

High Performance Vector Control Inverter

FRENIC-VG Drives for Crane & Hoist Applications



Features

Performance

High Overload Capability

Improved overload rating during intermittent operation enables cycle operation at 200% torque for hoisting and other applications.

Low Current Distortion Properties

Improved current response reduces output current distortion.

Fast Speed Response

High-speed calculation achieves a speed control response of 600Hz; it is 5-times faster than conventional model VG7.

Note: Inverter equipment control response; actual response depends on motor/mechanism response lag.

Torque Control Accuracy

Achieves ±3% torque accuracy.

Reduced motor oscillation

Even compared to the high performance of the previous generation VG7, the new VG series further reduces the motor oscillation at low speeds to 1/3.

Specification

Generous Available I/O

- 9 digital inputs plus dedicated FWD and REV
- 4 digital outputs plus dedicated fault and brake output
- Option card available for additional I/O

Real-Time Clock with Battery Backup

Battery backed up real-time clock allows precise date and time stamping for fault logs.

Built-In Braking Transistor

Built-in braking transistor (with 200V 55kW or less and 400V 160kW or less) allows for direct connection of dynamic braking resistors.

Standard PG Input for Encoder

Standard Multi-Function Key Pad

- Standard RJ45 connection
- Large 7-segment LED provides excellent visibility
- A clear, liquid crystal screen and an interactive display system make operations simple and straightforward
- Remote mounting capability
- Capability to store up to 3 parameters



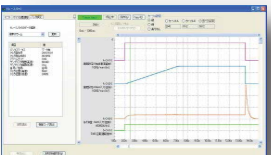
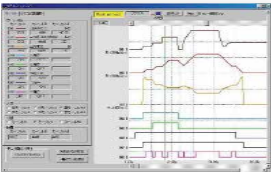
Data Control

Fault Analysis

- Equipped with a real-time clock
- Features additional alarm information storage slots
- Alarm information (speed commands, torque, current, etc.) can be saved up to 4 times
- Prevents the original alarm from being overwritten and deleted by secondary alarms

FRENIC loader (Support Software)

Fuji Electric's FRENIC Loader Software makes it easier than ever to monitor and edit data, as well as perform detailed analysis.



Trace Back Function

Inverter can memorize operation data and date & time in case of malfunction. In the event of a power supply failure, data is memorized in the inverter's internal memory and will not be erased.

Safety

Safety Standard Compliance

Inverter unit EN terminal complies with ISO 13849-1 (STO)
Option cards comply with safety standards IEC61508 SIL2 (STO, SS1, SLS, SBC).

Enhanced PG Fault Detection Functions

Monitors PG wiring current and sounds an alarm if a disconnection is detected. In addition to signal line (PA, PB), it detects power supply line (PGP, PGM) disconnection.

Maintenance

Removable Terminal Block for Easy Upgrade and Maintenance

Instead of removing multiple control wires, simply remove the terminal block and place it in another unit.



Cooling Fan Replacement

The cooling fan can be replaced without having to remove the front cover or PC board. Cumulative fan operating time data can also be cleared with function codes.



Increased Lifespan of Operating Components

10 years for cooling fans, smoothing capacitors, and PC board electrolytic capacitors.

Improved Environment Resistance

Copper bars are plated with nickel or tin to improve corrosion resistance. PC board coating reduces malfunctions caused by dust, humidity and salt water atmosphere.

