Fuji Electric

Innovating Energy Technology

INVERTER
HMI
SERVO
SOLUTIONS

SELECTION GUIDE

DRIVES & AUTOMATION

PRODUCT LINE-UP

FUJI ELECTRIC EUROPE GMBH



Relax.
You have a Fuji.

Fuji Electric

Fuji Electric

A MANUFACTURER

WITH A HISTORY OF OVER 100 YEARS



ABOUT US

Founded in 1987, Fuji Electric Europe GmbH is supplying frequency inverters and power electronics to customers all over Europe, Africa and the Middle East. Our outstanding reputation is based on reliable quality, excellent product performance and innovating technology.

Our mother company Fuji Electric is a leader in electronics manufacturing and energy technology with more than 100 years of experience since 1923. As a pioneer of the industry to develop the first general purpose Variable Speed Drive ever in 1976, the company continues to design and develop solutions until today.

Applications for our drives and inverters include conveyor systems, water, HVAC and lift applications, general industrial applications, as well as renewable energies applications like wind and solar power. The FRENIC-Series is equipped with functions to meet all types of requirements, providing easy maintenance, saving of energy and cost and therefore environmental friendliness. Discover with this Selection Guide which series suits you best.

CONTENT

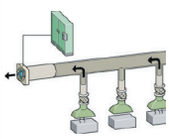
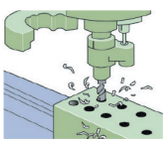
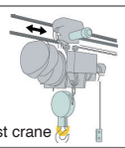
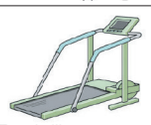
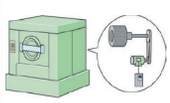
Applications 3
Capacity Range 4
Options 5
Specifications 6
Wiring Diagram 9
FRENIC-MEGA G2 10
FRENIC-Ace E2 11
FRENIC-VG unit type VG1 12
FRENIC-VG stack type VG1 13
FRENIC-Mini C2 14
FVR-Micro AS1S 15
FRENIC-AQUA AQ1 16
FRENIC-HVAC AR1 17
FRENIC-Ace-H E2E-H/E2S-H 18
FRENIC-Ace Solar Pumping 19
FRENIC-Lift LM2A 20
FRENIC-Lift LM2C 21
FRENIC-RHC (RHC-E) 22
FRENIC-eRHC 23
Alpha 7 24
MONITOUCH HMI: X1 + TS 25
MONITOUCH HMI: V9 26
MONITOUCH HMI: V10 27
Solutions: Solar Pumping 28
Solutions: Wallmount 29
Solutions: Cabinet 30

Brand Promise

Through our pursuit of innovation in electric and thermal energy technology, we develop products that maximize energy efficiency and lead to a responsible and sustainable society.

Scan or click for more information!

APPLICATIONS

Classification	Example image	Application example	FVR-Micro	FRENIC-Mini	FRENIC-Ace	FRENIC-Ace-H	FRENIC-HVAC	FRENIC-AQUA	FRENIC-MEGA	FRENIC-VG	FRENIC-Lift LM2A	FRENIC-Lift LM2C
Fluid machines	 Exhaust fan	Fan	○	○	○	⊙	⊙	⊙	⊙ ○			
		Pump	○	○	○	⊙	⊙	⊙	⊙ ○			
		Blower	○	○	○	⊙	⊙	⊙	⊙ ○			
		Compressor	○	○	○	⊙	⊙	⊙	⊙ ○			
		Piston pump			○	○	○	○	⊙			
Machine tools	 Drilling machine	Drilling machine			○				⊙			
		Turning machine			○				⊙			
		Grinding machine			○				⊙			
		Tool changer	○	○	⊙							
		Milling machine							○	⊙		
		Machining center							○	⊙		
Metal processing machine	 Pressing machine	Pressing machine							○	⊙		
		Winder							○	⊙		
		Wine drawing machine			○					⊙		
		Shearing machine			○					⊙		
		Dicer								⊙		
Conveyor machine (vertical)	 Hoist crane	Multi-level storage			○				⊙	⊙		
		Multi-level parking lot			○				⊙	⊙		
		Crane			○				⊙	⊙		
		Hoist crane			⊙				⊙	⊙		
Health, medical, welfare care instruments	 Treadmill	Stair lift	○	○	⊙							
		Treadmill	○	○	⊙							
		Care bed	○	○	⊙							
		Bubble bath	○	○	⊙	○						
Others	 Commercial laundry machine	Commercial laundry machine	○	○	○							
		Car wash	⊙	⊙	○							
		Food waste disposer	⊙	⊙	○							
		Conveyor-belt sushi	⊙	⊙	○							
		Stage installation			○							
Lift	 Lift and escalator installations	Platform lift	○	○	○						⊙	⊙
		Electrical lift									⊙	⊙
		Hydraulic lift			○						⊙	⊙
		High power/speed lift								⊙	⊙	
		Escalator			⊙				⊙	○	⊙	○

○ Suitable
⊙ Best match



CAPACITY RANGE

Application Category	Series	Voltage	Nominal applied motor [kW]
			0.1 100 200 300 400 500 600 700 800
General Purpose	FRENIC-MEGA (G2)	3ph 400 V	0.4 – 630
		3ph 200 V	0.4 – 90
	FRENIC-Ace (E2)	3ph 400 V	0.4 – 220 *2
		1ph 200 V	0.1 – 2.2
	FRENIC-VG unit (VG1)	3ph 400 V	0.4 – 630
		3ph 200 V	0.75 – 90
	FRENIC-VG stack (VG1)	3ph 400 V	30 – 800 *3
		3ph 690 V	90 – 450 *3
	FRENIC-Mini (C2)	3ph 400 V	0.1 – 15 *2
		3ph 200 V	0.4 – 15
		1ph 200 V	0.1 – 2.2
	FVR-Micro (AS1)	3ph 400 V	0.75 – 4.0
		1ph 200 V	0.4 – 2.2
Pumping & HVAC	FRENIC-HVAC (AR1)	3ph 400 V	0.75 – 710
	FRENIC-AQUA (AQ1)	3ph 400 V	0.75 – 710
	FRENIC-Ace-H (E2E-H/ E2S-H)	3ph 400 V	0.4 – 220
		1ph 200 V	0.1 – 2.2
Lift	FRENIC-Lift (LM2A)	3ph 400 V	2.2 – 45
		3ph 200 V	4.0 – 15 *1
		1ph 200 V	2.2 – 4.0
	FRENIC-Lift (LM2C)	3ph 400 V	4.0 – 15
		3ph 200 V	3.0 – 7.5 *1

Graph not to scale.

*1 3ph 400 VAC type supplied in 3ph 200 VAC (selection by parameter)

*2 3ph 400 VAC, 5.5 to 15 kW, w/o EMC-filter built-in

*3 More capacities up to 3,8 MW available in dual rating and multi drive system

OPTIONS

Options		FRENIC-MEGA	FRENIC-Ace	FRENIC-VG1	FRENIC-Mini	FVR-Micro	FRENIC-AQUA	FRENIC-HVAC	FRENIC-Ace-H	FRENIC-Lift LM2A
Fieldbus Option Communication Cards	CC-Link	OPC-CCL	OPC-CCL	OPC-VG1-CCL			OPC-CCL	OPC-CCL	OPC-CCL	
	DeviceNet	OPC-DEV	OPC-DEV	OPC-VG1-DEV			OPC-DEV	OPC-DEV	OPC-DEV	
	PROFIBUS DP	OPC-PDP2	OPC-PDP3	OPC-VG1-PDP			OPC-PDP2	OPC-PDP2	OPC-PDP3	
	CANopen	OPC-COP2	OPC-COP2				OPC-COP2	OPC-COP2	OPC-COP2	built-in
	LonWorks						OPC-LNW	OPC-LNW	OPC-LNW	
	T-Link	OPC-TL		OPC-VG1-TL						
	SX bus	OPC-SX		OPC-VG1-SX						
	E-SX bus			OPC-VG1-ESX						
	Modbus/TCP	OPC-ETM	OPC-PRT OPC-PRT3				OPC-ETH OPC-PRT2 OPC-PRT3	OPC-ETH OPC-PRT2 OPC-PRT3	OPC-PRT OPC-PRT3	
	Ethernet/IP	OPC-ETM	OPC-PRT OPC-PRT3				OPC-PRT2 OPC-PRT3	OPC-PRT2 OPC-PRT3	OPC-PRT OPC-PRT3	
	Bacnet/IP		OPC-PRT OPC-PRT3				OPC-PRT2 OPC-PRT3	OPC-PRT2 OPC-PRT3	OPC-PRT OPC-PRT3	
	EtherCAT		OPC-ETC2							
	PROFINET	OPC-ETM	OPC-PRT OPC-PRT3	OPC-VG1-PNET			OPC-PRT2 OPC-PRT3	OPC-PRT2 OPC-PRT3	OPC-PRT OPC-PRT3	
	High-Speed serial (for UPAC)			OPC-VG1-SIU						
	Terminal block for high speed			OPC-VG1-TBSI						
Other Options / Interface Cards	Battery			built-in			OPK-BP	OPK-BP		
	Relay output	OPC-RY					OPC-RY & OPC-RY2	OPC-RY & OPC-RY2	OPC-F2-RY	
	Analog input									
	Analog current output									
	Pt100 temperature sensor input card	OPC-PT					OPC-PT	OPC-PT	OPC-PT	
	Analog input/output card	OPC-AIO	OPC-AIO	OPC-VG1-AIO			OPC-AIO	OPC-AIO	OPC-AIO	
	Digital input/output card		OPC-DIO	OPC-VG1-DIO					OPC-DIO	
	Digital input card	OPC-DI		OPC-VG1-DI						
	Digital output card	OPC-DO								
	Analog output (x 2ch)						OPC-AO	OPC-AO		
	PG (encoder interface) 12-15V HTL	OPC-PG	OPC-E2-PG3	built-in						OPC-PG3
	PG (encoder interface) 5V TTL line driver	OPC-PG2		OPC-VG1-PG						OPC-PMPG
	PG (encoder interface) 5V TTL		OPC-E2-PG							
	PG (encoder interface) 5V TTL for synchr. operation	OPC-PG22		OPC-VG1-PMPG						
	Gray Code / switching signals 5V TTL line driver encoder	OPC-PMPG2		OPC-VG1-PMPG						OPC-PMPG
	RS-485 with 2RJ45 connectors		OPC-E2-RS							
	RS-485	built-in	built-in	built-in	built-in	built-in	built-in	built-in	built-in	built-in
	RS-485 option cage clamp terminal									
	Pulse output divider card									
	SinCos, SinCos encoder interface									OPC-PR
	SinCos EnDat 2.1 encoder interface									OPC-PSH OPC-PS
	SinCos Hiperface encoder interface									OPC-PSH
	SinCos SSI encoder interface									OPC-PSH OPC-PS
	SinCos Biss encoder interface									OPC-PSH OPC-PS
	Synchronized interface			OPC-VG1-DI						
	F/V converter			OPC-VG1-FV						
	User programming card			OP-VG1-UPAC						
	Functional safety card			OPC-VG1-SAFE						
	PG / ABS encoder with 17-bit high res.			OPC-VG1-SPGT						

