NOTES

When running general-purpose motors

- Driving a 400V general-purpose motor
  When driving a 400V general-purpose motor with an inverter using extremely long cables, damage to the insulation of the motor may occur. Use an output circuit filter (OFL) if necessary after checking with the motor manufacturer. Fuji's motors do not require the use of output circuit filters because of their reinforced insulation.
- Torque characteristics and temperature rise
  When the inverter is used to run a general-purpose motor, the temperature of the motor becomes higher than when it is operated using a commercial power supply. In the low-speed range, the cooling effect will be weakened, so decrease the output torque of the motor. If constant torque is required in the low-speed range, use a Fuji inverter motor or a motor equipped with an externally powered ventilating fan.
- Vibration
  When the motor is mounted to a machine, resonance may be caused by the natural frequencies, including that of the machine. Operation of a 2-pole motor at 60Hz or more may cause abnormal vibration.
  * Study use of tier coupling or dampening rubber.
  * It is also recommended to use the inverter jump frequency control to avoid resonance points.
- Noise
  When an inverter is used with a general-purpose motor, the motor noise level is higher than that with a commercial power supply. To reduce noise, raise carrier frequency of the inverter. High-speed operation at 60Hz or more can also result in more noise.

When running special motors

- High-speed motors
  When driving a high-speed motor while setting the frequency higher than 120Hz, test the combination with another motor to confirm the safety of high-speed motors.
- Explosion-proof motors
  When driving an explosion-proof motor with an inverter, use a combination of a motor and an inverter that has been approved in advance.
- Submersible motors and pumps
  These motors have a larger rated current than general-purpose motors. Select an inverter whose rated output current is greater than that of the motor.
  These motors differ from general-purpose motors in thermal characteristics. Set a low value in the thermal time constant of the motor when setting the electronic thermal facility.
- Brake motors
  For motors equipped with parallel-connected brakes, their braking power must be supplied from the primary circuit (commercial power supply). If the brake power is connected to the inverter power output circuit (secondary circuit) by mistake, problems may occur.
  Do not use inverters for driving motors equipped with series-connected brakes.
- Geared motors
  If the power transmission mechanism uses an oil-lubricated gearbox or speed changer/reducer, then continuous motor operation at low speed may cause poor lubrication. Avoid such operation.
- Synchronous motors
  It is necessary to use software suitable for this motor type. Contact Fuji for details.
- Single-phase motors
  Single-phase motors are not suitable for inverter-driven variable speed operation. Use three-phase motors.
  * Even if a single-phase power supply is available, use a three-phase motor as the inverter provides three-phase output.

Environmental conditions

- Installation location
  Use the inverter in a location with an ambient temperature range of -10 to 50°C.
  The inverter and braking resistor surfaces become hot under certain operating conditions. Install the inverter on nonflammable material such as metal.
  Ensure that the installation location meets the environmental conditions specified in "Environment" in inverter specifications.

Combination with peripheral devices

- Installing a molded case circuit breaker (MCCB)
  Install a recommended molded case circuit breaker (MCCB) or an earth leakage circuit breaker (ELCB) in the primary circuit of each inverter to protect the wiring. Ensure that the circuit breaker capacity is equivalent to or lower than the recommended capacity.
- Installing a magnetic contactor (MC) in the output (secondary) circuit
  If a magnetic contactor (MC) is mounted in the inverter's secondary circuit for switching the motor to commercial power or for any other purpose, ensure that both the inverter and the motor are fully stopped before you turn the MC on or off. Remove the surge killer integrated with the MC.
- Installing a magnetic contactor (MC) in the input (primary) circuit
  Do not turn the magnetic contactor (MC) in the primary circuit on or off more than once an hour as an inverter fault may result. If frequent starts or stops are required during motor operation, use FWD/REV signals.
- Protecting the motor
  The electronic thermal facility of the inverter can protect the motor. The operation level and the motor type (general-purpose motor, inverter motor) should be set. For high-speed motors or water-cooled motors, set a small value for the thermal time constant to protect the motor.
  If you connect the motor thermal relay to the motor with a long cable, a high-frequency current may flow into the wiring stray capacitance. This may cause the relay to trip at a current lower than the set value for the thermal relay. If this happens, lower the carrier frequency or use the output circuit filter (OFL).
- Discontinuance of power-factor correcting capacitor
  Do not mount power factor correcting capacitors in the inverter (primary) circuit. (Use the DC REACTOR to improve the inverter power factor.) Do not use power factor correcting capacitors in the inverter output circuit (secondary). An overcurrent trip will occur, disabling motor operation.
- Discontinuance of surge killer
  Do not mount surge killers in the inverter output (secondary) circuit.
- Reducing noise
  Use of a filter and shielded wires are typical measures against noise to ensure that EMC Directives are met. Refer to "Inverter design technical document (MHT221)" for details.
- Measures against surge currents
  If an overvoltage trip occurs while the inverter is stopped or operated under a light load, it is assumed that the surge current is generated by open/close of the phase-advancing capacitor in the power system.
  We recommend connecting a DC REACTOR to the inverter.
- Megger test
  When checking the insulation resistance of the inverter, use a 500V megger and follow the instructions contained in the Instruction Manual.

Wiring

- Wiring distance of control circuit
  When performing remote operation, use the twisted shield wire and limit the distance between the inverter and the control box to 20m.
- Wiring length between inverter and motor
  If long wiring is used between the inverter and the motor, the inverter will overheat or trip as a result of overcurrent (high-frequency current flowing into the stray capacitance) in the wires connected to the phases. Ensure that the wiring is shorter than 50m. If this length must be exceeded, lower the carrier frequency or mount an output circuit filter (OFL).
- Wiring size
  Select cables with a sufficient capacity by referring to the current value or recommended wire size.
- Wiring type
  Do not use multicore cables that are normally used for connecting several inverters and motors.
- Grounding
  Securely ground the inverter using the grounding terminal.

Selecting inverter capacity

- Driving general-purpose motor
  Select an inverter according to the applicable motor ratings listed in the standard specifications table for the inverter. When high starting torque is required or quick acceleration or deceleration is required, select an inverter with a capacity one size greater than the standard.
- Driving special motors
  Select an inverter that meets the following condition: Inverter rated current > Motor rated current.

Transportation and storage

When transporting or storing inverters, follow the procedures and select locations that meet the environmental conditions that agree with the inverter specifications.

Fuji Electric FA Components & Systems Co., Ltd.

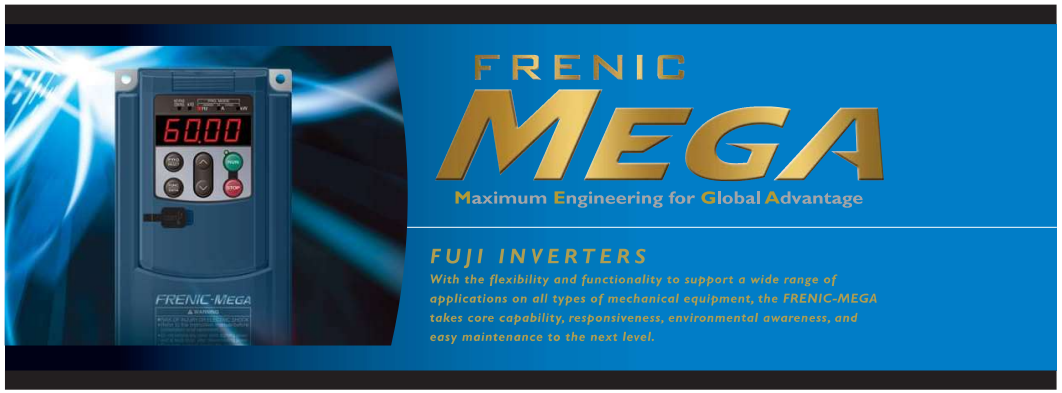
Mitsui Sumitomo Bank Ningyo-cho Bldg.,
5-7,Nihonbashi Odemma-cho,Chuo-ku,Tokyo 103-0011,Japan
Phone: +81-3-5847-8011 Fax: +81-3-5847-8172

Printed in Japan 2007-3 (C07a/K06) CM 50 FIS

e-Front runners

High Performance Multifunctional Inverters

FRENIC-MEGA Series



MH642a

The performance, reaching the peak in the industry

FRENIC-MEGA is a high performance, multifunctional inverter Fuji Electric has developed by gathering the best of its technologies. With our own state-of-the-art technology, the control performance has evolved to a new dimension.

FRENIC-MEGA has been developed to use with a variety of equipment by improving the basic performance, meeting the requirements for various applications, achieving lower maintenance, and enhancing the resistance to the environmental impacts.

FRENIC-MEGA, the inverter with the highest performance in the industry, is about to redefine the common sense of general-purpose inverters. Now, it is ready to answer your needs.

FRENIC MEGA
Maximum Engineering for Global Advantage

FUJI INVERTERS

With the flexibility and functionality to support a wide range of applications on all types of mechanical equipment, the FRENIC-MEGA takes core capability, responsiveness, environmental awareness, and easy maintenance to the next level.

High Performance Multifunctional Inverters

FRENIC-MEGA Series

Maximum Engineering for Global Advantage

Improved control performance

❶**Applicable control methods: PG vector control, sensorless vector control, dynamic torque vector control, and V/f control**

❷**Improved performance of current response and speed response** (vector control)

❸**Improved durability in overload operation**
HD (High duty) spec: 200% for 3 sec / 150% for 1 min
LD (Low duty) spec: 120% for 1 min

Lower maintainance

❶**Keypad with a USB connector**

❷**Maintenance warning signal output**

❸**Use of parts with a longer life cycle (Designed life: 10 years)**
(Main circuit capacitor, electrolytic capacitor, cooling fan)

FRENIC MEGA
Maximum Engineering for Global Advantage

Various applications

❶**Various functions that accommodate a wide range of applications**
Example: Breakage detection by braking transistor, improved reliability of brake signals, and operation at a specified ratio

❷**Expanded capacity of the brake circuit built-in model**
(Standard-equipped for 22kW or smaller models)

❸**Full network support**

Consideration for environment

❶**Great model variation meeting customers' needs**
Basic type, EMC filter built-in type, and the model compliant with the guideline supervised by the Ministry of Land, Infrastructure and Transport (available soon)

❷**Compliance with RoHS Directives (planned)**

❸**Improved resistance to the environmental impact**

Safety Precautions

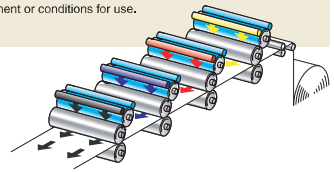
1. Use the contents of this catalog only for selecting product types and models. When using a product, read the Instruction Manual beforehand to use the product correctly.
2. Products introduced in this catalog have not been designed or manufactured for such applications in a system or equipment that will affect human bodies or lives. Customers, who want to use the products introduced in this catalog for special systems or devices such as for atomic-energy control, aerospace use, medical use, and traffic control, are requested to consult the Fuji's Sales Division. Customers are requested to prepare safety measures when they apply the products introduced in this catalog to such systems or facilities that will affect human lives or cause severe damage to property if the products become faulty.

Best vector control for the general-purpose inverter in the class

Ideal for highly accurate control such as positioning

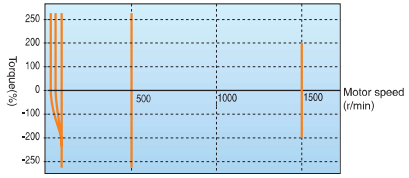
PG vector control
Effective in providing highly accurate control for applications such as offset printing

Speed control range: 1:1500
Speed response: 100Hz
Speed control accuracy: ±0.01%
Current response: 500Hz
Torque accuracy: ±10%
* The option card is required separately. (Available soon)
* The above specifications may vary depending on the environment or conditions for use.



Fuji's original dynamic torque vector control has further evolved.

Besides the dynamic torque vector control, the inverter is equipped with the motor constant tuning for compensating even a voltage error of the main circuit devices and the magnetic flux observer of a new system. This realizes a high starting torque of 200% even at a low-speed rotation of 0.3Hz.



Example torque characteristics [5.5kW]

Improved durability in overload operation

The inverter performs short-time acceleration and deceleration with the maximum capacity by achieving better time rating of the overload ratings compared with our previous models. This improves the operation efficiency of the equipment such as cutting machine or conveyance machine.
Overload durability: 200% for 3 sec and 150% for 1 min.

The standard model is available in two specifications concerning the operation load.

Classification	Overload	Major use
HD (High duty) spec	200% for 3 sec, 150% for 1 min	Operation under heavy load
LD (Low duty) spec	120% for 1 min	Operation under light load

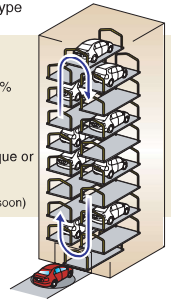
Expanded capacity for the brake circuit built-in models

A brake circuit is built in the 22kW or smaller models as a standard function. These inverters are applicable to the machine that uses regenerative load such as a vertical conveyance machine.
(The 7.5kW or smaller models also incorporate a braking resistor.)
* Since the capacity has been further expanded, 30kW to 55 kW models in 200V series and 30kW to 110kW models in 400V series can be manufactured on request.

Maximizing the performance of a general-purpose motor

Sensorless vector control (available soon)
Useful for the application that requires a high starting torque, such as the gondola type multi-level car parking tower

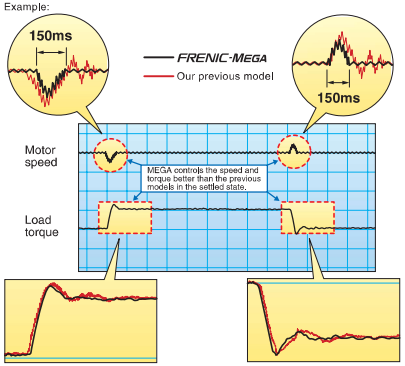
Speed control range: 1:200
Speed response: 20Hz
Speed control accuracy: ±0.5%
Current response: 500Hz
Torque accuracy: ±10%
Zero speed torque: ±20%
100% torque or over *
* The voltage detection option is required separately. (Available soon)



Improved reaction to the fluctuation of impact load

When a remarkable load fluctuation occurs, the inverter provides the torque response in the class-top level. It controls the flux to minimize the fluctuation in the motor speed while suppressing the vibration. This function is best suited for the equipment that requires stable speed such as a cutting machine.

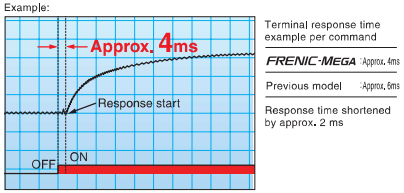
Example:



Quicker response to the operation commands

The terminal response to the operation commands has had an established reputation. FRENIC-MEGA has further shortened this response time, achieving the industry-top response time.
This function is effective in shortening the tact time per cycle and effective for use in the process including frequent repetitions.

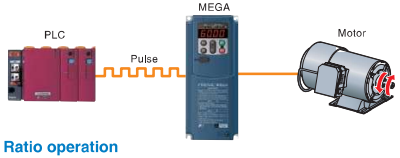
Example:



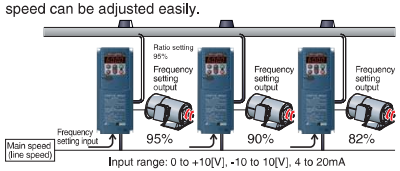
Accommodating various applications

Convenient function for operations at the specified speed

The pulse train input function is equipped as a standard function.
It is possible to issue the speed command with the pulse train input (single-phase pulse and a sign of command value) from the pulse generator, etc.
(Maximum pulse input: 100kpps)
This function is useful for controlling more than one inverter.



Ratio operation
The ratio operation is the function particularly convenient for adjusting two or more conveyance systems. The ratio of the main axis speed to the two or more trailing axes can be set as a frequency command. On the machine that handles load variation such as a conveyance machine, the conveyance speed can be adjusted easily.



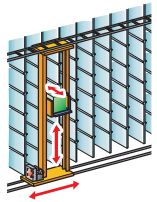
$$\text{Frequency setting output} = \text{Frequency setting input} \times \frac{\text{Analog input (Ratio setting)}}{100\%}$$

Thorough protection of the braking circuit

The inverter protects the braking resistor by monitoring the braking transistor operation. **The inverter outputs an exclusive signal on detection of the braking transistor abnormality.** A circuit for shutting off the input power supply is provided outside of the inverter. When this signal is output, the power is shut off; thus protecting the braking circuit.

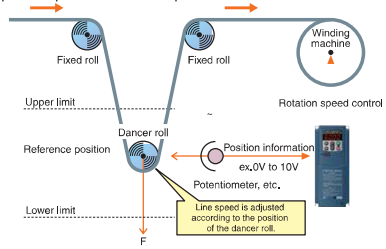
Optimum function for preventing an object from slipping down

The reliability of the brake signal was increased for uses such as vertical conveyance. Conventionally, the current value and the frequency have been monitored when the brake signal is output. By adding a torque value to these two values, the brake timing can be adjusted more easily.



Dancer control function optimum for winding control

The PID value, calculated by comparing the target value and the feedback value, is added to or subtracted from the reference speed. Since the PID calculator gain (in proportional range) can be set to a low value, the inverter can be applied to the automatic control system that requires quick response such as a speed controller.



More functions are available to meet various requirements

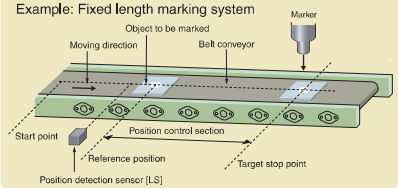
(1) Analog input (4 to 20mA) through 2 terminals with polarity (2) Low liquid level stop function (Pressurized operation is possible before low liquid level stop.) (3) Non-linear V/f pattern at 3 points (4) Dummy failure output function (5) Selection of up to the 4th motor (6) S-shape accel./decel. range setting (7) Detecting disconnection of the PID feedback (8) Output frequency: 500Hz

MEGA World Keeps Expanding

PG option card for positioning control (available soon)

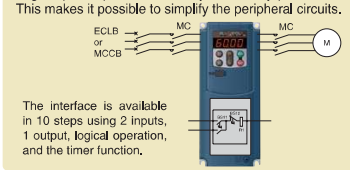
This control function is best suited for the application that requires highly accurate positioning such as that of the conveyance machine. By combined use of the position control device (APR) and PG vector control, the position control accuracy has been remarkably improved. Shortened positioning time by this function will be helpful to reduce the tact time of a cycle.

Example: Fixed length marking system



The customized logic interface function is adopted in the inverter body. (Available soon)

Logic input/output can be easily created by parameter setting. This makes it possible to simplify the peripheral circuits.



The interface is available in 10 steps using 2 inputs, 1 output, logical operation, and the timer function.

Introducing servo lock function (PG option card). (Available soon)

This function is effective in adjusting the stop timing or the braking torque when the equipment such as a conveyance machine is stopped by positioning of the motor. This function is helpful when torque is applied externally or holding torque is required during the stop time. The tact time per cycle will be reduced by shortened deceleration time.

Wide model variation meeting the customer needs

Wide model variation

1. Basic type
Suitable for the equipment that uses a peripheral device to suppress noise or harmonics.

2. EMC filter built-in type (available soon)
This type is designed in compliance with European EMC Directives (2nd Env), and reduces noise generation.
Objective standard: European EMC Directives category C3 (2nd Env) 'EN61800-3-2004'
* The EMC filter can be switched between effective and ineffective.
* Use of EMC filter will increase the leak current.

3. Inverter type designed to the guideline specified by the Ministry of Land, Infrastructure and Transport (available soon)
The inverter employs a DC reactor and complies with "Standard Specifications for Public Building Construction" supervised by the Ministry of Land, Infrastructure and Transport. This inverter suppresses harmonics and noise.
* The inverter incorporates the DC reactor, and the zero-phase reactor is supplied together with the inverter to meet the inverter installation standards stipulated in the Standard Specifications for Public Building Construction (Electric Equipment) 2004 version published under the supervision by Government Buildings Department in Minister/Secretariat of Land, Infrastructure and Transport.

Supports for simple maintenance

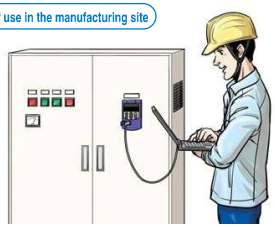
The built-in USB port allows use of a personal computer loader for easy information control!

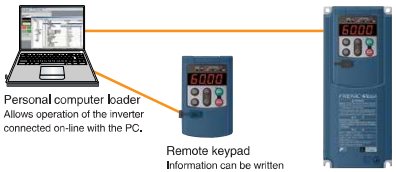
Improved working efficiency in the manufacturing site

- 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) Real-time operation monitor
   (3) Trouble history (indicating the latest four troubles)
   (4) Maintenance information
   (5) Historical trace (available soon)

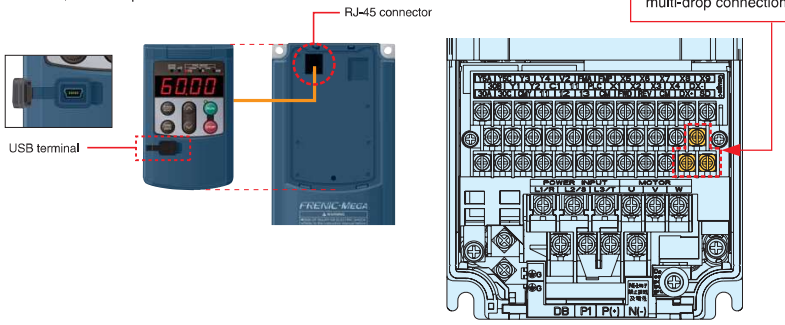
Network building

Connection with the network with the option card (available soon)

■SX bus interface card	■Profibus-DP	■CAN-BUS	■CC-Link
■T link interface card	■DeviceNET	■Ethernet/IP	etc.

Advanced network function

■RS-485 communication is possible as a standard function (terminal base).
Besides the port (RJ-45 connector) shared with the keypad, RS-485 terminal is provided as a standard function. Since the interface is connected through terminals, multi-drop connection can be made with ease.



Prolonged service life and improved life judgment function

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

The part life is estimated on condition that the inverter is used at:
an ambient air temperature of 40˚C and under the load rate of 100% (HD spec) or 80% (LD spec).

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

Full support of life warnings

The inverter is loaded with the functions for facilitating the maintenance of the equipment

Item	Purpose
Cumulative inverter run time (h)	Displays the total run time of the inverter.
Number of inverter startups	Displays the number of times the inverter has started the equipment. Example of use: This data indicates the timing to replace the equipment parts (such as a timing belt) operating under the normal load.
Equipment maintenance warning Cumulative run time (h) Number of startups	By inputting the signal for operation with the commercial power supply, the time outside the inverter operation time can also be measured. This makes it possible to manage the total run time of the equipment and the number of startups. Such data is usable for preparing the maintenance schedule.
Display of inverter life warning	The displayed contents include: main circuit capacitor capacity, total run time of the cooling fan (with ON/OFF compensation), total run time of the electrolytic capacitor on the printed circuit board, and total run time of the inverter.

Consideration for environment

Enhanced resistance to the environmental impacts

Resistance to the environmental impact has been enhanced compared with the conventional inverter.

(1) Enhanced durability of the cooling fan operated under the environmental impact
(2) Adoption of copper bars plated with nickel or tin

In MEGA, resistance to the environmental impact has been increased compared with the conventional model. However, examine the use of the inverter carefully according to the environment in the following cases:

a. Environment is subject to sulfide gas (at tire manufacturer, paper manufacturer, sewage disposer, or part of the process in textile industry).
b. Environment is subject to conductive dust or foreign matters (in metalworking, operation using extruding machine or printing machine, waste disposal).
c. Others: The inverter is used in the environment of which specification exceeds the specified range.

If you are examining use of the inverter under the above conditions, consult with us regarding the models with enhanced durability.

Compliance with RoHS Directives

MEGA complies with European regulations that limit the use of specific hazardous substances (RoHS) as a standard. This inverter is environment-friendly as the use of the following six hazardous substances is restricted.
<Six hazardous substances>
Lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyl (PBB), and polybrominated biphenyl ether (PBDE)
* Except the parts of some inverter models

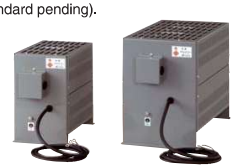
<About RoHS>
The Directive 2002/95/EC, promulgated by the European Parliament and European Council, limits the use of specific hazardous substances included in electrical and electronic devices.

Protection against micro surge (optional)

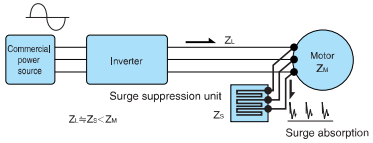
Surge suppression unit (optional)

If the motor drive cable is long, a very thin surge voltage (micro surge) is generated at the motor connection ends. This surge voltage causes deterioration of the motor, dielectric breakdown, or increase in noise. The surge suppression unit suppresses this surge voltage.

