MITSUBISHI ELECTRIC

Changes for the Better

INVERTER

Product catalog ▶ Video ▶

General-purpose

Function/performance

FR-A800

- Faster response with speed response of 50 Hz (for 3.7 kW or lower, with no load, under Real sensorless vector control)
- High-speed operation up to maximum 400 Hz under Real sensorless vector control and Vector control
- Parallel operation function (FR-A842-P) enabling operation of up to 1350 kW motors with the LD rating*
- PM motor auto tuning function enabling operation of non-Mitsubishi Electric PM motors
- Ethernet communication function model enabling monitoring via Internet

*Some functions from the standard inverter are limited or not available.

Three-phase 200V FR-A820 ····· 0.4kW — 90kW
Three-phase 400V FR-A840 ····· 0.4kW — 280kW
Three-phase 400V FR-A842/FR-A842-P ····· 315kW — 500kW
Three-phase 400V FR-A846 ····· 0.4kW — 132kW

Major applications Transfer systems, food packaging machines, lifts, machine tools, presses, printing machines, winding/unwinding, etc. (for heavy duty, under Vector control)

Conventional models FR-A200(E), FR-V200(E), FR-A500(L), FR-V500(L), FR-A700, etc.

FR-F800

- Advanced optimum excitation control providing a large starting torque with the same motor efficiency under the conventional Optimum excitation control
- IP55 compatible model enabling installation outside of the enclosure due to compatibility with hostile environments such as high humidity or dusty environments
- Multiple rating enabling selection between two types according to the fan/pump used
- Ethernet communication function model enabling monitoring via Internet

Three-phase 200V FR-F820 ····· 0.75kW — 110kW
Three-phase 400V FR-F840 ····· 0.75kW — 315kW
Three-phase 400V FR-F842 ····· 355kW — 560kW
Three-phase 400V FR-F846 ····· 0.75kW — 160kW

Major applications Fans, blowers, pumps, etc. (for light duty)

Conventional models FR-F500(L), FR-F700(P), etc.

FR-E800

- Addition of three-phase 200/400 V class 11K to 22K improving enclosure space efficiency
- Supporting position control under Vector control enabling accurate and stable transfer
- Support of major industrial Ethernet networks by the inverter alone*, enabling use of suitable inverters in various systems
- Functions for residual life diagnosis, predictive maintenance, and preventive maintenance supporting stable system operation
- AI technology and smartphone connectivity supporting initial startup or troubleshooting

*Multi-protocol support enables switching between protocols by setting parameters.(Supported protocols differ depending on the model.)

Three-phase 200V FR-E820 ····· 0.1kW — 22kW
Three-phase 400V FR-E840 ····· 0.4kW — 22kW
Three-phase 575V FR-E860 ····· 0.75kW — 7.5kW
Single-phase 200V FR-E820S ···· 0.1kW — 2.2kW *Three-phase 200 V output
Single-phase 100V FR-E810W ··· 0.1kW — 0.75kW *Three-phase 200 V output

Major applications Transfer systems, lifts, food packaging machines, machine tools, presses, printing machines

Conventional models FR-A024, FR-A044, FR-E500, FR-E700, etc.

FR-D700

- Easy wiring by adopting spring clamp terminals for the control circuit terminals
- Safety stop functions to comply with the safety standards
  EN ISO 13849-1 Category 3 / PLd
  EN 62061 / IEC61508 SIL2
- General-purpose magnetic flux vector control achieving high torque of 150% /1 Hz (for 3.7K or lower)

Three-phase 200V FR-D720 ····· 0.1kW — 15kW
Three-phase 400V FR-D740 ····· 0.4kW — 15kW
Single-phase 200V FR-D720S ··· 0.1kW — 2.2kW *Three-phase 200 V output
Single-phase 100V FR-D710W ··· 0.1kW — 0.75kW *Three-phase 200 V output

Major applications Transfer systems, food packaging machines, fans, pumps, etc. (for lighter load than when using FR-E700)

Conventional models FR-U100, FR-S500(E), SC-A, etc.

Special applications

Inverter for pressure-resistant explosion-proof motor

FR-B

- The inverters have passed the explosion-proof test by the Japanese Ministry of Health, Labor and Welfare on condition that the inverters are used in combination with Mitsubishi Electric pressure-resistant explosion-proof motors
- Variable-torque motors, constant-torque motors, and vector motors can be driven

FR-B: Three-phase 200V 0.75kW to 75kW
Three-phase 400V 0.75kW to 37kW, 55kW to 110kW
FR-B3: Three-phase 200V 0.4kW to 37kW
Three-phase 400V 0.4kW to 37kW
FR-B4: Three-phase 200V 1.5kW to 18.5kW

Inverter with the power regeneration function

FR-A701

- Continuous operation at 100% regenerative
- Wire and space saving

Conventional models
FR-A201(E), etc.

FR-A701: Three-phase 200V 5.5kW to 55kW
Three-phase 400V 5.5kW to 55kW

Inverter for IPM motor

FR-F700PJ

- Easy operation and compact body with optimum functions for fan and pump applications
- High energy saving effect with Optimum excitation control

Conventional models
FR-F500J, etc.

