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Mitsubishi Electric Releases FR-E800 General Purpose Inverter Series

Connectivity with various networks will enable smart factories and infrastructures in various fields

TOKYO, September 10, 2019 – Mitsubishi Electric Corporation (TOKYO: 6503) announced today that it will release the FR-E800 series power inverters, with a range of 44 new models, from December 9. The new series, with safety functionality meeting IEC 61508 standards, supports various networks such as CC-Link IE TSN, a next-generation open industrial network, and make manufacturing smarter in various fields by integrating the world's first[1] corrosive gas environment detection circuit[2] and the industry's first[1] AI-based diagnostic functions. From April 2020, Mitsubishi Electric will release successive new models with safety communication features such as safely-limited speed, similarly conforming to relevant IEC standards. The product range will be further expanded to a total of 120 models.

[1] According to Mitsubishi Electric research as of September 10, 2019
[2] Patent pending. Relevant press release dated September 4, 2019:
"Mitsubishi Electric Develops World's First Metal Corrosion Sensor Designed for Mounting on Printed Circuit Boards"
https://www.MitsubishiElectric.com/news/2019/0904.html

FR-E800 series

Key Features

1) Various networks supported, enabling smart factories and facilities

- Ethernet models and safety communication models support various open industrial networks such as CC-Link IE TSN, Ethernet/IP, and MODBUS/TCP. This will contribute to productivity improvement and energy saving at facilities including infrastructure such as air conditioning units and water treatment facilities.

2) Downtime reduction owing to predictive maintenance and data analysis

- Integrating the world's first corrosive gas environment detection circuit makes it possible to identify signs of inverter damage caused by hydrogen sulfide or other corrosive gases, reducing equipment downtime.
- Maisart®[3] is integrated in the inverter setup software FR Configurator2. The causes of downtime such as overcurrent caused by bursts of acceleration are analyzed using the industry's first AI-based diagnostic functions, helping to reduce such downtime.

[3] Mitsubishi Electric's AI creates the State-of-the-ART in technology Maisart

3) Safety functions to ensure safe operation of equipment (to be supported from April 2020)

- The safety of operators is ensured by the incorporation of safety functions conforming to international standards.
- The motor speed is calculated based on the current value or other data without using speed detectors when the safely-limited speed function is used. This will contribute to reductions in the use of wiring and to cost savings.

Development Completion Schedule

Specification	Type	Price	Development completion	Sales target
Ethernet models (22 models)	FR-E820-0.1KE to 7.5KE, 9 models	Contact our customer support	December 9	850,000 units in FY 2021
	FR-E840-0.4KE to 7.5KE, 7 models			
	FR-E860-0.75KE to 7.5KE, 6 models			
Standard models (22 models)	FR-E820-0.1K to 7.5K, 9 models			
	FR-E840-0.4K to 7.5K, 7 models			
	FR-E860-0.75K to 7.5K, 6 models			

Background

At manufacturing sites, in air conditioning units and at water treatment facilities or similar, customers have new requirements in recent years: these include support for various networks and high-speed data communication, ensuring safe operation of the equipment, and enabling remote monitoring using smart phones and tablets.

Our new FR-E800 series inverters support various open industrial networks such as CC-Link IE TSN for high-speed data communication. With the FR-E800 series inverters, we will contribute to making work processes smarter in various fields. Our annual sales target for fiscal year 2021 is approximately 850,000 units.

Other Key Features

—All models—

- Improved environmental resistance enables use in environments with a surrounding air temperature from -20 to +60 degrees Celsius [4] and compliance with IEC 60721-3-3(3C2)[5] for corrosive gas concentration.

[4] When the surrounding temperature is 50 degrees Celsius or higher, the current must not be more than the rated current specified for the temperature range.

[5] Nine types of corrosive gas such as sulfur dioxide.

- Our application for smart phones and tablets enables easy adjustment of inverter parameters and monitoring of inverters. Users can watch an online video to check how to use the product by scanning a QR code on the product or on the instruction manual.
- PLC functionality allows various operations by means of the inverter receiving signals from sensors. This function also allows cooperative operation by communication between multiple inverters.
- Compliance with standards such as UL, cUL, EC Directives (CE marking), Radio Waves Act (South Korea, KC marking), and Eurasian Conformity (EAC) has been certified.

