

LEE TECH TALK

TECHNICAL APPLICATION NEWS BRIEF

NEW INERT PINCH TUBE VALVE ENABLES FAST SAMPLE SWITCHING AND FLUSHING IN THIRD GENERATION GENE SEQUENCING APPLICATIONS

THE CHALLENGE

The maturity of next generation sequencing (NGS) instruments and constant demand for lower cost and higher throughput sequencing have led to new fluidic challenges that defy tradition. Instrument manufacturers are focused on adding fully automated library preparation and target enrichment to sequencers where precise control and repeatability are paramount. The objectives are the same whether the approach is SBS, nanoball, cPAL, FISSEQ or any other method of massively parallel sequencing: minimize internal volume of fluidic components, and quickly transition between samples and reagents.

THE SOLUTION

The Xover™ internal pinch tube solenoid valve features an innovative Y-shaped elastomer tube in a 3-way configuration. The unique geometry allows for the smallest possible internal volume and an extremely low volume carried over between fluids; this enables efficient switching between samples, reagents, cleaning solutions, or calibrants. Unlike traditional pinch valves, Xover is durable and does not require maintenance during its extensive life cycle. Inert materials in the flow path make the valve suitable for sequencing applications where chemical and biocompatibility are a concern.



Xover improves the fluidic performance of gene sequencers by reducing the time between introduction of primers, terminators, and wash solution; this in turn leads to higher sample throughput and faster sequencing. The low internal volume of the valve also reduces usage of critical fluids, further decreasing sequencing costs. The relatively small size of Xover, as compared to traditional rotary shear valves, enables the development of smaller point-of-care sequencing devices without sacrificing performance. The planar flow path through the valve enables undisturbed flow that stabilizes fluids within the system instead of disrupting them.

THE BENEFITS

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POTENTIAL APPLICATIONS

The Xover solenoid valve can be easily combined with traditional fluidic system components, such as positive displacement pumps, or added to augment the functionality of rotary shear valves. In addition, the valve can be used in vacuum and pressure systems, affording flexibility to system designers who can place the valve wherever it is needed on the system schematic. The versatility of Xover means that it can be used with any NGS technology as it meets the core requirements of these applications and offers tremendous value.

FIELD-PROVEN INNOVATION

The Lee Company has been at the forefront of fluid control technology since 1948, supplying millions of innovative products worldwide from our state-of-the-art manufacturing facilities in Connecticut, USA. We transform complex problems into deliverable solutions through ongoing research, design, development, and our commitment to quality and innovation. Our in-depth application knowledge enables us to collaborate with customers and provide personal, technical support through a wide network of experienced sales engineers who are ready to address any challenge.