The Dover Revolution™ XL air bearing spindle from Danaher Motion was developed to meet and exceed the challenging requirements of today’s head & media testing. Extensive work with our customers resulted in the development of a robust spindle with a wide range of operating capabilities. The spindle has extremely low AEM (asynchronous error motion) which is crucial to today’s demanding track densities, and with a <10 ns encoder jitter spec, the spindle is one of the most stable available on the market today.

In addition, each Revolution™ spindle includes Dover's proprietary Conductive Path Architecture, designed to minimize electrostatic discharge (ESD) potential.

A proprietary ultra hard diamond-like-carbon coating is applied to all interior air-bearing surfaces. This coating is highly lubricious and can withstand high-energy loads before failure. This makes the Revolution XL an extremely durable and robust air-bearing spindle, and an ideal selection for use in today’s modern automated factories where uptime is critical.

An optional particle removal ring can be added to the front of the spindle for capturing any minor particulate that may be generated from accidental excessive impact to the rotating spindle while at speed. The particle ring is connected to a vacuum source and the outflow of air from the spindle is drawn down thru the spindle and out to an appropriate location. In the event of particle generation, the particulate is carried harmlessly away with the outflow of air from the spindle.

Dover has advanced the grounding interface between the rotating and stationary spindle components. The rotating contact surface area has been reduced significantly to minimize the surface velocity of the pin /contact interface. Wear of the silver alloy contact is also minimized due to the care taken to assure a highly polished spherical contact pin, free of machining marks that can act as an abrasive. In addition, an optional ground contact removal device is available to disengage the contact for the most sensitive applications that cannot tolerate even the minutest vibrations.

The combined effect of all of these features provides a highly reliable product with superior performance for use in many rigorous and demanding applications.

Available options include Media clamps, Mechanical clamps, Vacuum clamps, as well as pressure actuated clamps. The internal porting allows for both high vacuum flow as well as high pressure for use in unclamping spring activated clamps. A pneumatics module, including filters, regulator, air tank, membrane air dryer and pressure sensor for safety interlock, is available. The Dover DMM 1020 servo control system, offering DSP technology with the Delta Tau PMAC control card, provides precise control of the Air bearing spindle, and can be used to control one additional axis of motion. Additional controller options are available for up to 4 axes of sine-commutated motion.

With thousands of spindles in the field, reliability has proven outstanding and cost of ownership is very low. Contact your Danaher Motion Sales Rep. today at 508-366-1456 and ask for the sales department.
Revolution™ XL Air bearing Spindle

Spindle Specifications:

- Asynchronous Error Motion (AEM) 1 Sigma¹: < 0.5 nm to 10 krpm
  < 0.6 nm to 15 krpm
  < 1.0 nm to 25 krpm

- Speed Range: up to 25 krpm

- Velocity Accuracy²: < 0.005%

- Velocity Stability²: < 0.005%

- Acceleration²: < 2.0 sec to 15 krpm

- Motor 8 Pole brushless dc w/ Hall effects

- Encoder 1024 lpr / TTL Differential outputs
  600Khz max, (LVDS output optional)
  <10nsec Jitter at all speeds, measured from index to A or B channel

Dover Revolution XL Air Bearing Spindle
Asynchronous Error Motion (AEM)

¹ AEM testing is performed at 1.0-inch registration height [taller registration heights will cause performance variation].
² Tested with Dover DMM controller

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