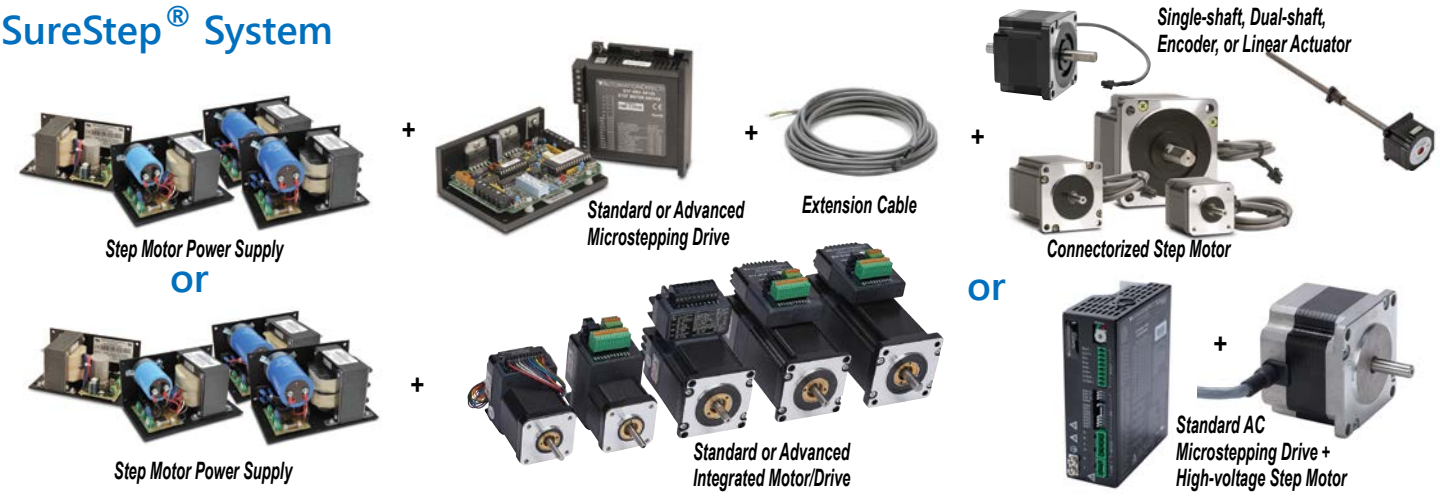
Stepping System Components

SureStep® System



SureStep stepping family includes:

- Linear step motor power supplies
- DIP-switch configurable microstepping drives
- Software-configurable advanced microstepping drives
- Motor extension cables
- NEMA 14, 17, 23, 24, 34, and 42 frame size step motors in single shaft, dual-shaft, IP65, high bus voltage, or encoder mounted configurations
- NEMA 17, 23, and 24 frame size integrated motor/drives
- NEMA 17 and 23 linear actuators (6", 9", and 12" lengths)
- Variety of step motor accessories including encoders, control cables, and connector kits
- SureStep PC adapter, USB to RS-485
- SureMotion Pro software for advanced drive and integrated motor/drive systems

Motor features

- Low voltage, high torque, 2-phase, bipolar, 1.8° per step, 4-lead
- High voltage, high torque, 2-phase, bipolar, 1.8° per step, 8-lead
- Available in single-shaft and dual-shaft models
- Connectorized pigtails or integrated 10' cable (STP-MTRAC only)
- Optional encoder feedback (STP-MTR-xxxxE)
- IP65 versions available (STP-MTR-xxxxW)
- High bus voltage versions available (STP-MTRAC-xxxx)
- Linear actuators have lead screws for motor shafts (STP-LExx-xxxxxx)
- Linear actuators ADJ series available with encoder-ready rear shaft and machined journals on screw ends for easy bearing mounting
- Wide variety of NEMA 14 , 17, 23, and 34 motors

Power supply features

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

NOTE: If a switching power supply is desired, we recommend the PSB12-xxxS, PSB24-xxxS, or PSB48-xxxS series.

Standard stepper drive features

(STP-DRV-4035, -4830, -4845, -6575, STP-MTRD-x, STP-DRVAC-24025)

- Low cost, digital step motor driver in compact package
- Operates from Step and Direction signals, or Step CW and Step CCW (jumper selectable).
- Fault output and Enable input
- Optically isolated I/O
- Digital filters prevent position error from electrical noise on command signals; jumper selectable: 150 kHz or 2MHz
- Rotary or DIP switch easily selects from many popular motors
- Electronic damping and anti-resonance
- Automatic idle current reduction to reduce heat when motor is not moving; switch selectable: 50% or 90% of running current
- Switch-selectable step resolution: 200–25,600 steps per revolution depending on drive
- Switch-selectable microstep emulation provides smoother, more reliable motion in full- and half-step modes
- Automatic self test (switch selectable)
- Optional external encoder feedback (integrated models)
- Operates from a 24–65 VDC or 12–40 VDC power supply, depending upon model. STP-DRVAC drive operates off AC voltage.
- Running current from 0.35–7.5A

Advanced stepper drive features

(STP-DRV-4850, STP-DRV-80100, STP-MTRD-xR, & STP-MTRD-xRE)

- 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, and serial communication inputs
- Serial communications allow point-to-point positioning
- AB quadrature/encoder following (integrated models)
- Optional internal encoder feedback (integrated models)
- RS-485 communications (integrated models)
- Four 5 to 24 volt digital "Variable I/O" points (NEMA 24 integrated models)
- Controllable via streaming SCL commands

Stepping System Components

SureStep Power Supply / DC Input Drive Compatibility

Drive(1)(2)	Recommended Linear Power Supply(1)(2)(5)			
Model #	STP-PWR-3204	STP-PWR-4805	STP-PWR-4810	STP-PWR-7005(3)
STP-DRV-4035	√	No	No	No
STP-DRV-4830	√	√	√	No
STP-DRV-4845	√	√	√	No
STP-DRV-4850	√	√	√	No
STP-DRV-6575	√	√	√	No
STP-DRV-80100	√	√	√	√
STP-MTRD-17(4)	√	√	√	No
STP-MTRD-23(4)	√	√	√	√
STP-MTRD-24(4)	√	√	√	√

1) Do NOT use a power supply that exceeds the drive's input voltage range. If using a linear power supply, ensure that the unloaded voltage does not float above the drive's maximum input range.
2) For best performance, use the lowest voltage power supply that supplies the required speed and torque.
3) An unloaded STP-PWR-7005 can float above the allowable input voltages of some drives if it is fed with a high AC input voltage (greater than 120VAC).
4) Integrated motor/drives are included here because they include a drive as well as a motor.
5) STP-DRVAC-x drives are AC powered and cannot be powered by DC power supplies.

