

# FR-E800

## The Compact Drive Series



- Compact design – world's smallest class inverter
- Dual overload rating for top performance
- Reduce downtime by using AI functionality
- Functional safety
- Multiple control methods

# World's smallest class inverter with high functionality



## The multi-purpose inverter

The FR-E800 series frequency inverter is built upon Mitsubishi Electric's proven variable speed control technology throughout years of reliable operation across various constant and variable torque applications. Designed to save energy and minimize cost, the FR-E800 brings together advances in quality, performance, and predictive maintenance capabilities in one multi-purpose inverter.

These frequency inverters, with safety functionality meeting IEC 61508 standards, support various networks such as Ethernet or CC-Link IE TSN, a next-generation open industrial network, and make manufacturing smarter in various fields by integrating the world's first corrosive gas environment detection circuit and the industry's first AI-based diagnostic functions.

## Three different models

- Standard models
- Ethernet models, which allows switching between Ethernet protocols simply by changing internal parameters
- Safety communication models that support Ethernet-based safety communication protocols certified as compliant with international standards.

## Compact Design

Save space with a compact footprint to control 3-phase motors up to 30 kW at 200 V, 400 V and 600 V.

## Dual Overload Rating

Achieve top performance while reducing space requirements and costs with two rating types of different rated current and permissible load.

## Auto-tune to IM & PM motors

Setup and commission quickly and easily without time-consuming tuning or the need for on-site support.

## Integrated PLC

Reduce internal components and save panel space, eliminating wiring time, and reducing system setup times. Operation of the system can be customized by the FR-E800's built-in PLC feature.

## Inverter-to-Inverter linking

Create small-scale systems by connecting multiple inverters via Ethernet protocols. The communication between multiple inverters is carried out through the inputs/outputs and built-in PLC.

## Life Diagnostics function

Analyze and determine the remaining lifetime of critical components, such as capacitors, contact relays, cooling fan, and inrush current limit resistor.



### Improved environmental resistance

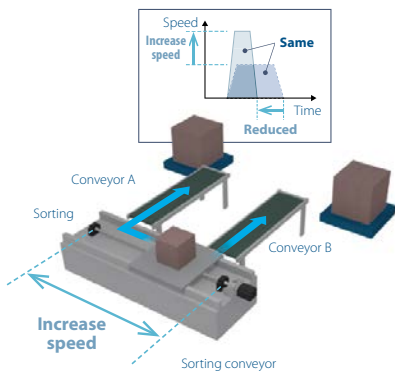
Various applications are supported by allowing for corrosive environments or a wide range of surrounding air temperatures. The FR-E800 operates in ambient temperatures from -20 °C to 60 °C and the control card is conformal coated to withstand harsh environments.



Water treatment plant

Painting line

### PM sensorless vector control



The torque is not reduced in the high-speed range (up to the rated speed) during PM sensorless vector control as compared with operation using a stepper motor. High-speed system operation improves the tact time.

### 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® is integrated into 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.

### Control method

Switching between control methods with the FR-E800 inverter, Vector control for lift application (with the plug-in option), Advanced magnetic flux vector control for conveyors, etc., reduces the number of required spare inverters.

PM sensorless vector control is available when inverters are used with PM motors.

CONTROL	SPEED CONTROL	TORQUE CONTROL	POSITION CONTROL	MOTOR
V/F control	●	—	—	Induction motor
Advanced magnetic flux vector control	●	—	—	
Real sensorless vector control	●	●	—	
PM sensorless vector control	●	—	○	PM motor
Vector control (with plugin option FRASAP E kit used)	○	○	○	Induction motor

●: Supported ○: To be supported

### Compatibility with both induction motors and PM motors

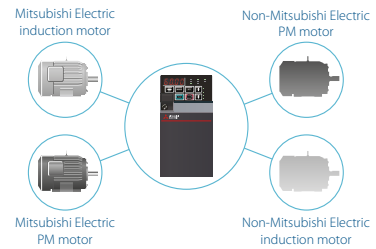
Energy-saving operation is enabled by using IE3/IE4 induction motors or permanent magnet (PM) motors. FR-E800 inverters support both type of motors, enabling step-by-step replacement of existing devices.

### PLC function

In accordance with the machine specifications, users can set various operation patterns: inverter movements at signal inputs, signal outputs at particular inverter statuses or monitor outputs, etc. Operation of the system can be customized by the inverter alone.

### Offline auto-tuning

As well as Mitsubishi Electric general-purpose (induction) motors and permanent magnet (PM) motors, various motors including non-Mitsubishi Electric induction motors and PM motors can be controlled as appropriate. Users can use existing motors with new inverters.



