MITSUBISHI ELECTRIC
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INVERTER

New Product RELEASE No.17-2E

Parallel Operation Function

Release of the FR-A842-P Inverter, FR-CC2-P Converter unit, and FR-POL Balance Reactor

To support parallel operation functions, new models are added to the lineup of the FR-A800 series inverters (separated converter type) and the converter units, and the compatible balance reactors are newly released.

Features

Enlarged range of applicable motor capacity

A motor of up to 1350 kW can be driven by operating the inverters in parallel, enhancing the application to larger scale systems.*1

Operation of two or three inverters in parallel*1

Driving a large capacity motor is possible without increasing the size of the inverter or converter unit, facilitating installation into the enclosure.

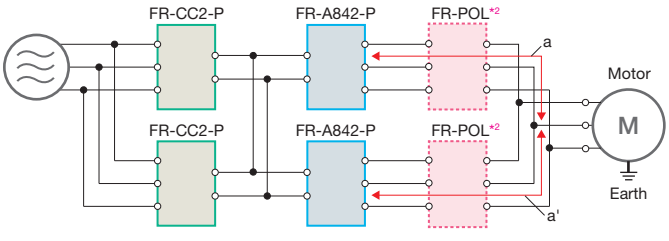
*1: Some functions same as those in the standard inverter are limited or not available. (For example, communication through the RS-485 terminals, upper limit frequency setting during high-speed operation, multiple rating setting, and PM motor driving.) For the details of each function, refer to the A800 Parallel Operation Function Manual.

Application example


Crane


Compressor

System configuration example



*2: When the cable length from an inverter to the node point (a/a') is less than 10 m, install the FR-POL.

Inverter		Converter unit	Balance reactor	Number of inverters connected in parallel	Capacity of the system	
Model	Multi-rating				Motor capacity (kW)	Output current (A)
FR-A842-400K-P	ND	FR-CC2-H400K-P	FR-POL-H400K	2	630	1232
				3	945	1848
	LD	FR-CC2-H450K-P	FR-POL-H500K	2	710	1386
				3	1065	2078
FR-A842-450K-P	ND	FR-CC2-H450K-P	FR-POL-H500K	2	710	1386
				3	1065	2078
	LD	FR-CC2-H500K-P	FR-POL-H500K	2	800	1539
				3	1200	2309
FR-A842-500K-P	ND	FR-CC2-H500K-P	FR-POL-H500K	2	800	1539
				3	1200	2309
	LD	FR-CC2-H560K-P	FR-POL-H500K	2	900	1750
				3	1350	2626

Release schedule February 2017

Lineup

Inverter*1

F R - A 8 4 2 - 09620 - 1 - [ ] P

Symbol	Voltage class
4	400 V class

Symbol	Structure, functionality
2	Separated converter type

Symbol	Description
09620 to 12120	Inverter rated current (SLD rated current of the single standard FR-A802) (A)
400K to 500K	ND rated inverter capacity (kW)

Symbol	Type
1	FM
2	CA*2

Symbol	Circuit board coating (conforming to IEC60721-3-3 3C2/3S2)	Plated conductor
None	Without	Without
60	With	Without
06	With	With

Symbol	Function
P	Parallel operation

Converter unit*3

F R - CC2 - H 400K - 60 P

Symbol	Voltage class
H	400 V class

Symbol	Description
400K to 560K	Rated converter unit capacity (kW)

Symbol	Circuit board coating (conforming to IEC60721-3-3 3C2/3S2)	Plated conductor
60	With	Without
06	With	With

Symbol	Function
P	Parallel operation

Balance reactor

F R - POL - H 400K

Symbol	Voltage class
H	400 V class

Symbol	Description
400K, 500K	Reactor capacity (kW)

*1: The inverters are compatible with UL, cUL, EC Directives (CE marking). They are also certified as compliant with the Eurasian Conformity (EAC) but have not yet been certified as compliant with the safety standards.
*2: The CA type inverter has terminal CA (analog 0-20 mADC current output) instead of terminal FM (pulse train output) as the output terminal for the monitoring.
*3: The converter units are compatible with UL, cUL, EC Directives (CE marking). They are also certified as compliant with the Eurasian Conformity (EAC).

