

INVERTER

New Product RELEASE

No.20-5E

New Model Added to the FR-A800 Series with High Functionality and High Performance

The slim model has been added to the 400 V class inverters.

Slim structure

Enclosure cost reduction

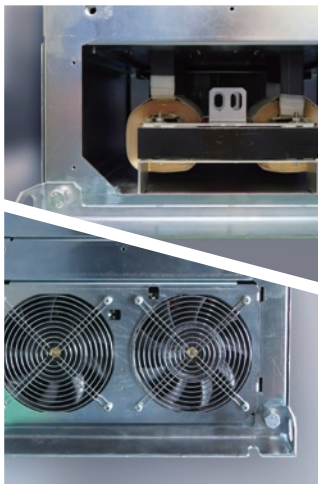
Built-in DC reactor, EMC filter, and brake transistor

Less wiring work and less space required

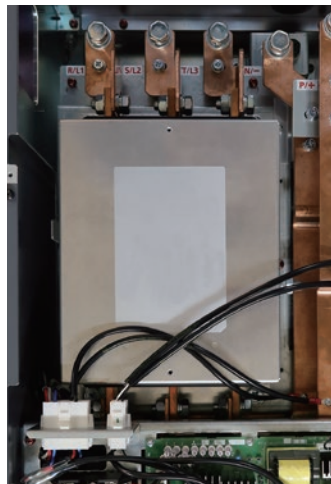
Highly protective structure (IP20)

Higher safety and reliability ensured by
covering charged sections

Top (built-in DC reactor)¹



Bottom (cooling fan)



Inside (built-in EMC filter)^{1, 2}



FR-A840M-160K

¹: Product view without covers

²: For the FR-A840M-[[K-C2

Benefit

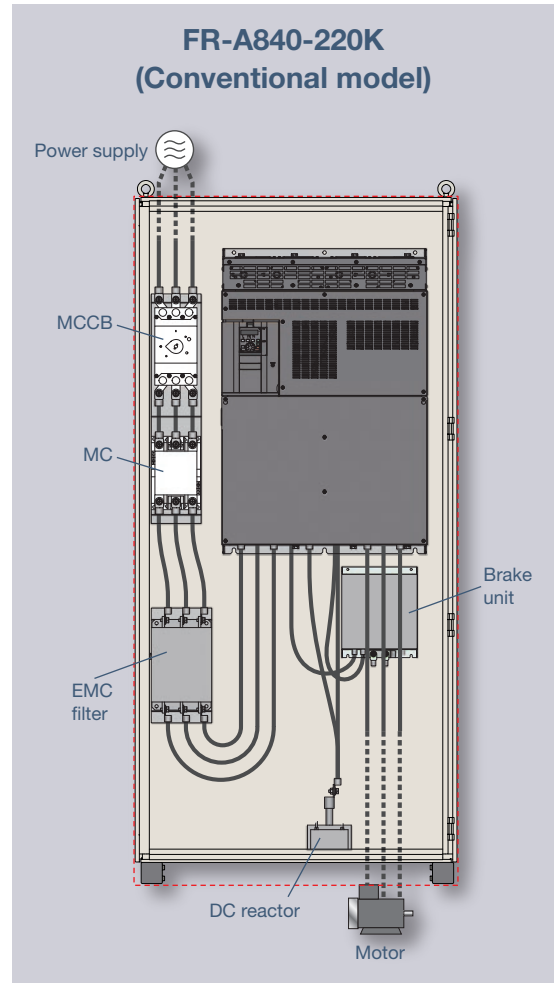
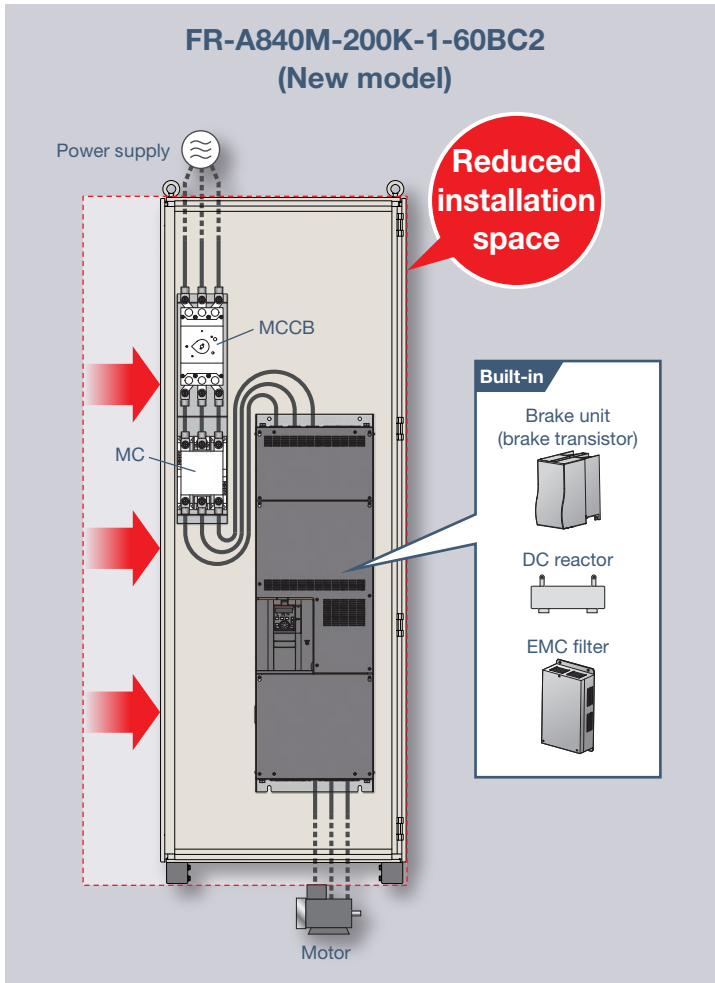
Enclosure cost reduction