SPECIFICATIONS

General Purpose Inverters

Inverter series	Input voltage class	Motor capacity range (kW)	Overload capability	Digital input X terminal including FWD/REV terminal	Digital output Y terminal + Relay Output	Analog input *1	Analog output *1	Output frequency range
FVR-Micro AS1S	1-phase 200 VAC	0.4 to 2.2 kW	150% for 1 min	5	1 + 1	2	1	0.1 to 400 Hz
	3-phase 400 VAC	0.4 to 3.7 kW						
FRENIC-Mini C2	3-phase 200 VAC	0.1 to 15 kW	150% for 1 min 200% for 0.5 s	5	1 + 1	2	1	0.1 to 400 Hz
	3-phase 400 VAC	0.4 to 15 kW						
	1-phase 200 VAC	0.1 to 2.2 kW						
	1-phase 100 VAC	0.1 to 0.75 kW						
FRENIC-Ace E2	1-phase 200 VAC (HND)	0.1 to 30 kW	120% for 1 min	7	2 + 1	2	2	0.1 to 500 Hz
	1-phase 200 VAC (HHD)	0.1 to 22 kW	150% for 1 min 200% for 0.5 s					0.1 to 500 Hz
	3-phase 400 VAC (ND)	0.75 to 315 kW	120% for 1 min					0.1 to 120 Hz
	3-phase 400 VAC (HD)	0.75 to 250kW	150% for 1 min					0.1 to 500 Hz
	3-phase 400 VAC (HND)	0.75 to 280kW	120% for 1 min					0.1 to 500 Hz
	3-phase 400 VAC (HHD)	0.4 to 220kW	150% for 1 min 200% for 0.5 s					0.1 to 500 Hz
	1-phase 200 VAC (HHD)	0.1 to 2.2 kW	150% for 1 min 200% for 0.5 s					0.1 to 500 Hz
FRENIC-MEGA G2	3-phase 200 VAC (HHD)	0.4 to 90 kW	150% for 1 min 200% for 3s	11	4 + 2	3	2	0.1 to 599 Hz*3
	3-phase 400 VAC (HHD)	0.4 to 630 kW						
	3-phase 200 VAC (HND)	7.5 to 110 kW	120% for 1 min					
	3-phase 400 VAC (HND)	7.5 to 710 kW						
	3-phase 400 VAC (HD)	37 to 710 kW	150% for 1 min					
	3-phase 400 VAC (ND)	45 to 800 kW	120% for 1 min					
FRENIC-VG VG1 unit type	3-phase 200 VAC (HD)	0.75 to 90 kW	150% for 1 min	11	4 + 2	3	3	0.1 to 500 Hz
	3-phase 400 VAC (HD)	3.7 to 630 kW	200% for 3 s					
	3-phase 400 VAC (MD)	110 to 450 kW	150% for 1 min					
	3-phase 200 VAC (LD)	37 to 110 kW	120% for 1 min					
	3-phase 400 VAC (LD)	37 to 710 kW						
FRENIC-VG VG1 stack type	3-phase 400 VAC (MD)	30 to 800 kW	150% for 1 min					0.1 to 150 Hz
	3-phase 690 VAC (MD)	90 to 450 kW						
	3-phase 400 VAC (LD)	37 to 1000 kW	110% for 1 min					
	3-phase 690 VAC (LD)	110 to 450 kW						
FRENIC-Ace-H E2E-H/E2S-H	1-phase 200 VAC (HND)	0.1 to 30 kW	120% for 1 min	7	2 + 1	2	2	0.1 to 500 Hz
	1-phase 200 VAC (HHD)	0.1 to 22 kW	150% for 1 min 200% for 0.5 s					0.1 to 500 Hz
	3-phase 400 VAC (ND)	0.75 to 315 kW	120% for 1 min					0.1 to 120 Hz
	3-phase 400 VAC (HD)	0.75 to 250kW	150% for 1 min					0.1 to 500 Hz
	3-phase 400 VAC (HND)	0.75 to 280kW	120% for 1 min					0.1 to 500 Hz
	3-phase 400 VAC (HHD)	0.4 to 220kW	150% for 1 min 200% for 0.5 s					0.1 to 500 Hz

*1 The behaviour of analog input and output can be switched by settings. Refer to the catalog of each series.
*2 Consult our sales representatives.
*3 The inverter trips when the output frequency upper limit of 599 Hz is exceeded due to a review of export control regulations (frequency converter).

SPECIFICATIONS

Control functions

Inverter series	AS1S	C2	E2	G2	VG1	E2E-H / E2S-H
Auto-restart after momentary power failure		○	○	○	○	○
Slip compensation control		○	○	○	○	○
PID control		○	○	○	○	○
Automatic energy saving operation		○	○	○	○	○
Regeneration prevention control		○	○	○		○
Overload prevention control		○	○	○		○
Torque limiter			○	○	○	○
Preventing condensation in motor				○		
Number of motor switching options		2	2	4	3	2
Pick-up operation, draw operation			○	○	○	○
Commercial power supply switching operation				○	○	
Customiziable logic function			○	○	○	○
Hit-and-stop control			○	○	○	○
Dancer roll control			$○_2$	○	○	$○_2$
Velocity zero control			○	○	○	
Servo lock			○	○	○	
Synchronous motor driving		○	○	○	○	○
Calendar function					○	
Traceback function				○	○	
Online tuning			○	○	○	○
Functional safety (STO)			○	○	○	○
Pattern operation, timer operation		○	○	○		○
Fire Mode				○		○
Cascade Control						○
Mutual Operation						○

SPECIFICATIONS

Specialist inverters: HVAC & AQUA, Lift, Solar Pumping

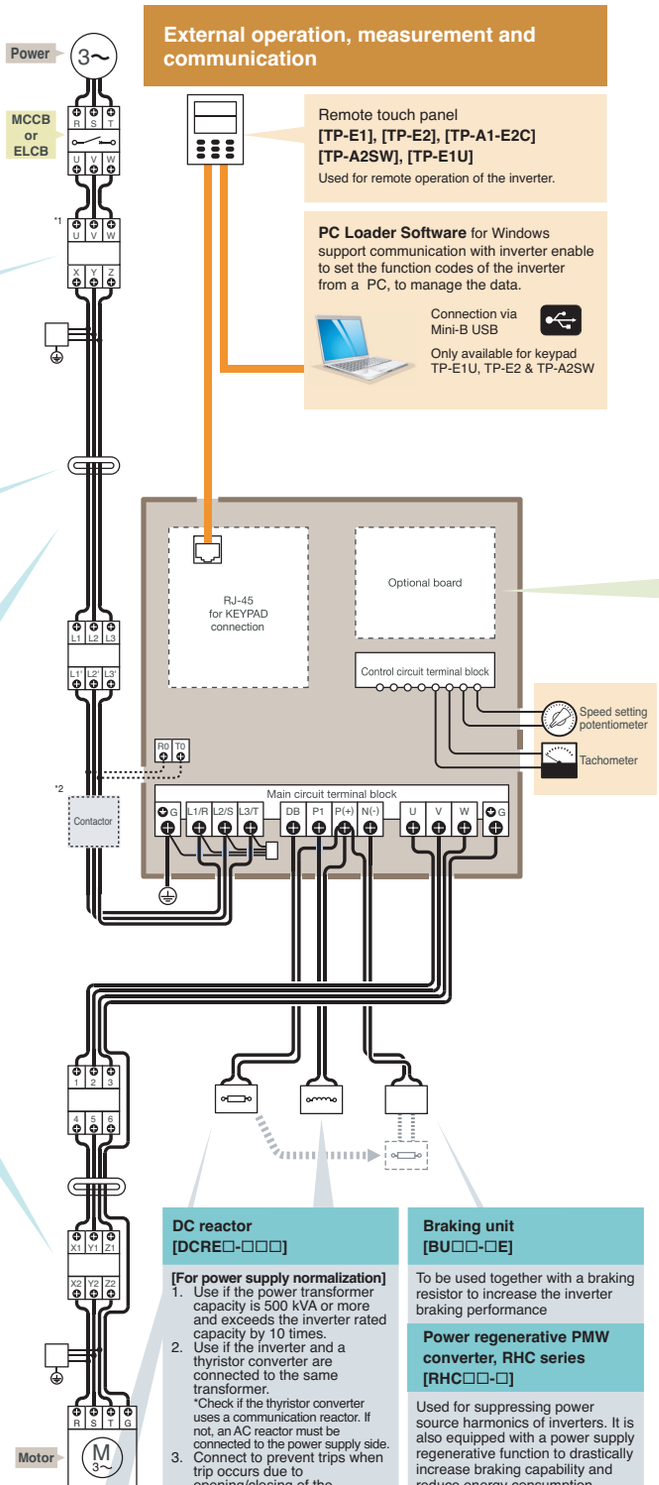
Inverter series	Input voltage class	Motor capacity range (kW)	Overload capability	Digital input X terminal including FWD/REV terminal	Digital output Y terminal + Relay Output	Analog input *1	Analog output *1	Output frequency range
FRENIC-HVAC AR1	3-phase 400 VAC	0.75 to 710 kW	110% for 1 min	9	4 + 2	3	2	0.1 to 120 Hz
FRENIC-AQUA AQ1	3-phase 400 VAC	0.75 to 710 kW	110% for 1 min	9	4 + 2	3	2	0.1 to 120 Hz
FRENIC-Lift LM2A	3-phase 400 VAC	2.2 to 45 kW	200% for 3 s	10	2+4	3	1	0 to 200 Hz
	1-phase 200 VAC	2.2 to 4 kW						
FRENIC-Lift LM2C	3-phase 400 VAC	4 to 15 kW	180% for 3 s	10	2+4	3	1	0.1 to 200 Hz
FRENIC-Ace for Solar Pumping	1-phase 200 VAC (HND)	0.1 to 30 kW	120% for 1 min	7	2 + 1	2	2	0.1 to 500 Hz
	3-phase 400 VAC (HND)	0.75 to 280kW	120% for 1 min					

Control functions

Inverter series	Auto-restart after momentary power failure	Slip compensation control	PID control	Automatic energy saving operation	Regeneration prevention control	Overload prevention control	Torque limiter	Preventing condensation in motor	Number of motor switching options	Pick-up operation, draw operation	Commercial power supply switching operation	Customizable logic function	Synchronous motor driving	Calendar function	Online tuning	Functional safety (STO)	Pattern operation, timer operation	Fire Mode	Cascade Control	Mutual Operation	MPPT for solar panels	Pump control	Lift functions	Velocity zero control
FRENIC-HVAC AR1	○	○	○	○	○	○	○	○		○	○	○	○*	○	○	○	○	○				○		
FRENIC-AQUA AQ1	○	○	○	○	○	○	○	○		○	○	○	○*	○	○	○	○	○	○	○		○		
FRENIC-Lift LM2A		○										○	○			○							○	○
FRENIC-Lift LM2C		○										○				○							○	
FRENIC-Ace for Solar Pumping	○	○	○	○	○	○	○		2	○			○		○	○	○				○	○		

* Special software version

WIRING DIAGRAM



For main power input and inverter output

AC Reactor [ACR□-□□□]

Used when the power supply voltage is unstable.

Ferrite ring for reducing radio noise [ACL-40B, ACL-74B, F200160]

Used to reduce radio noise. Suppressive effect to the frequency band is available by approximately 1MHz or more. This is appropriate as simple measure against noise since it affects broad range in the frequency band.

EMC compliance filter [EFL□□□-, FS□□, FN□□]

Dedicated filter to comply with the European EMC Directive (Emission). Install the filter while referring to the details in the installation manual.

Output circuit filter

Connected to the output of an inverter to:

- Suppress fluctuations of motor terminal voltage
- Prevent damages to the motor insulation due to surge voltage in 200/400/690 V series inverter

*This filter is not limited by carrier frequency. Also, motor can be tuned while this option is installed. Sinus or dV/dt filter depends on fc.

