



WE ENABLE **CLEAN ENERGY**

Sensing and Safety Solutions
for Electric Vehicles

Honeywell

BATTERY MONITORING SUITE

Honeywell sensors and switches for electric vehicles bring the best combination of performance and reliability. Honeywell is pleased to support the transition to a sustainable future.

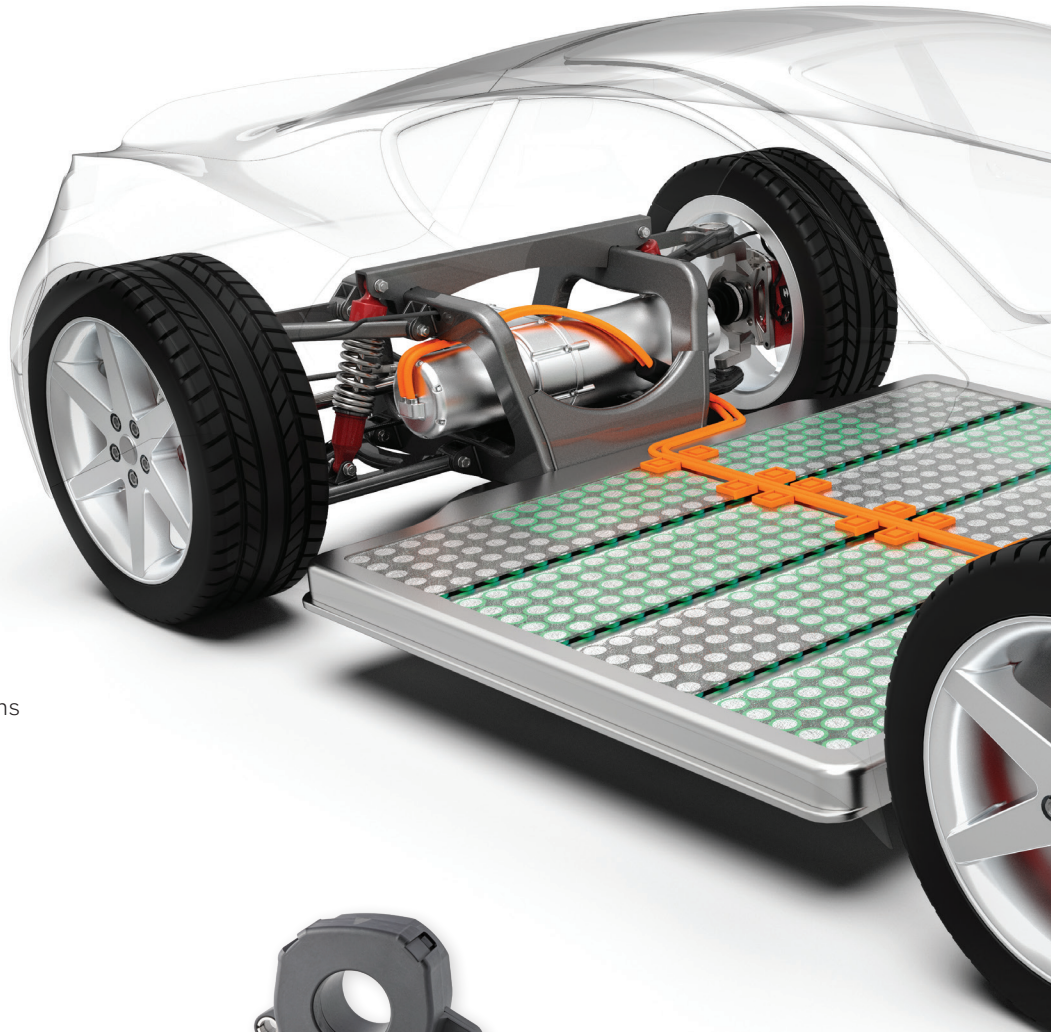


Current Sensors for Battery Management

CSNV Series

- ± 500 A: Closed loop sensing*
- ± 700 A: Closed loop sensing
- ± 1500 A: Advanced closed loop sensing*
- High accuracy and low temperature drift
- Excellent performance in diverse magnetic environments
- CAN Bus output with ID options
- Diagnostic functionality
- Designed for battery management systems

*CSNV700 Series available, other Series coming soon.