The 390-mm-wide slim design saves enclosure space. Reduced enclosure size helps keep the cost down.

Wire and Space Saving

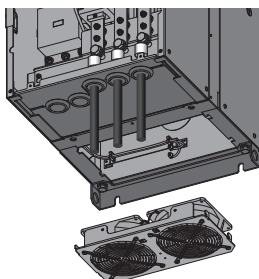
A DC reactor and an EMC filter*1 are built in the inverter. The built-in brake transistor model is also available. Less wiring work and less space for the peripheral devices are required.

*1: The inverter with a built-in Class C3 or C2 filter can be selected.

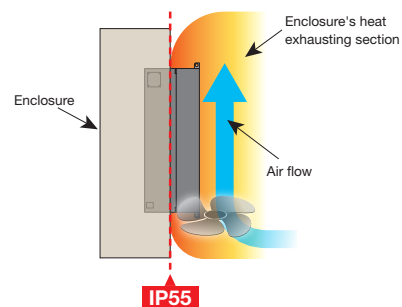


Higher safety and reliability

- The inverter alone has the protection level of IP20. The charged sections are covered, ensuring the safety during maintenance of the enclosure.
- The cooling fan can be replaced without disconnecting the main circuit wiring. Maintenance of the inverter can be carried out smoothly.



- The enclosure can be downsized by protruding the heat exhausting section (heat sink) using the panel through attachment (to be supported). The protective structure is higher compared to other models, as the protection level is IP55 between internal and external regions.



Inverter model

Symbol	Voltage class	Symbol	Structure	Symbol	Description
4	400 V class	M	Slim model	160K, 200K	Inverter ND rated capacity (kW)
				03630, 04540	Inverter SLD rated current (A)

FR - A 840 M - 160K - 1 - 60

Symbol	Type ¹	Communication type	Symbol	Circuit board coating (conforming to IEC 60721-3-3 3C2/3S2)	Plated conductor	Built-in brake transistor	Symbol	EMC filter
1	FM	RS-485	60	60	Without	Without	None	Built-in C3 filter
2	CA			60	With	With	C2	Built-in C2 filter
E1	FM	60B		With	Without			
E2	CA	60B		With	With			

*1 Specification differs by the type. Major differences are shown in the table below.