(1) The unit significantly suppresses the surge voltage when simply connected with the motor.
(2) Since no additional work is required, it can be easily mounted on the existing equipment.
(3) The unit is applicable to the motors regardless of their capacity. (However, consult us for application to the motor with a capacity of 75kW or over.)
(4) The unit requires no power source and no maintenance.
(5) Two types are available; One for 50m cable and the other for 100m cable.
(6) Compliant with environmental standard and safety standard (Compliant with RoHS Directives, and application to UL standard pending).



●Surge suppression unit structure



Global compatibility

●Application to the world standards pending

Europe	North America/Canada
EC Directive (CE marking)	UL standard (cUL certified)
CE	c UL us LISTED

●Wide voltage range
Applicable to 240V and 480V power supplies as standard

Model list

HD : High Duty spec 200% for 3 sec, 150% for 1min
LD : Low Duty spec 120% for 1 min

Standard applied motor (kW)	Basic type			
	3-phase 200 V series		3-phase 400 V series	
	HD spec (150%)	LD spec (120%)	HD spec (150%)	LD spec (120%)
0.4	FRN0.4G1S-2J		FRN0.4G1S-4J	
0.75	FRN0.75G1S-2J		FRN0.75G1S-4J	
1.5	FRN1.5G1S-2J		FRN1.5G1S-4J	
2.2	FRN2.2G1S-2J		FRN2.2G1S-4J	
3.7	FRN3.7G1S-2J		FRN3.7G1S-4J	
5.5	FRN5.5G1S-2J		FRN5.5G1S-4J	
7.5	FRN7.5G1S-2J	FRN5.5G1S-2J	FRN7.5G1S-4J	FRN5.5G1S-4J
11	FRN11G1S-2J	FRN7.5G1S-2J	FRN11G1S-4J	FRN7.5G1S-4J
15	FRN15G1S-2J	FRN11G1S-2J	FRN15G1S-4J	FRN11G1S-4J
18.5	FRN18.5G1S-2J	FRN15G1S-2J	FRN18.5G1S-4J	FRN15G1S-4J
22	FRN22G1S-2J	FRN18.5G1S-2J	FRN22G1S-4J	FRN18.5G1S-4J
30	FRN30G1S-2J	FRN22G1S-2J	FRN30G1S-4J	FRN22G1S-4J
37	FRN37G1S-2J	FRN30G1S-2J	FRN37G1S-4J	FRN30G1S-4J
45	FRN45G1S-2J	FRN37G1S-2J	FRN45G1S-4J	FRN37G1S-4J
55	FRN55G1S-2J	FRN45G1S-2J	FRN55G1S-4J	FRN45G1S-4J
75	FRN75G1S-2J	FRN55G1S-2J	FRN75G1S-4J	FRN55G1S-4J
90	FRN90G1S-2J	FRN75G1S-2J	FRN90G1S-4J	FRN75G1S-4J
110		FRN90G1S-2J	FRN110G1S-4J	FRN90G1S-4J
132			FRN132G1S-4J	FRN110G1S-4J
160			FRN160G1S-4J	FRN132G1S-4J
200			FRN200G1S-4J	FRN160G1S-4J
220			FRN220G1S-4J	FRN200G1S-4J
280			FRN280G1S-4J	FRN220G1S-4J
·			·	·
·			·	·
·			·	·
·			·	·
630			FRN630G1S-4J	FRN500G1S-4J
710				FRN630G1S-4J

[Available soon] The EMC filter built-in type and the zero-phase reactor/DC reactor built-in type that complies with the guideline supervised by the Ministry of Land, Infrastructure and Transport will be added to the lineups. Available soon

*When HD spec of FRN55G1S-2J or FRN55G1S-4J is ordered, no DC reactor is supplied as a standard device. But, when LD spec is ordered, the DC reactor is supplied as a standard device.

How to read the inverter model

FRN 0.75 G 1 S - 2 J

Code	Series name
FRN	FRENIC series

Code	Applicable motor rating
0.4	0.4kW
0.75	0.75kW
to	to
55	55kW
75	75kW
90	90kW

Code	Applicable range
G	High performance, multifunctional type

Code	Destination / Instruction manual
J	Japan / Japanese

Code	Input power source
2	3-phase 200V
4	3-phase 400V

Code	Enclosure
S	Standard (basic type)

Code	Order of development
1	Series

Caution The contents of this catalog are provided to help you select the product model that is best for you. Before the actual use, be sure to read the User's Manual thoroughly for proper operations.

Keypad Operations

Keypad switches and functions

LED monitor

4-digit, 7-segment LED monitor
The following data is displayed in each operation mode.

- ■Run mode : Operation information (output frequency, output current, output voltage, etc.) When a minor trouble occurs, the monitor shows a minor trouble warning L-AL
- ■Program mode : Menu, function code, function code data, etc.
- ■Alarm mode : Alarm code indicating the cause that triggered the protection function.

Program/Reset key

Used to change the operation mode.

- ■Run mode : Press the key to switch the program mode.
- ■Program mode : Press the key to switch the run mode.
- ■Alarm mode : After solving the problem, press this key to turn off the alarm and switch to the run mode.

Function/Data key

Use this key for the following operations.

- ■Run mode : Press the key to switch the operation status information to be displayed (output frequency, output current and output voltage). When a minor trouble warning is displayed, holding down this key resets the alarm and switches back to Running mode.
- ■Program mode : Press the key to display the function code or establish data.
- ■Alarm mode : Press the key to display the detailed alarm information.

Keypad control LED

This LED is on when the key on the keypad is enabled and can issue an operation command. In the program mode or alarm mode, however, no operation is possible even if this LED is lit.

USB port

Enables connection of the inverter with the PC using USB cable. The inverter side connector is of the mini B-type.

x10 LED

If the data to be displayed exceeds 9999, the x10 LED lights, indicating that the actual data is ten times the displayed data.

Example: If the data is "12,345," the LED monitor displays "1234," and the "x10 LED" appears at the same time, indicating that the actual value is 1,234 x 10 = 12,340.

Unit LED (3 places)

m/min r/min
■Hz □A ■kW
Combination of the three LEDs shows the unit used when the operating condition is monitored in the run mode.

PRG. MODE
When the program is selected, the right and left LEDs are on.eft LEDs are on.
■Hz □A ■kW

RUN LED

This LED is on during operation with key, FWD/REV signal or with communication operation command.

RUN key

Starts the motor operation.

STOP key

Stops the motor operation.

Up/Down key

Used to select the setting items displayed on the LED monitor or change the function mode data.

Monitor display and key operation

The keypad modes are classified into the following 3 modes.

Monitor, keys \ Operation mode			Programming mode		Running mode		Alarm mode
			STOP	RUN	STOP	RUN	
Monitor	8888	Function	Displays the function code and data.		Displays the output frequency, set frequency, loaded motor speed, power consumption, output current, and output voltage.		Displays the alarm description and alarm history.
		Display	Lighting		Blinking	Lighting	Blinking/Lighting
	PRG.MODE	Function	Indicates that the program mode is selected.		Displays the units of frequency, output current, power consumption, and rotation speed.		None
		Display	PRG.MODE ON		Frequency display / Speed display / Current display / Capacity or Current indication: PRG.MODE ON		OFF
	KEYPAD CONTROL	Function	Operation selection (keypad operation/terminal operation) is displayed.				
		Display	Lit in keypad operation mode				
	RUN	Function	Indicates absence of operation commands.	Indicates presence of operation commands.	Indicates absence of operation commands.	Indicates presence of operation commands.	Indicates that the operation is trip-stopped.
		Display	RUN unlit	RUN lit	RUN unlit	RUN lit	If an alarm occurs during operation, the lamp is unlit during keypad operation and lit during terminal block operation.
Keys	PRG RESET	Function	Switches to running mode / Digit shift (cursor movement) in data setting		Switches to programming mode.		Releases the trip and switches to stop mode or running mode.
	FUNC DATA	Function	Determines the function code, stores and updates data.		Switches the LED monitor display.		Displays the operation information.
	▲ ▼	Function	Increases/decreases the function code and data.		Increases/decreases the frequency, motor speed and other settings.		Displays the alarm history.
	RUN	Function	Invalid		Starts running (switches to running mode (RUN)).	Invalid	Invalid
	STOP	Function	Invalid	Deceleration stop (switches to programming mode (STOP)).	Invalid	Deceleration stop (switches to running mode (STOP)).	Invalid

Inverter Support Loader

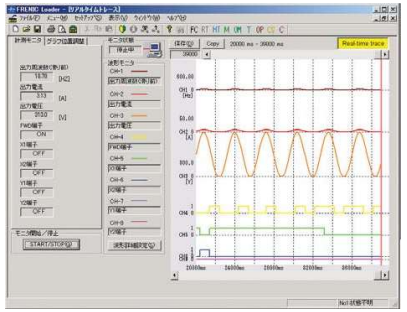
Full-fledged maintenance with the FRENIC loader

- ■Editing, comparing and copying the function code data
- ■Operation monitor, real-time historical trace, trouble monitor, and multi-monitor
- ■Test run, motor auto tuning
- ■Operation of Windows2000 and XP is guaranteed.
- ■The real-time trace function monitors the inverter operating conditions with the waveforms in the multi-channel graph format, and the results can be stored in a data file. The stored data can be used for motion analysis etc.

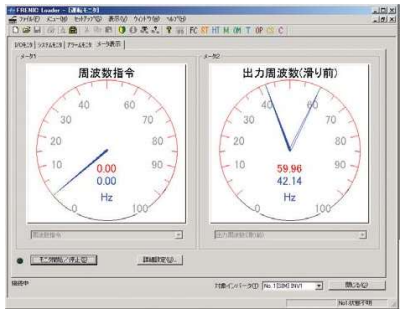
* The loader software can be downloaded for free from FUJI's website.

Function code list editing

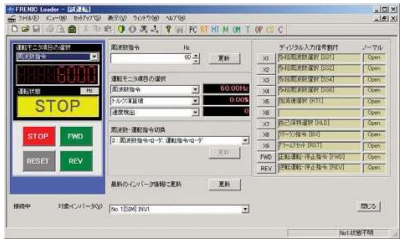
Real-time trace



Operation monitor



Test run screen



Standard Specifications (Basic type)

Three-phase 200V series

HD (High Duty) spec for heavy load

Item			Specifications																
Type (FRN□□□G1S-2J)			0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90
Nominal applied motor [kW] (*1)			0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90
Output ratings	Rated capacity [kVA] (*2)		1.1	1.9	3.0	4.2	6.8	10	14	18	24	28	34	45	55	68	81	107	131
	Rated voltage [V] (*3)		Three-phase 200 to 240V (with AVR)											Three-phase 200 to 230V (with AVR)					
	Rated Current [A] (*4)		3	5	8	11	18	27	37	49	63	76	90	119	146	180	215	283	346
	Overload capability		150% for 1min, 200% for 3.0s																
	Rated frequency [Hz]		50, 60Hz																
Input ratings	Main circuit power Phases, voltage, frequency		Three-phase 200 to 240V, 50/60Hz											Three-phase 200 to 220V, 50Hz Three-phase 200 to 230V, 60Hz					
	Auxiliary control power input Phases, voltage, frequency		–	Single-phase 200 to 240V, 50/60Hz										Single-phase 200 to 230V, 50/60Hz					
	Auxiliary power input for fan Phases, voltage, frequency (*5)		–												Single-phase 200 to 220V, 50Hz Single-phase 200 to 230V, 60Hz				
	Voltage, frequency variations		Voltage:+10 to -15% (Voltage unbalance:2% or less (*6)) Frequency:+5 to -5%																
	Rated current [A] (*7)	with DCR	1.6	3.2	6.1	8.9	15	21.1	28.8	42.2	57.6	71.0	84.4	114	138	167	203	282	334
		without DCR	3.1	5.3	9.5	13.2	22.2	31.5	42.7	60.7	80.1	97.0	112	151	185	225	270	–	–
	Required power supply capacity (*8)	with DCR	0.6	1.2	2.2	3.1	5.2	7.4	10	15	20	25	30	40	48	58	71	98	116
Braking	Torque [%] (*9)		150%		100%					20%				10 to15%					
	Braking transistor		Built-in											–					
	Minimum connective resistance		100		40		24	16	12	8	6	4		–					
	Torque [%]		180%		180%		180%	180%	180%	180%	180%	180%							
	Built-in braking resistance		100Ω		40Ω			20Ω		–									
		Braking time[s]	5s							–									
		%ED	5	3	5	3	2	3	2	–									
	DC injection braking		Starting frequency:0.0 to 60.0Hz, Braking time: 0.0 to 30.0s, Braking level:0 to 100%																
DC reactor (DCR) (*10)			Optional															Standard accessory	
Applicable safety standards			UL508C, C22.2No.14 (pending), EN61800-5-1:2003																
Enclosure (IEC60529)			IP20 (IEC60529) closed type UL open type (UL 50)											IP00 open type, UL open type					
Cooling method			Natural cooling			Fan cooling													
Weight/Mass [kg]			1.8	2	2.8	3	3.2	6.5	7	7	9.5	9.5	10	26	32	42	43		

LD (Low Duty) spec for light load

Item			Specifications																
Type (FRN□□□G1S-2J)			0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90
Nominal applied motor [kW] (*1)			–	–	–	–	–	7.5	11	15	18.5	22	30	37	45	55	75	90	110
Output ratings	Rated capacity [kVA] (*2)		–	–	–	–	–	11	16	20	25	30	43	55	68	81	107	131	158
	Rated voltage [V] (*3)				–			Three-phase 200 to 240V (with AVR)						Three-phase 200 to 230V (with AVR)					
	Rated Current [A] (*4)		–	–	–	–	–	31.8 (29)	46.2 (42)	59.4 (55)	74.8 (68)	88 (80)	115 (107)	146	180	215	283	346	415
	Overload capability				–			120% for 1min											
	Rated frequency [Hz]				–			50, 60Hz											
Input ratings	Main circuit power Phases, voltage, frequency				–			Three-phase 200 to 240V, 50/60Hz						Three-phase 200 to 220V, 50Hz Three-phase 200 to 230V, 60Hz					
	Auxiliary control power input Phases, voltage, frequency				–			Single-phase 200 to 240V,50/60Hz						Single-phase 200 to 230V, 50/60Hz					
	Auxiliary power input for fan Phases, voltage, frequency (*5)				–			–							Single-phase 200 to 220V, 50Hz Single-phase 200 to 230V, 60Hz				
	Voltage, frequency variations				–			Voltage:+10 to -15% (Voltage unbalance:2% or less (*6)) Frequency:+5 to -5%											
	Rated current [A] (*7)	with DCR	–	–	–	–	–	28.8	42.2	57.6	71.0	84.4	114	138	167	203	282	334	410
		without DCR	–	–	–	–	–	42.7	60.7	80.1	97.0	112	151	185	225	270	–	–	–
	Required power supply capacity (*8)	with DCR	–	–	–	–	–	10	15	20	25	30	40	48	58	71	98	116	143
Braking	Torque [%] (*9)				–			70%		15%				7 to12%					
	Braking transistor				–			Built-in						–					
	Minimum connective resistance				–			16	12	8	6	4	4	–					
	Torque [%]							130%	120%	130%	140%	150%	130%						
	Built-in braking resistance				–			20Ω		–									
		Braking time (s)			–			3.7s	3.4s	–									
		%ED			–			2.2	1.4	–									
	DC injection braking				–			Starting frequency:0.0 to 60.0Hz, Braking time: 0.0 to 30.0s, Braking level:0 to 80%											
DC reactor (DCR) (*10)					–			Optional										Standard accessory	
Applicable safety standards					–			UL508C, C22.2No.14 (pending), EN61800-5-1:2003											
Enclosure (IEC60529)					–			IP20 (IEC60529) closed type UL open type(UL 50)						IP00 open type UL open type					
Cooling method					–			Fan cooling											
Weight/Mass [kg]					–			6.5	7	7	9.5	9.5	10	26	32	42	43		

(*1) Fuji's 4-pole standard motor
(*2) Rated capacity is calculated by assuming the output rated voltage as 220V for three-phase 200V series and 440V for three-phase 400V series.
(*3) Output voltage cannot exceed the power supply voltage.
(*4) When using the inverter in the ambient temperature of 40°C or over and with carrier frequency at 3kHz or higher, adjust the current under continuous running to be the value in ( ) or lower by controlling the load.
(*5) The auxiliary power input is used as an AC fan power input when combining the unit such as high power factor PWM converter with power regenerative function. (Generally not used.)
(*6) 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.
(*7) The value is calculated on assumption that the inverter is connected with a power supply capacity of 500kVA (or 10 times the inverter capacity if the inverter capacity exceeds 50kVA) and %X is 5%.
(*8) Obtained when a DC reactor (DCR) is used.
(*9) Average braking torque obtained by use of a motor. (Varies with the efficiency of the motor.)
(*10) The 55kW DC reactor (DCR) is optional with HD spec, and is provided as a standard accessory with LD spec.

Three-phase 400V series

(0.4 to 55kW) HD (High Duty) spec for heavy load

Item			Specifications														
Type (FRN□□□G1S-4J)			0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55
Nominal applied motor [kW] (*1)			0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55
Output ratings	Rated capacity [kVA] (*2)		1.1	1.9	2.8	4.1	6.8	10	14	18	24	29	34	45	57	69	85
	Rated voltage [V] (*3)		Three-phase 380 to 480V (with AVR)														
	Rated Current [A] (*4)		1.5	2.5	4	5.5	9	13.5	18.5	24.5	32	39	45	60	75	91	112
	Overload capability		150% for 1min, 200% for 3.0s														
	Rated frequency [Hz]		50, 60Hz														
Input ratings	Main circuit power Phases, voltage, frequency		Three-phase 380 to 480V, 50/60Hz														
	Auxiliary control power input Phases, voltage, frequency		–	Single-phase 380 to 480V, 50/60Hz													
	Auxiliary power input for fan Phases, voltage, frequency (*5)		–														
	Voltage, frequency variations		Voltage:(10 to -15% (Voltage unbalance:2% or less (*6)) Frequency:+5 to -5%														
	Rated current [A] (*7)	with DCR	0.85	1.6	3.0	4.5	7.5	10.6	14.4	21.1	28.8	35.5	42.2	57.0	68.5	83.2	102
		without DCR	1.7	3.1	5.9	8.2	13.0	17.3	23.2	33	43.8	52.3	60.6	77.9	94.3	114	140
	Required power supply capacity (*8)	with DCR	0.6	1.2	2.1	3.2	5.2	7.4	10	15	20	25	30	40	48	58	71
Braking	Torque [%] (*9)		150%		100%					20%				10 to 15%			
	Braking transistor		Built-in											–			
	Minimum connective resistance		200		160		96	64	48	32	24	16		–			
	Torque [%]		180%		180%		180%	180%	180%	180%	180%	180%					
	Built-in braking resistance		720Ω	470Ω	160Ω			80Ω		–							
		Braking time[s]	5s							–							
		%ED	5	3	5	3	2	3	2	–							
	DC injection braking		Starting frequency:0.0 to 60.0Hz, Braking time: 0.0 to 30.0s, Braking level:0 to 100%														
DC reactor (DCR) (*10)			Optional														
Applicable safety standards			UL508C, C22.2No.14 (pending), EN61800-5-1:2003														
Enclosure (IEC60529)			IP20 (IEC60529) closed type, UL open type (UL 50)											IP00 open type, UL open type			
Cooling method			Natural cooling			Fan cooling											
Weight/Mass [kg]			1.8	2	2.8	3	3.2	6.5	7	7	9.5	9.5	10	26	26	32	36

(75 to 630kW) HD (High Duty) spec for heavy load

Item			Specifications													
Type (FRN□□□G1S-4J)			75	90	110	132	160	200	220	280	315	355	400	500	630	
Nominal applied motor [kW] (*1)			75	90	110	132	160	200	220	280	315	355	400	500	630	
Output ratings	Rated capacity [kVA] (*2)		114	134	160	192	231	287	316	396	445	495	563	731	891	
	Rated voltage [V] (*3)		Three-phase 380 to 480V (with AVR)													
	Rated Current [A] (*4)		150	176	210	253	304	377	415	520	585	650	740	960	1170	
	Overload capability		150% for 1min, 200% for 3.0s													
	Rated frequency [Hz]		50, 60Hz													
Input ratings	Main circuit power Phases, voltage, frequency		Three-phase 380 to 480V, 50Hz Three-phase 380 to 480V, 60Hz													
	Auxiliary control power input Phases, voltage, frequency		Single-phase 380 to 480V, 50/60Hz													
	Auxiliary power input for fan Phases, voltage, frequency (*5)		Single-phase 380 to 440V, 50Hz Single-phase 380 to 480V, 60Hz													
	Voltage, frequency variations		Voltage:+10 to -15% (Voltage unbalance:2% or less (*6)) Frequency:+5 to -5%													
	Rated current [A] (*7)	with DCR	138	164	210	238	286	357	390	500	559	628	705	881	1115	
		without DCR	–	–	–	–	–	–	–	–	–	–	–	–	–	
	Required power supply capacity [kVA] (*8)	with DCR	96	114	140	165	199	248	271	347	388	436	489	611	773	
Braking	Torque [%] (*9)		10 to 15%													
	Braking transistor		–													
	Minimum connective resistance		–													
	Torque [%]															
	DC injection braking		Starting frequency:0.0 to 60.0Hz, Braking time: 0.0 to 30.0s, Braking level:0 to 100%													
DC reactor (DCR) (*10)			Standard accessory													
Applicable safety standards			UL508C, C22.2No.14 (pending), EN61800-5-1:2003													
Enclosure (IEC60529)			IP20(IEC60529) closed type, UL open type (UL 50)													
Cooling method			Fan cooling													
Weight/Mass [kg]			43													

(*1) Fuji's 4-pole standard motor
(*2) Rated capacity is calculated by assuming the output rated voltage as 220V for three-phase 200V series and 440V for three-phase 400V series.
(*3) Output voltage cannot exceed the power supply voltage.
(*5) The auxiliary power input is used as an AC fan power input when combining the unit such as high power factor PWM converter with power regenerative function. (Generally not used.)
(*6) 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.
(*7) The value is calculated on assumption that the inverter is connected with a power supply capacity of 500kVA (or 10 times the inverter capacity if the inverter capacity exceeds 50kVA) and %X is 5%.
(*8) Obtained when a DC reactor (DCR) is used.
(*9) Average braking torque obtained by use of a motor. (Varies with the efficiency of the motor.)
(*10) The 55kW DC reactor (DCR) is optional with HD spec, and is provided as a standard accessory with LD spec.

Standard Specifications (Basic type)

Three-phase 400V series

(5.5 to 55kW) LD (Low Duty) spec for light load

Item			Specifications														
Type (FRN□□□G1S-4J)			0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55
Nominal applied motor [kW] (*1)			–	–	–	–	–	7.5	11	15	18.5	22	30	37	45	55	75
Output ratings	Rated capacity [kVA] (*2)		–	–	–	–	–	12	17	22	28	33	45	57	69	85	114
	Rated voltage [V] (*3)		Three-phase 380 to 480V (with AVR)														
	Rated Current [A] (*4)		–	–	–	–	–	16.5	23	30.5	37	45	60	75	91	112	150
	Overload capability		–					120% for 1min									
	Rated frequency [Hz]		–					50, 60Hz									
Input ratings	Main circuit power Phases, voltage, frequency		–					Three-phase 380 to 480V, 50/60Hz									
	Auxiliary control power input Phases, voltage, frequency		–					Single-phase 380 to 480V, 50/60Hz									
	Auxiliary power input for fan Phases, voltage, frequency (*5)		–					–									
	Voltage, frequency variations		–					Voltage:+10 to -15% (Voltage unbalance:2% or less (*6)) Frequency:+5 to -5%									
	Rated current [A] (*7)	with DCR	–	–	–	–	–	14.4	21.1	28.8	35.5	42.2	57.0	68.5	83.2	102	138
		without DCR	–	–	–	–	–	23.2	33.0	43.8	52.3	60.6	77.9	94.3	114	140	–
	Required power supply capacity (*8)	with DCR	–	–	–	–	–	10	15	20	25	30	40	48	58	71	96
Braking	Torque [%] (*9)		–					70%		15%				7 to 12%			
	Braking transistor		–					Built-in						–			
	Minimum connective resistance / Torque [%]		–					64 / 130%	48 / 120%	32 / 130%	24 / 140%	16 / 150%	16 / 130%	–			
	Built-in braking resistance		–					80Ω		–							
		Braking time[s]	–					3.7s	3.4s	–							
		%ED	–					2.2	1.4	–							
	DC injection braking		–					Starting frequency:0.0 to 60.0Hz, Braking time: 0.0 to 30.0s, Braking level:0 to 80%									
DC reactor (DCR) (*10)			–					Optional									Standard accessory
Applicable safety standards			–					UL508C, C22.2No.14 (pending), EN61800-5-1:2003									
Enclosure (IEC60529)			–					IP20 (IEC60529) closed type, UL open type (UL 50)						IP00 open type, UL open type			
Cooling method			–					Fan cooling									
Weight/Mass [kg]			–					6.5	7	7	9.5	9.5	10	26	26	32	36

(75 to 630kW) LD (Low Duty) spec for light load

Item			Specifications													
Type (FRN□□□G1S-4J)			75	90	110	132	160	200	220	280	315	355	400	500	630	
Nominal applied motor [kW] (*1)			90	110	132	160	200	220	280	355	400	450	500	630	710	
Output ratings	Rated capacity [kVA] (*2)		134	160	192	231	287	316	396	495	563	640	731	891	1044	
	Rated voltage [V] (*3)		Three-phase 380 to 480V (with AVR)													
	Rated Current [A] (*4)		176	210	253	304	377	415	520	650	740	840	960	1170	1370	
	Overload capability		120% for 1min													
	Rated frequency [Hz]		50, 60Hz													
Input ratings	Main circuit power Phases, voltage, frequency		Three-phase 380 to 440V/50Hz Three-phase 380 to 480V/60Hz													
	Auxiliary control power input Phases, voltage, frequency		Single-phase 380 to 440V, 50/60Hz													
	Auxiliary power input for fan Phases, voltage, frequency (*5)		Single-phase 380 to 440V/50Hz Single-phase 380 to 480V/60Hz													
	Voltage, frequency variations		Voltage:+10 to -15% (Voltage unbalance:2% or less (*6)) Frequency:+5 to -5%													
	Rated current [A] (*7)	with DCR	164	210	238	286	357	390	500	628	705	789	881	1115	1256	
		without DCR	–	–	–	–	–	–	–	–	–	–	–	–	–	
	Required power supply capacity [kVA] (*8)	with DCR	114	140	165	199	248	271	347	436	489	547	611	773	871	
Braking	Torque [%] (*9)		7 to 12%													
	Braking transistor		–													
	Minimum connective resistance / Torque [%]		–													
	DC injection braking		Starting frequency:0.0 to 60.0Hz, Braking time: 0.0 to 30.0s, Braking level:0 to 80%													
DC reactor (DCR) (*10)			Standard accessory													
Applicable safety standards			UL508C, C22.2No.14 (pending), EN61800-5-1:2003													
Enclosure (IEC60529)			IP00 open type, UL open type													
Cooling method			Fan cooling													
Weight/Mass [kg]			43													

(*1) Fuji's 4-pole standard motor
(*2) Rated capacity is calculated by assuming the output rated voltage as 220V for three-phase 200V series and 440V for three-phase 400V series.
(*3) Output voltage cannot exceed the power supply voltage.
(*5) The auxiliary power input is used as an AC fan power input when combining the unit such as high power factor PWM converter with power regenerative function. (Generally not used.)
(*6) 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.
(*7) The value is calculated on assumption that the inverter is connected with a power supply capacity of 500kVA (or 10 times the inverter capacity if the inverter capacity exceeds 50kVA) and %X is 5%.
(*8) Obtained when a DC reactor (DCR) is used.
(*9) Average braking torque obtained by use of a motor. (Varies with the efficiency of the motor.)
(*10) The 55kW DC reactor (DCR) is optional with HD spec, and is provided as a standard accessory with LD spec.

