



WARNING

To minimize the risk of potential safety problems, you should follow all applicable local and national codes that regulate the installation and operation of your equipment. These codes vary from area to area. It is your responsibility to determine which codes should be followed, and to verify that the equipment, installation, and operation are in compliance with the latest revision of these codes.

Equipment damage or serious injury to personnel can result from the failure to follow all applicable codes and standards. We do not guarantee the products described in this publication are suitable for your particular application, nor do we assume any responsibility for your product design, installation, or operation.

If you have any questions concerning the installation or operation of this equipment, or if you need additional information, please call our technical support at 770-844-4200.

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GETTING STARTED

Make sure you have the following equipment:

- A compatible stepper motor (designed for high bus voltage, like STP-MTRAC-x)
- An AC supply voltage, 90-240 VAC single-phase
- A source of pulse and direction signals

SureStep™ Microstepping Drive Specifications	
Part Number	STP-DRVAC-24025
Input Power	90-240 VAC
Output Current	0.6-2.5 A
Current Controller	MOSFET, dual H-bridge and 4-quadrant PWM at 20kHz
Input Signals	Step 5 -24 VDC nominal (range: 4-28 VDC); optically isolated, differential. Maximum pulse frequency = 150kHz or 2MHz (user selectable). Minimum pulse width: 3 usec at 150 kHz setting SW9 1 usec at 2 MHz setting SW9 Function = Step or Step CW pulse.
	Direction 5 -24 VDC nominal (range: 4-28 VDC); optically isolated, differential. Maximum pulse frequency = 150kHz or 2MHz (user selectable). Minimum pulse width: 3 usec at 150 kHz setting SW9 1 usec at 2 MHz setting SW9 Function = Direction or Step CCW pulse.
	Enable 5 -24 VDC nominal (range: 4-30 VDC); (5mA @ 4V; 15 mA @ 30V); Optically isolated, differential. Max pulse frequency: 10kHz Minimum pulse width: 500usec Function = disable motor when closed.
Output Signal	Fault 30VDC max / 100mA max, optically isolated photodarlington, sinking or sourcing. Function = closes on drive fault.
Internal Jumper Selectable Function	Step Pulse Type Step and Direction: Step signal = step/pulse; Direction signal = direction. Step CW & CCW: Step signal = CW step; Direction signal = CCW step.
DIP Switch Selectable Functions	Step Resolution Selectable from 200 steps/rev up to 25600 steps/rev using SW1-4.
	Running Current The output current drive to the motor is set by the SW5, SW6, and SW7 switches and can be changed from 0.6 A to 2.5 A per phase.
	Idle Current Reduction Reduce power consumption and heat generation by limiting motor idle current to 90% or 50% of running current. (Holding torque is reduced by the same %.)
	Step Noise Filter Select 150kHz or 2MHz using SW9.
	Load Inertia Set the load inertia to 0-4x or 5-10x using SW10 (also referred to as anti-resonance)
	Smoothing Filter Softens the effect of immediate changes in velocity and direction, making the motion of the motor less jerky. Can cause a small delay in following the control signal.
	Selt Test Automatically rotate the motor back and forth two turns in each direction in order to confirm that the motor is operational.
Drive Cooling Method	Natural cooling or fan-forced cooling
Mounting	Use (2) M4 screws to mount to metal surface
Removable Connectors*	DEGSON: 2EDGK-7.62-02P-14-00A(H), 2 pin power connector 2EDGK-5.08-04P-14-00A(H), 4 pin motor connector 15EDGK-3.81-08P-14-00A(H), 8 pin I/O connector
Weight	0.88 kg [1lb 15oz]
Operating Temperature	0-85 °C [32-185 °F] (interior of electronics section)
Ambient Temperature	0-40 °C [32-104 °F]
Humidity	Maximum 90% non-condensing
Agency Approvals	CE, cURus

