

FUJI ELECTRIC INVERTERS SELECTION GUIDE

Great performance in a compact
Welcome to the next generation
of low-noise Inverters



FRENIC-Mini Series



FRENIC-ECO Series



FRENIC-Multi Series



FRENIC-MEGA Series



FRENIC 5000VG7S Series

Advanced Products Supported by Cuttingedge Technology

Quality and High-Performance Line Up

FRENIC-Mini Series

- Optimum performance for traversing conveyors
- The ideal functions to serve a multiplicity of needs for small-capacity inverters
- Simple operation and wiring
- Interface for peripheral devices and comprehensive protective functions
- Multiple Options
- Frequency setting potentiometer is provided as standard equipment for easy frequency setting.

- Loaded with functions ideal for horizontal conveyance machines, i.e. automatic torque boost, current limiting function, and slip compensation function.
- The automatic energy-saving function and the PID control function are suitable for controlling fans and pumps.
- Side-by-side mounting is possible.



FRENIC-ECO Series

- Energy saving effects are even further enhanced
- Long life design that meets your expectation
- Maintenance is simplified for both the inverter and equipment
- Consideration of the surrounding environment and panel design
- Operator-friendly features
- Network compatibility
- Developed exclusively for variable torque load required for the equipment such as fans and pumps.

- Various functions including automatic power-saving function of a new system, PID control function, lifetime forecast function, and sequence for switching to the operation on the commercial power source.
- Suitable for fans, pumps, and air conditioners. The AC drive satisfies the conditions of adoption such as cost and functions which have not been achieved by the conventional general-purpose inverter.
- Side-by-side mounting is possible.



FRENIC-Multi Series

- Gentler on the environment
- Expanded capacity range and abundant model variation
- The highest standards of control and performance in its class
- Optimum for the operations specific to vertical and horizontal conveyance
- Simple and thorough maintenance

- Simple operation, simple wiring
- Consideration of peripheral equipment, and a full range of protective functions
- You can use an inverter equipped with functions like these
- Fully compatible with network operation
- Global compatibility



FRENIC-MEGA Series

- Applicable control methods: PG vector control, sensorless vector control, dynamic torque vector control, and V/f control
- Improved performance of current response and speed response (vector control)
- Improved durability in overload operation
- Keypad with a USB connector (option)
- Use of parts of a longer life cycle (Designed life: 10 years)

- Various functions that accommodate a wide range of applications
- Expanded capacity of the brake circuit built-in model (~22kW)
22kW~110kW: Contact Fuji
- Great model variation meeting customer's needs
- Compliance with RoHS Directives (planned)
- Improved resistance to the environmental impact



FRENIC 5000VG7S Series

- The industry's best control performance
- Use with different control types (multi-drive function)
- A wide range of capacity/flexible applications
- Built-in user-programmable functions (option as UPAC)
- Enhanced network readiness
- High-end inverter loader software
- Enhanced built-in functions
- Upgraded maintenance/protective functions

- Upgraded maintenance/protective functions
- Interactive KEYPAD for simple operation
- Conformity to world standards

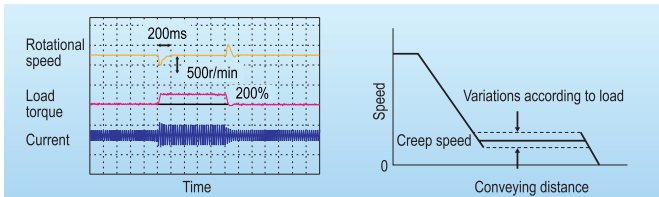


The highest standards of control and performance in its class

Multi /
MEGA / VG7

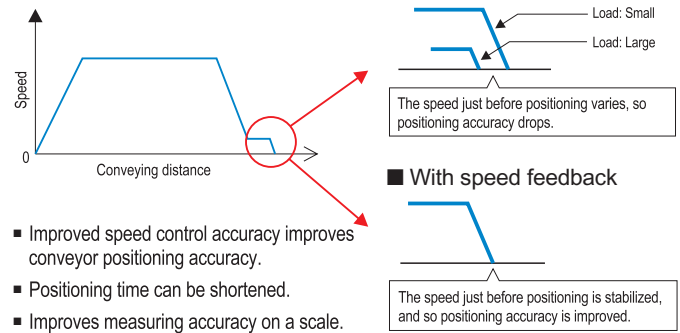
Shortened setting time in slip compensation control

Through "slip compensation control" + "voltage tuning," speed control accuracy at low speeds is improved. This minimizes variations in speed control accuracy at times when the load varies, and since the time at creep speeds is shortened, single cycle tact times can be shortened.



Compatible with PG feedback control

<Example of conveyor operation pattern>

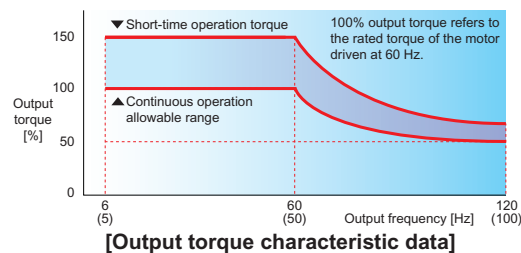
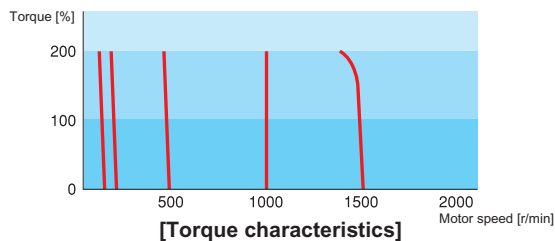


Optimum performance for traversing conveyors

Mini / Multi

High starting torque, at 150% or more

Equipped with Fuji's original simplified torque-vector control system and the automatic torque boost function, the inverter provides consistent powerful operation (when automatic torque boost is ON, slip compensation control is ON, and when running at 5Hz or more).



*The above graph shows an example of torque characteristics obtained when FRENIC-Mini is combined one-to-one with Fuji's standard three-phase motor (8-type series: 4 poles).

The highly used functions for fans and pumps

Mini / Eco /
Multi / MEGA

Automatic energy-saving provided as a standard function

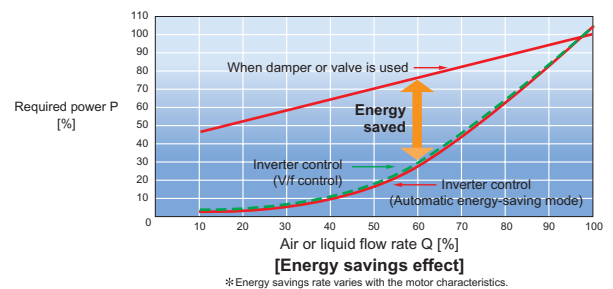
By controlling the motor loss to a minimum, FRENIC-Mini further saves electric power when applied to fans or pumps.
*Energy saving rate varies with the motor characteristics.

PID control function

Permits motor operation while controlling temperature, pressure, or flow rate without using an external device such as temperature controller.

Cooling fan ON/OFF control function

The inverter's cooling fan can be turned off while the fan or pump is stopped for noise reduction and energy savings.



The ideal functions to serve a multiplicity of needs for small-capacity inverters

Mini

Compatible with a wide range of frequency settings

The optimum frequency setting method can be selected to match your machine or equipment. Setting can be done by keypad panel (●● keys, potentiometer), analog input (4 to 20mA, 0 to +10V, 0 to 5V, 1 to 5V), multistep speed settings (8 steps) etc.

A transistor output is provided.

This enables an overload early warning, lifetime forecast or other information signals to be output during operation.

The output frequency can be set to a maximum of 400Hz.

The inverter can be used for equipment that requires a high motor speed such as centrifugal separator. In this case, check the operation in combination with the motor.

Two points can be set for a non-linear V/f pattern.

One point for the non-linear V/f pattern, which can be set as desired, has been added (making a total of 2 points), and so the V/f pattern can be adjusted to match the application.