SureStep Power Supply / DC Input Drive Compatibility

Drive(1)(2)	Recommended Switching Power Supply(1)(2)(4)		
Model #	PSB12-xxxS	PSB24-xxxS	PSB48-xxxS
STP-DRV-4035	√	√	No
STP-DRV-4830	√	√	√
STP-DRV-4845	No	√	√
STP-DRV-4850	No	√	√
STP-DRV-6575	No	√	√
STP-DRV-80100	No	√	√
STP-MTRD-17(3)	√	√	√
STP-MTRD-23(3)	√	√	√
STP-MTRD-24(3)	√	√	√

1) Do NOT use a power supply that exceeds the drive's input voltage range.
2) For best performance, use the lowest voltage power supply that supplies the required speed and torque.
3) Integrated motor/drives are included here because they include a drive as well as a motor.
4) STP-DRVAC-x drives are AC powered and cannot be powered by DC power supplies.

SureStep AC Motor/Drive Compatibility

Model #	STP-DRVAC-24025	
	Series Wired Motor	Parallel Wired Motor
STP-MTRAC-23044(x)	√	No
STP-MTRAC-23055(x)	√	No
STP-MTRAC-23078(x)	√	No
STP-MTRAC-34075(x)	√	No
STP-MTRAC-34115(x)	√	No
STP-MTRAC-34156(x)	√	No

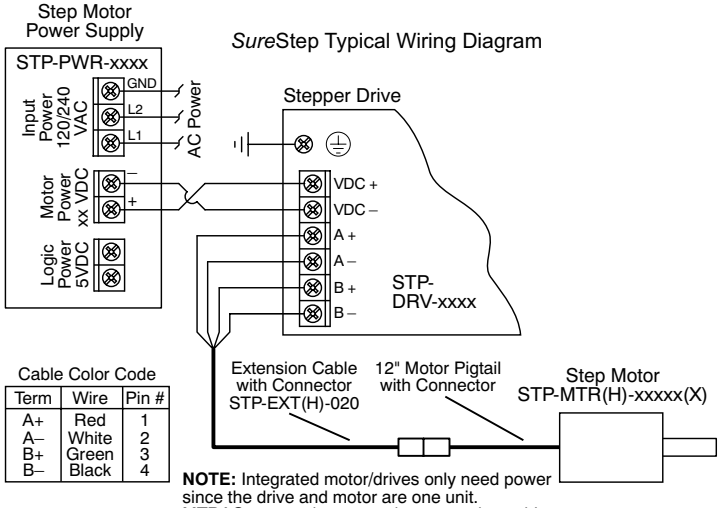
NOTE: STP-MTRAC-34156(x) motors have a 5/8" front shaft.

SureStep DC Input Drive / Motor Compatibility(3)

Motor(1)			Recommended Drive(1)					
Model #(1)	Rated Amps(2)	Extension Cable	STP-DRV-4035(1)	STP-DRV-4830	STP-DRV-4845	STP-DRV-4850(1)	STP-DRV-6575(1)	STP-DRV-80100(1)
STP-MTRL-14026(x)	0.35	STP-EXTL-0xx	√	√	–	√	–	–
STP-MTRL-14034(x)	0.8		√	√	√	√		
STP-MTR-17040(x)	1.7	STP-EXT-0xx	√	√	√	√	√	√
STP-MTR-17048(x)	2.0		√	√	√	√	√	√
STP-MTR-17060(x)	2.0		√	√	√	√	√	√
STP-MTR-23055(x)	2.8		√	√	√	√	√	√
STP-MTR-23079(x)	2.8		√	√	√	√	√	√
STP-MTR-34066(x)	2.8		√	√	√	√	√	√
STP-MTRAC-42100(x)	4.2	STP-EXT42 0xx	–	–	√	√	√	√
STP-MTRAC-42151(x)	6		–				√	√
STP-MTRAC-42202(x)	6						√	√
STP-MTRH-23079(x)	5.6	STP-EXTH-0xx					√	√
STP-MTRH-34066(x)	6.3						√	√
STP-MTRH-34097(x)	6.3						√	√
STP-MTRH-34127(x)	6.3						√	√
STP-MTRACH-42100(x)	6	STP-EXTH42 0xx					√	√
STP-MTRACH-42151(x)	8						–	√
STP-MTRACH-42202(x)	8						–	√

1) The combinations above will perform according to the published speed/torque curves. Using a motor with a current rating higher than the drive's output rating will proportionally limit the motor torque.
2) Listed NEMA42 motor amperages are for Bipolar Series wiring. See the NEMA42 motor specs for amperages with other wiring types.
3) Table not applicable to integrated motor/drives as drives and motors are already paired.

Typical Wiring Diagram



NOTE: Integrated motor/drives only need power since the drive and motor are one unit. MTRAC motors do not need an extension cable, they have 10' leads coming from the motor.

NOTE: STP-MTRAC-23xxx/34xxx motors and STP-DRVAC drives are designed to work with AC input power to the drive. They are not designed to work with DC input power.

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
Price		$0432p:	$432n:	$432o:	$-009uj:	See Integrated Motor/Drives section	Retired	$-009ui:	$009uk:	See Integrated Motor/ Drives section
Drive Type		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
Output Current		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	–
Input Voltage		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)
Configuration Method		rotary dial, dip switches, jumpers				dip switches		SureMotion Pro software (SM-PRO: free download)		
Amplifier Type		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
Current Control		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			
Microstep Resolution		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		
Modes of Operation	**Step & Dir**	YES	YES	YES	YES	YES	YES	YES	YES	YES
	CW/CCW	YES	YES	YES	YES	YES	n/a	YES	YES	YES
	A/B Quad	n/a	n/a	n/a	n/a	n/a	n/a	YES	YES	YES
	Oscillator	n/a	n/a	n/a	n/a	n/a	n/a	YES	YES	YES
	Serial Indexing	n/a	n/a	n/a	n/a	n/a	n/a	YES	YES	YES
Digital Input Signals	**Step/Pulse**	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		
	Direction									
	Enable	motor disable				motor enable	motor disable	motor enable, alarm reset, speed select (oscillator mode)		
Analog Input		n/a	n/a	n/a	n/a	n/a	n/a	speed control		signal range, offset, dead band, and filtering
Output Signal		fault	n/a	fault	fault	fault	n/a	fault, motion, tach		brake, fault, motion, tach
Communication Interface		n/a	n/a	n/a	n/a	n/a	n/a	YES (programming/communication cable included)		
Non-volatile Memory Storage		n/a	n/a	n/a	n/a	n/a	n/a	YES		
Idle Current Reduction		YES								
Self Test		YES								
Additional Features		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 Motors