### Flexible installation

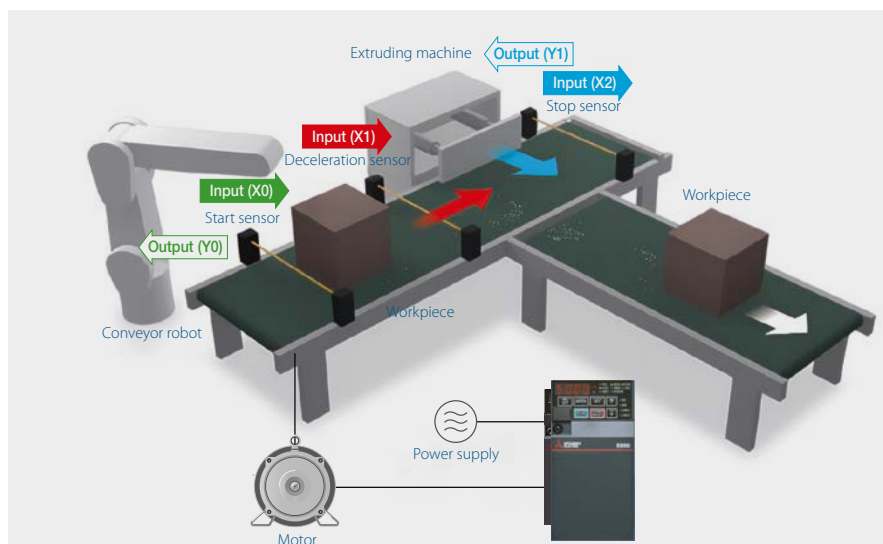
When the surrounding air temperature is 40 °C or less, multiple inverters can be installed side-by-side. Users can select the most suitable layout for the intended installation area.



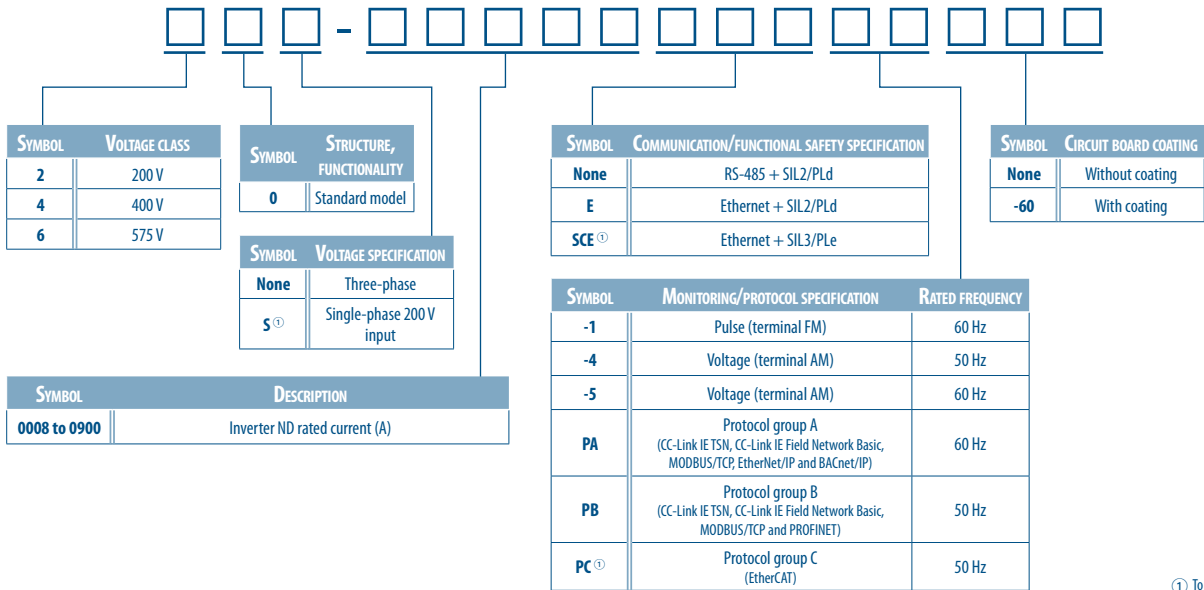
Side-by-side installation

### Safety functions to ensure the safe operation of equipment

The safety of operators is ensured by the incorporation of safety functions conforming to international standards. The FR-E800 supports STO/SS1/SLS/SBC SSM and can be integrated into a SIL2/ SIL3 system.



Nomenclature chart



① To be released

Dual rating

For LD rating for light duty applications, a smaller capacity controller may be used to drive a larger motor, resulting in reduced footprint and cost.

SINGLE-PHASE 200–240V	KW	A (ND)
E820S-0008	0.1	0.8
E820S-0015	0.2	1.5
E820S-0030	0.4	3
E820S-0050	0.75	5
E820S-0080	1.5	8
E820S-0110	2.2	11

THREE-PHASE 380–480V	KW	A (ND)	A (LD)
E840-0016	0.4	1.6	2.1
E840-0026	0.75	2.6	3.5
E840-0040	1.5	4	5.5
E840-0060	2.2	6	6.9
E840-0095	3.7	9.5	11.1
E840-0120	5.5	11.2	17.5
E840-0170	7.5	17	23
E840-0230	11	23	35
E840-0300	15	30	41
E840-0380	18.5	38	45
E840-0440	22	44	60

THREE-PHASE 200–240V	KW	A (ND)
E820-0008	0.1	0.8
E820-0015	0.2	1.5
E820-0030	0.4	3
E820-0050	0.75	5
E820-0080	1.5	8
E820-0110	2.2	11
E820-0175	3.7	17.5
E820-0240	5.5	24
E820-0330	7.5	33

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