Specification

HD (Heavy Overload) Three-phase 200V series

Type	FRN□VG1S-2□	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90
Nominal applied motor [kW]		0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90
Rated capacity [kVA] (*)		1.9	3.0	4.1	6.8	10	14	18	24	28	34	45	55	68	81	107	131
Rated current [A]		5	8	11	18	27	37	49	63	76	90	119	146	180	215	283	346
Overload current rating	150% of rated current -1min. (*), 200% -3s(*)																
Power supply voltage	Main power Phase, Voltage, Frequency	3-phase 200 to 230V, 50Hz/60Hz										3-phase 200 to 220V/50Hz, 200 to 230V/60Hz (*)					
	Auxiliary control power supply Phase, Voltage, Frequency	Single-phase 200 to 230V, 50Hz/60Hz															
	Auxiliary input for fan power Phase, Voltage, Frequency (*)	-										Single phase 200 to 220V, 50Hz 200 to 230V/60Hz (*)					
	Voltage/frequency variation	Voltage: +10 to -15% (Voltage unbalance: 2% or less (*)), Frequency: +5 to -5%															
	Rated current [A] (with DCR)	3.2	6.1	8.9	15.0	21.1	28.8	42.2	57.6	71.0	84.4	114	138	167	203	282	334
	(*) (without DCR)	5.3	9.5	13.2	22.2	31.5	42.7	60.7	80.1	97.0	112	151	185	225	270	-	-
Required power supply capacity [kVA] (*)		1.2	2.2	3.1	5.2	7.4	10	15	20	25	30	40	48	58	71	98	116
Braking method /braking torque		Braking resistor discharge control: 150% braking torque, Separately installed braking resistor (option), Separately installed braking unit (option for FRN75VG1S-2□ or higher)															
Carrier frequency [kHz] (*)		2 to 15													2 to 10		
Approx.weight [kg]		6.2	6.2	6.2	6.2	6.2	6.2	11	11	11	12	25	32	42	43	62	105
Enclosure		IP20 closed type UL open type										IP00 open type UL open type (IP20 closed type is available as option)					

HD (Heavy Overload) Three-phase 400V series

Type		FRN□VG1S-4□		3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	200	220	280	315	355	400	500	630		
Nominal applied motor [kW]				3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	200	220	280	315	355	400	500	630		
Rated capacity [kVA] (*)				6.8	10	14	18	24	29	34	45	57	69	85	114	134	160	192	231	287	316	396	445	495	563	731	891		
Rated current [A]				9.0	13.5	18.5	24.5	32.0	39.0	45.0	60.0	75.0	91.0	112	150	176	210	253	304	377	415	520	585	650	740	960	1170		
Overload current rating				150% of rated current -1min. (*)																200% -3s. (*)									
Power supply voltage	Main power Phase, Voltage, Frequency	3-phase 380 to 480V, 50Hz/60Hz														3-phase 380 to 440V/50Hz, 380 to 480V/60Hz (*)													
	Auxiliary control power supply Phase, Voltage, Frequency	Single phase 380 to 480V, 50Hz/60Hz																											
	Auxiliary input for fan power Phase, Voltage, Frequency (*)	-														Single phase 380 to 440V, 50Hz 380 to 480V/60Hz (*)													
	Voltage/frequency variation	Voltage: +10 to -15% (Voltage unbalance: 2% or less (*)), Frequency: +5 to -5%																											
	Rated current [A] (with DCR) (*) (without DCR)	7.5 13.0	10.6 17.3	14.4 23.2	21.1 33	28.8 43.8	35.5 52.3	42.2 60.6	57.0 77.9	68.5 94.3	83.2 114	102 140	138 -	164 -	210 -	238 -	286 -	357 -	390 -	500 -	559 -	628 -	705 -	881 -	1115 -				
Required power supply capacity [kVA] (*)				5.2	7.4	10	15	20	25	30	40	48	58	71	96	114	140	165	199	248	271	347	388	436	489	610	773		
Braking method /braking torque				Braking resistor discharge control: 150% braking torque, Separately installed braking resistor (option), Separately installed braking unit (option for FRN200VG1S-4□ or higher)																									
Carrier frequency [kHz] (*)				2 to 15												2 to 10										2 to 5			
Approx.weight [kg]				6.2	6.2	6.2	11	11	11	11	25	26	31	33	42	62	64	94	98	129	140	245	245	330	330	555	555		
Enclosure				IP20 closed type UL open type												IP00 open type UL open type (IP20 closed type is available as option)													

*Condition may apply, for more details, please refer full catalog 24A1-E-0002 at <https://felib.fujielectric.co.jp/>.

