High performance and multipurpose

Output torque [%]

3Hz
5Hz
10Hz

Motor speed [r/min]

200
100
0
-100
-200

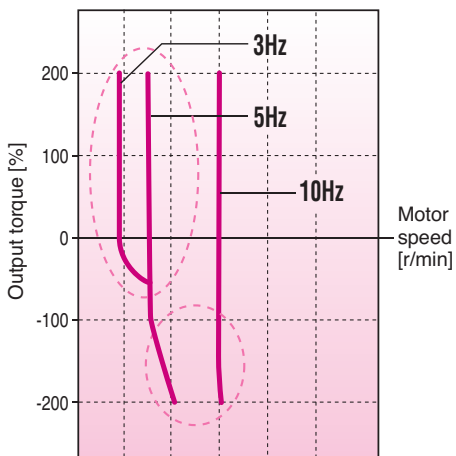## ● Dynamic torque vector control system

Fuji's original dynamic torque vector control system is known for its top-of-the line performance, delivering stabile torque output even at low speeds. This feature has a wide range of applications, including conveyors and high-inertia loads that demand high starting torque.

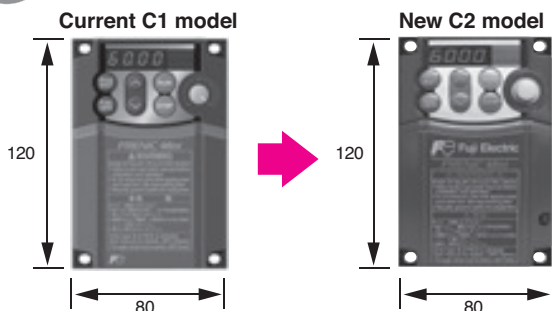## ● Slip compensation controller shortens setting time

The slip compensation controller works with voltage tuning for even more accurate speed control at low velocity. This reduces speed control variability and stabilizing creep speed for more accurate stopping in conveyors and similar equipment.

● Fastest CPU processor in its class

Advanced CPU processes data at twice the speed of our current model

Even easier to use and fully compatible with existing products

Current C1 model

120

80

New C2 model

120

80

External dimensions	Interchangeable
Installed dimensions	Interchangeable
Number of terminals	Same for both main circuit and controllers
Terminal position	Compatible terminal wire length
Function codes	Compatible function codes
RS-485 communication	Shared communications protocol

Note: Three-phase 200V 0.1−0.75kW dimensions shown (mm)
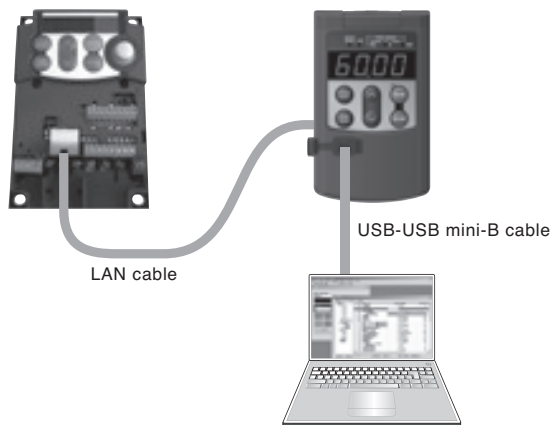
Easy operation and maintenance

● Usability

Delivers all the usability of the C1. Provides volume of frequency and the same ease of operation as the current model.

● Easier maintenance

Function	Description
Mock malfunction	Select a function to set off a mock alarm
Number of startups	Count the total number of ON/OFF run cycles
Cumulative motor running time	Monitor motor run time
Total power	Set to measure total power consumption
Trip history	Saves and displays information on up to four past trips

●USB keypad

Optional USB keypad available. Enhanced PC loader connectivity.

