

SELECTION GUIDE



Frequency Inverters

Fuji Electric Europe



Fuji Electric, a renowned manufacturer of power electronics, drive engineering and automation technology

Founded in 1987, Fuji Electric Europe has long been a trusted partner, supplying frequency inverters and power electronics to customers in Europe, Russia, Africa and the Middle East. Our outstanding reputation is based on reliable quality, excellent product performance and innovating technology.

In recent years, more and more new applications such as wind and solar power and electrically powered cars have evolved in the renewable energies sector.



Fuji Electric meets these new challenges with economically viable custom solutions, combining newest technology and know-how with high efficiency, reliability and long life.

Our wide product range is supported by an excellent global logistic network and has a solution for every problem.



Visit us on www.fujielectric-europe.com

The precision control of Fuji Electric inverters allows AC drives to operate at an optimal speed throughout your application, reducing overall power and energy consumption to minimize operating costs.

Applications for our drives and inverters include conveyor systems, water, HVAC and lift applications, and others. The FRENIC-Series is equipped with functions and performance to meet all types of requirements, providing easy maintenance, energy and cost saving and environmental friendliness.

In this Selection Guide, you will find Fuji Electric Europe's Low Voltage Inverters and their supplements.

In this Selection Guide for Fuji Electric's Low Voltage Drives Products, you will find all our main series of frequency inverters in one booklet.

The Selection Guide makes it easy to find the matching product for your requirements: look into the overview tables for applications, check the capacity ranges and option availabilities, and find out about the specifications of our FRENIC-Series.

For knowing more about each product,
find Drive & Automation products on our website
www.fujielectric-europe.com
or ask your local Fuji Electric Sales Representative.

Our FRENIC Series

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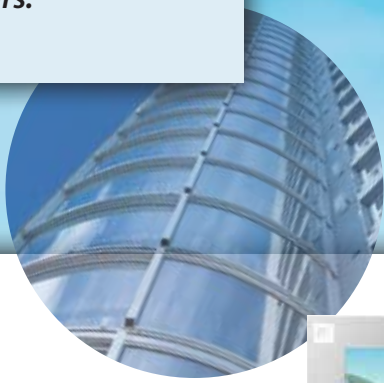
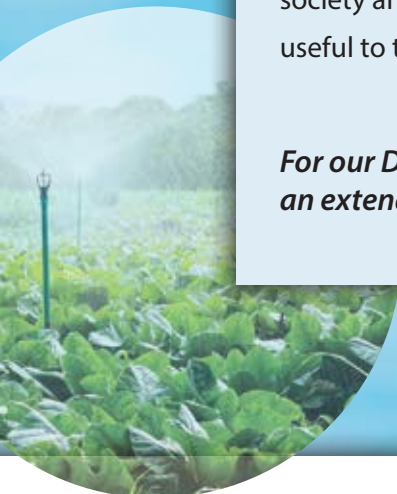
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**“Quality is never an accident.
It is always the result of intelligent effort.
There must be the will to produce a superior thing.”**
by John Ruskin (1819-1900)

To ensure the satisfaction of all customers, the duty of Fuji Electric is to maintain the highest levels of quality in the industry for the products and services it produces and sells. Aiming to be a company with high value in society, we will remain aware of our roles and responsibilities in society and continue to provide products and services useful to the public and thereby earn their trust.

For our Drive & Automation products we have an extended warranty period of 3-5 years.



Over  **90** years
of Japanese Quality

Extended Warranty Periods

Relax. You have a Fuji.



*3 to 5 years warranty on all drive products from Fuji Electric.
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APPLICATIONS

Applications		FRENIC-AQUA	FRENIC-HVAC	FRENIC-MEGA	FRENIC-Lift <small>NEW</small>
Fans	Exhaust fan		●		
	AHU (air handling unit)		●		
	Compressor		●	●	
	Air-conditioning system		●	●	
	Dryer		●	●	
	Boiler fan		●	●	
	Fans for controlling furnace temperature		●	●	
	Roof fans controlled as a group		●	●	
	Refrigerator		●	●	
	Built-in blower in film-manufacturing machines	●	●	●	
	Cooling-tower fan		●	●	
	Ventilating fan		●	●	
	Separator fan		●	●	
Machine Tools	Grinding machine				
	Polishing machine				
	Milling machine				
	Lathe				
	Boring machine				
	Turntable			●	
	Work positioning unit			●	
	PCB drilling machine			●	
	Winding machine			●	
	Press			●	
Electric Pumps	Chillers			●	
	Drinking water supply	●	●		
	Tankless water-supply system	●			
	Submersible pump	●		●	
	Vacuum pump	●		●	
	Fountain pump	●		●	
	Cooling water pump	●		●	
	Circulating hot water pump	●		●	
	Well pump	●		●	
	Irrigation	●		●	
	Water treatment system	●		●	
	Constant-flow pump	●		●	
	Sludge pump	●		●	
	Solar pumping	●		●	
Conveyance machinery	Cranes (travelling, traversing, hoisting)	●	●	●	
	Automated warehouse			●	
	Conveyor (belt, chain, screw, roller)			●	
	Lift			●	●
	Car parking system			●	
	Elevator, escalator			●	●
	Automatic door			●	
Chemical machinery / wood working machines	Shutter			●	
	Fluids mixing machine			●	
	Extruder			●	
	Vibrator			●	
	Centrifugal separator			●	
	Coating machine			●	
	Take-up roller			●	
	Router machine			●	
Packaging machinery	Planing machine			●	
	Individual packing / inner packing			●	
	Packing machine			●	
Food processing machinery	Outer packing machine			●	
	Food mixer			●	
	Food slicer			●	
	Grain processing machine			●	
	Tea manufacturing machine			●	
	Rice milling machine			●	
	Rice sorters			●	
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			●	

APPLICATIONS

Applications		FVR-Micro ^{NEW}	FRENIC-Ace ^{NEW}	FRENIC-Mini C2	FRENIC-VG1	
Fans	Exhaust fan					
	AHU (air handling unit)					
	Compressor		●	●	●	
	Air-conditioning system	●	●	●	●	
	Dryer	●	●	●	●	
	Boiler fan		●	●		
	Fans for controlling furnace temperature		●	●		
	Roof fans controlled as a group	●	●	●		
	Refrigerator		●	●	●	
	Built-in blower in film-manufacturing machines		●	●		
	Cooling-tower fan		●	●		
	Ventilating fan	●	●	●		
Separator fan		●	●			
Machine Tools	Grinding machine				●	
	Polishing machine				●	
	Milling machine				●	
	Lathe				●	
	Boring machine		●	●	●	
	Turntable		●	●	●	
	Work positioning unit		●	●	●	
	PCB drilling machine		●	●	●	
	Winding machine		●	●	●	
	Press		●		●	
	Electric Pumps	Chillers			●	
		Drinking water supply			●	
Tankless water-supply system			●	●		
Submersible pump			●	●		
Vacuum pump			●	●	●	
Fountain pump			●	●		
Cooling water pump			●	●		
Circulating hot water pump			●	●		
Well pump			●	●	●	
Irrigation			●	●	●	
Water treatment system			●	●		
Constant-flow pump			●	●	●	
Sludge pump			●	●		
Solar pumping			●			
Conveyance machinery	Cranes (travelling, traversing, hoisting)		●		●	
	Automated warehouse		●	●	●	
	Conveyor (belt, chain, screw, roller)	●	●	●	●	
	Lift		●	●	●	
	Car parking system		●	●	●	
	Elevator, escalator		●	●	●	
	Automatic door		●	●	●	
	Shutter		●	●	●	
Chemical machinery / wood working machines	Fluids mixing machine		●	●	●	
	Extruder		●	●	●	
	Vibrator		●	●	●	
	Centrifugal separator	●	●	●	●	
	Coating machine		●	●	●	
	Take-up roller		●	●	●	
	Router machine		●	●	●	
Packaging machinery	Individual packing / inner packing	●	●	●	●	
	Packing machine	●	●	●	●	
	Outer packing machine		●	●	●	
Food processing machinery	Food mixer		●	●	●	
	Food slicer		●	●	●	
	Grain processing machine	●	●	●	●	
	Tea manufacturing machine		●	●	●	
	Rice milling machine		●	●	●	
	Rice sorters	●	●	●	●	
Paper making / textile machinery	Spinning machine		●	●	●	
	Knitting machine		●	●	●	
	Textile printing machine		●	●	●	
	Industrial sewing machine		●	●	●	
	Synthetic fiber manufacturing plant		●	●	●	
Other machinery	Slitters		●	●	●	
	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	●		●		