SureStep® Stepping Motors

SureStep Series Part Numbers – Bipolar Stepping Motors, *continued*					
Bipolar Stepping Motors	**Price**	**Shaft Type**	**Torque Level**	**Encoder Mounting**	**Drawing**
Motors listing continued from previous page					
STP-MTRAC-23044	$0432d:	single	High voltage High torque	not available	PDF
STP-MTRAC-23044D	$-0432j:	dual		optional	PDF
STP-MTRAC-23055	$0432e:	single		not available	PDF
STP-MTRAC-23055D	$0432k:	dual		optional	PDF
STP-MTRAC-23078	$;0432f:	single		not available	PDF
STP-MTRAC-23078D	$-0432l:	dual		optional	PDF
STP-MTRAC-34075	$0432a:	single		not available	PDF
STP-MTRAC-34075D	$0432g:	dual		optional	PDF
STP-MTRAC-34115	$0432b:	single		not available	PDF
STP-MTRAC-34115D	$0432h:	dual		optional	PDF
STP-MTRAC-34156	$0432c:	single*		not available	PDF
STP-MTRAC-34156D	$-0432i:	dual*		optional	PDF
STP-MTRAC-42100	$;04!p?:	single	High voltage Higher torque	not available	PDF
STP-MTRAC-42100D	$;04!q4:	dual		optional**	PDF
STP-MTRAC-42151	$;04!q0:	single		not available	PDF
STP-MTRAC-42151D	$;04!q6:	dual		optional**	PDF
STP-MTRAC-42202	$;04!q2:	single		not available	PDF
STP-MTRAC-42202D	$;04!q8:	dual		optional**	PDF
STP-MTRACH-42100	$;;04!p,:	single		not available	PDF
STP-MTRACH-42100D	$;04!q5:	dual		optional**	PDF
STP-MTRACH-42151	$;04!q1:	single		not available	PDF
STP-MTRACH-42151D	$;04!q7:	dual		optional**	PDF
STP-MTRACH-42202	$;04!q3:	single		not available	PDF
STP-MTRACH-42202D	$;04!q9:	dual		optional**	PDF

** 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**
STP-MTRA-RB-85	$-96i:	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
STP-MTRA-42ENC	$;4!qg:	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 Same Sky AMT132/ AMT332 encoders and US Digital E6 encoders.	PDF	SureStep NEMA 42 motors

STP-MTRA-42ENC

Stepping System Motors

SureStep® Stepping Motors

SureStep Series Specifications – Connectorized Stepping Motors							
Stepping Motors			*Higher voltage High torque*				
			STP-MTRAC-42100(x)	*STP-MTRAC-42151(x)*	*STP-MTRAC-42202(x)*	*STP-MTRACH-42100(x)*	*STP-MTRACH-42151(x)*	*STP-MTRACH-42202(x)*
NEMA Frame Size			42	42	42	42	42	42
Optional Encoder[1]			Y	Y	Y	Y	Y	Y
Max Holding Torque (N·m)	*Unipolar Series*		9.7	19.0	26.0	9.7	17.5	26.0
	Bipolar Series		12.2	22.0	31.0	12.3	22.0	32.0
	Bipolar Parallel		12.2	22.0	31.0	12.3	22.0	32.0
Rotor Inertia (g·cm2)			5500	10900	16200	5500	10900	16200
Rated RMS Current (A/phase)	*Unipolar Series*		6	9.4	9	8.5	11.3	11.5
	Bipolar Series		4.2	6	6	6	8	8
	Bipolar Parallel		8.4	12	12	12	16	16
Resistance (Ω/phase)	*Unipolar Series*		0.6	0.34	0.46	0.32	0.215	0.29
	Bipolar Series		1.19	0.68	0.91	0.64	0.43	0.58
	Bipolar Parallel		0.3	0.17	0.23	0.159	0.108	0.144
Inductance (mH/phase)	*Unipolar Series*		5	3.6	5.5	2.5	1.9	3.2
	Bipolar Series		19.8	14.5	22	10.1	7.6	13
	Bipolar Parallel		5	3.6	5.5	2.5	1.9	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]	17.6 [8]	25.6 [11.6]
Agency Approval			$_{C}$UR$_{US}$					

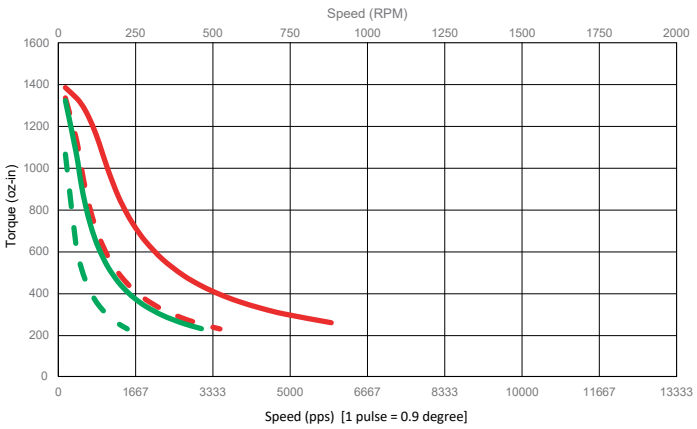
1 - Dual-shaft versions only. For US Digital E6 or Same Sky AMT13/AMT33 encoder mounting, the STP-MTRA-42ENC encoder adapter plate is required.

SureStep® Motor Torque vs. Speed Charts (continued)

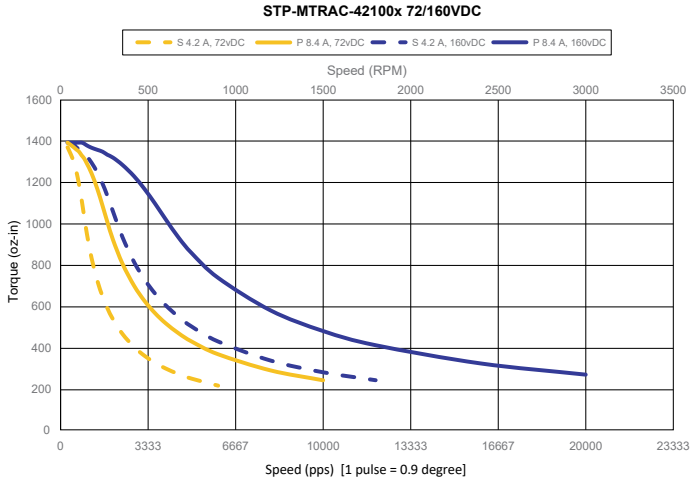
STP-MTRAC(H)-42xxx(x) NEMA 42 Step Motors

