains replacement connectors	
<b>Maximum Humidity</b>	90% non-condensing	
<b>Storage/Ambient Temperature</b>	0 to 40 °C [32 to 104 °F]	
<b>Operating Temperature</b>	0 to 85 °C [32 to 185 °F] (interior of electronics section)	
<b>Drive Cooling Method</b>	Natural convection (mount drive to metal surface)	
<b>Mounting</b>	(2) M4 screws to mount to metal surface	
<b>Weight</b>	1 lb 15 oz [0.88 kg]	
<b>Agency Approvals</b>	CE, cUR <sub>US</sub>	

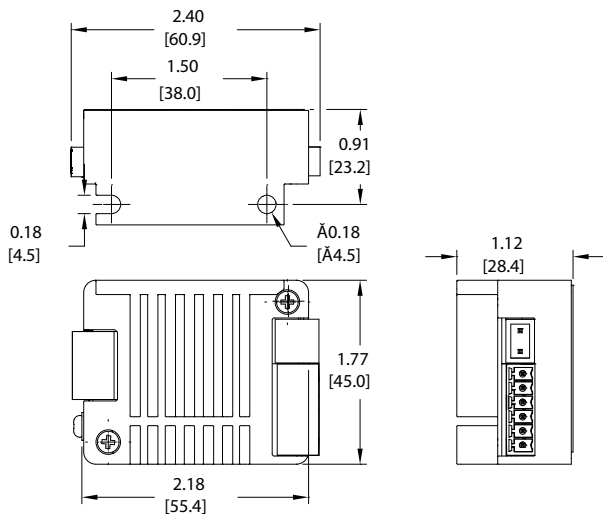


# Stepping System Drives

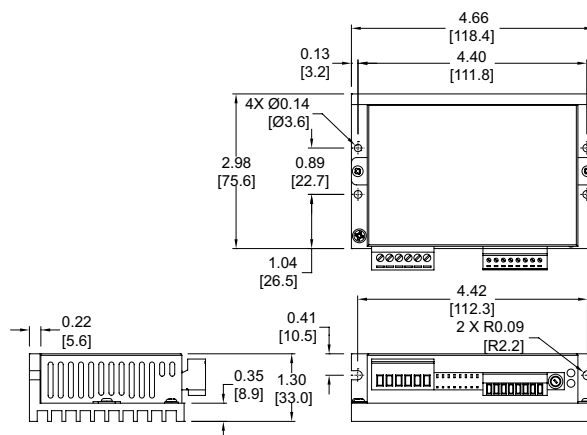
## SureStep® Microstepping Drives Dimensions

Dimensions = in [mm]