FR-F700PJ: Three-phase 200V 0.4kW to 15kW
Three-phase 400V 0.4kW to 15kW

Notation

[A800]: RS-485 model, [A800-E]: Ethernet model, [A800-GF]: CC-Link IE Field Network communication function type, [A800-GN]: CC-Link IE TSN communication function type
[F800]: RS-485 model, [F800-E]: Ethernet model
[E800]: Standard model, [E800-E]: Ethernet model, [E800-EPA]: Ethernet model (Protocol group A only), [E800-EPB]: Ethernet model (Protocol group B only),
[E800-SCE]: Safety communication model, [E800-SCEPA]: Safety communication model (Protocol group A only), [E800-SCEPB]: Safety communication model (Protocol group B only)

"✓" mark or description: Available
Blank: Not available

Item		FR-A800	FR-F800	FR-E800	FR-D700	FR-F700PJ
Control method	V/F control	✓	✓	✓	✓	✓
	General-purpose magnetic flux vector control				✓	✓
	Advanced magnetic flux vector control	✓	✓	✓		
	Real sensorless vector control	✓		✓		
	Vector control*1	✓		✓		
	PM sensorless vector control	✓		✓		
	PM motor control		✓			✓
Starting torque	Induction motor	AD MFVC 200% 0.5 Hz (3.7K or lower) 150% 0.5 Hz (5.5K or higher) Sensorless Vector 200%*2 at 0.3 Hz	AD MFVC 120% 0.5 Hz	AD MFVC 150% 0.5 Hz Sensorless Vector 200% 0.3 Hz (3.7K or lower) 150% 0.3 Hz (5.5K or higher)	General-purpose MFVC 150% 1 Hz 200% 3 Hz (3.7K or lower) with slip compensation enabled	General-purpose MFVC 120% 1 Hz with slip compensation enabled
	PM motor	High frequency superposition control: 200%*3 Current synchronization operation: 50%	50%	EM-A, MM-GKR: 200% Motor other than the above: 50%		50%
Output frequency range		0.2 to 590 Hz*4			0.2 to 400 Hz	
Regenerative braking	Built-in brake transistor	200 V class: Built-in for 0.4K to 22K 400 V class: Built-in for 0.4K to 55K		Built-in for 0.4K to 22K	Built-in for 0.4K to 15K	Built-in for 0.4K to 15K
Acceleration/deceleration time setting		0 to 3600 s				
	Individual acceleration/deceleration setting	Up to 3 types		Up to 2 types		
Multi-speed		Speed 15				
Speed command	Analog	0 to 5 VDC, 0 to 10 VDC, 0 to ±5 VDC, 0 to ±10 VDC, 4 to 20 mA		0 to 5 VDC, 0 to 10 VDC, 4 to 20 mA		
	Digital	Set with pulse train input, operation panel, or parameter unit. 4-digit BCD or 16-bit binary (when using the FR-A8AX plug-in option).		Set with the operation panel or parameter unit. 4-digit BCD or 16-bit binary (when using the FR-A8AX plug-in option).	Set with the setting dial, operation panel, or parameter unit.	
Restart after instantaneous power failure		Available (reduced voltage method [frequency search method selectable])				
Input signal	Contact input	12		[E800] : 7 [E800-E] : 2 [E800-SCE] : 0	5	
	Pulse train input	100k pulses/s				
Output signal	Open collector output	5		[E800] : 2 [E800-E] [E800-SCE] : 0		
	Contact output (1 changeover contact)	2		1		
Fault output		1 changeover contact (230 VAC 0.3 A, 30 VDC 0.3 A), open collector output		1 changeover contact (250 VAC 2 A, 30 VDC 1 A), open collector output	1 changeover contact (230 VAC 0.3 A, 30 VDC 0.3 A), open collector output	
	Fault code (4 bits) output	✓	✓			
Monitor function	Pulse train output	1440 pulses/s, 2 mA (FM type)		1440 pulses/s, 1 mA (FM type)	1440 pulses/s, 1 mA	
	Analog output	0 to ±10 VDC		0 to ±10 VDC (AM type)		
Removable terminal block		Used for control circuit terminals				
Built-in communication function*5	RS-485 (Mitsubishi inverter protocol)	✓	✓	[E800]	✓	✓
	RS-485 (MODBUS®RTU)	[A800] [A800-GF] [A800-GN]	[F800]	[E800]	✓	✓
	CC-Link IE TSN	1Gbps/100Mbps [A800-GN]	1Gbps/100Mbps Supported by options	100Mbps [E800-EPA] [E800-EPB] [E800-SCEPA] [E800-SCEPB]		
	CC-Link IE Field Network	[A800-GF]	Supported by options			
	CC-Link IE Field Network Basic	[A800-E]	[F800-E]	[E800-EPA] [E800-EPB] [E800-SCEPA] [E800-SCEPB]		
	MODBUS/TCP	[A800-E]	[F800-E]	[E800-EPA] [E800-EPB] [E800-SCEPA] [E800-SCEPB]		
	PROFINET	✓(HMS network option)	✓(HMS network option)	[E800-EPB] [E800-SCEPB]		
	EtherNet/IP	✓(HMS network option)	✓(HMS network option)	[E800-EPA] [E800-SCEPA]		
	BACnet/IP		[F800-E]	[E800-EPA] [E800-SCEPA]		
	CC-Link IE TSN safety communication function			[E800-SCEPA] [E800-SCEPB]		
	PROFIsafe			[E800-SCEPB]		
	CIP Safety			[E800-SCEPA]		
Safety stop function		✓	✓	✓	✓	

*1: Vector control is available when a Vector control compatible option is installed.
*2: In the initial setting for the FR-A820-00340(5.5K) or higher and the FR-A840-00170(5.5K) or higher, the starting torque is limited to 150% by the torque limit level.
*3: The starting torque for use with MM-CF is 200% for the 1.5 kW or lower, and 150% for the 2.0 kW or higher.
*4: The upper frequency limit is 400 Hz under Advanced magnetic flux vector control, Real sensorless vector control, Vector control, PM sensorless vector control, and PM motor control.
*5: Refer to the relevant inverter catalog for other available communication functions or communication functions supported by options.

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