News Release

2024/ 09/ 09

To whomsoever it may concern

E-THERMOGENTEK Co.,

Eliminate the Need for Battery Replacement in Various IoT Wireless Sensors!
Introducing the Ultra-Compact stand-alone Power Supply "S1α Series" for IoT,
Powered by Thermoelectric Generation Utilizing Waste Heat!
Accelerating the Adoption of IoT Systems with Wireless Sensors

E-ThermoGentek Co., Ltd. (CEO: Michio Okajima) is pleased to announce the development of the **S1α Series**, an ultra-compacts stand-alone power supply for IoT applications. This new series features an optimized power circuit specifically designed for stable output control in thermoelectric generation. This development allows for the simple replacement of batteries in various wireless sensors with thermoelectric power sources that utilize waste heat. In response to customer feedback, we have also reviewed and improved the power generation unit configuration.

In collaboration with **Murata Manufacturing Co., Ltd.** (President: Norio Nakajima), we have developed simple connection components that enable easy replacement of primary batteries in Murata's widely used vibration sensors for predictive maintenance of motors with the ultra-compact **S1α Series**. As a result, when replacing the batteries in Murata's vibration sensors, they can now be easily substituted with E-ThermoGentek's **S1α Series** stand-alone power supplies. Sales of the **S1α Series** will commence in September.

Background

E-ThermoGentek had previously succeeded in developing the S1 Series, an autonomous power supply for IoT applications utilizing thermoelectric generation. This series, equipped with our proprietary flexible thermoelectric module "Flexiina®," can be easily attached to heat source pipes and offers compact size and high output. We have been offering samples of the S1 Series to the market.

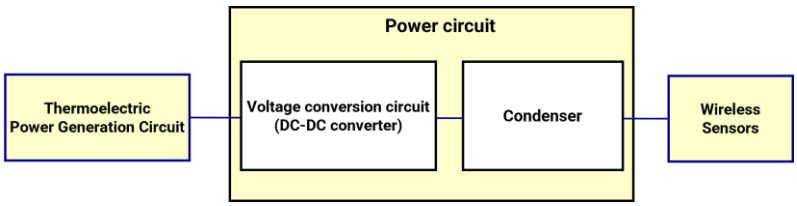
However, the adoption of IoT systems with wireless sensors in manufacturing settings has been slow in Japan. Recently, due to a severe labor shortage, the deployment of IoT systems with wireless sensors has begun to accelerate. Along with this, it has become apparent that the task of replacing primary batteries of wireless sensors is far more challenging than anticipated, especially with the rising cost of labor. As the number of sensors increases, battery replacement becomes nearly unmanageable.

Currently, most batteries used in various IoT wireless sensors are typically lithium thionyl chloride batteries. However, as the operating temperature increases, the battery capacity decreases, necessitating more frequent replacements. Moreover, with the implementation of the European Battery Regulation last year, which mandates the collection of used batteries starting in 2030, the continued use of primary batteries is expected to become increasingly challenging. As a result, environmental power sources such as thermoelectric generation are now seen as essential for powering various IoT wireless sensors in the future.

[Announcement Details]

In response to the growing need for replacing batteries in various wireless sensors, E-ThermoGentek has newly optimized the design of the power circuit for stable output control in thermoelectric generation. This allows for the replacement of commonly used primary batteries, such as lithium thionyl chloride batteries, in current IoT wireless sensors. Additionally, we have reviewed and redesigned the thermoelectric power generation unit of our IoT stand-alone power supply S1 Series, achieving a significant cost reduction (approximately half the price of our previous products).

As a result, the newly developed IoT stand-alone power supply **S1α Series** is expected to accelerate the widespread adoption of IoT systems utilizing wireless sensors.



Murata Manufacturing Co., Ltd.'s vibration sensors (LBAC0ZZ1TF), widely recognized for predictive maintenance of various motors in factories, are one of the most popular wireless sensors for IoT applications. In collaboration with Murata, E-ThermoGentek has developed simple connection components, enabling easy replacement of the vibration sensor's battery with the ultra-compact **S1α Series**. This functionality has been validated through multiple proof of concept (PoC) projects with several companies using these vibration sensors. Consequently, users of Murata's vibration sensors can now effortlessly replace the batteries with E-ThermoGentek's ultra-compact IoT stand-alone power supply **S1α Series**. The **S1α Series** will be available as a replacement for the batteries in Murata's vibration sensors starting in September.