Applications

Applications		FRENIC-Mini	FRENIC-Eco	FRENIC-Multi	FRENIC-MEGA	FRENIC5000 VG7S
Fans	Air-conditioning system	●	●	●	●	
	Dryer	●	●	●	●	
	Boiler fan		●	●	●	
	Fans for controlling furnace temperature		●	●	●	
	Roof fans controlled as a group	●	●		●	
	Refrigerator			●	●	●
	Compressor				●	●
	Built-in blower in a film-manufacturing machines		●	●	●	
	Cooling-tower fans		●	●	●	
	Ventilating fans	●	●	●	●	
	Air-conditioning equipment	●	●	●	●	
	Separator fans		●	●	●	
	Machine tools	Grinding machine				
Polishing machine						●
Milling machine						●
Lathe						●
Boring machine				●	●	●
Turntable				●	●	●
Work positioning unit				●	●	●
PC board drilling machine				●	●	●
Winding machine				●	●	●
Press				●	●	●
Conveyance machinery		Crane (traveling, traversing, hoisting)		●	●	●
	Automated warehouse			●	●	●
	Conveyor (belt, chain, screw, roller)	●	●	●	●	●
	Lift			●	●	●
	Car parking system			●	●	●
	Elevator, escalator		●	●	●	●
	Automatic door	●		●	●	●
	Shutter			●	●	●
	Speed changer	●	●	●	●	●
	Chemical machinery/ wood working machines	Fluids mixing machine			●	●
Extruder					●	●
Vibrator				●	●	●
Centrifugal separator		●	●	●	●	●
Coating machine				●	●	●
Take-up roller				●	●	●
Router machine				●	●	●
Sanding machine				●	●	●
Planing machine				●	●	●
Food processing machines		Food mixer			●	●
	Food slicer			●	●	
	Grain processing machine	●	●	●	●	●
	Tea manufacturing machine			●	●	●
	Rice milling machine			●	●	●
	Rice sorters	●	●	●	●	●
Electric pumps	Tankless water-supply system		●	●	●	
	Submersible pump		●	●	●	
	Vacuum pump			●	●	●
	Fountain pump		●	●	●	
	Cooling water pump		●	●	●	
	Circulating hot water pump		●	●	●	
	Well pump		●	●	●	●
	Pump for agricultural water storage		●	●	●	●
	Water treatment system		●		●	
	Constant-flow pump			●	●	●
	Sludge pump		●	●	●	
	Water-supply pumps/handy pumps	●	●	●	●	
	Packaging machinery	Individual packing/inner packing	●	●	●	●
Packing machine		●	●	●	●	●
Outer packing machine			●	●	●	●
Paper making/ textile machinery	Spinning machine			●	●	●
	Knitting machine			●	●	●
	Textile printing machine			●	●	●
	Industrial sewing machine			●	●	●
	Synthetic fiber manufacturing plant					●
	Slitters	●		●	●	
Other machinery	Automated food/medicine blending machine			●	●	●
	Commercial-use washing machine				●	●
	Offset printing press			●	●	●
	Bookbinding machine			●	●	●
	Car washing machine			●	●	●
	Shredder	●	●	●	●	●
	Food washing machine			●	●	●
	Test equipment			●	●	●
	Crushers		●	●	●	●
	Air curtains/window shades/kitchen ventilating fans	●				

Product Range

Wide Variations Available for Meeting Various Needs.

Applicable motor rating [kW]	FRENIC-Mini		FRENIC-Eco		FRENIC-Multi		FRENIC-MEGA (HD spec)		FRENIC5000VG7S	
	Three-phase 400V	Three-phase 200V	Three-phase 400V	Three-phase 200V	Three-phase 400V	Three-phase 200V	Three-phase 400V	Three-phase 200V	Three-phase 400V CT use	Three-phase 200V CT use
0.1		FRN0.1C1□-2■				FRN0.1E1□-2■				
0.2		FRN0.2C1□-2■				FRN0.2E1□-2■				
0.4	FRN0.4C1□-4■	FRN0.4C1□-2■			FRN0.4E1□-4■	FRN0.4E1□-2■	FRN0.4G1□-4■	FRN0.4G1□-2■		
0.75	FRN0.75C1□-4■	FRN0.75C1□-2■	FRN0.75F1□-4■	FRN0.75F1□-2■	FRN0.75E1□-4■	FRN0.75E1□-2■	FRN0.75G1□-4■	FRN0.75G1□-2■		FRN0.75VG7S-2
1.5	FRN1.5C1□-4■	FRN1.5C1□-2■	FRN1.5F1□-4■	FRN1.5F1□-2■	FRN1.5E1□-4■	FRN1.5E1□-2■	FRN1.5G1□-4■	FRN1.5G1□-2■		FRN1.5VG7S-2
2.2	FRN2.2C1□-4■	FRN2.2C1□-2■	FRN2.2F1□-4■	FRN2.2F1□-2■	FRN2.2E1□-4■	FRN2.2E1□-2■	FRN2.2G1□-4■	FRN2.2G1□-2■		FRN2.2VG7S-2
3.7	FRN3.7C1□-4■	FRN3.7C1□-2■	FRN3.7F1□-4■	FRN3.7F1□-2■	FRN3.7E1□-4■	FRN3.7E1□-2■	FRN3.7G1□-4■	FRN3.7G1□-2■	FRN3.7VG7S-4	FRN3.7VG7S-2
5.5			FRN5.5F1□-4■	FRN5.5F1□-2■	FRN5.5E1□-4■	FRN5.5E1□-2■	FRN5.5G1□-4■	FRN5.5G1□-2■	FRN5.5VG7S-4	FRN5.5VG7S-2
7.5			FRN7.5F1□-4■	FRN7.5F1□-2■	FRN7.5E1□-4■	FRN7.5E1□-2■	FRN7.5G1□-4■	FRN7.5G1□-2■	FRN7.5VG7S-4	FRN7.5VG7S-2
11			FRN11F1□-4■	FRN11F1□-2■	FRN11E1□-4■	FRN11E1□-2■	FRN11G1□-4■	FRN11G1□-2■	FRN11VG7S-4	FRN11VG7S-2
15			FRN15F1□-4■	FRN15F1□-2■	FRN15E1□-4■	FRN15E1□-2■	FRN15G1□-4■	FRN15G1□-2■	FRN15VG7S-4	FRN15VG7S-2
18.5			FRN18.5F1□-4■	FRN18.5F1□-2■			FRN18.5G1□-4■	FRN18.5G1□-2■	FRN18.5VG7S-4	FRN18.5VG7S-2
22			FRN22F1□-4■	FRN22F1□-2■			FRN22G1□-4■	FRN22G1□-2■	FRN22VG7S-4	FRN22VG7S-2
30			FRN30F1□-4■	FRN30F1□-2■			FRN30G1□-4■	FRN30G1□-2■	FRN30VG7S-4	FRN30VG7S-2
37			FRN37F1□-4■	FRN37F1□-2■			FRN37G1□-4■	FRN37G1□-2■	FRN37VG7S-4	FRN37VG7S-2
45			FRN45F1□-4■	FRN45F1□-2■			FRN45G1□-4■	FRN45G1□-2■	FRN45VG7S-4	FRN45VG7S-2
55			FRN55F1□-4■	FRN55F1□-2■			FRN55G1□-4■	FRN55G1□-2■	FRN55VG7S-4	FRN55VG7S-2
75			FRN75F1□-4■	FRN75F1□-2■			FRN75G1□-4■	FRN75G1□-2■	FRN75VG7S-4	FRN75VG7S-2
90			FRN90F1□-4■	FRN90F1□-2■			FRN90G1□-4■	FRN90G1□-2■	FRN90VG7S-4	FRN90VG7S-2
110			FRN110F1□-4■	FRN110F1□-2■			FRN110G1□-4■		FRN110VG7S-4	
132			FRN132F1□-4■				FRN132G1□-4■		FRN132VG7S-4	
160			FRN160F1□-4■				FRN160G1□-4■		FRN160VG7S-4	
200			FRN200F1□-4■				FRN200G1□-4■		FRN200VG7S-4	
220			FRN220F1□-4■				FRN220G1□-4■		FRN220VG7S-4	
250									FRN250VG7S-4	
280			FRN280F1□-4■				FRN280G1□-4■		FRN280VG7S-4	
315			FRN315F1□-4■				FRN315G1□-4■		FRN315VG7S-4	
355			FRN355F1□-4■				FRN355G1□-4■		FRN355VG7S-4	
400			FRN400F1□-4■				FRN400G1□-4■		FRN400VG7S-4	
450			FRN450F1□-4■							
500			FRN500F1□-4■				FRN500G1□-4■		FRN500VG7S-4	
560			FRN560F1□-4■							
630							FRN630G1□-4■		FRN630VG7S-4	

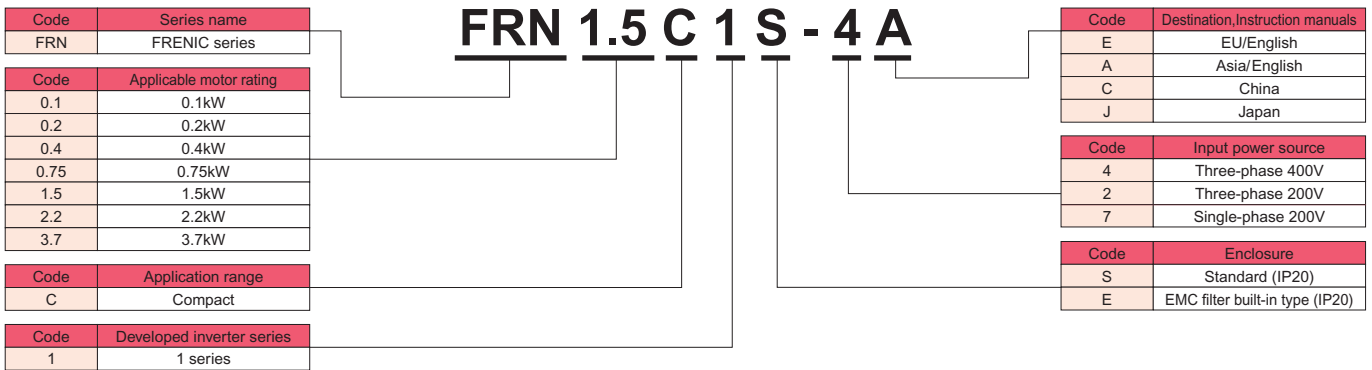
* The VG7 series also includes FRN710BVG7S-4 (460V, 710kW) and FRN800BVG7S-4 (460V, 800kW). Contact Fuji for details.