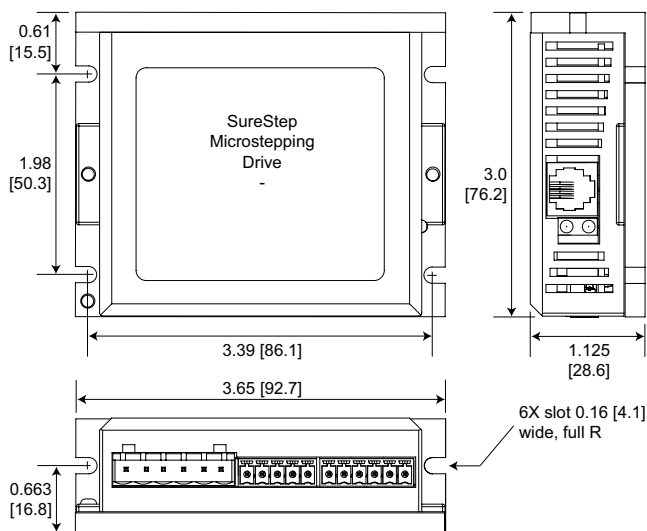
### STP-DRV-4830



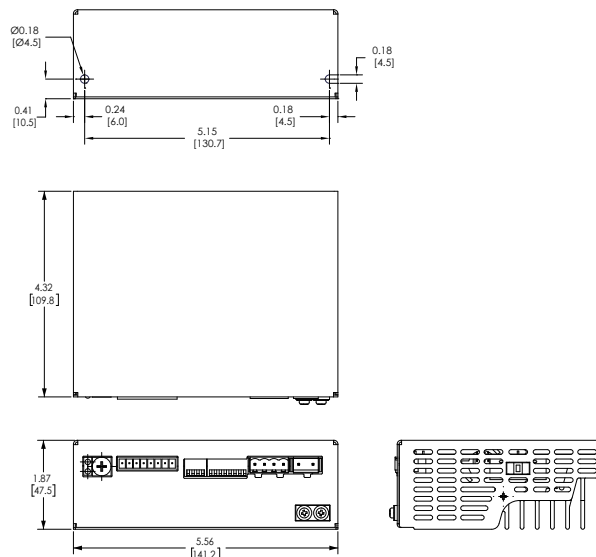
### STP-DRV-4845 & STP-DRV-6575



### STP-DRV-4850 & STP-DRV-80100



### STP-DRVAC-24025





# 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**

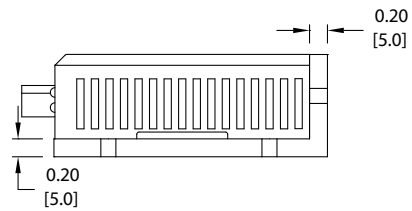
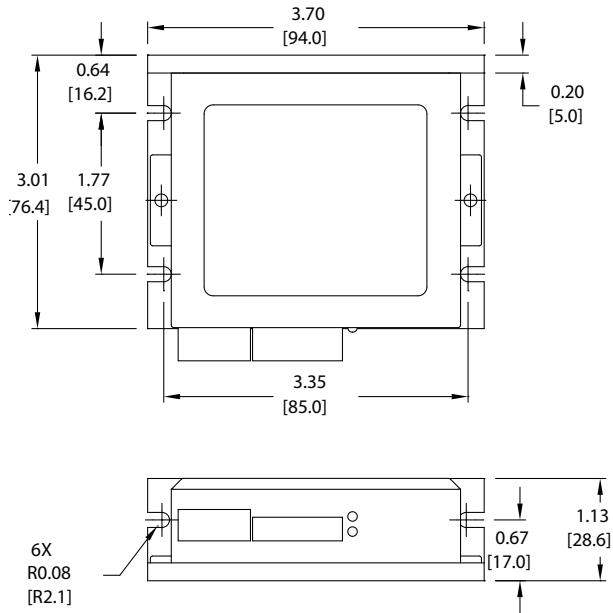
Sure Step Series Specifications – Microstepping Drives Optional Accessories			
Part Number	Price	Description	Drawing
<u><a href="#">STP-DRVA-RC-050A</a></u> *	\$61.00	Regen Clamp: 50W, for DC input stepper and servo drives, enclosed	<a href="#">PDF</a>
<u><a href="#">STP-MTRA-17DMP</a></u>	\$15.00	SureStep 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.

## SureStep<sup>®</sup> 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).

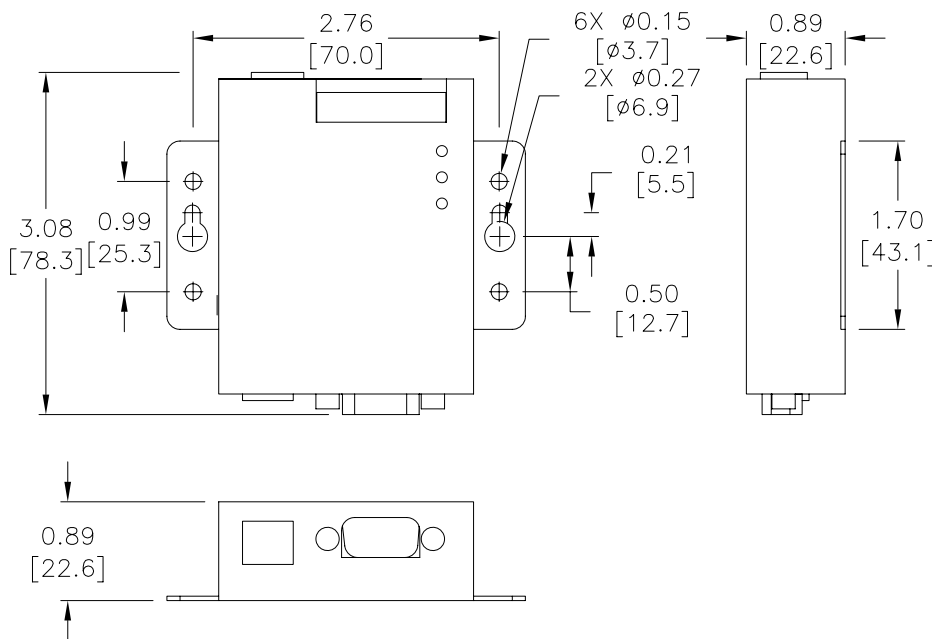
The Advanced Integrated motor/drives use RS-485. While the Advanced Integrated motor/drives can be wired for either 2- or 4-wire networks, 4-wire is require for use with SureMotion Pro due to the Firmware Download utility and the Status Monitor Screen.