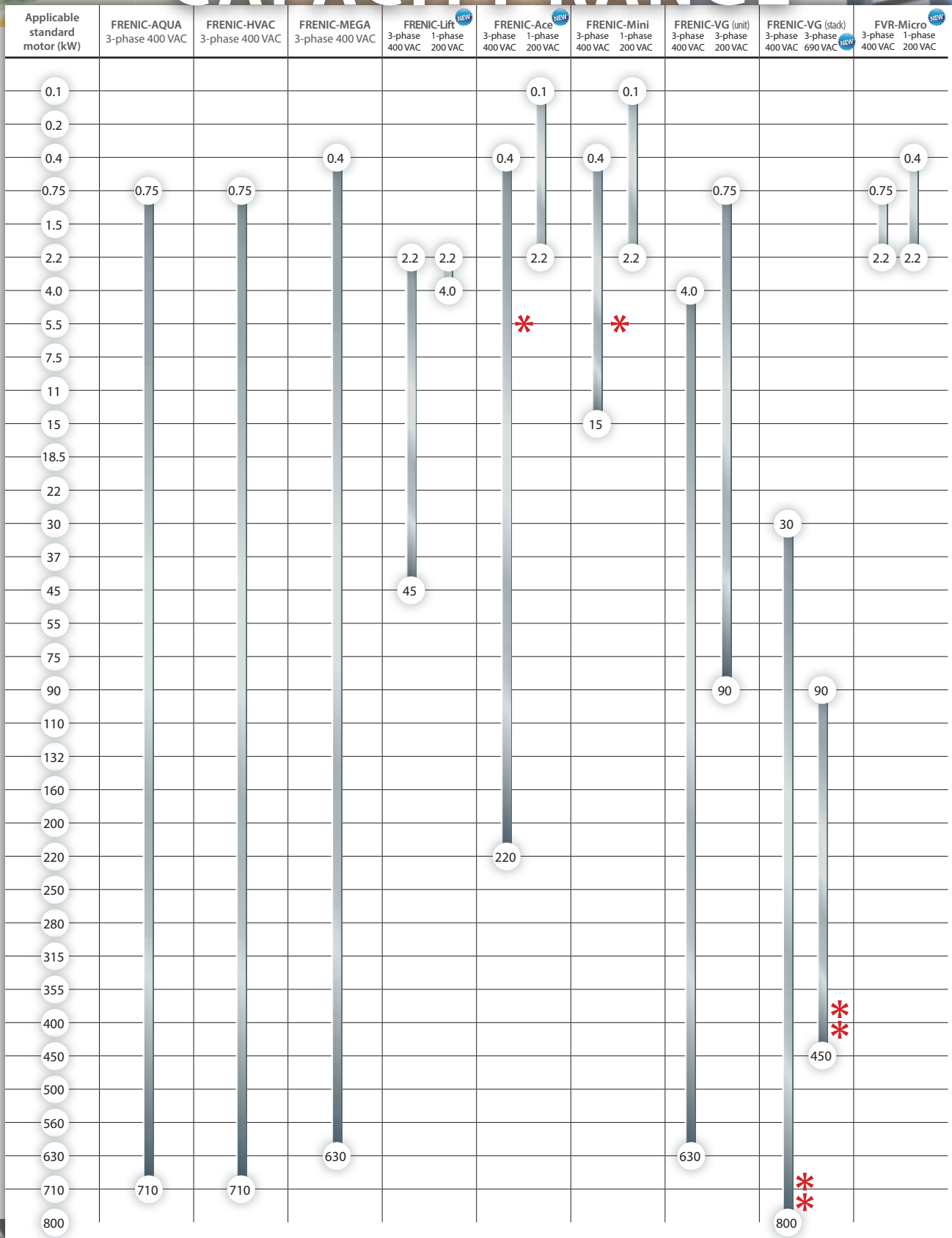
OPTIONS

Options		FRENIC-AQUA	FRENIC-HVAC	FVR-Micro <small>NEW</small>	FRENIC-Mini
Fieldbus Options	CC-Link communication card	•	•		
	DeviceNet communication card	•	•		
	PROFIBUS DP communication card	•	•		
	CANopen communication card	•	•		
	LonWorks communication card	•	•		
	Ethernet communication card	•	•		
	T-Link communication card				
	SX bus communication card				
	E-SX bus communication card				
	PROFINET-RT communication card				
	PROFINET-IRT communication card				
	High-Speed serial communication card (for UPAC)				
	Terminal block for high speed communication				
Other Options	Battery	•	•		
	Relay output interface card	•	•		
	Analog input interface card	•	•		
	Analog current output interface card	•	•		
	Pt100 temperature sensor input card	•	•		
	Additional analog input/output card				
	Additional digital input/output card				
	Additional digital input card				
	Additional digital output card				
	Analog output (x 2ch)				
	PG (encoder) interface 12-15V HTL				
	PG (encoder) interface 5V TTL line driver				
	PG (encoder) interface 5V TTL (not line driver)				
	PG (encoder) interface 5V TTL (not line driver) for synchronous operation				
	Gray Code / switching signals 5V TTL line driver encoder interface				
	RS-485 option with 2RJ45 connectors for branch connection				
	RS-485 communication interface				
	RS-485 option cage clamp terminal				
	Pulse output divider card				
	SinCos, SinCos encoder interface				
	SinCos, EnDat 2.1 encoder interface				
	Hiperface encoder interface				
	SSI encoder interface				
	Biss encoder interface				
	Synchronized interface				
	F/V converter				
	User programming card				
	Functional safety card				
	PG interface card / Open collector				
	PG interface card / ABS encoder with 17-bit high resolution				
PG card for synchronous motor drive / Open collector					
PG card for synchronous motor drive / Line driver					

OPTIONS

Options		FRENIC-MEGA	FRENIC-Ace <small>NEW</small>	FRENIC-Lift <small>NEW</small>	FRENIC-VG1
Fieldbus Options	CC-Link communication card	•	•		•
	DeviceNet communication card	•	•		•
	PROFIBUS DP communication card	•	•		•
	CANopen communication card	•	•		
	LonWorks communication card				
	Ethernet communication card	•	•		
	T-Link communication card	•			•
	SX bus communication card	•			•
	E-SX bus communication card				•
	PROFINET-RT communication card	•	•		
	PROFINET-IRT communication card				•
	High-Speed serial communication card (for UPAC)				•
	Terminal block for high speed communication				•
Other Options	Battery				•
	Relay output interface card	•			
	Analog input interface card				
	Analog current output interface card				
	Pt100 temperature sensor input card				
	Additional analog input/output card	•	•		•
	Additional digital input/output card		•		•
	Additional digital input card	•			•
	Additional digital output card	•			
	Analog output (x 2ch)	•			
	PG (encoder) interface 12-15V HTL	•	•	•	
	PG (encoder) interface 5V TTL line driver	•		•	•
	PG (encoder) interface 5V TTL (not line driver)		•		
	PG (encoder) interface 5V TTL (not line driver) for synchronous operation				
	Gray Code / switching signals 5V TTL line driver encoder interface			•	
	RS-485 option with 2RJ45 connectors for branch connection		•		
	RS-485 communication interface				
	RS-485 option cage clamp terminal				
	Pulse output divider card			•	
	SinCos, SinCos encoder interface			•	
	SinCos, EnDat 2.1 encoder interface			•	
	Hiperface encoder interface			•	
	SSI encoder interface			•	
	Biss encoder interface			•	
	Synchronized interface				•
	F/V converter				•
	User programming card				•
	Functional safety card				•
	PG interface card / Open collector				•
	PG interface card / ABS encoder with 17-bit high resolution				•
PG card for synchronous motor drive / Open collector				•	
PG card for synchronous motor drive / Line driver				•	

CAPACITY RANGE



* More capacities up to 3 MW available in dual rating and multi drive system.

* 3-phase 400 VAC, 5.5 to 15 kW, w/o EMC-filter built-in



SPECIFICATIONS

			FRENIC-AQUA (AQ1)	FRENIC-HVAC (AR1)	FRENIC-Mini (C2)
Input ratings	Phase, Voltage, Frequency	3-phase 400 VAC	380 to 440 VAC, 50 Hz / 390 to 480 VAC, 60 Hz	380 to 440 VAC, 50 Hz / 390 to 480 VAC, 60 Hz	380 to 480 VAC, 50/60 Hz
		3-phase 200 VAC	---	---	---
	1-phase	---	---	200 to 240 VAC, 50/60 Hz	
Variations		Voltage: +10 to -15% (Voltage unbalance: 2% or less) Frequency: +5 to -5%	Voltage: +10 to -15% (Voltage unbalance: 2% or less) Frequency: +5 to -5%	Voltage: +10 to -15%, voltage unbalance: 2% or less (3-phase, 400 VAC) / +10 to -10% (1-phase, 200 VAC) Frequency: +5 to -5%	
Output overload capability			110% -1 min (Overload tolerated interval: compliant with IEC 61800-2)	110% -1 min (Overload tolerated interval: compliant with IEC 61800-2)	150% of rated current for 1 min or 200% of rated current for 0.5 s
Output frequency setting	Maximum frequency		25 to 120 Hz	25 to 120 Hz	25 to 400 Hz
	Base frequency		25 to 120 Hz	25 to 120 Hz	25 to 400 Hz
	Starting frequency		0.1 to 60.0 Hz	0.1 to 60.0 Hz	0.1 to 60.0 Hz
	Carrier frequency		0.75 to 16 kHz	0.75 to 16 kHz	0.75 to 16 kHz Note: the unit is equipped with an automatic reduction/stop function that may automatically drop the carrier frequency to protect the inverter when it is running at frequencies above 6 kHz, depending on ambient temperature, output current, and other conditions. ¹ Under modulated carrier conditions, the system scatters carrier frequency to reduce noise.
Starting torque			100% or higher, reference frequency 1.0 Hz, base frequency 50 Hz, with slip compensation and torque boost active	100% or higher, reference frequency 1.0 Hz, base frequency 50 Hz, with slip compensation and torque boost active	150% or more / frequency set to 3 Hz Slip compensation / automatic torque boost active
Brake	Standard torque (%) ⁶		20 (0.75 to 22 kW), 10 to 15 (30 to 710 kW)	20 (0.75 to 22 kW), 10 to 15 (30 to 710 kW)	3-phase 400 VAC: 100 (0.4 to 0.75 kW), 50 (1.5 kW), 30 (2.2 to 4.0 kW), 20 (5.5 to 15 kW, w/o EMC-filter built-in) 1-phase 200 VAC: 150 (0.1/0.2 kW), 100 (0.4/0.75 kW), 50 (1.5 kW), 30 (2.2 kW)
	DC injection braking	Starting frequency	0.0 to 60.0 Hz	0.0 to 60.0 Hz	0.0 to 60.0 Hz
		Braking time	0.0 to 30.0 s	0.0 to 30.0 s	0.0 to 30.0 s
		Braking level	0 to 60%	0 to 60%	0 to 100%
Control method			V/f control with slip compensation, dynamic torque vector control	V/f control with slip compensation, dynamic torque vector control	Induction motor drive: - V/f control - Slip compensation - Automatic torque boost - Dynamic torque vector control Synchronous motor drive: - Sensorless magnetic positioning (speed control range: 10% of base frequency and up)
Acceleration/deceleration time			0.00 to 3600 s	0.00 to 3600 s	0.00 to 3600 s
Multistep frequency			Selectable from 16 steps (step 0 to 15)	Selectable from 16 steps (step 0 to 15)	Selectable from 16 steps (step 0 to 15)
Frequency setting control (analog input)			0 to +10 V DC / 0 to 100% (terminal 12) 4 to +20 mA DC / 0 to 100%, 0 to +20 mA DC / 0 to 100% (terminal C1)	0 to +10 V DC / 0 to 100% (terminal 12) 4 to +20 mA DC / 0 to 100%, 0 to +20 mA DC / 0 to 100% (terminal C1)	0 to +10 V DC / 0 to 100% (terminal 12) 4 to +20 mA DC / 0 to 100%, 0 to +20 mA DC / 0 to 100% (terminal C1)
Standard functions			<ul style="list-style-type: none"> Fire mode (forced operation) Customized logic Multi pump control Real time clock 	<ul style="list-style-type: none"> 4 PID control Motor pick up function Customized logic Filter clogging prevention Real time clock 	<ul style="list-style-type: none"> PID control function Sensorless synchronous motor control RS 485 communication port Braking signal function Motor switching function, motor auto-tuning High starting torque, at 150% or more Braking resistor connectable to the inverter Tripless deceleration by automatic deceleration control Automatic energy-saving function Frequency setting potentiometer
Protection			<ul style="list-style-type: none"> Short-circuit Ground fault Overvoltage Undervoltage Motor overload (PTC) 	<ul style="list-style-type: none"> Short-circuit Ground fault Overvoltage Undervoltage Motor overload (PTC) 	<ul style="list-style-type: none"> Overcurrent, Short-circuit, Ground fault, Overvoltage, Undervoltage, Input phase loss, Output phase loss, Inverter overheat, Braking resistor overheat, Overload, Motor Electronic thermal overload relay, PTC Thermistor, Motor Overload early warning, Stall prevention, Step-out detection, External alarm input, Memory error, Remote keypad (option), communications error, CPU error, Operation Error, Tuning error, RS-485 communications error, Data save error during undervoltage, Surge protection, Protection against momentary power failure, Overload prevention control, Mock alarm, PID feedback wire break detection
Enclosure (IEC/EN60529)			IP21/IP55 (0.75 to 90 kW), IP00 (110 to 710 kW)	IP21/IP55 (0.75 to 90 kW), IP00 (110 to 710 kW)	IP20 (IEC 60529:1989) / UL open type (UL50)
Cooling method			Natural cooling (0.75 to 2.2 kW), Fan cooling (4.0 to 710 kW)	Natural cooling (0.75 to 2.2 kW), Fan cooling (4.0 to 710 kW)	3-phase 400 VAC: Natural cooling (0.4/0.75 kW), Fan cooling (1.5 to 15 kW) 1-phase 200 VAC: Natural cooling (0.1 to 0.75 kW), Fan cooling (1.5/2.2 kW)
Conformed standard			EC Directive (CE marking) ² UL standard (cUL certification) ³ EAC ⁴	EC Directive (CE marking) ² UL standard (cUL certification) ³ EAC ⁴	EC Directive (CE marking) ² UL standard (cUL certification) ³ EAC ⁴

5 Functional Safety: EN61800-5-2: SIL2, ISO 13849-1, SIL2, PL=d, cat. 3, Safe torque off, stop cat. 0
6 Ratings applicable when no optional braking resistor is installed.
7 With dynamic torque-vector control selected.