□ : S : standard ■ : A : Asia
 E : EMC filter built-in type E : EU
 H : DC Reactor built-in type C : China
 B : waterproof type J : Japan

How to read the model number

Compact inverter

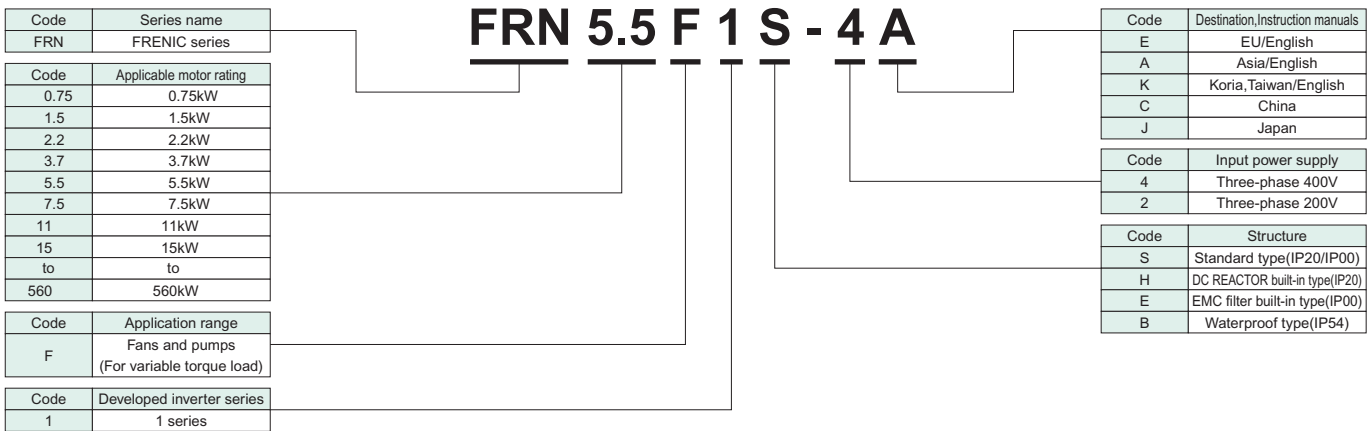
■ FRENIC-Mini



Note) If "Built-in option" is "None" and "Brake" is "Standard", the model numbers are indicated in the same format as those of the above standard specifications.

Fan&Pumps

■ FRENIC-Eco



Note: When the lower three digits of the model number indicate a keypad (standard), no built-in option, and screw terminals (standard), the inverter is a standard type in the above model list. There may be some nonstandard models that we cannot manufacture.

⚠ Caution Use the contents of this catalog only for selecting product types and models. When using a product, read the Instruction Manual beforehand to use the product correctly.

High performance and compact

■ FRENIC-Multi

Code	Series name
FRN	FRENIC series

Code	Applicable motor rating
0.1	0.1kW
0.2	0.2kW
0.4	0.4kW
0.75	0.75kW
to	to
15	15kW

Code	Application range
E	High performance/Compact

Code	Developed inverter series
1	1 series

FRN 0.75 E 1 S - 4 A

Code	Destination, Instruction manuals
E	EU/English
A	Asia/English
K	Korea, Taiwan/English
C	China
J	Japan

Code	Input power source
4	Three-phase 400V
2	Three-phase 200V
7	Single-phase 200V

Code	Enclosure
S	Standard type (IP20)
E	EMC filter built-in type

High performance and multi functional type

■ FRENIC-MEGA

Code	Series name
FRN	FRENIC series

Code	Applicable motor rating
0.4	0.4kW
0.75	0.75kW
to	to
630	630kW

Code	Applicable range
G	High performance, multifunctional type

Code	Developed inverter series
1	1 series

FRN 0.75 G 1 S - 4 A

Code	Destination, Instruction manuals
E	EU/English
A	Asia/English
T	Taiwan/English
C	China
J	Japan

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

Code	Enclosure
S	Standard type
E	EMC filter built-in type

High performance and vector control

■ FRENIC5000VG7S

Code	Series name
FRN	FRENIC5000 series

Code	Applicable motor rating
0.75	0.75kW
1.5	1.5kW
2.2	2.2kW
3.7	3.7kW
5.5	5.5kW
7.5	7.5kW
to	to
710	710kW(stack type)
800	800kW(stack type)

Code	Structure
None	Unit type
B	Stack type(only 710kW and 800kW)

FRN 5.5 VG 7 S - 2 SX

Code	Unit series
None	Standard type
SX	SX-bus-compliant type
CC	CC-Link-compliant type
FB	Profibus-DP-compliant type, Device Net compliant

Code	Input power source
4	Three-phase 460V
2	Three-phase 230V

Code	Enclosure
S	Standard

Code	Developed inverter series
7	7 series

Code	Application range
VG	High performance vector control

⚠ Caution Use the contents of this catalog only for selecting product types and models. When using a product, read the Instruction Manual beforehand to use the product correctly.

Specifications

			FRENIC-Mini (Catalog No.MEH441)	FRENIC-Eco (Catalog No.MEH442)	FRENIC-Multi (Catalog No.MEH652)	
Input ratings	Phase, Voltage, Frequency	Three-phase 400V	Three-phase 380 to 480V 50/60Hz	Three-phase 380 to 480V 50/60Hz	Three-phase 380 to 480V (with AVR)	
		Three-phase 200V	Three-phase 200 to 230V 50/60Hz	Three-phase 200 to 240V 50/60Hz	Three-phase 200 to 240V (with AVR)	
		Single-phase	Single-phase 200 to 240V 50/60Hz	Single-phase 200 to 240V 50/60Hz	Single-phase 200 to 240V (with AVR)	
	Variations	Voltage: Three-phase: +10 to -15% (Voltage unbalance *3): 2% or less) Single-phase: +10 to -10% Frequency: +5 to -5%	Voltage: Three-phase: +10 to -15% (Voltage unbalance *3): 2% or less) Single-phase: +10 to -10% Frequency: +5 to -5%	Voltage: Three-phase: +10 to -15% (Voltage unbalance *3): 2% or less) Single-phase: +10 to -10% Frequency: +5 to -5%	Voltage: Three-phase: +10 to -15% (Voltage unbalance *3): 2% or less) Single-phase: +10 to -10% Frequency: +5 to -5%	
Output overload capability		150% of rated current for 1min, 200% of rated current for 0.5s	150% of rated current for 1min	150% of rated current for 1min, 200% of rated current for 0.5s		
Output frequency setting	Maximum frequency	25 to 400Hz	25 to 120Hz	25 to 400Hz variable setting		
	Base frequency	25 to 400Hz	25 to 120Hz	50, 60Hz		
	Starting frequency	0.1 to 60.0Hz	0.1 to 60.0Hz	0.1 to 60.0Hz variable setting, Duration: 0.0 to 10.0s		
	Carrier frequency*4)	0.75 to 15kHz	0.75 to 15kHz (230V/460V: 0.75 to 22kW) 0.75 to 10kHz (230V/460V: 30 to 75kW) 0.75 to 6kHz (230V/460V: 90 to 560kW) 0.75 to 4kHz (230V/460V: 37 to 90kW,IP54 series)	0.75 to 15kHz variable setting		
Starting torque		150% or over (Auto torque boost in 5Hz operation)	50% or over	200% or over (Auto torque boost in 0.5Hz operation, slip compensation and auto torque boost)		
Braking	Standard torque*6)		150% (0.1,0.2kW), 100% (0.4,0.75kW), 50% (1.5kW), 30% (2.2,3.7kW)	20% (22kW or smaller) 10 to 15% (30kW or larger)	150% (0.1,0.2kW), 100% (0.4,0.75kW), 70%(1.5kW), 40%(2.2,3.7kW), 20%(5.5kW or larger)	
	DC injection braking	Starting frequency	0.0 to 60.0Hz	0.0 to 60.0Hz	0.1 to 60.0Hz	
		Braking time	0.0 to 30.0s	0.0 to 30.0s	0.0 to 30.0s	
		Braking level	0 to 100%	0 to 60%	0 to 100%	
Control method		V/f control (Simplified torque-vector control)	V/f control	<ul style="list-style-type: none"> V/f control Dynamic torque-vector control (magnetic flux estimator) V/f control (with sensor, when the PG interface card (option) is installed) 		
Acceleration/deceleration time		0.00 to 3600s / 0.00 to 3600s	0.00 to 3600s / 0.00 to 3600s	0.00 to 3600s / 0.00 to 3600s		
Multistep frequency		8 steps	8 steps	16 steps		
Frequency setting control (analog input)		0 to +5V DC (Inverse mode available) 0 to +10V DC (Inverse mode available) 4 to +20mA (Inverse mode available)	0 to +5V DC (or +1 to +5V DC) (Inverse mode available) 0 to +10V DC (Inverse mode available) 4 to +20mA (Inverse mode available)	0 to +5V DC (or +1 to +5V DC) (Inverse mode available) 0 to +10V DC (Inverse mode available) 4 to +20mA (Inverse mode available)		
Standard functions		Bias frequency, Gain for frequency setting, High and low frequency limiter, Jump frequency control, Slip compensation, Auto-restart after momentary power failure, Automatic deceleration, Torque limiting, Energy saving operation, Automatic torque boost, PID control, Link operation, Fan stop operation, Droop operation, Torque control	Bias frequency, Gain for frequency setting, High and low frequency limiter, Jump frequency control, Auto-restart after momentary power failure, PID control, Link operation (Option)	Torque boost, Motor sound, Power-on start (V type), Reverse-phase sequence lock (V type), Auto-restart after momentary power failure, RS-485 serial communication (C type)		
Protection		Overcurrent (Short-circuit, Ground fault), Overvoltage, Incoming surge, Undervoltage, Input phase loss, Overheating, Motor overload (Electronic thermal overload trip), Stall prevention, External alarm input, Memory error, Communication error (KEYPAD, Option, RS-485), CPU error, Option error, Output phase loss error	Overcurrent (Short-circuit, Ground fault), Overvoltage, Undervoltage, Overheating, Motor overload (Electronic thermal overload trip), Stall prevention, External alarm input, Memory error, RS-485 Communication error, CPU error,	Short-circuit, Ground fault, Overvoltage, Undervoltage, Overheating, Motor overload (Electronic thermal overload trip), Stall prevention		
Enclosure (IEC60529)		IP20, UL open type	IP20, UL open type	IP20 (IEC60529) / UL open type (UL50)		
Cooling method		Natural cooling : 0.75kW or smaller Fan cooling : 1.5kW or larger	Natural cooling : 1.5kW or smaller Fan cooling : 2.2kW or larger	Natural cooling : 0.75kW or smaller Fan cooling : 1.5kW or larger		
Conformed standard		EC Directive(CE marking) / TÜV certification / UL standard(cUL certification)	EC Directive(CE marking) / UL standard(cUL certification)	EC Directive(CE marking) / UL standard(cUL certification)		

