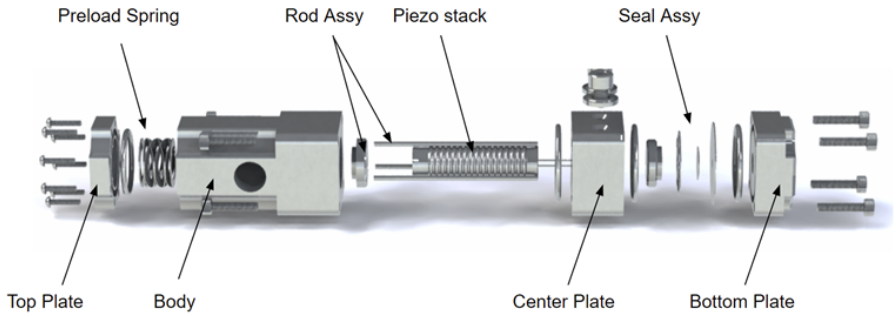
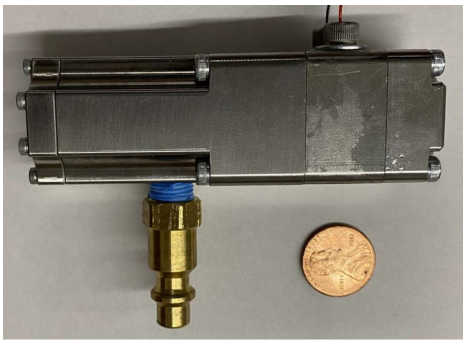
UNIVERSITY OF MINNESOTA
Driven to Discover℠

High performance, highly efficient valves for controlling gas flows

A disruptive pneumatic proportional valve technology has been developed that replaces traditional solenoid actuators with piezoelectric actuators. The valves offer two order of magnitude reductions in power consumption, making them ideal for portable applications. They match the flow capacity of most miniature pneumatic valves. They offer highly linear control regardless of operating pressure. They are the fastest of any available pneumatic valves.

Technology No. 2019-320-2022-120





IP Status: Provisional Patent Application Filed. Related to US Patent #10,330,212; Continuation Patent Application Filed;

Applications

- Mass flow controllers
- Portable medical ventilators
- Aerospace control valves
- Soft robotics
- Remote field applications
- Service in strong magnetic fields
- Generic control valves

Technology Overview

Piezoelectric actuators require near-zero power to hold them at any static position. In contrast, conventional solenoid actuators constantly consume power to hold them at non-equilibrium positions. Piezoelectric pneumatic valves are superior for portable applications, as batteries can be downsized. However, to date, piezoelectric pneumatic valves have gained little commercial acceptance due to low flow capacity, low pressure capacity, or both. The revolutionary UMN valves achieve flow and pressure capacities comparable to common miniature pneumatic valves by combining unique seal or orifice plates with piezoelectric stack actuators. Their control characteristics are superior to solenoid valves, making them ideal for high precision applications such as mass flow controllers.

Phase of Development

TRL: 4-5
Proof of concept prototype available.

Desired Partnerships

This technology is now available for:

- License
- Sponsored research
- Co-development

Please contact our office to share your business' needs and learn more.

Researchers

- **Thomas Chase, PhD** Professor, Mechanical Engineering Department

Licensing Terms

MN-IP Try and Buy

Center for Compact and Efficient Fluid Power (CCEFP) Try and Buy – Available to CCEFP member companies

Try

- Trial period is up to 12 months
- Trial fee is $0; In place of Try fee, a business plan for the Try period is required
- No US patent fees during Try period[1]

Buy

- In place of a conversion fee, a post-Try period business plan is required[2]
- First $1M cumulative sales are royalty-free
- Sublicense freely
- Royalty rate: 2% of Net Sales
- Patent(s) expenses paid by licensee
- Qualified startups: 5% of equity of startup is allocated to University at formation[3]
- Transfer fee for transferring license to a third party - $25,000

Please contact us for detailed term sheet for a Try & Buy agreement as well as guidelines for Try[1] and post-Try period[2] business plans as well as qualified startups[3]

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