Standard Specifications (EMC filter buit-in type)

Three-phase 200V series

HD (High Duty) spec for heavy load

Item			Specifications															
Type(FRN□□□G1E-2J)			0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90
Nominal applied motor [kW] (*1)			0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90
Output ratings	Rated capacity [kVA] (*2)		1.1	1.9	3	4.2	6.8	10	14	18	24	28	34	45	55	68	81	107	131
	Rated voltage [V] (*3)		Three-phase 200 to 240V (with AVR)											Three-phase 200 to 230V (with AVR)					
	Rated Current [A] (*4)		3	5	8	11	18	27	37	49	63	76	90	119	146	180	215	283	346
	Overload capability		150% for 1min, 200% for 3.0s																
	Rated frequency [Hz]		50, 60Hz																
Input ratings	Main circuit power Phases, voltage, frequency		Three-phase 200 to 240V, 50/60Hz											Three-phase 200 to 220V, 50Hz Three-phase 200 to 230V, 60Hz					
	Auxiliary control power input Phases, voltage, frequency		–	Single-phase 200 to 240V, 50/60Hz										Single-phase 200 to 230V, 50/60Hz					
	Auxiliary power input for fan Phases, voltage, frequency (*5)		–											Single-phase 200 to 220V/50Hz Single-phase 200 to 230V/60Hz					
	Voltage, frequency variations		Voltage:+10 to -15% (Voltage unbalance:2% or less (*6)) Frequency:+5 to -5%																
	Rated current [A] (*7)	with DCR	1.6	3.2	6.1	8.9	15	21.1	28.8	42.2	57.6	71	84.4	114	138	167	203	282	334
		without DCR	3.1	5.3	9.5	13.2	22.2	31.5	42.7	60.7	80.1	97	112	151	185	225	270	–	–
	Required power supply capacity (*8)	with DCR	0.6	1.2	2.2	3.1	5.2	7.4	10	15	20	25	30	40	48	58	71	98	116
Braking	Torque [%] (*9)		150%		100%			20%						10 to 15%					
	Braking transistor		Built-in											–					
	Minimum connective resistance / Torque [%]		100 / 180%		40 / 180%		24 / 180%	16 / 180%	12 / 180%	8 / 180%	6 / 180%	4 / 180%		–					
	Built-in braking resistance		100Ω		40Ω		20Ω	–											
		Braking time[s]	5s					–											
		%ED	5	3	5	3	2	3	2	–									
	DC injection braking		Starting frequency:0.0 to 60.0Hz, Braking time: 0.0 to 30.0s, Braking level:0 to 100%																
EMC filter			EMC standard compliance: emission, immunity: category C3(2nd Env.)(EN61800-3:2004)																
DC reactor (DCR) (*10)			Optional																Standard accessory
Applicable safety standards			UL508C, C22.2No.14 (pending), EN61800-5-1:2003																
Enclosure (IEC60529)			IP20 closed type, UL open type											IP00 open type, UL open type					
Cooling method			Natural cooling		Fan cooling														
Weight/Mass [kg]			2.0	2.2	3.0	3.2	3.4	7.1	7.6	7.6	10.7	10.7	11.2	26	32	42	43		

LD (Low Duty) spec for light load

Item			Specifications															
Type(FRN□□□G1E-2J)			0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90
Nominal applied motor [kW] (*1)			–	–	–	–	–	7.5	11	15	18.5	22	30	37	45	55	75	90	110
Output ratings	Rated capacity [kVA] (*2)		–	–	–	–	–	11	16	20	25	30	43	55	68	81	107	131	158
	Rated voltage [V] (*3)		Three-phase 200 to 240V (with AVR)											Three-phase 200 to 230V (with AVR)					
	Rated Current [A] (*4)		–	–	–	–	–	31.8 (29)	46.2 (42)	59.4 (55)	74.8 (68)	88 (80)	115 (107)	146	180	215	283	346	415
	Overload capability		–					120% for 1min											
	Rated frequency [Hz]		–					50, 60Hz											
Input ratings	Main circuit power Phases, voltage, frequency		–					Three-phase 200 to 240V,50/60Hz						Three-phase 200 to 220V,50Hz Three-phase 200 to 230V,60Hz					
	Auxiliary control power input Phases, voltage, frequency		–					Single-phase 200 to 240V,50/60Hz						Single-phase 200 to 230V,50/60Hz					
	Auxiliary power input for fan Phases, voltage, frequency (*5)		–					–						Three-phase 200 to 220V,0Hz Three-phase 200 to 230V,60Hz					
	Voltage, frequency variations		–					Voltage:+10 to -15% (Voltage unbalance:2% or less (*6)) Frequency:+5 to -5%											
	Rated current [A] (*7)	with DCR	–	–	–	–	–	28.8	42.2	57.6	71.0	84.4	114	138	167	203	282	334	410
		without DCR	–	–	–	–	–	42.7	60.7	80.1	97.0	112	151	185	225	270	–	–	–
	Required power supply capacity (*8)	with DCR	–	–	–	–	–	10	15	20	25	30	40	48	58	71	98	116	143
Braking	Torque [%] (*9)		–					70%		15%				7 to 12%					
	Braking transistor		–					Built-in						–					
	Minimum connective resistance / Torque [%]		–					16 / 130%	12 / 120%	8 / 130%	6 / 140%	4 / 150%	4 / 130%	–					
	Built-in braking resistance		–					20Ω		–									
		Braking time[s]	–					3.7s	3.4s	–									
		%ED	–					22	14	–									
	DC injection braking		–					Starting frequency:0.0 to 60.0Hz, Braking time: 0.0 to 30.0s, Braking level:0 to 80%											
EMC filter			–					EMC standard compliance: emission, immunity: category C3(2nd Env.)(EN61800-3:2004)											
DC reactor (DCR) (*10)			–					Optional											Standard accessory
Applicable safety standards			–					UL508C, C22.2No.14 (pending), EN61800-5-1:2003											
Enclosure (IEC60529)			–					IP20 (IEC60529) closed type, UL open type (UL 50)						IP00 open type, UL open type					
Cooling method			–					Fan cooling											
Weight/Mass [kg]								7.1	7.6	7.6	10.7	10.7	11.2	26	32	42	43		

(*1) Fuji's 4-pole standard motor
(*2) Rated capacity is calculated by assuming the output rated voltage as 220V for three-phase 200V series and 440V for three-phase 400V series.
(*3) Output voltage cannot exceed the power supply voltage.
(*5) The auxiliary power input is used as an AC fan power input when combining the unit such as high power factor PWM converter with power regenerative function. (Generally not used.)
(*6) 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.
(*7) The value is calculated on assumption that the inverter is connected with a power supply capacity of 500kVA (or 10 times the inverter capacity if the inverter capacity exceeds 50kVA) and %X is 5%.
(*8) Obtained when a DC reactor (DCR) is used.
(*9) Average braking torque obtained by use of a motor. (Varies with the efficiency of the motor.)
(*10) The 55kW DC reactor (DCR) is optional with HD spec, and is provided as a standard accessory with LD spec.

Standard Specifications (EMC filter buit-in type)

Three-phase 400V series

(0.4 to 55kW) HD (High Duty) spec for heavy load

Item			Specifications															
Type(FRN□□□G1E-4J)			0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55
Nominal applied motor [kW] (*1)			0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55
Output ratings	Rated capacity [kVA] (*2)		1.1	1.9	2.8	4.1	6.8	10	14	18	24	29	34	45	57	69	85
	Rated voltage [V] (*3)		Three-phase 380 to 480V (with AVR)														
	Rated Current [A] (*4)		1.5	2.5	4	5.5	9	13.5	18.5	24.5	32	39	45	60	75	91	112
	Overload capability		150% for 1min, 200% for 3.0s														
	Rated frequency [Hz]		50, 60Hz														
Input ratings	Main circuit power Phases, voltage, frequency		Three-phase 380 to 480V,50/60Hz														
	Auxiliary control power input Phases, voltage, frequency		–	Single-phase 380 to 480V, 50/60Hz													
	Auxiliary power input for fan Phases, voltage, frequency (*5)		–														
	Voltage, frequency variations		Voltage:+10 to -15% (Voltage unbalance:2% or less (*6)) Frequency:+5 to -5%														
	Rated current [A] (*7)	with DCR	0.85	1.6	3.0	4.5	7.5	10.6	14.4	21.1	28.8	35.5	42.2	57.0	68.5	83.2	102
		without DCR	1.7	3.1	5.9	8.2	13.0	17.3	23.2	33	43.8	52.3	80.6	77.9	94.3	114	140
	Required power supply capacity (*8)	with DCR	0.6	1.2	2.1	3.2	5.2	7.4	10	15	20	25	30	40	48	58	71
Braking	Torque [%] (*9)		150%			100%				20%				10 to 15%			
	Braking transistor		Built-in											–			
	Minimum connective resistance		200		180		96	64	48	32	24	16		–			
	Torque [%]		180%		180%		180%	180%	180%	180%	180%	180%					
	Built-in braking resistance		720Ω	470Ω	160Ω			80Ω		–							
		Braking time[s]	5s							–							
		%ED	5	3	5	3	2	3	2	–							
	DC injection braking		Starting frequency:0.0 to 60.0Hz, Braking time: 0.0 to 30.0s, Braking level:0 to 100%														
EMC filter			EMC standard compliance: emission, immunity: category C3 (2nd Env.)(EN61800-3:2004)														
DC reactor (DCR) (*10)			Optional														
Applicable safety standards			UL508C, C22.2No.14 (pending), EN61800-5-1:2003														
Enclosure (IEC60529)			IP20(IEC60529) closed type, UL open type (UL 50)											IP00 open type, UL open type			
Cooling method			Natural cooling			Fan cooling											
Weight/Mass [kg]			2.0	2.2	3.0	3.2	3.4	7.1	7.6	7.6	10.7	10.7	11.2	26	26	32	36

(75 to 630kW) HD (High Duty) spec for heavy load

Item			Specifications														
Type(FRN□□□G1E-4J)			75	90	110	132	160	200	220	280	315	355	400	500	630		
Nominal applied motor [kW] (*1)			75	90	110	132	160	200	220	280	315	355	400	500	630		
Output ratings	Rated capacity [kVA] (*2)		114	134	160	192	231	287	316	396	445	495	563	731	891		
	Rated voltage [V] (*3)		Three-phase 380 to 480V (with AVR)														
	Rated Current [A] (*4)		150	176	210	253	304	377	415	520	585	650	740	960	1170		
	Overload capability		150% for 1min, 200% for 3.0s														
	Rated frequency [Hz]		50, 60Hz														
Input ratings	Main circuit power Phases, voltage, frequency		Three-phase 380 to 440V/50Hz Three-phase 380 to 480V/60Hz														
	Auxiliary control power input Phases, voltage, frequency		Single-phase 380 to 480V, 50/60Hz														
	Auxiliary power input for fan Phases, voltage, frequency (*5)		Single-phase 380 to 440V/50Hz Single-phase 380 to 480V/60Hz														
	Voltage, frequency variations		Voltage:+10 to -15% (Voltage unbalance:2% or less (*6)) Frequency:+5 to -5%														
	Rated current [A] (*7)	with DCR	138	164	201	238	286	357	390	500	559	628	705	881	1115		
		without DCR	–	–	–	–	–	–	–	–	–	–	–	–	–		
	Required power supply capacity [kVA] (*8)	with DCR	96	114	140	165	199	248	271	347	388	436	489	611	773		
Braking	Torque [%] (*9)		10 to 15%														
	Braking transistor		–														
	Minimum connective resistance Torque [%]		–														
	DC injection braking		Starting frequency:0.0 to 60.0Hz, Braking time: 0.0 to 30.0s, Braking level:0 to 100%														
EMC filter			EMC standard compliance: emission, immunity: category C3 (2nd Env.)(EN61800-3:2004)														
DC reactor (DCR) (*10)			Standard accessory														
Applicable safety standards			UL508C, C22.2No.14 (pending), EN61800-5-1:2003														
Enclosure (IEC60529)			IP00 open type, UL open type														
Cooling method			Fan cooling														
Weight/Mass [kg]			43														

(*1) Fuji's 4-pole standard motor
(*2) Rated capacity is calculated by assuming the output rated voltage as 220V for three-phase 200V series and 440V for three-phase 400V series.
(*3) Output voltage cannot exceed the power supply voltage.
(*5) The auxiliary power input is used as an AC fan power input when combining the unit such as high power factor PWM converter with power regenerative function. (Generally not used.)
(*6) 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.
(*7) The value is calculated on assumption that the inverter is connected with a power supply capacity of 500kVA (or 10 times the inverter capacity if the inverter capacity exceeds 50kVA) and %X is 5%.
(*8) Obtained when a DC reactor (DCR) is used.
(*9) Average braking torque obtained by use of a motor. (Varies with the efficiency of the motor.)
(*10) The 55kW DC reactor (DCR) is optional with HD spec, and is provided as a standard accessory with LD spec.

Three-phase 400V series

(5.5 to 55kW) LD (Low Duty) spec for light load

Item			Specifications														
Type(FRN□□□G1E-4J)			0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55
Nominal applied motor [kW] (*1)			–	–	–	–	–	7.5	11	15	18.5	22	30	37	45	55	75
Output ratings	Rated capacity [kVA] (*2)		–	–	–	–	–	12	17	22	28	33	45	57	69	85	114
	Rated voltage [V] (*3)		Three-phase 380 to 480V (with AVR)														
	Rated Current [A] (*4)		–	–	–	–	–	16.5	23	30.5	37	45	60	75	91	112	150
	Overload capability		–					120% for 1min									
	Rated frequency [Hz]		–					50, 60Hz									
Input ratings	Main circuit power Phases, voltage, frequency		–					Three-phase 380 to 480V, 50/60Hz									
	Auxiliary control power input Phases, voltage, frequency		–					Single-phase 380 to 480V, 50/60Hz									
	Auxiliary power input for fan Phases, voltage, frequency (*5)		–					–									
	Voltage, frequency variations		–					Voltage:+10 to -15% (Voltage unbalance:2% or less (*6)) Frequency:+5 to -5%									
	Rated current [A] (*7)	with DCR	–	–	–	–	–	14.4	21.1	28.8	35.5	42.2	57.0	68.5	83.2	102	138
		without DCR	–	–	–	–	–	23.2	33.0	43.8	52.3	60.6	77.9	94.3	114	140	–
	Required power supply capacity (*8)	with DCR	–	–	–	–	–	10	15	20	25	30	40	48	58	71	96
Braking	Torque [%] (*9)		–					70%		15%				7 to 12%			
	Braking transistor		–					Built-in						–			
	Minimum connective resistance		–					64	48	32	24	16	16	–			
	Torque [%]							130%	120%	130%	140%	150%	130%				
	Built-in braking resistance		–					80Ω		–							
		Braking time[s]	–					3.7s	3.4s	–							
		%ED	–					2.2	1.4	–							
	DC injection braking		–					Starting frequency:0.0 to 60.0Hz, Braking time: 0.0 to 30.0s, Braking level:0 to 80%									
EMC filter			–					EMC standard compliance: emission, immunity: category C3 (2nd Env.)(EN61800-3:2004)									
DC reactor (DCR) (*10)			–					Optional									Standard accessory
Applicable safety standards			–					UL508C, C22.2No.14 (pending), EN61800-5-1:2003									
Enclosure (IEC60529)			–					IP20 (IEC60529) closed type UL open type (UL 50)						IP00 open type, UL open type			
Cooling method			–					Fan cooling									
Weight/Mass [kg]			–					7.1	7.6	7.6	10.7	10.7	11.2	26	26	32	36

(75 to 630kW) LD (Low Duty) spec for light load

Item			Specifications														
Type(FRN□□□G1E-4J)			75	90	110	132	160	200	220	280	315	355	400	500	630		
Nominal applied motor [kW] (*1)			90	110	132	160	200	220	280	355	400	450	500	630	710		
Output ratings	Rated capacity [kVA] (*2)		134	160	192	231	287	316	396	495	563	640	731	891	1044		
	Rated voltage [V] (*3)		Three-phase 380 to 480V (with AVR)														
	Rated Current [A] (*4)		176	210	253	304	377	415	520	650	740	840	960	1170	1370		
	Overload capability		120% for 1min														
	Rated frequency [Hz]		50, 60Hz														
Input ratings	Main circuit power Phases, voltage, frequency		Three-phase 380 to 440V/50Hz Three-phase 380 to 480V/60Hz														
	Auxiliary control power input Phases, voltage, frequency		Single-phase 380 to 440V, 50/60Hz														
	Auxiliary power input for fan Phases, voltage, frequency (*5)		Single-phase 380 to 440V/50Hz Single-phase 380 to 480V/60Hz														
	Voltage, frequency variations		Voltage:+10 to -15% (Voltage unbalance:2% or less (*6)) Frequency:+5 to -5%														
	Rated current [A] (*7)	with DCR	164	210	238	286	357	390	500	628	705	789	881	1115	1256		
		without DCR	–	–	–	–	–	–	–	–	–	–	–	–	–		
	Required power supply capacity [kVA] (*8)	with DCR	114	140	165	199	248	271	347	436	489	547	611	773	871		
Braking	Torque [%] (*9)		7 to 12%														
	Braking transistor		–														
	Minimum connective resistance Torque [%]		–														
	DC injection braking		Starting frequency:0.0 to 60.0Hz, Braking time: 0.0 to 30.0s, Braking level:0 to 80%														
EMC filter			EMC standard compliance: emission, immunity: category C3 (2nd Env.) (EN61800-3:2004)														
DC reactor (DCR) (*10)			Standard accessory														
Applicable safety standards			UL508C, C22.2No.14 (pending), EN61800-5-1:2003														
Enclosure (IEC60529)			IP00 open type, UL open type														
Cooling method			Fan cooling														
Weight/Mass [kg]			43														

(*1) Fuji's 4-pole standard motor
(*2) Rated capacity is calculated by assuming the output rated voltage as 220V for three-phase 200V series and 440V for three-phase 400V series.
(*3) Output voltage cannot exceed the power supply voltage.
(*5) The auxiliary power input is used as an AC fan power input when combining the unit such as high power factor PWM converter with power regenerative function. (Generally not used.)
(*6) 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.
(*7) The value is calculated on assumption that the inverter is connected with a power supply capacity of 500kVA (or 10 times the inverter capacity if the inverter capacity exceeds 50kVA) and %X is 5%.
(*8) Obtained when a DC reactor (DCR) is used.
(*9) Average braking torque obtained by use of a motor. (Varies with the efficiency of the motor.)
(*10) The 55kW DC reactor (DCR) is optional with HD spec, and is provided as a standard accessory with LD spec.

Common Specifications

Item			Explanation	Remarks
Output frequency	Setting range	Maximum frequency	・25 to 500Hz (HD spec, V/f control *1, *2, *3) ・25 to 200Hz (HD spec, V/f control w/ PG/vector control w/ PG *4, *5, *7) ・25 to 120Hz (HD spec, sensorless vector control *6　LD spec, various controls*1 to 7)	
		Base frequency	・25 to 500Hz variable setting (LD spec: 120Hz)	
		Starting frequency	・0.1 to 60.0Hz variable setting　(sensorless vector control *6/ vector control w/ PG, 0.0Hz for *7)	
		Carrier frequency	・0.75 to 16kHz variable setting (HD spec: 0.4 to 5.5kW, LD spec: 5.5 to 22kW) ・0.75 to 10kHz variable setting (HD spec: 75 to 400kW, LD spec: 30 to 55kW) ・0.75 to 6kHz variable setting (HD spec: 500 to 630kW, LD spec: 75 to 500kW) ・0.75 to 4kHz variable setting (　　LD spec: 630kW) Note) Frequency drops automatically to protect the inverter depending on environmental temperature and output current. (This auto drop function can be canceled.)	
	Output frequency accuracy		・Analog setting: ±0.2% of max. frequency (at 25±10℃) *1 ・Keypad setting: ±0.01% of max. frequency (at -10 to +50℃)	
	Setting resolution		・Analog setting: 1/3000 of max. frequency (1/1500 with V2 input)　The resolution can be set in the function code. (0.01 to 500Hz) ・Keypad setting: 0.01Hz (99.99Hz or less), 0.1Hz (100.0 to 500Hz) ・Link setting: 1/20000 of max. frequency or 0.01Hz (fixed)	*8
	Speed control range		・Min. speed: Base speed　1:1500 (4P 1r/min to 1500r/min) *7 ・Min. speed: Base speed　1:200 (4P 7.5r/min to 1500r/min) *6 ・Min. speed: Base speed　1:100　1:200 (4P 15r/min to 1500r/min, 1024p/r) *4, *5 ・Min. speed: Base speed　1:4　*7 ・Min. speed: Base speed　1:2　*4 ,*5 ,*6	*8 *8 *8
	Speed control accuracy		・Analog setting: ±0.2% of max. frequency (at 25±10℃) *4,*5,*7 ・Digital setting: ±0.01% of max. frequency (at -10 to +50℃)	
			・Analog setting: ±0.5% or below of base speed (at 25±10℃) *6 ・Digital setting: ±0.5% or below of base speed (at -10 to +50℃)	*8
Control	Control method		・V/f control *1 ・Dynamic torque vector control *2 ・V/f control, the slip compensation is available. *3 ・V/f control　w/ speed sensor (PG optional) *4 ・Dynamic torque vector control w/ speed sensor (PG optional) *5 ・Speed sensorless vector control *6 ・Vector control w/ speed sensor (PG optional) *7	*8 *8 *8
	Voltage/freq. characteristic	200V series	・Base frequency and max. output frequency can be set to 80 to 240V　in common. ・The AVR control ON/OFF can be selected. *1, *4 ・Non-linear V/f setting (3 points): Free voltage (0 to 240V) and frequency (0 to 500Hz) can be set. *1, *4	
		400V series	・Base frequency and max. output frequency can be set to 160 to 240V　in common. ・The AVR control ON/OFF can be selected. *1, *4 ・Non-linear V/f setting (3 points): Free voltage (0 to 240V) and frequency (0 to 500Hz) can be set. *1, *4	
	Torque boost		・Auto torque boost (For constant torque load) *1 to *4 ・Manual torque boost: Torque boost value can be set between 0.0 and 20.0%. *1,*4 ・An applied load can be selected. (For constant torque load and variable torque load) *1,*4	
	Starting torque (HD spec)		・22kW or below: 200% or higher, 30kW or above: 180% or higher/set frequency: 0.3Hz *6 ・22kW or below: 200% or higher, 30kW or above: 180% or higher/set frequency: 0.3Hz　Base frequency 50Hz, slip compensation and auto torque boost operation *1 to*4	*8
	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	: Can be set with ∧ and ∨ keys	"DC+1 to +5V" can be adjusted with bias and analog input gain.
			External Volume: Can be set with external potentiometer. (1 to 5kΩ 1/2W)	
			Analog Input : 0 to ±10V DC (±5V DC)/0 to ±100% (terminal 12,V2) , 0 to +10V DC (+5V DC)/0+ +100% (terminal 12,V2) : +4 to +20mA DC/0 to 100% (terminal C1)	
			UP/DOWN operation: Frequency can be increased or decreased while the digital input signal is ON.	
			Multistep frequency: Selectable from 16 steps (step 0 to 15)	
			Linked operation: Frequency can be set through RS-485.　(Standard setting)	
			Switching frequency setting: Frequency setting can be switched (2 settings) with external signal (digital input).　Remote/local switching, link switching	
			Auxiliary frequency setting: Terminal 12, C1 or V2 input can be selected respectively as an additional input.	
			Operation at a specified ratio: The ratio can be set by analog input signal.	
			Inverse operation: The setting "0 to +10V DC/0 to 100%" can be switched to "+10 to 0V DC/0 to 100%" by external command. : The setting "4 to +20mA DC/0 to 100%" can be switched to "+20 to 4mA DC/0 to 100%" by external command.	
			Pulse train input: Pulse input = X7 terminal, rotational direction = general terminal Complementary output: Max. 100kHz, Open collector output: Max. 30kHz	
			Pulse train input: PG interface option CW/CCW pulse, pulse + rotational direction Complementary output: Max. 100kHz, Open collector output: Max. 25kHz	
	Acceleration/deceleration time		Setting range: Between 0.00 and 6000s	
			Switch: The four types of accel./decel. time can be set or selected individually (switchable during operation).	
			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 STOP .	
			Auto tuning by shortest accel./decel. mode and optimal accel./decel. mode	*8

