Battery Monitoring Sensor

By attaching to the negative post of a lead battery, the sensor monitors the charging and discharging current, voltage and temperature of the battery at a high level of precision. It provides battery information important for power management of vehicles. In this way, the product helps to boost mileage and reduce CO₂ emissions by avoiding dead battery as well as charge controlling and idling stops.

What is a battery-monitoring sensor?

While current sensors have a function for outputting measurement values of the current (voltage and sensor temperature), battery-monitoring sensors detect and output the charging rate (SOC), discharging performance (SOF), remaining capacity (SOH) and other factors indicating the lead battery status, based on measurement values. They also estimate the restarting performance at times of idling stop and the discharging capacity at times of operation at high power.

Product features

Feature: high-precision detection of battery status

The unique detection algorithm has been configured based on abundant experience and knowledge in automotive lead batteries, enabling high-precision detection of battery status.

Benefits when used with non-idling stop vehicles

- Mileage improved by 4% compared to vehicles not equipped with the sensor. (Test values by our company)

Benefits when used with idling stop vehicles

- Improved mileage
- Reduced CO₂ emissions

Detection accuracy of SOC and SOF

<table>
<thead>
<tr>
<th>Item</th>
<th>Our method</th>
<th>General method</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC detection accuracy</td>
<td>±10% (High-speed estimation of stable OCV*, using actual equipment)</td>
<td>About ±15% (Direct reading of terminal voltage, in desktop experiment)</td>
</tr>
<tr>
<td>SOF detection accuracy</td>
<td>±0.5V or less (Impedance active estimation, using actual equipment)</td>
<td>About ±1.5V (Passive measurement, in desktop experiment)</td>
</tr>
</tbody>
</table>

* OCV: open circuit voltage (Open voltage)
**Structure**

Negative post of battery
Opposite tightening direction may also be set

Tripolar connector (For +B, Lin, and internal resistance)

Product size: 81W×73L×26Hmm
Product weight: about 80 g

**[Sensor grade]**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Method to detect internal resistance</th>
<th>Detected items</th>
<th>OCV</th>
<th>SOC</th>
<th>SOF</th>
<th>Battery temperature</th>
<th>Compatibility with HEV and EV</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Starter startup current</td>
<td></td>
<td>○</td>
<td>○</td>
<td>X</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>B</td>
<td>Pulse discharge current</td>
<td></td>
<td>○</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

* OCV: open circuit voltage (Open voltage)

**Specifications**

**[Major common specifications]**

<table>
<thead>
<tr>
<th>Environmental properties</th>
<th>Storage temperature range</th>
<th>Operating temperature range</th>
<th>Operating voltage range</th>
<th>Current consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>−40 ~ 105°C</td>
<td>−40 ~ 105°C</td>
<td>6 ~ 16V</td>
<td>When operating: 10mA typ</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>When not operating: 1mA or less</td>
</tr>
</tbody>
</table>

**[Telecommunication specifications]**

As per LIN 2.0

**[Connector specifications]**

Tripolar (for measuring +B, LIN and internal resistance)
Waterproof 025 size

JIS D 05301/SAE J537/DIN 72311

**[Measurement items (Accuracy)]**

- Current: 1mA to 1,500A <±1%>
- Voltage: 6V to 16V <±0.2%>
- Micro computer temperature: −40°C to 105°C <±4%>

**[Detected items (Accuracy)]**

- OCV <±0.1V>
- SOC <±10%>
- SOF <±0.5V>
- Battery internal resistance <±0.5mΩ>
- Battery temperature <±10°C>

**[Operation-checked batteries]**

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Furukawa Battery</td>
<td>55B23</td>
</tr>
<tr>
<td>GS-YUASA</td>
<td>70D23</td>
</tr>
<tr>
<td>Panasonic</td>
<td>80D26</td>
</tr>
<tr>
<td>JCI</td>
<td>L1</td>
</tr>
<tr>
<td></td>
<td>L2</td>
</tr>
</tbody>
</table>

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