

High Frequency Inverter

FRENIC-HF Series



High Performance & Many Functions

FUJI High Frequency Inverter
FRENIC-HF

FUJI INVERTERS

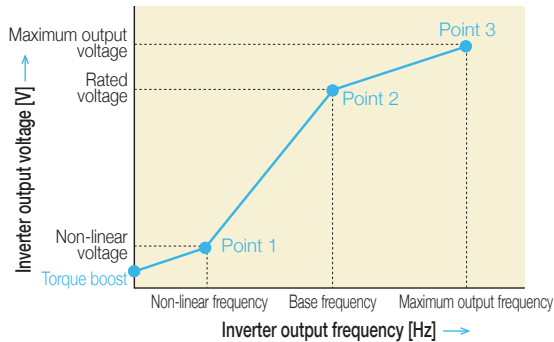
FRENIC-HF is an inverter developed for high frequency using the latest control technology to the full extent.

Packed with cutting-edge technology

High Performance & Many Functions

High-speed motor with optimal control

The FRENIC-HF high-speed motor is designed to handle output frequencies of up to 1667 Hz. The ability to calibrate non-linear frequency settings at points 1, 2, and 3 in the graph below allows for custom V/f settings.



Switch between multiple motors

One inverter can switch between five different motors. A digital input feature allows you to switch between them by simply entering function codes and terminals.

Easier to operate and maintain

Built-in USB port allows you to use the PC loader to manage data with ease!

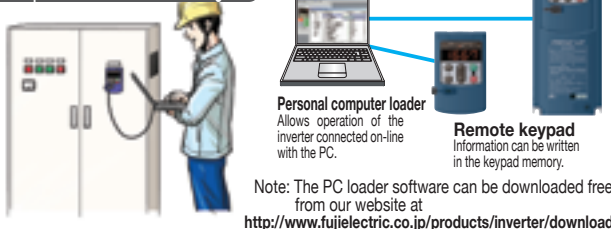
Improved working efficiency in the manufacturing site

- A variety of data about the inverter body can be saved in the keypad memory, allowing you to check the information in any place.
- Data can be transferred from the USB port of the keypad directly to the computer (personal computer loader) in the manufacturing site.
- Periodical collection of life information can be carried out efficiently.
- The real-time tracing function permits the operator to check the equipment for abnormality.

Example of use in the office



Example of use in the manufacturing site



Features

1. The keypad can be directly connected to the computer through a commercial USB cable (Mini B) without using a converter. The computer can be connected on-line with the inverter.
2. With the personal computer loader, the inverter can support the following functions (1) to (5).
 - (1) Editing, comparing, and copying the function code data
 - (2) Operation monitor and real-time trace
 - (3) Trouble history (indicating the latest four troubles)
 - (4) Maintenance information
 - (5) Historical trace



FUJI High Frequency Inverter
FRENIC-HF Series

Packed with features

- Multistage frequency selection: Select from a maximum of 15 steps
- Features include auto-restart after momentary power failure, cooling fan ON/OFF control, and more
- Built-in Safe Torque Off feature (EN1/EN2 terminal) shuts off the output of the inverter (motor output torque) immediately.

Switch between digital input terminal sink and source methods.

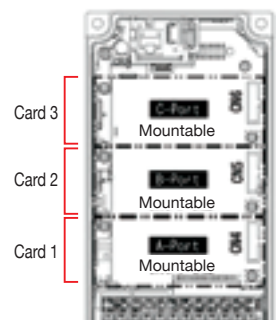
- Digital input terminal (X1–X7) logic methods can be switched between sink and source to match the application you want to control. Flexibly links to PLCs and other upper-level control devices.
- Switching is done via a switch mounted inside the inverter on the control board.

Optional network cards link you to a variety of networks

Simply insert the FRENIC-HF option card into a connector slot inside the inverter. Use up to three cards for maximum versatility.

Note: Some option cards are not compatible with one another. Contact us for details.

- DeviceNet communication card
- CC-Link communication card
- PROFIBUS-DP communication card
- CANopen communication card
- SX bus communication card



Designed life 10 years

For the various consumable parts inside the inverter, their designed lives have been extended to 10 years, which also extended the equipment maintenance cycles.