Item		Explanation	Remarks
Control	Frequency limiter (Upper limit and lower limit frequencies)	・Both upper and lower limit frequencies can be variably set in hertz. ・It is possible to choose the operation done when the set frequency drops below the lower limit from between continuous operation at lower limit frequency and operation stop.	
	Bias frequency	・Bias of set frequency and PID command can be independently set (setting range: 0 to ±100%).	
	Analog input	・Gain　: Set in the range from 0 to 200% ・Off-set : Set in the range from -5.0 to +5.0% ・Filter　: Set in the range from 0.00s to 5.00s	
	Jump frequency	・Actuation points (3 points) and their common jump widths (0 to 30.0Hz) can be set.	
	Jogging operation	・Operation with RUN key (remote keypad), FWD , or REV key (multifunction keypad), or digital contact input FWD , REV (Exclusive accel/decel time setting, exclusive frequency setting)	
	Auto-restart after momentary power failure	・Trip at power failure: The inverter trips immediately after power failure. ・Trip at power recovery: Coast-to-stop at power failure and trip at power recovery ・Deceleration stop: Deceleration stop at power failure, and trip after stoppage ・Continuous operation: Operation is continued using the load inertia energy. ・Start at the frequency selected before momentary stop: Coast-to-stop at power failure and start after power recovery at the frequency selected before momentary stop. *1 to *3 ・Start at starting frequency: Coast-to-stop at power failure and start at the starting frequency after power recovery.　*1 to *3	
	Current limit by hardware	・Limiting the current by hardware to prevent overcurrent trip due to sharp load change or momentary power failure which cannot be controlled by software current limit (This function can be cancelled.)	
	Operation by commercial power supply	・With commercial power selection command, the inverter outputs 50/60Hz (SW50, SW60). *1 to *3　・The inverter has the commercial power supply selection sequence.	
	Slip compensation	・Compensates for decrease in speed according to the load. *1 to *3	
	Droop control	・Decreases the speed according to the load torque.	
	Torque limit	・Switchable between 1st or 2nd torque limit values ・Torque limit, torque current limit, and power limit are set for each quadrant. *6, *7 ・Analog torque limit input	*8
	Current control (software current limit)	・Automatically reduces the frequency so that the output current becomes lower than the preset operation level. *1 to *5	
	PID Control	・PID adjuster for process control and that for dancer control ・Switchable between forward and reverse operations ・Low liquid level stop function (pressurized operation possible before low liquid level stop)・ PID command: Keypad, analog input (from terminals 12, C1, V2), RS485 communication ・PID feedback value (from terminals 12, C1,V2) ・Alarm output (absolute value alarm, deviation alarm)　・PID output limiter　・Integration reset/hold ・Anti-reset wind-up function	
	Pick-up	・Estimates the speed of the motor running under no load and starts the motor without stopping it. (Motor electric constant needs tuning: Offline tuning)　*1 to * 3 and *6	
	Automatic deceleration	・If the DC link bus voltage or calculated torque exceeds the automatic deceleration level during deceleration, the inverter automatically prolongs the deceleration time to avoid overvoltage trip. (It is possible to select forcible deceleration actuated when the deceleration time becomes three times longer.) ・If the calculated torque exceeds automatic deceleration level during constant speed operation, the inverter avoids overvoltage trip by increasing the frequency.	
	Deceleration characteristic (improved braking capacity)	・The motor loss is increased during deceleration to reduce the regenerative energy in the inverter to avoid overvoltage trip. *1, *4	
	Automatic energy-saving operation	・The output voltage is controlled to minimize the total sum of the motor loss and inverter loss at a constant speed. (With digital input signal, automatic energy saving mode　can be turned ON or OFF by an external device.)	*8
	Overload prevention control	・If the ambient temperature or GBT joint　temperature increases due to overload, the inverter lowers the output frequency to avoid overload.	
	Off-line tuning	・Rotary type and non-rotary type are available for tuning the motor constant.	
	On-line tuning	・Used as a motor constant for compensating the temperature change	*8
	Cooling fan ON/OFF control	・Detects the internal temperature of the inverter and stops the cooling fan when the temperature is low. ・The fan control signal can be output to an external device.	
	Settings for 2nd to 4th motors	・Switchable among the four motors ・Code data for four kinds of　specific functions can be switched　(even during operation). It is possible to set the base frequency, rated current, torque boost, and electronic thermal slip compensation as the data for 1st to 4th motors.	*8
	Universal DI	・The status of external digital signal connected with the universal digital input terminal is transferred to the host controller.	
	Universal DO	・Digital command signal from the host controller is output to the universal digital output terminal.	
	Universal AO	・The analog command signal from the host controller is output to the　analog output terminal.	
	Overload stop function	・When the torque or the current exceeds the set value, the inverter slows down and stop or coast-to-stop the motor. When the motor is stopped by hitting, the inverter controls the current to secure the holding torque. *1 to *5	*8
	Speed control	・Notch filter for vibration control, vibration suppressing observer. *7 ・Estimates the GD² value applied to the motor shaft from the load, and automatically controls the ASR system constant. *6 and *7	*8
	Preliminary excitation	・Excitation is carried out to create the motor flux before starting the motor. *6 and*7	
	Zero speed control	・The motor speed is held to zero by forcibly zeroing the speed command. *7	
	Servo lock	・Stops the inverter and holds the motor in stop position. *7	*8
	Torque control　*6, *7	・Analog torque command input ・Speed limit function is provided to prevent the motor from becoming out of control.	*8
	Rotating direction control	・Preventing reverse　rotation　・Preventing forward rotation	
	Preventing condensation in motor	・When the inverter is stopped, current is automatically supplied　to the motor to keep the motor warm and avoid condensation.	
	Customized logic interface	・Available in 10 steps with the functions of 2-input, 1-output, logical operation, and timer function	*8
Display	Run / Stop	・Speed monitor (set frequency, output frequency, motor speed, load shaft speed, line speed, and speed indication with percent) Output current [A], output voltage [V], calculated torque, input power [kW], PID reference value, PID feedback value, PID output	
	Inverter life warning	・Life judgment of the main circuit capacitor, electrolytic capacitor on printed circuit board, and cooling fan ・Life warning information can be output to an external device. ・Ambient temperature: 40℃, Load rate: inverter rated current 100% (LD type: 80%)	
	Cumulative running hours	・Displays the inverter cumulative running hours, integrated power, cumulative motor running hours, and the number of operation start times (of each motor). ・Outputs the warning when the maintenance time or the number of start times has exceeded the preset.	
	Trip mode	・Displays the cause of trip.	
	Light-alarm	・Shows the light-alarm display [L-AL].	
	Running　or trip mode	・Trip history: Saves and displays the cause of　the last four trips (with a code). ・Also saves and displays the detailed data recorded on occurrence of the last four trips.	

*1　Effective function in V/f control
*2　Effective function in dynamic torque vector control
*3　Effective function when the slip compensation is made active under V/f control
*4　Effective function under the V/f control with speed sensor (PG option is necessary.)
*5　Effective function in dynamic torque vector control with speed sensor. (PG option is necessary.)
*6　Effective function in vector control without speed sensor
*7　Effective function in vector control with speed sensor (PG option is necessary.)
*8　Function not incorporated in the inverters of initial version

Common Specifications

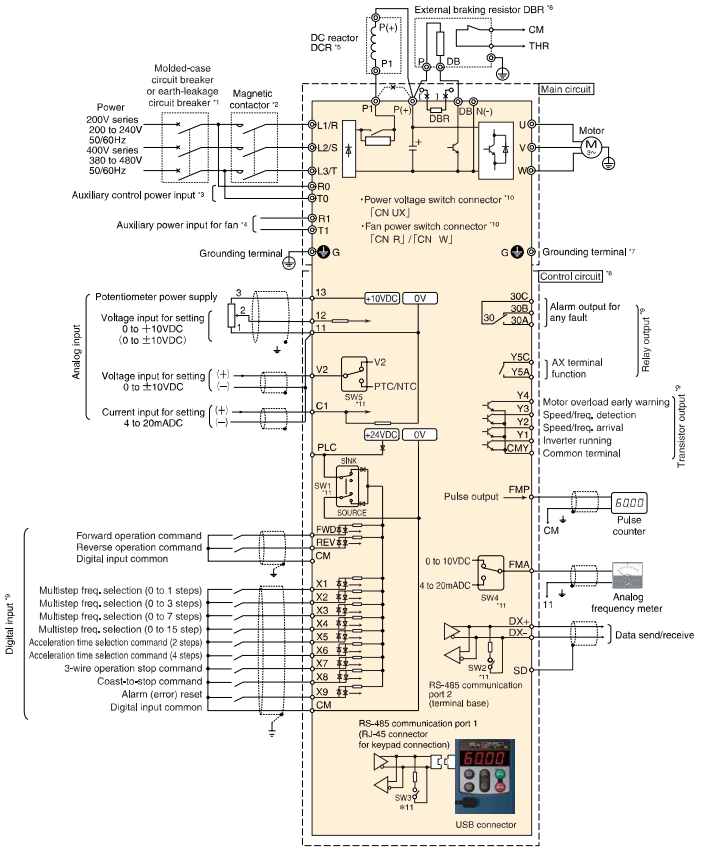
	Item		Explanation	Remarks
Control	Overcurrent protection		・The inverter is stopped for protection against overcurrent.	
	Short circuit protection		・The inverter is stopped for protection against overcurrent caused by a short circuit in the output circuit.	OC1,OC2,OC3
	Grounding fault protection		・The inverter is stopped for protection against overcurrent caused by a grounding fault in the output circuit. (200V 22kW, 400V 22kW or below)	
			・Detecting zero-phase current of output current, the inverter is stopped for protection against overcurrent caused by a grounding fault in the output circuit. (200V 30kW, 400V 30kW or above)	EF
	Overvoltage protection		・An excessive voltage (200V series: 400V DC, 400V series: 800V DC) in the DC link circuit is detected and the inverter is stopped. If an excessive voltage is applied by mistake, the protection can not be guaranteed.	OU1,OU2,OU3
	Under voltage protection		・The voltage drop (200V series: 200V DC, 400V series: 400V DC) in the DC link circuit is detected to stop the inverter. However, the alarm will not be issued when the re-starting after instantaneous stop is selected.	LU
	Input phase loss protection		・The input phase loss is detected to shut off the inverter output. This function protects the inverter. ・When the load to be connected is small or DC REACTOR is connected a phase loss is not detected.	Lin
	Output phase loss protection		・Detects breaks in inverter output wining during running, to shut off the inverter output.	OPL
	Overheating protection		・Stop the inverter output detecting excess cooling fan temperature in case of a cooling fan fault or overload. ・Stop the inverter output detecting a fault of inner agitating fan. (200V 45kW, 400V 75kW or above)	OH1
			・Stop the inverter output detecting inner temperature of the inverter unit for a cooling fan fault or overload.	OH3
			・Protect the braking resistor from over heat by setting the braking resistor electronic thermal function.	dbH
	Overload protection		・Stop the inverter output detecting a cooling unit temperature of the inverter cooling fan and a switching element temperature calculated with the output current.	OLU
	External alarm input		・With the digital input signal (THR) opened, the inverter is stopped with an alarm.	OH2
	Fuse breaking		・Stop the inverter output detecting the fuse breaking of the main circuit in the inverter. (200V 75kW, 400V 90kW or above)	FUS
	Charge circuit abnormality		・Stop the inverter output detecting the charge circuit abnormality in the inverter. (200V 37kW, 400V 75kW or above)	PbF
	Brake transistor abnormality		・Stop the inverter detecting the brake transistor abnormality. (DB transistor built-in type only)	dbAL
	Over-speed protection *4 to *7		・Stop the inverter when the detected speed exceeds 120% of max. output frequency.	OS
	PG breakwire *4 *5 *7		・Stop the inverter detecting the PG breaking.	Pg
	Motor protection	Electronic thermal	・The inverter is stopped with an electronic thermal function set to protect the motor. Protects the general-purpose motor inverter over all frequency range.(The running level and thermal time constant (0.5 to 75.0 min) can be set.)	OL1～OL4
		PTC thermistor	・A PTC thermistor input stops the inverter to protect the motor. Connect a PTC thermistor between terminal V2 and 11 and set the switch on control print board and the function code.	OH4
		NTC thermistor	・The NTC thermistor detects a motor temperature. Connect a NTC thermistor between terminal V2 and 11 and set the switch on control print board and the function code.	
		NTC thermistor breaking	・Stop the inverter output detecting the built-in motor NTC breaking.	nrb
		Overload early warning	・Warning signal is output at the predetermined level before stopping the inverter with electronic thermal function.	—
	Memory error		・Data is checked upon power-on and data writing to detect any fault in the memory and to stop the inverter if any.	Er1
	Keypad communication error		・The keypad is used to detect a communication fault between the keypad and inverter main body during operation and to stop the inverter.	Er2
	CPU error		・Stop the invert detecting a CPU error or LSI error caused by noise.	Er3
	Option communication error		・When each option is used, a fault of communication with the inverter main body is detected to stop the inverter.	Er4
	Option error		・When each option is used, the option detects a fault to stop the inverter.	Er5
	Operation error		・STOP key priority Pressing the STOP key on the keypad or entering the digital input signal will forcibly decelerate and stop the motor even if the operation command through signal input or communication is selected. Er6 will be displayed after the stop. ・Start check: If the running command is being ordered when switching the running command method from power-on, alarm reset, or the linked operation, the operation starts suddenly. This function bans running and displays Er6.	Er6
	Tuning error		・Stop the inverter output when tuning failure, interruption, or any fault as a result of tuning is detected during tuning for motor constant.	Er7
	RS-485 communication error (port1)		・When the connection port of the keypad connected via RS485 communication port to detect a communication error, the inverter is stopped and displays an error.	Er8
	Speed deviation excess *4 to *7		・Stop the inverter output when the speed deviation excesses the specified value (difference between speed command and feedback).	ErE
	Data save error upon undervoltage		・When the undervoltage protection function works, an alarm is displayed if the data is not properly saved.	ErF
	RS-485 communication error (port2)		・Stop the inverter output detecting the communication error between the inverter main unit and a mate when the RS-485 connection port of the touch panel is used to configure the network.	ErP
	Hardware error		・Stop the inverter output detecting the LSI abnormality of the print board for power supply which is mainly caused by noise.	ErH
	Simulation error		・Simulated alarm is output by the keypad operation.	Err
	PID feedback breaking detection		・Stop the inverter output detecting a breaking when the input current is allocated to the PID control feedback. (Select valid/invalid.)	CoF
	Alarm relay output (for any fault)		・The relay signal is output when the inverter stops upon an alarm. ・PRG/RESET key is used to reset the alarm stop state.	
	Light-alarm (warning)		・The "light-alarm" display is indicated when alarm or warning matters set as minor troubles occurred. The operation is continued. Registration objects: Heat sink overheat (OH1), external alarm(OH2), overheat inside the inverter (OH3), motor overheat (OH4), braking resistor overheat (dbH), motor overload (OL1-OL4), keypad communication error (Er2), optional communication error (Er4), Optional error 8Er5), RS-485 communication error (port1) (Er8), Speed variance (excessive speed deviation) (ErE), RS-485 communication error (port2)(ErP), DC fan lock detection, overload prediction (for motor), cooling fan overheat prediction, life prediction (main circuit capacitor capacity, electrolytic capacitor on the print board or cooling fan), thermistor detection (PTC), machine life (motor running accumulated time error), machine life (number of starting times error)	L—AL
	Stall prevention		・Operates when the inverter output goes beyond the instantaneous overcurrent limiting level, and avoids tripping, during acceleration and constant speed operation.	
	Retry function		・When the motor is tripped and stopped, this function automatically resets the tripping state and restarts operation.	
	Surge protection		・The inverter is protected against surge voltage intruding between the main circuit power line and ground.	
	Command loss detection		・A loss (breaking, etc.) of the frequency command is detected to output an alarm and the operation is continued at the preset frequency (set at a ratio to the frequency before detection).	
	Momentary power failure protection		・A protective function (inverter stoppage) is activated upon a momentary power failure for 15msec or longer. ・If restart upon momentary power failure is selected, the inverter restarts upon recovery of the voltage within the set time.	
Environment	Installation location		・Shall be free from corrosive gases, flammable gases, oil mist, dusts, direct sunlight.(Pollution degree 2 (IEC60664-1)). Indoor use only.	
	Ambient temperature		・-10 to +50℃ (-10 to +40℃ when installed side-by-side without clearance (22kW or below))	
	Ambient humidity		・5 to 95% RH (without condensation)	
	Altitude		・Lower than 1,000m	
	Vibration		200V 55kW, 400V 75kW or below: 3mm : 2 to less than 9Hz, 9.8m/s2 : 9 to less than 20Hz, 2m/s2 : 20 to less than 55Hz, 1m/s 2.55 to less than 200Hz 200V 75kW, 400V 90kW or above: 3mm : 2 to less than 9Hz, 2m/s2 : 9 to less than 55Hz, 1m/s2 : 55 to less than 200Hz	
	Storage temperature		・-25 to +65℃	
	Storage humidity		・5 to 95% RH (without condensation)	

*1 Effective function in V/f control
*2 Effective function in dynamic torque vector control
*3 Effective function when the slip compensation is made active under V/f control
*4 Effective function under the V/f control with speed sensor (PG option is necessary.)
*5 Effective function in dynamic torque vector control with speed sensor. (PG option is necessary.)
*6 Effective function in vector control without speed sensor
*7 Effective function in vector control with speed sensor (PG option is necessary.)
*8 Function not incorporated in the inverters of initial version

Basic Wiring Diagram

Wiring of main circuit terminal and grounding terminal

Basic wiring diagram



*1 Install a recommended molded-case circuit breaker (MCCB) or an earth-leakage circuit-breaker (ELCB) (with an overcurrent protection function) in the primary circuit of the inverter to protect wiring. At this time, 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 ELCB, when necessary.
*3 Connect this terminal to the power source to maintain the alarm relay output issued by the protective function or to keep displaying the touch panel at the break of inverter main power.
*4 The auxiliary input is not necessary to be connected generally. Use this when combining the unit such as high power factor power regenerative PWM converter: RHS series (hereafter described as PWM converter).
*5 Remove the short bar between P1 and P(+) terminals when connecting the DC reactor (DCR) (optional). Be sure to connect the DC reactor since the 55kW motor with LD spec and 75kW or higher motor are equipped with it as the standard accessory. Use the DC reactor when the power supply transformer capacity is 500kVA or higher and is 10 or more times the rated capacity of the inverter, or a thyristors transformer is connected as a load on the same transformer.
*6 The built-in braking resistor is connected between terminal P(+) and DB in the inverter of 7.5kW or lower models. It is necessary to disconnect the built-in braking resistor when connecting an external braking resistor (optional).
*7 A grounding terminal for the motor. Connect it as necessary.
*8 For the control signal wires, use shielded or twisted wires. Ground the shielded wires. To prevent malfunction due to noise, keep the control circuit wiring away from the main circuit wiring as far as possible (recommended: 10cm 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.
*9 Each function assigned for following terminals are set as the factory setting: terminal FWD, REV and X1 to X9 (digital input), terminal Y1 to Y4 (transistor output), and terminal Y5A/C, 30A/B/C (relay output).
*10 The connector to switch the main circuit. See the User's Manual for the detail.
*11 Various switches on the control print board, which set inverter operation. See the User's Manual for the detail.

Function Settings

●F codes: Fundamental Functions

Code	Name	Data setting range	Change when running	Data copying	Default setting	Drive control V/f	Drive control Vector
F00	Data Protection	0 : Disable both data protection and digital reference protection 1 : Enable data protection and disable digital reference protection 2 : Disable data protection and enable digital reference protection 3 : Enable both data protection and digital reference protection	○	○	0	○	○
F01	Frequency Command 1	0 : ▲ / ▼ keys on keypad 1 : Analog voltage input to terminal [12] (-10 to +10 VDC) 2 : Analog current input to terminal [C1] (4 to 20 mA DC) 3 : Analog sum of voltage and current inputs to terminals [12] and [C1] 5 : Analog voltage input to terminal [V2] (0 to ±10 VDC) 7 : Terminal command UP/DOWN control 8 : ▲ / ▼ keys on keypad(balanceless-bumpless switching available) 12 : Pulse train input	×	○	0	○	○
F02	Operation Method	0 : RUN/STOP keys on keypad (Motor rotational direction specified by terminal command FWD/REV) 1 : External signal (digital input) 2 : RUN/STOP keys on keypad (forward) 3 : RUN/STOP keys on keypad (reverse)	×	○	2	○	○
F03	Maximum Frequency 1	25.0 to 500.0 Hz	×	○	60.0	○	○
F04	Base Frequency 1	25.0 to 500.0 Hz	×	○	50.0	○	○
F05	Rated Voltage at Base Frequency 1	0 : Output a voltage in proportion to input An AVR-uncontrolled voltage 80 to 240 V : Output an AVR-controlled voltage(for 200 V class series) 160 to 500 V : Output an AVR-controlled voltage(for 400 V class series)	×	△2	200 400	○	○
F06	Maximum Output Voltage 1	80 to 240 V : Output an AVR-controlled voltage(for 200 V class series) 160 to 500 V : Output an AVR-controlled voltage(for 400 V class series)	×	△2	200 400	○	×
F07	Acceleration Time 1	0.00 to 6000 s	○	○	*1	○	○
F08	Deceleration Time 1	Note: Entering 0.00 cancels the acceleration time, requiring external soft-start.	○	○	*1	○	○
F09	Torque Boost 1	0.0% to 20.0% (percentage with respect to "Rated Voltage at Base Frequency 1")	○	○	*2	○	×
F10	Electronic Thermal Overload Protection for Motor 1 (Select motor characteristics)	1 : For a general-purpose motor with shaft-driven cooling fan 2 : For an inverter-driven motor, non-ventilated motor, or motor with separately powered cooling fan	○	○	1	○	○
F11	(Overload detection level)	0.00: Disable 1% to 135% of the rated current (allowable continuous drive current) of the motor	○	△1△2	*3	○	○
F12	(Thermal time constant)	0.5 to 75.0 min	○	○	*4	○	○
F14	Restart Mode after Momentary Power Failure (Mode selection)	0 : Trip immediately 1 : Trip after a recovery from power failure 2 : Trip after decelerate-to-stop 3 : Continue to run, for heavy inertia or general loads 4 : Restart at the frequency at which the power failure occurred, for general loads 5 : Restart at the starting frequency	○	○	1	○	○
F15	Frequency Limiter (High)	0.0 to 500.0 Hz	○	○	70.0	○	○
F16	(Low)	0.0 to 500.0 Hz	○	○	0.0	○	○
F18	Bias (Frequency command 1)	-100.00% to 100.00%	◎	○	0.00	○	○
F20	DC Braking 1 (Braking starting frequency)	0.0 to 60.0 Hz	○	○	0.0	○	○
F21	(Braking level)	0% to 100% (HD mode), 0% to 80% (LD mode)	○	○	0	○	○
F22	(Braking time)	0.00 (Disable); 0.01 to 30.00 s	○	○	0.00	○	○
F23	Starting Frequency 1	0.0 to 60.0 Hz	○	○	0.5	○	○
F24	(Holding time)	0.00 to 10.00 s	○	○	0.00	○	○
F25	Stop Frequency	0.0 to 60.0 Hz	○	○	0.2	○	○
F26	Motor Sound (Carrier frequency)	0.75 to 16 kHz (HD-mode inverters with 55 kW or below and LD-mode ones with 22 kW or below) 0.75 to 10 kHz (HD-mode inverters with 75 to 630 kW and LD-mode ones with 30 to 55 kW) 0.75 to 6 kHz (LD-mode inverters with 75 to 630 kW)	○	○	2	○	○
F27	(Tone)	0 : Level 0 (Inactive) 1 : Level 1 2 : Level 2 3 : Level 3	○	○	0	○	×
F29	Terminal [FMA] (Mode selection)	0 : Output in voltage (0 to 10 VDC) 1 : Output in current (4 to 20 mA)	○	○	0	○	○
F30	(Gain to output voltage)	0% to 300%	◎	○	100	○	○
F31	(Function)	0 : Output frequency 1 (before slip compensation) 1 : Output frequency 2 (after slip compensation) 2 : Output current 3 : Output voltage 4 : Output torque 5 : Load factor 6 : Consumption power 7 : PID feedback amount 8 : PG feedback value 9 : DC link bus voltage 10 : Universal AO 13 : Motor output 14 : Analog output test (+) 15 : PID command (SV) 16 : PID output (MV)	○	○	0	○	○
F33	Terminal [FMP] (Pulse rate)	25 to 6000 p/s (Pulse rate at 100% output)	◎	○	1440	○	○
F34	(Gain to output voltage)	0%: Output pulse rate (Fixed at 50% duty) 1% to 300%: Voltage output adjustment (Pulse rate fixed at 2000 p/s. Adjust the maximum pulse duty.)	◎	○	0	○	○
F35	(Function)	0 : Output frequency 1 (before slip compensation) 1 : Output frequency 2 (after slip compensation) 2 : Output current 3 : Output voltage 4 : Output torque 5 : Load factor 6 : Consumption power 7 : PID feedback amount 8 : PG feedback value	○	○	0	○	○