Moreover, the updated **S1α Series** lineup is presented in the table below. This lineup

now includes a new series that can operate with a temperature difference as low as 15°C between the heat source and the surrounding environment. In addition to the conventional pipe-wrapping type (S1-P001E), the lineup includes a flat type (S1-F102) that can be magnetically attached to flat heat sources such as motors, and a finless type (S1-P051B) that can be installed even in densely packed heat source piping.

The **S1α Series**, powered by thermoelectric generation, is expected to significantly accelerate the adoption of IoT systems utilizing wireless sensors in the future.

【Specification】

	Exhaust pipe wrapping type		Flat Type
	Standard	Finless	
	S1-P001E ※	S1-P051B	S1-F102
	10mW output stand-alone power supply for IoT	5mW output stand-alone power supply for IoT	10mW output stand-alone power supply for IoT
Output	3.6V、10mW (At a temperature difference of 50°C between heat source and surrounding) 3.6V、1.5mW (At a temperature difference of 15°C between heat source and surrounding)	3.6V、5mW (At a temperature difference of 50°C between heat source and surrounding) 3.6V、0.2mW (At a temperature difference of 15°C between heat source and surrounding)	3.6V、10mW (At a temperature difference of 50°C between heat source and surrounding) 3.6V、0.7mW (At a temperature difference of 15°C between heat source and surrounding)
Compatible Heat sources	25A pipe (15~150°C)		Flat surface (15~85°C)
Surrounding temperature	0°C~60°C		
Application	Stand-alone powersupplies for Temperature sensors, Vibration sensors, Data loggers, and Wireless modules		
Bonding method	Wrapped around heatsource		Attached to flat heat source using magnets
Image			

The results marked with an "※" were made possible through a project funded by the New Energy and Industrial Technology Development Organization (NEDO).

Future Developments

The practical application of various wireless IoT sensors has already begun. As demonstrated in this announcement, by developing simple connection components, similar initiatives can be applied to the batteries used in these wireless sensors.

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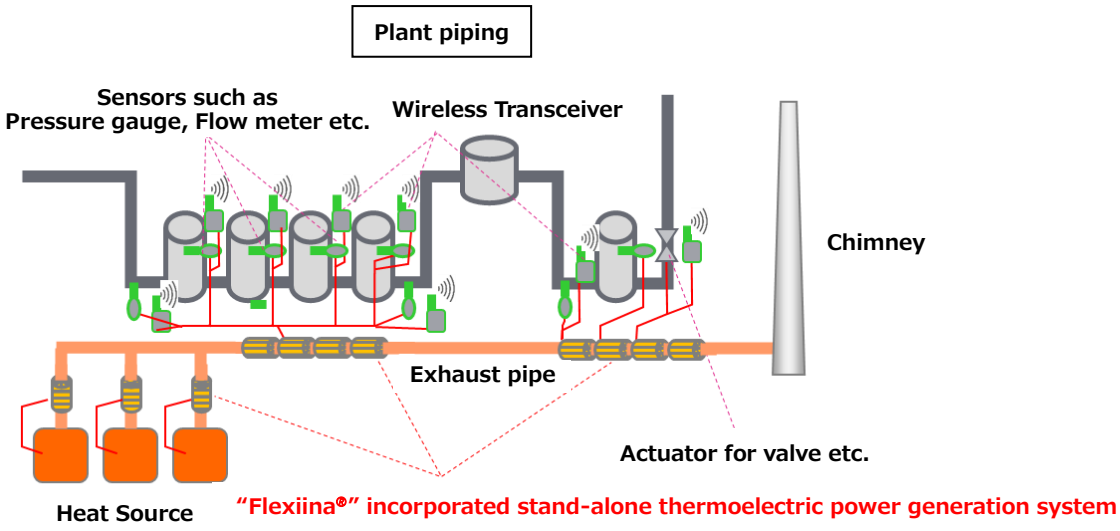
Starting in September, we will collaborate with various wireless sensor manufacturers to replace their primary batteries and begin sales to accelerate the adoption of IoT systems. Furthermore, as demand for SDGs initiatives aimed at reducing CO_2 emissions increases, this technology is expected to contribute to a low-carbon, circular society by effectively utilizing previously unused waste heat.

