

# GETTING STARTED

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# CHAPTER 1

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## Manual Overview

### Overview of this Publication

Thank you for selecting the SureStep™ Stepping System components. This user manual describes the selection, installation, configuration, and methods of operation of the SureStep™ Stepping System. We hope our dedication to performance, quality and economy will make your motion control project successful.

### Who Should Read this Manual

This manual contains important information for those who will install, maintain, and/or operate any of the SureStep™ Stepping System devices.

### Technical Support

**By Telephone: 770-844-4200**

**(Mon.-Fri., 9:00 am – 6:00 pm E.T.)**

**On the Web: [www.automationdirect.com](http://www.automationdirect.com)**

Our technical support group is glad to work with you in answering your questions. If you cannot find the solution to your particular application, or, if for any reason you need additional technical assistance, please call technical support at **770-844-4200**. We are available weekdays from 9:00 am to 6:00 pm Eastern Time.

We also encourage you to visit our web site where you can find technical and non-technical information about our products and our company. Visit us at **[www.automationdirect.com](http://www.automationdirect.com)**.

### Special Symbols



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*When you see the “notepad” icon in the left-hand margin, the paragraph to its immediate right will be a special note which presents information that may make your work quicker or more efficient.*

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*When you see the “exclamation mark” icon in the left-hand margin, the paragraph to its immediate right will be a **WARNING**. This information could prevent injury, loss of property, or even death (in extreme cases).*

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## SureStep™ System Introduction

SureStep open-loop and inclusive position verification (semi-closed loop) stepping systems provide simple and accurate control of position and speed where lower power and cost are considerations. The SureStep family of stepping components includes power supplies, drives, motors, and cables. The AutomationDirect family of PLCs or other indexers and motion controllers can be used to provide the signals that are “translated” by the microstepping drives into precise movement of the stepping motor shaft.

### SureStep™ Part Number Explanation

#### Drives

STP-DRV-6575

##### ■ Component Capacity

2-digit max nominal voltage followed by  
max current with 1 implied decimal place

4035: 40VDC, 3.5 A  
4830: 48VDC, 3.0 A  
4845: 48VDC, 4.5 A  
4850: 48VDC, 5.0 A  
6575: 65VDC, 7.5 A  
80100: 80VDC, 10.0 A  
24025: 120/240VAC, 2.5 A

##### ■ Component Type

DRV: DC powered stepper drive  
DRVAC: AC powered stepper drive  
DRVA: drive accessory

##### ■ SureStep Series Designation: STP

#### Motors

STP-MTRx-23079x

##### ■ Motor Shaft Type/Variant

blank: single shaft  
D: dual shaft  
E: encoder pre-mounted  
W: IP65 (washdown)

##### ■ Component Capacity

2-digit NEMA frame size followed by  
approximate stack\* length in mm

##### ■ Component Type

MTRL: low-power DC stepper motor  
MTR: high-power stepper motor  
MTRH: higher-power stepper motor  
MTRA: motor accessory  
MTRAC: high-bus voltage stepper motor\*\*  
MTRACH: high-power high-bus voltage stepper motor

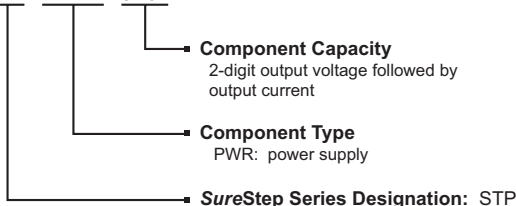
##### ■ SureStep Series Designation: STP

\* The length of the motor that produces torque (not including shaft)

\*\* NEMA 23/34 motors optimized for use with DRVAC drives

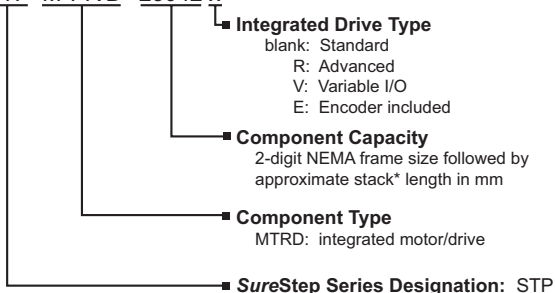
### Power Supplies

STP-PWR-3204



### Integrated Motors/Drives

STP-MTRD-23042x



\* The length of the motor that produces torque

### Cables and Accessories

| SureStep Cables & Accessories  |   |
|--|---|
| Part Number  | Description   |
| STP-EXTx-xx  | Motor extension cable, xx = cable length in feet, x=H for high power, L for low power, W for IP65 |
| STP-DRVA-xx  | Drive accessory, xx= accessory descriptor   |
| STP-MTRA-xx  | Motor accessory, xx = accessory descriptor  |
| <i>Note: See Appendix A for the full range of SureStep accessories</i> |   |

