



General Safety Considerations

General Safety Considerations for Stepper Motor Applications

The following safety considerations must be observed during all phases of operation, service and repair. Failure to comply with these precautions violates safety standards of design, manufacture, and intended use of the product. Anaheim Automation assumes no liability for the customer's failure to comply with these requirements. Even well built products, operated or installed improperly, can be hazardous. Safety precautions must be observed by the user with respect to the load and operating environment. The customer is responsible for proper selection, installation and operation of the products purchased from Anaheim Automation.

- Use caution when handling, testing, and adjusting during installation, set-up and operation
- Service should not be performed with power applied
- Exposed circuitry should be properly guarded or enclosed to prevent unauthorized human contact with live circuitry
- All products should be securely mounted and adequately grounded
- Provide adequate air flow and heat dissipation
- Do not operate in the presence of flammable gases, vapors, liquids or dust

Common Causes for Stepper Motor Driver/Driver Pack Failure

Note: Always read the specification sheet/user's guide that accompanies the product

Problem: Intermittent or erratic driver function.

Solution: This is the most common cause of failure and one of the most difficult to detect. Start by checking to insure that all connections are tight. Evidence of discoloration at the terminals/connections, may indicate a loose connection. Stress wires and connections for worse conditions and check with an ohmmeter. When replacing a driver in a system or Driver Pack, be sure to inspect all terminal blocks and connectors. Check cabling/wiring for accuracy.

Problem: Motor wires were disconnected while the driver was powered up.

Solution: Avoid performing any service to the driver while the power is on, especially in regard to motor connections. This precaution is imperative for both the driver and the technician.

Problem: The cabling/wiring is too long.

Solution: Keep motor wire/cable lengths under 25 feet. For applications where the wiring from the motor to the driver exceeds 25 feet, please contact the factory for instructions, as it is likely that transient voltage protection devices will be required.



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Problem: The step motor has a shorted winding or a short to the motor case.

Solution: It is likely that you have a defective motor. Do not attempt to repair motors. Opening the motor case may de-magnetize the motor, causing poor performance *and* voiding your warranty. Call the factory if you suspect a defective motor. The motor windings can be tested with an ohmmeter. As a rule of thumb, if the step motor is a frame size 11, 17, 23, or 34 and the warranty period has expired, it is not cost-effective to return the motor for repair.

Problem: The driver or Driver Pack is over-heating.

Solution: Ventilation and cooling are essential – failure to provide adequate airflow will affect the driver's performance and will shorten the life of the driver. Keep driver temperatures below 60 degrees Celsius. To maintain good airflow, use fans, heat sink material, and base plates, so not to exceed the maximum temperature rating. Be mindful of temperatures inside cabinets and enclosures where drivers may be mounted.

Problem: Environmental factors, such as welding, chemical vapors, moisture, humidity, dust, etc., can damage both the electronics and motors, over time.

Solution: Protect the driver and motor from environments that are corrosive, which contain voltage spikes, or prevent good ventilation. Anaheim Automation offers products in several line voltage ranges. For AC lines that contain voltage spikes, a line regulator will likely be required.

Problem: Pulse rates (Clock or Step) to the driver are too high.

Solution: The typical half-step driver can drive the step motor at a maximum rate of 20,000 pulse per second. Pulse rates of above 60,000 pulses per second can damage the driver.

Problem: Stalling the step motor.

Solution: In some cases, stalling the motor causes a large voltage spike that often damages the phase transistors on the driver. Some drivers are designed to protect itself from such an occurrence. If not, Transient Suppression Devices can be added externally. Consult the factory for further information.

Problem: The step motor is back-driving the driver.

Solution: A step motor that is being turned by a load creates a back EMF voltage on the driver. Higher speeds will produce higher voltage levels. If the rotational speed gets very high, this voltage might cause damage to the driver. This is especially dangerous when the motor is back-driven while the driver is still on. Put a mechanical stop or brake in applications that might be subject to these phenomena.

Please Use a RMA Form should you need to return a product for REPAIR