1 Only valid when induction motor drive is in operation.
2 EMC Directive: EN61800-3 / Low Voltage Directive: EN61800-5-1
3 UL508, C22.2, No. 14
4 GOST-R, GOST-K, GOST-B

SPECIFICATIONS

		FVR-Micro (S2S) <small>NEW</small>	FRENIC-Ace (E2) <small>NEW</small>	FRENIC-MEGA (G1)	FRENIC-Lift (LM2A) <small>NEW</small>
Input ratings	Phase, Voltage, Frequency	3-phase 400 VAC 3-phase 200 VAC 1-phase	280 to 440 VAC, 50/60Hz	380 to 480 VAC, 50/60 Hz	380 to 480 VAC, 50/60 Hz
	Variations	Voltage: -15% to +10% Frequency: 47 to 63 Hz	Voltage: +10 to -15%, voltage unbalance: 2% or less / Frequency: +5 to -5%	Voltage: +10 to -15%, voltage unbalance: 2% or less / Frequency: +5 to -5%	Voltage: +10 to -15%, Frequency: -5 to +5% Voltage unbalance for 3-phase: 2% or less according to IEC61800-3
	Output overload capability	150% of rated current 1 minute 180% of rated current 10 seconds 200% of rated current 1 second	150% of rated current for 1 min (HHD) (HD) 120% of rated current for 1 min (ND) (HND) 200% of rated current for 3 seconds (HHD)	150% of rated current for 1 min (HD) (MD) 120% of rated current for 1 min (LD) 200% of rated current for 3 seconds (HD)	200% for 3 sec
Output frequency setting	Maximum frequency	0.0 to 400 Hz variable setting	HHD/HND/HD mode: 25 to 500 Hz variable under V/f control, Magnetic pole position sensorless vector control (Up to 200 Hz under vector control with speed sensor) ND mode: 25 to 120 Hz (under any drive control)	25 to 500 Hz (120 Hz for inverters in MD/LD mode)	1 to 200 Hz (1.20 to 12000 rpm)
	Base frequency	0.0 to 400 Hz variable setting	25 to 500 Hz variable (in conjunction with max. frequency)	25 to 500 Hz variable (in conjunction with max. frequency)	1 to 200 Hz (1.20 to 12000 rpm)
	Starting frequency	0.0 to 50 Hz	0.1 to 60.0 Hz variable (0.0 Hz under vector control with speed sensor)	0.1 to 60 Hz variable setting	Dynamic torque vector control: 0.1 Hz Vector control with PG: 0.0 Hz
	Carrier frequency	1 to 8 kHz variable setting	3-phase 200 VAC series FRN030/0040/0056/0069E -2 : - 0.75 to 16 kHz variable (HHD/HND mode) 3-phase 400 VAC series FRN022/0029/0037/0044/0059E2 S-4 : - 0.75 to 16 kHz variable (HHD/HND/HD mode) - 0.75 to 10 kHz variable (ND mode) FRN072/0085/0105/0139/0168E2 -4 : - 0.75 to 16 kHz variable (HHD mode) - 0.75 to 10 kHz variable (HND/HD mode) - 0.75 to 6 kHz variable (ND mode) FRN0203E2 -4 or above: - 0.75 to 10 kHz variable (HHD mode) - 0.75 to 6 kHz variable (HND/HD/ND mode)	0.1 to 60 Hz variable setting - 0.75 to 16 kHz (HD mode): 0.4 to 55 kW, LD mode: 5.5 to 18.5 kW - 0.75 to 10 kHz (HD mode: 75 to 400 kW, LD mode: 22 to 55 kW) - 0.75 to 6 kHz (HD mode: 500 and 630 kW, LD mode: 75 to 500 kW) - 0.75 to 4 kHz (LD mode: 630 kW) - 0.75 to 2 kHz (MD mode: 90 to 400 kW)	5 to 16 kHz
Starting torque		3-phase 200 VAC series: 200% or above, reference frequency 0.5 Hz (HHD FRN0069E2 -2 or below), 150% or above, ref. frequency 0.5 Hz (HND FRN0069E2 -2 or below), 3-phase 400 VAC series: 200% or above, ref. frequency 0.5 Hz (HHD FRN0072E2 -4 or below), 150% or above, ref. frequency 0.5 Hz (HND FRN0085E2 -4 or below), 120% or above, ref. frequency 0.5 Hz (HND/ND), 150% or above, ref. frequency 0.5 Hz (HD), Base frequency 50 Hz, with slip compensation and auto torque boost active	200% (22 kW or smaller) ⁷ 180% (30 kW or larger) ⁷	200%	
Brake	Standard torque (%) ⁶				80% (Average torque for 60 s braking with 50%ED)
	DC injection braking	Starting frequency Braking time Braking level	0.0 to max. frequency 0.0 to 50.0 s 0 to 100%	0.0 to 60.0 Hz 0.0 to 30.0 s 0 to 100%	0.0 to 5.00 Hz (0.00 to 300.0 rpm) 0.00 to 30.00 s 0 to 100%
	Control method	V/f control (possibility of Auto slip compensation)	Induction motor drive: V/f control - Vector control without speed sensor (Dynamic torque vector) - V/f control, with slip compensation - V/f control, with slip sensor (PG option) - V/f control with speed sensor (+Auto Torque Boost) (PG option) - Vector control with speed sensor (PG option) / Synchronous motors: Vector control without magnetic pole position sensor	V/f control, Dynamic torque-vector control, V/f control, the slip compensation is available, V/f control w/ speed sensor (PG optional), Speed sensorless vector control, Vector control w/ speed sensor (PG optional)	- Vector control with PG (Asynchronous Motor) - Vector control with PG (Synchronous Motor) - Dynamic torque vector control without PG (Asynchronous Motor) - Vector control with Peripheral PG (Synchronous Motor) - Sensor-less vector control for rescue operation (Synchronous Motor) (coming soon)
Acceleration/deceleration time	0.00 to 3600 s	0.00 to 6000 s	0.01 to 6000 s	0.00 to 99.9 s	
Multistep frequency	16 steps	16 steps	16 steps	16 steps	
Frequency setting control (analog input)	0 to +10 VDC or 0 to 20 mA selectable	Term [I2]: 0 to ±10 VDC (±5 VDC) / 0 to ±100%, 0 to +10 VDC (+5 VDC) / 0 to +100%, Term [C1] C1 function: 4 to 20 mA DC / 0 to +100% / 0 to ±100%, 0 to 20 mA DC / 0 to +100% / 0 to ±100% Term [C1] V2 function: 0 to +10 VDC (+5 VDC) / 0 to +100% / 0 to ±100% Inverse function available (20 to 4; 20 to 0)	0 to +10 VDC (inverse mode available), 0 to +10 VDC (inverse mode available), 4 to +20 mA (inverse mode available)	0 to ±10 VDC (2 inputs) 4 to 20 mADC	
Standard functions	Setting max/min output frequency; momentary power off restarting; fault, restarting; acceleration/deceleration time; auto-voltage stabilizing output modulation; digital frequency output signal; fault records; parameters locking; reset to factory setting; over voltage stalling prevention, electronic thermal relay, traverse function, PID control, non-linear V/f pattern	Customizable logic, Droop control, Torque control, PID Control (with Dancer control), Torque limiter, Auto-tuning, Online tuning, 1st and 2nd motor settings, Zero speed control, Cooling fan ON/OFF control, Speed control, Positioning control with pulse counter, Master-follower operation, Pre-excitation, DC Braking, Mechanical brake 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, PID control, Link operation, Fan stop operation, Droop operation, Torque control	Forward rotation, reverse rotation and stop command, coast-to-stop command, alarm reset, forced stop, Multistep speed, analog signal for speed reference, multi-function keypad, communication, individual settings of each point of start, acceleration completion, deceleration beginning, and stop, ASR feedforward compensation, ASR parameter change, Digital torque bias, Analog torque bias, Motor parameters tuning, Pole position tuning, Unbalanced load compensation, Creepless operation, Battery operation, digital output for short circuit for motor phases at stopping (PM motors), hidden parameters depending on control mode, Distance estimation for acceleration/deceleration, Rescue operation by motor brakes control, function for EN81-1 A3 UCM, Trip counter for EN81-1 A3. Safety gear function, Output phase rotation, customizable logic interface, etc.	
Protection	Overcurrent, Overvoltage, Overheating, Low voltage, Output current limiting, Inverter overload, Motor overload, External alarm, Communications alarm,	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), Stall prevention, External alarm input, Memory error, Communication error, (KEYPAD, Option, RS-485), CPU error, Option error, Output phase loss error	Overcurrent, short circuit, grounding fault, overvoltage, undervoltage, input phase loss, output phase loss, overheating, overload, external alarm, motor protection (electronic thermal and PTC), memory error, keypad communication error, CPU error, option communication error, option error, operation error, tuning error, RS485 communication error, data save error upon undervoltage, option hardware error, EN terminal circuit error, PG wiring broken, CAN bus communication error, overspeed prevention, speed mismatching, charging circuit fault, over torque current, etc.	
Enclosure (IEC/EN60529)	IP00	IP20 closed type, UL open type (22 kW or smaller), IP00 open type, UL open type (30 kW or larger)	IP20 (IEC60529) closed type, UL open type (UL50) (22 kW or smaller), IP00 open type, UL open type (30 kW or larger)	IP20 + IP54 Heat sink (From 2.2 to 15 kW) IP20 (from 18,5 to 22 kW), IP00 (from 30 to 45 kW)	
Cooling method	Single-phase 230 V 0.4-0.75 kW natural cooling Single-phase 230 V 1.5-2.2 kW fan cooling Three-phase 400 V 0.75-2.2 kW fan cooling	Fan cooling	Natural cooling (1.5 kW or smaller) Fan cooling (2.2 kW or larger)	Fan cooling	
Conformed standard	EC Directive (CE marking) ²	EC Directive (CE marking) ² , UL standard (cUL certification) ⁴ , EAC, ST0 ⁵	EC Directive (CE marking) ² , UL standard (cUL certification) ⁴ , EAC, ST0 ⁵	- EC Directive (CE marking) ¹ - EAC ² - Canada Safety Standard: CSA B44.1-11/ASME A17.5-2011 - Lift Directive (in extracts) EN 81-1 + A3 According to contactors less, brake monitoring (UCM) and Travel direction counter - Low Voltage Directive, EN61800-5-1: Over voltage category 3 - EMC Directive: EN12015, EN12016, EN 61800-3 +A1, EN 61326-3-1, (Emission) Built-in EMC filter type : Category 2 (0025 (11kW) or lower), Category 3 (0032 (15kW) or higher), (Immunity) 2nd Env. - Machinery Directive EN ISO13849-1: PL-e / EN62024-1: stop category 0 EN61800-5-2: STO SIL3 / EN62061: SIL3	