Examples of IoT System Implementations

Pipe-Wrapped Model



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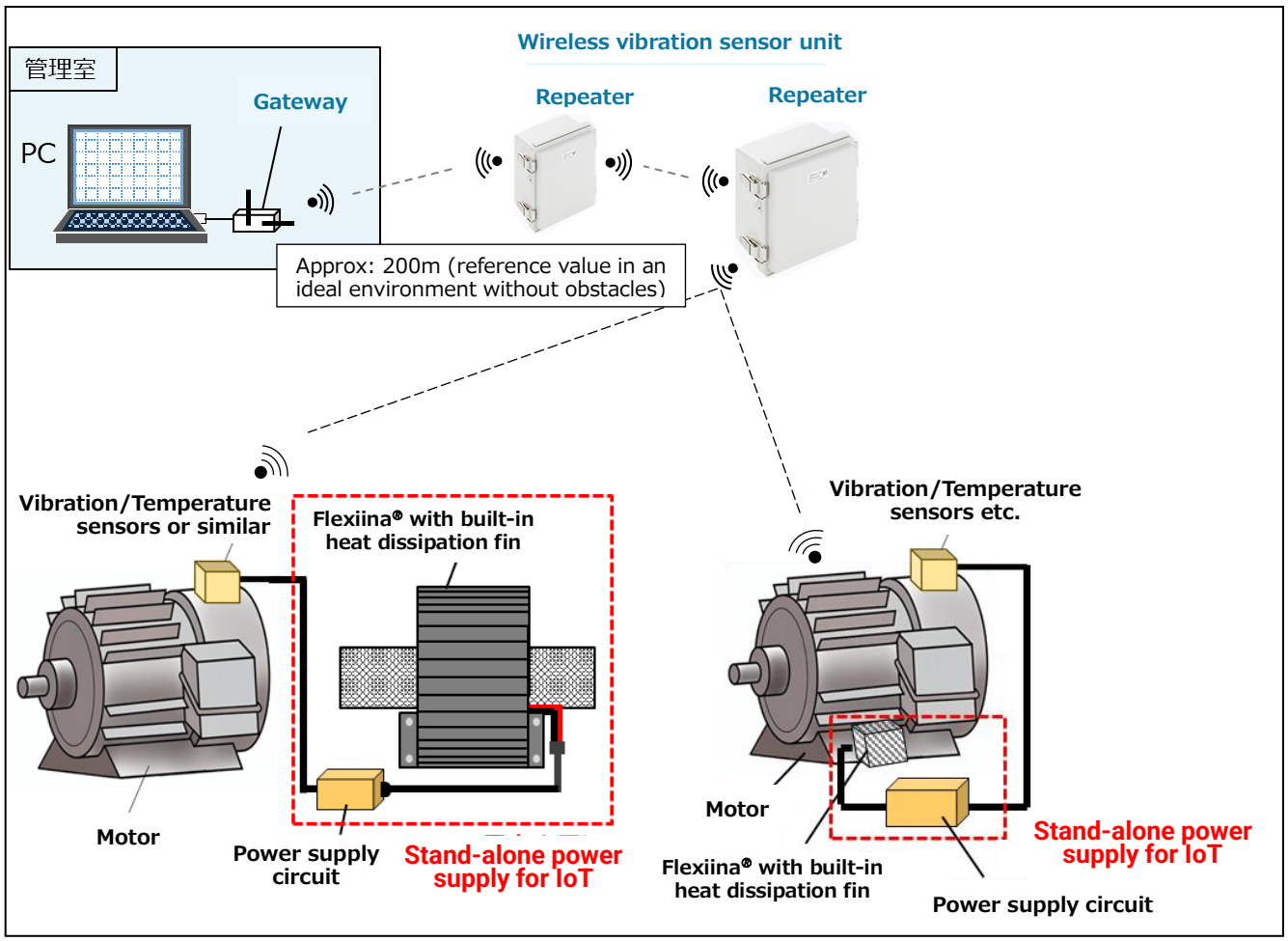
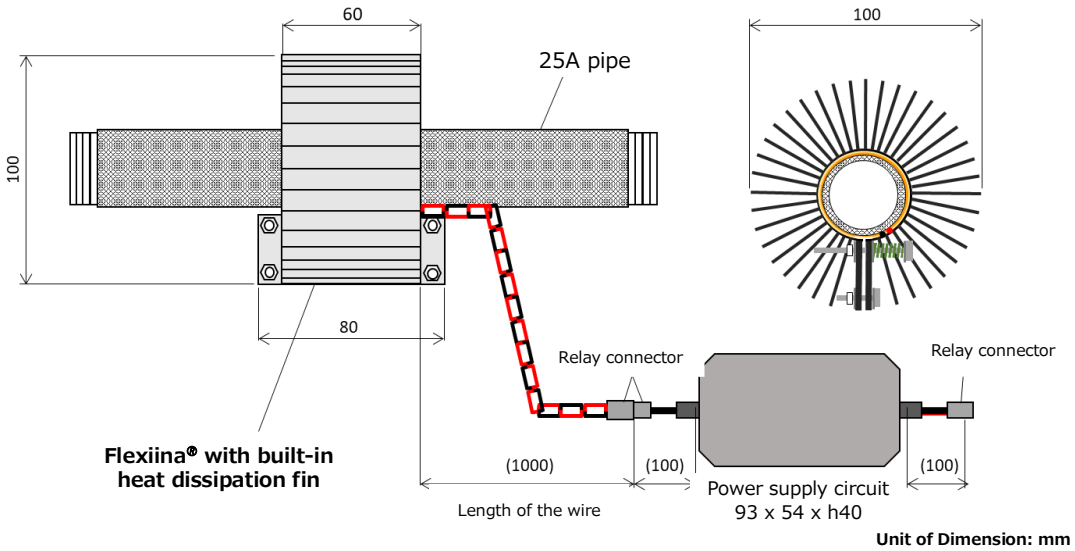
E-thermo

