

Linear Stepper Actuators and Precision Lead Screws for Blood/Dialysis Pump Applications



Different types of syringe and peristaltic pumps are utilized in the medical industry to extract, replace and treat blood in a wide range of applications.

One example is dialysis machines, which mix and monitor dialysate fluid that's used to remove unwanted waste products from a patient's blood. The dialysate fluid also works to restore a patient's electrolytes and minerals to proper levels. Blood pumps pull blood from the access side of the dialysis catheter and return the blood at the same rate of flow. Consistent and accurate flow is important to ensure that the filter will not clot.

For these applications, actuators and precision lead screws are required to drive the pumping action, and to open/close the fluid valves. The challenges & requirements for these applications include:

- Consistent actuator feedback to ensure volumetric efficiency and cycle
- Low rotary backlash / direct drive
- Output shaft radial loading.

Haydon Kerk Motion Solutions has a successful track record providing stepper motor linear actuators and precision lead

screws (in conjunction with rotary hybrid stepper or DC motor/gearmotors) to instrument developers in the medical industry.

Component lifetime and reliability are of paramount importance to instrument developers. HKP's stepper motors and the drive train are specifically designed to run reliably for the life of the instrument, eliminating electromechanical risk factors and unnecessary downtime for repair or exchange.



Lead screw plays a critical role in these applications. Below are 7 reasons why Haydon Kerk Motion Solutions' Lead Screws are a preferred choice for Blood/Dialysis Pump Applications:

- 1. Screw Accuracy:** Haydon Kerk uses a unique precision rolling process for screw manufacturing. Standard lead accuracy for Kerk screws is .0006 in./in. (mm/mm). Lead accuracies are available up to .0001 in./in. (mm/mm).
- 2. End Machining:** Haydon Kerk can custom machine screws to any specification. Lengths can be specified up to 12 ft. (4M) from stock, and they can be cut to a desired length.

- 3. Critical Speed:** or the rotational speed at which a screw may experience vibration or other dynamic problems, is addressed by using a longer lead, with a larger diameter and/or increased bearing mount support.
- 4. Traverse Speed:** HKP's nut materials provide long wear-life over a wide variety of conditions.
- 5. Maximum Load:** Anti-Backlash Assemblies are capable of withstanding exceedingly high loads.

- 6. Torque:** the motor torque required to drive a lead screw assembly is the sum of three components: the inertial torque, drag torque, and torque-to-move load. Kerk Anti-Backlash Assemblies are typically supplied with drag torque of 1 to 7 oz.-in.
- 7. Efficiency:** or the relationship of work input to work output, is one of the hallmarks of Haydon Kerk's Lead Screw Assemblies.

To learn more about Haydon Kerk Motion Solutions' offerings for Blood/Dialysis Pump Applications contact us today.

Headquarters

Haydon Kerk Motion Solutions, Inc
 Haydon Products Division
 1500 Meriden Road
 Waterbury, CT 06705 USA

+1 800 243 2715 (Toll Free)
 +1 203 756 8724 (Fax)
 +1 203 756 7441 (International)
 info.haydonkerk@ametek.com
 www.HaydonKerkPittman.com

Locations

Waterbury, CT
 Milford, NH
 Harleysville, PA
 New District, Changzhou, China
 Jiuting, Shanghai, China

Bouguenais, France
 Pegnitz, Germany
 Bangalore, India
 Suwon-city, Gyeonggi-do, Korea
 Penang, Malaysia
 Reynosa, Tamaulipas, Mexico