



Voice Coil Actuators

The following configuration options for Sensata's VCAs are:

1. Cylindrical Frameless Linear Voice Coil Actuator

The most cost effective and versatile line of VCAs. Frameless voice coil actuators (VCA), also known as un-housed VCAs, are sold in pairs of coil and field assemblies. These assemblies are required to be aligned within the customer's application. Frameless VCAs are the most cost effective and versatile types of linear actuators, allowing customers to integrate them into their systems in a way that is best suited for the application. VCA technology features many inherent advantages, such as direct-drive, zero backlash and cog free operation for accurate motion, as well as high acceleration and use of a single phase.

- Capable of withstanding billions of cycles of use
- Constructed with high energy product rare earth magnets
- Moving coil and moving magnet designs available
- Wide offering of standard products, reducing lead time and cost

2. Cylindrical Semi-housed Linear Voice Coil Actuator

Precision shaft with multiple options available. Semi-housed voice coil actuators (VCA) enhance the basic frameless VCAs by adding both a shaft and self-aligning bushings to the unit. The lead wires have also been upgraded to a high flex variant, allowing for added protection from wear and tear. Various shaft options are available depending on the size of the actuator, including both external and internal threading, as well as a standard smooth shaft.

- Precision shaft with multiple options available
- Zero cogging and backlash free
- Life tested in excess of 500 million cycles

3. Cylindrical Housed Linear Voice Coil Actuator

Among the easiest VCA's to integrate into a customer's system. A fully house voice coil actuator (VCA) further expands upon the idea of the semi-housed VCA that incorporates self-aligning bushings and a shaft. This design fully captures the coil assembly to maintain concentricity with the field assembly. An added internal flex circuit protects external moving wires and limits axial travel on both ends of the stroke.

As a single piece, the linear actuator can be mounted on one side and does not require a customer supplied alignment system, making it easy to integrate into applications. Housed voice coil actuators feature all of the inherent advantages of VCA technology, such as direct-drive, zero backlash and cog free operation for accurate motion, as well as high acceleration and use of single phase.

- Designs available with magnet springs and/or latches
- Different shaft options available
- Housing offers additional mechanical and environmental protection
- Single unit that is more easily integrated into customer applications
- Life tested in excess of 500 million cycles

4. Cylindrical Housed Linear VCA with an Integrated Sensor

Housed VCA with an integrated Hall effect sensor. The “Cylindrical housed linear VCA with integrated position sensor” is a housed VCA with an integrated Hall effect sensor. This convenient design enables users to run the actuator in a closed loop, allowing them to directly control the velocity, position, acceleration and/or oscillation of the shaft. In applications where high speed, high reliability, extreme accuracy, and superior performance are vital, this actuator is the perfect match.

Sensata's VCA Developer's Kit pairs this VCA with integrated sensor with a controller, software and cables to allow customers to quickly develop an actuation system and demonstrate a working design concept.

- Easiest VCA to integrate into customer applications
- Resolution of up to 10 microns
- Absolute analog output
- Compatible with several DC servo drive controllers
- Life tested in excess of 500 million cycles

5. Rectangular Linear Voice Coil Actuator

Ideal for long stroke and high force applications. Rectangular voice coil actuators (VCA) are linear VCAs just like the cylindrical models, but are often used for applications that require a higher force and/or a longer stroke. Due to their shape, they can be designed to fit into tighter or thinner systems or optimized for their sheer power and high speeds. Rectangular voice coil actuators feature all of the inherent advantages of VCA technology, such as direct-drive, zero backlash and cog free operation for accurate motion, as well as high acceleration and use of single phase.

- Zero friction caused by moving parts
- Ideal for high acceleration applications
- Offers higher forces than cylindrical actuators based on their size

6. Rotary Voice Coil Actuators

Ideal for high acceleration applications that require angular movement. Rotary voice coil actuators (VCA) are ideal for high acceleration applications that require angular movement. There are two types of designs available: cylindrical and arc-segment. Cylindrical models are typically used in long stroke applications, whereas arc-segment designs are better suited for short stroke and precise positioning. Rotary actuators feature all of the inherent advantages of VCA technology, such as direct-drive, zero backlash and cog free operation for accurate motion, as well as high acceleration and the use of single phase.

- Wide range of torque and excursion angles
- Various mechanical mounting options available
- Arc-segment and cylindrical designs available