SPECIFICATIONS

		FRENIC-VG (VG1 unit)	FRENIC-VG (VG1 stack / 400 V)	FRENIC-VG (VG1 stack / 690 V) <small>NEW</small>	
Input ratings	Phase, Voltage, Frequency	3-phase 400 VAC	380 to 480 VAC, 50/60 Hz (3.7~55 kW) 380 to 440 VAC, 50 Hz (55~630 kW) 380 to 480 VAC, 60 Hz (55~630 kW)	380 to 440 VAC, 50 Hz 380 to 460 VAC, 60 Hz (For additional information refer to RHC-D and RHD-D specifications)	660 to 690 VAC, 50/60 Hz 575 to 600 VAC, 50/60 Hz (For additional information refer to RHC-D and RHD-D specifications)
		3-phase 200 VAC	200 to 230 VAC, 50/60 Hz (0.75~22 kW) 200 to 220 VAC, 50 Hz (30~90 kW) 200 to 230 VAC, 60 Hz (30~90 kW)	---	---
		1-phase	---	---	---
	Variations	Voltage: +10 to -15%, Frequency: -5 to +5% Voltage unbalance for 3-phase: 2% or less according to IEC61800-3	Voltage: +10 to -15%, Frequency: -5 to +5% Voltage unbalance for 3-phase: 2% or less according to IEC61800-3 (For additional information refer to RHC-D and RHD-D specifications)	Voltage: +10 to -15%, Frequency: -5 to +5% Voltage unbalance for 3-phase: 2% or less according to IEC61800-3 (For additional information refer to RHC-D and RHD-D specifications)	
Output overload capability		150% of rated current for 1 min (HD) (MD) 120% of rated current for 1 min (LD) 200% of rated current for 3 seconds (HD)	150% of rated current for 1 min (MD) 110% of rated current for 1 min (LD)	150% of rated current for 1 min (MD) 110% of rated current for 1 min (LD)	
Output frequency setting	Maximum frequency	500 Hz	150 Hz (Vector control with PG for IM, PMSM & V/f) 120 Hz (Vector control without PG for IM)	150 Hz (Vector control with PG for IM, PMSM & V/f) 120 Hz (Vector control without PG for IM)	
	Base frequency	500 Hz	150 Hz (Vector control with PG for IM, PMSM & V/f) 120 Hz (Vector control without PG for IM)	150 Hz (Vector control with PG for IM, PMSM & V/f) 120 Hz (Vector control without PG for IM)	
	Starting frequency	Vector control with PG (IM/PMSM): 0 Hz, Vector control without PG (IM): 1.250, V/f (IM): 0.2 Hz	Vector control with PG (IM/PMSM): 0 Hz Vector control without PG (IM): 1.250 V/f (IM): 0.2 Hz	Vector control with PG (IM/PMSM): 0 Hz Vector control without PG (IM): 1.250 V/f (IM): 0.2 Hz	
	Carrier frequency	2 to 15 kHz (0.75~55 kW in HD) 2 to 10 kHz (75~400 kW in HD) 2 to 5 kHz (500~630 kW in HD) 2 to 4 kHz (90~400 kW in MD) 2 to 10 kHz (30~55 kW in LD) 2 to 5 kHz (75~500 kW in LD) 2 kHz (630 kW in LD)	2 kHz	2 kHz	
Starting torque		200% (HD) 150% (MD), 120% (LD)	150% (MD) 110% (LD)	150% (MD) 110% (LD)	
Brake	Standard torque (%)		150%	Braking only available when RHC-D is used	Braking only available when RHC-D or BUC-D is used
	DC injection braking	Starting frequency	0.00 to 3600.00 rpm	0.00 to 3600.00 rpm	0.00 to 3600.00 rpm
		Braking time	0.00 to 30.00 s	0.00 to 30.00 s	0.00 to 30.00 s
		Braking level	0 to 100 %	0 to 100 %	0 to 100 %
Control method		· Vector control with PG (IM) · Vector control without PG (IM) · V/f (IM) · Vector control with PG (PMSM)	· Vector control with PG (IM) · Vector control without PG (IM) · V/f (IM) · Vector control with PG (PMSM)	· Vector control with PG (IM) · Vector control without PG (IM) · V/f (IM) · Vector control with PG (PMSM)	
Acceleration/deceleration time		0.00 to 99.9 s	0.00 to 99.9 s	0.00 to 99.9 s	
Multistep frequency		16 steps	16 steps	16 steps	
Frequency setting control (analog input)		0 to ±10 VDC 4 to 20 mA DC	0 to ±10 VDC 4 to 20 mA DC	0 to ±10 VDC 4 to 20 mA DC	
Standard functions		Start/stop operation, speed setting, speed detection, speed control, running status signals, acceleration/deceleration times, speed setting gains, jump speed, auto search for idling motor speed, auto-restart after momentary power failure, slip compensation, droop control, torque limit, torque control, PID control, cooling fan ON/OFF control, toggle monitor control, torque bias, motor selection, temperature detection, self-diagnostic function for PG detection circuit, load adaptive control, multiplex system (multiple winding motor drive and direct parallel connection), UP/DOWN control, stop function, PG pulse output, observer, offline tuning, online tuning, position control, pulse train, synchronous operation, STO, SSI, SBC, etc.	Start/stop operation, speed setting, speed detection, speed control, running status signals, acceleration/deceleration times, speed setting gains, jump speed, auto search for idling motor speed, auto-restart after momentary power failure, slip compensation, droop control, torque limit, torque control, PID control, cooling fan ON/OFF control, toggle monitor control, torque bias, motor selection, temperature detection, self-diagnostic function for PG detection circuit, load adaptive control, multiplex system (multiple winding motor drive and direct parallel connection), UP/DOWN control, stop function, PG pulse output, observer, offline tuning, online tuning, position control, pulse train, synchronous operation, STO, SSI, SBC, etc.	Start/stop operation, speed setting, speed detection, speed control, running status signals, acceleration/deceleration times, speed setting gains, jump speed, auto search for idling motor speed, auto-restart after momentary power failure, slip compensation, droop control, torque limit, torque control, PID control, cooling fan ON/OFF control, toggle monitor control, torque bias, motor selection, temperature detection, self-diagnostic function for PG detection circuit, load adaptive control, multiplex system (multiple winding motor drive and direct parallel connection), UP/DOWN control, stop function, PG pulse output, observer, offline tuning, online tuning, position control, pulse train, synchronous operation, STO, SSI, SBC, etc.	
Protection		Braking transistor broken, braking resistor overheated, DC fuse blown, excessive positioning deviation, PG communication error, safety circuit error, grounding fault, memory error, keypad communication error, CPU error, network error, RS485 communication error, operation error, output wiring fault, A/D converter error, speed not agreed, UPAC error, inter-inverter communications link error, hardware error, mock alarm, PG failure, input phase loss, start delay, undervoltage, NTC wire brake error, overcurrent, heat sink overheat, external alarm, inverter internal overheat, motor overheat, motor 1 overload, motor 2 overload, motor 3 overload, inverter overload, output phase loss, overspeed, overvoltage, PG wire brake, charger circuit fault, DC fan locked, E-SX bus tact synchronization error, toggle abnormality error, functional safety card error, light alarm (warning), surge protection, main power shut down	Braking transistor broken, braking resistor overheated, DC fuse blown, excessive positioning deviation, PG communication error, safety circuit error, grounding fault, memory error, keypad communication error, CPU error, network error, RS485 communication error, operation error, output wiring fault, A/D converter error, speed not agreed, UPAC error, inter-inverter communications link error, hardware error, mock alarm, PG failure, input phase loss, start delay, undervoltage, NTC wire brake error, overcurrent, heat sink overheat, external alarm, inverter internal overheat, motor overheat, motor 1 overload, motor 2 overload, motor 3 overload, inverter overload, output phase loss, overspeed, overvoltage, PG wire brake, charger circuit fault, DC fan locked, E-SX bus tact synchronization error, toggle abnormality error, functional safety card error, light alarm (warning), surge protection, main power shut down, etc.	Braking transistor broken, braking resistor overheated, DC fuse blown, excessive positioning deviation, PG communication error, safety circuit error, grounding fault, memory error, keypad communication error, CPU error, network error, RS485 communication error, operation error, output wiring fault, A/D converter error, speed not agreed, UPAC error, inter-inverter communications link error, hardware error, mock alarm, PG failure, input phase loss, start delay, undervoltage, NTC wire brake error, overcurrent, heat sink overheat, external alarm, inverter internal overheat, motor overheat, motor 1 overload, motor 2 overload, motor 3 overload, inverter overload, output phase loss, overspeed, overvoltage, PG wire brake, charger circuit fault, DC fan locked, E-SX bus tact synchronization error, toggle abnormality error, functional safety card error, light alarm (warning), surge protection, main power shut down, etc.	
Enclosure (IEC/EN60529)		IP20 (from 0.75 to 22 kW), IP00 (from 30 to 630 kW, IP20 available as an option)	IP00	IP00	
Cooling method		Fan cooling	Fan cooling	Fan cooling	
Conformed standard		EC Directive (CE marking) ² UL standard (cUL certification) ⁴ EAC ³ Machinery Directive: IEC/EN ISO13849-1: PL-d, IEC/EN60204-1: Stop category 0 IEC/EN61800-5-2: SIL2, IEC/EN62061: SIL2	EC Directive (CE marking) ² UL standard (cUL certification) ⁴ EAC ³ Machinery Directive: IEC/EN ISO13849-1: PL-d, IEC/EN60204-1: Stop category 0 IEC/EN61800-5-2: SIL2, IEC/EN62061: SIL2	US and Canada Safety Standard ⁴ UL, cUL (UL508C, C22.2 No. 14) Machinery Directive* IEC/EN ISO13849-1: PL-d IEC/EN60204-1: Stop category 0 IEC/EN61800-5-2: SIL2 IEC/EN62061: SIL2 Low Voltage Directive* EN61800-5-1: Over voltage category 3 EMC Directive (with external EMC filter installed)* EN61800-3 *pending	

5 Functional Safety: EN61800-5-2: SIL2, ISO13849-1: SIL2, PL-d, cat. 3, Safe torque off, stop cat. 0
6 Ratings applicable when no optional braking resistor is installed.
7 With dynamic torque-vector control selected.

1 Non-EMEA standard product.
2 EMC Directive: EN61800-3 / Low Voltage Directive: EN61800-5-1
3 GOST-R, GOST-R, GOST-R
4 UL508, C22.2 No. 14

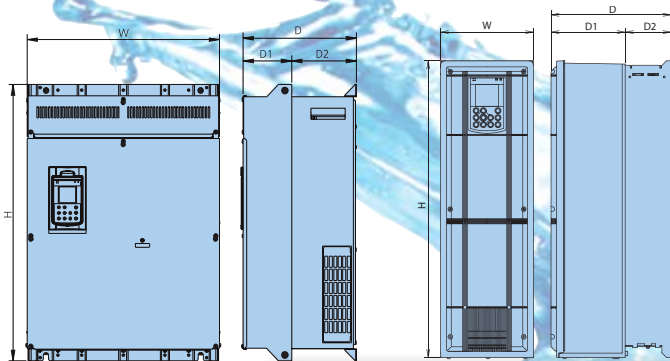
FRENIC-AQUA



FRENIC-AQUA is the first slim type inverter from Fuji Electric and dedicated to a variety of applications of water supply and wastewater treatment systems.

This new series follows European trends with keeping high Japanese reliability. Specific functions to prevent damage on the systems and new energy saving functions are installed as standard and positioning FRENIC-AQUA as a high performance inverter on the pumping application market.

- Wide capacity range from 0.75 kW to 710 kW
- IP21 & IP55 with same dimension
- DCR and EMC filter built-in up to 90 kW. Built-in EMC filter for all capacities
- Overload capability 110%
- Torque Vector Control
- Battery (OPK-BP)
- Modbus RTU, BACnet MS/TP, Metasys N2; integrated as standard
- Large LCD display, 19 languages + user customizable language
- Specific macros for common pump applications
- Customizable Logic (mini PLC), 14 steps, possibility to manage digital and also analog signals
- Real Time Clock (RTC)
- 4 PID Sets
- Unit conversion function (kPa, bar, l/min, etc.), Fire mode (forced operation)
- Password function
- New energy saving functions (sleep mode)
- Multipump control (up to 9 pumps with one inverter)
- Anti jam function
- Pipe fill mode
- Extension cable for remote operation (CB...S)



□ Protective structure: M: IP21, L: IP55. Type of frame: up to 37 kW plastic enclosure, 45 kW and above metal enclosure.