External operation, measurement and communication

Remote touch panel
[TP-E1], [TP-E2], [TP-A1-E2C]
[TP-A2SW], [TP-E1U]
Used for remote operation of the inverter.

PC Loader Software for Windows support communication with inverter enable to set the function codes of the inverter from a PC, to manage the data.

Connection via Mini-B USB

Only available for keypad TP-E1U, TP-E2 & TP-A2SW

Built-in option cards

Control option cards

Relay Output Interface Card [OPC-■-RY2]
Conversion of transistor outputs of the inverter to relay output signals

Digital Interface Card [OPC-■-DIO], [OPC-G1-DI/DO]
Frequency setting with binary or BCD digital signals

Analog Interface Card [OPC-■-AIO]
Torque control with external analog signals

PG Interface Card [OPC-■-PG□]
PG vector control with feedback signals by the encoder [OPC-■-PMPG]
Synchronous motor operation with sensors enabled by combination with MEGA (synchronized motor drive type)

Resistance Temperature Detector Input Card [OPC-PT]
Resistance temperature detectors (RTD) can be connected directly to the inverter without a converter, converting temperatures to digital values.

Communication option cards

RS-485 Communications Card [OPC-■-RS]
Data link between a computer with an RS-485 interface and the inverter

T-Link Communications Card [OPC-■-TL]
Data link between PLC (MICREX-F) and the inverter

PROFIBUS-DP Communications Card [OPC-■-PDP2, PDP3]

DeviceNet Communications Card [OPC-■-DEV]

CANopen Communications Card [OPC-■-COP2]

CC-Link Communications Card [OPC-■-CCL]

LONWORKS Communications Card [OPC-■-LNW]

Profinet Communications Card [OPC-■-PNET]

OPC-PRT, -PRT2, -PRT3

Ethercat Communications Card [OPC-ETC2]

Peripheral and structure options

The series names (C2, E2, LM1, LM2, G2, AR1, AQ1, VG1) are put on the place of ■ in the type names.

Attachment for IP40 [P40■-□□]

Converting the protection structure of the inverter to all-closed form (IP40)

NEMA 1 Kit [NEMA1-□□□■-□]

Converting the protection structure of the inverter to NEMA 1 standards (certified for UL TYPE 1)

Compatibility attachment [MA-■-□□]

An attachment for providing mount compatability with old models manufactured by our company

Braking resistor [DBE□□-□, DBE□□-□C]

Increases braking capability for highly frequent stopping and large moment of inertia. When used together with a braking unit, connect this to the connection terminal of the braking unit.

DC reactor [DCRE□-□□□]

[For power supply normalization]

1. Use if the power transformer capacity is 500 kVA or more and exceeds the inverter rated capacity by 10 times.
2. Use if the inverter and a thyristor converter are connected to the same transformer.
   *Check if the thyristor converter uses a communication reactor. If not, an AC reactor must be connected to the power supply side.
3. Connect to prevent trips when trip occurs due to opening/closing of the phase-advancing capacitor for the power supply lines
4. Use if the voltage unbalance exceeds 2%.
5. Mandatory for 55 kW and above in some series

[For improving the input power-factor and reducing harmonics]

- Used to reduce the input harmonic current (connecting power-factor)
- For the drop effect, refer to the guideline appendix.

Braking unit [BU□□-□E]

To be used together with a braking resistor to increase the inverter braking performance

Power regenerative PMW converter, RHC series [RHC□□-□]

Used for suppressing power source harmonics of inverters. It is also equipped with a power supply regenerative function to drastically increase braking capability and reduce energy consumption.
*Use in combination with the RHC series dedicated pressurization reactor, resistor, and capacitor.

Dedicated filter for RHC series
A filter dedicated for RHC series, which is used when other electronic devices are connected to the same power supply.
*Use this filter in combination with the dedicated filter reactor, filter condenser and filter resistor as a set.

Rail mount base [RMA-■-□□]

An attachment for mounting to IEC rail with a width of 35 mm

Attachment for external cooling [PB-■-□□]

An attachment for taking the cooling fin of the inverter out of the board

NOTE: Some accessories not feature in this selection guide, please consult your local Fuji Electric.

INVERTER SERIES
GENERAL PURPOSE

FRENIC-MEGA G2

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FRENIC-MEGA G2 SERIES

FRENIC-MEGA G2 series is the successor of the G1 series. Inherits the excellent performance specifications and functionality of the G1 series while providing a more stylish design. High basic performance, suitable for various applications, easy maintenance, and after all an inverter that is environmentally restistant. The G2 series is designed to meet today's demanding market requirements for a more precise and stable speed control of driven equipment, which improves the overall productivity.

- 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
- Customizable logic (mini PLC, 260 steps), superior flexibility
- 3 slots for 3 different options at the same time (encoder, fieldbus, I/O expansion)
- Removable control terminals
- External EMC filter (footprint up to 22 kW) for higher EMC compliance (EN 61800-3, category C2)
- Marine approval DNV + NK

DIMENSIONS

Power Supply Voltage	Applicable standard motor (kW) ND	HD	HND	HHD	Inverter Model	W (mm)	H (mm)	D (mm)
3-phase 400 VAC	-	-	-	0.4	FRN0002G2E-4G	110	260	130
	-	-	-	0.75	FRN0003G2E-4G			145
	-	-	-	1.5	FRN0004G2E-4G	150		
	-	-	-	2.2	FRN0006G2E-4G			
	-	-	-	3.7	FRN0009G2E-4G			
	-	-	7.5	5.5	FRN0018G2E-4G	220		195
	-	-	11	7.5	FRN0023G2E-4G			
	-	-	15	11	FRN0035G2E-4G			
	-	-	18.5	15	FRN0041G2E-4G	250	400	
	-	-	22	18.5	FRN0045G2E-4G			
	-	-	30	22	FRN0060G2E-4G			
	45	37	37	30	FRN0085G2E-4G	326.2	550	261.3
	55	45	45	37	FRN0105G2E-4G			
	75	55	55	45	FRN0139G2E-4G	361.2	615	276.3
	90	75	75	55	FRN0179G2E-4G		175	
	110	90	110	75	FRN0217G2E-4G		740	
	132	110	132	90	FRN0261G2E-4G	535.8		321.3
	160	132	160	110	FRN0290G2E-4G			
	200	160	200	132	FRN0376G2E-4G	536.4	1000	366.3
	220	200	220	160	FRN0431G2E-4G			
	280	220	280	200	FRN0547G2E-4G	686.4		
	315	250	315	220	FRN0610G2E-4G			
	400	315	355	280	FRN0739G2E-4G		1400	445.5
	450	355	400	315	FRN0840G2E-4G			
	560	400	500	355	FRN1039G2E-4G	886.4		446.3
	630	450	560	400	FRN1169G2E-4G			
	710	560	630	500	FRN1385G2E-4G	1006	1550	505.9
	800	710	710	630	FRN1480G2E-4G			

- 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)
- Positioning function (when encoder option is used)

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CAPACITY RANGE

Voltage	Nominal applied motor [kW] 0.1	100	200	300	400	500	600	700	800
3ph 400 V	0.4 (HHD)								800 (ND)

Graph not to scale.

TYPE CODE

FRN 0003 G2 E - 4 G

- FRN: Series name: FRN, FRENIC series
- 0003: Applicable rated current (A): 0003 from 0002 to 1480
- G2: Applied for: G2 MEGA G2
- E: Model: E EMC filter built-in
- 4: Input power supply: 4 3ph 400 V
- G: Destination: G Global

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FRENIC-Ace

FRENIC-Ace E2

INVERTER SERIES
GENERAL PURPOSE



FRENIC-ACE E2 SERIES

FRENIC-ACE is the inverter that produces excellent cost-performance with maintaining its high performance through optimal design. With 200 steps of 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 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
- CAN Open communications built-in as standard
- 10 years lifetime design
- Wide variety of functions as a standard feature
- Safety enable input STO (compliant to EN/ISO13849-1, SIL3, Pl=e, cat. 3)
- Optional multifunctional keypad
- Closed loop for IM and Sensorless PMSM control modes



*Available as cabinet solution

DIMENSIONS

Power Supply Voltage	Applicable standard motor (kW) HHD	HND	HD	ND	Inverter Model	W (mm)	H (mm)	D (mm)
1-phase 200 VAC	0.1	-	-	-	FRN0001E2□-7□	68	127	85
	0.2	-	-	-	FRN0002E2□-7□			
	0.4	-	-	-	FRN0003E2□-7□			107
	0.75	-	-	-	FRN0005E2□-7□			152
	1.5	-	-	-	FRN0008E2□-7□	110	130	153
	2.2	-	-	-	FRN0011E2□-7□	140		
3-phase 400 VAC	0.4	0.75	0.75	0.75	FRN0002E2□-4□	110	140	162
	0.75	1.1	1.1	1.5	FRN0004E2□-4□			186
	1.5	2.2	2.2	2.2	FRN0006E2□-4□	140		199
	2.2	3.0	3.0	3.0	FRN0007E2□-4□			
	4.0	5.5	5.5	5.5	FRN0012E2□-4□			
	5.5	7.5	7.5	11	FRN0022E2□-4□	180	230	158
	7.5	11	11	15	FRN0029E2□-4□			
	11	15	15	18.5	FRN0037E2□-4□	220	270	190
	15	18.5	18.5	22	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□		740	
	90*	110*	110*	132*	FRN0240E2□-4□	536.4	740	321
	110*	132*	132*	160*	FRN0290E2□-4□			
	132*	160*	160*	200*	FRN0361E2□-4□		1000	366
	160*	200*	200*	220*	FRN0415E2□-4□			
	200*	220*	220*	280*	FRN0520E2□-4□	686.4		
	220*	280*	280*	315*	FRN0590E2□-4□			

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 HND (from 72 till 168), at 10 kHz for HHD (from 72 till 168), at 4 kHz for ND,HD, HND (from 203 till 590), at 6 kHz for HHD (from 203 till 590)

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

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

☐ See type code explanations below.

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CAPACITY RANGE

Voltage	Nominal applied motor [kW] 0.1	100	200	300	400	500	600	700	800
1ph 200 V	0.1 – 2.2								
3ph 400 V	0.4 – 315 (ND)								

Graph not to scale.

TYPE CODE

FRN 0059 E2 S - 4 E

- FRN: Series name: **FRN** FRENIC series
- 0059: Applicable rated current at Normal Duty: **0059** from 0001 to 0590
- E2: Applied for: **E2** Ace
- S: Model: **E** EMC filter built-in; **S** Without EMC filter
- 4: Input power supply: **4** 3ph 400 V; **2** 3ph 200 V; **7** 1ph 200 V
- E: Destination: **E** Europe; **GA** Global, with terminal block; **GB** Global, without terminal block

INVERTER SERIES
GENERAL PURPOSE

FRENIC-VG VG1 unit type

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FRENIC-VG SERIES (UNIT)

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 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 covers various applications which require powerful but also accurate performance.