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	
<b>Price</b>	\$130.00
<b>Drawing</b>	PDF
<b>Communications</b>	2-wire RS-232 2- or 4-wire RS-485
<b>Configure With</b>	Internal jumpers and external DIP switches
<b>Compatible Cables</b>	STP-232RJ11-CBL STP-485DB9-CBL-2 USB

**Dimensions = in [mm]**





# 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>	\$13.00	motor to drive extension	6 ft	STP-MTR-xxxx(x)	pigtail / Molex 43020-0401 connector	<a href="#">PDF</a>
<a href="#">STP-EXT-010</a>	\$14.50		10 ft			<a href="#">PDF</a>
<a href="#">STP-EXT-020</a>	\$18.50		20 ft			<a href="#">PDF</a>
<a href="#">STP-EXTH-006</a>	\$26.50		6 ft	STP-MTRH-xxxx(x)	pigtail / Molex 39-01-2041 connector	<a href="#">PDF</a>
<a href="#">STP-EXTH-010</a>	\$31.50		10 ft			<a href="#">PDF</a>
<a href="#">STP-EXTH-020</a>	\$38.00		20 ft			<a href="#">PDF</a>
<a href="#">STP-EXTHW-006</a>	\$50.00		6 ft	STP-MTRHW-xxxx(x)	Bulgin # PXP4011/06P/6065	<a href="#">PDF</a>
<a href="#">STP-EXTHW-010</a>	\$55.00		10 ft			<a href="#">PDF</a>
<a href="#">STP-EXTHW-020</a>	\$71.00		20 ft			<a href="#">PDF</a>
<a href="#">STP-EXTL-006</a>	\$11.50		6 ft	STP-MTRL-xxxx(x)	pigtail / Molex 105308-22004 connector	<a href="#">PDF</a>
<a href="#">STP-EXTL-010</a>	\$14.50		10 ft			<a href="#">PDF</a>
<a href="#">STP-EXTL-020</a>	\$18.00		20 ft			<a href="#">PDF</a>
<a href="#">STP-EXTW-006</a>	\$50.00		6 ft	STP-MTRW-xxxx(x)	Bulgin # PXP4011/06P/6065	<a href="#">PDF</a>
<a href="#">STP-EXTW-010</a>	\$55.00		10 ft			<a href="#">PDF</a>
<a href="#">STP-EXTW-020</a>	\$71.00		20 ft			<a href="#">PDF</a>
<a href="#">STP-EXT42-006</a>	\$26.00		motor to drive extension	6 ft	STP-MTRAC-42xxxx	10-pin / pigtail
<a href="#">STP-EXT42-010</a>	\$31.00	10 ft		<a href="#">PDF</a>		
<a href="#">STP-EXT42-020</a>	\$44.50	20 ft		<a href="#">PDF</a>		
<a href="#">STP-EXT42H-006</a>	\$26.00	6 ft		STP-MTRACH-42xxxx	<a href="#">PDF</a>	
<a href="#">STP-EXT42H-010</a>	\$31.00	10 ft			<a href="#">PDF</a>	
<a href="#">STP-EXT42H-020</a>	\$44.50	20 ft			<a href="#">PDF</a>	
<a href="#">STP-232RJ11-CBL*</a>	\$11.00	programming/communication	10 ft	STP-DRV-4850, STP-DRV-80100	DB9 female / RJ11(6P4C)	<a href="#">PDF</a>
<a href="#">STP-232HD15-CBL-2**</a>	\$17.00	communication	6.6 ft	STP-DRV-4850, STP-DRV-80100 DL06, D2-250-1, D2-260	HD 15-pin male / RJ12 6-pin plug	n/a