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

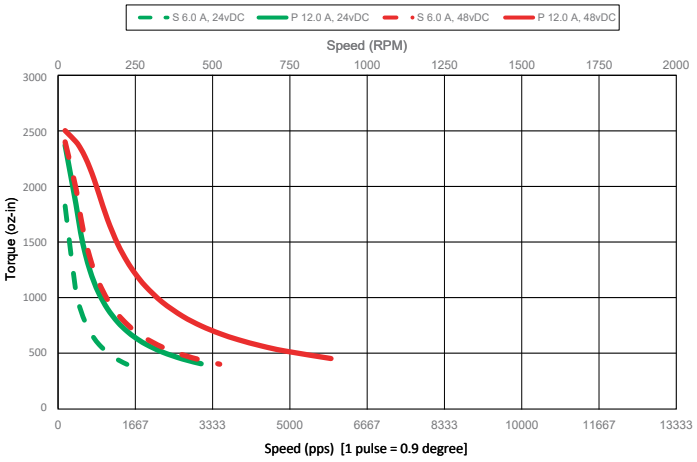
STP-MTRAC-42100x 24/48 VDC



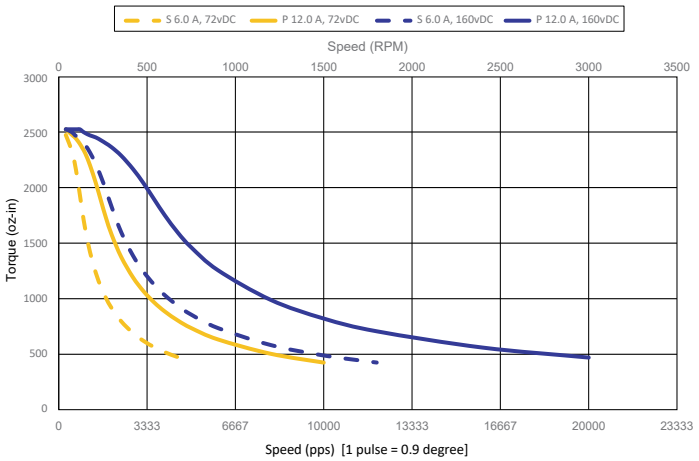
STP-MTRAC-42100x 72/160VDC



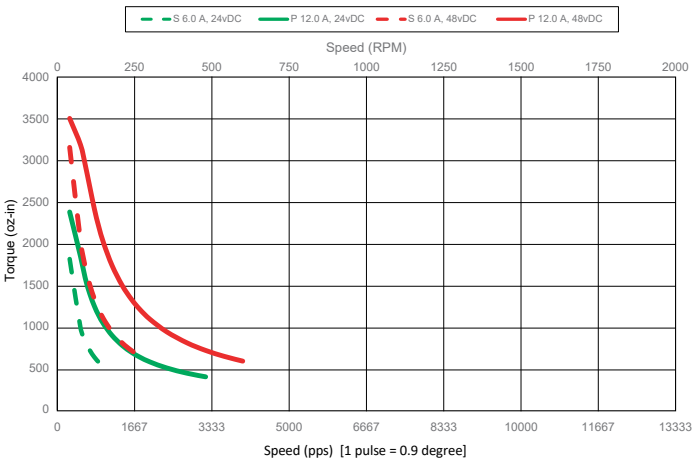
STP-MTRAC-42151x 24/48 VDC



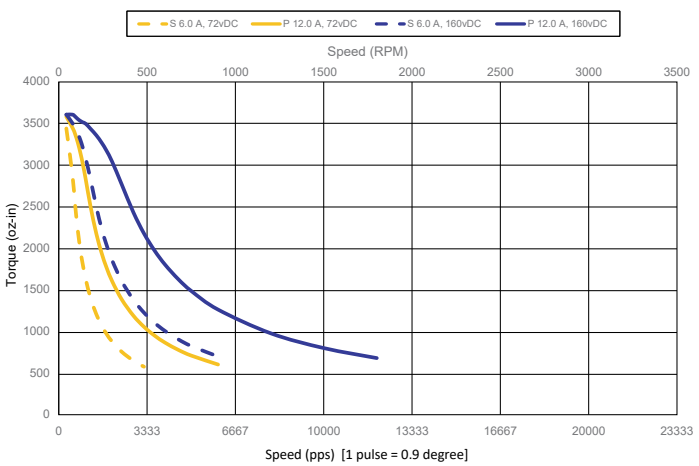
STP-MTRAC-42151x 72/160VDC



STP-MTRAC-42202x 24/48 VDC



STP-MTRAC-42202x 72/160VDC

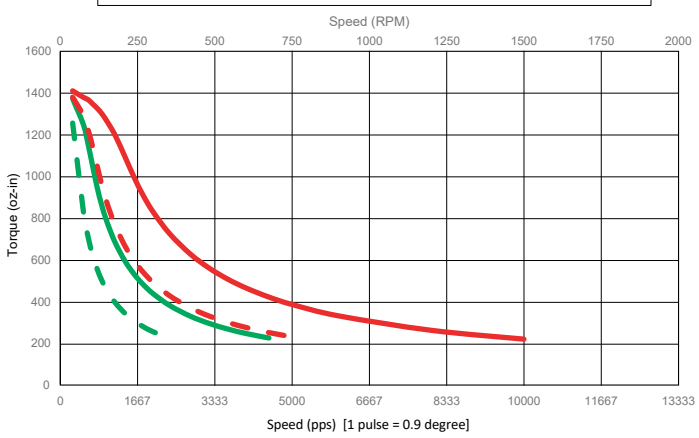


SureStep® Motor Torque vs. Speed Charts (continued)

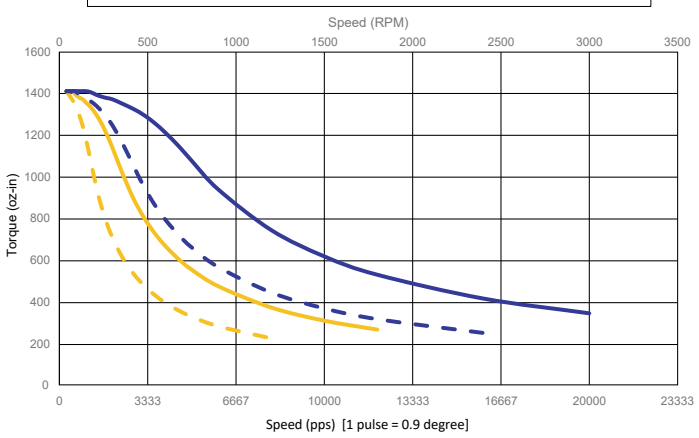
STP-MTRAC(H)-42xxx(x) NEMA 42 Step Motors