Consumable part	Designed life
Main circuit capacitor	10 years
Electrolytic capacitor on PCB	10 years
Cooling fan	10 years

Operating conditions:
Ambient temperature: 40°C
Load: 100%

* The designed lives are the calculated values and not the guaranteed ones.

Standard Specifications

Standard Specifications

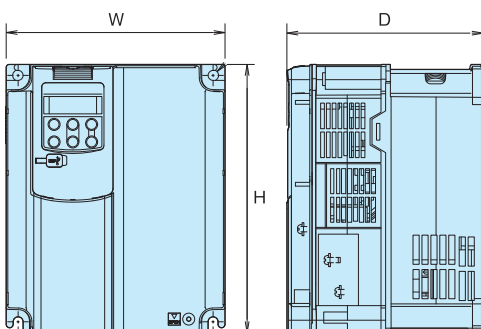
Type (FRN***H1S-2J)	2.2	3.7	5.5	7.5	11	15	18.5
Nominal applied motor [kW] (*1) (Rated output)	2.2	3.7	5.5	7.5	11	15	18.5
Output ratings	Rated capacity [kVA] (*2)	3.8	5.7	9.5	12	16	26
	Rated voltage [V] (*3)	Three-phase 200 to 240 V (with AVR)					
Input ratings	Rated current [A] Figures in parentheses: [F8] = f (*4)	10 (9.0)	15 (11)	25 (22)	33 (29)	43 (39)	56 (50) 70 (65)
	Overload capability	125%-1min					
	Voltage, frequency	200 to 240 V, 50/60 Hz					
Output frequency	Voltage, frequency variations	Voltage: +10 to -15% (Voltage unbalance: 2% or less (*5) Frequency: +5 to -5%)					
	Required power supply capacity (with DCR) [kVA] (*6)	3.1	5.2	7.4	10	15	20
Setting range	Maximum frequency	25 to 1667 Hz variable setting					
	Base frequency	25 to 1667 Hz variable setting					
	Non-linear frequency	0.0 (cancel) or 0.1-1667 Hz variable setting					
	Starting frequency	1 to 100 Hz variable setting					
Output frequency accuracy	Analog setting: ± 0.2% of maximum frequency (at 25 ± 10 °C) Keypad setting: ± 0.15% of maximum frequency (at -10 to +50 °C)						
V/f characteristics	Non-linear V/f setting (1 point): Free voltage (0 to 240V) and frequency (0 to 1667 Hz) can be set. ·Manual torque boost: Torque boost value can be set between 0.0 and 20.0%. ·Base frequency and max. output frequency can be set to 80 to 240V in common. ·The AVR control ON/OFF can be selected.						
Braking	Torque [%] (*7)	100%				20%	
	Braking transistor	Built-in					
	Built-in braking resistance [Ω]	40		20		-	
	Braking time [s]	5s					
Usage rate [%ED]	3	2	3	2			
Applicable safety standards	-						
Enclosure (IEC 60529)	IP20 closed type						
Cooling method	Fan cooling						
Control	Control method	V/f control					
	Start/operation	Keypad operation: Start and stop with RUN and STOP keys (Remote keypad: supplied as standard) Start and stop with FWD/REV and STOP keys (Multifunctional keypad: optional) · External signals: FWD (REV) RUN, STOP commands (3 wire operation possible), (digital inputs) coast-to-stop, external alarm, alarm reset, etc. · Linked operation: Operation through RS-485 or field buss (option) communications · Switching operation command: Remote/local switching, link switching					
	Frequency setting	Keypad operation, external volume, analog input, UP/DOWN control, multistep frequency (max. 15 steps), digital input, linked operation (RS485), switching frequency setting, auxiliary frequency setting, operation at a specified ratio, inverse operation					
	Acceleration/deceleration time	Setting range: Can set up and switch among five different motors between 0.00 and 6000 s · Acceleration/deceleration pattern: Linear accel./decel., S-shape accel./decel. (weak, free (strong)), curvilinear accel./decel. (accel./decel. max. capacity of constant output) · Decel. mode (coast-to-stop): Coast-to-stop at the operation command OFF. · Forcible stop decel. time: Deceleration stop by the forcible STOP.					
Weight/Mass [kg]	3.0	3.0	6.5	6.5	9.5	9.5	9.5
Protection	Overcurrent protection, short-circuit protection, overvoltage protection, insufficient voltage protection, input phase loss protection, overheating protection, overload protection, external alarm input, brake transistor abnormalities, motor protection, memory errors, keypad communications errors, CPU errors, option communications errors, option errors, drive motion errors, RS-485 communications error, data save errors during insufficient voltage, simulated malfunctions, enable circuit abnormalities, motor selection errors, batch alarm output, minor malfunctions (warnings), retry, surge protection, command loss detection, momentary power loss protection						

