Detroit Engineered Products (DEP) is an engineering services, product development, software development, consulting, and talent acquisition company. Since its inception in 1998 in Troy, USA, DEP has expanded globally, with operations in Europe, China, Korea, Japan, and India. DEP employs an accelerated and transformed product development process, facilitated by our proprietary platform, DEP MeshWorks, which significantly reduces the development time of products across various industries.

DEP (Detroit Engineered Products) specializes in delivering advanced solutions for detecting thermal runaway in batteries. Traditional indicators such as smoke emissions, temperature escalation, and pressure changes can serve as signals of thermal runaway onset. However, our thermal runaway sensors are meticulously engineered to precisely detect the ionization of gases released prior to thermal runaway, enabling swift intervention to mitigate potential risks. Thermal runaway, typically instigated by internal short circuits within cells, induces a rapid temperature surge due to excessive current flow. This elevation triggers the release of high-temperature gases and excessive heat from the cell, potentially culminating in fires or explosions.

Safety is our top concern when dealing with the challenges of thermal runaway. Early detection and prevention are crucial for avoiding potential disasters. These measures not only improve safety but also help maintain continuous operations, meet regulatory requirements, and reduce financial risks related to repairs, liabilities, and product recalls. By focusing on proactive steps, we effectively manage these challenges and ensure the reliability of lithium-ion batteries in electric vehicles.

DEP

Smarter solutions. Realized.

Thermal Runaway Sensor

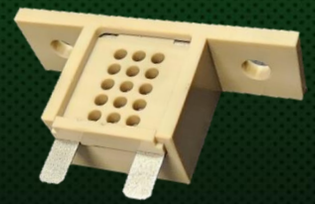
Advanced IC Thermal Runaway Sensor

- Tailor-made for cell, module or pack integration
- Early detection of thermal event
- Low cost and suitable for high volume applications

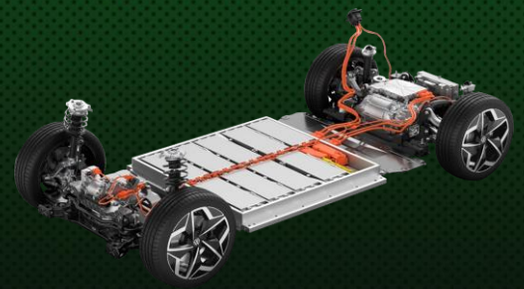
Detecting thermal runaway in battery packs is essential for meeting safety and regulatory standards.

Thermal Runaway Sensor

Early gas release detection prior to thermal runaway.



Our processing unit monitors the signal and immediately alerts the Battery Management System (BMS) that thermal runaway is imminent.



Fundamental importance of battery safety

- **TR sensing backbone for battery safety:**
  Provides crucial insights and early warnings.
- **Constant and vigilant monitoring:**
  Identifies potential issues promptly.
- **Sensors enable timely preventive intervention:**
  Averts safety risks effectively.
- **Meets regulatory and safety standards:**
  Important for adherence and certification.

Customization Options:

Our conditioning and amplifying unit can connect up to 6 sensors with **Integration options**

- Shape and Dimensions of our sensors can be made to the customer's specifications
- Attachment or fixture of sensors to location can also be designed to requirements
- Conditioning unit can be integrated into the customer system

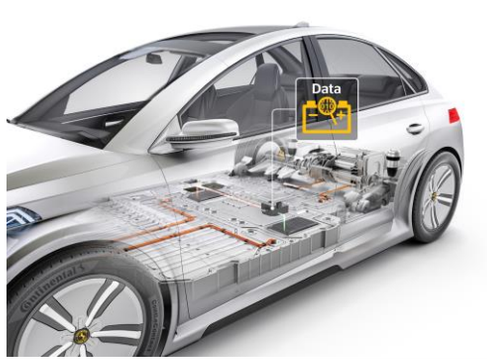
Advantages of Thermal Runaway Sensor:

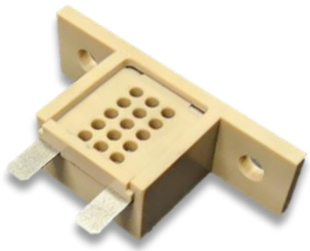
- **Exceptional Performance:** Our sensor network delivers outstanding performance, guaranteeing swift responses and reliable detection of gas vents during thermal runaway events.
- **Rapid Response:** With our sensors, you can expect quick reactions to thermal runaway situations, enhancing safety and minimizing potential damage.
- **High Reliability:** Our sensor network offers high reliability, providing dependable gas venting detection capabilities even in challenging conditions.
- **Mitigation of Drawbacks:** Our sensors address the limitations of sensing technologies, ensuring a more robust and accurate solution for early identification and prevention of thermal runaway incidents.
- **Robust Solution:** By overcoming drawbacks, our sensors offer a resilient solution, increasing confidence in the safety and performance of battery systems.
- **Proactive Safety:** Swift response to thermal runaway events.
- **Reliable Operation:** Long-lasting sensor with low power consumption.

Key features

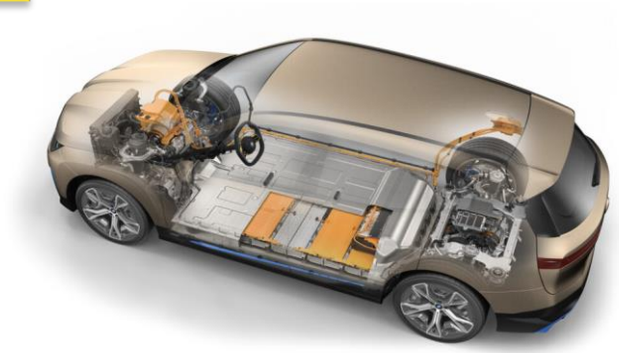
- **Fast Response Time:** Quick detection of ionization during thermal runaway.
- **Accurate Measurement:** Precise monitoring of Li-ion gas release.
- **Real-Time Detection:** Monitors the ionization of Li-ion gases during thermal runaway.

IC TR Sensor





Conditioning unit



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