●F codes: Fundamental Functions

Code	Name	Data setting range	Change when running	Data copying	Default setting	Drive control V/f	Drive control Vector
F35	Terminal [FMP] (Function)	9 : DC link bus voltage 10 : Universal AO 13 : Motor output 14 : Analog output test (+) 15 : PID command (SV) 16 : PID output (MV)	○	○	0	○	○
F37	Load Selection/ Auto Torque Boost/ Auto Energy Saving Operation 1	0 : Variable torque load 1 : Constant torque load 2 : Auto torque boost 3 : Auto energy saving(Variable torque load during ACC/DEC) 4 : Auto energy saving(Constant torque load during ACC/DEC) 5 : Auto energy saving(Auto torque boost during ACC/DEC)	×	○	1	○	○
F38	Stop Frequency (Detection mode)	0 : Detected speed 1 : Commanded speed	×	○	0	×	○
F39	(Holding Time)	0.00 to 10.00 s	○	○	0.00	○	○
F40	Torque Limiter 1-1	-300% to 300%; 999 (Disable)	○	○	999	○	○
F41	1-2	-300% to 300%; 999 (Disable)	○	○	999	○	○
F42	Drive Control Selection 1	0 : V/f control with slip compensation inactive 1 : Dynamic torque vector control 2 : V/f control with slip compensation active 6 : Vector control with speed sensor	×	○	0		
F43	Current Limiter (Mode selection)	0 : Disable (No current limiter works.) 1 : Enable at constant speed (Disable during ACC/DEC) 2 : Enable during ACC/constant speed operation	○	○	2	○	×
F44	(Level)	20% to 200% (The data is interpreted as the rated output current of the inverter for 100%.)	○	○	160	○	×
F50	Electronic Thermal Overload Protection for Braking Resistor (Discharging capability)	0 (Braking resistor built-in type), 1 to 9000 kWs, OFF (Disable)	○	△1△2	*5	○	○
F51	(Allowable average loss)	0.001 to 99.99 kW	○	△1△2	0.001	○	○
F52	(Resistance)	0.01 to 999Ω	○	△1△2	0.01	○	○
F80	Switching between HD and LD drive modes	0 : HD (High Duty) mode 1 : LD (Low Duty) mode	×	○	0	○	○

●E codes: Extension Terminal Functions

Code	Name	Data setting range	Change when running	Data copying	Default setting	Drive control V/f	Drive control Vector
E01	Terminal [X1] Function	0 (1000) : Select multi-frequency (0 to 1 steps) (SS1)	×	○	0	○	○
E02	Terminal [X2] Function	1 (1001) : Select multi-frequency (0 to 3 steps) (SS2)	×	○	1	○	○
E03	Terminal [X3] Function	2 (1002) : Select multi-frequency (0 to 7 steps) (SS4)	×	○	2	○	○
E04	Terminal [X4] Function	3 (1003) : Select multi-frequency (0 to 15 steps) (SS8)	×	○	3	○	○
E05	Terminal [X5] Function	4 (1004) : Select ACC/DEC time (2 steps) (RT1)	×	○	4	○	○
E06	Terminal [X6] Function	5 (1005) : Select ACC/DEC time (4 steps) (RT2)	×	○	5	○	○
E07	Terminal [X7] Function	6 (1006) : Enable 3-wire operation (HLD)	×	○	6	○	○
E08	Terminal [X8] Function	7 (1007) : Coast to a stop (BX)	×	○	7	○	○
E09	Terminal [X9] Function	8 (1008) : Reset alarm (RST)	×	○	8	○	○
	(Function)	9 (1009) : Enable external alarm trip (9 = Active OFF, 1009 = Active ON) (THR)				○	○
		10 (1010) : Ready for jogging (JOG)				○	○
		11 (1011) : Select frequency command 2/1 (Hz2/Hz1)				○	○
		12 (1012) : Select motor 2 (M2)				○	○
		13 : Enable DC braking (DCBRK)				○	○
		14 (1014) : Select torque limiter level 2/1 (TL2/TL1)				○	○
		15 : Switch to commercial power (50 Hz) (SW50)				○	×
		16 : Switch to commercial power (60 Hz) (SW60)				○	×
		17 (1017) : UP (Increase output frequency) (UP)				○	○
		18 (1018) : DOWN (Decrease output frequency) (DOWN)				○	○
		19 (1019) : Enable data change with keypad (WE-KP)				○	○
		20 (1020) : Cancel PID control (Hz/PID)				○	○
		21 (1021) : Switch normal/inverse operation (IVS)				○	○
		22 (1022) : Interlock (IL)				○	○
		24 (1024) : Enable communications link via RS-485 or field bus (option) (LE)				○	○
		25 (1025) : Universal DI (U-DI)				○	○
		26 (1026) : Enable auto search for idling motor speed at starting (STM)				○	×
		30 (1030) : Force to stop (30 = Active OFF, 1030 = Active ON) (STOP)				○	○
		32 (1032) : Pre-excitation (EXCITE)				×	○
		33 (1033) : Reset PID integral and differential components (PID-RST)				○	○
		34 (1034) : Hold PID integral component (PID-HLD)				○	○
		35 (1035) : Select local (keypad) operation (LOC)				○	○
		36 (1036) : Select motor 3 (M3)				○	○
		37 (1037) : Select motor 4 (M4)				○	○
		39 : Protect motor from dew condensation (DWP)				○	○
		40 : Enable integrated sequence to switch to commercial power (50 Hz) (ISW50)				○	×
		41 : Enable integrated sequence to switch to commercial power (60 Hz) (ISW60)				○	×
		48 : Pulse train input (available only on terminal [X7] (E07)) (PIN)				○	○
		49 (1049) : Pulse train sign (available on terminals except [X7] (E01 to E06, E08 and E09)) (SIGN)				○	○
		72 (1072) : Count the run time of commercial power-driven motor 1 (CRUN-M1)				○	×
		73 (1073) : Count the run time of commercial power-driven motor 2 (CRUN-M2)				○	×

The shaded function codes ( ) are applicable to the quick setup.

*1 6.00 s for inverters with a capacity of 22 kW or below; 20.00 s for those with 30 kW or above.

*2 The factory default differs depending upon the inverter's capacity. See Table 5.1.

*3 The motor rated current is automatically set. See Table 5.2 (function code P03).

*4 5.0s min for inverters with a capacity of 22 kW or below; 10.0s min for those with 30 kW or above.

*5 0 for inverters with a capacity of 7.5 kW or below; OFF for those with 0.11 kW or above.

<Data change, reflection and strage> ×: Not available ○: After changing data with using ▲ ▼ keys, execute and save data by pressing ⏎ key. ○: After changing and executing data with using ▲ ▼ keys, save the data by pressing ⏎ key.

Function Settings

●E codes: Extension Terminal Functions

Code	Name	Data setting range	Change when running	Data copying	Default setting	Drive control V/f	Drive control Vector
E09	Terminal [X9] Function	74 (1074) : Count the run time of commercial power-driven motor 3 (CRUN-M3) 75 (1075) : Count the run time of commercial power-driven motor 4 (CRUN-M4) 76 (1076) : Select droop control (DROOP) Setting the value of 1000s in parentheses ( ) shown above assigns a negative logic input to a terminal.	×	○	8	○	×
E10	Acceleration Time 2	0.00 to 6000 s Note: Entering 0.00 cancels the acceleration time, requiring external soft-start and-stop.	○	○	*1	○	○
E11	Deceleration Time 2		○	○	*1	○	○
E12	Acceleration Time 3		○	○	*1	○	○
E13	Deceleration Time 3		○	○	*1	○	○
E14	Acceleration Time 4		○	○	*1	○	○
E15	Deceleration Time 4		○	○	*1	○	○
E16	Torque Limiter 2-1	-300% to 300%; 999 (Disable)	○	○	999	○	○
E17	Torque Limiter 2-2	-300% to 300%; 999 (Disable)	○	○	999	○	○
E20	Terminal [Y1] Function (Function)	0 (1000) : Inverter running (RUN)	×	○	0	○	○
E21	Terminal [Y2] Function	1 (1001) : Frequency (speed) arrival signal (FAR)	×	○	1	○	○
E22	Terminal [Y3] Function	2 (1002) : Frequency (speed) detected (FDT)	×	○	2	○	○
E23	Terminal [Y4] Function	3 (1003) : Undervoltage detected (Inverter stopped) (LU)	×	○	7	○	○
E24	Terminal [Y5A/C] Function	4 (1004) : Torque polarity detected (B/D)	×	○	15	○	○
E27	Terminal [30A/B/C] Function (Relay output)	5 (1005) : Inverter output limiting (IOL)	×	○	99	○	○
		6 (1006) : Auto-restarting after momentary power failure (IPF)				○	○
		7 (1007) : Motor overload early warning (OL)				○	○
		8 (1008) : Keypad operation enabled (KP)				○	○
		10 (1010) : Inverter ready to run (RDY)				○	○
		11 : Switch motor drive source between commercial power and inverter output (SW88)				○	×
		12 : Switch motor drive source between commercial power and inverter output (SW52-2)				○	×
		13 : Switch motor drive source between commercial power and inverter output (SW52-1)				○	×
		15 (1015) : Select AX terminal function (For MC on primary side) (AX)				○	×
		22 (1022) : Inverter output limiting with delay (IOL2)				○	○
		25 (1025) : Cooling fan in operation (FAN)				○	○
		26 (1026) : Auto-resetting (TRY)				○	○
		27 (1027) : Universal DO (U-DO)				○	○
		28 (1028) : Heat sink overheat early warning (OH)				○	○
		30 (1030) : Lifetime alarm (LIFE)				○	○
		31 (1031) : Frequency (speed) detected 2 (FDT2)				○	○
		33 (1033) : Reference loss detected (REF OFF)				○	○
		35 (1035) : Inverter output on (RUN2)				○	○
		36 (1036) : Overload prevention control (OLP)				○	○
		37 (1037) : Current detected (ID)				○	○
		38 (1038) : Current detected 2 (ID2)				○	○
		39 (1039) : Current detected 3 (ID3)				○	○
		41 (1041) : Low current detected (IDL)				○	○
		42 (1042) : PID alarm (PID-ALM)				○	○
		43 (1043) : Under PID control (PID-CTL)				○	○
		44 (1044) : Motor stopped due to slow flowrate under PID control (PID-STP)				○	○
		45 (1045) : Low output torque detected (U-TL)				○	○
		46 (1046) : Torque detected 1 (TD1)				○	○
		47 (1047) : Torque detected 2 (TD2)				○	○
		48 (1048) : Motor 1 selected (SWM1)				○	○
		49 (1049) : Motor 2 selected (SWM2)				○	○
		50 (1050) : Motor 3 selected (SWM3)				○	○
		51 (1051) : Motor 4 selected (SWM4)				○	○
		52 (1052) : Running forward (FRUN)				○	○
		53 (1053) : Running reverse (RRUN)				○	○
		54 (1054) : In remote operation (RMT)				○	○
		56 (1056) : Motor overheat detected by thermistor (THM)				○	○
		57 (1057) : Brake signal (BRKS)				○	○
		58 (1058) : Frequency (speed) detected 3 (FDT3)				○	○
		59 (1059) : Terminal [C1] wire break (C1OFF)				○	○
		70 (1070) : Speed valid (DNZS)				×	○
		71 (1071) : Speed agreement (DSAG)				×	○
		72 (1072) : Frequency (speed) arrival signal 3 (FAR3)				○	○
		76 (1076) : PG error detected (PG-ERR)				×	○
		84 (1084) : Maintenance timer (MNT)				○	○
		98 (1098) : Light alarm (L-ALM)				○	○
		99 (1099) : Alarm output (for any alarm) (ALM)				○	○
		105 (1105): Braking transistor broken (DBAL)				○	○
		Setting the value of 1000s in parentheses ( ) shown above assigns a negative logic input to a terminal.					
E30	Frequency Arrival (Detection width)	0.0 to 10.0 Hz					
E31	Frequency Detection 1 (Level)	0.0 to 500.0 Hz	○	○	2.5	○	○
E32	(Hysteresis width)	0.0 to 500.0 Hz	○	○	60.0	○	○
E34	Overload Early Warning/ (Level)	0.00 (Disable); Current value of 1% to 200% of the inverter rated current	○	○	1.0	○	○
E35	Current Detection (Timer)	0.01 to 600.00s	○	△1△2	*3	○	○
E36	Frequency Detection 2 (Level)	0.0 to 500.0Hz	○	○	10.00	○	○
E37	Current Detection 2/ (Level)	0.00 (Disable); Current value of 1% to 200% of the inverter rated current	○	○	60.0	○	○
E38	Low Current Detection (Timer)	0.01 to 600.00 s	○	△1△2	*3	○	○
E40	PID Display Coefficient A	-999 to 0.00 to 9990	○	○	10.00	○	○
E41	PID Display Coefficient B	-999 to 0.00 to 9990	○	○	100	○	○
E42	LED Display Filter	0.0 to 5.0 s	○	○	0.00	○	○
E43	LED Monitor (Item selection)	0 : Speed monitor (select by E48) 3 : Output current 4 : Output voltage 8 : Calculated torque 9 : Consumption power 10 : PID command	○	○	0.5 0	○	○

●E codes: Extension Terminal Functions

Code	Name	Data setting range	Change when running	Data copying	Default setting	Drive control V/f	Drive control Vector
E43	LED Monitor (Item selection)	12 : PID feedback amount 14 : PID output 15 : Load factor 16 : Motor output 17 : Analog input 23 : Torque current (%) 24 : Magnetic flux command (%) 25 : Input watt-hour	○	○	0	○	○
E44	(Display when stopped)	0 : Specified value 1 : Output value	○	○	0	○	○
E45	LCD Monitor (Item selection)	0 : Running status, rotational direction and operation guide 1 : Bar charts for output frequency, current and calculated torque	○	○	0	○	○
E46	(Language selection)	0 : Japanese 1 : English 2 : German 3 : French 4 : Spanish 5 : Italian	○	○	0	○	○
E47	(Contrast control)	0 (Low) to 10 (High)	○	○	5	○	○
E48	LED Monitor (Speed monitor item)	0 : Output frequency (Before slip compensation) 1 : Output frequency (After slip compensation) 2 : Reference frequency 3 : Motor speed in r/min 4 : Load shaft speed in r/min 5 : Line speed in m/min 7 : Display speed in %	○	○	0 (Japan) ↓ (Asia)	○	○
E50	Coefficient for Speed Indication	0.01 to 200.00	○	○	30.00	○	○
E51	Display Coefficient for Input Watt-hour Data	0.000 (Cancel/reset), 0.001 to 9999	○	○	0.010	○	○
E52	Keypad (Menu display mode)	0 : Function code data editing mode (Menu #0, #1, and #7) 1 : Function code data check mode (Menu #2 and #7) 2 : Full-menu mode	○	○	0	○	○
E54	Frequency Detection 3 (Level)	0.0 to 500.0 Hz	○	○	60.0	○	○
E55	Current Detection 3 (Level)	0.00 (Disable); Current value of 1% to 200% of the inverter rated current	○	1△2△	*3	○	○
E56	(Timer)	0.01 to 600.00 s	○	○	10.00	○	○
E61	Terminal [12] Extended Function	0 : None	×	○	0	○	○
E62	Terminal [C1] Extended Function	1 : Auxiliary frequency command 1	×	○	0	○	○
E63	Terminal [V2] Extended Function	2 : Auxiliary frequency command 2	×	○	0	○	○
		3 : PID command 1				○	○
		5 : PID feedback amount					
		6 : Ratio setting					
		7 : Analog torque limit value A					
		8 : Analog torque limit value B					
		20 : Analog input monitor					
E64	Saving of Digital Reference Frequency	0 : Automatic saving (when main power is turned OFF) 1 : Saving by pressing key	○	○	1	○	○
E65	Reference Loss Detection (Continuous running frequency)	0 : Decelerate to stop, 20% to 120%, 999: Disable	○	○	999	○	○
E78	Torque Detection 1 (Level)	0% to 300%	○	○	100	○	○
E79	(Timer)	0.01 to 600.00 s	○	○	10.00	○	○
E80	Torque Detection 2/ (Level)	0% to 300%	○	○	20	○	○
E81	Low Torque Detection (Timer)	0.01 to 600.00 s	○	○	20.00	○	○
E98	Terminal [FWD] Function	0 (1000) : Select multi-frequency (0 to 1 steps) (SS1)	×	○	98	○	○
E99	Terminal [REV] Function	1 (1001) : Select multi-frequency (0 to 3 steps) (SS2)	×	○	99	○	○
		2 (1002) : Select multi-frequency (0 to 7 steps) (SS4)				○	○
		3 (1003) : Select multi-frequency (0 to 15 steps) (SS8)				○	○
		4 (1004) : Select ACC/DEC time (2 steps) (RT1)				○	○
		5 (1005) : Select ACC/DEC time (4 steps) (RT2)				○	○
		6 (1006) : Enable 3-wire operation (HLD)				○	○
		7 (1007) : Coast to a stop (BX)				○	○
		8 (1008) : Reset alarm (RST)				○	○
		9 (1009) : Enable external alarm trip(9 = Active OFF, 1009 = Active ON) (THR)				○	○
		10 (1010) : Ready for jogging (JOG)				○	○
		11 (1011) : Select frequency command 2/1 (Hz2/Hz1)				○	○
		12 (1012) : Select motor 2 (M2)				○	○
		13 : Enable DC braking (DCBRK)				○	○
		14 (1014) : Select torque limiter level 2/1 (TL2/TL1)				○	○
		15 : Switch to commercial power (50 Hz) (SW50)				○	×
		16 : Switch to commercial power (60 Hz) (SW60)				○	×
		17 (1017) : UP (Increase output frequency) (UP)				○	○
		18 (1018) : DOWN (Decrease output frequency) (DOWN)				○	○
		19 (1019) : Enable data change with keypad (WE-KP)				○	○
		20 (1020) : Cancel PID control (Hz/PID)				○	○
		21 (1021) : Switch normal/inverse operation (IVS)				○	○
		22 (1022) : Interlock (IL)				○	○
		24 (1024) : Enable communications link via RS-485 or field bus (LE)				○	○
		25 (1025) : Universal DI (U-DI)				○	○
		26 (1026) : Enable auto search for idling motor speed at starting (STM)				○	×

The shaded function codes ( ) are applicable to the quick setup.
*1 6.00 s for inverters with a capacity of 22 kW or below; 20.00 s for those with 30 kW or above.
*3 The motor rated current is automatically set. See Table 5.2 (function code P03).
<Data change, reflection and strage> ×: Not available ○: After changing data with using keys, execute and save data by pressing key. ○ After changing and executing data with using keys, save the data by pressing key.

Function Settings

E codes: Extension Terminal Functions

Code	Name	Data setting range	Change when running	Data copying	Default setting	Drive control V/f	Drive control Vector
E99	Terminal [REV] Function	30 (1030) : Force to stop ((30 = Active OFF, 1030 = Active ON) (STOP)	×	○	99	○	○
		32 (1032) : Pre-excitation (EXCITE)				×	○
		33 (1033) : Reset PID integral and differential components (PID-RST)				○	○
		34 (1034) : Hold PID integral component (PID-HLD)				○	○
		35 (1035) : Select local (keypad) operation (LOC)				○	○
		36 (1036) : Select motor 3 (M3)				○	○
		37 (1037) : Select motor 4 (M4)				○	○
		39 : Protect motor from dew condensation (DWP)				○	○
		40 : Enable integrated sequence to switch to commercial power (50 Hz) (ISW50)				○	×
		41 : Enable integrated sequence to switch to commercial power (60 Hz) (ISW60)				○	×
		49 (1049) : Pulse train sign (SIGN)				○	○
		72 (1072) : Count the run time of commercial power-driven motor 1 (CRUN-M1)				○	×
		73 (1073) : Count the run time of commercial power-driven motor 2 (CRUN-M2)				○	×
		74 (1074) : Count the run time of commercial power-driven motor 3 (CRUN-M3)				○	×
		75 (1075) : Count the run time of commercial power-driven motor 4 (CRUN-M4)				○	×
		76 (1076) : Select droop control (DROOP)				○	×
		98 : Run forward (FWD)				○	○
		99 : Run reverse (REV)				○	○
		Setting the value of 1000s in parentheses ( ) shown above assigns a negative logic input to a terminal.					

C codes: Control Functions of Frequency

Code	Name	Data setting range	Change when running	Data copying	Default setting	Drive control V/f	Drive control Vector
C01	Jump Frequency 1	0.0 to 500.0 Hz	○	○	0.0	○	○
C02	2		○	○	0.0	○	○
C03	3		○	○	0.0	○	○
C04	(width)	0.0 to 30.0 Hz	○	○	3.0	○	○
C05	Multi-frequency 1	0.00 to 500.00 Hz	○	○	0.00	○	○
C06	2		○	○	0.00	○	○
C07	3		○	○	0.00	○	○
C08	4		○	○	0.00	○	○
C09	5		○	○	0.00	○	○
C10	6		○	○	0.00	○	○
C11	7		○	○	0.00	○	○
C12	8		○	○	0.00	○	○
C13	9		○	○	0.00	○	○
C14	10		○	○	0.00	○	○
C15	11		○	○	0.00	○	○
C16	12		○	○	0.00	○	○
C17	13		○	○	0.00	○	○
C18	14		○	○	0.00	○	○
C19	15		○	○	0.00	○	○
C20	Jogging Frequency	0.00 to 500.00 Hz	○	○	0.00	○	○
C30	Frequency Command 2	0 : Enable ▲ / ▼ keys on the keypad 1 : Analog voltage input to terminal [12] (-10 to +10 VDC) 2 : Analog current input to terminal [C1] (4 to 20 mA DC) 3 : Analog sum of voltage and current inputs to terminals [12] and [C1] 5 : Analog voltage input to terminal [V2] (0 to 10 VDC) 7 : Terminal command UP/DOWN control 8 : Enable ▲ / ▼ keys on the keypad (balanceless-bumpless switching available) 12 : Pulse train input	×	○	2	○	○
C31	Analog Input Adjustment for [12] (Offset)	-5.0% to 5.0%	◎	○	0.0	○	○
C32	(Gain)	0.00% to 200.00%	◎	○	100.0	○	○
C33	(Filter time constant)	0.00 to 5.00 s	○	○	0.05	○	○
C34	(Gain base point)	0.00% to 100.00%	◎	○	100.00	○	○
C35	(Polarity)	0 : Bipolar 1 : Unipolar	×	○	1	○	○
C36	Analog Input Adjustment for [C1] (Offset)	-5.0% to 5.0%	◎	○	0.0	○	○
C37	(Gain)	0.00% to 200.00%	◎	○	100.00	○	○
C38	(Filter time constant)	0.00 to 5.00s	○	○	0.05	○	○
C39	(Gain base point)	0.00% to 100.00%	◎	○	100.00	○	○
C41	Analog Input Adjustment for [V2] (Offset)	-5.0% to 5.0%	◎	○	0.0	○	○
C42	(Gain)	0.00% to 200.00%	◎	○	100.00	○	○
C43	(Filter time constant)	0.00 to 5.00 s	○	○	0.05	○	○
C44	(Gain base point)	0.00% to 100.00%	◎	○	100.00	○	○
C45	(Polarity)	0 : Bipolar 1 : Unipolar	×	○	1	○	○
C50	Bias(Frequency command 1)(Bias base point)	0.00% to 100.00%	◎	○	0.00	○	○
C51	Bias(PID command 1) (Bias value)	-100.00% to 100.00%	◎	○	0.00	○	○
C52	(Bias base point)	0.00% to 100.00%	◎	○	0.00	○	○
C53	Selection of Normal/Inverse Operation (Frequency command 1)	0 : Normal operation 1 : Inverse operation	○	○	0	○	○

The shaded function codes ( ) are applicable to the quick setup.
*2 The factory default differs depending upon the inverter's capacity. See Table 5.1.
*6 The motor constant is automatically set, depending upon the inverter's capacity. See Table 5.2.
<Data change, reflection and strage> ×: Not available ○: After changing data with using ▲ ▼ keys, execute and save data by pressing [STR] key. ◎ After changing and executing data with using ▲ ▼ keys, save the data by pressing [STR] key.