(*1) Fuji's 4-pole standard motor. (*2) Rated capacity is calculated by assuming the output rated voltage as 220V. (*3) Output voltage cannot exceed the power supply voltage. (*4) Output method was changed, limiting rated current value. (*5) Interphase voltage unbalance ratio[%] = (max. voltage [V] - min. voltage [V])/3-phase average voltage [V]×67(See IEC61800-3.) Use the DC reactor (ACR: optional) when used with 2 to 3 % of unbalance ratio. (*6) Obtained when a DC reactor (DCR) is used. (*7) Average braking torque obtained by use of a motor. (Varies with the efficiency of the motor.)

Basic Dimensions

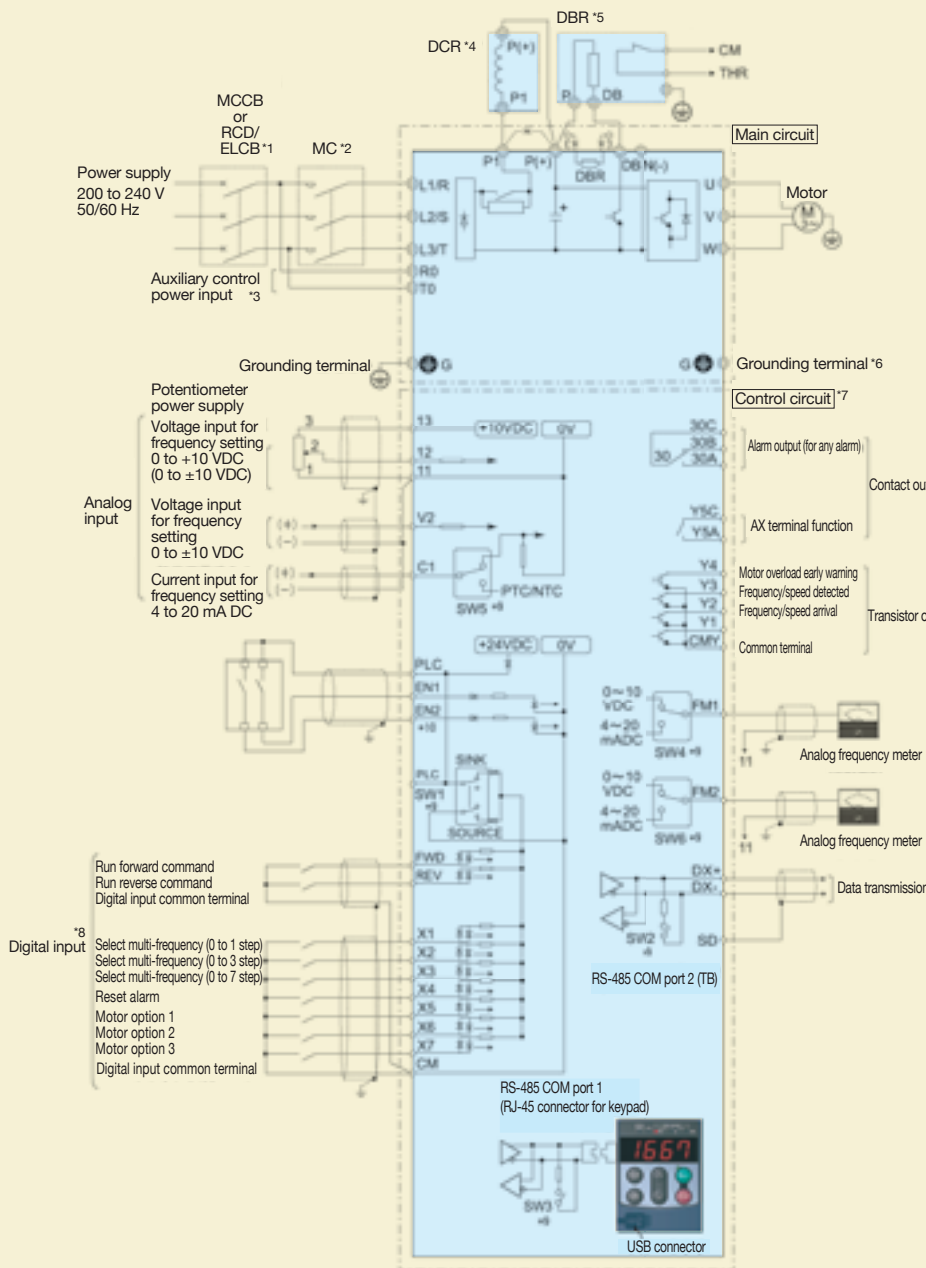
External Dimensions

[Unit: mm]



Type	W	H	D
FRN2.2H1S-2J	150	260	145
FRN3.7H1S-2J	150	260	145
FRN5.5H1S-2J	220	260	195
FRN7.5H1S-2J	220	260	195
FRN11H1S-2J	250	400	195
FRN15H1S-2J	250	400	195
FRN18.5H1S-2J	250	400	195

The wiring diagram assumes that enable input function is being used.
(Factory setting: SINK mode)



- *1) Install a recommended molded case circuit breaker (MCCB) or residual-current-operated protective device (RCD)/earth leakage circuit breaker (ELCB) (with overcurrent protection function) in the primary circuit of the inverter to protect wiring. Ensure that the circuit breaker capacity is equivalent to or lower than the recommended capacity.
- *2) Install a magnetic contactor (MC) for each inverter to separate the inverter from the power supply, apart from the MCCB or RCD/ELCB, when necessary. Connect a surge absorber in parallel when installing a coil such as the MC or solenoid near the inverter.
- *3) To retain an alarm output signal ALM issued on inverter's programmable output terminals by the protective function or to keep the keypad alive even if the main power has shut down, connect these terminals to the power supply lines. Without power supply to these terminals, the inverter can run.