- Powerful: from 0.75 kW to 710 kW in triple rating HD, MD and LD
- Strong: even in hard environments such as sulfurizing gas, salty environments, dust, humidity, etc.
- Flexible: IM (open and closed loop) and PMSM (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

DIMENSIONS

Power Supply Voltage	Applicable standard motor (kW) HD	MD	LD	Inverter Model	W (mm)	H (mm)	D (mm)
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			
	30	-	37	FRN30VG1S-4E	326.2	550	261.3
	37	-	45	FRN37VG1S-4E			
	45	-	55	FRN45VG1S-4E	361.2	615	276.3
	55	-	75	FRN55VG1S-4E		675	
	75	-	90	FRN75VG1S-4E		740	
	90	110	110	FRN90VG1S-4E	536.4		321.3
	110	132	132	FRN110VG1S-4E			
	132	160	160	FRN132VG1S-4E		1000	366.3
	160	200	200	FRN160VG1S-4E			
	200	220	220	FRN200VG1S-4E	686.4		
	220	-	280	FRN220VG1S-4E			
	280	315	355	FRN280VG1S-4E		1400	445.5
	315	355	400	FRN315VG1S-4E			
	355	400	450	FRN355VG1S-4E	886.4		446.3
	400	450	500	FRN400VG1S-4E			
	500	-	630	FRN500VG1S-4E	1006	1550	505.9
	630	-	710	FRN630VG1S-4E			

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

- Making safety easier: STO as a standard / SS1, SLS and SBC via option card (SIL 2 Cat. 3 PI d)
- 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.

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CAPACITY RANGE

Voltage	Nominal applied motor [kW]								
	0.1	100	200	300	400	500	600	700	800
3ph 400 V	3.7							710 (LD)	

Graph not to scale.

TYPE CODE

FRN 30 VG1 S - 4 E

- FRN — Series name: **FRN** FRENIC series
- 30 — Nominal applied motor capacity (kW): **30** from 3.7 to 630
- VG1 — Applied for: **VG1** VG series type 1
- S — Model: **S** Standard type
- 4 — Input power supply: **4** 3ph 400 V
- E — Destination: **E** Europe

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FRENIC-VG

FRENIC-VG VG1 stack type

INVERTER SERIES
GENERAL PURPOSE





Available as cabinet solution:
all types except for FRN30SVG1S-4E to FRN110SVG1S-4E

FRENIC-VG SERIES (STACK)

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 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: 30 kW to 3.8 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.
- DC bus link sharing: multiple possibilities of power layout
- Redundancy: possible to work at half power in case of maintenance or stack failure
- Fire mode and other possibilities
- Making safety easier: STO as a standard / SS1, SLS and SBC via option card (SIL 2 Cat. 3 Pl d)
- 690 VAC series available
- Marine approval DNV + NK
- Equipped with SiC hybrid module

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CAPACITY RANGE

Products line-up
Expanded capacity range (parallel operation)

3ph 400 V series

Type	Form	Applicable Load	Nominal applied motor [kW] 50 100 500 1000 5000
	Standard stack	MD (LD)	30 (37) kW — 315 (355) kW Direct parallel — 1195 (1350) kW / 1800 (2000) kW Multiwinding motor
	Stack by phase	MD (LD)	630 (710) kW Direct parallel — 3040 (3800) kW / 4800 (6000) kW Multiwinding motor

* not valid for SVG1S-69

3ph 690 V series

Type	Form	Applicable Load	Nominal applied motor [kW] 50 100 500 1000 5000
	Standard stack	MD (LD)	90 (90) kW — 450 (450) kW Direct parallel — 1700 (1700) kW / 2700 (2700) kW Multiwinding motor

Graphs not to scale.

TYPE CODE

FRN 30 S VG1 S - 4 E

- FRN: Series name: FRN, FRENIC series
- 30: Nominal applied motor capacity (kW): 30
- S: S Standard stack; B Stack by phase; None Unit type
- VG1: Applied for: VG1, VG series type 1
- S: Model: S Standard type
- 4: Input power supply: 4 3ph 400 V; 2 3ph 200 V; 69 3ph 690 V
- E: Destination: E Europe

INVERTER SERIES

GENERAL PURPOSE

FRENIC-Mini C2

Scan me or click me FRENIC-Mini



FRENIC-MINI C2 SERIES

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
- 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

DIMENSIONS

	Power Supply Voltage	Applicable Standard Motor (kW)	Inverter Model	W (mm)	H (mm)	D (mm)	D1 (mm)	D2 (mm)
EMC filter built-in	3-phase 400 VAC	0.4	FRN0002C2E-4□	110	130	158	118	40
		0.75	FRN0004C2E-4□			182		64
		1.5	FRN0005C2E-4□	140	180			
		2.2	FRN0007C2E-4□					
		4.0	FRN0011C2E-4□					
	1-phase 200 VAC	0.1	FRN0001C2E-7□	80	120	100	90	10
		0.2	FRN0002C2E-7□					
		0.4	FRN0004C2E-7□			115		25
		0.75	FRN0006C2E-7□	110	130	139	99	40
		1.5	FRN0010C2E-7□	140	180	182	118	64
		2.2	FRN0012C2E-7□					

	Power Supply Voltage	Applicable Standard Motor (kW)	Inverter Model	W (mm)	H (mm)	D (mm)	D1 (mm)	D2 (mm)
Without EMC filter	3-phase 400 VAC	0.4	FRN0002C2S-4□	110	130	115	75	40
		0.75	FRN0004C2S-4□			139		64
		1.5	FRN0005C2S-4□					
		2.2	FRN0007C2S-4□					
		4.0	FRN0011C2S-4□	140	180			
		5.5	FRN0013C2S-4□	180	230	158	70.3	87.7
		7.5	FRN0018C2S-4□					
		11	FRN0024C2S-4□	220	270	190	100	90
		15	FRN0030C2S-4□					
	1-phase 200 VAC	0.1	FRN0001C2S-7□	80	120	80	70	10
		0.2	FRN0002C2S-7□					
		0.4	FRN0004C2S-7□			95		25
		0.75	FRN0006C2S-7□			140	90	50
		1.5	FRN0010C2S-7□	110	130	149	85	64
		2.2	FRN0012C2S-7□	140	180	139	75	

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

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CAPACITY RANGE

EMC Filter	Voltage	Nominal applied motor [kW] 0.1 100 200 300 400 500 600 700 800
EMC filter built-in	3ph 400 V	0.4 – 4.0
	1ph 200 V	0.1 – 2.2
w/o EMC filter	3ph 400 V	0.4 – 15
	1ph 200 V	0.1 – 2.2

Graph not to scale.

TYPE CODE

FRN 0011 C2 E - 4 E

- FRN: Series name: FRN, FRENIC series
- 0011: Applicable rated current at Normal Duty (A): 0011, from 0001 to 0030
- C2: Applied for: C2, Mini C2 (successor of C1)
- E: Model: E EMC filter built-in; S Without EMC filter
- 4: Input power supply: 4 3ph 400 V; 7 1ph 200 V; 2 2ph 200 V
- E: Destination: E Europe

Scan me or click me FVR-Micro

FVR-Micro AS1S

INVERTER SERIES
GENERAL PURPOSE



FVR-MICRO AS1S

The new version of FVR-Micro (AS1S) combines two major characteristics: it's small and strong. The design is held especially simple, so the user benefits from an easy installation and smooth operations. Its conceptual design ensures saving space and energy, as well as costs.

FRENIC-Micro AS1S is a highly economic inverter for general purpose applications. It matches perfectly any application with limited space and where small capacities are needed, such as e.g. conveyor transports, mixer machines, or small wood-working machineries with basic functions.

- Capacity range from 0.4 to 3.7 kW
- 3-phase 400 V (0.4 to 3.7 kW)
- Single-phase 200 V (0.4 to 2.2 kW)
- Adoption of control system to minimize motor loss
- Equipped with RS-485 as standard
- PID control function
- Analog input / analog output / multi-stage frequency / jog operation / remote/local
- CE mark and UL/cUL approved standards

DIMENSIONS

Power Supply Voltage	Applicable Standard Motor (kW)	Inverter Model	W (mm)	H (mm)	D (mm)
3-phase 400 VAC	0.4	FVR0.4AS1S-4E	108	128	139
	0.75	FVR0.75AS1S-4E			
	1.5	FVR1.5AS1S-4E			
	2.2	FVR2.2AS1S-4E			
	3.7	FVR3.7AS1S-4E	140		
1-phase 200 VAC	0.4	FVR0.4AS1S-7E	68		116
	0.75	FVR0.75AS1S-7E			
	1.5	FVR1.5AS1S-7E	108		139
	2.2	FVR2.2AS1S-7E			

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CAPACITY RANGE

Voltage	Nominal applied motor [kW]								
	0.1	100	200	300	400	500	600	700	800
3ph 400 V	0.75 – 3.7								
1ph 200 V	0.4 – 2.2								

Graph not to scale.

TYPE CODE

FVR | 1.5 | AS1 | S | - | 4 | E

- FVR: Series name: **FVR** FRENIC/FVR
- 1.5: Standard applicable motor capacity (kW): **1.5** from 0.4 to 3.7
- AS1: Applied for: **AS1** Micro, AS1S series
- S: Model: **S** Protection Structure IP20
- 4: Input power supply: **4** 3ph 400 V
- 7: Input power supply: **7** 1ph 200 V
- E: Destination: **E** Europe

INVERTER SERIES

PUMPING & HVAC

FRENIC-AQUA AQ1

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FRENIC-AQUA



FRENIC-AQUA AQ1 SERIES

FRENIC-AQUA is Fuji Electric's first slim type inverter.
It is dedicated to a variety of applications of water supply and wastewater treatment systems.
This 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, manages digital + analog signals
- Unit conversion function (kPa, bar, l/min, etc.)
- Real Time Clock (RTC)
- 4 PID Sets

DIMENSIONS

Power Supply Voltage	Applicable Standard Motor (kW)	Inverter Model	W (mm)	H (mm)	D (mm)	D1 (mm)	D2 (mm)
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			
	15	FRN15AQ1□-4E					
	18.5	FRN18.5AQ1□-4E					
	22	FRN22AQ1□-4E					
	30	FRN30AQ1□-4E	203	645			
	37	FRN37AQ1□-4E					
	45	FRN45AQ1□-4E	265	736	284	184	
	55	FRN55AQ1□-4E					
	75	FRN75AQ1□-4E	300	885	368	241	127
	90	FRN90AQ1□-4E					
	110*	FRN110AQ1□-4E	530	740	315	135	180
	132*	FRN132AQ1□-4E					
	160*	FRN160AQ1□-4E		1000	360	180	
	200*	FRN200AQ1□-4E					
	220*	FRN220AQ1□-4E	680				
	280*	FRN180AQ1□-4E					
	315*	FRN315AQ1□-4E		1400	440	260	
	355*	FRN355AQ1□-4E					
	400*	FRN400AQ1□-4E					
	500*	FRN500AQ1□-4E	880				
	630*	FRN630AQ1□-4E	1000	1550	500	313	187
	710*	FRN710AQ1□-4E					

*Available as cabinet solution

- Fire mode (forced operation)
- Sensorless PMSM sensorless control mode up to 90kW (upon request)
- Extension cable for remote operation (CB-…S)
- New energy saving functions (sleep mode)
- Multipump control (up to 9 pumps with one inverter)
- Password function
- Anti jam function
- Pipe fill mode
- SIL2, Pl d



Fuji Electric 5 Year Warranty

c UL LISTED CE

CAPACITY RANGE

Voltage	Nominal applied motor [kW]								
	0.1	100	200	300	400	500	600	700	800
3ph 400 V	0.75							710	

Graph not to scale.