Predictive maintenance for Motors



【Dimensions】

■ S1-P001E



Unit of Dimension: mm

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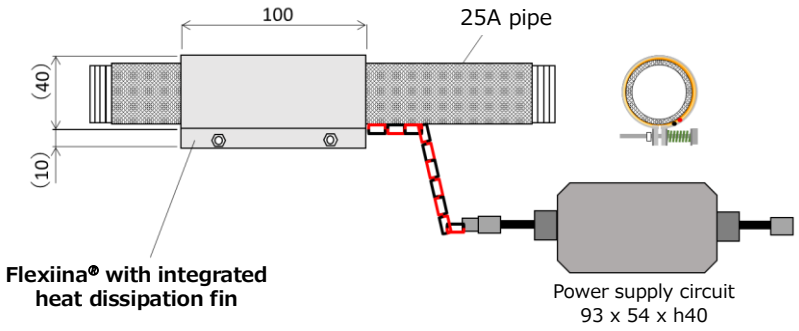
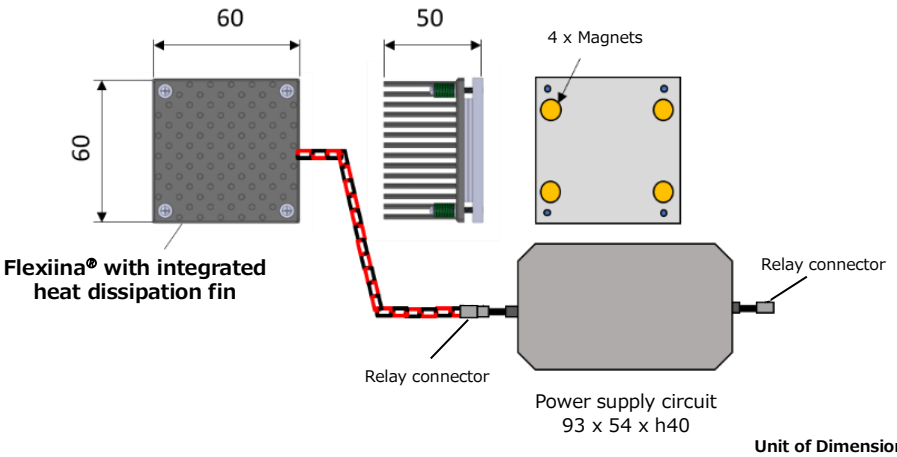
■S1-P051B



Unit of Dimension: mm

■S1-F102



Unit of Dimension: mm

[Contact for inquiries:]

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