

**Smile to the Environment**

# FRENIC-HVAC

~ Energy Saving for the environment and our children's future ~

## Product Outline and Characteristics of FRENIC-HVAC Series



### Wide range of capacity

0.75kW-710kW / 400V

Inverter capacity	EMC filter	DC reactor	Protective structure
0.75kW to 90kW	Built-in	Built-in	IP21/IP55
110kW to 710kW	Built-in	External	IP00

### Optimum control by dedicated functions for HVAC usage and energy-saving

- The following functions are installed as standard: linearization, temperature difference constant control and pressure difference constant control, wet-bulb temperature presumption control, etc.

### User-friendly, useful functions

- The following user-friendly, useful functions are installed as standard: real time clock, fire mode (forced operation), filter clogging prevention, anti-jam, user password, etc.

### Countermeasures against noise and harmonics

- Generation of harmonics is suppressed substantially by the EMC filter and built-in DCR.
- Compliant EMC standard:
- Emission C2 supported (0.75 to 90kW) / C3 supported (110kW to 710kW)
  - Immunity 2nd Environment supported (0.75kW to 710kW)

### User-friendly keypad

\*Displays the regulator with the large-size liquid-crystal display.

1. Present value (PV)
2. Setting value (SV)
3. Manipulating value (MV)
4. Frequency
5. Output current
6. Output voltage
7. Torque
8. Rotation speed
9. Power consumption
10. Cumulative energy



\*Possible to show understandable indications through the unit conversion function.  
\*Multi-language function: 19 languages + user customized language supported

## Optimum Control for HVAC Facilities

**The first slim-type inverter specialized in energy-saving from Fuji Electric.**  
**Achieves a great effect on energy-saving of pumps!**  
**Contributes drastically to cost reduction by cutting power consumption!**

Using an inverter achieves high energy-saving effect. More and more HVAC (heating, ventilation, and air-conditioning) facilities have been introducing the inverter for their fan pump usage promptly and the higher function and performance are demanded for the inverter in the market. The FRENIC-HVAC series, a Fuji's new product, is optimum for energy-saving of the fan pump. It cuts waste by adjusting the flow rate, being fully utilized in saving electricity with energy-saving and in cost reduction.

- Application**
- Cooling pump
  - Ventilation fan
  - Freezing machine
  - Water supply/distribution pump
  - Cooling tower
  - AHU



### Significant Energy Saving Realized!!

For an air-conditioning heat source system, the needed quantity of the cooling or heating water fluctuates generally in seasons or days and nights. Therefore, operations continuing in a water conveyance pressure constant control may lead to high operating unnecessary pressures on terminals at low operating state. Thus, the pump consumes an ineffectual electric power for maintaining the high water conveyance pressure.

FRENIC-HVAC can perform an estimated terminal pressure control by linearization function which estimates target pressure from load flow rate.

It is possible to reduce the ineffectual pump power consumption and to achieve a great energy-saving effect together with maintaining comfortable current air conditioning.

## Standard specifications

### 3-phase, 400V series (0.75 to 37kW)

Item		Specifications											
Model	FRN □□□ AR1 □-4A : HVAC	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37
	FRN □□□ AR1 □-4E : HVAC	0.75	1.5	2.2	4.0	5.5	7.5	11	15	18.5	22	30	37
Applicable standard motor (rated output) [kW] *1		0.75	1.5	2.2	3.7/4.0	5.5	7.5	11	15	18.5	22	30	37
Output ratings	Rated capacity [kVA] *2	1.9	3.1	4.1	6.8	10	14	18	24	29	34	45	57
	Voltage [V] *3	3-phase, 380~480V (with AVR function)											
	Rated current [A]	2.5	4.1	5.5	9.0	13.5	18.5	24.5	32	39	45	60	75
	Overload current rating	110%-1min(Overload tolerated interval: compliant with IEC 61800-2)											
	Rated frequency [Hz]	50, 60Hz											
Input Power Supply	Main power supply (No. of phase, voltage, frequency)	3-phase, 380~480V, 50/60Hz											
	Control power supply auxiliary-input (No. of phase, voltage, frequency)	Single phase, 380~480V, 50/60Hz											
	Fan power supply auxiliary-input (No. of phase, voltage, frequency) *4	—											
	Voltage, frequency variations	Voltage: +10 ~ -15%(Unbalance rate between phases is within 2%) *5 Frequency : +5 ~ -5%											
	Rated input current [A] *6	1.6	3.0	4.3	7.4	10.3	13.9	20.7	27.9	34.5	41.1	55.7	69.4
Required power supply capacity [kVA]	1.2	2.1	3.0	5.2	7.2	9.7	15	20	24	29	39	49	
Braking	Braking torque [%] *7	20										10~15	
	DC braking	Braking starting frequency: 0.0~60.0Hz, Braking time: 0.0~30.0s, Braking level: 0~60%											
EMC filter (EN61800-3:2004)		Compliant with EMC standard Emission Immunity: Category-C2 (2nd Env.)											
DC reactor (DCR)		Standard accessory (EN61800-3-2 / EN61800-3-12)											
Power factor(at rated load)	Fundamental wave PF	0.98											
	Total PF	0.90											
Compliant with safety standard with		UL508C, C22.2No.14, EN61800-5-1:2007											
Enclosure(IEC60529)		IP21/IP55IP21/IP55											
Cooling method		Natural cooling						Fan cooling					
Weight/Mass [kg]	IP21/IP55	10	10	10	10	10	10	18	18	18	18	23	23