NOTES: *1) When the input voltage is 380 to 398V/50Hz or 380 to 430V/60Hz, the tap of the auxiliary transformer must be changed.

*2) Order individually.

*3) Refer to IEC 61800-3 (5.2.3).

*4) When inverter is operating at a carrier frequency of 10kHz or higher, the inverter may automatically reduce the carrier frequency to 8kHz for protecting inverter.

*5) With Dynamic torque-vector control selected.

*6) With a nominal applied motor, this value is average torque when the motor decelerates and stops from 60Hz.
(It may change according to motor loss.)

*7) Available soon.

FRENIC-MEGA (HD spec) (Catalog No.MEH642)	FRENIC5000VG7 (Catalog No.MEH405)
Three-phase 380 to 480V 50/60Hz	15kW or smaller : Three-phase 380 to 480V, 50Hz/60Hz 18.5 to 220kW : Three-phase 380 to 440V/50Hz, 380 to 480V/60Hz (*8) 280kW or larger : Three-phase 380 to 480V, 50Hz/60Hz
22kW or smaller : Three-phase 200 to 240V 50/60Hz 30kW or larger : Three-phase 200 to 220V/50Hz (220 to 230V/50Hz) *2 200 to 230V 60Hz	15kW or smaller :Three-phase 200 to 230V, 50Hz/60Hz 18.5kW or larger:Three-phase 200 to 220V/50Hz, 200 to 230V/60Hz (*2)
Voltage : +10 to -15% (Voltage unbalance *3): 2% or less) Frequency : +5 to -5%	Voltage : +10 to -15% (Voltage unbalance *3): 2% or less) Frequency : +5 to -5%
150% of rated current for 1min, 200% of rated current for 3.0s	150% of rated current for 1min(CT use) 110% of rated current for 1min(VT use) 200% of rated current for 10 s (HT use)
25 to 500Hz	200Hz in terms of inverter output frequency
25 to 500Hz	—
0.1 to 60Hz variable setting	—
0.75 to 16kHz (0.4 to 55kW) 0.75 to 10kHz (75 to 400kW) 0.75 to 6kHz (500 to 630kW)	0.75 to 15kHz
200% (22kW or smaller) *5) 180% (30kW or larger) *5)	Starting speed : 0.0 to 150.0 r/min
150% (0.75kW or smaller), 100% (1.5 to 7.5kW), 20% (11 to 22kW), 10 to 15% (30kW or larger)	150%
0.1 to 60.0Hz	Braking speed : 1 to 3600 r/min
0.0 to 30.0s	0.0 to 30.0s
0 to 100%	—
<ul style="list-style-type: none"> • V/f control • Dynamic torque vector control • V/f control, the slip compensation is available. • V/f control w/ speed sensor (PG optional) • Dynamic torque vector control speed sensor (PG optional) • Speed sensorless vector control • Vector control w/ speed sensor (PG optional) 	<ul style="list-style-type: none"> ·V/f control ·vector control ·Sensorless vector control
0.01 to 6000s / 0.01 to 6000s	0.01 to 3600s / 0.01 to 3600s
16 steps	16 steps
0 to +10V DC (or ±5V DC) (Inverse mode available) 0 to +10V DC (or + 1 to +5V DC) (Inverse mode available) 4 to +20mA (Inverse mode available)	0 to ±10V
Bias frequency, Gain for frequency setting, High and low frequency limiter, Jump frequency control, Slip compensation, Auto-restart after momentary power failure, Automatic deceleration, Torque limiting, Energy saving operation, Automatic torque boost, PID control, Link operation, Fan stop operation, Droop operation, Torque control	Bias frequency, Gain for frequency setting, High and low frequency limiter, Jump frequency control, Slip compensation, Auto-restart after momentary power failure, Automatic deceleration, Torque limiting, Energy saving operation, Automatic torque boost, Rotating motor pick-up, Line/Inverter changeover operation, PID control, Link operation, Fan stop operation Droop operation, Torque control
Overcurrent (Short-circuit, Ground fault), Overvoltage, Incoming surge, Undervoltage, Input phase loss, Overheating, Motor overload (Electronic thermal overload trip), Stall prevention, External alarm input, Memory error, Communication error (KEYPAD, Option, RS-485), CPU error, Option error, Output phase loss error	Overcurrent (Short-circuit, Ground fault), Overvoltage, Incoming surge, Undervoltage, Input phase loss, Overheating, Motor overload (Electronic thermal overload trip), Fuse blown, Stall prevention, Active drive, External alarm input, Overspeed, Memory error, Communication error (KEYPAD, Option, RS-485), CPU error, Option error, Operation procedure error, Output phase loss error
IP20 (IEC60529) closed type UL open type (UL 50) (22kW or smaller), IP00 open type, UL open type (30kW or larger)	IP20 (15kW or smaller) ,IP00(18.5kW or larger)(IP20 : Option for 18.5kW lager)
Natural cooling : 1.5kW or smaller Fan cooling : 2.2kW or larger	Fan cooling
UL standard(cUL certification)	EC Directive(CE marking) / UL standard(cUL certification)

Functions

Function		FRENIC-Mini	FRENIC-Eco	FRENIC-Multi	FRENIC-MEGA	Related function code
Operation command	Keypad operation (FWD/REV/STOP key) (RUN/STOP key)	●	●	●	●	F02
		●	●	●	●	
	FWD or REV signal input	●	●	●	●	
	RS-485	●	●	●	●	
Frequency command	Keypad operation (\wedge or \vee key)	●	●	●	●	F01
	Voltage input	●	●	●	●	
	Current input	●	●	●	●	
	Voltage + Current input	●	●	●	●	
	Reversible operation, Inverse mode operation	●	●	●	●	
	Frequency setting POT (attached)	●	▲	▲	▲	
	RS-485	●	●	●	●	
Monitoring on inverter display	Running or stopping	●	●	●	●	E43
	Output frequency	●	●	●	●	
	Output current	●	●	●	●	
	Output voltage	●	●	●	●	
	Motor synchronous speed	●	●	●	●	
	Line speed	●	●	●	●	
	Torque calculation value	●	●	●	●	
	Input power	●	●	●	●	
	PID reference value, feedback value	●	●	●	●	
V/f characteristics setting	Maximum frequency	25-400Hz	25-120Hz	25-400Hz	50-400Hz	F03
	Base frequency	25-400Hz	25-120Hz	25-400Hz	25-400Hz	F04
	V/f pattern (Torque boost) (A: Automatic)	● A	● A	● A	● A	F09
	Motor 2 setting	●	●	●	●	A01- A18
	Starting frequency	0.1-60.0Hz	0.1-60.0Hz	0.1-60.0Hz	0.1-60.0Hz	F23
Input control signal	3-wire operation stop [HLD]	●	●	●	●	E01-
	Coast-to-stop [BX]	●	●	●	●	E01-
	Alarm reset [RST]	●	●	●	●	E01-
	External fault [THR]	●	●	●	●	E01-
	Line/Inverter changeover [SW50], [SW60]	●	●	●	●	E01-
	UP/DOWN control [UP],[DOWN]	●	●	●	●	E01-
	Inverse/normal changeover [IVS]	●	●	●	●	E01-
Control functions	Restart mode after momentary power failure	●	●	●	●	F14, H13-H16
	High and low frequency limiter	●	●	●	●	F15, F16
	Gain (for frequency setting signal)	●	●	●	●	F17
	Bias frequency setting	●	●	●	●	F18
	DC injection brake	●	●	●	●	F20-F22
	Starting frequency	●	●	●	●	F23, F24
	Motor sound select	●	●	●	●	F26, F27
	Torque limiter (Driving, Braking)	●	●	●	●	F40,F41,E16,E17
	ACC/DEC time setting	●	●	●	●	F07, F08, E10-
	Dynamic torque vector control	●	●	●	●	F42
	Jump frequency	●	●	●	●	C01-C04
	Multistep speed setting	8 steps	16 steps	16 steps	16 steps	C05-
	PATTERN operation	●	●	●	●	C21-C28
	Tuning	●	●	●	●	P04, A13
	On-line tuning	●	●	●	●	P05, A14
	Slip compensation control	●	●	●	●	P09, A18
	Auto reset	●	●	●	●	H04, H05
	Fan stop operation	●	●	●	●	H06
	ACC/DEC pattern (Non-linear)	●	●	●	●	H07
	Reverse phase sequence lock	●	●	●	●	H08
	Rotating motor pick up	●	●	●	●	H09
	Energy saving operation	●	●	●	●	H10
	Torque control	●	●	●	●	H18
	PID control	●	●	●	●	H20-H25
	Droop operation	●	●	●	●	H28