*Replacement connectors are available in connector kit STP-CON-6

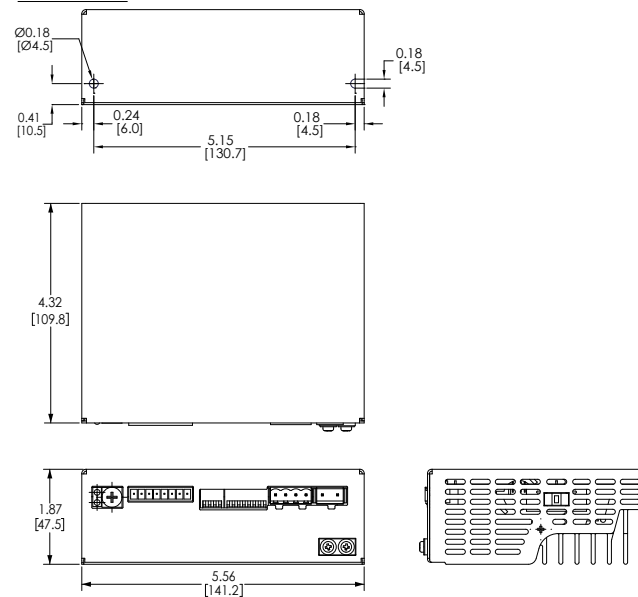
MOUNTING THE DRIVE

The STP-DRVAC-24025 drive can be mounted only on the narrow side of the chassis using (2) M4 screws in the holes at the back of the drive. Use forced air cooling such as a fan to operate the drive continuously at maximum power.

WARNING:

- Never mount the drive in a space where there is no air flow, or where other devices can heat the surrounding air to 40°C [104°F].
- Never put the drive where it can get wet, or where metal or other electrically-conductive particles can get on the circuitry.
- Always provide air flow around the drive. Minimum allowable spacing between multiple drives is 0.5 inches [13 mm].

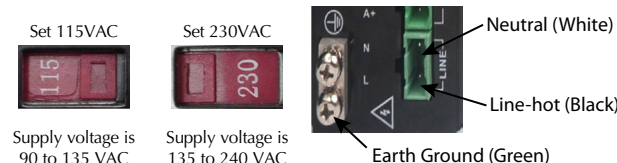
DIMENSIONS



CONNECTING THE POWER SUPPLY

DO NOT apply power until all connections to the drive have been made. Use a 4A fuse on the line connection for drive protection.

1. Select power input voltage. AC input voltage must be selected by switch. Check input voltage to avoid damage before powering on.



Supply voltage is 90 to 135 VAC Supply voltage is 135 to 240 VAC

2. Wire the drive to the AC power source. Use 16 AWG wire for Line (L) and Neutral (N). Use 14 AWG for Earth Ground (G).

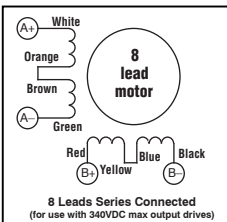
WARNING: If set to 115V, the drive will use its internal voltage doubler to provide a high motor bus voltage. Always wire the stepper motor for high voltage (in series).

CONNECTING THE MOTOR

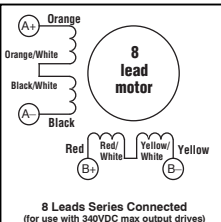
WARNING: When connecting a step motor to the STP-DRVAC-24025 drive, be sure that the motor power supply is switched off. When using a motor not supplied by AutomationDirect, secure any unused motor leads so that they can't short out. Never disconnect the motor while the drive is powered up. Never connect the motor leads to ground or directly to the power supply.

1. Connect the drive to the motor. If using a non AutomationDirect motor, consult the motor specs for wiring information.

STP-MTRAC-23044(x),
23055(x), 23078(x), 34156(x)



STP-MTRAC-34075(x), 34115(x)



WARNING:
Always wire STP-MTRAC motors in series when using the STP-DRVAC-24025.

Note: Typical output voltage for 220VAC input is 340VDC. STP-DRVAC-24025 outputs 340VDC with 110VAC or 220VAC due to voltage doubler.

SELECT THE MOTOR

Each position of the 16-bit rotary switch selects a different motor, automatically setting the configuration parameters in the drive. The STP-DRVAC-24025 drive comes programmed with up to 6 SureStep motors as factory defaults.

WARNING: Do NOT use standard low-voltage stepper motors with the AC-input drive. Only use stepper motors rated for AC-input systems (such as the STP-MTRAC motors). The high bus voltage on the STP-DRVAC drive will overheat and damage standard stepper motors that are wound for lower-voltage DC systems.

If the motor selection is changed, the drive power supply will need to be cycled.

Note: Motor current is limited by the lower value between rotary switch setting and the Running Current dip switches. The default setting for the running current is 0.6 A for motor protection. Be sure to adjust this setting when selecting a motor.

For a custom motor, please select the closest comparable motor via the rotary switch, then use the DIP switches to configure motor current, anti-resonance, and other settings.