Rating

Inverter

Model FR-A842-[]-P		Two in parallel			Three in parallel		
		09620	10940	12120	09620	10940	12120
		400K	450K	500K	400K	450K	500K
Applicable motor capacity (kW)	LD	710	800	900	1065	1200	1350
	ND (initial setting)	630	710	800	945	1065	1200
Output: Rated capacity (kVA)*1	LD	1056	1173	1334	1584	1759	2002
	ND (initial setting)	939	1056	1173	1409	1584	1759
Output: Rated current (A)*2	LD	1386	1539	1750	2078	2309	2626
	ND (initial setting)	1232	1386	1539	1848	2078	2309
Output: Overload current rating*3	LD	120% 60 s, 150% 3 s (inverse-time characteristics) at surrounding air temperature of 50°C					
	ND (initial setting)	150% 60 s, 200% 3 s (inverse-time characteristics) at surrounding air temperature of 50°C					
Output: Rated voltage*4		Three-phase 380 to 500 V					
Output: Regenerative braking torque*5 (When the converter unit is used)	Maximum brake torque	10% torque/continuous					
Input power: DC power supply voltage		430 to 780 VDC					
Input power: Control power supply auxiliary input		Single phase 380 to 500 V 50/60 Hz*6					
Input power: Permissible control power supply auxiliary input fluctuation		Frequency ±5%, voltage ±10%					
Protective structure (IEC 60529)*7		Open type (IP00)					
Cooling system		Forced air cooling					
Approx. mass (kg)*8		486	486	486	729	729	729

*1: The rated output capacity indicated assumes that the output voltage is 440 V.
*2: Total output current of the inverters operated in parallel
*3: The % value of the overload current rating indicated 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 √2.
*5: ND rating reference value
*6: For the power voltage exceeding 480 V, set Pr.977 Input voltage mode selection.
*7: FR-DU08: IP40 (except for the PU connector section)
*8: Total mass of the inverters operated in parallel

Converter unit

Model FR-CC2-H[]-P	Two in parallel				Three in parallel			
	400K	450K	500K	560K	400K	450K	500K	560K
Applicable motor capacity (kW)	630	710	800	900	945	1065	1200	1350
Output: Overload current rating*1	150% 60 s, 200% 3 s							
Output: Rated voltage*2	430 to 780 VDC*3							
Power supply: Rated input AC voltage/frequency	Three-phase 380 to 500 V 50/60 Hz							
Power supply: Permissible AC voltage fluctuation	Three-phase 323 to 550 V 50/60 Hz							
Power supply: Permissible frequency fluctuation	±5%							
Power supply: Rated input current (A)*4	1232	1386	1539	1750	1848	2078	2309	2626
Power supply: Power supply capacity (kVA)*5	939	1056	1173	1334	1409	1584	1759	2002
Protective structure (IEC 60529)	Open type (IP00)							
Cooling system	Forced air cooling							
DC reactor	Built-in							
Approx. mass (kg)*6	564	570	576	586	846	855	864	879

*1: The % value of the overload current rating indicated is the ratio of the overload current to the inverter's rated output current. For repeated duty, allow time for the converter unit and the inverter to return to or below the temperatures under 100% load.
*2: The converter unit output voltage varies according to the input power supply voltage and the load. The maximum point of the voltage waveform at the converter unit output side is approximately the power supply voltage multiplied by √2.
*3: The permissible voltage imbalance ratio is 3% or less. (Imbalance ratio = (highest voltage between lines - average voltage between three lines) / average voltage between three lines x 100)
*4: Total input current of the converter units operated in parallel
*5: The power supply capacity is the value when at the rated output current. It varies by the impedance at the power supply side (including those of the input reactor and cables).
*6: Total mass of the converter units operated in parallel

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