NOTES 1: ● : Available No symbol : Not available ▲ : Available (Option)
 2: For details of the FRENIC-VG7S series, see catalog, No.MEH405.

Function		FRENIC-Mini	FRENIC-Eco	FRENIC-Multi	FRENIC-MEGA	Related function code	
Output signal	Output frequency	●	●	●	●	F30, F31	
	Output current	●	●	●	●	F30, F31	
	PID feedback value	●	●	●	●	F30, F31	
	DC link circuit voltage	●	●	●	●	F30, F31	
	Output voltage	●	●	●	●	F30, F31	
	Output torque	●	●	●	●	F30, F31	
	Load factor	●	●	●	●	F30, F31	
	Input power	●	●	●	●	F30, F31	
	Universal AO		●	●	●	F30, F31	
	Inverter running [RUN]	●	●	●	●	E20-	
	Frequency equivalence signal [FAR]	●	●	●	●	E20-	
	Frequency level detection [FDT]	●	●	●	●	E20-	
	Undervoltage detection signal [LU]	●	●	●	●	E20-	
	Torque polarity [B/D]			●	●	E20-	
	Low output torque detected [U-TL]		●		●	E20-	
	Auto-restarting [IPF]	●	●	●	●	E20-	
	Overload early warning [OL]	●	●	●	●	E20-	
	Keypad operation mode [KP]				●	E20-	
	Inverter stopping [STP]					E20-	
	Ready output [RDY]		●		●	E20-	
	Line/Inverter changeover [SW88],[SW52-2],[SW52-1]		●		●	E20-	
	Motor2/Motor1 [SWM2]				●	●	E20-
	PATTERN operation [TU],[TO],[STG1],[STG2],[STG4]				●		E20-
	Alarm output (for any alarm) [ALM]	●	●	●	●	E20-	
	Fan operation [FAN]		●		●	E20-	
	Auto resetting [TRY]	●	●	●	●	E20-	
Universal DO [U-DO]		●	●	●	E20-		
Overheat early warning [OH]		●	●	●	E20-		
Protection	Overcurrent (Short-circuit)(Ground fault)(OC,EF)	●	●	●	●		
	Overvoltage (OU)	●	●	●	●		
	Incoming surge	●	●	●	●		
	Undervoltage (LU)	●	●	●	●	F14	
	Input phase loss (Lin)	●	●	●	●		
	Overheating (OH)	●	●	●	●		
	Braking resistor overheating (dbH)	●		●	●	F13	
	Motor protection (Electronic thermal relay) (OL)	●	●	●	●	F10-F12,A06-A08	
	Motor protection (PTC thermistor)	●	●	●	●	H26,H27	
	Stall prevention	●	●	●	●	F40,F41,E16,E17,H12	
	Active drive				●	H19	
	External alarm input (OH2)	●	●	●	●		
	Memory error (Er1)	●	●	●	●		
	Keypad panel communication error (Er2)	●	●	●	●	F02	
	CPU error (Er3)	●	●	●	●		
	Option communication error (Er4)		●	●	●		
	Option error (Er5)		●	●	●		
	Operation procedure error (Er6)	●	●	●	●		
	Output phase loss error (Er7)		●	●	●		
	RS-485 communication error (Er8)	●	●	●	●		
Others	Data protection	●	●	●	●	F00	
	Data initializing (Data reset)	●	●	●	●	H03	

NOTES 1: ● : Available No symbol : Not available ▲ : Available (Option)
2: For details of the FRENIC-VG7S series, see catalog, No.MEH405.

Outline Dimensions

FRENIC-Mini

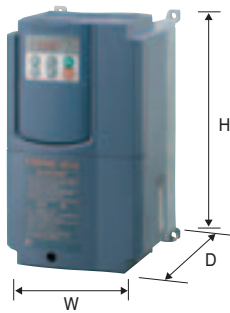


Basic type				
Three-phase 400V				
Applicable motor rating [kW]	Type	Dimensions (mm)		
		W	H	D
0.4	FRN0.4C1S-4	110	130	115
0.75	FRN0.75C1S-4	110	130	139
1.5	FRN1.5C1S-4	110	130	139
2.2	FRN2.2C1S-4	110	130	139
3.7	FRN3.7C1S-4	140	180	139
Three-phase 200V				
Applicable motor rating [kW]	Type	Dimensions (mm)		
		W	H	D
0.1	FRN0.1C1S-2	80	120	80
0.2	FRN0.2C1S-2	80	120	80
0.4	FRN0.4C1S-2	80	120	95
0.75	FRN0.75C1S-2	80	120	120
1.5	FRN1.5C1S-2	110	130	139
2.2	FRN2.2C1S-2	110	130	139
3.7	FRN3.7C1S-2	140	180	139
Single-phase 200V				
Applicable motor rating [kW]	Type	Dimensions (mm)		
		W	H	D
0.1	FRN0.1C1S-7	80	120	80
0.2	FRN0.2C1S-7	80	120	80
0.4	FRN0.4C1S-7	80	120	95
0.75	FRN0.75C1S-7	80	120	140
1.5	FRN1.5C1S-7	110	130	149
2.2	FRN2.2C1S-7	110	130	149
3.7	FRN3.7C1S-7	140	180	139
Single-phase 200V				
Applicable motor rating [kW]	Type	Dimensions (mm)		
		W	H	D
0.1	FRN0.1C1S-6	80	120	100
0.2	FRN0.2C1S-6	80	120	100
0.4	FRN0.4C1S-6	80	120	115

EMC filter built-in type				
Three-phase 400V				
Applicable motor rating [kW]	Type	Dimensions (mm)		
		W	H	D
0.4	FRN0.4C1E-4	110	180	158
0.75	FRN0.75C1E-4	110	180	182
1.5	FRN1.5C1E-4	140	245	182
2.2	FRN2.2C1E-4	140	245	182
3.7	FRN3.7C1E-4	140	245	182
Three-phase 200V				
Applicable motor rating [kW]	Type	Dimensions (mm)		
		W	H	D
0.1	FRN0.1C1E-2	80	170	100
0.2	FRN0.2C1E-2	80	170	100
0.4	FRN0.4C1E-2	80	170	115
0.75	FRN0.75C1E-2	80	170	140
1.5	FRN1.5C1E-2	140	245	182
2.2	FRN2.2C1E-2	140	245	182
3.7	FRN3.7C1E-2	140	245	182
Single-phase 200V				
Applicable motor rating [kW]	Type	Dimensions (mm)		
		W	H	D
0.75	FRN0.75C1E-7	110	180	139
1.5	FRN1.5C1E-7	140	245	182
2.2	FRN2.2C1E-7	140	245	182