- *4) When connecting an optional DC reactor (DCR), remove the jumper bar from the terminals P1 and P (+).
If the capacity of the power transformer is more than 500 kVA, or if there is a thyristor load somewhere in the same power system, apply the optional direct current reactor.
- *5) Inverters with a capacity of 7.5 kW or below have a built-in braking resistor (DBR) between the terminals P(+) and DB. When connecting an external braking resistor (DBR), be sure to disconnect the built-in one.
- *6) A grounding terminal for a motor. Use this terminal if needed.
- *7) For control signal wires, use twisted or shielded-twisted wires. When using shielded-twisted wires, connect the shield of them to the common terminals of the control circuit. To prevent malfunction due to noise, keep the control circuit wiring away from the main circuit wiring as far as possible (recommended: 10 cm or more). Never install them in the same wire duct. When crossing the control circuit wiring with the main circuit wiring, set them at right angles.
- *8) The connection diagram shows factory default functions assigned to digital input terminals [X1] to [X7], [FWD] and [REV], transistor output terminals [Y1] to [Y4], and relay contact output terminals [Y5A/C] and [30A/B/C].
- *9) Various switches on the control printed circuit board.
- 10) If you are not using the enable input function, use a short-circuit line to create a short circuit between the EN1 terminal and the PLC and between the EN2 terminal and the PLC.

⚠ SAFETY PRECAUTIONS

- Always read the instruction manual before operating to ensure safety. You may also consult with your retailer or with Fuji Electric to ensure proper use.
- The products described in this brochure are limited in terms of their applications and usage locations and also require periodic inspection. Check with your retailer or with Fuji Electric for details.
- Always have a skilled professional handle electrical and wiring work to ensure safety.