

Innovating Energy Technology

SiC Hybrid Module Applicable FRENIC-VG

690V Series Industry First

Stack Type 690V Series Capacity Expansion

Compact stack and capacity expansion (355 to 450kW) realized **Overview** through the adoption of an SiC hybrid module to reduce loss More compact size than competitor's products equipment "space-saving" Customer and "maintainability improvements" realized value **Features Extend capacity** Hybrid module Slim construction through direct parallel applicable connection Loss reduced by 28%, Stack width Expansion up to 1200kW possible **Realizing single-unit** unified at 226.2 mm by connecting up to 3 units (Large capacity of up to 2700kW capacity up to 450kW with multiwinding motor drive) **Benefits of SiC Hybrid Module** Loss comparison Circuit configuration Appearance [with 450kW application] 28% loss reduction 28% loss reduction Si-IGBT SiC-SBD 100% compared to (conventional) conventional Si 75% (silicon) modules -oss through SiC hybrid 50% module application 25% SiC hybrid 0% module Si (conventional) SiC hybrid **Merits Applications** Applications extending chiefly to large-scale equipment, plants [New product] [Conventional]

Oil. chemicals







Water treatment





Use of a "single" 450kW system configuration realized with SiC hybrid module application



Width 226.2 mm x 2 Si module units 250kW x 2 units = 450kW

Width 226 2 mm SiC hybrid module 450kW x 1 unit











Air conditioning

(fans, pumps)

3-phase 690V Series (Stack Type)

MD specification (for middle overload)

Specification Item Type FRN SVG1S-69J 90 110 132 160 200 250 280 315 Nominal applied motor [kW] *5 90 110 132 160 200 250 280 315 355 400 450 Rated capacity [kVA]*1 120 155 167 192 258 317 353 394 436 490 550 Rated current [A] 100 130 140 161 216 265 295 330 365 410 460 Overload current rating 150% of rated current -1min. Refer to the diode rectifier, PWM converter specifications. Main power voltage Inverters Auxiliary control power supply Single phase 575 to 690V, 50/60Hz Phase, Voltage, Frequency supply Auxiliary input for fan power Single phase 660 to 690V, 50/60Hz Single phase 575 to 600V, 50/60Hz*3 Power Phase, Voltage, Frequency Voltage/frequency variation Voltage: +10 to -15%, Frequency: +5 to -5% 2 Carrier frequency [kHz] *4 Approx. weight [kg] 45 45 95 95 95 135 135 135 135 135 135 Enclosure IP00 open type

Note 1) The above specifications apply when function code F80 = 1 (MD specification).

LD specification (for light overload)

Item			Specification									
Inverters	Тур	e FRN SVG1S-69J	90	110	132	160	200	250	280	315	355	400
	Nor	minal applied motor [kW] *5	110	132	160	200	220	280	315	355	400	450
	Rat	ted capacity [kVA] ^{*1}	155	167	192	258	281	353	394	436	490	550
	Rated current [A]		130	140	161	216	235	295	330	365	410	460
	Overload current rating		110% of rated current -1min. "2									
	ge	Main power	See specifications for diode rectifier or PWM converter.									
	Power supply voltage	Auxiliary control power supply Phase, Voltage, Frequency	Single phase 575 to 690V, 50/60Hz									
		Auxiliary input for fan power Phase, Voltage, Frequency	Single phase 660 to 690V, 50/60Hz Single phase 575 to 600V, 50/60Hz '3									
	Ъ	Voltage/frequency variation	Voltage: +10 to -15%, Frequency: +5 to -5%									
	Carrier frequency [kHz] *4		2									
	Арр	prox. weight [kg]	45	45	95	95	95	135	135	135	135	135
	Enc	losure	IP00 open type									

Note 1) The above specifications are for Function Code F80=1 (LD specification). *1) Indicates values when the rated output voltage is 690 V.

*2) When the converted inverter output frequency is less than 1Hz, the inverter may trip earlier in some ambient temperature conditions if the motor is overloaded.
*3) Stack internal connector switching is necessary for a power supply of 575 to 600 V, 50/60Hz.
*4) If running motors at or below the synchronous motor allowable carrier capacity, they may become demagnetized due to permanent magnet overheating caused by output current high frequency. Always

*5) The nominal applied electric motor capacity indicates values for a 690V electric motor. When selecting an electric motor with different voltage specification, or when making a detailed selection, ensure that the inverter rated current is equal to or higher than the electric motor rated current.

Same shape

as inverter stack

[Unit: mm]

External Dimensions

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Voltage	Nominal applied electric motor capacity	Inverter Type	External dimensions				
Ŭ	(kW)		w	н	D		
	90	FRN90SVG1S-6J	226.2	880	406.3		
	110	FRN110SVG1S-6J	220.2		400.5		
	132	FRN132SVG1S-6J		1100			
	160	FRN160SVG1S-6J	226.2		567.3		
3-phase	200	FRN200SVG1S-6J					
690V	220	FRN250SVG1S-6J		1400	567.3		
0.50 v	280	FRN280SVG1S-6J	226.2				
	315	FRN315SVG1S-6J					
	355	FRN355SVG1S-6J		1400			
	400	FRN400SVG1S-6J	226.2		567.3		
	450	FRN450SVG1S-6J					

Peripheral Devices, Options

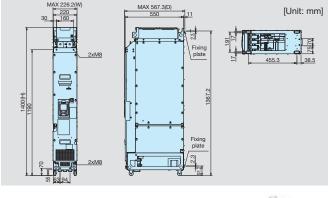
[Peripheral devices]

- Diode rectifier applicable capacity: 220, 450kW On sale
- PWM converter stack applicable capacity: 132 to 450kW Coming soon
- Filter stack applicable capacity: 160 to 450kW Coming soon

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External Dimensions



[Options]

Various options such as a hand lifter, breaking resistor, breaking unit DC reactor, and communication card are available



Equipped with SiC hybrid module