\*1) Applicable standard motors are the case of Fuji Electric's 4-pole standard motors.

\*2) The rated capacity indicates the case of 440V ratings

\*3) Output voltage cannot exceed the power supply voltage.

\*4) Used as the AC fan power supply input when combined with a high power factor PWM converter with power regenerative function or similar unit.

\*5) Interphase voltage unbalance ratio [%] = (max. voltage [V] - min. voltage [V]) / 3-phase average voltage

[V] x 67 (See IEC61800-3.) Use the AC reactor(ACR: optional) when used with 2 to 3%, of unbalance ratio.

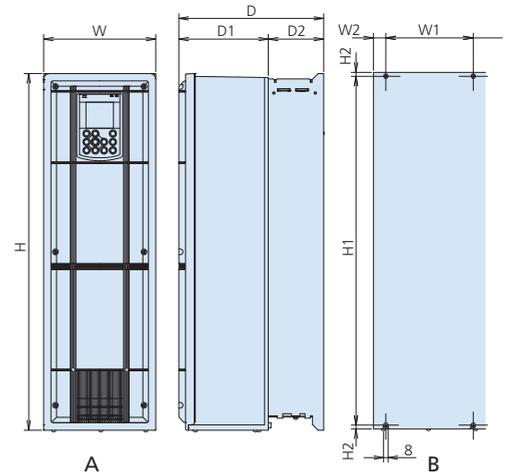
\*6) USB port equipped, three types of optional board can be mounted!!

\*7) Average braking torque obtained by use of a motor.(Varies with the efficiency of the motor)

## Outline drawing

Power supply voltage	Applicable standard motor (kW)	Inverter model	Outside dimensions (mm)					Mounting dimensions (mm)					
			Drawing	W	H	D	D1	D2	Drawing	W1	W2	H1	H2
3-phase 400V	0.75	FRN0.75AR1 □-4#	A	150	465	262	162	100	B	115	17.5	451	7
	1.5	FRN1.5AR1 □-4#											
	2.2	FRN2.2AR1 □-4#											
	3.7	FRN3.7AR1 □-4#											
	5.5	FRN5.5AR1 □-4#											
	7.5	FRN7.5AR1 □-4#		203	585	262	162	100		158	22.5	571	7
	11	FRN11AR1 □-4#											
	15	FRN15AR1 □-4#											
	18.5	FRN18.5AR1 □-4#											
	22	FRN22AR1 □-4#											
30	FRN30AR1 □-4#	203	645	262	162	100	158	22.5	631	7			
37	FRN37AR1 □-4#												

□(Protective structure) : M : IP21, L : IP55 # (Destination) : A : Asia, E : Europe, C : China



## Option

USB port equipped, three types of optional board can be mounted!!

- Relay output card (2 × 1c)/(7 × 1a)
- Analog input/output interface card
- Pt100 temperature sensor input card
- PROFIBUS-DP communication card
- CC-Link communication card

- LONWORKS communication card
- DeviceNet communication card
- CANopen communication card
- Ethernet communication card

\*BACnet MS/TP, Modbus RTU, Metasys N2 are equipped as standard.

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