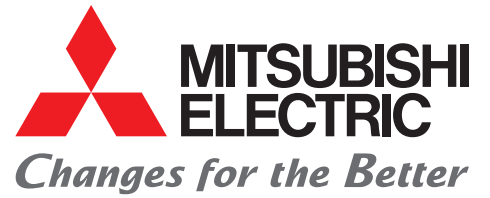




for a greener tomorrow



FACTORY AUTOMATION

New Product RELEASE

No.17-9E

INVERTER FR-A800 Plus

Liquid cooled type



A800 Plus



LIQUID COOLED



FR-A800 Plus series **3rd**

Release of the new liquid cooled type inverter, FR-A800-LC

Coolant is used for cooling the inside of the inverter. Liquid cooling enables new applications in the environments where heat is difficult to be dissipated.



A800 Plus
LIQUID COOLED



A800 Plus

A new lineup of dedicated inverters for specialized fields are born! Plus! The optimum functions for each dedicated field are added to the already high performance and high functionality FR-A800 series inverter.

Features

Effective solution for downsizing of the enclosure

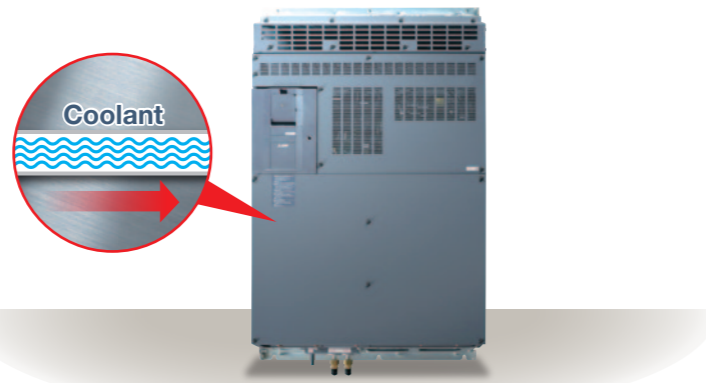
A smaller enclosure can be used since the quantity of the heat dissipated in the enclosure is reduced.

Dedicated monitoring functions

A sensor (flow switch) is attached at the inlet of coolant to send a signal to the inverter. When the coolant flow rate decreases, a warning is output, enabling quick, direct detection of system faults.

Lineup of 690 V class inverters

The power supply voltage of 690 VAC is supported. A wider range of power supply voltage is covered.



Application examples

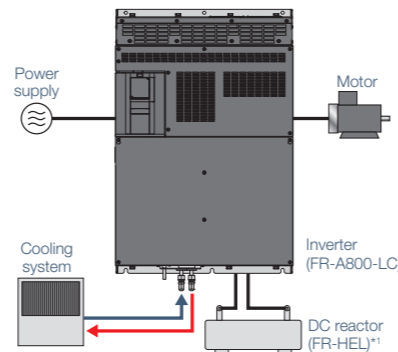


Shield machine



Chiller

System configuration example



*1: Always connect a DC reactor appropriate to the applied motor capacity.

Model

Inverter FR - A 8 4 0 - 280K - 1 - LC

Symbol	Voltage class	Voltage class	Symbol	Description	Symbol	Type	Symbol	Circuit board coating (conforming to IEC60721-3-3 3C2/3S2)	Plated conductor	Symbol	Function
4	400 V class	400 V class	110K to 280K	Inverter ND rated capacity (kW)	1	FM	None	Without	Without	None	Standard type
7	690 V class	690 V class	03250 to 06830	Inverter rated current (SLD rated current of the standard FR-A800 inverter) (A)	2	CA*1	60	With	Without	LC	Liquid cooled type
			280K, 355K	Inverter ND rated capacity (kW)			06	With	With		
			03590, 04560	Inverter SLD rated current (A)							

*1: For the CA type, the monitor output terminal FM/CA operates as terminal CA (analog current output: 0 to 20 mA DC), not as terminal FM (pulse train output).

DC reactor FR - HEL - H 280K

Symbol	Voltage class	Symbol	Description
H	400 V class*1	280K to 400K	Applied motor capacity (kW)
N	690 V class		

*1: For the details of the 400 V class, refer to the catalog of the FR-A800 inverter.