## SureStep™ System Recommended Component Compatibility

| SureStep Power Supply / DC Powered Drive Compatibility  |   |                  |                  |                                 |
|---|---|------------------|------------------|---------------------------------|
| Drive (1)(2)(4)   | Recommended Linear Power Supply (1)(2)(4) |                  |                  |                                 |
| Model Number  | STP-PWR<br>-3024                          | STP-PWR<br>-4805 | STP-PWR<br>-4810 | STP-PWR<br>-7005 <sup>(3)</sup> |
| STP-DRV-4035<br>12-32 VDC input (40V max)   | ✓   | No               | No               | No                              |
| STP-DRV-4830<br>12-48 VDC Input (48V max)   | ✓   | ✓                | ✓                | No                              |
| STP-DRV-4845<br>24-48 VDC Input (48V max)   | ✓   | ✓                | ✓                | No                              |
| STP-DRV-4850<br>24-48 VDC input (48V max)   | ✓   | ✓                | ✓                | No                              |
| STP-DRV-6575<br>24-75 VDC input (85V max)   | ✓   | ✓                | ✓                | No                              |
| STP-DRV-80100<br>24-80 VDC input (80V max)  | ✓   | ✓                | ✓                | ✓                               |
| STP-MTRD-17<br>12-48 VDC input  | ✓   | ✓                | ✓                | No                              |
| STP-MTRD-23, -24<br>12-70 VDC input   | ✓   | ✓                | ✓                | ✓                               |
| <p>1) Do NOT use a power supply that exceeds the drive's input voltage range. If using a non-STP linear power supply, ensure that the unloaded voltage does not float above the drive's maximum input range.</p> <p>2) For best performance, use the lowest voltage power supply that supplies the required speed and torque.</p> <p>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).</p> <p>4) STP-DRVAC-x drives are AC powered and cannot be powered by DC power supplies. Please see Chapter 5 for use of AC power drives and motors.</p> |   |                  |                  |                                 |

| SureStep Power Supply / Drive Compatibility   |  |            |            |
|---|--|------------|------------|
| Drive (1)(2)(3)   | Recommended Switching Power Supply (1)(2)(3) |            |            |
| Model Number  | PSB12-xxxS                                   | PSB24-xxxS | PSB48-xxxS |
| STP-DRV-4035<br>12-32 VDC input (40V max)   | ✓  | ✓          | No         |
| STP-DRV-4830<br>12-48 VDC Input (48V max)   | ✓  | ✓          | ✓          |
| STP-DRV-4845<br>24-48 VDC Input (48V max)   | No   | ✓          | ✓          |
| STP-DRV-4850<br>24-48 VDC input (48V max)   | No   | ✓          | ✓          |
| STP-DRV-6575<br>24-75 VDC input (85V max)   | No   | ✓          | ✓          |
| STP-DRV-80100<br>24-80 VDC input (80V max)  | No   | ✓          | ✓          |
| STP-MTRD-17<br>12-48 VDC input  | ✓  | ✓          | ✓          |
| STP-MTRD-23, -24<br>12-70 VDC input   | ✓  | ✓          | ✓          |
| 1) Do NOT use a power supply that exceeds the drive's input voltage range.<br>2) For best performance, use the lowest voltage power supply that supplies the required speed and torque.<br>3) STP-DRVAC-x drives are AC powered and cannot be powered by DC power supplies. Please see Chapter 5 for use of AC power drives and motors. |  |            |            |

## Drive and Motor Compatibility

The following pages detail which SureStep drives are compatible with which SureStep motors.