<a href="#">STP-232RJ12-CBL-2**</a>	\$10.50	communication	6.6 ft	STP-DRV-4850, STP-DRV-80100 DL05, CLICK	RJ11 (6P4C) plug / RJ12 6-pin plug	n/a
<a href="#">STP-CBL-CA6</a>	\$19.00	control cable	6 ft	STP-MTRD-17038 STP-MTRD-17038E	11-pin / pigtail	<a href="#">PDF</a>
<a href="#">STP-CBL-CA10</a>	\$23.00	control cable	10 ft		11-pin / pigtail	<a href="#">PDF</a>
<a href="#">STP-CBL-CA20</a>	\$33.50	control cable	20 ft		11-pin / pigtail	<a href="#">PDF</a>
<a href="#">STP-CBL-EA6</a>	\$19.00	encoder cable	6 ft	STP-MTRD-xxxxE STP-MTRA-ENC1, STP-MTRA-ENC3 STP-MTRA-ENC5, STP-MTRA-ENC7 STP-MTRA-ENC11, STP-MTRA-ENC13 (for line driver encoders)	10-pin / pigtail	<a href="#">PDF</a>
<a href="#">STP-CBL-EA10</a>	\$23.00	encoder cable	10 ft		10-pin / pigtail	<a href="#">PDF</a>
<a href="#">STP-CBL-EA20</a>	\$33.50	encoder cable	20 ft		10-pin / pigtail	<a href="#">PDF</a>
<a href="#">STP-CBL-EB3</a>	\$31.00	encoder cable	3 ft	AMT112Q-V AMT112S-V (for both line driver and push-pull (totem) encoders)	17-pin / pigtail	<a href="#">PDF</a>
<a href="#">STP-CBL-EB6</a>	\$48.50	encoder cable	6 ft		17-pin / pigtail	<a href="#">PDF</a>
<a href="#">STP-CBL-EB10</a>	\$72.00	encoder cable	10 ft		17-pin / pigtail	<a href="#">PDF</a>
<a href="#">STP-CBL-EB20</a>	\$133.00	encoder cable	20 ft		17-pin / pigtail	<a href="#">PDF</a>
<a href="#">STP-CBL-ED6</a>	\$19.00	encoder cable	6 ft	STP-MTRA-ENC2, STP-MTRA-ENC4 STP-MTRA-ENC6, STP-MTRA-ENC8 STP-MTRA-ENC12, STP-MTRA-ENC14 (for push-pull (totem) encoders)	5-pin / pigtail	<a href="#">PDF</a>
<a href="#">STP-CBL-ED10</a>	\$23.50	encoder cable	10 ft		5-pin / pigtail	<a href="#">PDF</a>
<a href="#">STP-CBL-ED20</a>	\$34.50	encoder cable	20 ft		5-pin / pigtail	<a href="#">PDF</a>
<a href="#">STP-CON-1</a>	\$18.00	replacement connector kit	n/a	STP-DRV-4845 & -6575	-	n/a
<a href="#">STP-CON-2</a>	\$18.00	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>	\$36.50	replacement connector kit	n/a	STP-MTRD-xxxxR	-	n/a
<b>STP-CON-4</b>	\$18.00	replacement connector kit	n/a	STP-DRVA-RC-050A	-	n/a
<b>STP-CON-5</b>	\$18.00	replacement connector kit	n/a	STP-DRV-4830	-	<a href="#">PDF</a>
<b>STP-CON-6</b>	\$23.50	replacement connector kit	n/a	STP-DRVAC-24025	-	n/a
<b>STP-485DB9-CBL-2</b>	\$42.00	4-wire programming cable	6.5 ft	STP-MTRD-xxxxR	DB9 / Phoenix 5-conductor plug	<a href="#">PDF</a>

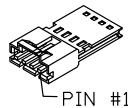
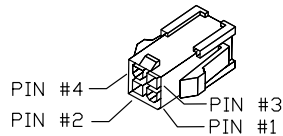
### STP-EXT(x)-0xx Extension Cable Wiring Diagram