Power supply voltage	Applicable standard motor (kW)	Inverter model	Outside dimensions (mm)				
			W	H	D	D1	D2
3-phase 400 VAC	0.75	FRN0.75AQ1□-4E	150	465	262	162	100
	1.5	FRN1.5AQ1□-4E					
	2.2	FRN2.2AQ1□-4E					
	4.0	FRN4.0AQ1□-4E					
	5.5	FRN5.5AQ1□-4E					
	7.5	FRN7.5AQ1□-4E					
	11	FRN11AQ1□-4E	203	585	262	162	100
	15	FRN15AQ1□-4E					
	18.5	FRN18.5AQ1□-4E					
	22	FRN22AQ1□-4E	203	645	284	184	127
	30	FRN30AQ1□-4E					
	37	FRN37AQ1□-4E					
	45	FRN45AQ1□-4E	265	736	360	180	180
	55	FRN55AQ1□-4E					
	75	FRN75AQ1□-4E					
	90	FRN90AQ1□-4E	300	885	360	241	127
	110	FRN110AQ1S-4E					
	132	FRN132AQ1S-4E					
	160	FRN160AQ1S-4E	530	740	315	135	180
	200	FRN200AQ1S-4E					
	220	FRN220AQ1S-4E					
	280	FRN280AQ1S-4E	680	1000	360	180	180
	315	FRN315AQ1S-4E					
	355	FRN355AQ1S-4E					
400	FRN400AQ1S-4E	880	1400	440	260	180	
500	FRN500AQ1S-4E						
630	FRN630AQ1S-4E						
710	FRN710AQ1S-4E	1000	1550	500	313	187	

TYPE CODE

Series name: FRENIC **FRN** Standard applicable motor capacity (kW) **0.75** Applied for: AQUA **AQ1** Destination: E (Europe) **M - 4 E** Input power supply: 4: 3-phase 400 VAC Protection Structure: S: IP00 M: IP21 L: IP55



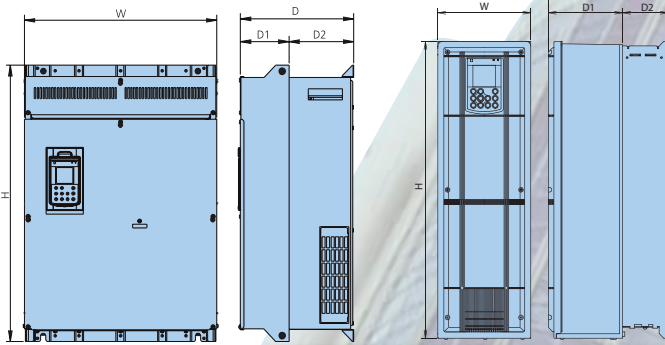
FRENIC-HVAC



FRENIC-HVAC is the first slim type inverter from Fuji Electric and dedicated to a variety of HVAC applications. This new series follows European trends with keeping high Japanese reliability.

Specific functions to manage fan and compressor applications and new energy saving functions are installed as standard and positioning FRENIC-HVAC as a high performance inverter on the HVAC and compressor market.

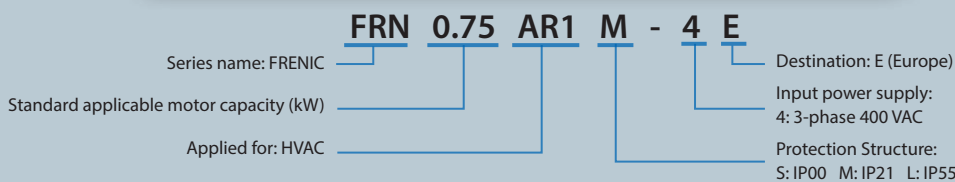
- Wide capacity range from 0.75 kW to 710 kW
- IP21 & IP55 with same dimension
- DCR and EMC filter built-in up to 90 kW. Built-in EMC filter for all capacities
- Overload capability 110%
- Torque Vector Control
- Modbus RTU, BACnet MS/TP,
- Metasys N2; integrated as standard
- Large LCD display, 19 languages + user customizable language
- Specific macros for common fan and compressor applications
- Customizable Logic (mini PLC), 14 steps, possibility to manage digital and also analog signals
- Real Time Clock (RTC)
- 4PID sets
- Unit conversion function (kPa, bar, l/min, etc.)
- Fire mode (forced operation) Catch spinning motor
- Password function
- Extension cable for remote operation (CB-...S)
- Battery (OPK-BP)



Power supply voltage	Applicable standard motor (kW)	Inverter model	Outside dimensions (mm)				
			W	H	D	D1	D2
3-phase 400V	0.75	FRN0.75AR1□-4E	150	465	262	162	100
	1.5	FRN1.5AR1□-4E					
	2.2	FRN2.2AR1□-4E					
	4.0	FRN4.0AR1□-4E					
	5.5	FRN5.5AR1□-4E					
	7.5	FRN7.5AR1□-4E					
	11	FRN11AR1□-4E	203	585	262	162	100
	15	FRN15AR1□-4E					
	18.5	FRN18.5AR1□-4E					
	22	FRN22AR1□-4E					
	30	FRN30AR1□-4E	203	645	262	162	100
	37	FRN37AR1□-4E					
	45	FRN45AR1□-4E	265	736	284	184	100
	55	FRN55AR1□-4E					
	75	FRN75AR1□-4E	300	885	368	241	127
	90	FRN90AR1□-4E					
	110	FRN110AR1S-4E	530	740	315	135	180
	132	FRN132AR1S-4E					
	160	FRN160AR1S-4E					
	200	FRN200AR1S-4E					
	220	FRN220AR1S-4E	680	1000	360	180	180
	280	FRN280AR1S-4E					
	315	FRN315AR1S-4E					
	355	FRN355AR1S-4E	880	1400	440	260	180
	400	FRN400AR1S-4E					
	500	FRN500AR1S-4E	1000	1550	500	313	187
	630	FRN630AR1S-4E					
	710	FRN710AR1S-4E					

□ Protective structure: M: IP21, L: IP55. Type of frame: up to 37 kW plastic enclosure, 45 kW and above metal enclosure.

TYPE CODE



FVR-Micro S2S NEW

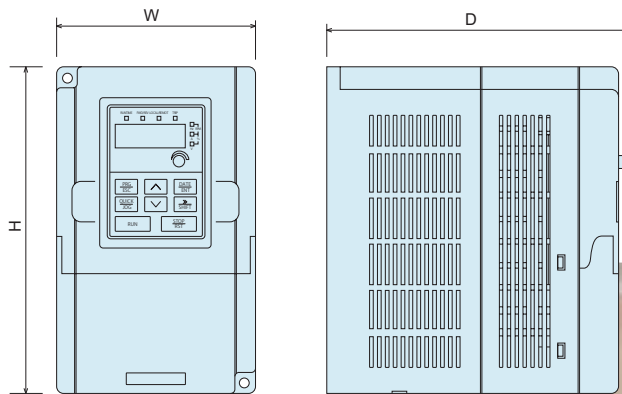


FVR-Micro is an economical inverter that demonstrates great effectiveness with a small initial cost. Because of the simple and compact design, FVR-Micro is preferable to be used at any applications which require small space, small capacities, and simple and basic function, such as traversing conveyors etc.

Once installed, the users will enjoy its user-friendliness, simple operation and easy maintenance.

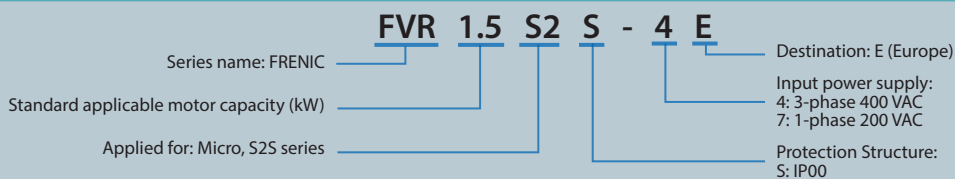


- High overload: 150% of rated current during 1 min, 180% during 10s, 200% during 1s
- Compatible with a wide range of frequency settings: up to 2.2 kW in single-phase 200 VAC or in three-phase 400 VAC power supply
- Built-in RS485 communications port as standard
- Travers control and pattern operation included in standard software
- 5 Alarms history
- PID built in
- Low voltage ride through
- Potentiometer built-in the keypad, to be used as frequency or PID command



Power supply voltage	Applicable standard motor (kW)	Inverter model	Outside dimensions (mm)		
			W	H	D
3-phase 400 VAC	0.75	FVR0.75S2S-4E	100	165	153.2
	1.5	FVR1.5S2S-4E			
	2.2	FVR2.2S2S-4E			
1-phase 200 VAC	0.4	FVR0.4S2S-7E	85	140	134.2
	0.75	FVR0.75S2S-7E			
	1.5	FVR1.5S2S-7E	100	165	153.2
	2.2	FVR2.2S2S-7E			

TYPE CODE



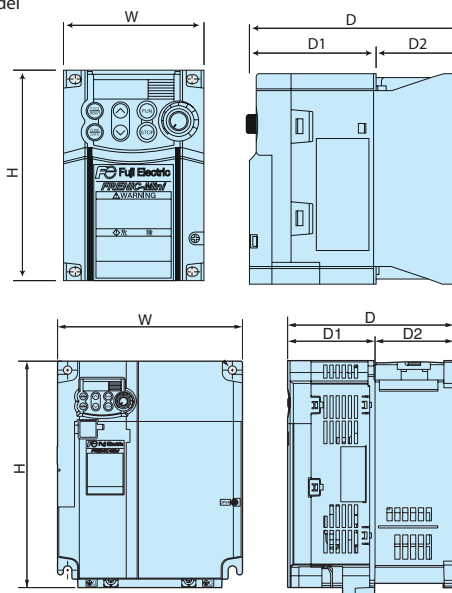
FRENIC-Mini C2



With its rich functionality, compact design, simple operation, and global compatibility, the new FRENIC-Mini elevates the performance of a wide range of devices and equipment.

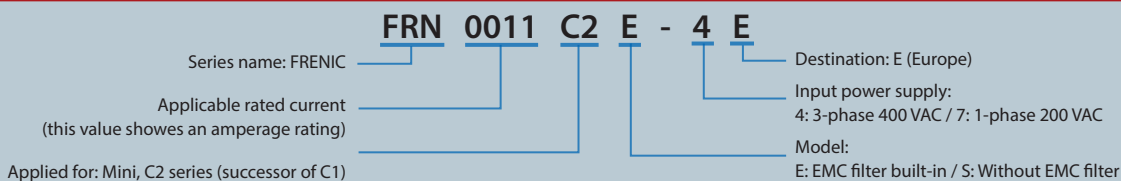
Including conveyors, fans, pumps, centrifugal separators, and food processing machines - we provide you the system integration, energy efficiency, reduced labour, and lower overall costs you're looking for.