Bipolar Steppers are very universal in their compatibility. If you would like to use SureStep motors with a different brand of drives (Leadshine, for example) or use SureStep drives with other motors, you need to follow some basic guidelines:

1. Ensure the drive can supply enough phase current to meet the motor's rated current. Example: we recommend STP-DRV-6575 (7.5 A max current) and STP-DRV-80100 (10A max current) to drive the STP-MTRH-34xxxx motors (6.3 A rated current). Technically, a smaller drive can power a larger motor, but the motor will not be able to produce its rated torque.
2. Ensure the applied drive voltage does not exceed the design voltage for the stepper motor. SureStep MTR motors are designed to be driven with drive input voltages less than 75VDC. MTRAC/MTRACH motors can also be driven by these low voltages, but are wound so that they can take advantage of higher voltages (110VAC or 220VAC drive input). The speed torque curves for high voltage input result in higher torque at much higher speeds. For a clear example, see the speed-torque curves for the NEMA 42 MTRAC/MTRACH motors. Compare the 24V torque curves for those motors vs the 160V curves. The higher voltage results in much higher speeds/torques.

| SureStep DC Drive / Motor Compatibility <sup>(3)</sup> |   |                    |                                    |                                    |                                    |                                    |                                    |                                      |
|--|---|--------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|--------------------------------------|
| Motor <sup>(1)</sup>                                   |   |                    | Recommended Drive <sup>(1)</sup>   |                                    |                                    |                                    |                                    |                                      |
| Model Number <sup>(2)</sup>                            | Rated Amps (RMS)<br>Bipolar Parallel<br>wound | Extension<br>Cable | STP-DRV-4035<br>(3.5 A max output) | STP-DRV-4830<br>(3.0 A max output) | STP-DRV-4845<br>(4.5 A max output) | STP-DRV-4850<br>(5.0 A max output) | STP-DRV-6575<br>(7.5 A max output) | STP-DRV-80100<br>(10.0 A max output) |
| STP-MTRL-14026x  | 0.35  | STP-EXTL-0xx       | ✓                                  | ✓                                  |                                    | ✓                                  | -                                  | -                                    |
| STP-MTRL-14034x  | 0.8   |                    | ✓                                  | ✓                                  | ✓                                  | ✓                                  | -                                  | -                                    |
| STP-MTR-17040x   | 1.7   | STP-EXTx-0xx       | ✓                                  | ✓                                  | ✓                                  | ✓                                  | ✓                                  | ✓                                    |
| STP-MTR-17048x   | 2.0   |                    | ✓                                  | ✓                                  | ✓                                  | ✓                                  | ✓                                  | ✓                                    |
| STP-MTR-17060x   | 2.0   |                    | ✓                                  | ✓                                  | ✓                                  | ✓                                  | ✓                                  | ✓                                    |
| STP-MTR-23055x   | 2.8   |                    | ✓                                  | ✓                                  | ✓                                  | ✓                                  | ✓                                  | ✓                                    |
| STP-MTR-23079x   | 2.8   |                    | ✓                                  | ✓                                  | ✓                                  | ✓                                  | ✓                                  | ✓                                    |
| STP-MTR-34066x   | 2.8   |                    | ✓                                  | ✓                                  | ✓                                  | ✓                                  | ✓                                  | ✓                                    |
| STP-MTRH-23079x  | 5.6   | STP-EXTHx-0xx      | -                                  |                                    |                                    |                                    |                                    | ✓                                    |
| STP-MTRH-34066x  | 6.3   |                    |                                    |                                    |                                    |                                    |                                    | ✓                                    |
| STP-MTRH-34097x  | 6.3   |                    |                                    |                                    |                                    |                                    |                                    | ✓                                    |
| STP-MTRH-34127x  | 6.3   |                    |                                    |                                    |                                    |                                    |                                    | ✓                                    |

1) The combinations above will perform according to the published speed/torque curves. However, any STP motor can be used with any STP drive. Using a motor with a current rating higher than the drive's output rating will proportionally limit the motor torque.

2) MTR motors have connectors compatible with the EXT extension cables.  
MTRH motors have connectors compatible with the EXTH extension cables.  
MTRL motors have connectors compatible with the EXTL extension cables.  
W-series motors have connectors compatible with the EXTW and EXTHW extension cables.