Current Sensors for Motor Control and Fault Detection

CSHV Series

- ± 100 A to ± 1500 A
- Open loop sensing
- Analog voltage output
- High accuracy and low temperature drift
- Fast response time
- Designed for current measurement in energy storage systems
- Designed for leakage detection and fault isolation in battery charging systems

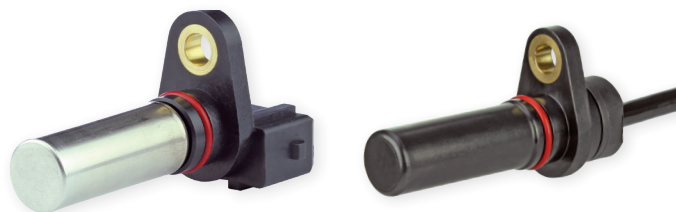


Current Sensors for Safety Critical Applications

CSSV Series* (Designed to meet ASIL-C requirements)

- ± 1500 A
- Dual channel sensing method
- High accuracy and low temperature drift
- Excellent performance in diverse magnetic environments
- CAN Bus output with ID options
- Diagnostic functionality
- Designed for safety critical applications

*Series coming soon.



Hall-effect Digital Sensors for Speed and Position Detection

SNG-S & SNDH-H Series

- Reports speed information
- Back-biased Hall-effect technology
- Zero speed detection
- O-ring seal
- Moisture ingress protection rated to IP69K
- Speed sensing in gears and shafts in wheels, transmissions, hydraulic motors, pumps and gear boxes

SNDH-T & SNG-Q Series

- Reports speed and direction information
- Dual differential Hall-effect technology
- Air gap up to 2 mm [0.08 in]
- Short circuit and reverse voltage protection
- Open collector output
- Automotive under-the-hood packaging
- Speed and direction sensing in gears and shafts in transmissions, hydraulic motors, pumps and gear boxes

Battery Safety Sensors for Thermal Runaway Detection

BPS Series



- Pressure sensing principle
- Detects pressure changes in Lithium-ion battery packs
- Settable warning threshold for absolute pressure monitoring
- CAN Bus output with ID options
- Different operating modes including ECO mode

BAS Series



- Light scattering principle
- Detects particulate matter such as smoke in Lithium-ion battery packs
- Early detection of thermal runaway event
- CAN Bus output with ID options
- Different operating Modes including ECO mode

BATTERY MONITORING SUITE

A suite of sensors for battery management systems, electric drive control, energy storage systems and battery safety applications.

CURRENT SENSORS BATTERY MANAGEMENT



CSNV500 Series*
CSNV700 Series
CSNV1500 Series*
CSSV1500 Series*



CSHV Series

Motor control and fault detection

Battery management

TECHNOLOGY

- Honeywell offers different sensing methods to deliver the best combination of performance and value. The advanced closed loop method delivers higher levels of accuracy, enabling the optimization of battery systems. The open loop sensing method delivers cost effective current sensing where fast response time is desired

VALUE TO THE CUSTOMER

- Designed to enable precise battery state measurement for improved user experience
- High accuracy enables battery safety and extended battery life
- Dual sensing channel increases overall system redundancy
- Magnetic immunity allows for easy integration into applications where magnetic stray fields may be present
- Solutions may be tailored to exact specifications for improved time to market, lower total system costs, and enhanced reliability.