- High performance and multipurpose
- Induction Motor control (V/f and Dynamic torque vector control), PMS Motor control (open loop)
- Slip compensation controller shortens setting time
- Fastest CPU processor in its class
- Even easier to use and fully compatible with existing products: External dimensions of C1 model equal C2 model
- Optional USB keypad available
- Energy use optimizer
- PID control function
- Cooling fan ON/OFF control function
- Network capabilities standard: RS-485 communications port
- Easier maintenance



Power supply voltage	Applicable standard motor (kW)	Inverter model	Outside dimensions (mm)				
			W	H	D	D1	D2
3-phase 400 VAC w/ EMC filter built-in	0.4	FRN0002C2E-4□	110	130	158	118	40
	0.75	FRN0004C2E-4□					
	1.5	FRN0005C2E-4□	140	180	182	64	
	2.2	FRN0007C2E-4□					
3-phase 400 VAC w/o EMC filter built-in	4.0	FRN0011C2E-4□	180	230	158	70.3	87.7
	5.5	FRN0013C2S-4□					
	7.5	FRN0018C2S-4□	220	270	190	100	90
	11	FRN0024C2S-4□					
1-phase 200 VAC w/ EMC filter built-in	15	FRN0030C2S-4□	80	120	100	90	10
	0.1	FRN0001C2E-7□					
	0.2	FRN0002C2E-7□	110	130	115	99	25
	0.4	FRN0004C2E-7□					
	0.75	FRN0006C2E-7□	140	180	139	118	64
	1.5	FRN0010C2E-7□					
	2.2	FRN0012C2E-7□					

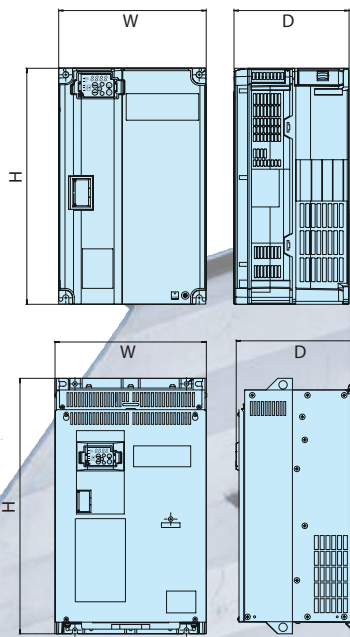
TYPE CODE



FRENIC-ACE is the inverter that produces excellent cost-performance with maintaining its high performance through optimal design. With the 200 steps of its customized logic as a standard feature, it enables users to customize their inverters from simple logistics function to full-scaled programming.

As a standard inverter for the next generation which can be applied to various machines and devices, FRENIC-Ace can be used in almost any type of application from fans and pumps up to specialized machines.

- Customizable logic (mini PLC, 200 steps), superior flexibility
- Quadruple rating from 18.5 kW to 220 kW
- CAN Open communications built-in as standard
- Wide variety of functions as a standard feature
- Safety enable input STO (compliant to EN/ISO13849-1, SIL3, PI=e, cat. 3)
- 10 years lifetime design
- Optional multifunctional keypad
- Closed loop for IM and Sensorless PMSM control modes



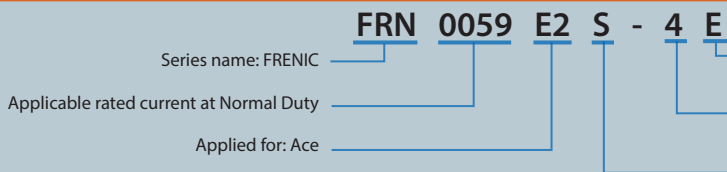
External dimensions with built-in filter except for 5.5 to 15 kW

Power supply voltage	Applicable standard motor (kW)				Inverter model	Outside dimensions (mm)		
	HHD*	HND*	HD*	ND*		W	H	D
3-phase 400 VAC	0.4	0.75	-	-	FRN0002E2□-4□	110	140	162
	0.75	1.1	-	-	FRN0004E2□-4□			186
	1.5	2.2	-	-	FRN0006E2□-4□	140	199	
	2.2	3.0	-	-	FRN0007E2□-4□			
	3.7	5.5	-	-	FRN0012E2□-4□			
	5.5	7.5	-	-	FRN0022E2□-4□	180	230	158
	7.5	11	-	-	FRN0029E2□-4□			
	11	15	-	-	FRN0037E2□-4□	220	270	190
	15	18.5	-	-	FRN0044E2□-4□			
	18.5	22	22	30	FRN0059E2□-4□	250	400	195
	22	30	30	37	FRN0072E2□-4□			
	30	37	37	45	FRN0085E2□-4□	326.2	550	261
	37	45	45	55	FRN0105E2□-4□			
	45	55	55	75	FRN0139E2□-4□	361.2	615	276
55	75	75	90	FRN0168E2□-4□	675			
75	90	90	110	FRN0203E2□-4□	536.4	740	321	
90	110	110	132	FRN0240E2□-4□		1000		
110	132	132	160	FRN0290E2□-4□	686.4	1000	366	
132	160	160	200	FRN0361E2□-4□				
160	200	200	220	FRN0415E2□-4□	686.4	1000	366	
200	220	220	280	FRN0520E2□-4□				
220	280	250	315	FRN0590E2□-4□				
1-phase 200 VAC	0.1	-	-	-	FRN0001E2□-7□	68	127	85
	0.2	-	-	-	FRN0002E2□-7□			107
	0.4	-	-	-	FRN0003E2□-7□	110	130	152
	0.75	-	-	-	FRN0005E2□-7□			153
	1.5	-	-	-	FRN0008E2□-7□	140	130	153
	2.2	-	-	-	FRN0011E2□-7□			143

Note
3-phase 200 VAC available in a different type code.

* HHD: 150% 1 min, 200% 0.5 s / HND, ND: 120% 1 min / HD: 150% 1 min
Additional conditions:
 - Temperature: at 40°C for HD and ND, at 50°C for HHD and HND
 - Carrier frequency: at 4 kHz for HD, ND (from 72 till 168), at 6 kHz for HHD, HND (from 72 till 168), at 10 kHz for HHD (from 72 till 168), at 4 kHz for HHD, HND (from 203 till 590), at 6 kHz for HHD (from 203 till 590)
 □ See type code explanations below.

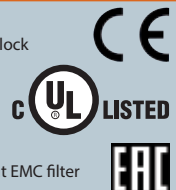
TYPE CODE



Destination:
 E: Europe / GA: Global, with terminal block
 GB: Global, without terminal block

Input power supply:
 4: 3-phase 400 VAC /
 2: 3-phase 200 VAC /
 7: 1-phase 200 VAC (coming soon)

Model: E: EMC filter built-in / S: Without EMC filter



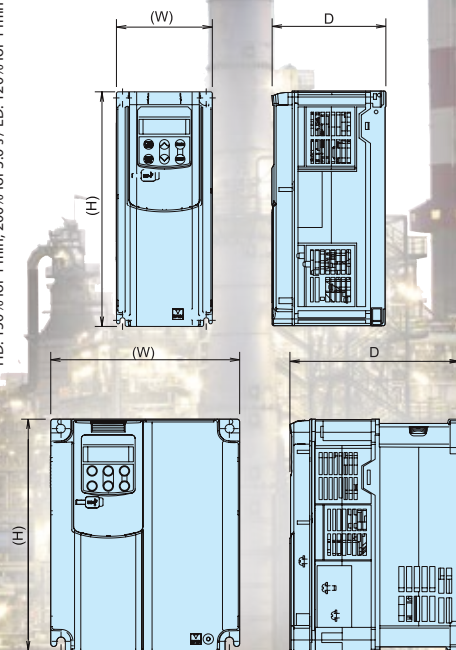
FRENIC-MEGA, which is the successor of former G11S series and named as a "Maximum Engineering for Global Advantage", is a high performance, multifunctional inverter Fuji Electric has developed by gathering the best of its technologies.

With the flexibility and functionality to support a wide range of applications on all types of mechanical equipment, FRENIC-MEGA takes core capability, responsiveness, environmental awareness, and easy maintenance to the next level.

- Safety enable input (compliant to EN/ISO13849- PL=d, cat. 3)
- Built-in EMC filter for all capacities (compliant to EN 61800-3, category C3)
- Sensorless vector control mode (100% torque at 0 Hz)
- Advanced PID functions (dancer control)
- Brake control function
- Logic gates for logic combination of input and output functions and delay timer (10 steps)
- Positioning function (when encoder option is used)
- 3 slots for 3 different options at the same time (encoder, fieldbus, I/O expansion)
- Removable control terminals (cage clamp type)
- External EMC filter (footprint up to 22 kW) for higher EMC compliance (EN 61800-3, category C2)
- Basic LED keypad with built-in USB port and copy function (1 complete function set, operation, maintenance and alarms information)
- Advanced LCD/LED keypad with clear text description and copy function (3 complete function sets)

Power supply voltage	Applicable standard motor (kW)		Inverter model	Outside dimensions (mm)		
	HD*	LD*		W	H	D
3-phase 400 VAC	0.4	-	FRN0.4G1□-4E	110	260	145
	0.75	-	FRN0.75G1□-4E	150		
	1.5	-	FRN1.5G1□-4E			
	2.2	-	FRN2.2G1□-4E			
	4.0	-	FRN4.0G1□-4E			
	5.5	7.5	FRN5.5G1□-4E			
	7.5	11	FRN7.5G1□-4E			
	11	15	FRN11G1□-4E			
	15	18.5	FRN15G1□-4E	250	400	195
	18.5	22	FRN18.5G1□-4E			
	22	30	FRN22G1□-4E	326.2	550	261.3
	30	37	FRN30G1□-4E			
	37	45	FRN37G1□-4E			
	45	55	FRN45G1□-4E	361.2	615	276.3
	55	75	FRN55G1□-4E		675	
	75	90	FRN75G1□-4E	535.8	740	321.3
	90	110	FRN90G1□-4E			
	110	132	FRN110G1□-4E			
	132	160	FRN132G1□-4E	536.4	1000	366.3
	160	200	FRN160G1□-4E			
	200	220	FRN200G1□-4E	686.4	1400	445.5
	220	280	FRN220G1□-4E			
	280	315	FRN280G1□-4E			
	315	355	FRN315G1□-4E	886.4	1400	446.3
355	400	FRN355G1□-4E				
400	500	FRN400G1□-4E	1006	1550	505.9	
500	630	FRN500G1□-4E				
630	710	FRN630G1□-4E				

Protection Structure: E: EMC Filter built-in / S: Standard basic type
*HD: 150% for 1 min, 200% for 3.0 s / LD: 120% for 1 min



TYPE CODE

Series name: FRENIC **FRN**
Standard applicable motor capacity (kW) **0.75**
Applied for: MEGA **G1**
Destination: E (Europe) **E**
Input power supply: 4: 3-phase 400 VAC / 7: 1-phase 200 VAC **- 4**
Model: E: EMC filter built-in / S: Without EMC filter **E**



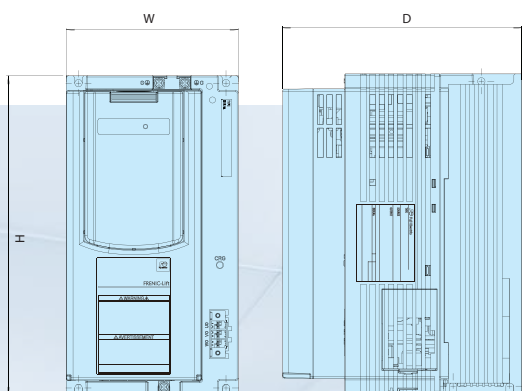
FRENIC-Lift LM2A NEW



In 2005, Fuji Electric designed the first FRENIC-Lift inverter to fulfill the requirements of lift applications. FRENIC-Lift is nowadays the most preferred inverter for lift application in the market.

By using the experiences in market, we have now developed the upgraded version of FRENIC-Lift, the LM2A: smaller but smarter.