Type	Monitor output	Initial setting			
		Built-in EMC filter	Control logic	Rated frequency	Pr.19 Base frequency voltage
FM (terminal FM equipped model)	Terminal FM: pulse train output Terminal AM: analog voltage output (0 to ±10 VDC)	OFF ³	Sink logic	60Hz	9999 (same as the power supply voltage)
CA (terminal CA equipped model)	Terminal CA: analog current output (0 to 20 mADC) Terminal AM: analog voltage output (0 to ±10 VDC)	ON	Source logic	50Hz	8888 (95% of the power supply voltage)

*2 Inverter equipped with a built-in Ethernet board (FR-A8ETH).

*3 ON when the inverter has a built-in Class C2 EMC filter.

Model	160K	200K	250K	315K	355K	400K	450K	500K
FR-A840M-[]	●	●	—	—	—	—	—	—
FR-A842M-[] (Separated converter type)	—	—	○	○	○	○	○	○
FR-CC2M-[] (Converter unit)	—	—	○	○	○	○	○	○

● : Released, ○ : To be released, — : Not applicable

Inverter rating

Model FR-A840M-[]		160K	200K
		03630	04540
Applicable motor capacity (kW) ¹	SLD	200	250
	ND (initial setting)	160	200
Rated capacity (kVA) ²	SLD	200	250
	ND (initial setting)	160	200
Rated current (A)	SLD	363	454
	ND (initial setting)	293	363
Overload current rating ³	SLD	110% 60 s, 120% 3 s (inverse-time characteristics) at surrounding air temperature of 40°C	
	ND (initial setting)	150% 60 s, 200% 3 s (inverse-time characteristics) at surrounding air temperature of 40°C	
Rated voltage ⁴		Three-phase 380 to 500 V	
Regenerative braking	Brake transistor	Built-in (Built-in brake transistor model only.)	
	Maximum brake torque ⁵	100% torque ⁵	
Rated input AC voltage/frequency		Three-phase 380 to 500 V, 50/60 Hz ¹⁰	
Permissible AC voltage fluctuation		323 to 550 V, 50/60 Hz	
Permissible frequency fluctuation		±5%	
Rated input current (A) ⁷	SLD	363	454
	ND (initial setting)	293	363
Power supply capacity (kVA) ⁸	SLD	277	346
	ND (initial setting)	223	277
Protection rating of structure (IEC 60529) ⁹		IP20 (IP55 between internal and external air regions)	
Cooling system		Forced air	
Noise level (dB) ¹¹		73.4	73.4
Approx. mass (kg)		148	148

*1 : The applicable motor capacity indicated is the maximum capacity applicable for use of the Mitsubishi Electric 4-pole standard motor.

*2 : The rated output capacity is the value with respect to 440 V output voltage.

*3 : The percentage of the overload current rating is the ratio of the overload current to the inverter's rated output current. For repeated duty, allow time for the inverter and motor to return to or below the temperatures under 100% load.

*4 : The maximum output voltage does not exceed the power supply voltage. The maximum output voltage can be changed within the setting range. However, the maximum point of the voltage waveform at the inverter output side is the power supply voltage multiplied by about $\sqrt{2}$.

*5 : The value when a commercially-available brake resistor is used. (Set the value of %ED in Pr.70 Special regenerative brake duty.)

Do not use the brake resistor with a resistance smaller than the minimum resistance shown below. Also, the brake resistor must have a sufficient capacity to consume the regenerative power.

Inverter	Minimum resistance (Ω)	Power consumption of resistor (kW)
FR-A840M-160K (03630)	3.85	160
FR-A840M-200K (04540)	3	200

*6 : Value for the ND rating

*7 : The rated input current is the value at a rated output voltage. The input power impedances (including those of the input reactor and cables) affect the value.

*8 : The power supply capacity is the value at the rated output current. The input power impedances (including those of the input reactor and cables) affect the value.

