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Shortcuts

 **Systems**

 **Inchworm Motors**

- Configurations
- Controllers
- Technology
- TSE-150
- IW-700 Series
- UHV Series
- ARIS-10/11

 **PZT Actuators**

 **F.A.Q.'s**

 **News**

 **Info. Request**



IW-700 Series Inchworm Motors

IW-700 Series Inchworm Motors

The **IW-700 Series Inchworm Motors** are the foundation of an Inchworm nanopositioning system for ambient or high-vacuum environments.

They can be arranged with position measuring devices, translation stages, or other mounting accessories. They offer standard range of motions of 6, 25 and 50 mm. Like all Inchworm Motors, they feature mechanical resolution of 4 nm over their entire range of motion. Since the Inchworm Motor design is inherently open loop, no direct indication of position can be obtained from the motor unless it is ordered as an IW-710 Series Motor with a built-in optical encoder.

Maximum speed of these motors is specified at 1.5 mm/sec. They also feature a non-rotating shaft and forward and reverse limit switches.

These Motors can support light loads (less than 100 g) that are directly coupled to the shaft. If direct coupling is used, the lateral stability option may be advantageous. It reduces lateral shaft runout from $\pm 1 \mu\text{m}$ to less than $\pm 0.2 \mu\text{m}$. For heavier loads or multi-dimensional configurations, they are often used with translation stages such as Burleigh [TS-100 Stages](#).

As with any Inchworm Motor, the IW-700 & IW-710 Series can be made compatible for high-vacuum environments (10^{-7} torr). Some IW-700 Series Motors can be made without any magnetic parts.

The shaft-mounted integral encoder on the IW-710 Series requires no set-up, installation, or alignment. It directly measures the shaft position with a resolution of $0.5 \mu\text{m}$.

IW-700 Specifications

Max Range of Motion 6,25 or 50mm	Max Axial Load 1.0kg
Motor Resolution ~4nm	Max Lateral Load 0.1kg
Encoder Resolution 0.5 μ m (optional)	Lateral motion \pm 1 μ m (\pm 0.2 μ m with lateral stability option)
Encoder Accuracy \pm 1.5 μ m	Operating temperature 0-50°C
Nominal Speed 4nm/sec to 1.5mm.sec	

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