EXT & EXTH CABLES

PIN#	COLOR
1	RED
2	WHITE
3	GREEN
4	BLACK

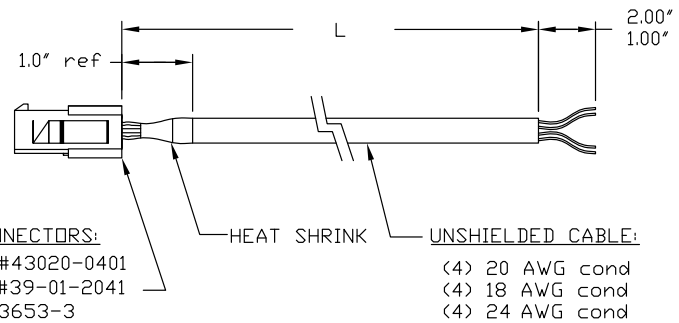
EXTL CABLES

PIN#	COLOR
1	RED
2	WHITE
3	GREEN
4	BLACK

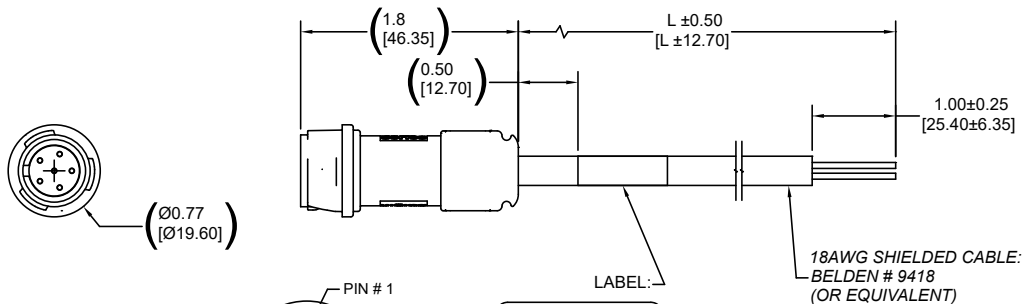


CONNECTORS:

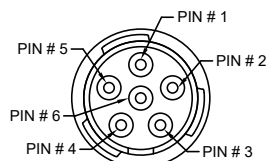
EXT: Molex #43020-0401  
 EXTH: Molex #39-01-2041  
 EXTL: TE #103653-3