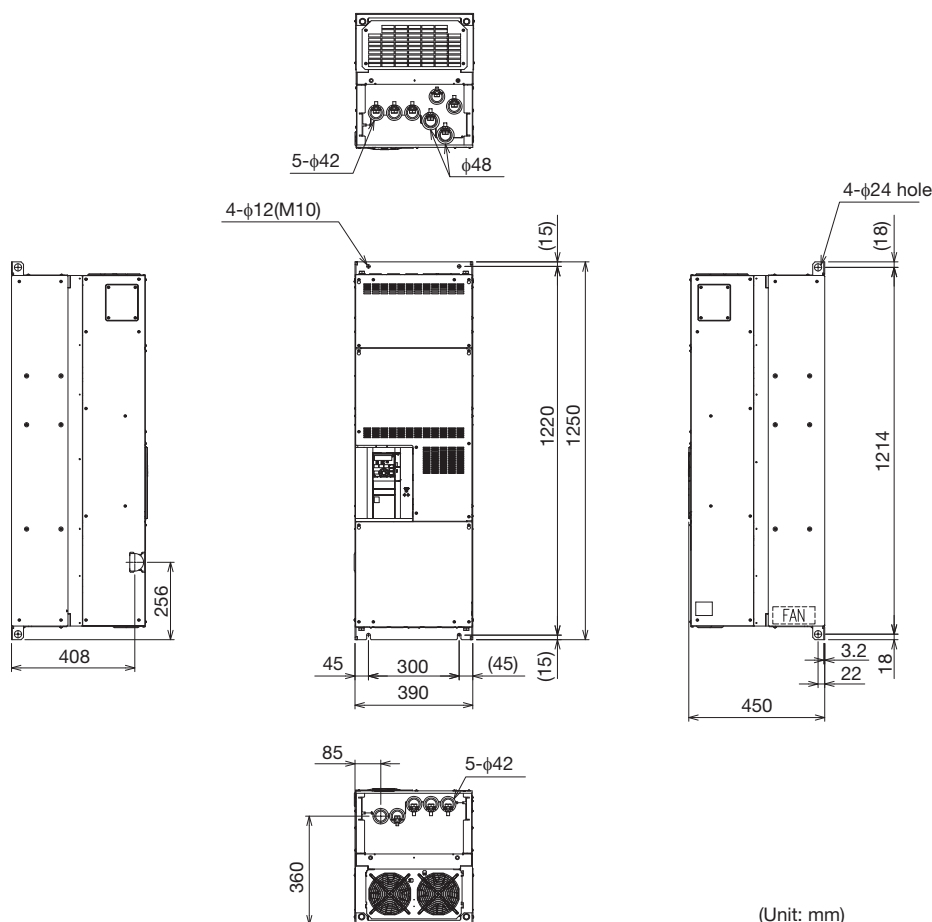
*9 : FR-DU08: IP40 (except for the PU connector)

*10 : For the power voltage exceeding 480 V, set Pr.977 Input voltage mode selection. (For details, refer to the FR-A800 Instruction Manual (Detailed).)

*11 : Values measured 1 m in front of the inverter and 1.6 m from the floor.

Outline dimension drawings

FR-A840M-160K(03630), FR-A840M-200K(04540)



(Unit: mm)

Differences with the FR-A840

Item	FR-A840M (New model)	FR-A840 (Conventional model)
Surrounding air temperature	-10°C to +40°C (non-freezing)	-10°C to +50°C (non-freezing) for LD, ND (initial setting), or HD rating -10°C to +40°C (non-freezing) for SLD rating
Protective structure	IP20 (IP55 between internal and external air regions) for all capacities	Open type (IP00) for FR-A840-30K(00770) or higher
Brake transistor (brake resistor usable)	Built-in brake transistor model is available.	Built-in for the FR-A840-0.4K(00023) to 55K(03160)
EMC filter	Class C3 filter is built in. (The inverter with a built-in Class C2 filter is also available.)	Class C3 filter is built in.
DC reactor	Built-in	Optional
Noise level (dB)	73.4	61.2 for the FR-A840-185K(04810)
PWM carrier frequency automatic reduction function (Pr.260) PWM frequency automatic switchover	Current value to enable the function for each rating: 50% of the rated current or higher	Current value to enable the function for each rating: 85% of the rated current or higher
Multiple ratings (Pr.570 Multiple rating setting)	SLD and ND (initial setting) ratings (Setting range: "0 or 2")	SLD, LD, ND (initial setting) and HD ratings (Setting range: "0 to 3")
Protective function E.IPF (Instantaneous power failure)	Activated when a power failure occurs for longer than 10 ms.	Activated when a power failure occurs for longer than 15 ms.

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE: TOKYO BLDG., 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN