

The Fuji Cabinet Solution

FRN Inverter Cabinets created in Europe



FRENIC-
HVAC

FRENIC-
AQUA

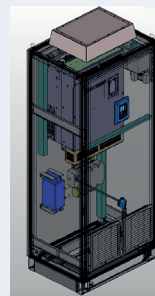
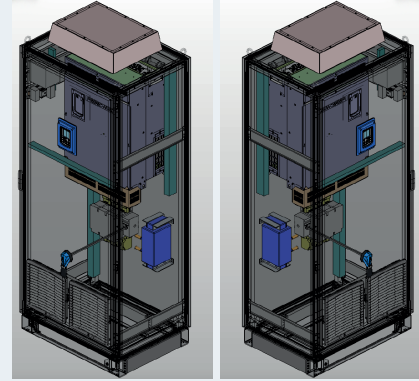
Improve your input
to sustainability

FE Fuji Electric





Simple but smart design



The cabinet is designed based on the customer's needs. There are selections in sizes and options which customers can choose depending on their application and space.

The Fuji Cabinet Solution

Now, through population growth and the rapid advance of industrialization, the world is facing energy and environmental issues. Building on its technology and experience, Fuji Electric aims to pursue innovation in energy and environment technology and to continue creating high value-added, environmentally friendly products that use energy with maximum efficiency.

Over a broad range of areas that encompasses industrial and social infrastructure – where there is growing demand for saving energy - we improve energy efficiency and stability by offering a full line-up of low voltage AC drives.

Building on its technology and experience, Fuji Electric Europe has now developed its customized cabinet solution.



Inverter Selection

Cabinet Selection

FRN	132	C	AR1S	-4	E	OPT-	1	R	100	D	54	K	2000
FRENIC Series	Power (kW) 110 132 160 200 220 280 315 355 400 500 630 710	Cabinet C -	Inverter AR1S (HVAC) AQ1S (AQUA)	Voltage	Software Version	Cabinet Options	Configuration 1 2 3 4	Door R L	Base Height (mm) 000 100 200	Keypad D I	IP 54 44	Closing Way K L	Cabinet Height (mm) (Base or ventilation not included) 1800 2000 2200

Configuration Main Parts	1	2	3	4
Fuses		●		●
Main Switch			●	●

Door	R	L
Right Opening	●	
Left Opening		●

Base Height	100	200	000
100 mm height	●		
200 mm height		●	
Without base			●

Keypad	D	I
Keypad placed on the door	●	
Keypad placed on the inverter		●

IP Degree	54	44
IP 54	●	
IP 44		●

Closing Way (Key / Lock)	K	L
Cabinet closed by Key	●	
Cabinet closed by Lock		●





FRENIC-HVAC / FRENIC-AQUA cabinet solution

Our FRENIC-HVAC/AQUA cabinet solution is our AC drives series FRENIC-HVAC/AQUA 110 kW to 710 kW with selectable options and accessories, already built in a cabinet.



Output Ratings 3-phase, 380 to 480V (with AVR function) 50, 60 Hz (Max 120 Hz)	Input Ratings 3-phase, 380 to 480V +10% -15% 50/60Hz +- 5%
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Nominal applied motor [kW]	Rated capacity [kVA]	Rated Current [A]	Overload Current 110% 1min [A]	Rated input current [A]	Required power supply capacity [kVA]
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A1 V1 cabinet:	FRN 110 C A_1S -4 E OPT- □ R 100 D 54 K 1800	110	160	210	231	201	140
	FRN 132 C A_1S -4 E OPT- □ R 100 D 54 K 1800	132	193	253	278,3	238	165
A1 V2 cabinet:	FRN 110 C A_1S -4 E OPT- □ R 100 D 54 K 2000	110	160	210	231	201	140
	FRN 132 C A_1S -4 E OPT- □ R 100 D 54 K 2000	132	193	253	278,3	238	165
A2 cabinet:	FRN 160 C A_1S -4 E OPT- □ R 100 D 54 K 2000	160	231	304	334,4	286	199
	FRN 200 C A_1S -4 E OPT- □ R 100 D 54 K 2000	200	287	377	414,7	357	248
B1 cabinet:	FRN 220 C A_1S -4 E OPT- □ R 100 D 54 K 2000	220	316	415	456,5	390	271
	FRN 280 C A_1S -4 E OPT- □ R 100 D 54 K 2000	280	396	520	572	500	347
B2 cabinet:	FRN 315 C A_1S -4 E OPT- □ R 100 D 54 K 2200	315	445	585	643,5	559	388
	FRN 355 C A_1S -4 E OPT- □ R 100 D 54 K 2200	355	495	650	715	628	436
	FRN 400 C A_1S -4 E OPT- □ R 100 D 54 K 2200	400	563	740	814	705	489
C cabinet:	FRN 500 C A_1S -4 E OPT- □ R 100 D 44 K 2200	500	731	960	1056	881	611
	FRN 630 C A_1S -4 E OPT- □ R 100 D 44 K 2200	630	891	1170	1287	1115	773
	FRN 710 C A_1S -4 E OPT- □ R 100 D 44 K 2200	710	1044	1370	1507	1256	871

□ 1, 2, 3 or 4 (1: inverter alone, 2: inverter + fuses, 3: inverter + main switch, 4: inverter + fuses + main switch)



Covering various HVAC and AQUA applications

It is dedicated for various fans and pumps applications, such as exhaust fan, AHU (Air Handling Unit), compressor, cooling tower, water treatment system, drinking water supply, irrigation and cooling water pump.

Product Description (Cabinet Name Code)														Weight (kg)	Dimensions height x width x depth (mm)
FRENIC-Series	Power	Cabinet	Inverter	Voltage	Software	Separator	Configuration	Door	Baseheight	Keypad	IP	Closing way	Height		
FRN	110	C	A_1S	-4	E	OPT-	□	R	100	D	54	K	1800	235	2100 x 800 x 625
FRN	110	C	A_1S	-4	E	OPT-	■	R	100	D	54	K	1800	240	2100 x 800 x 650
FRN	132	C	A_1S	-4	E	OPT-	□	R	100	D	54	K	1800	241	2100 x 800 x 625
FRN	132	C	A_1S	-4	E	OPT-	■	R	100	D	54	K	1800	246	2100 x 800 x 650
FRN	110	C	A_1S	-4	E	OPT-	□	R	100	D	54	K	2000	246	2300 x 800 x 625
FRN	110	C	A_1S	-4	E	OPT-	■	R	100	D	54	K	2000	251	2300 x 800 x 670
FRN	132	C	A_1S	-4	E	OPT-	□	R	100	D	54	K	2000	252	2300 x 800 x 625
FRN	132	C	A_1S	-4	E	OPT-	■	R	100	D	54	K	2000	257	2300 x 800 x 670
FRN	160	C	A_1S	-4	E	OPT-	□	R	100	D	54	K	2000	289	2300 x 800 x 625
FRN	160	C	A_1S	-4	E	OPT-	■	R	100	D	54	K	2000	305	2300 x 800 x 670
FRN	200	C	A_1S	-4	E	OPT-	□	R	100	D	54	K	2000	298	2300 x 800 x 625
FRN	200	C	A_1S	-4	E	OPT-	■	R	100	D	54	K	2000	314	2300 x 800 x 670
FRN	220	C	A_1S	-4	E	OPT-	□	R	100	D	54	K	2000	344	2450 x 1000 x 625
FRN	220	C	A_1S	-4	E	OPT-	■	R	100	D	54	K	2000	360	2450 x 1000 x 670
FRN	280	C	A_1S	-4	E	OPT-	□	R	100	D	54	K	2000	361	2450 x 1000 x 625
FRN	280	C	A_1S	-4	E	OPT-	■	R	100	D	54	K	2000	377	2450 x 1000 x 670
FRN	315	C	A_1S	-4	E	OPT-	□	R	100	D	54	K	2200	513	2650 x 1000 x 625
FRN	315	C	A_1S	-4	E	OPT-	■	R	100	D	54	K	2200	538	2650 x 1000 x 670
FRN	355	C	A_1S	-4	E	OPT-	□	R	100	D	54	K	2200	523	2650 x 1000 x 625
FRN	355	C	A_1S	-4	E	OPT-	■	R	100	D	54	K	2200	548	2650 x 1000 x 670
FRN	400	C	A_1S	-4	E	OPT-	□	R	100	D	54	K	2200	526	2650 x 1000 x 625
FRN	400	C	A_1S	-4	E	OPT-	■	R	100	D	54	K	2200	551	2650 x 1000 x 670
FRN	500	C	A_1S	-4	E	OPT-	□	R	100	D	44	K	2200	842	2650 x 1800 x 625
FRN	500	C	A_1S	-4	E	OPT-	■	R	100	D	44	K	2200	854	2650 x 1800 x 670
FRN	630	C	A_1S	-4	E	OPT-	□	R	100	D	44	K	2200	1065	2650 x 1800 x 625
FRN	630	C	A_1S	-4	E	OPT-	■	R	100	D	44	K	2200	1087	2650 x 1800 x 670
FRN	710	C	A_1S	-4	E	OPT-	□	R	100	D	44	K	2200	1087	2650 x 1800 x 625
FRN	710	C	A_1S	-4	E	OPT-	■	R	100	D	44	K	2200	1109	2650 x 1800 x 670

□ 1: inverter alone, 2: inverter + fuses
 ■ 3: inverter + main switch, 4: inverter + fuses + main switch



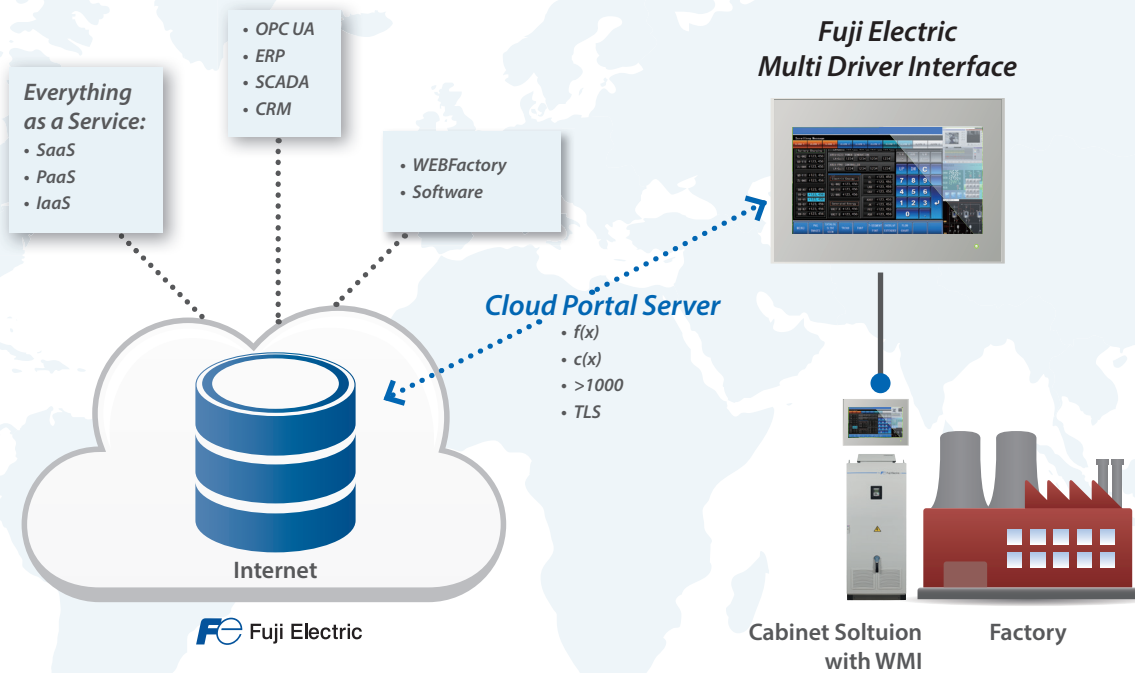
Improved technology ➤ optimized results

- ✓ Compact IP54 for cost-efficient installation (IP44 optional on request)
- ✓ Up to 710 kW solutions
- ✓ EMC filter built-in
- ✓ DC Reactor always included
- ✓ 4 different cabinet topologies:
 - ① inverter alone
 - ② inverter + fuses
 - ③ inverter + main switch
 - ④ inverter + fuses + main switch
- ✓ 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

Item		Inverter Specifications											
Model	FRN□□□AQ(AR)1■-4E: FRENIC-AQUA(HVAC)	110	132	160	200	220	280	315	355	400	500	630	710
Applicable standard motor (rated output) [kW] ¹⁾		110	132	160	200	220	280	315	355	400	500	630	710
Output ratings	Rated capacity [kVA] ²⁾	160	192	231	287	316	396	445	495	563	731	891	1044
	Voltage [V] ³⁾	3-phase, 380 to 480 V (with AVR function)											
	Rated current [A]	210	253	304	377	415	520	585	650	740	960	1170	1370
	Overload current rating	110% -1 min (Overload tolerated interval: compliant with IEC 61800-2)											
	Rated frequency [Hz]	50, 60 Hz											
Input power supply	Main power supply (No. of phase, voltage, frequency)	3-phase, 380 to 440 V, 50 Hz / 3-phase 390 to 480 V, 60 Hz											
	Control power supply auxiliary input (No. of phase, voltage, frequency)	Single phase, 380 to 480 V, 50/60 Hz											
	Voltage, frequency variations	Voltage: +10 to -15% (Unbalance rate between phases is within 2%) ⁴⁾ Frequency: +5 to -5%											
	Rated input current [A]	201	238	286	357	390	500	559	628	705	881	1115	1256
	Required power supply capacity [kVA]	140	165	199	248	271	347	388	436	489	611	773	871
Braking	Braking torque [%] ⁵⁾	10 to 15											
	DC Braking	Braking starting frequency: 0.0 to 60.0 Hz, Braking time: 0.0 to 30.0 s, Braking level: 0 to 60%											
EMC Filter (IEC/EN61800-3:2004)		Compliant with EMC standard: Emission: 2nd Env. (Category C3) Immunity: 1st and 2nd Env.											
DC Reactor (DCR)		Standard accessory (IEC/EN61000-3-2, IEC/EN61000-3-12)											
Compliant with Electrical Safety Standards		UL508C, C22.2No.14, IEC/EN61800-5-1:2007											
■ Enclosure (IEC/EN60529)		IP00											
Cooling method		Fan cooling											

*1) Applicable standard motors are the case of Fuji Electric's 4-pole standard motors.
 *2) The rated capacity indicates the case of 440 V ratings.
 *3) Output ratings cannot exceed the power supply voltage.
 *4) Interphase voltage unbalance ratio (%) = max. voltage [V] / 3-phase average voltage [V] x 67 (see IEC 61800-3).
 When unbalance ratio is between 2 and 3%, please use optional AC reactor (ACR).
 *5) Average braking torque obtained by use of a motor. (Varies with the efficiency of the motor)

Solution for Industry 4.0: Internet of Things plus Cloud Solution



Option V9 - HMI

- Access to various drives data via Internet
- Connections, calculations and monitoring
- Graphical display of site/machine
- Easy access by daily devices

Thanks to the flexible accessibility to data and information, users are able to monitor the operational status of machines or equipment **easily at any time, anywhere.**

It enables users to catch the sign of abnormalities or possible failures on their machines and plan counter-measures before it breaks down. This allows an easier maintenance and gives good service and reliability to the customer.

A Service of Fuji Electric

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