P codes: Motor 1 Parameters

Code	Name	Data setting range	Change when running	Data copying	Default setting	Drive control V/f	Drive control Vector
P01	Motor 1 (No. of poles)	2 to 22 poles	×	△1△2	4	○	○
P02	(Rated capacity)	0.01 to 1000 kW (when P99 = 0, 2, 3 or 4) 0.01 to 1000 HP (when P99 = 1)	×	△1△2	*6	○	○
P03	(Rated current)	0.00 to 2000 A	×	△1△2	*6	○	○
P04	(Auto-tuning)	0 : Disable 1 : Tune while the motor stops. (%R1, %X and rated slip frequency) 2 : Tune while the motor is rotating under V/f control(%R1, %X, rated slip frequency, no-load current, magnetic saturation factors 1 to 5, and magnetic saturation extension factors "a" to "c") 3 : Tune while the motor is rotating under vector control(%R1, %X, rated slip frequency, no-load current,magnetic saturation factors 1 to 5, and magnetic saturation extension factors "a" to "c". Available when the vector control is enabled.)	×	×	0	○	○
P05	Motor 1 (No-load current)	0.00 to 2000 A	×	△1△2	*6	○	○
P07	(%R1)	0.00% to 50.00%	○	△1△2	*6	○	○
P08	(%X)	0.00% to 50.00%	○	△1△2	*6	○	○
P09	(Slip compensation gain for driving)	0.0% to 200.0%	◎	○	100.0	○	○
P10	(Slip compensation response time)	0.01 to 10.00 s	○	△1△2	0.12	○	×
P11	(Slip compensation gain for braking)	0.0% to 200.0%	◎	○	100.0	○	○
P12	(Rated slip frequency)	0.00 to 15.00 Hz	×	△1△2	*6	○	○
P13	(Iron loss factor 1)	0.00% to 20.00%	○	△1△2	*6	○	○
P14	(Iron loss factor 2)	0.00% to 20.00%	○	△1△2	0.00	○	○
P15	(Iron loss factor 3)	0.00% to 20.00%	○	△1△2	0.00	○	○
P16	(Magnetic saturation factor 1)	0.0% to 300.0%	○	△1△2	*6	○	○
P17	(Magnetic saturation factor 2)	0.0% to 300.0%	○	△1△2	*6	○	○
P18	(Magnetic saturation factor 3)	0.0% to 300.0%	○	△1△2	*6	○	○
P19	(Magnetic saturation factor 4)	0.0% to 300.0%	○	△1△2	*6	○	○
P20	(Magnetic saturation factor 5)	0.0% to 300.0%	○	△1△2	*6	○	○
P21	(Magnetic saturation extension factor "a")	0.0% to 300.0%	○	△1△2	*6	○	○
P22	(Magnetic saturation extension factor "b")	0.0% to 300.0%	○	△1△2	*6	○	○
P23	(Magnetic saturation extension factor "c")	0.0% to 300.0%	○	△1△2	*6	○	○
P53	(%X correction factor 1)	0% to 300%	○	△1△2	100	○	○
P54	(%X correction factor 2)	0% to 300%	○	△1△2	100	○	○
P55	(Torque current under vector control)	0.00 to 2000 A	×	△1△2	*6	×	○
P56	(Induced voltage factor under vector control)	50% to 100%	×	△1△2	85	×	○
P99	Motor 1 Selection	0 : Motor characteristics 0 (Fuji standard motors, 8-series) 1 : Motor characteristics 1 (HP rating motors) 2 : Motor characteristics 2 (Fuji motors exclusively designed for vector control) 3 : Motor characteristics 3 (Fuji standard motors, 6-series) 4 : Other motors	×	△1△2	0	○	○

H codes: High Performance Functions

Code	Name	Data setting range	Change when running	Data copying	Default setting	Drive control V/f	Drive control Vector
H03	Data Initialization	0 : Disable initialization 1 : Initialize all function code data to the factory defaults 2 : Initialize motor 1 parameters 3 : Initialize motor 2 parameters 4 : Initialize motor 3 parameters 5 : Initialize motor 4 parameters	×	×	0	○	○
H04	Auto-reset (Times)	0 : Disable; 1 to 10	○	○	0	○	○
H05	(Reset interval)	0.5 to 20.0 s	○	○	5.0	○	○
H06	Cooling Fan ON/OFF Control	0 : Disable (Always in operation) 1 : Enable (ON/OFF controllable)	○	○	0	○	○
H07	Acceleration/Deceleration Pattern	0 : Linear 1 : S-curve (Weak) 2 : S-curve (Arbitrary, according to H57 to H60 data) 3 : Curvilinear	○	○	0	○	○
H08	Rotational Direction Limitation	0 : Disable 1 : Enable (Reverse rotation inhibited) 2 : Enable (Forward rotation inhibited)	×	○	0	○	○
H09	Starting Mode (Auto search)	0 : Disable 1 : Enable (Starting after instantaneous stop only) 2 : Enable (Normal start and starting after instantaneous stop only)	×	○	0	○	×
H11	Deceleration Mode	0 : Normal deceleration 1: Coast-to-stop	○	○	0	○	○
H12	Instantaneous Overcurrent Limiting (Mode selection)	0 : Disable 1 : Enable	○	○	1	○	×
H13	Restart Mode after Momentary (Restart time)	0.1 to 10.0 s	○	△1△2	*2	○	○
H14	Power Failure (Frequency fall rate)	0.00: Deceleration time selected, 0.01 to 100.00 Hz/s, 999: Follow the current limit command	○	○	999	○	×
H15	(Continuous running level)	200 to 300 V for 200 V class series 400 to 600 V for 400 V class series	○	△2	235 470	○	○
H16	(Allowable momentary power failure time)	0.0 to 30.0 s 999: Automatically determined by inverter	○	○	999	○	○
H26	Thermistor (for motor) (Mode selection)	0 : Disable 1 : PTC (The inverter immediately trips with OH4 displayed.) 2 : PTC (The inverter issues output signal THM and continues to run.) 3 : NTC (When connected)	○	○	0	○	○
H27	(Level)	0.00 to 5.00 V	○	○	0.35	○	○
H28	Droop Control	60.0 to 0.0 Hz	○	○	0.0	○	×
H30	Communications Link Function (Mode selection)	Frequency command / Run command 0 : F01/C30 / F02 1 : RS-485 (Port 1) / F02 2 : F01/C30 / RS-485 (Port 1) 3 : RS-485 (Port 1) / RS-485 (Port 1) 4 : RS-485 (Port 2) / F02 5 : RS-485 (Port 2) / RS-485 (Port 1) 6 : F01/C30 / RS-485 (Port 2)	○	○	0	○	○

Function Settings

●H codes: High Performance Functions

Code	Name	Data setting range	Change when running	Data copying	Default setting	Drive control V/f	Drive control Vector
H30	Communications Link Function (Mode selection)	Frequency command / Run command 7 : RS-485 (Port 1) / RS-485 (Port 2) 8 : RS-485 (Port 2) / RS-485 (Port 2)	○	○	0	○	○
H42	Capacitance of DC Link Bus Capacitor	Indication for replacement of DC link bus capacitor 0000 to FFFF (hex.)	○	×	—	○	○
H43	Cumulative Run Time of Cooling Fan	Indication for replacement of cooling fan (in units of 10 hours)	○	×	—	○	○
H44	Startup Counter for Motor 1	Indication of cumulative startup count 0000 to FFFF (hex.)	○	×	—	○	○
H45	Mock Alarm	0 : Disable 1 : Mock alarm	○	×	0	○	○
H46	Starting Mode (Auto search delay time 2)	0.1 to 10.0 s	○	△1△2	*2	○	×
H47	Initial Capacitance of DC Link Bus Capacitor	Indication for replacement of DC link bus capacitor 0000 to FFFF (hex.)	○	×	—	○	○
H48	Cumulative Run Time of Capacitors on PCB	Indication for replacement of capacitors (The cumulative run time can be modified or reset in units of 10 hours.)	○	×	—	○	○
H49	Starting Mode (Auto search delay time 1)	0.0 to 10.0 s	○	○	0.0	○	×
H50	Non-linear V/f Pattern 1 (Frequency)	0.0: Cancel, 0.1 to 500.0 Hz	×	○	*7	○	×
H51	(Voltage)	0 to 240: Output an AVR-controlled voltage (for 200 V class series) 0 to 500: Output an AVR-controlled voltage (for 400 V class series)	×	△2	*8	○	×
H52	Non-linear V/f Pattern 2 (Frequency)	0.0: Cancel, 0.1 to 500.0 Hz	×	○	0.0	○	×
H53	(Voltage)	0 to 240: Output an AVR-controlled voltage (for 200 V class series) 0 to 500: Output an AVR-controlled voltage (for 400 V class series)	×	△2	0	○	×
H54	Acceleration Time (Jogging)	0.00 to 6000 s	○	○	*1	○	○
H55	Deceleration Time (Jogging)	0.00 to 6000 s	○	○	*1	○	○
H56	Deceleration Time for Forced Stop	0.00 to 6000 s	○	○	*1	○	○
H57	1st S-curve acceleration range (Leading edge)	0% to 100%	○	○	10	○	○
H58	2nd S-curve acceleration range (Trailing edge)	0% to 100%	○	○	10	○	○
H59	1st S-curve deceleration range (Leading edge)	0% to 100%	○	○	10	○	○
H60	2nd S-curve deceleration range (Trailing edge)	0% to 100%	○	○	10	○	○
H61	UP/DOWN Control (Initial frequency setting)	0 : 0.00 Hz 1 : Last UP/DOWN command value on releasing the run command	×	○	1	○	○
H63	Low Limiter (Mode selection)	0 : Limit by F16 (Frequency limiter: Low) and continue to run 1 : If the output frequency lowers below the one limited by F16 (Frequency limiter: Low), decelerate to stop the motor.	○	○	0	○	○
H64	(Lower limiting frequency)	0.0: Depends on F16 (Frequency limiter, Low) 0.1 to 60.0 Hz	○	○	1.6	○	×
H65	Non-linear V/f Pattern 3 (Frequency)	0.0: Cancel, 0.1 to 500.0 Hz	×	○	0.0	○	×
H66	(Voltage)	0 to 240: Output an AVR-controlled voltage (for 200 V class series) 0 to 500: Output an AVR-controlled voltage (for 400 V class series)	×	△2	0	○	×
H67	Auto Energy Saving Operation (Mode selection)	0 : Enable during running at constant speed 1 : Enable in all modes	○	○	0	○	○
H68	Slip Compensation 1 (Operating conditions)	0 : Enable during ACC/DEC and at base frequency or above 1 : Disable during ACC/DEC and enable at base frequency or above 2 : Enable during ACC/DEC and disable at base frequency or above 3 : Disable during ACC/DEC and at base frequency or above	×	○	0	○	×
H69	Automatic Deceleration (Mode selection)	0 : Disable 2 : Torque limit control with Force-to-stop if actual deceleration time exceeds three times the specified one 3 : DC link bus voltage control with Force-to-stop if actual deceleration time exceeds three times the specified one 4 : Torque limit control with Force-to-stop disabled 5 : DC link bus voltage control with Force-to-stop disabled	○	○	0	○	○
H70	Overload Prevention Control	0.00: Follow the deceleration time selected 0.01 to 100.0 Hz/s 999: Cancel	○	○	999	○	○
H71	Deceleration Characteristics	0 : Disable 1 : Enable	○	○	0	○	×
H72	Main Power Down Detection (Mode selection)	0 : Disable 1 : Enable	○	○	1	○	○
H73	Torque Limiter (Operating conditions)	0 : Enable during ACC/DEC and running at constant speed 1 : Disable during ACC/DEC and enable during running at constant speed 2 : Enable during ACC/DEC and disable during running at constant speed	×	○	0	○	○
H76	Frequency increment limit for braking	0.0 to 500.0 Hz	○	○	5.0	○	×
H77	Service Life of DC Link Bus Capacitor (Remaining time)	0 to 8760 (in units of 10 hours)	○	×	-	○	○
H78	Maintenance Interval (M1)	0: Disable; 1 to 9999 (in units of 10 hours)	○	×	8760	○	○
H79	Preset Startup Count for Maintenance (M1)	0000: Disable; 0001 to FFFF (hex.)	○	×	0	○	○
H80	Output Current Fluctuation Damping Gain for Motor 1	0.00 to 0.40	○	○	0.20	○	×
H81	Light Alarm Selection 1	0000 to FFFF (hex.)	○	○	0	○	○
H82	Light Alarm Selection 2	0000 to FFFF (hex.)	○	○	0	○	○
H84	Pre-excitation (Initial level)	100% to 400%	○	○	100	×	○
H85	(Time)	0.00: Disable; 0.01 to 30.00 s	○	○	0.00	×	○
H86	Reserved	0 to 2	○	△1△2	0	○	○
H87	Reserved	25.0 to 120.0 Hz	○	○	25.0	○	○
H88	Reserved	0 to 3; 999	○	×	0	○	○
H89	Reserved	0, 1	○	○	0	○	○
H90	Reserved	0, 1	○	○	0	○	○
H91	PID Feedback Wire Break Detection	0.0: Disable alarm detection 0.1 to 60.0 s	○	○	0.0	○	○
H92	Continuity of Running (P)	0.000 to 10.000 times; 999	○	△1△2	999	○	○
H93	(I)	0.010 to 10.000 s; 999	○	△1△2	999	○	○
H94	Cumulative Motor Run Time 1	0 to 9999 (The cumulative run time can be modified or reset in units of 10 hours.)	×	×	—	○	○
H95	DC Braking (Select characteristics)	0 : Slow 1 : Quick	○	○	1	○	×
H96	STOP Key Priority/ Start Check Function	Data: STOP key priority / Start check function 0: Disable / Disable 1: Enable / Disable 2: Disable / Enable 3: Enable / Enable	○	○	0	○	○
H97	Clear Alarm Data	0 : Disable 1 : Enable (Setting "1" clears alarm data and then returns to "0.")	○	×	0	○	○
H98	Protection/Maintenance Function (Mode selection)	0 to 127: Display data in decimal format Bit 0: Lower the carrier frequency automatically (0: Disabled; 1: Enabled) Bit 1: Detect input phase loss (0: Disabled; 1: Enabled) Bit 2: Detect output phase loss (0: Disabled; 1: Enabled)	○	○	83	○	○

●H codes: High Performance Functions

Code	Name	Data setting range	Change when running	Data copying	Default setting	Drive control V/f	Drive control Vector
H98	Protection/Maintenance Function (Mode selection)	Bit 3: Select life judgment threshold of DC link bus capacitor (0: Factory default; 1: Customer's setting) Bit 4: Judge the life of DC link bus capacitor (0: Disabled; 1: Enabled) Bit 5: Detect DC fan lock (0: Enabled; 1: Disabled) Bit 6: Detect braking transistor error(for 22 kW or below) (0: Disabled; 1: Enabled)	○	○	83	○	○

●A codes: Motor 2 Parameters

Code	Name	Data setting range	Change when running	Data copying	Default setting	Drive control V/f	Drive control Vector
A01	Maximum Frequency 2	25.0 to 500.0 Hz	×	○	60.0	○	○
A02	Base Frequency 2	25.0 to 500.0 Hz	×	○	50.0	○	○
A03	Rated Voltage at Base Frequency 2	0 : An AVR-uncontrolled voltage Output a voltage in proportion to input voltage 80 to 240 : Output an AVR-controlled voltage (for 200 V class series) 160 to 500 : Output an AVR-controlled voltage (for 400 V class series)	×	△2	200 400	○	○
A04	Maximum Output Voltage 2	80 to 240 : Output an AVR-controlled voltage (for 200 V class series) 160 to 500 : Output an AVR-controlled voltage (for 400 V class series)	×	△2	200 400	○	×
A05	Torque Boost 2	0.0% to 20.0% (percentage with respect to "Rated Voltage at Base Frequency 2")	○	○	*2	○	×
A06	Electronic Thermal Overload Protection for Motor 2 (Select motor characteristics)	1 : For a general-purpose motor with shaft-driven cooling fan 2 : For an inverter-driven motor, non-ventilated motor, or motor with separately powered cooling fan	○	○	1	○	○
A07	(Overload detection level)	0.00: Disable 1% to 135% of the rated current (allowable continuous drive current) of the motor	○	△1△2	*3	○	○
A08	(Thermal time constant)	0.5 to 75.0 min	○	○	*4	○	○
A09	DC Braking 2 (Braking starting frequency)	0.0 to 60.0 Hz	○	○	0.0	○	○
A10	(Braking level)	0% to 100%	○	○	0	○	○
A11	(Braking time)	0.00: Disable; 0.01 to 30.00 s	○	○	0.00	○	○
A12	Starting Frequency 2	0.0 to 60.0 Hz	○	○	0.5	○	○
A13	Load Selection/ Auto Torque Boost/ Auto Energy Saving Operation 2	0 : Variable torque load 1 : Constant torque load 2 : Auto-torque boost 3 : Auto-energy saving operation(Variable torque load during ACC/DEC) 4 : Auto-energy saving operation(Constant torque load during ACC/DEC) 5 : Auto-energy saving operation(Auto-torque boost during ACC/DEC)	×	○	1	○	○
A14	Drive Control Selection 2	0 : V/f control with slip compensation inactive 1 : Dynamic torque vector control 2 : V/f control with slip compensation active 6 : Vector control with speed sensor	×	○	0	○	○
A15	Motor 2 (No. of poles)	2 to 22 poles	×	△1△2	4	○	○
A16	(Rated capacity)	0.01 to 1000 kW (when A39 = 0, 2, 3 or 4) 0.01 to 1000 HP (when A39 = 1)	×	△1△2	*6	○	○
A17	(Rated current)	0.00 to 2000 A	×	△1△2	*6	○	○
A18	(Auto-tuning)	0 : Disable 1 : Tune while the motor stops. (%R1, %X and rated slip frequency) 2 : Tune while the motor is rotating under V/f control (%R1, %X, rated slip frequency, no-load current, magnetic saturation factors 1 to 5, and magnetic saturation extension factors "a" to "c") 3 : Tune while the motor is rotating under vector control (%R1, %X, rated slip frequency, no-load current, magnetic saturation factors 1 to 5, and magnetic saturation extension factors "a" to "c." Available when the vector control is enabled.)	×	×	0	○	○
A20	(No-load current)	0.00 to 2000 A	×	△1△2	*6	○	○
A21	(%R1)	0.00% to 50.00%	○	△1△2	*6	○	○
A22	(%X)	0.00% to 50.00%	○	△1△2	*6	○	○
A23	(Slip compensation gain for driving)	0.0% to 200.0%	◎	○	100.0	○	○
A24	(Slip compensation response time)	0.01 to 10.00s	○	△1△2	0.12	○	×
A25	(Slip compensation gain for braking)	0.0% to 200.0%	◎	○	100.0	○	○
A26	(Rated slip frequency)	0.00 to 15.00 Hz	×	△1△2	*6	○	○
A27	(Iron loss factor 1)	0.00% to 20.00%	○	△1△2	*6	○	○
A28	(Iron loss factor 2)	0.00% to 20.00%	○	△1△2	0.00	○	○
A29	(Iron loss factor 3)	0.00% to 20.00%	○	△1△2	0.00	○	○
A30	(Magnetic saturation factor 1)	0.0% to 300.0%	○	△1△2	*6	○	○
A31	(Magnetic saturation factor 2)	0.0% to 300.0%	○	△1△2	*6	○	○
A32	(Magnetic saturation factor 3)	0.0% to 300.0%	○	△1△2	*6	○	○
A33	(Magnetic saturation factor 4)	0.0% to 300.0%	○	△1△2	*6	○	○
A34	(Magnetic saturation factor 5)	0.0% to 300.0%	○	△1△2	*6	○	○
A35	(Magnetic saturation extension factor "a")	0.0% to 300.0%	○	△1△2	*6	○	○
A36	(Magnetic saturation extension factor "b")	0.0% to 300.0%	○	△1△2	*6	○	○
A37	(Magnetic saturation extension factor "c")	0.0% to 300.0%	○	△1△2	*6	○	○
A39	Motor 2 Selection	0 : Motor characteristics 0 (Fuji standard motors, 8-series) 1 : Motor characteristics 1 (HP rating motors) 2 : Motor characteristics 2 (Fuji motors exclusively designed for vector control) 3 : Motor characteristics 3 (Fuji standard motors, 6-series) 4 : Other motors	×	△1△2	0	○	○
A40	Slip Compensation 2 (Operating conditions)	0 : Enable during ACC/DEC and at base frequency or above 1 : Disable during ACC/DEC and enable at base frequency or above 2 : Enable during ACC/DEC and disable at base frequency or above 3 : Disable during ACC/DEC and at base frequency or above	×	○	0	○	×
A41	Output Current Fluctuation Damping Gain for Motor 2	0.00 to 0.40	○	○	0.20	○	×
A42	Motor/Parameter Switching 2 (Mode selection)	0 : Motor (Switch to the 2nd motor) 1 : Parameter (Switch to particular A codes)	×	○	0	○	○
A43	Speed Control (Speed command filter)	0.000 to 5.000 s	○	○	0	×	○
A44	(Speed detection filter)	0.000 to 0.100 s	◎	○	0	×	○
A45	P (Gain)	0.1 to 200.0 times	◎	○	0	×	○
A46	I (Integral time)	0.001 to 1.000 s	◎	○	0	×	○
A48	(Output filter)	0.000 to 0.100 s	○	○	0	×	○

The shaded function codes ( ) are applicable to the quick setup.
*1 6.00 s for inverters with a capacity of 22 kW or below; 20.00 s for those with 30 kW or above.
*2 The factory default differs depending upon the inverter's capacity. See Table 5.1.
*3 The motor rated current is automatically set. See Table 5.2 (function code P03).
*4 5.0s for inverters with a capacity of 22 kW or below; 10.0s for those with 30 kW or above.
*6 The motor constant is automatically set, depending upon the inverter's capacity. See Table 5.2.
*7 0 for inverters with a capacity of 22 kW or below; 5.0 for those with 30 kW or above.
*8 0 for inverters with a capacity of 22 kW or below; 20 for those with 30 kW or above.
<Data change, reflection and strage> [×]: Not available [○]: After changing data with using ▲▼ keys, execute and save data by pressing [FUNC] key. [◎] After changing and executing data with using ▲▼ keys, save the data by pressing [FUNC] key.

