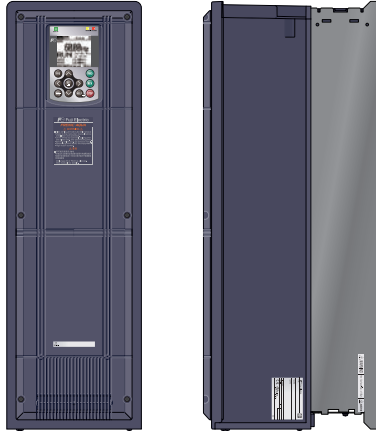


**Smile to the Environment**

# FRENIC-AQUA

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

## Product Outline and Characteristics of FRENIC-AQUA Series



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

The water business market including water purification plants and wastewater plants has continued to grow in recent years. Using a large volume of water, cost reduction is required and it largely depends on how efficiently water can be managed. It is of course achieved by reducing the amount of water to be used, however, the reduction in power consumption in water transfer and supply also allows significant cost reduction.

And the key to that is the dedicated inverter which controls pumps and motors. The FRENIC-AQUA series, a Fuji's new product, helps energy-saving of pumps, eliminating ineffectual operations by adjusting the amount of water properly to produce a significant effect both on electricity conservation and on cost reduction.

### User-friendly keypad

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

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



\*Possible to show understandable indications through the unit conversion function.

\*Multi-language function: 19 languages + user customized language supported

### 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 water treatment usage

- The following functions are installed as standard: cascade operation, rotary operation, customized logic, drought protection, high-frequency operation detection, etc.

### Comfort control by energy-saving functions

- The following functions are featured 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 featured as standard: real time clock, fire mode (forced operation), 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)

### Innovative functions

#### Rotary operation

Inverters are connected via communications; by which the system is configured without using a controller.

#### Customized logic

The customized logic interface function is adopted in the inverter body. This allows the logic circuit and arithmetic circuit to be built with the digital and analog input/output signals, which processes the signals as necessary to generate the simple relay sequence.

## Optimum for Various Applications in Water Business

Fan pump



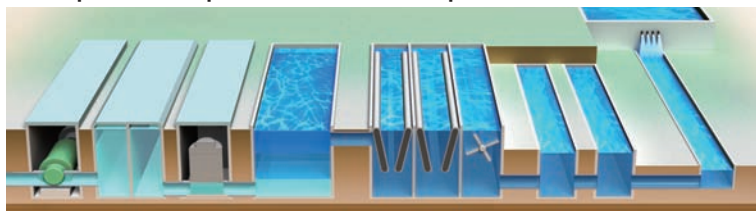
Compressor



Oil pump system



Water purification plant and wastewater plant



## Standard specifications

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

Item		Specifications											
Model	FRN □□□ AQ1 □-4A : AQUA	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37
	FRN □□□ AQ1 □-4E : AQUA	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.

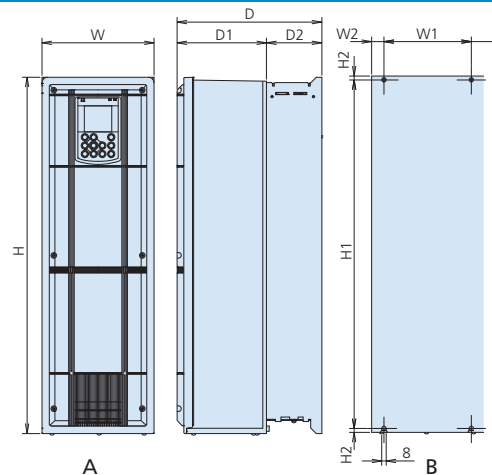
\*6) USB port equipped, three types of optional board can be mounted!!

\*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	FRN0.75AQ1□-4#	A	150	465	262	162	100	B	115	17.5	451	7
	1.5	FRN1.5AQ1□4#											
	2.2	FRN2.2AQ1□-4#											
	3.7	FRN3.7AQ1□-4#											
	5.5	FRN5.5AQ1□-4#											
	7.5	FRN7.5AQ1□-4#		203	585	262	162	100		158	22.5	571	7
	11	FRN11AQ1□-4#											
	15	FRN15AQ1□-4#											
	18.5	FRN18.5AQ1□-4#											
	22	FRN22AQ1□-4#											
30	FRN30AQ1□-4#	203	645	262	162	100	158	22.5	631	7			
37	FRN37AQ1□-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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