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

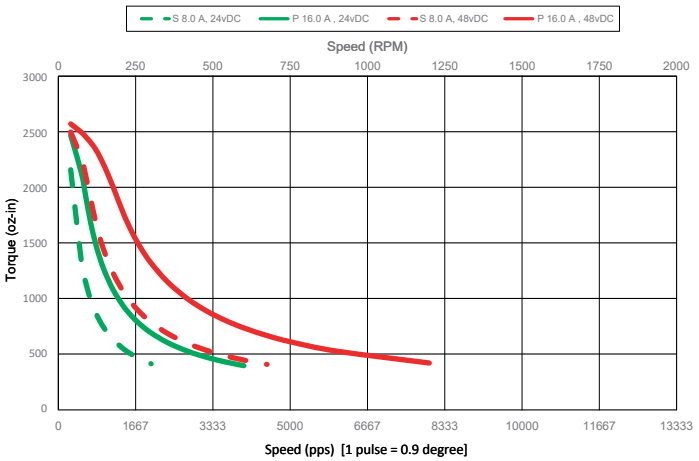
STP-MTRACH-42100x 24/48 VDC



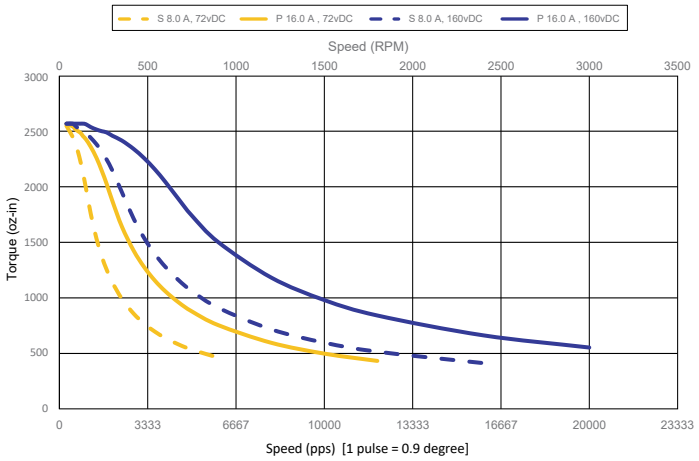
STP-MTRACH-42100x 72/160VDC



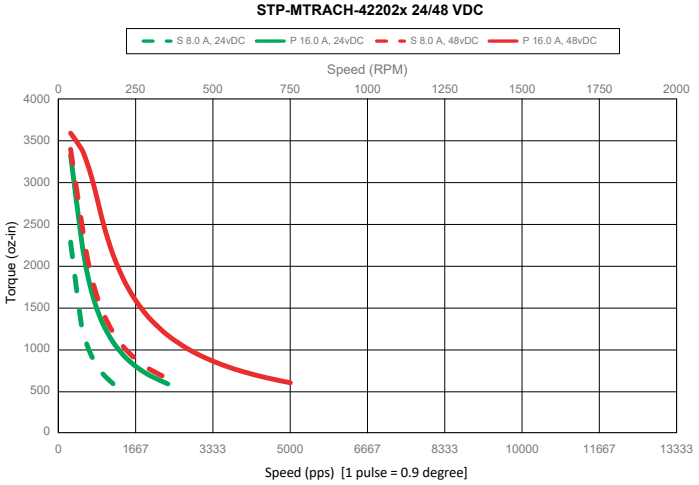
STP-MTRACH-42151x 24/48 VDC



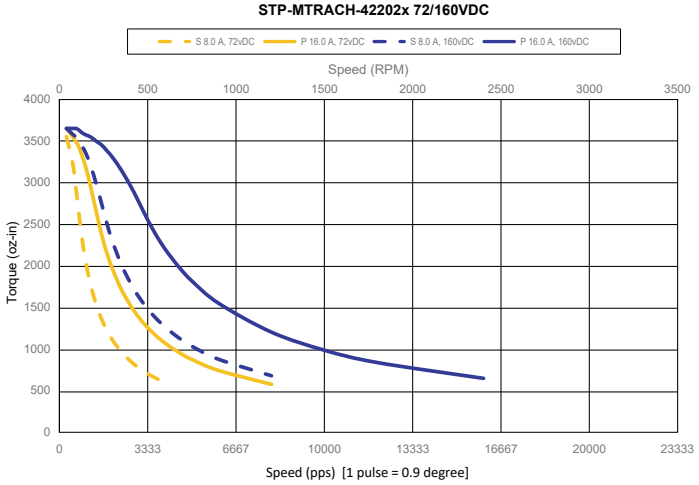
STP-MTRACH-42151x 72/160VDC



STP-MTRACH-42202x 24/48 VDC

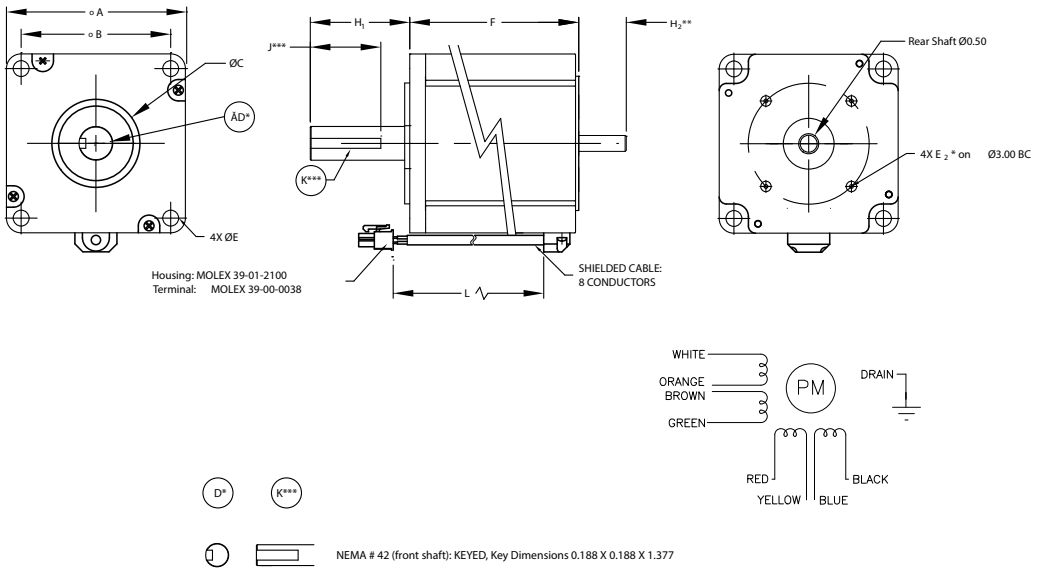


STP-MTRACH-42202x 72/160VDC



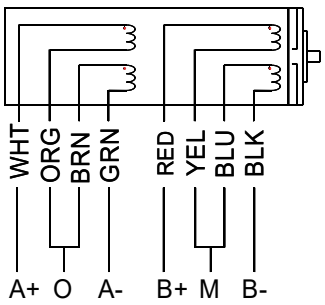
Stepping System Motors

STP-MTRAC-42xxx Motors

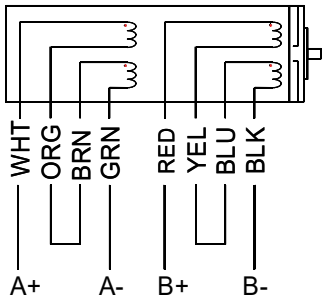


* Dimension D applies only to the front shaft.
** Dimension H2 applies only to dual-shaft (D) motors.
*** Dimensions J & Key do NOT apply to rear shafts of dual-shaft motors (all rear shafts are round style).