3) Not applicable to integrated motor/drives as drives and motors are already paired.

| SureStep AC Motor/Drive Compatibility |                    |                      |
|---------------------------------------|--------------------|----------------------|
| Model Number                          | STP-DRVAC-24025    |                      |
|                                       | Series Wired Motor | Parallel Wired Motor |
| STP-MTRAC-23044x                      | Yes                | No                   |
| STP-MTRAC-23055x                      | Yes                | No                   |
| STP-MTRAC-23078x                      | Yes                | No                   |
| STP-MTRAC-34075x                      | Yes                | No                   |
| STP-MTRAC-34115x                      | Yes                | No                   |
| STP-MTRAC-34156x                      | Yes                | No                   |

Note: Always use series motor wiring with STP-DRVAC-24025. The drive has an internal voltage doubler circuit, so it will output a very high bus voltage if fed with 120VAC or 240VAC.

| SureStep DC Drive / Motor Compatibility <sup>(3)</sup>   |   |   |  |                    |                                    |                                    |                                    |                                      |
|--|---|---|--|--------------------|------------------------------------|------------------------------------|------------------------------------|--------------------------------------|
| Motor  |   |   |  | Recommended Drive  |                                    |                                    |                                    |                                      |
| Model Number   | Rated Amps (RMS)<br>Bipolar Parallel<br>wound | Rated Amps (RMS)<br>Bipolar Series<br>wound | Rated Amps (RMS)<br>Unipolar Series<br>wound | Extension<br>Cable | STP-DRV-4845<br>(4.5 A max output) | STP-DRV-4850<br>(5.0 A max output) | STP-DRV-6575<br>(7.5 A max output) | STP-DRV-80100<br>(10.0 A max output) |
| STP-MTRAC-42100x   | 8.4   | 4.2   | 6  | STP-<br>EXT42-x    | √(1)                               | √(1)                               | √(1)                               | √                                    |
| STP-MTRAC-42151x   | 12  | 6   | 9.4  |                    |                                    |                                    | √(1)                               | √(1)                                 |
| STP-MTRAC-42202x   | 12  | 6   | 9  |                    |                                    |                                    | √(1)                               | √(1)                                 |
| STP-MTRACH-42100x  | 12  | 6   | 8.5  | STP-<br>EXT42H-x   |                                    |                                    | √(1)                               | √(1)                                 |
| STP-MTRACH-42151x  | 16  | 8   | 11.3   |                    |                                    |                                    |                                    | √(1)                                 |
| STP-MTRACH-42202x  | 16  | 8   | 11.5   |                    |                                    |                                    |                                    | √(1)                                 |
| 1) Series wound only   |   |   |  |                    |                                    |                                    |                                    |                                      |
| Note: The SureStep drives not listed on this table (STP-DRV-4035, STP-DRV-4830, STP-DRVAC-24025) do not supply enough current for the NEMA42 motors and will NOT work.   |   |   |  |                    |                                    |                                    |                                    |                                      |
| Unlike the smaller MTR motors, all 8 motor leads are available on the NEMA 42 motors. These motors can be wired in Bipolar Parallel, Bipolar Series, or Unipolar Series. |   |   |  |                    |                                    |                                    |                                    |                                      |



## Microstepping Drives Introduction

There are two different basic types of microstepping drives offered in the SureStep™ series. DIP-switch configurable models with pulse inputs are available, as well as two software configurable advanced models with multiple operating modes. Descriptions of integrated motor/drives (a drive integrally attached to the motor) follow the drive-only section.

### Standard Microstepping Drives

#### ***STP-DRV-4830, -4845, -6575***

These SureStep™ standard microstepping drives use pulse input signals, and are configured with DIP switches on the drive. These are fully enclosed drives, not open frame. To use these drives in a step motor control system, you will need the following:

- A 24–48 VDC power supply for the STP-DRV-4830/4845 or a 24–75 VDC power supply for the STP-DRV-6575. SureStep STP-PWR-x linear power supplies or PSBx Rhino regulated power supplies from AutomationDirect are good choices. If you decide not to use one of these recommended power supplies, then please read the section entitled “Choosing a Power Supply” in Chapter 8, “SureStep System Power Supplies.”
- A source of step pulses. Signal may be sinking (NPN), sourcing (PNP), or differential.
- The step inputs can be CW/CCW or Step & Direction. CW and CCW are viewed from the end opposite the drive end of the motor (looking out of the shaft).
- A compatible step motor, such as an AutomationDirect SureStep STP-MTRx. (Motor extension cables STP-EXTx are also available.)
- A small flat blade screwdriver for tightening the connectors.



Refer to the “SureStep STP-DRV-4830/4845/6575 Microstepping Drive” chapter of this user manual for complete details on the installation, configuration, and wiring of this drive.