—Ethernet models and safety communication models—

- Connection of inverters in series is supported with two Ethernet ports, eliminating the use of peripheral devices such as switching hubs to drive multiple inverters.

—Safety communication models—

- Safety communication models support the safety integrity level SIL3[6], enabling various safety monitoring functions such those which safely limit speed.
- Inverters with the protection level of IP67[7] are available.

[6] Safety integrity level specified in IEC 61508.
[7] Perfect protection against dust and water specified IEC 60529.

Contribution to the Environment

Driving or controlling motors using inverters contributes to a reduction in power consumption at manufacturing sites.

About Maisart

Maisart encompasses Mitsubishi Electric's proprietary artificial intelligence (AI) technology, including its compact AI, automated design deep-learning algorithm and extra-efficient smart-learning AI. Maisart is an abbreviation for "Mitsubishi Electric's AI creates the State-of-the-ART in technology." Under the corporate axiom "Original AI technology makes everything smart," the company is leveraging original AI technology and edge computing to make devices smarter and life more secure, intuitive and convenient.

List of Models and Major Functions

Specification	Model	Ethernet communication (Compatible with multiple networks)	Corrosive gas detection circuit[8] / AI technology	Safety level		Development completion
				SIL2 PLd[9]	SIL3 Ple[10]	
Standard models (40 models)	FR-E820-0.1K to 7.5K 9 models	—	●	●	—	Dec. 2019[11]
	FR-E840-0.4K to 7.5K 7 models	—	●	●	—	
	FR-E860-0.75K to 7.5K 6 models	—	●	●	—	
	FR-E820S-0.1K to 2.2K 6 models	—	●	●	—	Apr. 2020[11]
	FR-E810W-0.1K to 0.75K 4 models	—	●	●	—	
	FR-E820-11K to 22K 4 models	—	●	●	—	Dec. 2020[11]
	FR-E840-11K to 22K 4 models	—	●	●	—	

Ethernet models (40 models)	FR-E820-0.1KE to 7.5KE 9 models	●	●	●	—	Dec. 2019[11]
	FR-E840-0.4KE to 7.5KE 7 models	●	●	●	—	
	FR-E860-0.75KE to 7.5KE 6 models	●	●	●	—	
	FR-E820S-0.1KE to 2.2KE 6 models	●	●	●	—	Apr. 2020[11]
	FR-E810W-0.1KE to 0.75KE 4 models	●	●	●	—	
	FR-E820-11KE to 22KE 4 models	●	●	●	—	Dec. 2020[11]
	FR-E840-11KE to 22KE 4 models	●	●	●	—	
Safety communication model (40 models)	FR-E820-0.1KSCE to 7.5KSCE 9 models	●	●	—	●	Apr. 2020[11]
	FR-E840-0.4KSCE to 7.5KSCE 7 models	●	●	—	●	
	FR-E860-0.75KSCE to 7.5KSCE 6 models	●	●	—	●	
	FR-E820S-0.1KSCE to 2.2KSCE 6 models	●	●	—	●	
	FR-E810W-0.1KSCE to 0.75KSCE 4 models	●	●	—	●	
	FR-E820-11KSCE to 22KSCE 4 models	●	●	—	●	Dec. 2020[11]
	FR-E840-11KSCE to 22KSCE 4 models	●	●	—	●	

[8] Added to models with polyurethane circuit board coating
[9] Safe torque off (STO) function supported
[10] Functions such as safe torque off (STO) and safely-limited speed (SLS) functions supported
[11] Please contact local sales representatives in each region for the date of sales start.

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About Mitsubishi Electric Corporation

With nearly 100 years of experience in providing reliable, high-quality products, Mitsubishi Electric Corporation (TOKYO: 6503) is a recognized world leader in the manufacture, marketing and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications, consumer electronics, industrial technology, energy, transportation and building equipment. Embracing the spirit of its corporate statement, Changes for the Better, and its environmental statement, Eco Changes, Mitsubishi Electric endeavors to be a global, leading green company, enriching society with technology. The company recorded a revenue of 4,519.9 billion yen (US$ 40.7 billion*) in the fiscal year ended March 31, 2019. For more information visit:
www.MitsubishiElectric.com
*At an exchange rate of 111 yen to the US dollar, the rate given by the Tokyo Foreign Exchange Market on March 31, 2019