APPLICATIONS

- Current measurement for battery management systems in electrified vehicles (EV, HEV, PHEV, BEV)
- Current leakage detection and fault isolation in battery charging systems
- Current measurement in energy storage systems
- Fault detection in heavy industrial equipment

**CSNV700 Series available, other Series coming soon.*

SAFETY SENSORS

THERMAL RUNAWAY DETECTION



BAS Series
Battery safety aerosol sensor



BPS Series
Battery safety pressure sensor

TECHNOLOGY

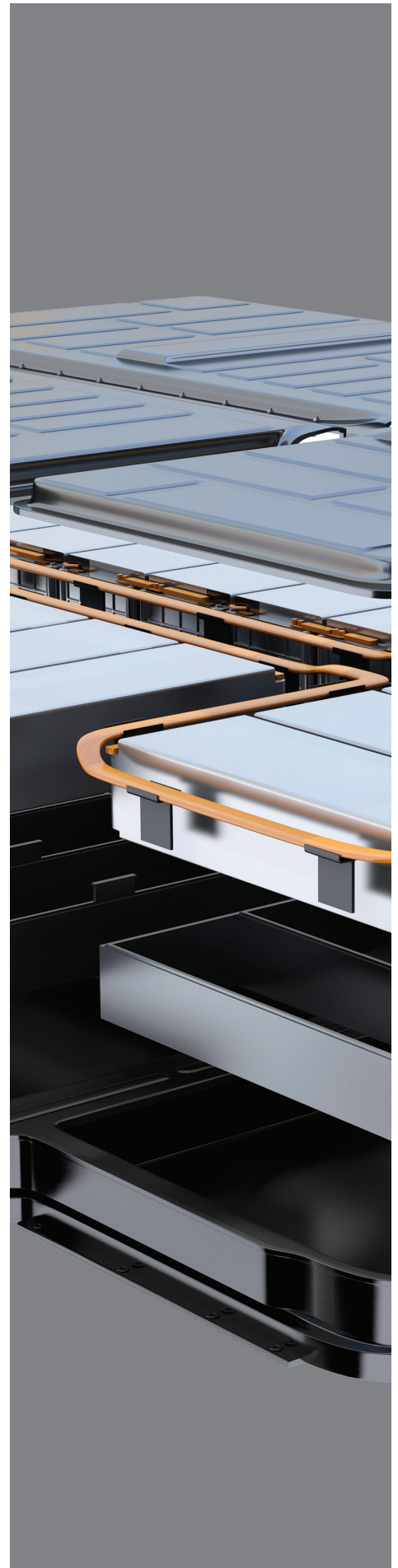
- Honeywell offers different sensing methods for detecting thermal runaway events in lithium-ion batteries. The Battery Safety Aerosol Sensor uses the **principle of light scattering** to detect presence of aerosols (particulate matter) while the Battery Safety Pressure Sensor uses MEMS (Micro-Electromechanical System) and ASIC (Application-Specific Integrated Circuit) technologies to detect transient pressure changes in the battery packs of electric vehicles.

VALUE TO THE CUSTOMER

- Early detection of thermal runaway event allows for the mitigation of loss of life and property
- ECO mode enables continuous system monitoring in low power mode
- Thermal runaway detection sensor allows compliance with international regulations and recommendations
- Solutions may be tailored to exact specifications for improved time to market, lower total system costs, and enhanced reliability

APPLICATIONS

- Thermal runaway detection in lithium-ion battery packs for electric vehicles and in energy storage





FOR MORE INFORMATION

Honeywell Sensing and Safety Technologies services its customers through a worldwide network of sales offices and distributors. For application assistance, current specifications, pricing, or the nearest Authorized Distributor, visit sps.honeywell.com or call:

USA/Canada	+302 613 4491
Latin America	+1 305 805 8188
Europe	+44 1344 238258
Japan	+81 (0) 3-6730-7152
Singapore	+65 6355 2828
Greater China	+86 4006396841

Honeywell

Sensing and Safety Technologies

830 East Arapaho Road
Richardson, TX 75081
www.honeywell.com

Warranty/Remedy

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgment or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items that Honeywell, in its sole discretion, finds defective.

The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.

While Honeywell may provide application assistance personally, through our literature and the Honeywell web site, it is customer's sole responsibility to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this writing. However, Honeywell assumes no responsibility for its use.