
Subject: Motors

Posted by [Wayne Parham](#) on Mon, 10 Jun 2002 06:01:09 GMT

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Spiders can be made having a constant rate or with variable rate. If the spider flexes easy over part of its travel and then harder as it nears maximum travel then it has a variable rate. As for motor configurations, an overhung voice coil is one where the coil form is longer than the magnet's gap and this ensures that a relatively large number of turns remains within the high energy area of magnetic flux. An underhung voice coil is one where the coil is shorter than the gap and it ensures that the coil is completely surrounded by the magnet and that it cannot be moved to a position where any part of the coil receives less than maximum flux. An overhung coil will always keep a portion of its length within the gap. This ensures that the motor enters displacement compression relatively slowly as the driver nears X_{max} . With an underhung coil, the total length of the coil is always within the magnetic gap. This design type is usually associated with high efficiency drivers and motors made this way enjoy increased linearity, reduced distortion and higher efficiency. However, once X_{max} is exceeded, the underhung motor becomes rapidly non-linear, as you might well expect. This is rarely an issue though, because the overall motor/diaphragm system is designed so that X_{max} is not exceeded until other parameters are nearing critical levels as well. But underhung designs are often more expensive, requiring larger and more powerful magnetic structures.