Function Settings

A codes: Motor 2 Parameters

Code	Name	Data setting range	Change when running	Data copying	Default setting	Drive control V/f	Drive control Vector
A51	Cumulative Motor Run Time 2	0 to 9999 (The cumulative run time can be modified or reset in units of 10 hours.)	×	×	-	○	○
A52	Startup Counter for Motor 2	Indication of cumulative startup count 0000 to FFFF (hex.)	○	×	-	○	○
A53	Motor 2 (%X correction factor 1)	0% to 300%	○	△1△2	100	○	○
A54	(%X correction factor 2)	0% to 300%	○	△1△2	100	○	○
A55	(Torque current under vector control)	0.00 to 2000 A	×	△1△2	*6	×	○
A56	(Induced voltage factor under vector control)	50 to 100	×	△1△2	85	×	○

b codes: Motor 3 Parameters

Code	Name	Data setting range	Change when running	Data copying	Default setting	Drive control V/f	Drive control Vector
b01	Maximum Frequency 3	25.0 to 500.0 Hz	×	○	60.0	○	○
b02	Base Frequency 3	25.0 to 500.0 Hz	×	○	50.0	○	○
b03	Rated Voltage at Base Frequency 3	0 : An AVR uncontrolled voltage (Output a voltage in proportion to input voltage.) 80 to 240 : Output an AVR-controlled voltage(for 200 V class series) 160 to 500 : Output an AVR-controlled voltage(for 400 V class series)	×	△2	200 400	○	○
b04	Maximum Output Voltage 3	80 to 240 : Output an AVR-controlled voltage(for 200 V class series) 160 to 500 : Output an AVR-controlled voltage(for 400 V class series)	×	△2	200 400	○	×
b05	Torque Boost 3	0.0% to 20.0%(percentage with respect to "b03: Rated Voltage at Base Frequency 3")	○	○	*2	○	×
b06	Electronic Thermal Overload Protection for Motor 3 (Select motor characteristics)	1 : For a general-purpose motor with shaft-driven cooling fan 2 : For an inverter-driven motor, non-ventilated motor, or motor with separately powered cooling fan	○	○	1	○	○
b07	(Overload detection level)	0.00: Disable 1% to 135% of the rated current (allowable continuous drive current) of the motor	○	△1△2	*3	○	○
b08	(Thermal time constant)	0.5 to 75.0 min	○	○	*4	○	○
b09	DC Braking 3 (Braking starting frequency)	0.0 to 60.0 Hz	○	○	0.0	○	○
b10	(Braking level)	0% to 100%	○	○	0	○	○
b11	(Braking time)	0.00: Disable; 0.01 to 30.00 s	○	○	0.00	○	○
b12	Starting Frequency 3	0.0 to 60.0 Hz	○	○	0.5	○	○
b13	Load Selection/ Auto Torque Boost/ Auto Energy Saving Operation 3	0 : Variable torque load 1 : Constant torque load 2 : Auto-torque boost 3 : Auto-energy saving operation(Variable torque load during ACC/DEC) 4 : Auto-energy saving operation(Constant torque load during ACC/DEC) 5 : Auto-energy saving operation(Auto-torque boost during ACC/DEC)	×	○	1	○	○
b14	Drive Control Selection 3	0 : V/f control with slip compensation inactive 1 : Dynamic torque vector control 2 : V/f control with slip compensation active 6 : Vector control with speed sensor	×	○	0	○	○
b15	Motor 3 (No. of poles)	2 to 22 poles	×	△1△2	4	○	○
b16	(Rated capacity)	0.01 to 1000 kW (when b39 = 0, 2, 3 or 4) 0.01 to 1000 HP (when b39 = 1)	×	△1△2	*6	○	○
b17	(Rated current)	0.00 to 2000 A	×	△1△2	*6	○	○
b18	(Auto-tuning)	0 : Disable 1 : Tune while the motor stops. (%R1, %X and rated slip frequency) 2 : Tune while the motor is rotating under V/f control (%R1, %X, rated slip frequency, no-load current, magnetic saturation factors 1 to 5, and magnetic saturation extension factors "a" to "c") 3 : Tune while the motor is rotating under vector control (%R1, %X, rated slip frequency, no-load current, magnetic saturation factors 1 to 5, and magnetic saturation extension factors "a" to "c". Available when the vector control is enabled.)	×	×	0	○	○
b20	(No-load current)	0.00 to 2000 A	×	△1△2	*6	○	○
b21	(%R1)	0.00% to 50.00%	○	△1△2	*6	○	○
b22	(%X)	0.00% to 50.00%	○	△1△2	*6	○	○
b23	(Slip compensation gain for driving)	0.0% to 200.0%	◎	○	100.0	○	○
b24	(Slip compensation response time)	0.01 to 10.00 s	○	△1△2	0.12	○	×
b25	(Slip compensation gain for braking)	0.0% to 200.0%	◎	○	100.0	○	○
b26	(Rated slip frequency)	0.00 to 15.00 Hz	×	△1△2	*6	○	○
b27	(Iron loss factor 1)	0.00% to 20.00%	○	△1△2	*6	○	○
b28	(Iron loss factor 2)	0.00% to 20.00%	○	△1△2	0.00	○	○
b29	(Iron loss factor 3)	0.00% to 20.00%	○	△1△2	0.00	○	○
b30	(Magnetic saturation factor 1)	0.0% to 300.0%	○	△1△2	*6	○	○
b31	(Magnetic saturation factor 2)	0.0% to 300.0%	○	△1△2	*6	○	○
b32	(Magnetic saturation factor 3)	0.0% to 300.0%	○	△1△2	*6	○	○
b33	(Magnetic saturation factor 4)	0.0% to 300.0%	○	△1△2	*6	○	○
b34	(Magnetic saturation factor 5)	0.0% to 300.0%	○	△1△2	*6	○	○
b35	(Magnetic saturation extension factor "a")	0.0% to 300.0%	○	△1△2	*6	○	○
b36	(Magnetic saturation extension factor "b")	0.0% to 300.0%	○	△1△2	*6	○	○
b37	(Magnetic saturation extension factor "c")	0.0% to 300.0%	○	△1△2	*6	○	○
b39	Motor 3 Selection	0 : Motor characteristics 0 (Fuji standard motors, 8-series) 1 : Motor characteristics 1 (HP rating motors) 2 : Motor characteristics 2 (Fuji motors exclusively designed for vector control) 3 : Motor characteristics 3 (Fuji standard motors, 6-series) 4 : Other motors	×	△1△2	0	○	○
b40	Slip Compensation 3 (Operating conditions)	0 : Enable during ACC/DEC and at base frequency or above 1 : Disable during ACC/DEC and enable at base frequency or above 2 : Enable during ACC/DEC and disable at base frequency or above 3 : Disable during ACC/DEC and at base frequency or above	×	○	0	○	×
b41	Output Current Fluctuation Damping Gain for Motor 3	0.00 to 0.40	○	○	0.20	○	×
b42	Motor/Parameter Switching 3 (Mode selection)	0 : Motor (Switch to the 3rd motor) 1 : Parameter (Switch to particular b codes)	×	○	0	○	○
b43	Speed Control 3 (Speed command filter)	0.000 to 5.000 s	○	○	0	×	○
b44	(Speed detection filter)	0.000 to 0.100 s	◎	○	0	×	○
b45	P (Gain)	0.1 to 200.0 times	◎	○	0	×	○
b46	I (Integral time)	0.001 to 1.000 s	◎	○	0	×	○
b48	(Output filter)	0.000 to 0.100 s	○	○	0	×	○
b51	Cumulative Motor Run Time 3	0 to 9999 (The cumulative run time can be modified or reset in units of 10 hours.)	×	×	—	○	○
b52	Startup Counter for Motor 3	Indication of cumulative startup count 0000 to FFFF (hex.)	○	×	—	○	○
b53	Motor 3 (%X correction factor 1)	0% to 300%	○	△1△2	100	○	○
b54	(%X correction factor 2)	0% to 300%	○	△1△2	100	○	○

b codes: Motor 3 Parameters

Code	Name	Data setting range	Change when running	Data copying	Default setting	Drive control V/f	Drive control Vector
b55	Motor3 (Torque current under vector control)	0.00 to 2000 A	×	△1△2	*6	×	○
b56	(Induced voltage factor under vector control)	50 to 100	×	△1△2	85	×	○

r codes: Motor 4 Parameters

Code	Name	Data setting range	Change when running	Data copying	Default setting	Drive control V/f	Drive control Vector
r01	Maximum Frequency 4	25.0 to 500.0 Hz	×	○	60.0	○	○
r02	Base Frequency 4	25.0 to 500.0 Hz	×	○	50.0	○	○
r03	Rated Voltage at Base Frequency 4	0 : An AVR-controlled voltage (Output a voltage in proportion to input voltage.) 80 to 240 : Output an AVR-controlled voltage(for 200 V class series) 160 to 500 : Output an AVR-controlled voltage(for 400 V class series)	×	△2	200 400	○	○
r04	Maximum Output Voltage 4	80 to 240 : Output an AVR-controlled voltage(for 200 V class series) 160 to 500 : Output an AVR-controlled voltage(for 400 V class series)	×	△2	200 400	○	×
r05	Torque Boost 4	0.0% to 20.0%(percentage with respect to "Rated Voltage at Base Frequency 4")	○	○	*2	○	×
r06	Electronic Thermal Overload Protection for Motor 4 (Select motor characteristics)	1 : For a general-purpose motor with shaft-driven cooling fan 2 : For an inverter-driven motor, non-ventilated motor, or motor with separately powered cooling fan	○	○	1	○	○
r07	(Overload detection level)	0.00: Disable 1% to 135% of the rated current (allowable continuous drive current) of the motor	○	△1△2	*3	○	○
r08	(Thermal time constant)	0.5 to 75.0 min	○	○	*4	○	○
r09	DC Braking 4 (Braking starting frequency)	0.0 to 60.0 Hz	○	○	0.0	○	○
r10	(Braking level)	0% to 100%	○	○	0	○	○
r11	(Braking time)	0.00: Disable; 0.01 to 30.00 s	○	○	0.00	○	○
r12	Starting Frequency 4	0.0 to 60.0 Hz	○	○	0.5	○	○
r13	Load Selection/ Auto Torque Boost/ Auto Energy Saving Operation 4	0 : Variable torque load 1 : Constant torque load 2 : Auto-torque boost 3 :Auto-energy saving operation (Variable torque load during ACC/DEC) 4 : Auto-energy saving operation (Constant torque load during ACC/DEC) 5 : Auto-energy saving operation (Auto-torque boost during ACC/DEC)	×	○	1	○	○
r14	Drive Control Selection 4	0 : V/f control with slip compensation inactive 1 : Dynamic torque vector control 2 : V/f control with slip compensation active 6 : Vector control with speed sensor	×	○	0	○	○
r15	Motor 4 (No. of poles)	2 to 22 poles	×	△1△2	4	○	○
r16	(Rated capacity)	0.01 to 1000 kW (when r39 = 0, 2, 3 or 4) 0.01 to 1000 HP (when r39 = 1)	×	△1△2	*6	○	○
r17	(Rated current)	0.00 to 2000 A	×	△1△2	*6	○	○
r18	(Auto-tuning)	0 : Disable 1 : Tune while the motor stops. (%R1, %X and rated slip frequency) 2 : Tune while the motor is rotating under V/f control (%R1, %X, rated slip frequency, no-load current, magnetic saturation factors 1 to 5, and magnetic saturation extension factors "a" to "c") 3 : Tune while the motor is rotating under vector control (%R1, %X, rated slip frequency, no-load current, magnetic saturation factors 1 to 5, and magnetic saturation extension factors "a" to "c". Available when the vector control is enabled.)	×	×	0	○	○
r20	(No-load current)	0.00 to 2000 A	×	△1△2	*6	○	○
r21	(%R1)	0.00% to 50.00%	○	△1△2	*6	○	○
r22	(%X)	0.00% to 50.00%	○	△1△2	*6	○	○
r23	(Slip compensation gain for driving)	0.0% to 200.0%	◎	○	100.0	○	○
r24	(Slip compensation response time)	0.01 to 10.00 s	○	△1△2	0.12	○	×
r25	(Slip compensation gain for braking)	0.0% to 200.0%	◎	○	100.0	○	○
r26	(Rated slip frequency)	0.00 to 15.00 Hz	×	△1△2	*6	○	○
r27	(Iron loss factor 1)	0.00% to 20.00%	○	△1△2	*6	○	○
r28	(Iron loss factor 2)	0.00% to 20.00%	○	△1△2	0.00	○	○
r29	(Iron loss factor 3)	0.00% to 20.00%	○	△1△2	0.00	○	○
r30	(Magnetic saturation factor 1)	0.0% to 300.0%	○	△1△2	*6	○	○
r31	(Magnetic saturation factor 2)	0.0% to 300.0%	○	△1△2	*6	○	○
r32	(Magnetic saturation factor 3)	0.0% to 300.0%	○	△1△2	*6	○	○
r33	(Magnetic saturation factor 4)	0.0% to 300.0%	○	△1△2	*6	○	○
r34	(Magnetic saturation factor 5)	0.0% to 300.0%	○	△1△2	*6	○	○
r35	(Magnetic saturation extension factor "a")	0.0% to 300.0%	○	△1△2	*6	○	○
r36	(Magnetic saturation extension factor "b")	0.0% to 300.0%	○	△1△2	*6	○	○
r37	(Magnetic saturation extension factor "c")	0.0% to 300.0%	○	△1△2	*6	○	○
r39	Motor 4 Selection	0 : Motor characteristics 0 (Fuji standard motors, 8-series) 1 : Motor characteristics 1 (HP rating motors) 2 : Motor characteristics 2 (Fuji motors exclusively designed for vector control) 3 : Motor characteristics 3 (Fuji standard motors, 6-series) 4 : Other motors	×	△1△2	0	○	○
r40	Slip Compensation 4 (Operating conditions)	0 : Enable during ACC/DEC and at base frequency or above 1 : Disable during ACC/DEC and enable at base frequency or above 2 : Enable during ACC/DEC and disable at base frequency or above 3 : Disable during ACC/DEC and at base frequency or above	×	○	0	○	×
r41	Output Current Fluctuation Damping Gain for Motor 4	0.00 to 0.40	○	○	0.20	○	×
r42	Motor/Parameter Switching 4 (Mode selection)	0 : Motor (Switch to the 4th motor) 1 : Parameter (Switch to particular r codes)	×	○	0	○	○
r43	Speed Control 4 (Speed command filter)	0.000 to 5.000 s	○	○	0	×	○
r44	(Speed detection filter)	0.000 to 0.100 s	◎	○	0	×	○
r45	P (Gain)	0.1 to 200.0 times	◎	○	0	×	○
r46	I (Integral time)	0.001 to 1.000 s	◎	○	0	×	○
r48	(Output filter)	0.000 to 0.100 s	○	○	0	×	○
r51	Cumulative Motor Run Time 4	0 to 9999 (The cumulative run time can be modified or reset in units of 10 hours.)	×	×	-	○	○
r52	Startup Counter for Motor 4	Indication of cumulative startup count 0000 to FFFF (hex.)	○	×	-	○	○
r53	Motor 4 (%X correction factor 1)	0% to 300%	○	△1△2	100	○	○
r54	(%X correction factor 2)	0% to 300%	○	△1△2	100	○	○
r55	(Torque current under vector control)	0.00 to 2000 A	×	△1△2	*6	×	○
r56	(Induced voltage factor under vector control)	50 to 100	×	△1△2	85	×	○

*2 The factory default differs depending upon the inverter's capacity. See Table 5.1.
*3 The motor rated current is automatically set. See Table 5.2 (function code P03).
*4 5.0s for inverters with a capacity of 22 kW or below; 10.0s for those with 30 kW or above.
*6 The motor constant is automatically set, depending upon the inverter's capacity. See Table 5.2.
<Data change, reflection and strage> ×: Not available ○: After changing data with using ▲ ▼ keys, execute and save data by pressing ⏎ key. ◎: After changing and executing data with using ▲ ▼ keys, save the data by pressing ⏎ key.

Function Settings

●J codes: Application Functions 1

Code	Name	Data setting range	Change when running	Data copying	Default setting	Drive control V/f	Drive control Vector
J01	PID Control (Mode selection)	0 : Disable 1 : Enable (Process control, normal operation) 2 : Enable (Process control, inverse operation) 3 : Enable (Dancer control)	×	○	0	○	○
J02	(Remote command SV)	0 : / keys on keypad 1 : PID process command 1 (Analog input terminals [12], [C1], and [V2]) 3 : UP/DOWN 4 : Command via communications link	×	○	0	○	○
J03	P (Gain)	0.000 to 30.000 times	○	○	0.100	○	○
J04	I (Integral time)	0.0 to 3600.0 s	○	○	0.0	○	○
J05	D (Differential time)	0.00 to 600.00 s	○	○	0.00	○	○
J06	(Feedback filter)	0.0 to 900.0 s	○	○	0.5	○	○
J08	Pressurization starting frequency)	0.0 to 500.0 Hz	○	○	0.0	○	○
J09	(Pressurizing time)	0 to 60 s	○	○	0	○	○
J10	(Anti reset windup)	0% to 200%	○	○	200	○	○
J11	(Select alarm output)	0 : Absolute-value alarm 1 : Absolute-value alarm (with Hold) 2 : Absolute-value alarm (with Latch) 3 : Absolute-value alarm (with Hold and Latch) 4 : Deviation alarm 5 : Deviation alarm (with Hold) 6 : Deviation alarm (with Latch) 7 : Deviation alarm (with Hold and Latch)	○	○	0	○	○
J12	(Upper level alarm (AH))	-100% to 100%	○	○	100	○	○
J13	(Lower level alarm (AL))	-100% to 100%	○	○	0	○	○
J15	(Stop frequency for slow flowrate)	0.0: Disable; 1.0 to 500.0 Hz	○	○	0.0	○	○
J16	(Slow flowrate level stop latency)	0 to 60 s	○	○	30	○	○
J17	(Starting frequency)	0.0 to 500.0 Hz	○	○	0.0	○	○
J18	(Upper limit of PID process output)	-150% to 150%; 999: Depends on setting of F15	○	○	999	○	○
J19	(Lower limit of PID process output)	-150% to 150%; 999: Depends on setting of F16	○	○	999	○	○
J21	Dew Condensation Prevention (Duty)	1% to 50%	○	○	1	○	○
J22	Commercial Power Switching Sequence	0 : Keep inverter operation (Stop due to alarm) 1 : Automatically switch to commercial-power operation	×	○	0	○	○
J56	PID Control (Speed command filter)	0.00 to 5.00 s	○	○	0.10	○	○
J57	(Dancer reference position)	-100% to 0% to 100%	○	○	0	○	○
J58	(Detection width of dancer position deviation)	0: Disable switching PID constant 1% to 100% (Manually set value)	○	○	0	○	○
J59	P (Gain) 2	0.000 to 30.000 times	○	○	0.100	○	○
J60	I (Integral time) 2	0.0 to 3600.0 s	○	○	0.0	○	○
J61	D (Differential time) 3	0.00 to 600.00 s	○	○	0.00	○	○
J62	(PID control block selection)	0 to 3 bit 0 : PID output characteristics 0: Plus (add), 1: Minus (subtract) bit 1 : Select compensation factor of output ratio 0 = Ratio (relative to the main setting) 1 = Speed command (relative to maximum frequency)	×	○	0	○	○
J68	Braking Signal (Brake-OFF current)	0% to 300%	○	○	100	○	○
J69	(Brake-OFF frequency/speed)	0.0 to 25.0 Hz	○	○	1.0	○	○
J70	(Brake-OFF timer)	0.0 to 5.0 s	○	○	1.0	○	○
J71	(Brake-ON frequency/speed)	0.0 to 25.0 Hz	○	○	1.0	○	○
J72	(Brake-ON timer)	0.0 to 5.0 s	○	○	1.0	○	○
J95	(Brake-OFF torque)	0% to 300%	○	○	100	○	○
J96	(Speed selection)	0 : Detected speed 1 : Commanded speed	○	○	0	○	○

●d codes: Application Functions 2

Code	Name	Data setting range	Change when running	Data copying	Default setting	Drive control V/f	Drive control Vector
d01	Speed control 1 (Speed command filter)	0.000 to 5.000 s	○	○	0.020	×	○
d02	(Speed detection filter)	0.000 to 0.100 s	◎	○	0.005	×	○
d03	P (Gain)	0.1 to 200.0 times	◎	○	10.0	×	○
d04	I (Integral time)	0.001 to 1.000 s	◎	○	0.100	×	○
d06	(Output filter)	0.000 to 0.100 s	○	○	0.002	×	○
d09	Speed control (Jogging)	0.000 to 5.000 s	○	○	0.020	×	○
d10	(Speed command filter)	0.000 to 0.100 s	◎	○	0.005	×	○
d11	(Speed detection filter)	0.1 to 200.0 times	◎	○	10.0	×	○
d12	P (Gain)	0.001 to 1.000 s	◎	○	0.100	×	○
d13	I (Integral time)	0.000 to 0.100 s	○	○	0.002	×	○
d14	Feedback Input (Output filter) (Pulse input property)	0 : Pulse train sign/Pulse train input 1 : Forward rotation pulse/Reverse rotation pulse 2 : A/B phase with 90 degree phase shift	×	○	2	×	○
d15	(Encoder pulse resolution)	20 to 60000	×	○	1024	×	○
d16	(Pulse count factor 1)	1 to 9999	×	○	1	×	○
d17	(Pulse count factor 2)	1 to 9999	×	○	1	×	○
d21	Speed Agreement/PG Error (Hysteresis width)	0.0% to 50.0%	○	○	10.0	×	○
d22	(Detection timer)	0.00 to 10.00 s	○	○	0.50	×	○
d23	PG Error Processing	0 : Continue to run 1 : Stop running with alarm 1 2 : Stop running with alarm 2	×	○	2	×	○
d24	Zero Speed Control	0 : Not permit at startup 1 : Permit at startup	×	○	0	×	○
d25	ASR Switching Time	0.000 to 1.000 s	○	○	0.000	×	○

●d codes: Application Functions 2

Code	Name	Data setting range	Change when running	Data copying	Default setting	Drive control V/f	Drive control Vector
d51	Reserved	0 to 500	×	○	10	○	○
d52	Reserved	0 to 500	×	○	10	○	○
d53	Reserved	0 to 500	×	○	10	○	○
d54	Reserved	0 to 500	×	○	10	○	○
d55	Reserved	0 : Enable compensation 1 : Disable compensation	×	○	0	○	○
d59	Command (Pulse train input) (Pulse input property)	0 : Pulse train sign/Pulse train input 1 : Forward rotation pulse/Reverse rotation pulse 2 : A/B phase with 90 degree phase shift	×	○	0	○	○
d61	(Filter time constant)	0.000 to 5.000 s	○	○	0.005	○	○
d62	(Pulse count factor 1)	1 to 9999	×	○	1	○	○
d63	(Pulse count factor 2)	1 to 9999	×	○	1	○	○

●y codes: LINK Functions

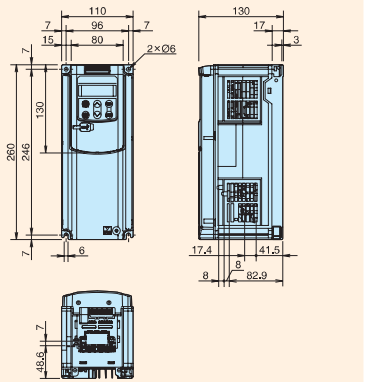
Code	Name	Data setting range	Change when running	Data copying	Default setting	Drive control V/f	Drive control Vector
y01	RS-485 Communication 1 (Station address)	1 to 255	×	○	1	○	○
y02	(Communications error processing)	0 : Immediately trip with alarm Er8 1 : Trip with alarm er8 after running for the period specified by timer Er8 2 : Retry during the period specified by timer y03. If the retry fails, trip with alarm Er8. If it succeeds, continue to run. 3 : Continue to run	○	○	0	○	○
y03	(Timer)	0.0 to 60.0 s	○	○	2.0	○	○
y04	(Baud rate)	0 : 2400 bps 1 : 4800 bps 2 : 9600 bps 3 : 19200 bps 4 : 38400 bps	○	○	3	○	○
y05	(Data length)	0 : 8 bits 1 : 7 bits	○	○	0	○	○
y06	(Parity bits check)	0 : None (2 stop bits) 1 : Even parity (1 stop bit) 2 : Odd parity (1 stop bit) 3 : None (1 stop bit)	○	○	0	○	○
y07	(Stop bits)	0 : 2 bits 1 : 1 bit	○	○	0	○	○
y08	(No-response error detection time)	0 : No detection; 1 to 60 s	○	○	0	○	○
y09	(Response interval)	0.00 to 1.00 s	○	○	0.01	○	○
y10	(Protocol selection)	0 : Modbus RTU protocol 1 : FRENIC Loader protocol (SX protocol) 2 : Fuji general-purpose inverter protocol			1		
y11	RS-485 Communication 2 (Station address)	1 to 255	×	○	1	○	○
y12	(Communications error processing)	0 : Immediately trip with alarm Erp 1 : Trip with alarm erp after running for the period specified by timer Erp 2 : Retry during the period specified by timer Erp. If the retry fails, trip with alarm erp. If it succeeds, continue to run. 3 : Continue to run	○	○	0	○	○
y13	(Timer)	0.0 to 60.0 s	○	○	2.0	○	○
y14	(Baud rate)	0 : 2400 bps 1 : 4800 bps 2 : 9600 bps 3 : 19200 bps 4 : 38400 bps	○	○	3	○	○
y15	(Data length)	0 : 8 bits 1 : 7 bits	○	○	0	○	○
y16	(Parity bits check)	0 : None (2 stop bits) 1 : Even parity (1 stop bit) 2 : Odd parity (1 stop bit) 3 : None (1 stop bit)	○	○	0	○	○
y17	(Stop bits)	0 : 2 bits 1 : 1 bit	○	○	0	○	○
y18	(No-response error detection time)	0 : No detection; 1 to 60 s	○	○	0	○	○
y19	(Response interval)	0.00 to 1.00 s	○	○	0.01	○	○
y20	(Protocol selection)	0 : Modbus RTU protocol 2 : Fuji general-purpose inverter protocol	○	○	0	○	○
y97	Communication Data Storage Selection	0 : Save into nonvolatile storage (Rewritable times limited) 1 : Write into temporary storage (Rewritable times unlimited) 2 : Save all data from temporary storage to nonvolatile one(After saving data, the data automatically returns to "1.")	○	○	0	○	○
y98	Bus Link Function (Mode selection)	Frequency command / Run command 0 : Follow H30 data / Follow H30 data 1 : Via field bus option / Follow H30 data 2 : Follow H30 data / Via field bus option 3 : Via field bus option / Via field bus option	○	○	0	○	○
y99	Loader Link Function (Mode selection)	Frequency command / Run command 0 : Follow H30 and y98 data / Follow H30 and y98 data 1 : Via RS-485 link Follow / H30 and y98 data(FRENIC Loader) 2 : Follow H30 and y98 data / Via RS-485 link (FRENIC Loader) 3 : Via RS-485 link / Via RS-485 link(FRENIC Loader)	○	×	0	○	○

<Data change, reflection and strage> ×: Not available ○: After changing data with using ▲▼ keys, execute and save data by pressing [SET] key. ◎ After changing and executing data with using ▲▼ keys, save the data by pressing [SET] key.