Options

User Programmable Application Cards

UPAC card is an optional PLC card for the inverter control installed on FRENIC-VG, offering additional higher level control.

Communication Cards

In addition to embedded RS485/Modbus communications, various option cards are available to cover most common fieldbus communications

- T-Link
 - CC-Link
- SX bus
 - E-SX bus
- PROFINET-IRT
 - PROFIBUS-DP
- DeviceNet

Extended I/O Cards

Various available options for additional I/O, including 115V

FRENIC-VG

High Performance Vector Control Inverter

Model Variation

Nominal applied motor (kW)	200V Series		400V Series	
	HD (150%, 1 min./200%, 3 sec.)		HD (150%, 1 min./200%, 3 sec.)	MD (150%, 1 min.)
Applied load	High Duty Spec		High Duty Spec	Middle Duty Spec
0.75	FRN0.75VG1S-2□			
1.5	FRN1.5VG1S-2□			
2.2	FRN2.2VG1S-2□			
3.7	FRN3.7VG1S-2□	FRN3.7VG1S-4□		
5.5	FRN5.5VG1S-2□	FRN5.5VG1S-4□		
7.5	FRN7.5VG1S-2□	FRN7.5VG1S-4□		
11	FRN11VG1S-2□	FRN11VG1S-4□		
15	FRN15VG1S-2□	FRN15VG1S-4□		
18.5	FRN18.5VG1S-2□	FRN18.5VG1S-4□		
22	FRN22VG1S-2□	FRN22VG1S-4□		
30	FRN30VG1S-2□	FRN30VG1S-4□		
37	FRN37VG1S-2□	FRN37VG1S-4□		
45	FRN45VG1S-2□	FRN45VG1S-4□		
55	FRN55VG1S-2□	FRN55VG1S-4□		
75	FRN75VG1S-2□	FRN75VG1S-4□		
90	FRN90VG1S-2□	FRN90VG1S-4□		
110		FRN110VG1S-4□	FRN90VG1S-4□	
132		FRN132VG1S-4□	FRN110VG1S-4□	
160		FRN160VG1S-4□	FRN132VG1S-4□	
200		FRN200VG1S-4□	FRN160VG1S-4□	
220		FRN220VG1S-4□	FRN200VG1S-4□	
250			FRN220VG1S-4□	
280		FRN280VG1S-4□		
315		FRN315VG1S-4□	FRN280VG1S-4□	
355		FRN355VG1S-4□	FRN315VG1S-4□	
400		FRN400VG1S-4□	FRN355VG1S-4□	
450			FRN400VG1S-4□	
500		FRN500VG1S-4□		
630		FRN630VG1S-4□		

* With the FRN55VG1S-2J/4J or higher (applicable motor of 75kW or higher), if driving motors of one frame or more from the inverter, the DC reactor provided as standard will differ between the HD, MD, and LD specifications. (Motor capacity becomes 1 frame larger.)

Model Number Nomenclature

FRN

30

S

VG1

S

-

4

J

Code	Series name
FRN	FRENIC Series

Code	Nominal applied motor capacity
0.75	0.75kW
1.5	1.5kW
2.2	2.2kW
?	?
800	800kW

Code	Form
None	Unit type
S	Standard stack
B	Stack by phase

Code	Destination / Instruction Manual
J	Japanese
E	English
C	Chinese

Code	Input power source
2	Three-phase 200V
4	Three-phase 400V
69	Three-phase 690V