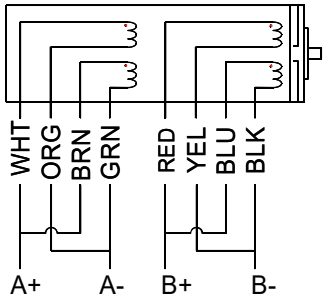
Uni-polar



Bi-polar series



Bi-polar parallel



SureStep Series Dimensions & Cabling – Higher Voltage Bipolar Stepping Motors												
	Higher Voltage High Torque											
Dimensions (in [mm]*)*	*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*	*STP-MTRACH-42202D*
A	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]	
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]	
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]	
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]	
E2	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	
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]	
H2	n/a		n/a		n/a		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]	
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.**

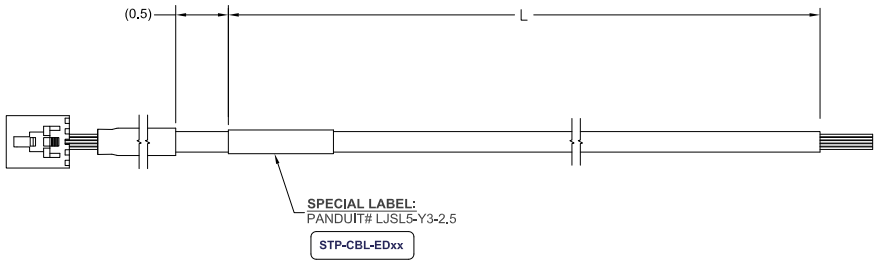
SureStep® Cables, continued

STP-CBL-EDxx Encoder Cable Wiring Diagram

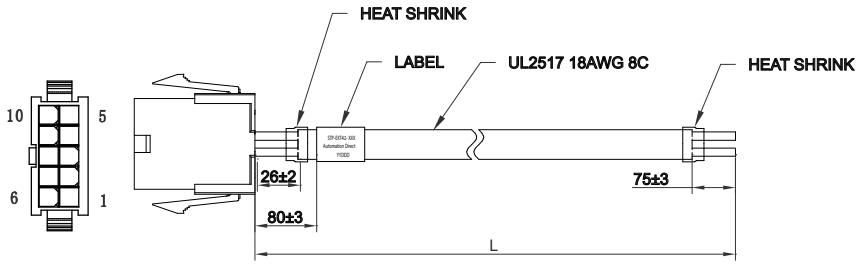
STP–EDxx CABLES

PIN#	Function	Color
1	Ground	Black
2	Index	Green
3	A Channel	White
4	+5VDC Power	Red
5	B Channel	Brown

TABLE INFORMATION	
CABLE NUMBER	CABLE LENGTH L
STP-CBL-ED6	6 Feet
STP-CBL-ED10	10 Feet
STP-CBL-ED20	20 Feet

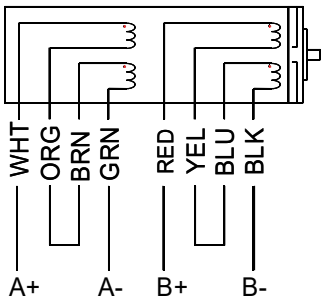


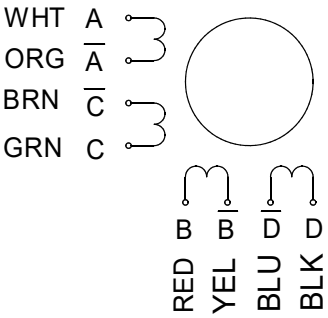
STP-EXT42(H)-xxx Cable Wiring Diagram



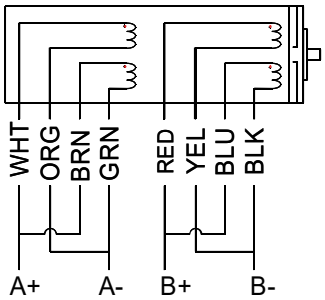
Pin	Wire Description
1	A - White
2	$\overline{A}$ - Orange
3	C - Green
4	$\overline{C}$ - Brown
5	B - Red
6	$\overline{B}$ - Yellow
7	D - Black
8	$\overline{D}$ - Blue
9	GND - Drain wire

Bi-polar series





Bi-polar parallel



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

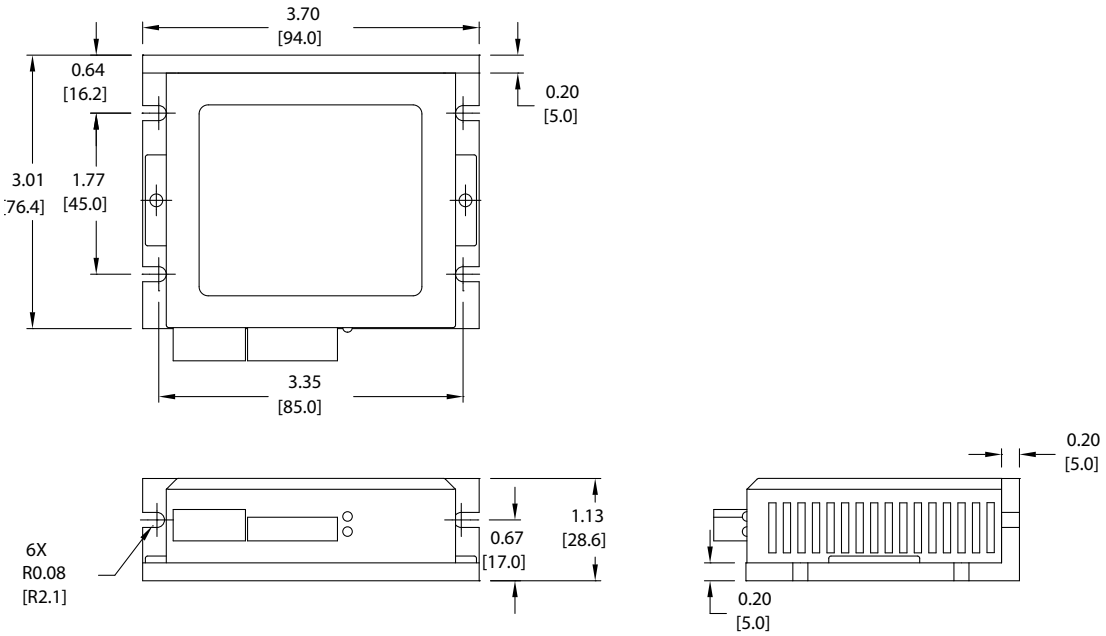
Sure Step Series Specifications – Microstepping Drives Optional Accessories			
Part Number	***Price***	***Description***	***Drawing***
STP-DRVA-RC-050A*	$4327:	Regen Clamp: 50W, for DC input stepper and servo drives, enclosed	PDF
STP-MTRA-17DMP	$2e9y:	SureStep damper, metal body. For use with NEMA 17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

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

SureStep® Microstepping Drives Accessories

Dimensions = in [mm]

STP-DRVA-RC-050A



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).