External Dimensions(Basic Type, EMC Filter Built-in Type)

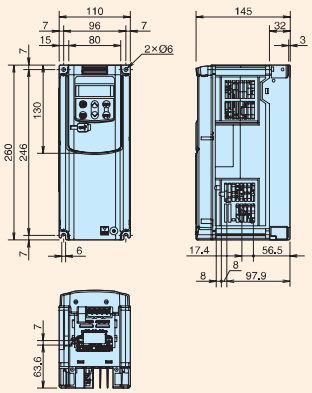
●Inverter main body (0.4kW)

[Unit:mm]



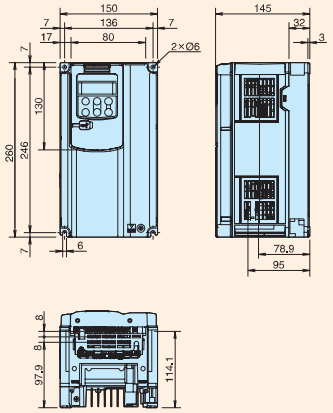
●Inverter main body (0.75kW)

[Unit:mm]



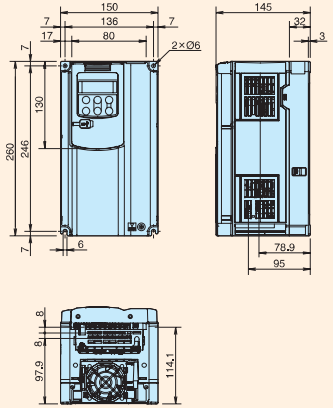
●Inverter main body (1.5kW)

[Unit:mm]



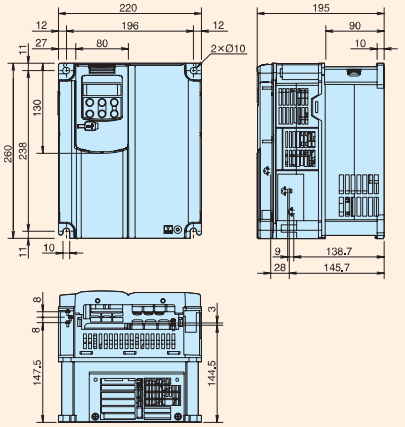
●Inverter main body (2.2･3.7kW)

[Unit:mm]



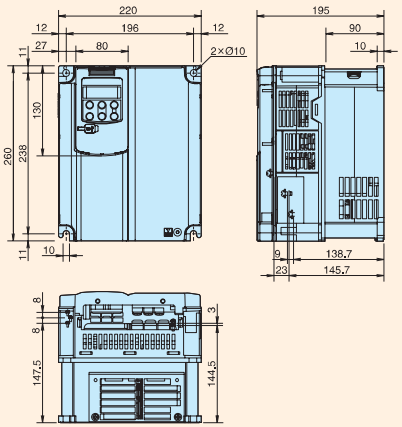
●Inverter main body (5.5kW)

[Unit:mm]



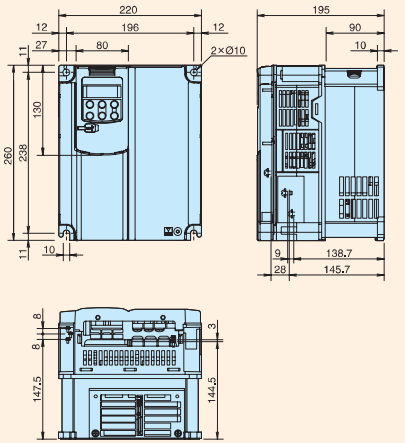
●Inverter main body (7.5kW)

[Unit:mm]



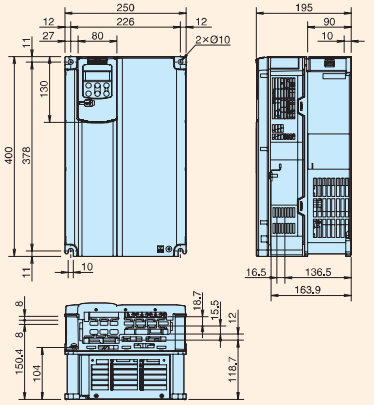
●Inverter main body (11kW)

[Unit:mm]



●Inverter main body (15･18.5･22kW)

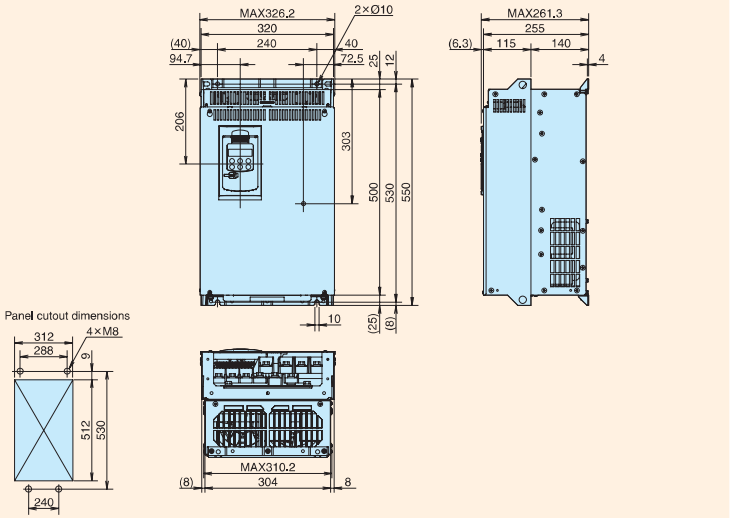
[Unit:mm]



External Dimensions(Basic Type, EMC Filter Built-in Type)

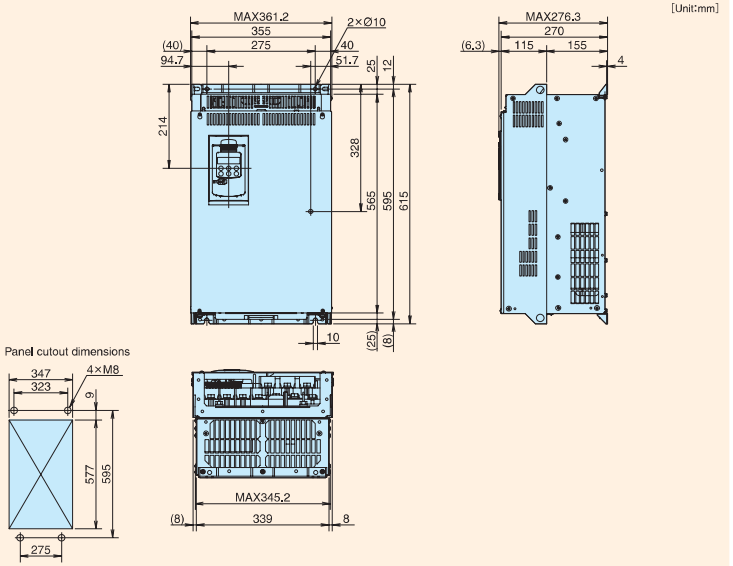
●Inverter main body (30kW)

[Unit:mm]



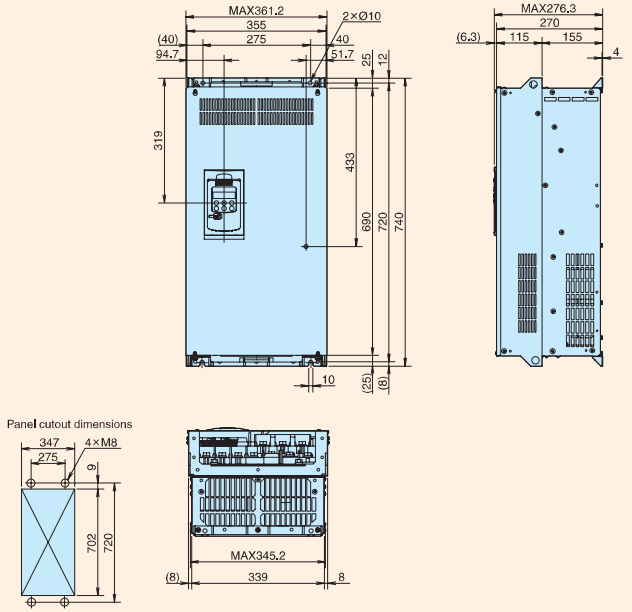
●Inverter main body (37kW)

[Unit:mm]



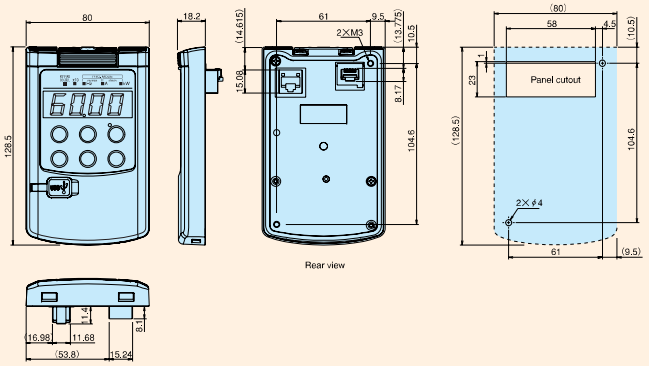
●Inverter main body (45・55kW)

[Unit:mm]



●Touch Panel

[Unit:mm]



* The inverter main body and the keypad are subject to change due to development.

Warranty

NOTES

When running general-purpose motor	Driving a 400V general-purpose motor	When driving a 400V general-purpose motor with an inverter using extremely long cables, damage to the insulation of the motor may occur. Use an output circuit filter (OFL) if necessary after checking with the motor manufacturer. Fuji's motors do not require the use of output circuit filters because of their reinforced insulation.
	Torque characteristics and temperature rise	When the inverter is used to run a general-purpose motor, the temperature of the motor becomes higher than when it is operated using a commercial power supply. In the low-speed range, the cooling effect will be weakened, so decrease the output torque of the motor. If constant torque is required in the low-speed range, use a Fuji inverter motor or a motor equipped with an externally powered ventilating fan.
	Vibration	When the motor is mounted to a machine, resonance may be caused by the natural frequencies, including that of the machine. Operation of a 2-pole motor at 60Hz or more may cause abnormal vibration. * Study use of tier coupling or dampening rubber. * It is also recommended to use the inverter jump frequency control to avoid resonance points.
	Noise	When an inverter is used with a general-purpose motor, the motor noise level is higher than that with a commercial power supply. To reduce noise, raise carrier frequency of the inverter. High-speed operation at 60Hz or more can also result in more noise.
When running special motors	High-speed motors	When driving a high-speed motor while setting the frequency higher than 120Hz, test the combination with another motor to confirm the safety of high-speed motors.
	Explosion-proof motors	When driving an explosion-proof motor with an inverter, use a combination of a motor and an inverter that has been approved in advance.
	Submersible motors and pumps	These motors have a larger rated current than general-purpose motors. Select an inverter whose rated output current is greater than that of the motor. These motors differ from general-purpose motors in thermal characteristics. Set a low value in the thermal time constant of the motor when setting the electronic thermal
	Brake motors	For motors equipped with parallel-connected brakes, their braking power must be supplied from the primary circuit (commercial power supply). If the brake power is connected to the inverter power output circuit (secondary circuit) by mistake, problems may occur. Do not use inverters for driving motors equipped with series-connected brakes.
	Geared motors	If the power transmission mechanism uses an oil-lubricated gearbox or speed changer/reducer, then continuous motor operation at low speed may cause poor lubrication. Avoid such operation.
	Synchronous motors	It is necessary to use software suitable for this motor type. Contact Fuji for details.
	Single-phase motors	Single-phase motors are not suitable for inverter-driven variable speed operation. Use three-phase motors. * Even if a single-phase power supply is available, use a three-phase motor as the inverter provides three-phase output.
Environmental conditions	Installation location	Use the inverter in a location with an ambient temperature range of -10 to +50°C. The inverter and braking resistor surfaces become hot under certain operating conditions. Install the inverter on nonflammable material such as metal. Ensure that the installation location meets the environmental conditions specified in "Environment" in inverter specifications.
Combination with peripheral devices	Installing a molded case circuit breaker (MCCB)	Install a recommended molded case circuit breaker (MCCB) or an earth leakage circuit breaker (ELCB) in the primary circuit of each inverter to protect the wiring. Ensure that the circuit breaker capacity is equivalent to or lower than the recommended capacity.
	Installing a magnetic contactor (MC) in the output (secondary) circuit	If a magnetic contactor (MC) is mounted in the inverter's secondary circuit for switching the motor to commercial power or for any other purpose, ensure that both the inverter and the motor are fully stopped before you turn the MC on or off. Remove the surge killer integrated with the MC.
	Installing a magnetic contactor (MC) in the input (primary) circuit	Do not turn the magnetic contactor (MC) in the primary circuit on or off more than once an hour as an inverter fault may result. If frequent starts or stops are required during motor operation, use FWD/REV signals.
	Protecting the motor	The electronic thermal facility of the inverter can protect the motor. The operation level and the motor type (general-purpose motor, inverter motor) should be set. For high-speed motors or water-cooled motors, set a small value for the thermal time constant to protect the motor. If you connect the motor thermal relay to the motor with a long cable, a high-frequency current may flow into the wiring stray capacitance. This may cause the relay to trip at a current lower than the set value for the thermal relay. If this happens, lower the carrier frequency or use the output circuit filter (OFL).
	Discontinuance of power-factor correcting capacitor	Do not mount power factor correcting capacitors in the inverter (primary) circuit. (Use the DC REACTOR to improve the inverter power factor.) Do not use power factor correcting capacitors in the inverter output circuit (secondary). An overcurrent trip will occur, disabling motor operation.
	Discontinuance of surge killer	Do not mount surge killers in the inverter output (secondary) circuit.
	Reducing noise	Use of a filter and shielded wires are typical measures against noise to ensure that EMC Directives are met. Refer to "Inverter design technical document (MHT221)" for details.
	Measures against surge currents	If an overvoltage trip occurs while the inverter is stopped or operated under a light load, it is assumed that the surge current is generated by open/close of the phase-advancing capacitor in the power system.We recommend connecting a DC REACTOR to the inverter.
	Megger test	When checking the insulation resistance of the inverter, use a 500V megger and follow the instructions contained in the Instruction Manual.
Wiring	Wiring distance of control circuit	When performing remote operation, use the twisted shield wire and limit the distance between the inverter and the control box to 20m.
	Wiring length between inverter and motor	If long wiring is used between the inverter and the motor, the inverter will overheat or trip as a result of overcurrent (high-frequency current flowing into the stray capacitance) in the wires connected to the phases. Ensure that the wiring is shorter than 50m. If this length must be exceeded, lower the carrier frequency or mount an output circuit filter (OFL).
	Wiring size	Select cables with a sufficient capacity by referring to the current value or recommended wire size.
	Wiring type	Do not use multicore cables that are normally used for connecting several inverters and motors.
	Grounding	Securely ground the inverter using the grounding terminal.
Selecting inverter capacity	Driving general-purpose motor	Select an inverter according to the applicable motor ratings listed in the standard specifications table for the inverter. When high starting torque is required or quick acceleration or deceleration is required, select an inverter with a capacity one size greater than the standard.
	Driving special motors	Select an inverter that meets the following condition : Inverter rated current > Motor rated current.
Transportation and storage		When transporting or storing inverters, follow the procedures and select locations that meet the environmental conditions that agree with the inverter specifications.

To all our customers who purchase Fuji Electric FA Components & Systems' products:

Please take the following items into consideration when placing your order.

When requesting an estimate and placing your orders for the products included in these materials, please be aware that any items such as specifications which are not specifically mentioned in the contract, catalog, specifications or other materials will be as mentioned below.
In addition, the products included in these materials are limited in the use they are put to and the place where they can be used, etc., and may require periodic inspection. Please confirm these points with your sales representative or directly with this company.
Furthermore, regarding purchased products and delivered products, we request that you take adequate consideration of the necessity of rapid receiving inspections and of product management and maintenance even before receiving your products.

1. Free of Charge Warranty Period and Warranty Range

1-1 Free of charge warranty period

(1) The product warranty period is "1 year from the date of purchase" or 24 months from the manufacturing date imprinted on the name place, whichever date is earlier.
(2) However, in cases where the use environment, conditions of use, use frequency and times used, etc., have an effect on product life, this warranty period may not apply.
(3) Furthermore, the warranty period for parts restored by Fuji Electric's Service Department is "6 months from the date that repairs are completed."

1-2 Warranty range

(1) In the event that breakdown occurs during the product's warranty period which is the responsibility of Fuji Electric, Fuji Electric will replace or repair the part of the product that has broken down free of charge at the place where the product was purchased or where it was delivered. However, if the following cases are applicable, the terms of this warranty may not apply.

1) The breakdown was caused by inappropriate conditions, environment, handling or use methods, etc. which are not specified in the catalog, operation manual, specifications or other relevant documents.
2) The breakdown was caused by the product other than the purchased or delivered Fuji's product.
3) The breakdown was caused by the product other than Fuji's product, such as the customer's equipment or software design, etc.
4) Concerning the Fuji's programmable products, the breakdown was caused by a program other than a program supplied by this company, or the results from using such a program.
5) The breakdown was caused by modifications or repairs affected by a party other than Fuji Electric.
6) The breakdown was caused by improper maintenance or replacement using consumables, etc. specified in the operation manual or catalog, etc.
7) The breakdown was caused by a chemical or technical problem that was not foreseen when making practical application of the product at the time it was purchased or delivered.
8) The product was not used in the manner the product was originally intended to be used.
9) The breakdown was caused by a reason which is not this company's responsibility, such as lightning or other disaster.

(2) Furthermore, the warranty specified herein shall be limited to the purchased or delivered product alone.
(3) The upper limit for the warranty range shall be as specified in item (1) above and any damages (damage to or loss of machinery or equipment, or lost profits from the same, etc.) consequent to or resulting from breakdown of the purchased or delivered product shall be excluded from coverage by this warranty.

1-3. Trouble diagnosis

As a rule, the customer is requested to carry out a preliminary trouble diagnosis. However, at the customer's request, this company or its service network can perform the trouble diagnosis on a chargeable basis. In this case, the customer is asked to assume the burden for charges levied in accordance with this company's fee schedule.

2. Exclusion of Liability for Loss of Opportunity, etc.

Regardless of whether a breakdown occurs during or after the free of charge warranty period, this company shall not be liable for any loss of opportunity, loss of profits, or damages arising from special circumstances, secondary damages, accident compensation to another company, or damages to products other than this company's products, whether foreseen or not by this company, which this company is not be responsible for causing.

3. Repair Period after Production Stop, Spare Parts Supply Period (Holding Period)

Concerning models (products) which have gone out of production, this company will perform repairs for a period of 7 years after production stop, counting from the month and year when the production stop occurs. In addition, we will continue to supply the spare parts required for repairs for a period of 7 years, counting from the month and year when the production stop occurs. However, if it is estimated that the life cycle of certain electronic and other parts is short and it will be difficult to procure or produce those parts, there may be cases where it is difficult to provide repairs or supply spare parts even within this 7-year period. For details, please confirm at our company's business office or our service office.

4. Transfer Rights

In the case of standard products which do not include settings or adjustments in an application program, the products shall be transported to and transferred to the customer and this company shall not be responsible for local adjustments or trial operation.

5. Service Contents

The cost of purchased and delivered products does not include the cost of dispatching engineers or service costs. Depending on the request, these can be discussed separately.

6. Applicable Scope of Service

Above contents shall be assumed to apply to transactions and use of the country where you purchased the products.
Consult the local supplier or Fuji for the detail separately.

Variation

The rich lineup of the active Fuji inverter family

Applications	Series Name (Catalog No.)	Features
General Industrial equipment	NEW FRENIC-MEGA (MEH●●●)	**High-performance, multi-functional inverter** (HD (High Duty) spec: Three-phase 200V: 0.4 to 90kW, Three-phase 400V: 0.4 to 630kW) (LD (Low Duty) spec: Three-phase 200V: 7.5 to 110kW, Three-phase 400V: 7.5 to 710kW) ● Loaded with vector control which is the peak of general purpose inverters. ● Prepared three types; the basic type, EMC filter built-in type, and type which complies with the guideline supervised by the Ministry of Land, Infrastructure and Transport. ● Maintainability is further improved with built-in USB port. ● The short-time acceleration and deceleration become enabled with achieving better rating of overload ratings at HD spec: 200% for 3 sec and 150% for 1 min and at LD spec: 120% for 1 min.
	FRENIC5000G11S (MEH403 for JE) (MEH413 for EN)	**High-performance, multi-functional inverter multi-functional** (Capacity range expanded) (Three-phase 200V: 0.2 to 90kW, Three-phase 400V: 0.4 to 630kW) ● Fuji's original dynamic torque vector control system delivers a starting torque of 200% at 0.5Hz. ● These inverters are packed with a full range of convenient functions, beginning with an auto tuning function. ● Compact, fully enclosed (22kW and below).
	FRENIC5000P11S (MEH403)	**Fan, pump inverter** (Capacity range expanded) (Three-phase 200V: 5.5 to110kW, Three-phase 400V: 5.5 to 710kW) ● Suitable for fans and pumps. ● The built-in automatic energy-saving function makes energy saving operation easy. ● An interactive keypad is standard-equipped for ease of operation.
	FRENIC-Multi (MEH652 for JE) (MEH653 for EN)	**High performance, compact inverter** (Three-phase 200V: 0.1 to 15kW, Single-phase 200V: 0.1 to 2.2kW, Three-phase 400V: 0.4 to 15kW) ● The inverter featuring environment-friendly and long life design (10 years) complies with RoHS Directives (products manufactured beginning in the autumn of 2005). ● With expanded capacity range, abundant model variation, and simple and thorough maintenance, the Multi is usable for a wide range of applications. ● Equipped with the functions optimum for the operations specific to vertical and horizontal conveyance, such as hit-and-stop control, brake signal, torque limit, and current limit.
	FRENIC-Eco (MEH442)	**Fan, pump inverter (for variable torque load)** (Three-phase 200V: 0.75 to 110kW, Three-phase 400V: 0.75 to 560kW) ● Developed exclusively for controlling variable torque load like fans and pumps. ● Full of new functions such as auto energy saving, PID control, life warning, and switching sequence to the commercial power supply. ● Ideal for air conditioners, fans, pumps, etc. which were difficult to use with conventional general-purpose inverters because of cost or functions.
	FRENIC-Mini (MEH441 for JE) (MEH451 for EN)	**Compact inverter** (Three-phase 200V: 0.1 to 3.7kW, Three-phase 400V: 0.4 to 3.7kW, Single-phase 200V: 0.1 to 2.2kW, Single-phase 100V: 0.1 to 0.75kW) ● A frequency setting device is standard-equipped, making operation simple. ● Loaded with auto torque boost, current limiting, and slip compensation functions, all of which are ideal for controlling traverse conveyors. ● Loaded with the functions for auto energy saving operation and PID control, which are ideal for controlling fans and pumps.
	FRENIC5000VG7S (MEH405)	**High performance, vector control inverter** (Capacity range expanded) (Three-phase 200V: 0.75 to 90kW, Three-phase 400V: 3.7 to 630kW) ● A high precision inverter with rapid control response and stable torque characteristics. ● Abundant functions and a full range of options make this inverter ideal for a broad range of general industrial systems. ● The auto tuning function makes vector control operation possible even for general-purpose motors.
	FRENIC5000MG5	**Inverter with the power supply regeneration function** (Three-phase 200V: 3.7 to 45kW) ● A separate converter is used, and up to 2 drive units can be connected to a single converter unit. ● The power regeneration function is standard-equipped in the converter unit. ● These inverters can be used for general-purpose motors.
High frequency operation	FRENIC5000H11S	**High frequency inverter** (Three-phase 200V: 2.2 to18.5kW) ● Fuji's original sine wave PWM control system delivers stable operation from the low speed range to the high speed range. ● Capable of handling output frequencies from 1 to 1667Hz. ● The desired V/f pattern can be set and polygonal line frequency can be set to match the motor characteristics.
Controlling machine tool	FRENIC5000MS5 (MEH391)	**Machine tool spindle drive system** (Three-phase 200V: 0.75 to 45kW) ● The separated converter allows you to configure a multi-axis system. ● Free combinations are made possible such as torque vector/high performance vector control and dynamic braking/power regeneration. ● Abundant option functions enable multitasking machining with a machine tool.

Safety Precautions

1. Use the contents of this catalog only for selecting product types and models. When using a product, read the Instruction Manual beforehand to use the product correctly.
2. Products introduced in this catalog have not been designed or manufactured for such applications in a system or equipment that will affect human bodies or lives. Customers, who want to use the products introduced in this catalog for special systems or devices such as for atomic-energy control, aerospace use, medical use, and traffic control, are requested to consult the Fuji's Sales Division. Customers are requested to prepare safety measures when they apply the products introduced in this catalog to such systems or facilities that will affect human lives or cause severe damage to property if the products become faulty.