

Global Leader

NEA® Electronics, Inc. is a global leader in spacecraft mechanisms. Our low shock release devices are relied upon for spaceflight applications more than any other device.

Reliable

Our designs are reliable, simple, insensitive to adverse environments and backed up by years of heritage and loyal customers.

Quality Assured

NEA, a trusted supplier of mission critical components, is certified to ISO 9001:2008 and AS9100:2009 C

NEA Solar Array Drive Actuators

Solar Array Drive Actuators

NEA has the capability to provide a range of Solar Array Drive Actuators for a broad range of applications.

NEA can provide Solar Array Drives that are based off of our Gimbal and Pointing Mechanisms architecture by adding optional components such as slip ring assemblies and twist capsules.

For lower cost applications that are less technically demanding NEA can provide a lower cost Solar Array Drive Actuator that features a twist capsule for limited array inertias.

For applications that require more power transfer capability that can be provided with our pointing mechanisms NEA can provide a dedicated Solar Array Drive Actuator optimized for power transmission with an integral slip ring assembly.

Engineering Philosophy

Due to the mission critical nature of the application NEA makes no compromises in the design of our Solar Array Drive Actuators. Every actuator features:

- Designs that are well supported and verifiable through analysis
- Bearings sized to operate below a mean Hertzian contact stress of 2,310 MPa (335 ksi) under all load conditions
- Multi-pass labyrinth seals
- Advanced Motor Technology
- All components derived from flight proven heritage technology
- Fine step angles that preclude the use of power inefficient microstepping drivers
- Integrated active thermal control

Available Configurations

NEA recognizes that one standard scalable product may not be the best fit for all Solar Array Drive applications. This is why NEA has chosen to develop three different approaches to provide an optimized approach to each application.

S3⁵ Solar Array Drive Actuator

The modular nature of our P35 series of actuators allows them to be coupled with either a slip ring module or a twist capsule module for use as an S3⁵ Solar Array Drive Actuator. The telemetry module is replaced by one of the power transfer module options, which shares the same mechanical interface, and the telemetry module is reattached on the end of the assembly.

The S3⁵ Solar Array Drive Actuator offers nearly all the performance and procurement benefits of the P3⁵ Pointing Mechanism however due to the custom nature of each application the power transfer assembly must be optimized for each application. The output torque performance of the S3⁵ Solar Array Drive Actuator will be slightly less than the P3⁵ due to the associated drag of the power transfer assembly. This reduction is also application dependent as it is a function of the number of power and signal transfers required.

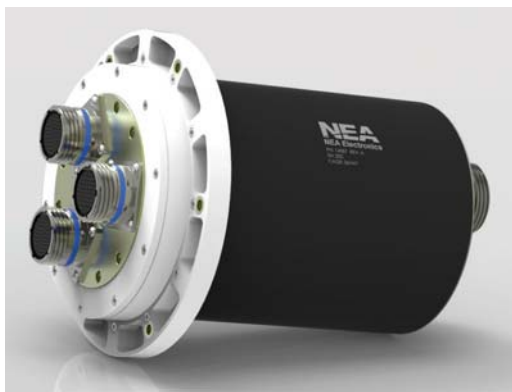
Low Cost Solar Array Drive Actuator



For applications that have smaller solar arrays and do not require continuous rotation NEA offers a smaller cost effective solution that features a small off-axis actuator driving through a low backlash spur gear. The SADA is configured to drive either one array or both arrays. A twist capsule provides signal and power transfer while telemetry is provided by a potentiometer. The can be provided in electrically redundant configurations if required at additional cost.

NEA Solar Array Drive Actuators

Custom Solar Array Drive Actuator



For applications that require continuous rotation and have a large number of power and signal transfers a custom designed Solar Array Drive Actuator can be provided.

The nature of a custom Solar Array Drive actuator is that it can be configured and optimized for the specific requirements of the application. It should be noted however that the custom nature of the design allows for design flexibility at the expense of possibly increased cost and schedule.

Advanced Motor Technology

NEA analyzes and designs all of our motors in-house using advanced state-of-the-art three-dimensional magnetic finite element analysis. Our analytical models accurately predict end unit performance and provide the underlying foundation for our torque margins and dynamic simulation models. In-house motor testing is performed at the motor component level on every motor we build with the results being compared against the analysis to verify the model and also allow capture of out of family performance.

Our precise models allow for performance optimization, weight reduction and in some cases the elimination of rare earth materials that drive cost. The motor configurations used in our pointing

mechanisms use far fewer components than most motors used on competitive products resulting in increased reliability, reduced manufacturing time, lower cost and better step accuracy. The additional capabilities our motors provide allow us to offer superior performance in a smaller envelope.

Optional Components

NEA Solar Array Drive Actuators can be provided with optional components just like NEA's Gimbals and Pointing Mechanisms.

Telemetry Options

The baseline pointing mechanism features a modular primary and course axis redundant potentiometers that provide voltage telemetry over the entire 360° of travel. For some applications changes to the telemetry angle may be desired. This can be accommodated through the use of a custom potentiometer element within the potentiometer module.

Other applications may require the use of an optical encoder or resolver. These options can also be provided easily due to the modular nature of the device.

Mission Success

NEA® Electronics, Inc. is dedicated to building mankind's legacy in space by supporting our customers in the aerospace industry through on time delivery of innovative products that exceed expectations and assure mission success.

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