### ***Standard Microstepping Drives (continued)***

#### ***STP-DRV-4035***

The SureStep™ STP-DRV-4035 standard microstepping drive uses pulse input signals, and is configured with DIP switches on the drive. To use this drive in a step motor control system, you will need the following:

- 12-42 volt DC power supply for the motor drive. The SureStep STP-PWR-3204 linear power supply from AutomationDirect is the best choice. If you decide not to use the STP-PWR-3204, please read the section entitled “Choosing a Power Supply” in Chapter 7, “SureStep System Power Supplies.”
- A source of step pulses. Signal may be sinking (NPN), sourcing (PNP), or differential.
- The step inputs can be CW/CCW, step and direction, or quadrature.
- A compatible step motor, such as an AutomationDirect SureStep STP-MTRx. (Motor extension cables STP-EXTx are also available.)
- A small flat blade or phillips screwdriver for tightening the connectors.

The STP-DRV-4035 standard microstepping drive is an open frame design.



**STP-DRV-4035**

Refer to the “SureStep STP-DRV-4035 Microstepping Drive” chapter of this user manual for complete details on the installation, configuration, and wiring of this drive.

## High Bus Voltage Microstepping Drives

### STP-DRVAC-24025

These SureStep™ high bus voltage drives use pulse input signals, and are configured with DIP switches on the drive. These are fully enclosed drives, not open frame. To use these drives in a step motor control system, you will need the following:

- A 90-240 VAC single phase power source (there is a 115/230V voltage selector switch on the drive).
- A source of step pulses. Signal may be sinking (NPN), sourcing (PNP), or differential.
- The step inputs can be CW/CCW or Step & Direction. CW and CCW are viewed from the end opposite the drive end of the motor (looking out of the shaft).
- A compatible step motor, such as an AutomationDirect SureStep STP-MTRAC-23x or STP-MTRAC-34x. The STP-MTRAC(H)-42x motors are not compatible with the STP-DRVAC-24025 (the motors can accept the high voltage, but the drive does not supply enough current).



**NOTE:** The drive always outputs a high bus voltage (~340V) that is compatible with our STP-MTRAC-x motors. This drive is not to be used with low-voltage STP-MTR-x motors. Always wire motors in series configuration with this drive. When supplied 115VAC, the drive has an internal voltage doubler, so the output voltage could be near 340V peak (whether supplied 115VAC or 230VAC).

Refer to “Chapter 5: SureStep STP-DRVAC-24025 Microstepping Drive” of this user manual for complete details on the installation, configuration, and wiring of this drive.



STP-DRVAC-24025

### Advanced Microstepping Drive

The SureStep™ advanced microstepping drives (STP-DRV-4850 & -80100) are capable of accepting several different forms of input signals for control: pulse, analog, serial communication, or internal indexing. These drives are configured by computer with software which is included with the drive. To use one of these drives in a step motor control system, you will need the following:

- A DC power supply for the motor drive. A compatible SureStep STP-PWR-xxxx linear power supply from AutomationDirect is the best choice.
- A source of input control signals, such as a PLC from AutomationDirect.
- A compatible step motor, such as an AutomationDirect SureStep STP-MTRx. (Motor extension cables STP-EXTx are also available.)
- A small flat blade screwdriver for tightening the connectors.

The SureStep advanced microstepping drives are enclosed with removable wiring terminal blocks.



STP-DRV-80100

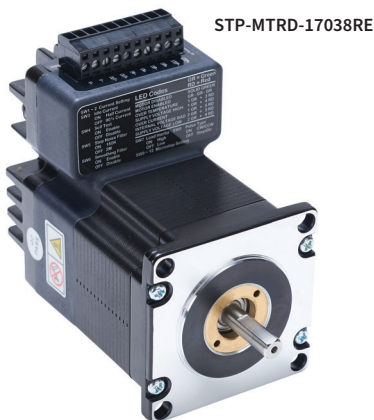
Refer to the “SureStep™ Advanced Microstepping Drives” chapter of this user manual for complete details on the installation, configuration, and wiring of this drive.