Code	Structure
S	Standard

Code	Developed inverter series
1	1 Series

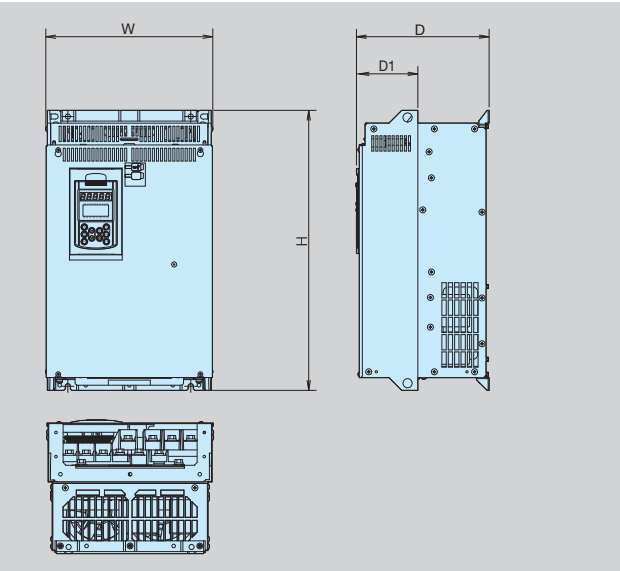
Code	Application range
VG	High performance vector control

FRENIC-VG

High Performance Vector Control Inverter

External Dimensions

[Unit: mm (Inch)]					
Series	Inverter type	External dimensions			
		W	H	D	D1
3-phase 200V	FRN0.75VG1S-2□	205 (8.07)	300 (11.81)	245 (9.65)	155 (6.10)
	FRN1.5VG1S-2□				
	FRN2.2VG1S-2□				
	FRN3.7VG1S-2□				
	FRN5.5VG1S-2□				
	FRN7.5VG1S-2□				
	FRN11VG1S-2□	250 (9.84)	400 (15.74)	261.3 (10.28)	115 (4.52)
	FRN15VG1S-2□				
	FRN18.5VG1S-2□				
	FRN22VG1S-2□				
	FRN30VG1S-2□				
	FRN37VG1S-2□	361.2 (14.22)	615 (24.21)	276.3 (10.88)	145 (5.71)
	FRN45VG1S-2□				
	FRN55VG1S-2□				
	FRN75VG1S-2□				
	FRN90VG1S-2□	535.8 (21.09)	750 (29.53)	291.3 (11.46)	180 (7.09)
		686.4 (27.02)	880 (34.65)	366.3 (14.42)	
3-phase 400V	FRN3.7VG1S-4□	205 (8.07)	300 (11.81)	245 (9.65)	155 (6.10)
	FRN5.5VG1S-4□				
	FRN7.5VG1S-4□				
	FRN11VG1S-4□				
	FRN15VG1S-4□				
	FRN18.5VG1S-4□	250 (9.84)	400 (15.74)	261.3 (10.28)	115 (4.52)
	FRN22VG1S-4□				
	FRN30VG1S-4□				
	FRN37VG1S-4□				
	FRN45VG1S-4□				
	FRN55VG1S-4□	361.2 (14.22)	615 (24.21)	276.3 (10.88)	135 (5.31)
	FRN75VG1S-4□				
	FRN90VG1S-4□				
	FRN110VG1S-4□				
	FRN132VG1S-4□	536.4 (21.12)	740 (29.13)	321.3 (12.65)	180 (7.09)
	FRN160VG1S-4□				
	FRN200VG1S-4□				
	FRN220VG1S-4□				
	FRN280VG1S-4□				
	FRN315VG1S-4□				
	FRN355VG1S-4□	686.4 (27.02)	1000 (39.37)	366.3 (14.42)	260 (10.24)
	FRN400VG1S-4□				
	FRN500VG1S-4□				
	FRN630VG1S-4□				
		886.4 (34.90)	1400 (55.12)	445.5 (17.54)	313.2 (12.33)
		1006 (39.61)	1550 (61.02)	505.9 (19.92)	



For specific external diagrams, refer to Fuji Electric website. (<http://www.fujielectric.co.jp/products/inverter/download/>)

Fuji Electric

Fuji Electric Corp. of America

47520 Westinghouse Drive, Fremont, CA 94539

Phone: 510-440-1060

www.americas.fujielectric.com

Information in this catalog is subject to change without notice.

Caution! The product detail described in this document is intended for selecting a model. When using a product, read the Instruction Manual carefully and use the product properly.