TYPE CODE

FRN | 0.75 | AQ1 | M | - | 4 | E

- Series name: **FRN** FRENIC series
- Standard applicable motor capacity (kW): **0.75** from 0.75 to 710
- Applied for: **AQ1** AQUA
- Protection Structure: **S** IP00, **M** IP21, **L** IP55
- Input power supply: **4** 3ph 400 V
- Destination: **E** Europe

Scan me or click me

FRENIC-HVAC

FRENIC-HVAC AR1

INVERTER SERIES

PUMPING & HVAC



FRENIC-HVAC AR1 SERIES

FRENIC-HVAC is dedicated to a variety of HVAC applications. This series follows European requirements while being a high reliability product from Japan.
Specific functions to manage fan and compressor applications and energy saving functions are installed as standard, which is 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 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

DIMENSIONS

Power Supply Voltage	Applicable Standard Motor (kW)	Inverter Model	W (mm)	H (mm)	D (mm)	D1 (mm)	D2 (mm)
3-phase 400 VAC	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			
	15	FRN15AR1□-4E					
	18.5	FRN18.5AR1□-4E					
	22	FRN22AR1□-4E					
	30	FRN30AR1□-4E	203	645			
	37	FRN37AR1□-4E					
	45	FRN45AR1□-4E	265	736	284	184	
	55	FRN55AR1□-4E					
	75	FRN75AR1□-4E	300	885	368	241	127
	90	FRN90AR1□-4E					
	110*	FRN110AR1□-4E	530	740	315	135	180
	132*	FRN132AR1□-4E					
	160*	FRN160AR1□-4E		1000	360	180	
	200*	FRN200AR1□-4E					
	220*	FRN220AR1□-4E	680				
	280*	FRN180AR1□-4E					
	315*	FRN315AR1□-4E		1400	440	260	
	355*	FRN355AR1□-4E					
	400*	FRN400AR1□-4E					
	500*	FRN500AR1□-4E	880				
	630*	FRN630AR1□-4E	1000	1550	500	313	187
	710*	FRN710AR1□-4E					

*Available as cabinet solution

- Extension cable for remote operation (CB-…S)
- Battery (OPK-BP)
- SIL2, Pl d
- Sensorless PMSM sensorless control mode up to 90kW (upon request)



CAPACITY RANGE

Voltage	Nominal applied motor [kW]								
	0.1	100	200	300	400	500	600	700	800
3ph 400 V	0.75							710	

Graph not to scale.

TYPE CODE

FRN 0.75 AR1 M - 4 E

- Series name: **FRN** FRENIC series
- Standard applicable motor capacity (kW): **0.75** from 0.75 to 710
- Applied for: **AR1** HVAC
- Protection Structure: **S** IP00, **M** IP21, **L** IP55
- Input power supply: **4** 3ph 400 V
- Destination: **E** Europe

INVERTER SERIES

PUMPING & HVAC

FRENIC-Ace-H

E2E-H / E2S-H

Scan me or click me

FRENIC-Ace-H



FRENIC-ACE-H SERIES

FRENIC-Ace-H offers optimum capability in terms of energy saving for HVAC and water pumping applications.
Its user friendliness, network compatibility, and long-term reliability are beneficial for long-run performance of systems.
By using customized logic, FRENIC-Ace-H enables to tailor its functionalities for specific requirements at each application.

- Quadruple Rating
- System Protection Functions
  (Slow flow rate, check valve protection, initial acceleration time, over pressure, PID alarms, wire break detection)
- Water supply and drainage system function
  (Dynamic torque vector control, cascade control [up to 4], PID control [2 PID], mutual operation [up to 4], floating method, fire mode, starting mode [Auto search], auto energy saving, customizable logic, mini PLC [200 steps], automatic deceleration, password function)
- STO functional safety function as standard:
  STO SIL 3, Cat 3, PL e
- Built-in EMC filter: Built-in category C2/C3 EMC filter
  (All types are “E”, except for 200 V >30 A: “S” type)
- PM synchronous motor drive: PM motor drive now possible with PM sensorless vector control
- Keypad built-in
- Optional multifunctional keypad



*Available as cabinet solution

DIMENSIONS

Power Supply Voltage	Applicable standard motor (kW) HHD	HND	HD	ND	Inverter Model	W (mm)	H (mm)	D (mm)
1-phase 200 VAC	0.1	-	-	-	FRN0001E2□-7□H	68	127	85
	0.2	-	-	-	FRN0002E2□-7□H			
	0.4	-	-	-	FRN0003E2□-7□H			107
	0.75	-	-	-	FRN0005E2□-7□H			152
	1.5	-	-	-	FRN0008E2□-7□H	110	130	153
	2.2	-	-	-	FRN0011E2□-7□H	140		
3-phase 400 VAC	0.4	0.75	0.75	0.75	FRN0002E2□-4□H	110	140	162
	0.75	1.1	1.1	1.5	FRN0004E2□-4□H			186
	1.5	2.2	2.2	2.2	FRN0006E2□-4□H	140		199
	2.2	3.0	3.0	3.0	FRN0007E2□-4□H			
	4.0	5.5	5.5	5.5	FRN0012E2□-4□H			
	5.5	7.5	7.5	11	FRN0022E2□-4□H	180	230	158
	7.5	11	11	15	FRN0029E2□-4□H			
	11	15	15	18.5	FRN0037E2□-4□H	220	270	190
	15	18.5	18.5	22	FRN0044E2□-4□H			
	18.5	22	22	30	FRN0059E2□-4□H	250	400	195
	22	30	30	37	FRN0072E2□-4□H			
	30	37	37	45	FRN0085E2□-4□H	326.2	550	261
	37	45	45	55	FRN0105E2□-4□H			
	45	55	55	75	FRN0139E2□-4□H	361.2	615	276
	55	75	75	90	FRN0168E2□-4□H		675	
	75	90	90	110	FRN0203E2□-4□H		740	
	90*	110*	110*	132*	FRN0240E2□-4□H	536.4	740	321
	110*	132*	132*	160*	FRN0290E2□-4□H			
	132*	160*	160*	200*	FRN0361E2□-4□H		1000	366
	160*	200*	200*	220*	FRN0415E2□-4□H			
	200*	220*	220*	280*	FRN0520E2□-4□H	686.4		
	220*	280*	280*	315*	FRN0590E2□-4□H			

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 HND (from 72 till 168), at 10 kHz for HHD (from 72 till 168), at 4 kHz for ND,HD, HND (from 203 till 590), at 6 kHz for HHD (from 203 till 590)

☐ See type code explanations below.

Fuji Electric 3 Year Warranty

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CAPACITY RANGE

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

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

Voltage	Nominal applied motor [kW] 0.1	100	200	300	400	500	600	700	800
1ph 200 V	0.1 – 2.2								
3ph 400 V	0.4 – 315 (ND)								

Graph not to scale.

TYPE CODE

FRN 0012 E2 E - 4 GA H

- Series name: FRN — FRENIC series
- Applicable rated current at Normal Duty (A): 0012 — from 0001 to 0590
- Applied for: E2 — Ace
- Model: E — EMC filter built-in; S — Without EMC filter
- Input power supply: 4 — 3ph 400 V; 2 — 3ph 200 V; 7 — 1ph 200 V
- Destination: E — Europe; GA — Global with terminal block; GB — Global without terminal block
- Software: H — Ace-H function

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FRENIC-Ace Solar Pumping

INVERTER SERIES
PUMPING & HVAC

DIMENSIONS

- 1: HND Overload capability: 120% for 1 min at 50°C
- 2: [A] = Current
- 3: Grid connection selectable for maintenance and backup system

Motor (kW)	Motor Voltage [3ph 400 VAC] *AC Power Supply [3ph 400 VAC]*3 DC Voltage Supply [400 to 800 VDC]*		Motor Voltage [3ph 200 VAC] *AC Power Supply [3ph 200 VAC]*3 DC Voltage Supply [180 to 360 VDC]*		Motor Voltage [3ph 200 VAC] *AC Power Supply [1ph 200 VAC]*3 DC Voltage Supply [180 to 360 VDC]*		Dimensions (mm)		
HND*1	Model	[A]*2	Model	[A]*2	Model	[A]*2	W	H	D
0.1					FRN0001E2E-7GA-CLI-SOL	0.8	68	127	112
0.2			FRN0001E2E-2GA-CLI-SOL	1.3	FRN0002E2E-7GA-CLI-SOL	1.6	68	127	112
0.4			FRN0002E2E-2GA-CLI-SOL	2	FRN0003E2E-7GA-CLI-SOL	3.0	68	127	112/127
0.75	FRN0002E2E-4GA-CLI-SOL	1.8	FRN0004E2E-2GA-CLI-SOL	3.5	FRN0005E2E-7GA-CLI-SOL	5	110/68/110	130/127/130	162/127/129
1.1	FRN0004E2E-4GA-CLI-SOL	3.4	FRN0006E2E-2GA-CLI-SOL	6	FRN0008E2E-7GA-CLI-SOL	8	110/68/140	130/127/130	186/152/199
1.5	FRN0006E2E-4GA-CLI-SOL	5	FRN0010E2E-2GA-CLI-SOL	9.6	FRN0008E2E-7GA-CLI-SOL	8	140	130	199
2.2	FRN0006E2E-4GA-CLI-SOL	5	FRN0010E2E-2GA-CLI-SOL	9.6	FRN0011E2E-7GA-CLI-SOL	11	140	130	199
3.0	FRN0007E2E-4GA-CLI-SOL	6.3	FRN0012E2E-2GA-CLI-SOL	12			140	130	199
4	FRN0012E2E-4GA-CLI-SOL	11.1	FRN0020E2E-2GA-CLI-SOL	19.6			140	130	199
5.5	FRN0012E2E-4GA-CLI-SOL	11.1	FRN0020E2E-2GA-CLI-SOL	19.6			140	130	199
7.5	FRN0022E2E-4E-CLI-SOL	17.5	FRN0030E2S-2GB-CLI-SOL	30			181.5/180	285/220	208/158
11	FRN0029E2E-4E-CLI-SOL	23	FRN0040E2S-2GB-CLI-SOL	40			181.5/180	285/220	208/158
15	FRN0037E2E-4E-CLI-SOL	31	FRN0056E2S-2GB-CLI-SOL	56			220/220	332/260	245/190
18.5	FRN0044E2E-4E-CLI-SOL	38	FRN0069E2S-2GB-CLI-SOL	69			220/220	332/260	245/190
22	FRN0059E2E-4E-CLI-SOL	45	FRN0088E2S-2GB-CLI-SOL	88			250	400	195
30	FRN0072E2E-4E-CLI-SOL	60	FRN0115E2S-2GB-CLI-SOL	115			250/250	400/400	195/195
37	FRN0085E2E-4E-CLI-SOL	75					326.2	550	261
45	FRN0105E2E-4E-CLI-SOL	91					326.2	550	261
55	FRN0139E2E-4E-CLI-SOL	112					361.2	615	276
75	FRN0168E2E-4E-CLI-SOL	150					361.2	675	276
90	FRN0203E2E-4E-CLI-SOL	176					361.2	740	276
110	FRN0240E2E-4E-CLI-SOL	210					536.4	740	321
132	FRN0290E2E-4E-CLI-SOL	253					536.4	740	321
160	FRN0361E2E-4E-CLI-SOL	304					536.4	1000	366
200	FRN0415E2E-4E-CLI-SOL	377					536.4	1000	366
220	FRN0520E2E-4E-CLI-SOL	415					686.4	1000	366
280	FRN0590E2E-4E-CLI-SOL	520					686.4	1000	366



Available as cabinet solution



FRENIC-ACE
for Solar Pumping

With FRENIC-Ace for Solar Pumping we contribute to renewable energy control. Water pumping via solar photovoltaic systems uses solar energy from photovoltaic (PV) panels. FRENIC-Ace acts as the interface between the PV panel und the pump motor and controls easily all system relevant functions.