## Standard Integrated Motors/Drives

The SureStep™ STP-MTRD standard series integrated motors/drives (STP-MTRD-17 and -23) use pulse input signals, and are configured with DIP switches on the drive. To use this motor/drive in a step motor control system, you will need the following:

- 12-48 volt (for 17 series) or 12-70 volt (for 23 series) DC power supply for the motor/drive. The SureStep linear power supplies from AutomationDirect are the best choice. If you decide not to use a STP-PWR-xxxx, please read the section entitled “Choosing a Power Supply” in Chapter 7, “SureStep System Power Supplies.”
- A source of step pulses. Signal may be sinking (NPN), sourcing (PNP), or differential.
- The step inputs can be CW/CCW, step and direction, or quadrature.
- A small flat blade screwdriver (3/32") for tightening the connectors.

The SureStep standard integrated motors/drives are enclosed with removable wiring terminal blocks. Models with external encoders (for position feedback to a PLC, motion controller, etc.) are available.



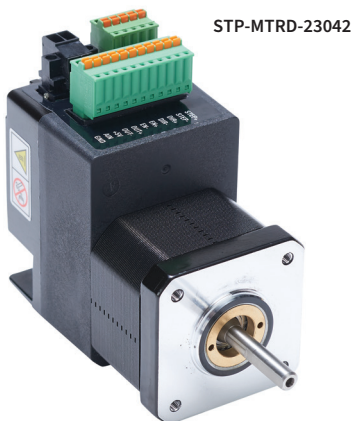
Refer to Chapter 5: “SureStep Integrated Motors/Drives” for complete details on the installation, configuration, and wiring of this motor/drive.

### Advanced Integrated Motors/Drives

The SureStep™ STP-MTRD advanced series integrated motors/drives (STP-MTRD-17R, -23R, and -24R) are capable of accepting several different forms of input signals for control: pulse, analog, serial communication, or internal indexing (via serial communications). These motors/drives are configured with software which is included with the drive. To use one of these motors/drives in a step motor control system, you will need the following:

- A DC power supply for the motor drive (12-48 volt for 17 series, 12-70 volt for 23 and 24 series). A compatible SureStep STP-PWR-xxxx linear power supply from AutomationDirect is the best choice.
- A source of input control signals, such as a PLC from AutomationDirect.
- A small flat blade screwdriver for tightening the connectors.

The SureStep advanced integrated motors/drives are enclosed with removable wiring terminal blocks. Models with internal encoders (for position verification and stall prevention inside the motor/drive) are available.



Refer to Chapter 5: “SureStep Integrated Motors/Drives” for complete details on the installation, configuration, and wiring of this motor/drive.

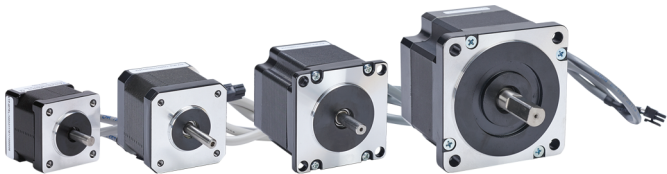
## Step Motor Introduction

AutomationDirect offers many different models of bipolar<sup>1</sup> step motors with mounting flanges in two different shaft configurations (single and dual-shaft), and in five different NEMA frame sizes (14, 17, 23, 34, and 42). There are a variety of motor types available: low torque (STP-MTRL), high torque (STP-MTR, STP-MTRAC), and higher torque (STP-MTRH, STP-MTRACH). Models that have a “D”, “E”, or “W” variant represent a dual shaft option (D), an encoder pre-mounted to the motor (E), or IP65 washdown rated (W) respectively. The “D” variants are encoder ready with pre-drilled and tapped holes on the rear face for encoder mounting. All low-voltage motors have a 12-inch connectorized cable, and optional matching 6, 10, or 20-foot connectorized extension cables (STP-EXTx) are also available. The IP65 motors (W models) have IP65 rated connectors. The high bus voltage NEMA 23 and 34 MTRAC motors have integrated 8-lead 10-foot cables. The NEMA42 motors have 12-inch connectorized cables that accept 8-lead extension cables in 6, 10, and 20 ft lengths (STP-EXT42x).

Refer to Chapter 6: “SureStep™ Stepping Motors” in this user manual for complete details on the specifications, installation, mounting, dimensions, and wiring of the SureStep step motors.

<sup>1</sup>: All SureStep motors are bipolar wound, but STP-MTRAC(H)-42x motors can be wired for bipolar series, bipolar parallel, or unipolar use. Automation Direct does not have a drive that can run a unipolar wired motor.