- Book type frame up to 15 kW Dual Mounting (book type)
- Feed through mounting with IP54 heat sink (book type)
- Removable input and output power terminals (book type)
- Contactorless solution compliant to EN81-1/2 and EN81-20
- Different energy saving levels according to Draft ISO 25745 & VDI 4707
- Easier rescue operation with 24 VDC power supply for control board
- Built-in EMC filter
- Built-in advanced fieldbuses dedicated to lift applications (CANopen CiA DSP 402 & 417* and DCP 3 & 4tz) (*coming soon)
- Faster speed and current control loop for easier and faster comfort adjustment
- Removable control terminals
- Two new motor control modes: Vector control with peripheral PG and sensorless vector control for rescue operation (PMSM)* (*coming soon)
- Several certified functions for safety operation
- New software functions to make easier setup
- Customizable logic capability (PLC function)



Power Supply Voltage	Type	Applied motor current	Applied motor capacity	Outside Dimensions (mm)		
				W	H	D
3-phase 400 VAC	FRN0006LM2A-4E	6.1 A	2.2 kW	140	260	195
	FRN0010LM2A-4E	10 A	4.0 kW			
	FRN0015LM2A-4E	15 A	5.5 kW			
	FRN0019LM2A-4E	18.5 A	7.5 kW			
	FRN0025LM2A-4E	24.5 A	11 kW	160	360	195
	FRN0032LM2A-4E	32 A	15 kW			
	FRN0039LM2A-4E	39 A	18.5 kW	250	400	195
	FRN0045LM2A-4E	45 A	22 kW			
	FRN0060LM2A-4E	60 A	30 kW			
	1-phase 200 VAC	FRN0075LM2A-4E	75 A	37 kW	326.2	550
FRN0091LM2A-4E		91 A	45 kW			
FRN0011LM2A-7E		11 A	2.2 kW	140	260	195
FRN0018LM2A-7E		18 A	4.0 kW			

TYPE CODE

FRN 0025 LM2A - 4 E

Series name: FRENIC — FRN

Applicable rated current — 0025

Applied for: Lift — LM2A

Destination: E: Europe — 4

Input power supply: 4: 3-phase 400 VAC, 7: 1-phase 200 VAC — E



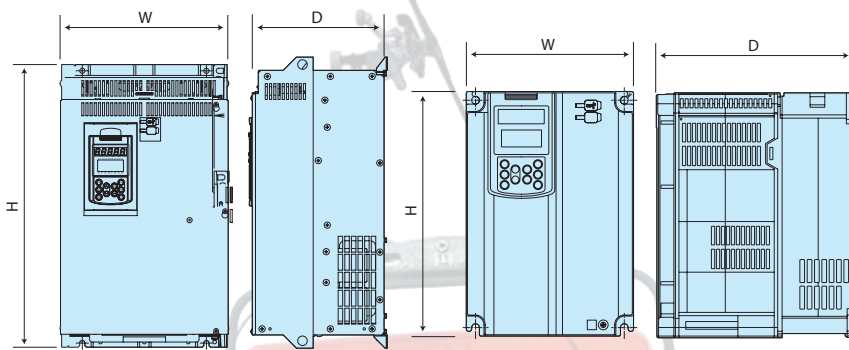
FRENIC-VG unit type



With FRENIC-VG, Fuji Electric has concentrated its technologies to deliver the best-performing inverter on the market. In addition to its basic performance, this model features the following great improvements: support for previously difficult applications due to technical and capability limitations, easier and more user-friendly maintenance, as well as environmental friendliness and safety. With using its vector control, FRENIC-VG unit type will cover various applications which require powerful but also accurate performance.

- Powerful: from 0.75 kW to 630 kW in triple rating HD, LD and MD
- Strong: even though in hard environment such as sulfurizing gas, salty environments, dust, humidity, etc.
- Flexible: IM (open and closed loop) and PMSM (open* and closed loop) control
- Torque accuracy: +/- 3%
- Current loop bandwidth: 2000 Hz
- Speed control accuracy: +/- 0,005%
- Speed loop bandwidth: 600Hz
- Connected to the world: USB on board, typical field buses and Ethernet based field bus
- Making safety easier: STO, SS1, SLS, SBC
- All applications solved: Cranes, rubber, paper, winding, test benches, press, shipboard winch, flying shear, positioning, etc are included
- Adaptable and versatile: 5 slots for adjusting to the requirements, real time built in, FULL PLC on board optional, etc.

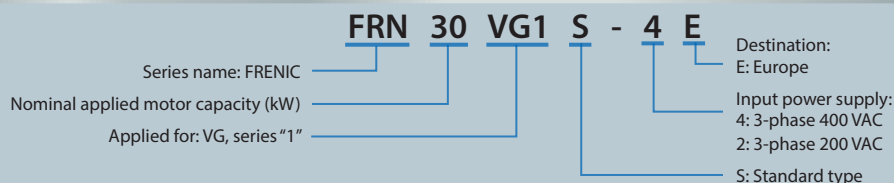
* coming soon



Power supply voltage	Applicable standard motor (kW)			Inverter model	Outside dimensions (mm)			
	HD*	MD*	LD*		W	H	D	
3-phase 400 VAC	3.7	-	-	FRN3.7VG1S-4E	205	300	245	
	5.5	-	-	FRN5.5VG1S-4E				
	7.5	-	-	FRN7.5VG1S-4E				
	11	-	-	FRN11VG1S-4E	250	400		
	15	-	-	FRN15VG1S-4E				
	18.5	-	-	FRN18.5VG1S-4E				
	22	-	-	FRN22VG1S-4E	326.2	550	261.3	
	30	-	37	FRN30VG1S-4E				
	37	-	45	FRN37VG1S-4E				
	45	-	55	FRN45VG1S-4E	361.2	615		
	55	-	75	FRN55VG1S-4E				
	75	-	90	FRN75VG1S-4E				
	90	110	110	FRN90VG1S-4E	536.4	740	321.3	
	110	132	132	FRN110VG1S-4E				
	132	160	160	FRN132VG1S-4E				
	160	200	200	FRN160VG1S-4E	686.4	1000		366.3
	200	220	220	FRN200VG1S-4E				
	220	-	280	FRN220VG1S-4E				
	280	315	355	FRN280VG1S-4E	886.4	1400	445.5	
	315	355	400	FRN315VG1S-4E				
355	400	450	FRN355VG1S-4E					
400	450	500	FRN400VG1S-4E	1006	1550	505.9		
500	-	630	FRN500VG1S-4E					
630	-	710	FRN630VG1S-4E					

*200 VAC series: HD: 150% 1 min, 200% 3 s / LD: 120% 1 min / MD: 150% 1 min / LD: 120% 1 min
400 VAC series: HD: 150% 1 min, 200% 3 s / MD: 150% 1 min / LD: 120% 1 min

TYPE CODE

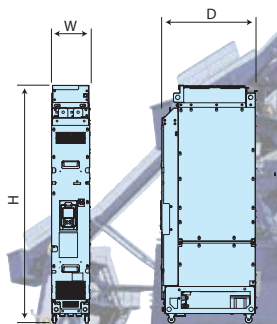
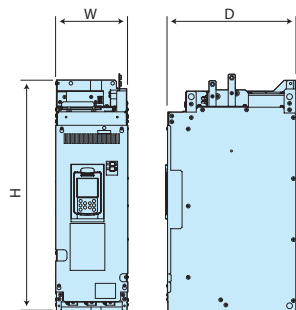


FRENIC-VG stack type



With FRENIC-VG, Fuji Electric has concentrated its technologies to deliver the best performing inverter on the market. In addition to its basic performance, this model features the following great improvements: support for previously difficult applications due to technical and capability limitations, easier and more user-friendly maintenance, as well as environmental friendliness and safety. With using its parallel installation, FRENIC-VG stack type will cover various applications which require forceful performance.

- Powerful: from 30 kW to 3 MW in dual rating (MD/LD)
- Regenerative (converter) and non-regenerative (rectifier) headers from 132 kW to 3 MW
- Flexible: IM (open and closed loop) and PMSM (closed loop) control
- Easy to install
- Harmonic distortion mitigation: Sinusoidal-wave Regenerative Header, 12 pulses layout, etc.
- Taking the most benefits from DC bus link sharing: multiple possibilities of power layout
- Redundancy: possible to work at half power in case of maintenance or stack failure
- Non-stop function and other possibilities
- Making safety easier: STO, SS1, SLS, SBC
- 690 VAC series



Power supply voltage	No. of units	Applicable standard motor (kW)		Inverter model	Outside dimensions (mm)						
		MD*	LD*		W	H	D				
3-phase 400 VAC	1	30	37	FRN30SVG1S-4E	226.2	740	406.3				
		37	45	FRN37SVG1S-4E							
		45	55	FRN45SVG1S-4E							
		55	75	FRN55SVG1S-4E							
		75	90	FRN75SVG1S-4E							
		90	110	FRN90SVG1S-4E							
		3-phase 690 VAC	1	110	132	FRN110SVG1S-4E	226.2	1100	567.3		
				132	160	FRN132SVG1S-4E					
				160	200	FRN160SVG1S-4E					
				200	220	FRN200SVG1S-4E					
				220	250	FRN220SVG1S-4E					
				250	280	FRN250SVG1S-4E					
				3-phase 690 VAC	2	280	315	FRN280SVG1S-4E	226.2	1400	567.3
						315	355	FRN315SVG1S-4E			
						630	710	FRN630BVG1S-4E**			
						710	800	FRN710BVG1S-4E**			
						800	1000	FRN800BVG1S-4E**			
						355	400	FRN200SVG1S-4E			
3-phase 690 VAC	3	400	-			FRN220SVG1S-4E	226.2	1100	567.3		
		-	500			FRN250SVG1S-4E					
		500	630			FRN280SVG1S-4E					
		1000	1200			FRN630BVG1S-4E**					
		1200	1200			FRN630BVG1S-4E**					
		-	1500			FRN710BVG1S-4E**					
		3-phase 690 VAC	3	1500	1800	FRN800BVG1S-4E**	226.2	1400	567.3		
				630	-	FRN220SVG1S-4E					
				-	710	FRN250SVG1S-4E					
				-	800	FRN250SVG1S-4E					
				710	-	FRN280SVG1S-4E					
				800	-	FRN280SVG1S-4E					
3-phase 690 VAC	3			-	1000	FRN315SVG1S-4E	226.2	1400	567.3		
				1800	2000	FRN630BVG1S-4E**					
				2000	2400	FRN710BVG1S-4E**					
				2400	1800	FRN800BVG1S-4E**					
				90	110	FRN90SVG1S-69E					
				110	132	FRN110SVG1S-69E					
		3-phase 690 VAC	1	132	160	FRN132SVG1S-69E	226.2	880	406.3		
				160	200	FRN160SVG1S-69E					
				200	220	FRN200SVG1S-69E					
				250	280	FRN250SVG1S-69E					
				280	315	FRN280SVG1S-69E					
				315	355	FRN315SVG1S-69E					
3-phase 690 VAC	1			355***	400***	FRN355SVG1S-69E	226.2	1100	567.3		
				400***	450***	FRN400SVG1S-69E					
				450***	-	FRN450SVG1S-69E					
				90	110	FRN90SVG1S-69E					
				110	132	FRN110SVG1S-69E					
				132	160	FRN132SVG1S-69E					

* MD: 150% 1 min / LD: 110% 1 min
 ** One set of the inverter consists of three stacks.
 The touch panel is connected to the V phase only.
 *** Equipped with SiC hybrid module

NEW

TYPE CODE

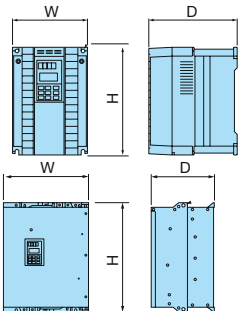
Series name: FRENIC **FRN**
 Nominal applied motor capacity (kW) **30**
 Form: S: Standard stack / B: Stack phase / None: Unit type **S**
 Applied for: VG, series "1" **VG1**
 Destination: E: Europe **S**
 Input power supply: 4: 3-phase 400 VAC 69: 3-phase 690 VAC **- 4 E**
 Standard type **S**