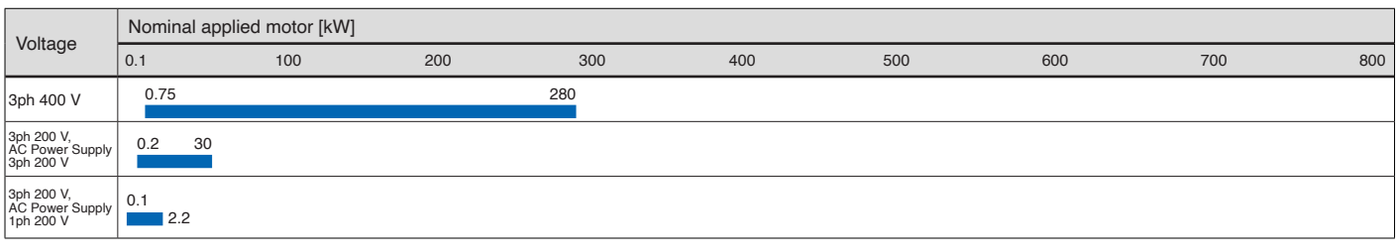
Submersible pumps are mainly used for ground water extraction in the field of irrigation, potable water extraction or livestock watering. Our optional intelligent monitoring system (IoT) helps to monitor and control the water consumption.

- True and outstanding MPPT function (Maximum Power Point Tracking)
- Start criteria by system conditions and time
- Stop criteria selectable
- Dry pump detection function
- Low power function
- Water tank level control
- It allows to control asynchronous motors and permanent magnets synchronous motors
- Detection of sudden changes of conditions (especially irradiance)
- Two sets of PID gains, for a fast and smooth operation
- Grid connection selectable for maintenance and backup system

CE
c UL LISTED

Fuji Electric 3 Year Warranty

CAPACITY RANGE



Graph not to scale.

TYPE CODE

FRN | 0059 | E2 | E - 4 E - CLI - SOL

- FRN: Series name: **FRN** FRENIC series
- 0059: Applicable rated current at Normal Duty: **0059** from 0001 to 0590
- E2: Applied for: **E2** Ace
- E: Model: **E** EMC filter built-in; **S** Without EMC filter
- 4: Input power supply (AC connection): **4** 3ph 400 V; **2** 3ph 200 V; **7** 1ph 200 V
- E: Destination: **GA** Global, with terminal block; **GB** Global, without terminal block; **E** Europe
- CLI - SOL: Especially eqipped for solar pumping applications

INVERTER SERIES
LIFT

FRENIC-Lift LM2A

Scan me or click me
FRENIC-Lift



FRENIC-LIFT LM2A SERIES

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

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

DIMENSIONS

Power Supply Voltage	Applied motor current	Applied motor capacity	Inverter Model	W (mm)	H (mm)	D (mm)
3-phase 400 VAC	6.1 A	2.2 kW	FRN0006LM2A-4E*	140	260	195
	10 A	4.0 kW	FRN0010LM2A-4E*			
	15 A	5.5 kW	FRN0015LM2A-4E*			
	18.5 A	7.5 kW	FRN0019LM2A-4E*			
	24.5 A	11 kW	FRN0025LM2A-4E*	160	360	195
	32 A	15 kW	FRN0032LM2A-4E*			
	39 A	18.5 kW	FRN0039LM2A-4E	250	400	195
	45 A	22 kW	FRN0045LM2A-4E			
	60 A	30 kW	FRN0060LM2A-4E	326.2	550	261.3
	75 A	37 kW	FRN0075LM2A-4E			
	91 A	45 kW	FRN0091LM2A-4E	361.2	615	276.3
1-phase 200 VAC	11 A	2.2 kW	FRN0011LM2A-7E	140	260	195
	18 A	4.0 kW	FRN0018LM2A-7E			

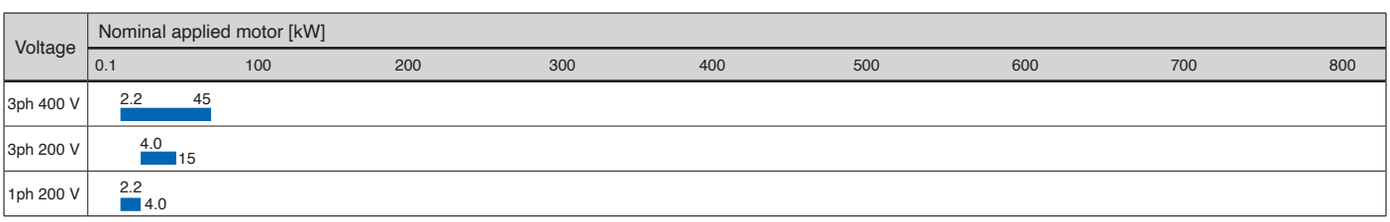


*Available as wallmounted solution

- 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 EN81-20
- Different energy saving levels according to ISO 25745
- 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, DCP 3 & 4)
- Faster speed and current control loop for easier and faster comfort adjustment
- Removable control terminals
- Two new motor control modes:
  1. Vector control with peripheral PG
  2. Sensorless vector control for rescue operation (PMSM)
- Several certified functions for safety operation
- New software functions for an easier setup
- Customizable logic capability (PLC function)

Fuji Electric 3 Year Warranty

CAPACITY RANGE



Graph not to scale.

TYPE CODE

FRN 0025 LM2A - 4 E

- FRN — Series name: **FRN** FRENIC series
- 0025 — Applicable rated current at Normal Duty (A): **0025** from 0006 to 0091
- LM2A — Applied for: **LM2A** Lift LM2A
- 4 — Input power supply: **4** 3ph 400 V, 3ph 200 V; **7** 1ph 200 V
- E — Destination: **E** Europe

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FRENIC-Lift LM2C

INVERTER SERIES
LIFT



DIMENSIONS

Power Supply Voltage	Applied motor current	Applied motor capacity	Inverter Model	W (mm)	H (mm)	D (mm)
3-phase 400 VAC	10 A	*4.0 kW*	FRN0010LM2A-4E	140	260	195
	15 A	*5.5 kW*	FRN0015LM2A-4E			
	18.5 A	*7.5 kW*	FRN0019LM2A-4E			
	24.5 A	*11 kW*	FRN0025LM2A-4E			
	32 A	*15 kW*	FRN0032LM2A-4E	160	360	195

FRENIC-LIFT LM2C SERIES

LM2 has a new version: LM2C. Excellent price-performance ratio for everyday lift applications. Combine the most important features of our bestseller FRENIC-Lift with the demand of easy, elementary elevator applications - and get our new FRENIC-Lift LM2C.
Cost efficiency and basic structures, not more, not less.
This inverter gets to the point:

Simple application = simple solution.

- Motor control: Induction motor in open loop
- Book type shape. Allows side mounting for the most convenient way of installation depending on space limitations (e.g. door frames)
- Feed through mounting with IP54 heat sink, making cabinet design smaller and cheaper for shaft installation
- Removable input and output power terminals makes the installation easier and faster by pre-wiring
- Contactorless solution compliant to EN81-20
- Different energy saving levels according to ISO 25745
- Easier rescue operation with 24 VDC power supply for control board
- CANopen, DCP and Modbus RTU are available thanks to the 3 built-in communication ports
- Able to control any induction motor in the market
- New coating makes PCB stronger against humidity and dust
- Customizable logic capability (PLC function). Easy programming of your own PLC via loader software, up to 200 steps.

Fuji Electric 3 Year Warranty

CAPACITY RANGE

Voltage	Nominal applied motor [kW]								
	0.1	100	200	300	400	500	600	700	800
3ph 400 V	4.0 — 15								
3ph 200 V	3 — 7.5								

Graph not to scale.

TYPE CODE

FRN 0025 LM2C - 4 E

- FRN — Series name: **FRN** FRENIC series
- 0025 — Applicable rated current at Normal Duty (A): **0025** from 0010 to 0032
- LM2C — Applied for: **LM2C** Lift LM2C
- 4 — Input power supply: **4** 3ph 400 V, 3ph 200 V
- E — Destination: **E** Europe

REGENE-
RATIVE
UNITS

FRENIC-RHC (RHC-E)

Regenerative
Fuji Compact power regenerative PWM converter series



RHC-E SERIES

Converter stack and unit type
RHC series is the active-front-end of Fuji Electric in stack and unit type configuration.

- Rating available in MD and LD
- A capacity range from 45 kW to 6 MW
- Two configurations available: Standard Stack / Phase Stack
- Able to work with isolated and non-isolated transformers
- SiC technology
- 400 VAC, 690 VAC series
- Each RHC type has its associated RHF
- RHF dimensions are equivalent to RHC dimensions

RHF-D SERIES

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

- The RHF-D series is a dedicated filter stack for the high power factor PWM converter with power regenerative function (RHC-E Series).
- This device is used in combination with the RHC-E Series, and peripheral devices (filtering circuit, boosting circuit, charging circuit) required by the PWM converter have been combined into a single unit.
- Peripheral device wire reduction and attachment space saving is possible.
- A stack type with same shape as the inverter (stack type) and PWM converter (RHC-E) has been adopted. This has been effective in making panels more compact.
- 690 and 400 VAC Marine Approval: DNV type approval certificate available

Fuji Electric 3 Year Warranty

CAPACITY RANGE

Single machine
Transformerless parallel system
Transformer insulated type parallel system

c UL LISTED CE

UNIT TYPE

Series	Applicable Load	Nominal applied motor [kW]
		50 100 500 1000 5000
400 VAC	MD (CT) (LD (VT))	45 (55) kW — 630 (500) kW — 2500 (2000) kW — 3700 (3000) kW

Graphs not to scale.

STACK TYPE

Series	Type	Stack Type	Applicable Load	Nominal applied motor [kW]
				50 100 500 1000 5000
3phase 400 VAC	PWM Converter (RHC-E)	Standard stack	MD (LD)	132 (160) kW — 315 (355) kW — 1200 (1400) kW — 1800 (2000) kW
		Stack by phase	MD (LD)	630 (710) kW — 800 (1000) kW — 3200 (4000) kW — 4800 (6000) kW
	Filter Stack (RHF-D)	Standard stack	-	160 kW — 355 kW

Series	Type	Stack Type	Applicable Load	Nominal applied motor [kW]
				50 100 500 1000 5000
3phase **690 VAC**	PWM Converter (RHC-E)	Standard stack	MD (LD)	132 (160) kW — 450 (450) kW — 1800 (1800) kW — 2700 (2700) kW
	Filter stack (RHF-D)	Standard stack	-	160 kW — 450 (450) kW

FRENIC-eRHC



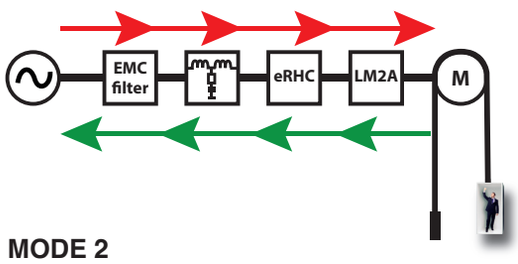
FRENIC-eRHC SERIES

The FRENIC-eRHC series work like an Active Front End when paired with an inverter. They convert the input current into a smoother sinusoidal wave, which helps reduce unwanted electrical noise, meeting the IEEE 519 standard. Plus, they are designed to recycle energy back into the power source, which ultimately saves energy.

