

A photograph of a male worker in a white hard hat, safety glasses, and a high-visibility vest, leaning over a piece of machinery in a factory. He is holding a clipboard and looking at it with a slight smile. The background is a blurred industrial environment.

AIRFLOW CONTROL FOR BATTERY MANUFACTURING

Enhancing quality, environmental efficiency,
and manufacturing flexibility in battery
manufacturing cleanrooms.

REIMAGINE YOUR FACILITY'S AIRFLOW CONTROL CAPABILITIES

Demand for batteries is growing and will continue to grow thanks to increased consumer demand for electric vehicles (EV), automaker commitments, and growing utility grid-scale power storage projects – all of which are supported by government regulations and incentives. As the demand for electric vehicles continues to surge, battery manufacturing plants must tailor their facility design to maximize production capacity and efficiency while optimizing product yields and quality.

Battery manufacturing requires precise environmental control to reduce impurities and contaminants and regulate humidity to improve battery range and lifespan. Contaminants and particulate from materials (biological or non-biological), machinery, off gassing, and employees can contaminate the environment, compromise battery quality, and pose environmental safety risks.

Airflow control technology for high-purity manufacturing environments has evolved to do much more than simply keep your systems running. Adopting a new airflow control strategy can help you gain a competitive edge and maximize the performance of your critical manufacturing environment. Keep reading to explore the ways in which you can work toward enhanced battery quality, improved production yields, and achieved sustainability goals.

BEST PRACTICES FOR EV BATTERY MANUFACTURING CLEANROOMS

- ✓ Particulate control with ISO class between 5-8 depending on space use
- ✓ Support space humidity control with 1-5% RHH
- ✓ 20-40% relative humidity (1-5% in support spaces)
- ✓ Temperature setpoint 68-77 degrees Fahrenheit 20-25 degrees Celsius
- ✓ Monitoring sensitive areas for Points of Creation (POC) and Points of Degradation (POD)
- ✓ **Demand based ventilation through a variable air volume approach vs. constant volume approach.**



THE PHOENIX CONTROLS DIFFERENCE

Battery production facilities demand a specialized approach to airflow control. Phoenix Controls' integrated HVAC solutions keep environmental factors consistent with repeatable accuracy, reliability, and precision. Learn how our demand-based ventilation approach provides reliable pressure control and versatility.



CONTAMINATION CONTROL

Monitor and respond quickly to particulate matter (PM) surge or contamination and adjust ISO Class criteria or air exchange rate within seconds - all without having to rebalance the pressurized zone.



CONSISTENT PRESSURIZATION

Reduce system downtime and maintain¹ clean space standards with reliable and repeatable pressurization - even when repurposing or switching of ISO class space.



FLEXIBLE PRODUCTION SPACES

Easily adapt functional areas to meet changing demands or trends with our adjustable control measures.



IMPROVED PRODUCT QUALITY

A lack of environmental quality management can lead to lower product quality, shorter range, and shorter life batteries. The Phoenix Controls system provides constant monitoring and enables active management helping to prevent contaminants and debris from coming in. Automated zone balancing, precision temperature, and humidity control can contribute to improved output.



SUSTAINABLE PRACTICES

Capitalize on **federal funding¹** and **tax breaks²** when you align your manufacturing processes with sustainable best practices. Phoenix Controls can help battery production facilities improve their bottom line without compromising sustainability or employee health.



MONITOR AND REPORT

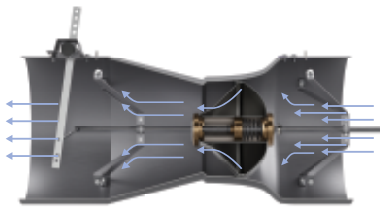
Phoenix Controls provides intuitive access to your facility's data enabling easy identification of deviations and aiding root cause analysis. Facility operators can leverage this information to optimize critical environments like never before, ensuring top-notch performance, productivity, and efficiency. Phoenix Controls' BACnet MS/TP communication protocol and BAS agnostic solutions allows you to integrate with the building management system of your choice.

¹ <https://www.congress.gov/bill/117th-congress/house-bill/4346>

² https://afdc.energy.gov/laws/409?utm_medium=email&utm_source=govdelivery

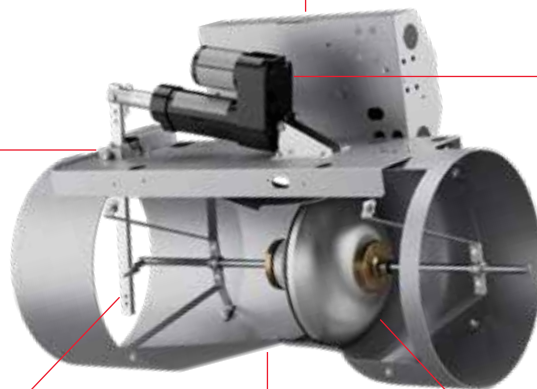
HOW WE DO IT: OUR VENTURI VALVE

The Phoenix Controls venturi valve lies at the heart of air pressure control for critical spaces requiring strict tolerances in pressure setpoints. It does this with a unique spring-controlled restrictor allowing it to constantly react to static pressure changes in the ductwork. Virtually maintenance-free, Phoenix Controls venturi valves arrive pre-characterized for your application. No measuring or balancing required.



Potentiometer gives feedback to Actuator when targeted position is reached

Pivot arm moves cone assembly in or out of the venturi according to demand setpoint



Venturi valve body

Specific flow/position curve, created during calibration is saved on valve controller board

Actuator moves the cone to defined position - if required, within 1 second after command

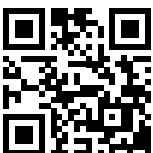
During pressure changes, Cone position is adjusted independently from the actuator by a mechanical spring

ABOUT PHOENIX CONTROLS

Since 1985, pharmaceutical companies, universities, hospitals, government research facilities, and industry have turned to Phoenix Controls for precision airflow control systems for critical environments. When you work with Phoenix Controls, you'll gain access to an experienced global network of dealers and system integrators with a singular focus on critical environments and their operators.

GET STARTED

Unlock the potential of your EV battery manufacturing facility. Contact a Phoenix Controls partner today to explore how our tailored environmental airflow control solutions can improve production yields. Together, let's reimagine your facility's air control capabilities and pave the way for a sustainable future.



Contact a Phoenix Controls representative to learn how to ensure precision airflow control.

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