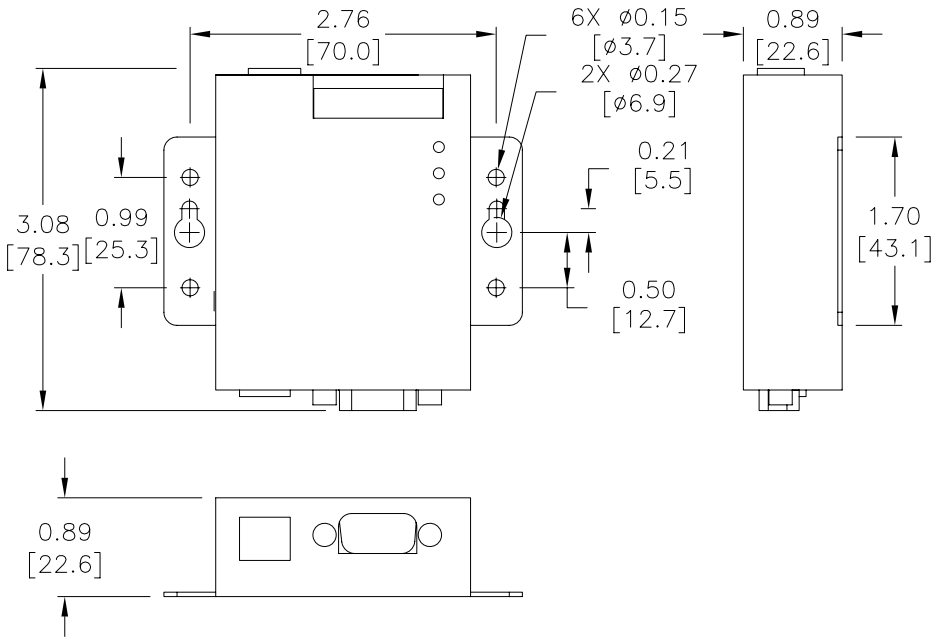
SureStep Advanced Drives communicate via RS-232 (for control and for configuration via SureMotion Pro).

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	
Price	$;02b[_:
Drawing	PDF
Communications	2-wire RS-232 2- or 4-wire RS-485
Configure With	Internal jumpers and external DIP switches
Compatible Cables	STP-232RJ11-CBL STP-485DB9-CBL-2 USB

Dimensions = in [mm]



same sky Stepping System Accessories

AMT Series Stepping System Encoders

AMT Series Encoders, continued			
Part Number	***Price***	***Description***	***Drawing***
AMT132S-V	$4goa:	Same Sky incremental (quadrature) modular encoder, 5 VDC, radial, push-pull (totem) output, configurable up to 4096 ppr. For use with NEMA 34 and 42 dual shaft motors.	PDF
AMT132Q-V	$4gob:	Same Sky incremental (quadrature) modular encoder, 5 VDC, radial, line driver (differential) output, configurable up to 4096 ppr. For use with NEMA 34 and 42 dual shaft motors.	PDF
AMT332S-V	$4goe:	Same Sky incremental (quadrature)/commutation modular encoder, 5 VDC, radial, push-pull (totem) encoder output, configurable up to 4096 ppr, push-pull (totem) commutation output. For use with NEMA 34 and 42 dual shaft motors.	PDF
AMT332D-V	$;4gof:	Same Sky incremental (quadrature)/commutation modular encoder, 5 VDC, radial, line driver (differential) encoder output, configurable up to 4096 ppr, line driver (differential) commutation output. For use with NEMA 34 and 42 dual shaft motors.	PDF

See Accessories section for configuration and signal cables.
Same Sky (formerly CUI Devices) Datasheets provide detailed encoder specifications. These datasheets can be found on each encoder's web page at www.automationdirect.com.

AMT132S-V

AMT332S-V

AMT Series Encoder Accessories		
Part Number	***Price***	***Description***
CUI-KIT-1	$4gph:	Same Sky encoder accessory kit, replacement. For use with Same Sky AMT102 encoders. Includes (1) AMT102 base, (1) AMT102 wide base, and (1) AMT10 sleeve kit (9 sleeves sized from 2-8mm).
CUI-KIT-2	$-4gpi:	Same Sky encoder accessory kit, replacement. For use with Same Sky AMT103 encoders. Includes (1) AMT standard base, (1) AMT standard wide base, and (1) AMT10 sleeve kit (9 sleeves sized from 2-8mm).
CUI-KIT-3	$-4gpj:	Same Sky encoder accessory kit, replacement. For use with Same Sky AMT11, AMT21, and AMT31 encoders. Includes (1) AMT standard base, (1) AMT standard wide base, and (1) AMT standard sleeve kit (9 sleeves sized from 2-8mm).
CUI-KIT-4	$4gpk:	Same Sky encoder sleeve kit, replacement. For use with Same Sky AMT13 and AMT33 encoders. Includes (8) sleeves sized from 9-14mm.
STP-MTRA-SCRWKT-1	$-4gpl:	SureStep encoder mounting screw kit, for use with all stepper encoders.

CUI-KIT-1

CUI-KIT-2

CUI-KIT-3

CUI-KIT-4

STP-MTRA-SCRWKT-1

same sky Stepping System Accessories

AMT Series Stepping System Encoders

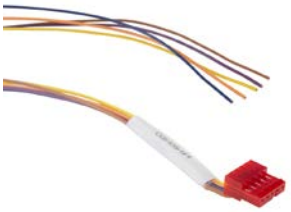
AMT Series Encoder Compatibility

Part Number	Max PPR[1]	Bore Diameter	Output Type	PLC Compatibility	Encoder Cable	Configuration Cable	Motor Compatibility
AMT102-V	2048	2mm, 3mm, 1/8", 4mm, 3/16", 5mm, 6mm, 1/4", 8mm	push-pull (totem) (radial connector)	BRX[2], CLICK C0-1xDxE-D[2]	CUI-3131-x CUI-3132-1FT	n/a	NEMA 14, 17, 23 dual-shaft
AMT103-V[3]	2048		push-pull (totem) (axial connector)		CUI-435-x CUI-3934-6FT		
AMT112S-V	4096		push-pull (totem)		AMT-17C-1-x	AMT-PGRM-17C	
AMT112Q-V	4096		line driver (differential)	P2-HSI, P3-HSI, BRX[2], CLICK C0-1xDxE-D[2]	AMT-17C-1-x		
AMT312D-V	4096		line driver (differential) encoder+commutation	P2-HSI, P3-HSI, BRX[2], CLICK C0-1xDxE-D[2]	AMT-17C-1-x	AMT-PGRM-17C	
AMT312S-V	4096		push-pull (totem) encoder+commutation	BRX[2], CLICK C0-1xDxE-D[2]	AMT-17C-1-x		
AMT132S-V	4096	9mm, 3/8", 10mm, 11mm, 12mm, 1/2", 13mm, 14mm, 5/8"	push-pull (totem)		AMT-18C-3-x	AMT-PGRM-18C	NEMA 34 and 42[4] dual-shaft (Does not fit STP-MTRAC-34 motors)
AMT132Q-V	4096		line driver (differential)	P2-HSI, P3-HSI, BRX[2], CLICK C0-1xDxE-D[2]	AMT-18C-3-x		
AMT332S-V	4096		push-pull (totem) encoder+commutation	BRX[2], CLICK C0-1xDxE-D[2]	AMT-18C-3-x		
AMT332D-V	4096		line driver (differential) encoder+commutation	P2-HSI, P3-HSI, BRX[2], CLICK C0-1xDxE-D[2]	AMT-18C-3-x		

