

At SEMICON West, Festo Puts Controlled Pneumatics to Work for Higher Wafer Yield and Lower Production Costs

A new digital-pneumatic control reduces particle generation and resource consumption in semiconductor manufacturing.

MASON, Ohio, October 6, 2026 — Semiconductor wafer fab equipment manufacturers are increasingly challenged to develop systems that reduce particle generation, lower energy and inert gas consumption, and improve yield.

At SEMICON West, [Festo](#) features a range of solutions based on [Controlled Pneumatics](#), a new generation of digital-pneumatic valve technology that advances pressure, flow, and motion regulation to deliver greater control over the factors that affect throughput and quality. **Festo Booth #1053, South Hall, Moscone Center, San Francisco, October 13–15.**

Controlled Pneumatics proportional air pressure and flow control deliver low-vibration motion. The level of precision produced by digitally controlled piezo-bender actuators ensures motion that generates fewer particles and extends component service life, helping semiconductor manufacturers improve wafer yield.

Controlled Pneumatics closed-loop control delivers accurate, stable, and linear flow rates – without hysteresis. Repetition accuracy is rated at $\pm 0.25\%$ of setpoint. These digitally controlled valves have a peak particle size per switching cycle of $0.1\ \mu\text{m}$, which is about five times smaller than proportional pressure regulators. Controlled Pneumatics valves use 95% less energy than solenoid valves. Precision closed-loop control lowers compressed air usage by up to 50%.

Reduce particles and extend isolation valve life

Pneumatically actuated isolation valves must open and close quickly as wafers move between load locks and process chambers. Opening and closing isolation valves too aggressively increases impact and vibration, accelerating seal wear and disturbing particles that spread contamination throughout the chamber.

Festo's new Controlled Pneumatics VESC valve creates a motion profile for isolation valves that enables both soft-start and stop operation while delivering rapid movement through the middle part of the stroke. The VESC integrates into existing machine architecture.

At SEMICON West, a three-module wafer-handling display simulates semiconductor processes. In this demonstration, the VESC controls an isolation valve with soft-start/soft-stop motion, allowing attendees to compare Controlled Pneumatics digital precision with typical solenoid valve performance.

Protect wafers while reducing nitrogen consumption

Wafers stored and transported in Front-Opening Unified Pods (FOUPs) require a controlled N_2 environment to protect those wafers from oxygen and particle contamination. Festo's

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Controlled Pneumatics VEFC mass flow controller continuously and precisely regulates nitrogen flow to the application's specified setpoint. VEFC valves can reduce N₂ flow from 20 to 5 liters per minute per FOUP, a 75% reduction over traditional solutions, and can cut total nitrogen consumption at a large fab by up to 18%. Reducing N₂ generation goes directly to the bottom line through savings in electricity usage.

The Controlled Pneumatics VTED multi-channel mass-flow-controller manifold provides proportional flow regulation when multiple FOUP positions must be purged. Rather than installing a standalone controller at each point, OEMs can use a single EtherCAT-connected VTED manifold with 2, 5, or 8 stations to regulate multiple purge points.

The Festo Mass Flow Controller Dynamic booth demo shows the VEFC single-channel and VTED multi-channel units in operation. Digital setpoints, physical flow meters, and illuminated flow paths showcase these units in action.

Bring cleanroom motion to any major control architecture

Controlled Pneumatics precise regulation addresses pressure, flow, and pneumatic motion, but semiconductor manufacturing also relies on electric axes for wafer handling and other positioning tasks.

The Festo ELGD electromechanical linear axis provides precise, low-particle motion. With its vacuum extraction capability, the ELGD axis achieves ISO Class 4 cleanroom suitability according to the ISO 14644-1 standard for cleanrooms and controlled environments.

Paired with Festo servo motors and CMMT-AS multiprotocol servo drives, ELGD axes become part of an electric motion architecture that integrates seamlessly with all major PLC platforms, including Rockwell Automation, Siemens, Beckhoff, and Mitsubishi Electric Automation. ELGD axes can be specified and ordered with motor, cables, and other accessories in as little as 20 minutes by utilizing the Festo Handling Guide Online design tool. All components are sized for the applications and are interoperable.

The wafer handling display in the Festo booth shows an ELGD paired with a CMMT servo drive moving wafers from a FOUP.

Build the skills to keep semiconductor automation productive

Rapid semiconductor industry growth is creating demand for technicians who can operate, maintain, and troubleshoot process equipment. Festo Didactic, the learning arm of Festo, provides vendor-neutral, semiconductor-specific training that combines classroom instruction with hands-on experience. Didactic representatives along with lab-based training equipment round out the Festo SEMICON West booth.

A tech talk on isolation valve automation

During the show, Bradley Shields, Head of Semiconductor Business Development for Festo in the United States, will present: *Precision Isolation Valve Control for Enhanced Process Stability in Semiconductor Tools*. His talk will be held during the Factory Intelligence Starts Here session Tuesday morning from 10:35 – 10:55 on October 13 in the South Hall Upper Mezzanine, Room 154.

OEMs, integrators, and manufacturers attending SEMICON West 2026 should make a point of meeting with Festo applications specialists at Booth #1053, South Hall, to discuss their current automation projects and process improvement and training needs.

Persfoto's



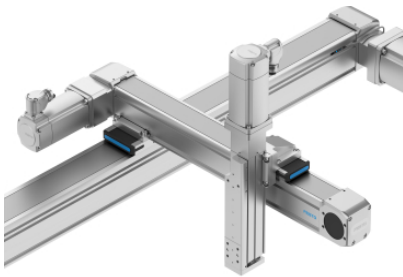
VESC

VESC pneumatic isolation valve controllers feature closed-loop motion profiles that meet a setpoint with low hysteresis and an accuracy of $\pm 0.25\%$.



VEFC

Festo's Controlled Pneumatics VEFC mass flow controller continuously and precisely regulates nitrogen flow to the application's specified setpoint. VEFC valves can reduce N_2 flow per FOUP by up to 75% compared to traditional solutions.



ELGD

The Festo ELGD electromechanical linear axes provide precise, low-particle motion and achieve ISO Class 4 cleanroom suitability.