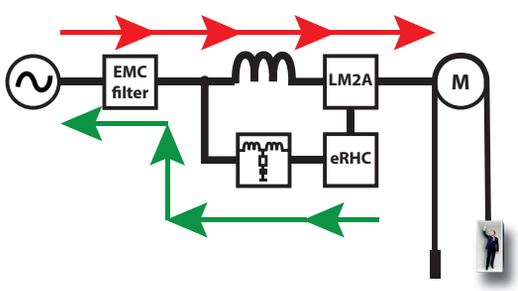
- **Practical Guide for Reducing Electrical Noise**
  Using Pulse Width Modulation (PWM) control significantly cuts down on unwanted electrical noise by creating a smoother sinusoidal waveform on the power supply side. According to the "Guideline for Reducing Electrical Noise for Users Receiving High Voltage or Special High Voltage," issued by the Ministry of Economy, Trade and Industry, setting the converter factor (Ki) to "0" effectively eliminates harmonic disturbances when paired with an inverter. This ensures compliance with the IEEE 519 Standard for noise reduction.
- **Potential for Decreasing Facility Size**
  The control of power factor ensures that the current aligns closely with the voltage phase of the power supply. This means the equipment operates with a nearly perfect power factor of "1." Consequently, it becomes feasible to downsize power transformers and other devices compared to what would be required without the converter.

WORKING MODES

MODE 1
Active Front End (AFE)



MODE 2
Regenerated energy converter ("Electronic Braking Resistor")



- **Improved Braking Performance**
  During frequent acceleration and machine operation, any regenerated energy is sent back to the power supply. This results in energy savings during these operations. Moreover, as the current waveform remains sinusoidal during regeneration, it poses no disruption to the power supply system.

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CE

CAPACITY RANGE

WORKING MODE 1

Voltage	Nominal applied motor [kW]								
	0.1	100	200	300	400	500	600	700	800
400 V	5.5 18.5								

WORKING MODE 2

Voltage	Nominal applied motor [kW]								
	0.1	100	200	300	400	500	600	700	800
400 V	5.5 75								

Graph not to scale.

TYPE CODE

RHC 22 C - 4 E E

- RHC — Series name: RHC, PWM Converter
- 22 — Standard applied inverter capacity: 5.5 to 75, 5.5 kW to 75 kW
- C — Form: C, Compact unit type
- 4 — Input power supply: 4, 3ph 400 V
- E — Development series: E, E Series
- E — Destination/manual: E, English

SERVO SYSTEMS

ALPHA7

ALPHA7

Scan me or click me



- **Speed:** Speed and frequency response at 3.2 kHz realizes ultra-high-speed control. Fuji's proprietary control algorithm achieves a speed and frequency response at 3.2kHz, the highest level in the industry. This reduces the tact time, enabling high-speed control.
- **Strength:** Maximum instantaneous torque of 350%* enables response to high-speed commands. The maximum instantaneous torque of the servo motor is now as high as 350%. *This is applicable only to certain models.
- **Precision:** The 24-bit fine resolution INC/ABS encoder significantly improves the precision of control. The encoder resolution is now as high as 24 bits. This provides much higher control precision than before, enabling high-precision control.
- **Safety:** Safer operations are ensured by various safety functions. Standard equipment includes the STO function defined in the international standard IEC61800-5-2. In addition, the WSU-ST1 option adds support for SS1, SLS, SBC, and SSM. These safety functions can be easily configured with parameters.
- **EtherCAT communications:** EtherCAT communications for command interface, parameter editing, and monitoring.VC Amplifier model supports CoE compliant with CiA402 drive profile with six different control modes: pp, pv, hm, csp, csv, cst.
- The amplifier can be used in asynchronous (Free run) mode or synchronous (DC, SM2) mode. Minimum cycle time 125us. Maximum length up to 100m between nodes with a maximum of 65535 units connectable.

ALPHA 7 SERVO DRIVES

When industrial high-tech equipment is developing and advancing fast, you need a well responsive servo system which proves reliable high precision. The supremely elaborated control functions turned Fuji Servo System ALPHA7 into one of the fastest and most precise servo systems on the market of drive control. It supports a wide range of monitoring functions and delivers extreme safety at the same time. Customer requirements are being met to the point: it improves productivity, reduces costs, and provides safety.

COMBINE MOTOR + SERVO

	MOTORS		RATED SPEED (Max speed)			
Image of motor	Model	Type Name	3000 rpm (6000 rpm)	3000 rpm (5000 rpm)	2000 rpm (5000 rpm)	1500 rpm (5000 rpm)
	GYS Motor Ultra low inertia	GYS***D7-*B2 (-B)	0.05kW to 0.75kW	1.50kW to 5.0kW		
	GYB Motor Medium Inertia	GYB***D7-*B2 (-B/-C/-D)	0.2kW to 0.75kW			
	GYG Motor Medium Inertia	GYG***C7-*B2-(B)			1.0kW to 2.0kW	
	GYG Motor Medium Inertia	GYG***B7-*B2-(B)				0.85kW to 1.8kW

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MONITOUCH HMI



X1 SERIES

The new X1 series programmable operator interface solutions brings with it a new level of IT integration and creates a flexible solution for the new generation of Smart Factories. It presents an edge-computing solution to accelerate the transition the smart production sites.

- The OS is Windows 10, allowing all familiar applications to run smoothly on its Quad Core/Quad Thread, 1.6GHz processor and 4Gb of RAM.
- Broad range of communication possibilities – dual LAN, Serial and multiple USB ports (USB3.0 x 2 & USB2.0 x 2). Options for WLAN and Bluetooth add further enhancements.
- Multi-media with HDMI output and Audio output
- Supports OPC UA (Server & Client compatibility), MQTT, Microsoft AZURE and SQL Server
- Capacitive (PCAP) Touchscreen
- Available in either 12.1" (WXGA 1280x800) or 15.1" (FHD1920x1080)



TECHNOSHOT SERIES

Powerful connectivity on bright TFT colour liquid crystal wide screens.
With its sophisticated communication technology, the TECHNOSHOT becomes a strong and price-competitive HMI in the European market.

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TS1000

Model	Display Size	Resolution	Specifications							Sound Output
			Touch Switch	Ethernet (LAN) Ports	Wireless LAN	Serial Ports	SD Card	USB type A & Mini B	VPN	
TS1100i	10.2" Wide	800 x 480	Resistive	1	-	3	-	Yes	-	-
TS1070	7" Wide	800 x 480	Resistive	-	-	3	-	Yes	-	-
TS1070i	7" Wide	800 x 480	Resistive	1	-	3	-	Yes	-	-

TS2000

Model	Display Size	Resolution	Specifications							Sound Output
			Touch Switch	Ethernet (LAN) Ports	Wireless LAN	Serial Ports	SD Card	USB type A & Mini B	VPN	
TS2060	5.7"	320 x 240	Resistive	-	-	2	-	Only Mini B	-	-
TS2060i	5.7"	320 x 240	Resistive	1	-	3*	Yes	Yes	-	-

TYPE CODE

TYPE CODE TS1000

TS1□□0□

Display size
07: 7" wide
10: 10.2" wide

Interface
i: with built-in LAN port

TYPE CODE TS2000

TS2060□

i
optional unit DUR-00 and CUR-XX can be attached
SD/SDHC slot: 1 CH
Ethernet: 1 CH
USB type A: 1 port

MONITOUCH V9

V9 series

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V9 SERIES

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

V9, known as the 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.

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	Model	Display Size	Resolution	Specifications						Sound Output
				Touch Switch	Ethernet (LAN) Ports	Wireless LAN	Serial Ports	SD Card	USB type A & Mini B	VPN	
ADVANCED	V9101iWRLD	10.1" Wide	1024 x 600	Capacitive	2	Yes	3	Yes	Yes	Yes[1]	Yes
	V9100iWRLD			Resistive	2	Yes	3	Yes	Yes	Yes[1]	Yes
	V9101iWLD			Capacitive	2	-	3	Yes	Yes	Yes[1]	Yes
	V9100iWLD			Restistive	2	-	3	Yes	Yes	Yes[1]	Yes
	V9071iWRLD	7" Wide	800 x 480	Capacitive	2	Yes	3[2]	Yes	Yes	Yes[1]	-
	V9070iWRLD			Restistive	2	Yes	3[2]	Yes	Yes	Yes[1]	-
	V9071iWLD			Capacitive	2	-	3[2]	Yes	Yes	Yes[1]	-
	V9070iWLD			Restistive	2	-	3[2]	Yes	Yes	Yes[1]	-
STANDARD	V9150iXD	15"	1024 x 768	Restistive	1	-	3	Yes	Yes	Yes[1]	Yes
	V9150iXLD				2	-	3	Yes	Yes	Yes[1]	Yes
	V9120iSD	12.1"	800 x 600	Restistive	1	-	3	Yes	Yes	Yes[1]	Yes
	V9120iSBD				1	-	3	Yes	Yes	Yes[1]	Yes
	V9120iSLD				2	-	3	Yes	Yes	Yes[1]	Yes
	V9120iSLBD				2	-	3	Yes	Yes	Yes[1]	Yes
	V9100iSD	10.4"	800 x 600	Restistive	1	-	3	Yes	Yes	Yes[1]	Yes
	V9100iSBD				1	-	3	Yes	Yes	Yes[1]	Yes
	V9100iSLD				2	-	3	Yes	Yes	Yes	Yes
	V9100iSLBD				2	-	3	Yes	Yes	Yes[1]	Yes
	V9080iSD	8.4"	800 x 600	Restistive	1	-	3	Yes	Yes	Yes[1]	Yes
	V9080iSBD				1	-	3	Yes	Yes	Yes[1]	Yes
	V9080iSLD				2	-	3	Yes	Yes	Yes[1]	Yes
	V9080iSLBD				2	-	3	Yes	Yes	Yes[1]	Yes
LITE	V9100iCD	10.4"	640 x 480	Restistive	1	-	3	Yes	Yes	Yes[1]	-
	V9100iCBD				1	-	3	Yes	Yes	Yes[1]	-
	V9080iCD	8.4"	640 x 480	Restistive	1	-	3	Yes	Yes	Yes[1]	-
	V9080iCBD				1	-	3	Yes	Yes	Yes[1]	-
	V9060iTD	5.7"	640 x 480	Restistive	1	-	3[2]	Yes	Yes	Yes[1]	-
	V9060iTBD				1	-	3[2]	Yes	Yes	Yes[1]	-

1: VPN (built-in router, licence needed)
2: When optional unit DUR-00 is installed

TYPE CODE

V9□□□ i □□□□□

- Power supply: D: 24V DC
- Front case color: B: Black; N/A: Light grey
- Extended wired LAN I/F: L: With extended wired LAN I/F; N/A: Without extended wired LAN I/F
- Wireless LAN I/F: R: With wireless LAN I/F; N/A: Without wireless LAN I/F
- Display device: W: TFT color LCD (10.1" wide type=WSVGA/7.0" wide type = WVGA); X: TFT color LCD (XGA); S: TFT color LCD (SVGA); C: TFT color LCD (VGA); T: TFT color LCD (VGA)
- Interface: i: With a built-in LAN port
- Touch switch: 0: Resistive; 1: Capacitive
- Display size: 15: 15.0"; 12: 12.1"; 10: 10.4" (Standard)/ 10.1" widescreen (Advanced); 08: 8.4"; 07: 7.0" widescreen (Advanced); 06: 5.7"

MONITOUCH V10

V10 SERIES



Introducing the revolutionary Monitouch V10 series – your ultimate solution for stress-free operations in the world of HMI technology. Enjoy smooth navigation and effortless switching.

One of the outstanding features of the V10 series is its lightning-fast rendering capability, one of the highest screen switching speeds in the market. No more delays: instead you'll get seamless transitions between screens, so you can effortlessly navigate your HMI experience.

The V10 series also offers the fastest available response time for inputs. Every touch and interaction is immediately fed back, ensuring a fluid and responsive user interface. With the shortest startup time after power-on, you'll be up and running in no time, and you won't waste valuable minutes waiting for your HMI system to initialize.