Note: For specific AutomationDirect PLC and step motor model compatibility, please see Appendix A in the SureStep User Manual.
1 - Configurable (default=400). AMT103-V is dip switch configurable. All others require configuration cable, see below.
1 - Requires FC-ISO-C (see wiring diagrams for DIP switch settings).
2 - For AMT103-V to maintain NEMA23 compatibility, CUI-KIT-2 must be purchased to use the standard wide base for mounting.
3 - For STP-MTRAC(H)-42 series motors, encoder mounting kit STP-MTRA-42ENC is required.

AMT Series Encoder Signal Cables

Part Number	Price	Description	Drawing
CUI-3132-1FT	$-4goi:	Same Sky encoder cable, 5-pin connector to pigtail, 1ft cable length. For use with Same Sky AMT102 encoders.	PDF
CUI-3131-6FT	$-4goj:	Same Sky encoder cable, 5-pin connector to pigtail, shielded, twisted pair, 6ft cable length. For use with Same Sky AMT102 encoders.	PDF
CUI-3131-10FT	$4gok:	Same Sky encoder cable, 5-pin connector to pigtail, shielded, twisted pair, 10ft cable length. For use with Same Sky AMT102 encoders.	PDF
CUI-3131-20FT	$-4gol:	Same Sky encoder cable, 5-pin connector to pigtail, shielded, twisted pair, 20ft cable length. For use with Same Sky AMT102 encoders.	PDF
CUI-435-1FT	$4gon:	Same Sky encoder cable, 5-pin connector to pigtail, 1ft cable length. For use with Same Sky AMT103 encoders.	PDF
CUI-3934-6FT	$4goo:	Same Sky encoder cable, 5-pin connector to pigtail, shielded, twisted pair, 6ft cable length. For use with Same Sky AMT103 encoders.	PDF
CUI-435-10FT	$4gop:	Same Sky encoder cable, 5-pin connector to pigtail, 10ft cable length. For use with Same Sky AMT103 encoders.	PDF
CUI-435-20FT	$4goq:	Same Sky encoder cable, 5-pin connector to pigtail, 20ft cable length. For use with Same Sky AMT103 encoders.	PDF



CUI-435-1FT
CUI-435-10FT
CUI-435-20FT

CUI-3131-6FT
CUI-3131-10FT
CUI-3131-20FT

CUI-3132-1FT

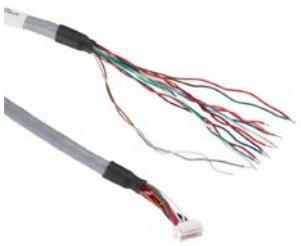
CUI-3934-6FT

same sky Stepping System Accessories

AMT Series Stepping System Encoders

AMT Series Encoder Signal Cables			
Part Number	***Price***	***Description***	***Drawing***
AMT-17C-1-036	$4gox:	Same Sky encoder cable, 17-pin connector to pigtail, shielded, twisted pair, 3ft cable length. For use with Same Sky AMT112 and AMT312 encoders.	PDF
AMT-17C-1-072	$4goy:	Same Sky encoder cable, 17-pin connector to pigtail, shielded, twisted pair, 6ft cable length. For use with Same Sky AMT112 and AMT312 encoders.	PDF
AMT-17C-1-120	$04goz:	Same Sky encoder cable, 17-pin connector to pigtail, shielded, twisted pair, 10ft cable length. For use with Same Sky AMT112 and AMT312 encoders.	PDF
AMT-18C-3-036	$4go?:	Same Sky encoder cable, 18-pin connector to pigtail, shielded, twisted pair, 3ft cable length. For use with AMT13 and AMT33 encoders.	PDF
AMT-18C-3-072	$;4go,:	Same Sky encoder cable, 18-pin connector to pigtail, shielded, twisted pair, 6ft cable length. For use with AMT13 and AMT33 encoders.	PDF
AMT-18C-3-120	$04gp0:	Same Sky encoder cable, 18-pin connector to pigtail, shielded, twisted pair, 10ft cable length. For use with AMT13 and AMT33 encoders.	PDF

AMT-17C-1-036
AMT-17C-1-072
AMT-17C-1-120



AMT-18C-3-036
AMT-18C-3-072
AMT-18C-3-120

AMT Series Encoders Programming Cables		
Part Number	***Price***	***Description***
AMT-PGRM-17C	$4gp4:	Same Sky programming cable, miniB-USB to 17-pin connector, 1ft cable length. For use with Same Sky AMT112 and AMT312 encoders.
AMT-PGRM-18C	$4gp5:	Same Sky programming cable, miniB-USB to 18-pin connector, 1ft cable length. For use with Same Sky AMT13 and AMT33 encoders.

AMT-PGRM-17C

AMT-PGRM-18C

Stepping System Accessories

SureStep® Microstepping Drives Accessories

SureMotion Pro Drive Configuration Software - for Advanced Stepper Drives and Advanced Integrated Motor/Drives

Free Download
SureMotion Pro configuration software is available as a free download from our website for SureStep advanced components (STP-DRV-4850, -80100, & STP-MTRD-xxxxxR).

- Completely replaces SureStep Pro. Required for integrated motor/drives.
- Used for easy configuration and setup of the drive, including drive, motion control mode, I/O, motor.
- Open, Save, Upload, Download configuration files to Advanced Drives and Drive/Motors.
- Status Monitor screen aids in troubleshooting alarms and faults.
- Self Test Mode verifies motor wiring and functionality.
- SCL Terminal window allows testing/ verification of SCL (serial ASCII) commands before PLC programming begins.
- Help files include technical data, application information, advanced setup, serial command instructions.
- Runs on 32-bit/64-bit Windows operating systems.

SureStep Drive Configuration Software - for Advanced Stepper Drives		
Part Number	***Price***	***Description***
SM-PRO	$;;2b[,:	SureMotion Pro Windows configuration software, USB drive or free download. For use with SureStep stepper drives with serial port. Requires PC serial port, USB-RS232-1 or STP-USB485-4W serial adapters.

*** Available for purchase on USB or can be downloaded for free from the AutomationDirect Web site (www.AutomationDirect.com).**