Specifications

• FR-A840-LC, FR-A870-LC

Inverter	FR-A840-□-LC							FR-A870-□-LC	
	110K 03250	132K 03610	160K 04320	185K 04810	220K 05470	250K 06100	280K 06830	280K 03590	355K 04560
Applicable motor capacity (kW)*1	SLD LD							315	400
Rated capacity (kVA)*2	SLD LD							429	545
Rated current (A)	SLD LD							320	405
Overload current rating*3	SLD LD							110% 60 s, 120% 3 s (inverse-time characteristics) at surrounding air temperature of 40°C	
Rated voltage*4	Three-phase 380 to 500 V							Three-phase 525 to 690 V	
Rated input AC voltage/frequency	Three-phase 380 to 500 V 50/60 Hz*7							Three-phase 525 to 690 V 50/60 Hz	
Permissible AC voltage fluctuation	323 V to 550 V 50/60 Hz							525 V to 759 V 50/60 Hz	
Permissible frequency fluctuation	±5%							±5%	
Rated input current (A)*5	SLD LD							359	456
Power supply capacity (kVA)*6	SLD LD							320	405
Protective structure (IEC 60529)	Open type (IP00)							Open type (IP00)*8	
Cooling system	Liquid cooling + forced air cooling							Liquid cooling + forced air cooling	
Operation panel	Accessory cover							FR-DU08	
Approx. mass (kg)	83	83	124	124	172	172	172	212	212
Surrounding air temperature*9	-10°C to +50°C (non-freezing) (LD and ND ratings) -10°C to +40°C (non-freezing) (SLD rating)								
Surrounding air humidity	95% RH or less (non-condensing) (With circuit board coating (conforming to IEC60721-3-3 3C2/3S2)) 90% RH or less (non-condensing) (Without circuit board coating)								
Coolant*10	Copper (C1220) is used for the inverter internal piping. Select an appropriate cooling system and a coolant to prevent corrosion.								
Coolant temperature	1°C to 40°C (non-freezing)								
Coolant flow rate*11	2.9 to 3.7 L/min *For the FR-A840-03250(110K) and FR-A840-03610(132K) 6.0 to 7.5 L/min *For the FR-A840-04320(160K) to FR-A840-06830(280K), FR-A870-03590(280K), and FR-A870-04560(355K)								
Maximum permissible pressure	300 kPa								
Storage temperature	-20°C to +65°C*12								
Atmosphere	Indoors (without corrosive gas, flammable gas, oil mist, dust and dirt, etc.)								
Altitude	2000 m or less (For the installation at an altitude above 1000 m, consider a 3% reduction in the rated current per 500 m increase in altitude.)								
Vibration	2.9 m/s ² or less at 10 to 55 Hz (directions of X, Y, Z axes)								

*1: The capacity is the maximum capacity applicable to each voltage.

*2: The rated output capacity indicated assumes that the output voltage is 440 V for the FR-A840-LC and 690 V for the FR-A870-LC.

*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: The rated input current indicates a value at a rated output voltage. The impedance at the power supply side (including those of the input reactor and cables) affects the rated input current.

*6: 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).

*7: For the power voltage exceeding 480 V, set Pr.977 input voltage mode selection.

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

*9: Condensation may occur depending on the humidity and the coolant temperature. Adjust the humidity and the coolant temperature to prevent condensation.

*10: For the composition of the coolant, refer to the Instruction Manual of the inverter.

*11: Under normal conditions, keep the flow rate between 3.1 and 3.5 L/min for the FR-A840-03610(132K) or lower, and between 6.5 and 7.0 L/min for the FR-A840-04810(160K) or higher and the FR-A870-03590(280K) or higher. For the details of coolant selection, please contact your sales representative.

*12: Temperature applicable for a short time, e.g. in transit. To store the inverter after the coolant has passed through the pipes, fill the pipes with coolant sufficiently enough that it contains antifreezing agent to prevent corrosion. Or fill the pipes with nitrogen gas after the inside of the pipes is fully dried. If any moisture remains inside the pipes, it may react with oxygen in the air to form corrosion.

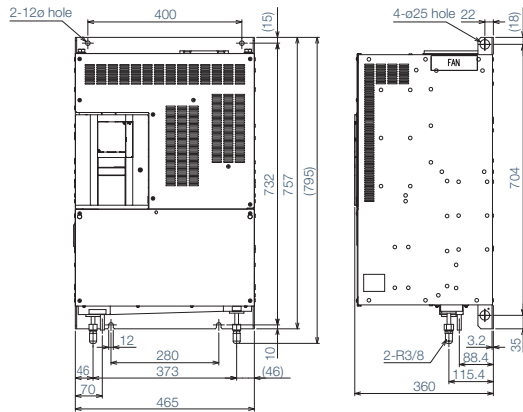
• FR-HEL-N

Power factor improving effect*13	Power supply power factor approx. 93% (at 100% load)
Power specifications	Three-phase 525 to 690 VAC 50/60 Hz
Surrounding air temperature	-10°C to +50°C (non-freezing)
Ambient humidity	90%RH or less (non-condensing)
Storage temperature	-20°C to +65°C (non-freezing)
Atmosphere	Indoors (free from corrosive gas, flammable gas, oil mist, dust and dirt)
Altitude/vibration	Max.1000 m, 5.9 m/s ² or less

