

November 1, 2023

Meidensha Corporation

To members of the media

Lithium-ion battery system for power grid sold to NTT Anode Energy, Kyushu Electric Power, Mitsubishi Corporation

Meidensha Corporation (Meiden) has installed its new type of power conditioning system (PCS) for lithium-ion batteries*¹ in a power storage system*² in Fukuoka Prefecture that is operated as part of a joint project involving NTT Anode Energy Corporation, Kyushu Electric Power Co., Inc. and Mitsubishi Corporation.

The power storage system, located in Kawara town, Tagawa-gun, became operational in July 2023, and is expected to contribute to stabilizing the power grid. Meiden has also installed lithium-ion batteries manufactured by GS Yuasa Corporation.

The three-company joint project is aimed at effectively using renewable energy, which is subject to output control when the power supply exceeds demand. This will promote decarbonization and result in the creation of a new modality to adjust the power supply/demand balance.

The project has been adopted for a subsidy program by the Agency for Natural Resources and Energy ("Project to Support the Introduction of Grid Storage Batteries, etc., to Accelerate the Introduction of Renewable Energy," a supplementary budget in 2021), as a way of attaining carbon neutrality, which is being promoted by Japan. The system will also be used for demonstrations for building a business model that purposes to minimize the amount of solar power output curtailment and enable the multi-use of grid storage batteries through transactions in electricity markets and other means.

The PCS that Meiden developed for the three-company project comes with functions that make it compatible with balancing market systems when it is operated in tandem with external systems owned by business operators.

Meiden is committed to realizing a more affluent society in the future by helping realize

decarbonization through efforts to make renewable energy a main source of energy and stabilize the power grid.

<System exterior>



Lithium-ion battery system installed in Kawara town, Tagawa-gun, Fukuoka Prefecture

<Features of Meiden's PCS for lithium-ion batteries>

- **Improved functions to respond to transactions in electricity markets and output control (Capable of responding to charging and discharging power on external command)**

The PCS will store and discharge power based on commands from external control systems when it is used to adjust the balancing market. It is expected to meet the requirement of the primary option that a PCS must have an exclusive line of control to store and discharge in order to respond to fluctuations in the output line of the PCS.

- **One integrated unit comprising the PCS, controller, power receiving component and transformer for other power sources (6.6V)**

The rated capacity of the PCS is between 0.7MVA and 2.1MVA. The 6.6kV component for receiving electric power is integrated, making it easier to connect to high-voltage power distribution grids such as power storage stations.

- **Independent operations**

The PCS is capable of supplying power from the power storage system to facilities used in emergencies, as stipulated in BCPs, even during blackouts caused by

problems and accidents in the power grid. It is capable of independently operating in parallel up to 2.1MVA.

■ **Virtual synchronous generator (VSG) function**

Its inverter is capable of supplying levels of inertia force^{*3} and synchronization force^{*4} equivalent to conventional synchronous generators. It uses the grid forming method (GFM), making it possible for the PCS to act as the sole power supply source in a power grid. It can also be operated in parallel with other voltage sources such as generators. Meiden is scheduled to complete the required development in order to equip the VSG function with the same type of PCS used for the three-company project during fiscal 2025.

<Meiden's services>

As a manufacturer of PCSs for large storage batteries, Meiden has a long history of delivering PCSs in combination with storage batteries made by various manufacturers. Meiden has installed PCSs at approximately 140 sites since 1996. Meiden is capable of handling the entire process of designing, manufacturing and providing maintenance for PCSs.

<Outline of equipment>

Power conditioning system (PCS)	Equipment capacity	1.4MVA
	Rated AC output voltage	6.6kV
Battery	Type	Lithium-ion battery LEPS-2-14
	Capacity	4.2MWh
	Size	2,350mm(W), 9,400mm (L), 2,800mm (H)
	No. of containers	2

*1: Please refer to the Meiden press release dated March 13, 2023, titled “Meiden completes development of new power conditioning system for lithium-ion batteries to help create a decarbonized society and better respond to power demand”

*2: Please refer to the press release dated July 19, 2023, and released by NTT Anode Energy Corporation, Kyushu Electric Power Co., Inc. and Mitsubishi Corporation titled “Launch of joint project to effectively utilize solar power by grid-scale battery storage.”
NTT Anode Energy Corporation
Kyushu Electric Power Co., Inc.

Mitsubishi Corporation

*3: Inertia force: The force to maintain the frequency level in the power grid. The greater the inertia force, the fewer frequency fluctuations (in range and speed) there are likely to be when there is an uneven balance between the supply and demand of electricity.

*4: Synchronization force: The force to recover the original state when there is a disruption to the synchronous state, in which synchronous generators are operated in parallel.