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GS Yuasa Corporation



**GS Yuasa's Lithium-ion Battery Chosen for
Kinki Sharyo's "Smart BEST" Battery-powered Railway Vehicle**

GS Yuasa Corporation (Tokyo Stock Exchange: 6674) announced today that its storage battery railway vehicle drive system using industrial lithium-ion battery module LIM30H-8A has been chosen by The Kinki Sharyo Co., Ltd. (Tokyo Stock Exchange: 7122) to power its "Smart BEST" self-charging battery-powered trains.

GS Yuasa and Kinki Sharyo collaborated on the development of the lithium-ion battery drive system for the "Smart BEST" series of railway vehicles. The system combines GS Yuasa's lithium-ion batteries, whose high charge-discharge current makes them ideal for railway applications, with Kinki Sharyo's sophisticated railway vehicle technologies to create the energy-efficient, highly advanced "Smart BEST" series of self-charging battery-powered trains.

"Smart BEST" comprises a small diesel engine generator used as a power source and high-capacity lithium-ion batteries. The system boasts highly-efficient recharging, as the high-capacity batteries are utilized for drive power and the diesel engine generator is used only to replenish discharged electricity. As a result, the per-vehicle engine output can be reduced by between a quarter to a third compared with the output of conventional railway vehicle diesel engines. The self-charging, battery-powered "Smart BEST" railway vehicles developed by Kinki Sharyo are now being tested by West Japan Railway Company on its Sanin Line.

Currently, a number of leading railway operators are conducting field tests on environmentally friendly railway vehicles equipped with storage batteries. In the future, the technology is expected to be adopted for mass-produced railway vehicles. GS Yuasa will continue to contribute to lowering the environmental burden by promoting the expanded adoption of industrial-use lithium-ion batteries for railway vehicles and stationary power storage systems for railway operations.

Features of the LIM30H-8A Lithium-ion Battery Module

1. High current charge/discharge performance

The maximum current capacity is 600A and the continuous current capacity is 100A, which ensures stable charge and discharge performance.

2. High input-output performance and longer operating life through reduced internal resistance

3. Lightweight, compact design

The use of plastic resins in the outer module casing enables a lightweight, compact design. The plastic resins have superior insulation properties, enabling them to be used even under high voltage conditions.

4. Standard battery-monitoring system to continuously monitor battery status

A proven battery-monitoring device for industrial-use lithium-ion batteries is a standard feature. The device continuously monitors the voltage of all cells as well as the module temperature. The device has a function to send battery data to the charging device and the system.

By adding a GS Yuasa battery management unit (BMU), battery data can also be output to external devices.

LIM30H-8A Lithium-ion Battery Module Specifications

| | | | |
|------------------------|-----------------------|------------------------------|---|
| Dimensions (mm) | W:231 x D:389 x H:147 | Mass (kg) | approx. 20 |
| Nominal voltage (V) | 28.8 | Nominal voltage per cell (V) | 3.6 |
| Capacity (Ah) | 30 | Operating voltage range (V) | 23.2 ~ 33.2 |
| Maximum current (A) | 600 | Direct current (A) | 100 |
| Temperature range (°C) | 0 ~ 45 | Monitoring device | All-cell monitoring; Module temperature monitoring |

Images

1. LIM30H-8A Lithium-ion Battery Module



2. Kinki Sharyo's "Smart BEST" Self-charging, Battery-powered Train