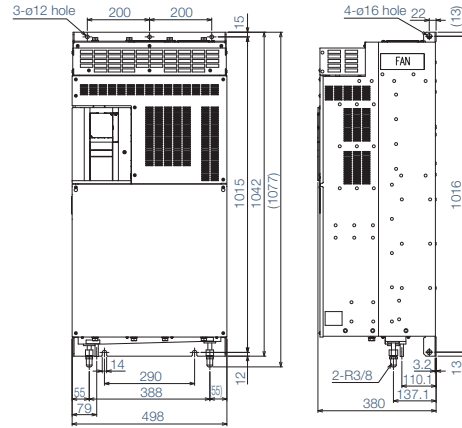
*13: The power factor is calculated on the assumption that the power impedance is 1%. The value changes according to the power supply capacity and power impedance.

Outline dimensions (Unit: mm)

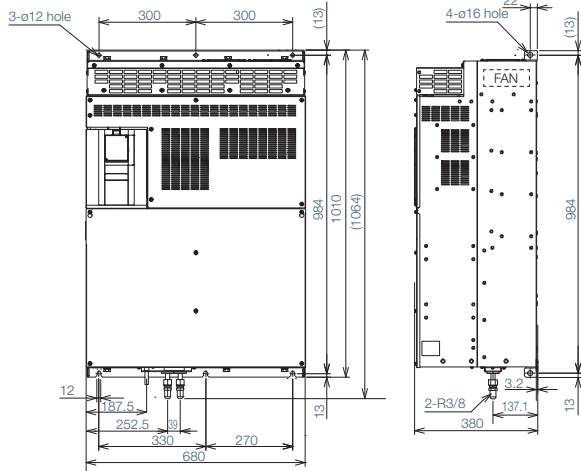
• FR-A840-03250(110K), 03610(132K)-LC



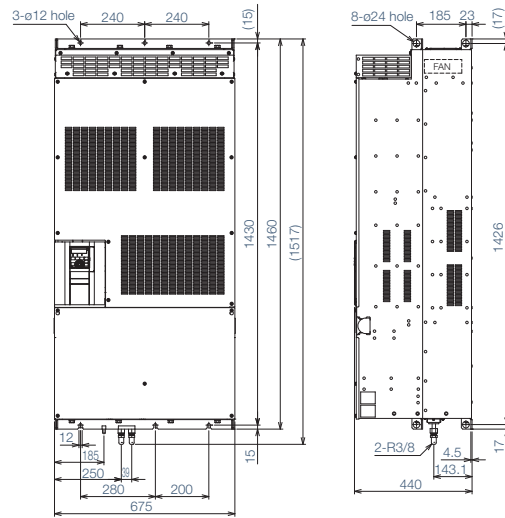
• FR-A840-04320(160K), 04810(185K)-LC



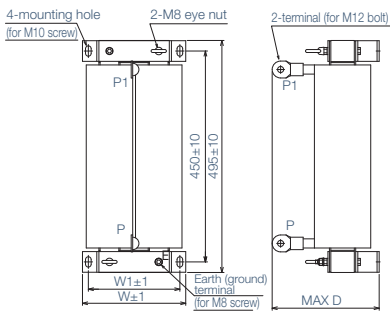
• FR-A840-05470(220K), 06100(250K), 06830(280K)-LC



• FR-A870-03590(280K), 04560(355K)-LC



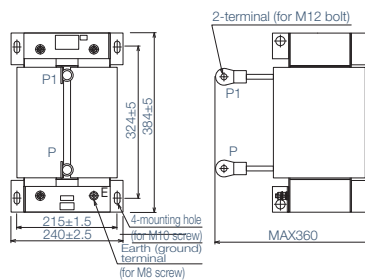
• FR-HEL-N280K, N315K



* Remove the eye nut after installation of the product.

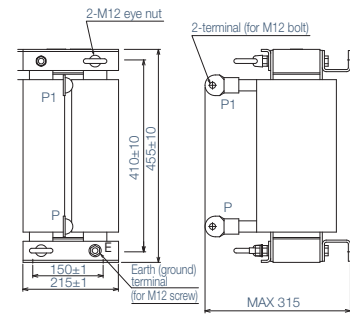
Model	Motor capacity	W	W1	D	Mass (kg)
FR-HEL-N280K	280 kW	210	185	215	45
FR-HEL-N315K	315 kW	220	195	230	50

• FR-HEL-N355K



Model	Motor capacity	Mass (kg)
FR-HEL-N355K	355 kW	76

• FR-HEL-N400K



* Remove the eye nut after installation of the product.

Model	Motor capacity	Mass (kg)
FR-HEL-N400K	400 kW	76

Release schedule

October 2017

MITSUBISHI ELECTRIC CORPORATION

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