PWM Converter

RHC-C SERIES unit type



- **Influence on power supply:**
 - Operation near unity power factor "1" (or "-1")
 - Reduce harmonic current and power supply capacity
- **High carrier frequency**
 - 6 to 15 kHz (changeable)
 - Filter dimensions reduction (electrical noise reduction)
- **Various protection and maintenance functions**
 - Output signals (overheat, overload, life time)
 - Easy troubleshooting by "trace-back" option
- **Stronger braking capability (lift application)**

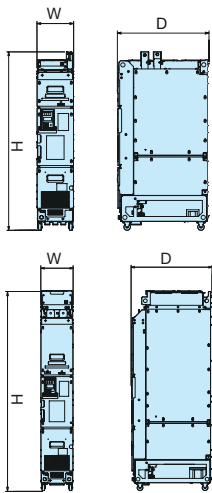
RHC-C series is the active front-end of Fuji Electric in unit type configuration. It can significantly reduce the harmonic distortion generated by the inverter that affects on electric power systems (IEEE 519-1992). On the other hand, the regenerated energy, all of which are returned to the power source, promotes energy saving. The capacity range which is offered in Europe heads from 7.5 kW to 55 kW.

unit type

Power supply voltage	Applicable inverter capacity (kW)		PWM converter type	Outside dimensions (mm)		
	MD (CT)*	LD (VT)*		W	H	D
400 VAC series	7.5	11	RHC7.5-4C	250	380	245
	11	15	RHC11-4C			
	15	22	RHC15-4C			
	22	30	RHC22-4C	340	480	255
	30	45	RHC30-4C		550	
	45	55	RHC45-4C	375	675	270
55	75	RHC55-4C				

* MD (CT): 150% 1 min / LD (VT): 120% 1 min

RHC-D SERIES stack type



PWM Converter RHC-D Series

RHC-D series is the active front-end of Fuji Electric in stack type configuration. All advantages of RHC-C series but in stack type are:

- Rating available in MD and LD
- A capacity range from 132 kW to 4.8 MW
- Two configurations available:
 - Standard stack
 - Phase stack
- Able to work with isolated and non-isolated transformers
- Input voltage: 400 VAC (690 VAC coming soon)

Filter Stack Type RHF Series

RHF series is the compact solution and dedicated filter for the PWM converter (RHC-D) in the shape of stack type. Charging circuit, harmonic filter and boosting reaction all in one.

- Rating available in MD and LD
- A capacity range from 160 kW to 1.36 MW
- Two configurations available:
 - Standard stack
 - Phase stack
- Input voltage: 400 VAC (690 VAC coming soon)

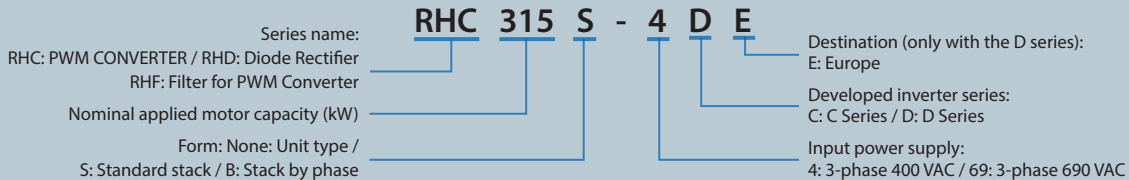
stack type

Note
Each RHC-D / RHD-D type has its associated RHF.
RHF dimensions are equivalent to RHC-D dimensions.

* MD: 150% 1 min / LD: 110% 1 min
** Each stack corresponds to one phase, and one set of the inverter consists of three stacks. The keyboards attached only to the S phase.
□ See type code explanations below.

Power supply voltage	Applicable inverter capacity (kW)		PWM converter type	Outside dimensions (mm)		
	MD*	LD*		W	H	D
400 VAC series	132	160	RHC132S-4D□	226.2	1100	565
	160	200	RHC160S-4D□			
	200	220	RHC200S-4D□			
	220	-	RHC220S-4D□			
	280	315	RHC280S-4D□			
	315	355	RHC315S-4D□			
	630	710	RHC630B-4D□**	1400	567.3	
	710	800	RHC710B-4D□**			
	800	1000	RHC800B-4D□**			

TYPE CODE





MONITOUCH

WMI V9 Series NEW Web Machine Interface

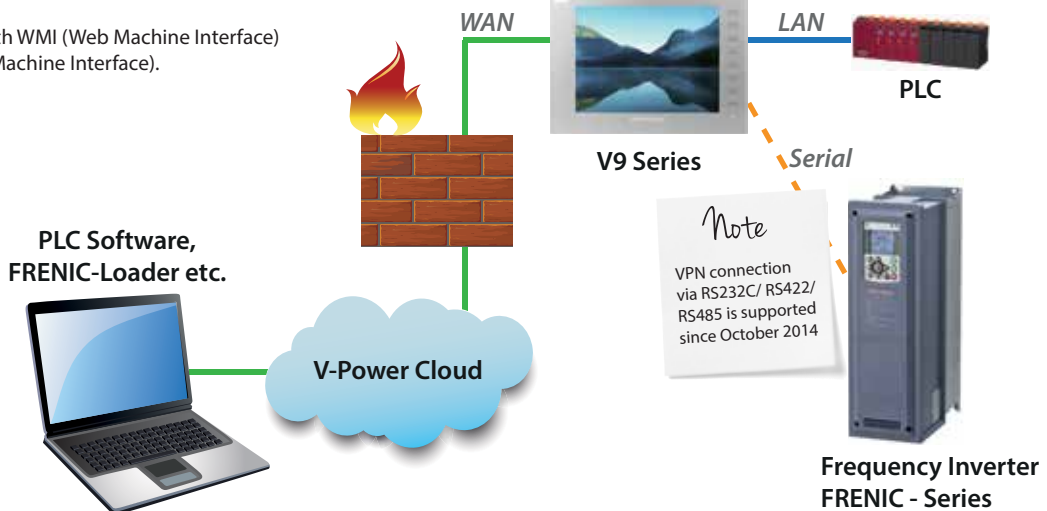
From *Human Machine Interface* to *Web Machine Interface*

The biggest revolution on the Graphical User Interfaces.

A new concept, a new philosophy, by which every system integrator can heavily access to the latest remote VPN access technologies offered by the global networking without any specific knowledge.

V9, known as Web Machine Interface, is the new generation of MONITOUCH series which offers compatibility with mobile equipment, advanced use of information through networking, high-speed free-style drawing and optimum operability.

- VPN router inside:
The routing function enables all the devices, which are connected to V9, to connect each other via Ethernet with only one click access to VPN.
- No need for IP masquerade setting:
The VPN function which constructs a virtual private network within a public network, enables a secure remote monitoring.
- Can be used as both WMI (Web Machine Interface) and HMI (Human Machine Interface).



MONITOUCH V9 series (V9080iSLD and V9100iSLD) is fully compatible with VPN.
You can access PLC and FRENIC series inverters through V9 series remotely.



Display size:
15: 15.0"
12: 12.1"
10: 10.4", 10.1"
08: 8.4"
07: 7.0"
06: 5.7"

Touch switch:
0: Analog resistance
1: Capacitance

Functional Specifications:
i: with built-in LAN port

V9 i D

Extended Wired LAN I/F:
L: With ext. wired LAN I/F
N/A: Without ext. wired LAN I/F

Wireless LAN I/F:
R: With wireless LAN I/F
N/A: Without wireless LAN I/F

Power Supply:
D: DC24V (CE/KC/UL/cUL certified)

Device Specifications:
W: TFT color LCD*
X: TFT color LCD (XGA)
S: TFT color LCD (SVGA)
C: TFT color LCD (VGA)
T: TFT color LCD (VGA)

* (0.1" wide = W3/G4 / 7.0" wide = W9GA)



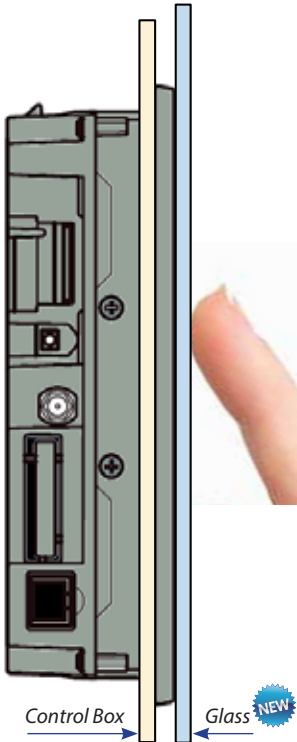
MONITOUCH

NEW

HMI MONITOUCH Hygiene

HMI Displays for the Medical & Pharmaceutical Industry
HMI Displays for the Food & Beverage Industry

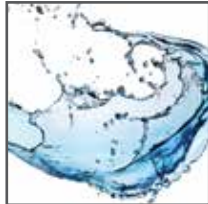
It's now possible to maintain the hygiene of the panel surface. In creating a flat, seamless panel surface, this also prevents the accumulation of dust and bacteria in any crevices.



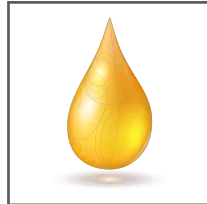
Acid based cleaning agents, chemical



High pressure water, steam



Oil, grease, shortening and animal fats



1 Tablet Connection

The MONITOUCH Hygiene series is equipped with VNC server function for remote monitoring and control of production directly from your tablet.



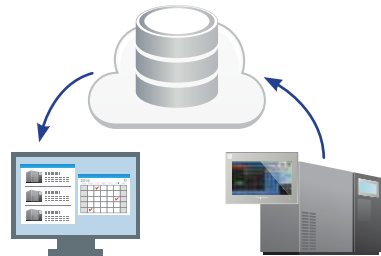
2 Database Connection

Machine data can be collected and saved within the database of the server, through the MONITOUCH Hygiene WLAN port.



3 VPN Connection

Our VPN remote access service enables support engineers to monitor and change screen programs from anywhere in the world.



7" wide
V9071iWRLD-xxx
V9071iWLD-xxx



10.1" wide
V9101iWRLD-xxx
V9101iWLD-xxx
coming soon



FRENIC4600FM5e



Medium Voltage Inverter FRENIC4600FM5e



- 250 kW to 9 000 kW
- 3.0 kV to 11 kV
- Asynchronous motors
- Air cooled
- 24-60 pulse (Low Harmonic)
- LV IGBT - Multi Level Topology
- Suitable for old & new motors
- Low parts count
- **MTBF ≥ 500.000 h !**
- User Friendly
- Global Network
- Japanese High Quality Design
- 3 Level Power Cell Technology
- No Output Filter Needed
- Sinusoidal Output
- Globally Installed Drives >1500



FRN46 - 4 F A - 60 5 60 - 1000 A

Series: FRENIC4600FM5e

Control method:
 F: Variable torque, V/f constant, simple speed sensor-less vector control
 S: Constant torque, speed sensor-less vector control
 V: Constant torque, vector control with speed sensor

Input voltage:
 30: 3.0 kV / 33: 3.3 kV / 42: 4.16 kV /
 60: 6.0 kV / 66: 6.6 kV / X0: 10 kV / X1: 11 kV

Auxiliary power:
 A: Control power: 1-phase 220 VAC, fan power: 3-phase 380 VAC Z:
 Other

Output capacity:
 0275 - 0980: 275 - 980 kVA / 1000 - 9500: 1000 - 9500 kVA / X500: 10500 kVA

Output voltage:
 30: 3.0 kV / 33: 3.3 kV / 42: 4.16 kV /
 60: 6.0 kV / 66: 6.6 kV / X0: 10 kV / X1: 11 kV

Input frequency: 5: 50 Hz / 6: 60 Hz



NOTES



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