News Release

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Nissin Electric Co., Ltd.

Development of Corrosion Detection Sensor
—Offering Further Reassurance and Safety through "Visualization" of Corrosion Risk in Electrical Devices—

Nissin Electric Co., Ltd. has developed a "corrosion detection sensor" as part of its multiple environment sensor series. This new sensor, which completed the development process in November 2020, enables the "visualization" of corrosion caused by corrosive gas (hydrogen sulfide) in the installation environment of electrical equipment to facilitate the prevention of electrical device failures. This product contributes to the realization of reassurance and safety. From April 2021, we will start installing this new sensor in our electrical equipment for waterworks (e.g., switchgear and supervisory control system).

In March 2015, we launched a series of multiple environment sensors MES-01/12/13 which enable recording and remote monitoring of environmental data as well as automatic control of air conditioning in industrial facilities, such as plants, switchgears, and electric rooms and detecting electrical equipment maintenance (cleaning) time. This series has acquired a good reputation as ideal devices for monitoring an equipment environment. The cumulative shipments for this series are expected to reach 2,500 units by the end of this fiscal year (FY2020). As a further expansion of our lineup of multiple environment sensor series, we developed the corrosion detection sensor this time.

In recent years in Japan, an ongoing labor shortage due to the declining birthrate and aging population makes it difficult for facility managers to secure the human resources required for electrical equipment maintenance. Some electrical equipment is installed in facilities where corrosive gas is generated, such as water and sewerage facilities. Corrosive gas can cause failures in parts including printed circuit boards used in electrical devices. For this reason, conventionally, the presence of corrosive gas in the installation environment of the electrical equipment has been investigated in advance as necessary. Based on the investigation results, anticorrosion measures have been taken before we hand it over to customers. Also, regular inspections have been conducted for the purpose of preventing failures.

The corrosion detection sensor developed this time continually monitors the risk of corrosion caused by corrosive gas, enabling the detection of the risk of failure in electrical devices in advance and the prevention of failure as well as contributing to the optimization of maintenance timing and the achievement of labor saving. The sensor head of this product consists of a light source, a reflector, and a photo sensor. The sensor detects changes in the reflectance of the light source caused by discoloration of the reflector made of silver. Silver has the property of being corroded and discolored by hydrogen sulfide contained in corrosive gas. Sensing changes in the reflectance caused by discoloration allows detection of the risk of corrosion and the timing of appearance of failure in the printed circuit board in advance.

From FY2021, we will install this product in our equipment for waterworks to contribute to improving the reliability of the equipment. We will continue to improve our lineup of multiple environment sensors and to develop diagnostic technologies so that we can contribute to the building of more intelligent maintenance operation systems for electrical equipment and provide farther safe and secure for customer.

Corrosion detection sensor

[Features of the corrosion detection sensor]

1. "Visualization" of the corrosion risk and the timing of appearance of failure in the printed circuit board (new function)
   Discoloration of silver caused by corrosive gas is optically detected. The optical method is our original technology (patent pending).

2. Remote monitoring function (a function common to the products of the multiple environment sensor series)
   A communication function enables automatic collection of measured data and remote monitoring. Two models are available for different communication methods: wired communication and wireless communication.
3. Data logging (a function common to the products of the multiple environment sensor series)
   Maximum 40,000 data (four-years' worth of data in the case of logging once every hour) can be recorded in the built-in memory. Recorded data can be transferred through a USB terminal, and therefore this product can be also used as a stand-alone device.
4. Simple installation
   Both the sensor body and the sensor head are light and compact. The sensor body can be installed to a DIN rail. Also, it can be easily installed and replaced by connecting and disconnecting the general-purpose socket. The sensor head can be easily replaced by disconnecting and connecting the connector.

[Specifications]

External dimensions & Weight: (1) Sensor body: W50 x H78 x D100 mm (excluding projecting parts), 250 g or below
(2) Sensor head: W51 x H30 x D91 mm, 200 g or below

Control power: AC 85 to 264 V, 47 to 63Hz

Measured items: Corrosion risk (estimation of hydrogen sulfide concentration) /Temperature

Communication method: MES-42 (wired communication type): RS-485
MES-43 (wireless communication type): 920MHz band multi-hop wireless system

Operation temperature range: 0 to 50°C