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



PIN OUT CONNECTION		
PIN #	COLOR	PHASE
1	RED	A+
2	WHITE	A-
3	GREEN	B+
4	BLACK	B-
5	GROUND	GROUND
6	N/A	N/A



VIEW FROM PIN CONNECTION  
 Connector: Bulgin # PXP4011/06P/6065

LABEL:  
 STP-EXTW-0XX  
 or  
 STP-EXTHW-0XX

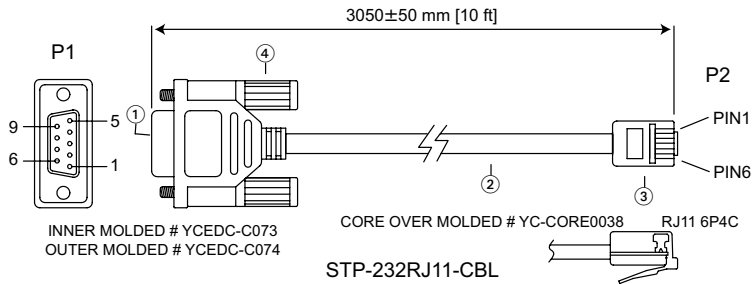




# Stepping System Cables

## SureStep® Cables, continued

### STP-232RJ11-CBL Programming Cable Wiring Diagram



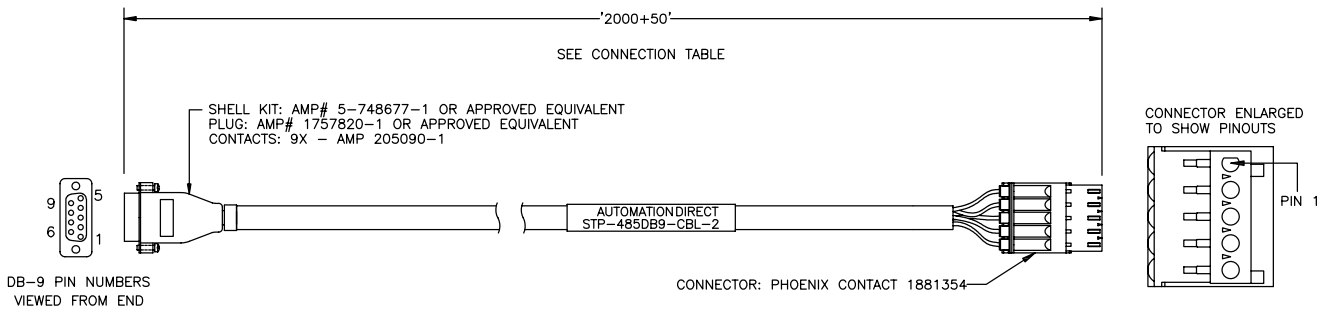
WIRE CONNECTION

(DB9) P1		P2 (RJ11 6P4C)
2	RX	TX
3	TX	RX
4	nc	nc
5	GND	GND

①	DB 9P FEMALE CONNECTOR SHELL: FRONT NICKEL BACK TIN INSULATOR COLOR: BLACK
②	CABLE: CAT-5 UTP 24AWG (7/0.203BA*2PR) 100MHz COLOR: BLACK OD: 4.5mm
③	RJ11 6P4C PLATED GOLD 3U"
④	SCREW: #4-40UNC PD40*175TNP COLOR: BLACK

### 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

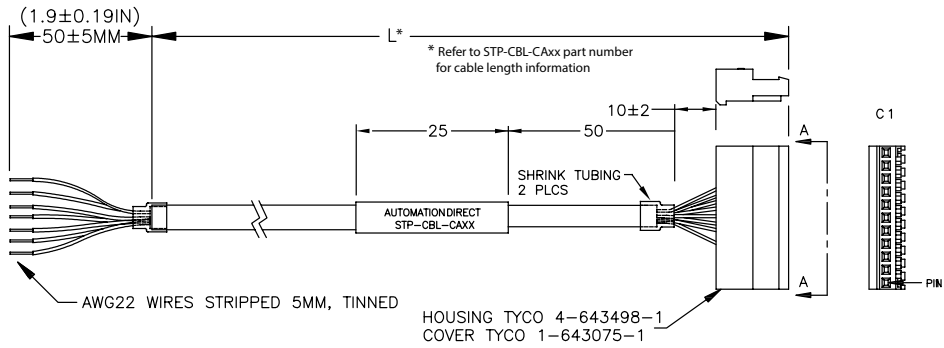


## SureStep® Cables, continued

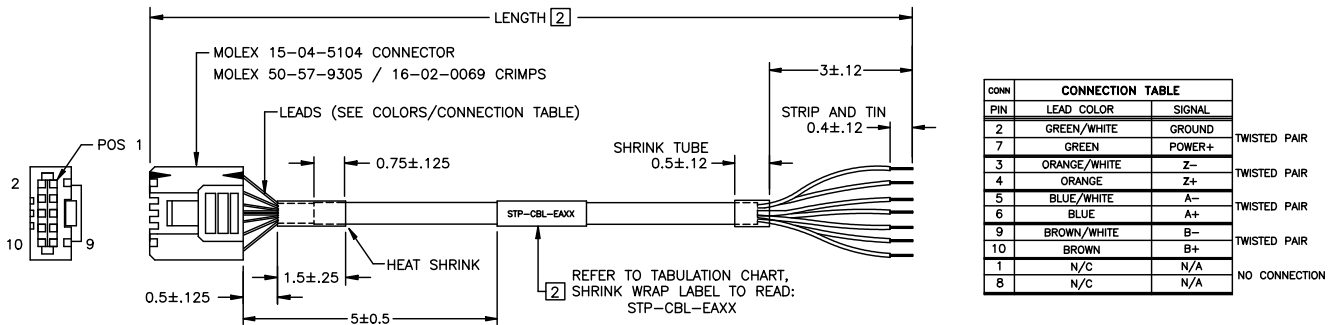
### STP-CBL-CAXx Control Cable Wiring Diagram

C 1		
PIN NO.	SIGNAL	WIRE COLOR
1	STEP+	ORANGE
2	STEP-	BROWN
3	DIR+	YELLOW
4	DIR-	GREEN
5	EN+	BLUE
6	EN-	TAN
7	OUT+	GRAY
8	OUT-	WHITE
9	N.C.	PINK
10	V-	BLACK
11	V+	RED
12	N/C	PURPLE - CUT

Note: For Rev A of this cable, STEP+ is Grey/Pink and EN- is Red/Blue



### STP-CBL-EAxx Encoder Cable Wiring Diagram



WIRE: 24AWG, CABLE: UL2464.

### STP-CBL-EBxx Encoder Cable Wiring Diagram