■ : Code
 E EU/English
 A Asia/English
 C China
 J Japan

FRENIC-Eco



Basic type				
Three-phase 400V				
Applicable motor rating [kW]	Type	Dimensions (mm)		
		W	H	D
0.75	FRN0.75F1S-4	150	260	163
1.5	FRN1.5F1S-4	150	260	163
2.2	FRN2.2F1S-4	150	260	163
3.7	FRN3.7F1S-4	150	260	163
5.5	FRN5.5F1S-4	150	260	163
7.5	FRN7.5F1S-4	220	260	215
11	FRN11F1S-4	220	260	215
15	FRN15F1S-4	220	260	215
18.5	FRN18.5F1S-4	250	400	215
22	FRN22F1S-4	250	400	215
30	FRN30F1S-4	250	400	215
37	FRN37F1S-4	320	550	255
45	FRN45F1S-4	320	550	255
55	FRN55F1S-4	355	550	270
75	FRN75F1S-4	355	615	270
90	FRN90F1S-4	355	740	300
110	FRN110F1S-4	355	740	300
132	FRN132F1S-4	530	740	315
160	FRN160F1S-4	530	740	360
200	FRN200F1S-4	530	1000	360
220	FRN220F1S-4	530	1000	360
280	FRN280F1S-4	680	1000	360
315	FRN315F1S-4	680	1000	360
355	FRN355F1S-4	680	1400	440
400	FRN400F1S-4	680	1400	440
450	FRN450F1S-4	880	1400	440
500	FRN500F1S-4	880	1400	440
560	FRN560F1S-4	880	1400	440
Three-phase 200V				
Applicable motor rating [kW]	Type	Dimensions (mm)		
		W	H	D
0.75	FRN0.75F1S-2	150	260	163
1.5	FRN1.5F1S-2	150	260	163
2.2	FRN2.2F1S-2	150	260	163
3.7	FRN3.7F1S-2	150	260	163
5.5	FRN5.5F1S-2	150	260	163
7.5	FRN7.5F1S-2	220	260	215
11	FRN11F1S-2	220	260	215
15	FRN15F1S-2	220	260	215
18.5	FRN18.5F1S-2	250	400	215
22	FRN22F1S-2	250	400	215
30	FRN30F1S-2	250	400	215
37	FRN37F1S-2	320	550	255
45	FRN45F1S-2	355	615	270
55	FRN55F1S-2	355	615	270
75	FRN75F1S-2	355	740	270
90	FRN90F1S-2	530	750	360
110	FRN110F1S-2	680	880	395

EMC filter built-in type				
Three-phase 400V				
Applicable motor rating [kW]	Type	Dimensions (mm)		
		W	H	D
0.75	FRN0.75F1E-4	152	415	184
1.5	FRN1.5F1E-4	152	415	184
2.2	FRN2.2F1E-4	152	415	184
3.7	FRN3.7F1E-4	152	415	184
5.5	FRN5.5F1E-4	152	415	184
7.5	FRN7.5F1E-4	220	440	260
11	FRN11F1E-4	220	440	260
15	FRN15F1E-4	220	440	260
Three-phase 200V				
Applicable motor rating [kW]	Type	Dimensions (mm)		
		W	H	D
0.75	FRN0.75F1E-2	152	415	184
1.5	FRN1.5F1E-2	152	415	184
2.2	FRN2.2F1E-2	152	415	184
3.7	FRN3.7F1E-2	152	415	184
5.5	FRN5.5F1E-2	152	415	184
7.5	FRN7.5F1E-2	220	440	260
11	FRN11F1E-2	220	440	260
15	FRN15F1E-2	220	440	260

DC Reactor built-in type				
Three-phase 400V				
Applicable motor rating [kW]	Type	Dimensions (mm)		
		W	H	D
0.75	FRN0.75F1H-4	152	415	184
1.5	FRN1.5F1H-4	152	415	184
2.2	FRN2.2F1H-4	152	415	184
3.7	FRN3.7F1H-4	152	415	184
5.5	FRN5.5F1H-4	152	415	184
7.5	FRN7.5F1H-4	220	440	260
11	FRN11F1H-4	220	440	260
15	FRN15F1H-4	220	440	260
18.5	FRN18.5F1H-4	250	600	260
22	FRN22F1H-4	250	600	260
30	FRN30F1H-4	250	600	260
37	FRN37F1H-4	355	770	255
45	FRN45F1H-4	355	770	255
55	FRN55F1H-4	390	770	270
75	FRN75F1H-4	390	850	270
Three-phase 200V				
Applicable motor rating [kW]	Type	Dimensions (mm)		
		W	H	D
0.75	FRN0.75F1H-2	152	415	184
1.5	FRN1.5F1H-2	152	415	184
2.2	FRN2.2F1H-2	152	415	184
3.7	FRN3.7F1H-2	152	415	184
5.5	FRN5.5F1H-2	152	415	184
7.5	FRN7.5F1H-2	220	440	260
11	FRN11F1H-2	220	440	260
15	FRN15F1H-2	220	440	260
18.5	FRN18.5F1H-2	250	600	260
22	FRN22F1H-2	250	600	260
30	FRN30F1H-2A	250	600	260
37	FRN37F1H-2	355	770	255
45	FRN45F1H-2	390	850	270
55	FRN55F1H-2	390	850	270
75	FRN75F1H-2	390	1000	270

Water proof type				
Three-phase 400V				
Applicable motor rating [kW]	Type	Dimensions (mm)		
		W	H	D
0.75	FRN0.75F1L-4	210	500	225
1.5	FRN1.5F1L-4	210	500	225
2.2	FRN2.2F1L-4	210	500	225
3.7	FRN3.7F1L-4	210	500	225
5.5	FRN5.5F1L-4	210	500	225
7.5	FRN7.5F1B-4	300	600	280
11	FRN11F1B-4	300	600	280
15	FRN15F1B-4	300	600	280
18.5	FRN18.5F1D-4	350	800	320
22	FRN22F1D-4	350	800	320
30	FRN30F1D-4	350	800	320
37	FRN37F1D-4	400	1100	320
45	FRN45F1D-4	400	1100	320
55	FRN55F1D-4	450	1170	350
75	FRN75F1D-4	450	1170	350
90	FRN90F1D-4	450	1280	360
Three-phase 200V				
Applicable motor rating [kW]	Type	Dimensions (mm)		
		W	H	D
0.75	FRN0.75F1L-2	210	500	225
1.5	FRN1.5F1L-2	210	500	225
2.2	FRN2.2F1L-2	210	500	225
3.7	FRN3.7F1L-2	210	500	225
5.5	FRN5.5F1L-2	210	500	225
7.5	FRN7.5F1B-2	300	600	280
11	FRN11F1B-2	300	600	280
15	FRN15F1B-2	300	600	280
18.5	FRN18.5F1D-2	350	800	320
22	FRN22F1D-2	350	800	320
30	FRN30F1D-2	350	800	320
37	FRN37F1D-2	400	1100	320
45	FRN45F1D-2	450	1280	360

■ : Code
 E EU/English
 A Asia/English
 K Korea/Taiwan/English
 C China
 J Japan

FRENIC-Multi



Basic type				
Three-phase 400V				
Applicable motor rating [kW]	Type	Dimensions [mm]		
		W	H	D
0.4	FRN0.4E1S-4	110	130	126
0.75	FRN0.75E1S-4	110	130	150
1.5	FRN1.5E1S-4	110	130	150
2.2	FRN2.2E1S-4	110	130	150
3.7	FRN3.7E1S-4	140	180	151
5.5	FRN5.5E1S-4	180	220	158
7.5	FRN7.5E1S-4	180	220	158
11	FRN11E1S-4	220	260	195
15	FRN15E1S-4	220	260	195
Three-phase 200V				
Applicable motor rating [kW]	Type	Dimensions [mm]		
		W	H	D
0.1	FRN0.1E1S-2	80	120	92
0.2	FRN0.2E1S-2	80	120	92
0.4	FRN0.4E1S-2	80	120	107
0.75	FRN0.75E1S-2	80	120	132
1.5	FRN1.5E1S-2	110	130	150
2.2	FRN2.2E1S-2	110	130	150
3.7	FRN3.7E1S-2	140	180	151
5.5	FRN5.5E1S-2	180	220	158
7.5	FRN7.5E1S-2	180	220	158
11	FRN11E1S-2	20	260	195
15	FRN15E1S-2	20	260	195
Single-phase 200V				
Applicable motor rating [kW]	Type	Dimensions [mm]		
		W	H	D
0.1	FRN0.1E1S-7	80	120	92
0.2	FRN0.2E1S-7	80	120	92
0.4	FRN0.4E1S-7	80	120	107
0.75	FRN0.75E1S-7	80	120	152
1.5	FRN1.5E1S-7	110	130	150
2.2	FRN2.2E1S-7	140	180	151

EMC filter built-in type				
Three-phase 400V				
Applicable motor rating [kW]	Type	Dimensions [mm]		
		W	H	D
0.4	FRN0.4E1E-4	110	130	169
0.75	FRN0.75E1E-4	110	130	193
1.5	FRN1.5E1E-4	140	180	194
2.2	FRN2.2E1E-4	140	180	194
3.7	FRN3.7E1E-4	140	180	194
5.5	FRN5.5E1E-4	181.5	285	208
7.5	FRN7.5E1E-4	181.5	285	208
11	FRN11E1E-4	220	332	250
15	FRN15E1E-4	220	332	250
Three-phase 200V				
Applicable motor rating [kW]	Type	Dimensions [mm]		
		W	H	D
0.1	FRN0.1E1E-2	80	120	112
0.2	FRN0.2E1E-2	80	120	112
0.4	FRN0.4E1E-2	80	120	127
0.75	FRN0.75E1E-2	80	120	152
1.5	FRN1.5E1E-2	140	180	194
2.2	FRN2.2E1E-2	140	180	194
3.7	FRN3.7E1E-2	140	180	194
5.5	FRN5.5E1E-2	181.5	285	213
7.5	FRN7.5E1E-2	181.5	285	213
11	FRN11E1E-2	220	357	260
15	FRN15E1E-2	220	357	260
Single-phase 200V				
Applicable motor rating [kW]	Type	Dimensions [mm]		
		W	H	D
0.1	FRN0.1E1E-7	80	120	112
0.2	FRN0.2E1E-7	80	120	112
0.4	FRN0.4E1E-7	80	120	127
0.75	FRN0.75E1E-7	110	130	150
1.5	FRN1.5E1E-7	140	180	194
2.2	FRN2.2E1E-7	140	180	194