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c UL LISTED CE

Custom Code

Highest processing speed for macro command execution!

Reducing stress in the operation of high-load screens



Stable operation even for four arithmetic operations and logical operation in multiple lines, comparison and transfer

Advantages to use the V10 series

Operation / Communication — **High-speed processing of quad-core CPU allows for stable operation and communication performance even on high-load screens!**

Start-up / Transfer — **Advanced storage device (eMMC) reduced startup/transfer time and man-hours!**

Compatibility — **Panel cutout size and functions Fully compatible with existing V series!**

Benefits for every department!



Designer	Operator	Maintenance Engineer
Start-up / Transfer: Reduced wait time for start-up and screen data transfer!	Start-up / Transfer: Reduced start-up wait time	Compatibility: Identical panel cutout size allows for easy updating from existing models.
Compatibility: Reduced debugging time for system updates thanks to full compatibilities with previous models!	Operation / Communication: Smooth setup and operation is now possible!	Operation / Communication: Smooth screen switching enables quick location of the error source when troubleshooting.

Wide variety of devices

Industry-leading number of connectable devices*1

Outstanding connectability with multiple devices for simultaneous communication and data transfer



Unparalleled number of connectable devices

No. of manufacturers : 77
No. of protocols : 456*2

List of connectable devices

www.monitouch.com/site/support-e/plc-01.html

*1 According to our own research. *2 As of April 2023.

Hardware

Panel Cutout — Panel cutout dimensions are the same for all models.



V9 series



V10 series

Communication Units — Communication units are fully compatible! Communication units (CUR-xx) for V9 series can be used.



Full compatibility in hardware! *4

*4 Expansion units (Video/RGB) are under development, scheduled to be released in April 2024.

TYPE CODE

V10□□ iS□□□

- **Display size**: 15: 15.0 inches; 12: 12.1 inches; 10: 10.4 inches; 08: 8.4 inches
- **Model type**: S: Standard
- **Functions**: N/A: Standard, L: With extended wired LAN, R: With wireless LAN
- **Power supply**: N/A: 100-240V AC, D: 24V DC
- **Front case color**: N/A: Light gray, B: Black

SOLAR PUMPING SOLUTION

SOLUTIONS

Solar Pumping Solution

Solar Pumping

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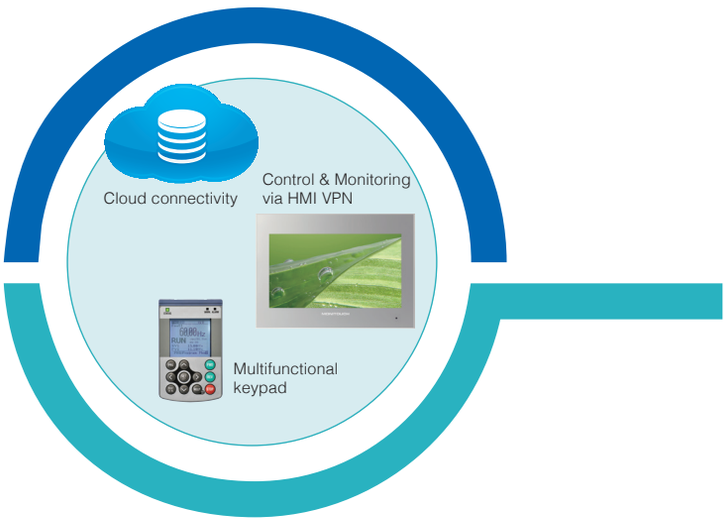
FRENIC-Ace for Solar Pumping





Cabinet Solution

Remote Options



SOLAR PUMPING SOLUTION

Our European Solar Pumping Solution offers an innovative off-grid solution for irrigation and potable water extraction. This system represents significant savings, the costs are fixed and known. By eliminating the need for diesel and butane gas, it relies entirely on renewable energy sources, making it environmentally friendly. With its high reliability and long lifespan, this solution also operates quietly and automatically, ensuring uninterrupted functionality. It also offers a wide capacity range, simple installation, and easy startup process, along with low maintenance requirements. Overall, Fuji Electric's Solar Pumping Solution provides an efficient and sustainable water supply solution without contributing to fume pollution.

Designed, developed and assembled in Europe.

- True and outstanding MPPT function (Maximum Power Point Tracking)
- Start criteria by system conditions and time
- Stop criteria selectable
- Dry pump detection function
- Low power function
- It allows to control asynchronous motors and permanent magnets synchronous motors
- Detection of sudden changes of conditions (especially irradiance)
- Two sets of PID gains, for a fast and smooth operation
- Water tank level control
- Grid connection selectable for maintenance and backup system

GENERIC SPECIFICATIONS

	400 V Motor	200 V Motor
Maximum input voltage (Voc)	800 VDC	360 VDC
Minimum input voltage	400 VDC	180 VDC
Recommended voltage DC (VMPP)	550 - 620 VDC	280 - 330 VDC
Nominal input voltage AC	3ph 380 - 480 V, 50/60 Hz	3ph 200 - 240 V, 50/60 Hz
Nominal output voltage AC	3ph 400 V	3ph 200 V
Output frequency	0 - 400 Hz	
Efficiency (inverter)	97 - 98%	
Ambient temperature range	-10 to 50° C	
Cooling	Natural / by means of internal fan	
Recommended input power	1.2 times the pump capacity (minimum)	
Warranty	3 years	
EMC filter* / Motor output	Built-in / optional (from distances over 50 m)	

* For more information regarding EMC filters (AC/DC) please contact Fuji Electric.

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CAPACITY RANGE INVERTER FRENIC-ACE

Voltage	Nominal applied motor [kW]								
	0.1	100	200	300	400	500	600	700	800
1ph 200 V	0.4 2.2								
3ph 200 V	0.4 30								
3ph 400 V	0.4 280								

Graph not to scale.

SOLUTIONS
Wallmount Solution

WALL-MOUNT SOLUTION

Frame 1





FRN0019WLM2A-4E-OPT-S1

Frame 2





FRN0025WLM2A-4E-OPT-S1

WALLMOUNT SOLUTION

The LM2A wall mounted solution is the new solution for elevators. Inverter and options as a standardized mounting board for direct mounting on walls - matching your needs.

- Inverter and options as a standardized mounting board
- Inverter and options do not occupy space in control cabinets any more
- Easy direct mounting on walls
- Pre-wired and configured according to the customers needs
- Built-in short circuit contactor
- Built-in DC reactor
- EMC built-in
- Shield connections / pull reliefs
- Charging lamp visible from external
- Keypad accesible from external

DIMENSIONS

	Width (mm)	Height (mm)	Depth (mm)
Frame 1	**303**	**542**	**204**
Frame 2	**323**	**704**	**204**

Depth: without considering the screws (209 mm considering the screws)

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TYPE CODE

FRN	0019	W	LM2A	-4	E	-OPT-	S	1
FRENIC Series	Current (A) Frame 1: 0010, 0015, 0019 Frame 2: 0025, 0032	Style Wall Mounted	Inverter LM2A	Voltage 3 phase 400 V	For European Market	Options	IM /PMSM N: w/o short circuit S: with short circuit	

CABINET SOLUTION

SOLUTIONS

The Cabinet Solution

Cabinet Solution

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FRENIC-VG

FRENIC-VG SERIES

Building on its technology and experience, Fuji Electric Europe has now developed its customized cabinet solution. Each Fuji Electric Cabinet Solution is designed based on the customer's needs. The customer selects the application, the inverter type, size and options, depending on their requirements and space.

The cabinet solution is currently available for the series:

1. FRENIC-VG stack
2. FRENIC-HVAC, -AQUA, -MEGA, -Ace

TYPE CODE DIAGRAM

	Inverter Selection						Electrical Features			Mechanical Features						
FRN	90	C	SVG1S	-69	E	OPT-	A	1	1	R	1	D	54	K	20	-MD
FRENIC Series	**Power** 90 110 132 160 200 220 250 280 315 355 400 450 500 560 630 710 800 1000 1200	**Cabinet** C DP -	**Inverter** SVG1S BVG1S	**Voltage** -4 -69	**Software Version** E	Separator	**Output** A B H D	**Configuration L1, L2, L3** 1 2 3 4 5 6 7 8	**Configuration Main Parts** 1 2 3	**Door** R L	**Baseheight** 0 1 2	**Keypad** D I H	**IP** 54 44 21	**Closing Way** K L	**Height** 20 22	**Duty** MD LD
			-4: 3ph 400 V -69: 3ph 690 V												(Baseheight or ventilation not included)	

For further information, please ask your Fuji Electric sales representative or check the related Fuji Electric Cabinet Solution catalogues.

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- IP54, IP44 and IP21 selectable depending on the cabinet power.
- From 90 kW to 1.2 MW as a standard solution. Other sizes and capacities upon request.
- EMC filter built-in
- Active Front End solution available from 132 kW to 1.2 MW.
- Different options for harmonic mitigation on request
- Height selectable for some power sizes
- Keypad on door optional
- Option cards available (several fieldbuses, real time clock backup battery, D I/O, A I/O, UPAC etc.)
- Functional Safety Functions: STO (SIL 2 Cat. 3 PI d as standard. Optional: SLS, SBC, SS1)
- 5 different cabinet topologies:
  - ❶ Rectifier supplied
  - ❷ PWM converter supplied
  - ❸ Optimized rectifier
  - ❹ 12 pulse optimized rectifier supplied
  - ❺ Optimized rectifier with main contactor

Cabinet Solution

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SOLUTIONS

The Cabinet Solution

CABINET SOLUTION



FRENIC-HVAC, FRENIC-AQUA, FRENIC-ACE, FRENIC-MEGA



FRENIC-HVAC | FRENIC-AQUA | FRENIC-Ace | FRENIC-MEGA

TYPE CODE DIAGRAM

	Inverter Selection							Electrical Features			Mechanical Features						FRENIC-MEGA / FRENIC-Ace	FRENIC-Ace	FRENIC-Ace
FRN	90	C	G1E	-4	E	OPT-	A	1	1	R	1	D	54	K	18	-HD	-CLI	-XXX

FRENIC Series

Power
90
110
132
160
200
220
280
315
355
400
500
630
710

Current (for Ace)
240
290
361
415
520
590

Cabinet
C

Inverter
AR1S (FRENIC-HVAC)
AQ1S (FRENIC-AQUA)
E2-E (FRENIC-Ace)
G1-E (FRENIC-MEGA)

Voltage
-4 (3ph 400 V)

Software Version
E

Separator

Output
A
B
C
D
E
F
G

Configuration Input AC
1
2
3
4
5
6
7
8

Configuration Input DC
1

Door
R
L

Baseheight
0
1
2

Keypad
D
I
H

IP
54
44

Closing Way
K
L

Height
10
14
18
20
22
(Baseheight or ventilation not included)

Duty
MD
LD
HHD
HND
HD
ND

Customized Logic Inside

Version
SOL
SMS
...

For further information, please ask your Fuji Electric sales representative or check the related Fuji Electric Cabinet Solution catalogs.

- Compact IP54 for cost-efficient installation (IP44 optional on request)
- Up to 710 kW solutions
- EMC filter built-in
- DC Reactor always included
- Height selectable for some power sizes
- Keypad on door
- Up to 3 option cards (several fieldbuses, real time clock backup battery, D I/O, A I/O, Pt 100/1000 options)
- STO SIL2 / SIL3 depending on the series
- Rectifier or Active Front End selectable in case of SVG1S
- 4 different cabinet topologies:
  - ❶ inverter alone
  - ❷ inverter + fuses
  - ❸ inverter + main switch
  - ❹ inverter + fuses + main switch

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