

## ■ Preservation of the Global Environment as Envisioned by Sanden

The Sanden Group is working to resolve social issues by following a management policy based on leveraging “global capabilities” and “quality capabilities” to realize an additional surge in corporate growth centered on core businesses providing environmentally-friendly products. Our efforts are focused on enacting global-scale initiatives that target achievement of sustainable development goals (SDGs).



Automobiles that are so indispensable to our social lives are becoming increasingly diverse, moving from primarily gasoline and diesel-powered vehicles to more environmentally friendly hybrids, plug-in hybrids, electric vehicles (EVs), and fuel cell vehicles.

Thanks to our global reach as well as the advanced and unique nature of our products, our Automotive Systems Business is contributing to the enhanced popularity and use of low environmental impact vehicles. Use of our heat pump systems and electric compressors, which can be used in electrified vehicles, is contributing to preservation of the environment as well as the advancement of the automotive industry.



Social issues having an impact on the distribution industry include the aging of society and the declining birthrate, as well as food safety and security, and reducing food loss.

Commercial Store Systems Business provides support to food distribution businesses, primarily in the retail-store systems and vending machines sectors. In addition to the production and sales of vending machines and beverage vending machines which serve to offset the adverse impacts from the labor shortage, the Sanden Group is committed to resolving social issues through the global development of cold chain systems that continuously maintain temperatures throughout the distribution process in order to minimize food losses and ensure food safety and security. We have also launched products for micromarkets, which are unmanned outlets with automated payment systems.

### Automotive Systems Business

As environmentally friendly vehicles such as hybrids and electric vehicles become increasingly prevalent, Sanden Automotive Systems Business is focused on developing technologies in car air-conditioning systems and compressors for car air-conditioning that contribute to preservation of the environment while simultaneously providing for a more comfortable interior.

More specifically, we are contributing to increased comfort and the protection of the environment through the development of heat pump air-conditioning system for electric vehicles, an Integrated Parking Cooling (IPC) system, a heat pump system that resolves the issue of reduced mileage in an electric vehicle when the heater is being used, a CO<sub>2</sub> compressor using a natural refrigerant, which is a low global warming potential refrigerant, and electric compressors that provide the comfort of air-conditioning and heating in electric vehicles without relying on the engine drive.

One of the most pressing issues among the auto manufacturers is improving fuel efficiency. By pursuing energy saving technologies and reducing the size and weight of compressors, we are working to not only improve fuel efficiency, but also reduce environmental impact on an overall basis.



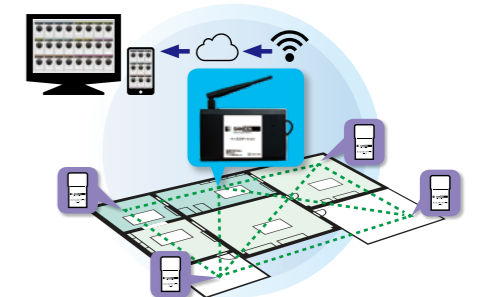
Electric compressor



CO<sub>2</sub> compressor



Heat pump system for electric vehicles



Temperature and humidity monitoring and maintenance service (e-mesh moderno)



Unmanned micromarkets

### Commercial Store Systems Business

In addition to the existing technologies we have built up in vending machines as well as in convenience store product, systems, and service operations, the Sanden Group is focused on the realization of next-generation global solutions in the field of IoT, including temperature and humidity monitoring devices.

More specifically, we are promoting cold-chain systems, in which items such as fresh foods are transported from the production site all the way through to consumption in a constant refrigerated or frozen state. We have introduced the “e-mesh moderno” system, a temperature and humidity monitoring and maintenance service that allows visualization of food safety and security by maintaining appropriate temperatures and humidity for products in the storage, transportation and sales stages. These types of temperature management systems are becoming increasingly common in the restaurant and medical fields as well.

With the aim of alleviating the effects of the labor shortage, we have been developing unmanned micromarkets in North America and developing labor saving self-payment stores and unmanned stores using vending machines in Japan.

In addition to the development of these new markets and new products, we established service and maintenance companies in South Korea and Thailand in fiscal 2017 as part of our effort to bolster our global service and maintenance system. Our efforts also include measures aimed at ensuring food safety and security in Southeast Asia.



The cold chain system that contributes to sustained freshness