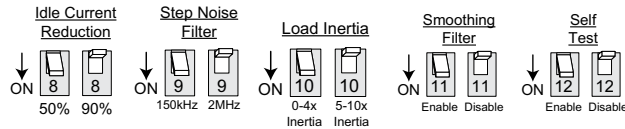
STP-DRVAC-24025 Motor Selection			
Rotary Switch Position	Motor	Rated Current (A/phase)	Wiring
0-6	Reserved		
7	STP-MTRAC-23044(D)	0.71	Series
8	STP-MTRAC-23055(D)	0.71	Series
9	STP-MTRAC-23078(D)	0.71	Series
A	STP-MTRAC-34075(D)	2.15	Series
B	STP-MTRAC-34115(D)	2.05	Series
C	STP-MTRAC-34156(D)	2.55	Series
D-F	Reserved		

DIP SWITCH SETTINGS (FACTORY DEFAULT = ALL SWITCHES OFF)

Many operational parameters of the STP-DRVAC-24025 can be set or changed by DIP switches - either by a single switch or a combination of ON/OFF settings of 2 or more switches.

STP-DRVAC-24025 Microstep Table				
MicroStep	Switch 1	Switch 2	Switch 3	Switch 4
200	ON	ON	ON	ON
400	OFF	ON	ON	ON
800	ON	OFF	ON	ON
1600	OFF	OFF	ON	ON
3200	ON	ON	OFF	ON
6400	OFF	ON	OFF	ON
12800	ON	OFF	OFF	ON
25600	OFF	OFF	OFF	ON
1000	ON	ON	ON	OFF
2000	OFF	ON	ON	OFF
4000	ON	OFF	ON	OFF
5000	OFF	OFF	ON	OFF
6000	ON	ON	OFF	OFF
8000	OFF	ON	OFF	OFF
10000	ON	OFF	OFF	OFF
20000	OFF	OFF	OFF	OFF

STP-DRVAC-24025 Running Current Table			
Peak A	Switch 5	Switch 6	Switch 7
0.6	ON	ON	ON
0.8	OFF	ON	ON
1.0	ON	OFF	ON
1.2	OFF	OFF	ON
1.6	ON	ON	OFF
1.8	OFF	ON	OFF
2.0	ON	OFF	OFF
2.5	OFF	OFF	OFF



Note: The power must be cycled each time the position of SW9 or SW11 is changed.

SELF TEST

The STP-DRVAC-24025 has a built-in Self Test function. If the self test switch is moved to the ON position the drive will automatically rotate the motor back and forth, two turns in each direction. This feature can be used to confirm that the motor is correctly wired, selected, and otherwise operational.

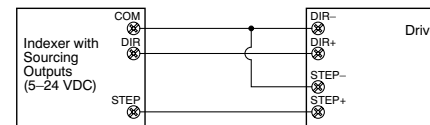
Full details of the STP-DRVAC-24025 are contained in the SureStep User Manual available online at <https://cdn.automation-direct.com/static/manuals/surestepmanual/surestepmanual.html>

STEP/DIRECTION MODE AND CW/CCW MODE JUMPER

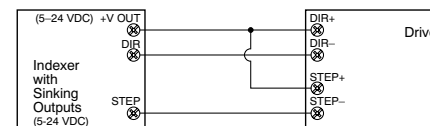
To adjust the STP-DRVAC-24025 drive to accept STEP CW and STEP CCW signals, remove the drive cover and move jumper J10 from the 1-2 position to the 2-3 position. The CW signal should be connected to the STEP input and the CCW signal should be connected to the DIR input.

CONNECTING THE INPUT SIGNALS – STEP & DIRECTION

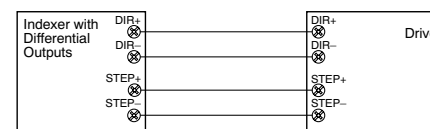
Connecting Drive to Indexer with Sourcing Outputs



Connecting Drive to Indexer with Sinking Outputs

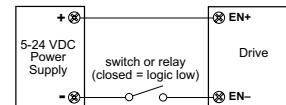


Connecting Drive to Indexer with Differential Outputs

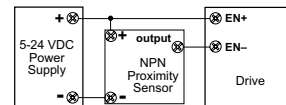


CONNECTING THE INPUT SIGNALS – ENABLE

Connecting Drive EN to Switch or Relay



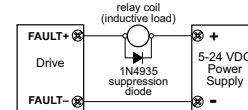
Connecting Drive EN to NPN



CONNECTING THE FAULT OUTPUT SIGNAL

Do not connect more than 30VDC. Current must not exceed 80mA.

Connecting Drive's Fault Output to Inductive Relay



Connecting Fault Output as Sinking Output Connecting Fault Output as Sourcing Output