■ : Code Destination, Instruction manuals
 E EU/English
 A Asia/English
 K Korea, Taiwan/English
 C China
 J Japan

FRENIC-MEGA

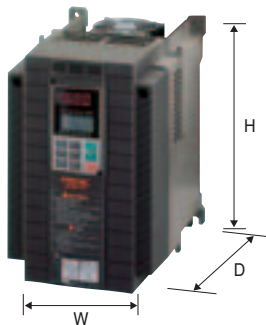


Basic type, EMC filter built-in type				
Three-phase 400V				
Applicable motor rating [kW]	Type	Dimensions [mm]		
		W	H	D
0.4	FRN0.4G1-4	110	260	130
0.75	FRN0.75G1-4	110	260	145
1.5	FRN1.5G1-4	150	260	145
2.2	FRN2.2G1-4	150	260	145
3.7	FRN3.7G1-4	150	260	145
5.5	FRN5.5G1-4	220	260	195
7.5	FRN7.5G1-4	220	260	195
11	FRN11G1-4	220	260	195
15	FRN15G1-4	250	400	195
18.5	FRN18.5G1-4	250	400	195
22	FRN22G1-4	250	400	195
30	FRN30G1-4	326.2	550	261.3
37	FRN37G1-4	326.2	550	261.3
45	FRN45G1-4	361.2	615	276.3
55	FRN55G1-4	361.2	675	276.3
75	FRN75G1-4	361.2	740	276.3

Basic type, EMC filter built-in type				
Three-phase 200V				
Applicable motor rating [kW]	Type	Dimensions [mm]		
		W	H	D
0.4	FRN0.4G1-2	110	260	130
0.75	FRN0.75G1-2	110	260	145
1.5	FRN1.5G1-2	150	260	145
2.2	FRN2.2G1-2	150	260	145
3.7	FRN3.7G1-2	150	260	145
5.5	FRN5.5G1-2	220	260	195
7.5	FRN7.5G1-2	220	260	195
11	FRN11G1-2	220	260	195
15	FRN15G1-2	250	400	195
18.5	FRN18.5G1-2	250	400	195
22	FRN22G1-2	250	400	195
30	FRN30G1-2	326.2	550	261.3
37	FRN37G1-2	361.2	615	276.3
45	FRN45G1-2	361.2	740	276.3
55	FRN55G1-2	361.2	740	276.3

□ : S: Basic type
 E: EMC filter built-in type
 ■ : Code Destination, Instruction manuals
 E EU/English
 A Asia/English
 T Taiwan/English
 C China
 J Japan

FRENIC5000VG7



Basic type				
Three-phase 400V				
Applicable motor rating [kW]	Type	Dimensions [mm]		
		W	H	D
3.7	FRN3.7VG7S-4	205	300	245
5.5	FRN5.5VG7S-4	205	300	245
7.5	FRN7.5VG7S-4	205	300	245
11	FRN11VG7S-4	250	380	245
15	FRN15VG7S-4	250	380	245
18.5	FRN18.5VG7S-4	340	480	255
22	FRN22VG7S-4	340	480	255
30	FRN30VG7S-4	340	550	255
37	FRN37VG7S-4	375	550	270
45	FRN45VG7S-4	375	675	270
55	FRN55VG7S-4	375	675	270
75	FRN75VG7S-4	375	740	270
90	FRN90VG7S-4	530	740	315
110	FRN110VG7S-4	530	740	315
132	FRN132VG7S-4	530	1000	360
160	FRN160VG7S-4	530	1000	360
200	FRN200VG7S-4	680	1000	360
220	FRN220VG7S-4	680	1000	360
250	FRN250VG7S-4	680	1000	360
280	FRN280VG7S-4	680	1400	450
315	FRN315VG7S-4	680	1400	450
355	FRN355VG7S-4	880	1400	450
400	FRN400VG7S-4	880	1400	450
500	FRN500VG7S-4	999	1550	500
630	FRN630VG7S-4	999	1550	500

Basic type				
Three-phase 200V				
Applicable motor rating [kW]	Type	Dimensions [mm]		
		W	H	D
0.75	FRN0.75VG7S-2	205	300	245
1.5	FRN1.5VG7S-2	205	300	245
2.2	FRN2.2VG7S-2	205	300	245
3.7	FRN3.7VG7S-2	205	300	245
5.5	FRN5.5VG7S-2	205	300	245
7.5	FRN7.5VG7S-2	205	300	245
11	FRN11VG7S-2	250	380	245
15	FRN15VG7S-2	250	380	245
18.5	FRN18.5VG7S-2	340	480	255
22	FRN22VG7S-2	340	480	255
30	FRN30VG7S-2	340	550	255
37	FRN37VG7S-2	375	550	270
45	FRN45VG7S-2	375	740	270
55	FRN55VG7S-2	375	740	270
75	FRN75VG7S-2	530	750	285
90	FRN90VG7S-2	680	880	360

* FRN710BVG7S-4 (460V, 710kW) and FRN800BVG7S-4 (460V, 800kW) are stack-type inverters. Contact Fuji for details.

Name		Function	Applicable inverter				
			FRENIC-Mini	FRENIC-Eco	FRENIC-Multi	FRENIC-MEGA	FRENIC 5000VG7S
Built-in options	Analog I/O interface card	Controls torque according to external analog signals				●	●
	Digital I/O interface card	Sets frequency according to binary and BCD data			●	●	●
	PG feedback card	For performing PG vector control using feedback signals obtained from a PG			●	●	●
	Synchronized operation card	Conducts synchronizd operation of two motors according to the encoder feedback signals			●	●	
	T-link interface card	Enables data link operation between program controller MICREX-F and inverter				●	●
	Relay output card	Converts transistor output signals from inverter into relay output signals		●		●	
	RS-485 communication	For adding RS-485 interface	●	●	●	Built-in standard	●
	Device Net Board	Field bus interface card		●	●	●	●
	CC-link card			●	●	●	●
	PROFIBUS card			●	●	●	●
LON WORKS interface card			●				
External options	Extension cable for keypad panel	Cable for connecting inverter unit and keypad panel	●	●	●	●	●
	Copy unit	For batch data transfer (read, store, write) between an inverter unit and the copy unit	●				
	Rail mounting base	Attachment for mounting inverter on 35mm wide IEC rail	●		●		
	IP20 enclosure adapter	Used to put 30kW or larger model to change its enclosure of IP00 into that of IP20				●	
	Mounting adapter for external cooling	Used to put the cooling fan section of the inverter outside the panel (22kW or smaller)		●		●	
	Compatible attachment	The new inverter can be installed using the existing inverter installation holes.	●	●	●	●	
	Braking resistor	Improves regenerative braking power	●		●	●	●
	Braking unit	Used in combination with braking resistor				●	●
	Ferrite ring for reducing radio noise	Reduces radio frequency noise	●	●	●	●	●
	DC reactor	Improves power factor of inverter (The reactor is connected with the inverter.)	●	●	●	●	●
	AC reactor	Used when the unbalance rate of power voltage exceeds 2 % or when the power factor needs improving	●	●	●	●	●
	EMC compliance filter	Complies with European EMC (emission) Directives	●	●	●	●	●
	Output circuit filter	Suppresses fluctuation of motor terminal voltage and reduces the leakage current from the output side wiring	●	●	●	●	●

To all our customers who purchase Fuji Electric FA Components & Systems' products:

Please take the following items into consideration when placing your order.

When requesting an estimate and placing your orders for the products included in these materials, please be aware that any items such as specifications which are not specifically mentioned in the contract, catalog, specifications or other materials will be as mentioned below.

In addition, the products included in these materials are limited in the use they are put to and the place where they can be used, etc., and may require periodic inspection. Please confirm these points with your sales representative or directly with this company.

Furthermore, regarding purchased products and delivered products, we request that you take adequate consideration of the necessity of rapid receiving inspections and of product management and maintenance even before receiving your products.

1. Free of Charge Warranty Period and Warranty Range

1-1 Free of charge warranty period

- (1) The product warranty period is "1 year from the date of purchase" or 24 months from the manufacturing date imprinted on the name plate, whichever date is earlier.
- (2) However, in cases where the use environment, conditions of use, use frequency and times used, etc., have an effect on product life, this warranty period may not apply.
- (3) Furthermore, the warranty period for parts restored by Fuji Electric's Service Department is "6 months from the date

1-2 Warranty range

- (1) In the event that breakdown occurs during the product's warranty period which is the responsibility of Fuji Electric, Fuji Electric will replace or repair the part of the product that has broken down free of charge at the place where the product was purchased or where it was delivered. However, if the following cases are applicable, the terms of this warranty may not apply.
 - 1) The breakdown was caused by inappropriate conditions, environment, handling or use methods, etc. which are not specified in the catalog, operation manual, specifications or other relevant documents.
 - 2) The breakdown was caused by the product other than the purchased or delivered Fuji's product.
 - 3) The breakdown was caused by the product other than Fuji's product, such as the customer's equipment or software design, etc.
 - 4) Concerning the Fuji's programmable products, the breakdown was caused by a program other than a program supplied by this company, or the results from using such a program.
 - 5) The breakdown was caused by modifications or repairs affected by a party other than Fuji Electric.
 - 6) The breakdown was caused by improper maintenance or replacement using consumables, etc. specified in the operation manual or catalog, etc.
 - 7) The breakdown was caused by a chemical or technical problem that was not foreseen when making practical application of the product at the time it was purchased or delivered.
 - 8) The product was not used in the manner the product was originally intended to be used.
 - 9) The breakdown was caused by a reason which is not this company's responsibility, such as lightning or other disaster.
- (2) Furthermore, the warranty specified herein shall be limited to the purchased or delivered product alone.
- (3) The upper limit for the warranty range shall be as specified in item (1) above and any damages (damage to or loss of machinery or equipment, or lost profits from the same, etc.) consequent to or resulting from breakdown of the purchased or delivered product shall be excluded from coverage by this warranty.