STP-MTRx  
NEMA 14, 17, 23, 34, 42  
Frame Sizes



STP-MTRx Motors available in Single-shaft, Dual-shaft (encoder ready), Encoder Mounted, and IP65 (washdown) Models. STP-MTRAC-x Motors available in Single-shaft or Dual-shaft (encoder ready) models.

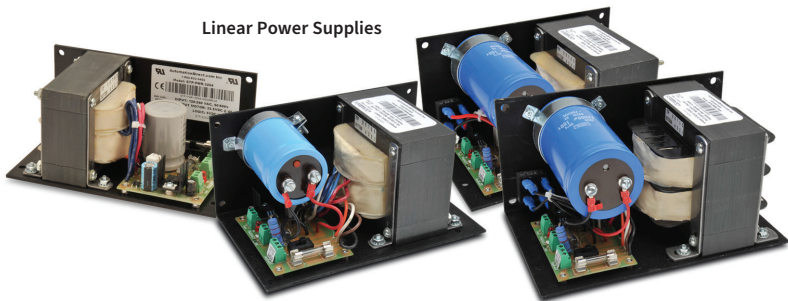


STP-MTRAC-42x

## Stepping System Power Supply Introduction

The SureStep stepping system power supplies are designed to work with SureStep microstepping drives and motors. The different power supply models can provide unregulated DC power at the applicable voltage and current levels for various SureStep drives and motors. The power supplies also provide a regulated 5VDC, 500 mA logic supply output for indexer and PLC logic outputs to control the SureStep drives. Automation Direct switching power supplies PSB12-xxxS, PSB24-xxxS, and PSB48-xxxS are good non-linear supplies. A regen clamp may be needed if using these supplies. For more information on using the power supplies please see Chapter 8: "SureStep System Power Supplies".

Linear Power Supplies



Switching Power Supplies

The stepping system power supplies can supply power for multiple SureStep STP-DRV-xxxx microstepping motor drives, depending on step motor size and application requirements.

Refer to the Power Supply chapter of this user manual for complete details on the specifications, installation, mounting, dimensions, and wiring of the SureStep stepping system power supplies.

Further information about braking accessories and regeneration clamping can be found in Appendix A: "SureStep Accessories" and the STP-DRVA-RC-050 or STP-DRVA-RC-50A REGENERATION CLAMP datasheet.



## Selecting the Stepping System

Refer to Appendix C: Selecting the SureStep™ Stepping System for detailed information on how to calculate requirements for various applications using stepping motors for motion control.

## Use with AutomationDirect PLCs

Refer to Appendix B: Using SureStep™ with AutomationDirect PLCs for detailed information on wiring the SureStep Stepping System components to AutomationDirect PLCs and high-speed counter modules.

The following is a summary of the AutomationDirect PLCs and module part numbers that are suitable to work with the SureStep Stepping Systems:

### High-Speed Pulse Output Control (Standard Drives)

Any AutomationDirect PLC with high speed pulse output can control the SureStep Standard and Advanced stepper drives and integrated motor/drives. Certain high-speed PLC outputs are 24VDC and may require dropping resistors to work with 5VDC stepper inputs. See Appendix B in this manual and the appropriate PLC User Manual for more detailed information.

AutomationDirect PLCs that can use pulse train outputs with SureStep drives:

**BRX Series** (all models with DC outputs on the CPU module)

**Productivity Series** (all P2 and P3 CPUs - with the P2-HSO/P3-HSO modules)

**Do-More Series** (all models that can use the H2-CTRIO2)

**DirectLogic Series**

- All CPU models that can use the H2-CTRIO2 (and other CTRIO models)
- Models with built-in high speed outputs (DL05, DL06)

### Serial Communication Control (Advanced Drives)

AutomationDirect PLCs with an RS-232 port can control an Advanced stepper drive (STP-DRV-4850, STP-DRV-80100) with serial communication (one drive per PLC communication port). A PLC with an RS-485 port can control multiple Advanced integrated stepper motor/drives.

The **Click Series**, **BRX Series**, **Productivity Series**, and **Do-More Series** of PLCs allow for simple ASCII control of the Advanced drives and motor/drives. Of the DirectLogic Series of PLCs, we recommend only using the DL06 and D2-260 CPUs due to their advanced ASCII instruction set which includes PRINTV and VPRINT commands.

See Appendix B and the appropriate PLC User Manual for more detailed information.

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