1-3. Trouble diagnosis

As a rule, the customer is requested to carry out a preliminary trouble diagnosis. However, at the customer's request, this company or its service network can perform the trouble diagnosis on a chargeable basis. In this case, the customer is asked to assume the burden for charges levied in accordance with this company's fee schedule.

2. Exclusion of Liability for Loss of Opportunity, etc.

Regardless of whether a breakdown occurs during or after the free of charge warranty period, this company shall not be liable for any loss of opportunity, loss of profits, or damages arising from special circumstances, secondary damages, accident compensation to another company, or damages to products other than this company's products, whether foreseen or not by this company, which this company is not be responsible for causing.

3. Repair Period after Production Stop, Spare Parts Supply Period (Holding Period)

Concerning models (products) which have gone out of production, this company will perform repairs for a period of 7 years after production stop, counting from the month and year when the production stop occurs. In addition, we will continue to supply the spare parts required for repairs for a period of 7 years, counting from the month and year when the production stop occurs. However, if it is estimated that the life cycle of certain electronic and other parts is short and it will be difficult to procure or produce those parts, there may be cases where it is difficult to provide repairs or supply spare parts even within this 7-year period. For details, please confirm at our company's business office or our service office.

4. Transfer Rights

In the case of standard products which do not include settings or adjustments in an application program, the products shall be transported to and transferred to the customer and this company shall not be responsible for local adjustments or trial operation.

5. Service Contents

The cost of purchased and delivered products does not include the cost of dispatching engineers or service costs. Depending on the request, these can be discussed separately.

6. Applicable Scope of Service

Above contents shall be assumed to apply to transactions and use of the country where you purchased the products. Consult the local supplier or Fuji for the detail separately.



NOTES

When running general-purpose motors

- **Driving a 400V general-purpose motor**
When driving a 400V general-purpose motor with an inverter using extremely long cables, damage to the insulation of the motor may occur. Use an output circuit filter (OFL) if necessary after checking with the motor manufacturer. Fuji's motors do not require the use of output circuit filters because of their reinforced insulation.
- **Torque characteristics and temperature rise**
When the inverter is used to run a general-purpose motor, the temperature of the motor becomes higher than when it is operated using a commercial power supply. In the low-speed range, the cooling effect will be weakened, so decrease the output torque of the motor. If constant torque is required in the low-speed range, use a Fuji inverter motor or a motor equipped with an externally powered ventilating fan.
- **Vibration**
When the motor is mounted to a machine, resonance may be caused by the natural frequencies, including that of the machine. Operation of a 2-pole motor at 60Hz or more may cause abnormal vibration.
* Study use of tie coupling or dampening rubber.
* It is also recommended to use the inverter jump frequency control to avoid resonance points.
- **Noise**
When an inverter is used with a general-purpose motor, the motor noise level is higher than that with a commercial power supply. To reduce noise, raise carrier frequency of the inverter. High-speed operation at 60Hz or more can also result in more noise.

When running special motors

- **High-speed motors**
When driving a high-speed motor while setting the frequency higher than 120Hz, test the combination with another motor to confirm the safety of high-speed motors.
- **Explosion-proof motors**
When driving an explosion-proof motor with an inverter, use a combination of a motor and an inverter that has been approved in advance.
- **Submersible motors and pumps**
These motors have a larger rated current than general-purpose motors. Select an inverter whose rated output current is greater than that of the motor.
These motors differ from general-purpose motors in thermal characteristics. Set a low value in the thermal time constant of the motor when setting the electronic thermal facility.
- **Brake motors**
For motors equipped with parallel-connected brakes, their braking power must be supplied from the primary circuit (commercial power supply). If the brake power is connected to the inverter power output circuit (secondary circuit) by mistake, problems may occur.
Do not use inverters for driving motors equipped with series-connected brakes.
- **Geared motors**
If the power transmission mechanism uses an oil-

lubricated gearbox or speed changer/reducer, then continuous motor operation at low speed may cause poor lubrication. Avoid such operation.

- **Synchronous motors**
It is necessary to use software suitable for this motor type. Contact Fuji for details.
- **Single-phase motors**
Single-phase motors are not suitable for inverter-driven variable speed operation. Use three-phase motors.
* Even if a single-phase power supply is available, use a three-phase motor as the inverter provides three-phase output.

Environmental conditions

- **Installation location**
Use the inverter in a location with an ambient temperature range of -10 to 50°C.
The inverter and braking resistor surfaces become hot under certain operating conditions. Install the inverter on nonflammable material such as metal. Ensure that the installation location meets the environmental conditions specified in "Environment" in inverter specifications.

Combination with peripheral devices

- **Installing a molded case circuit breaker (MCCB)**
Install a recommended molded case circuit breaker (MCCB) or an earth leakage circuit breaker (ELCB) in the primary circuit of each inverter to protect the wiring. Ensure that the circuit breaker capacity is equivalent to or lower than the recommended capacity.
- **Installing a magnetic contactor (MC) in the output (secondary) circuit**
If a magnetic contactor (MC) is mounted in the inverter's secondary circuit for switching the motor to commercial power or for any other purpose, ensure that both the inverter and the motor are fully stopped before you turn the MC on or off. Remove the surge killer integrated with the MC.
- **Installing a magnetic contactor (MC) in the input (primary) circuit**
Do not turn the magnetic contactor (MC) in the primary circuit on or off more than once an hour as an inverter fault may result. If frequent starts or stops are required during motor operation, use FWD/REV signals.
- **Protecting the motor**
The electronic thermal facility of the inverter can protect the motor. The operation level and the motor type (general-purpose motor, inverter motor) should be set. For high-speed motors or water-cooled motors, set a small value for the thermal time constant to protect the motor.
If you connect the motor thermal relay to the motor with a long cable, a high-frequency current may flow into the wiring stray capacitance. This may cause the relay to trip at a current lower than the set value for the thermal relay. If this happens, lower the carrier frequency or use the output circuit filter (OFL).
- **Discontinuance of power-factor correcting capacitor**
Do not mount power factor correcting capacitors in the inverter (primary) circuit. (Use the DC REACTOR to improve the inverter power factor.) Do

not use power factor correcting capacitors in the inverter output circuit (secondary). An overcurrent trip will occur, disabling motor operation.

- **Discontinuance of surge killer**
Do not mount surge killers in the inverter output (secondary) circuit.
- **Reducing noise**
Use of a filter and shielded wires are typical measures against noise to ensure that EMC Directives are met.
- **Measures against surge currents**
If an overvoltage trip occurs while the inverter is stopped or operated under a light load, it is assumed that the surge current is generated by open/close of the phase-advancing capacitor in the power system.
We recommend connecting a DC REACTOR to the inverter.
- **Megger test**
When checking the insulation resistance of the inverter, use a 500V megger and follow the instructions contained in the Instruction Manual.

Wiring

- **Wiring distance of control circuit**
When performing remote operation, use the twisted shield wire and limit the distance between the inverter and the control box to 20m.
- **Wiring length between inverter and motor**
If long wiring is used between the inverter and the motor, the inverter will overheat or trip as a result of overcurrent (high-frequency current flowing into the stray capacitance) in the wires connected to the phases. Ensure that the wiring is shorter than 50m. If this length must be exceeded, lower the carrier frequency or mount an output circuit filter (OFL).
- **Wiring size**
Select cables with a sufficient capacity by referring to the current value or recommended wire size.
- **Wiring type**
Do not use multicore cables that are normally used for connecting several inverters and motors.
- **Grounding**
Securely ground the inverter using the grounding terminal.

Selecting inverter capacity

- **Driving general-purpose motor**
Select an inverter according to the applicable motor ratings listed in the standard specifications table for the inverter. When high starting torque is required or quick acceleration or deceleration is required, select an inverter with a capacity one size greater than the standard.
- **Driving special motors**
Select an inverter that meets the following condition:
Inverter rated current > Motor rated current.

Transportation and storage

When transporting or storing inverters, follow the procedures and select locations that meet the environmental conditions that agree with the inverter specifications.

Fuji Electric FA Components & Systems Co., Ltd.

Mitsui Sumitomo Bank Ningyo-cho Bldg.,
5-7, Nihonbashi Odemma-cho, Chuo-ku, Tokyo 103-0011, Japan
Phone: +81-3-5847-8011 Fax: +81-3-5847-8172

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