USB-USB mini-B cable

LAN cable

· USB keypad scheduled for release soon

· PC loader software available as a free download

Features

Specifications

Terminal functions

External dimensions
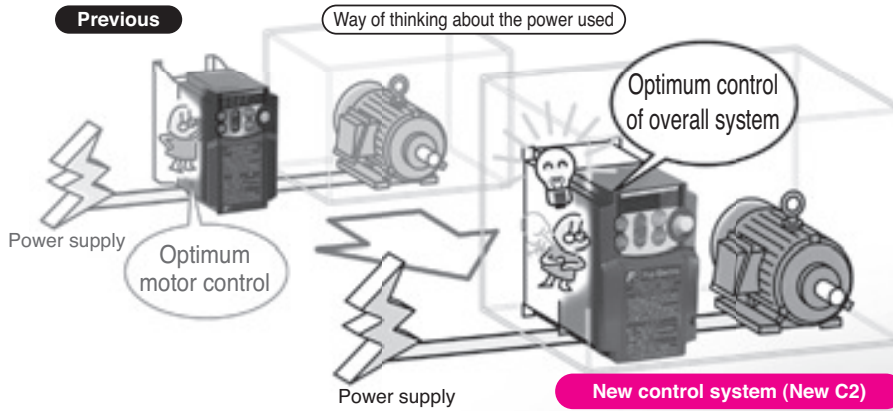
3

Energy optimization

● Energy use optimizer

Motor tuning minimizes power loss

Previous

Way of thinking about the power used

Optimum control of overall system

Power supply — Optimum motor control

Power supply

New control system (New C2)

● PID control function

Permits motor operation while controlling temperature, pressure, and flow rate without the use of a temperature controller or other external device

● Cooling fan ON/OFF control function

The cooling fan can be switched off when the fan or pump is not running to reduce both noise and energy consumption

● Synchronous motor control (coming soon)

Use of sensorless synchronous motor control together with the motor can reduce energy consumption

Network capabilities standard

●RS-485 communications port

Communications can be controlled through the standard RS-485 communications port using the Modbus-RTU or Fuji inverter protocol

RS-485 communications connector
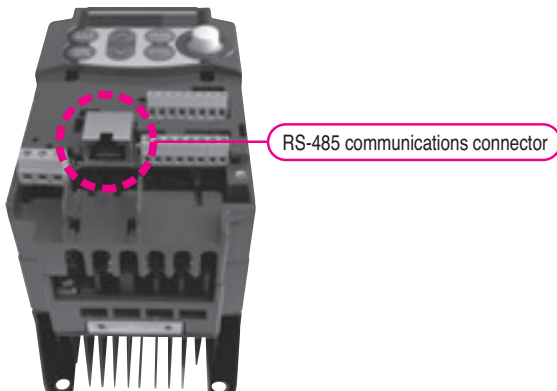
Other Other features

● Functions compatible with user applications

V/F (non-linear 3 step)
Switch between two motors (2-motor switch control)
Brake signal (brake release signal)
Rotational direction control (prevent forward/reverse movement)

● Global products

All standard models comply with the EC Directive (CE marking)

Europe

EC Directives (CE making)   C E

Variation

Applicable motor rating (kW)	Three-phase 200V series	Three-phase 400V series	Single-phase 200V series	Single-phase 100V series
Standard specifications				
0.1	FRN0001C2S-2□		FRN0001C2S-7□	FRN0001C2S-6U
0.2	FRN0002C2S-2□		FRN0002C2S-7□	FRN0002C2S-6U
0.4	FRN0004C2S-2□	FRN0002C2S-4□	FRN0004C2S-7□	FRN0003C2S-6U
0.75	FRN0006C2S-2□	FRN0004C2S-4□	FRN0006C2S-7□	FRN0005C2S-6U
1.5	FRN0010C2S-2□	FRN0005C2S-4□	FRN0010C2S-7□	
2.2	FRN0012C2S-2□	FRN0007C2S-4□	FRN0012C2S-7□	
3.7	FRN0020C2S-2□	FRN0011C2S-4□		
Destination □	A(Asia), U(USA)	A(Asia), C(China), E(Europe), U(USA)		U(USA)

☐ **Coming soon**

Model number information

FRN 0010 C 2 S - 4 A

Code	Series name
FRN	FRENIC series

Applicable current rating
This value shows an amperage rating
0001~0020

Code	Application range
C	Compact

Code	Developed inverter series
2	2-series

Code	Enclosure
S	Standard (IP20)

Code	Destination/Manual
A	Asia/English
C	China/Chinese
E	Europe/English
U	USA/English

Code	Input power source
2	Three-phase 200V
4	Three-phase 400V
6	Single-phase 100V
7	Single-phase 200V

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

Standard Specifications

Standard specifications

■ Three-phase 200V series (0.1 to 3.7kW) A(Asia), U(USA)

Item		Specifications							
Input power source		Three-phase 200V							
Type (FRN□□□ C2S-2□)		0001	0002	0004	0006	0010	0012	0020
Applicable motor rating[kW]		0.1	0.2	0.4	0.75	1.5	2.2	3.7
Output ratings	Rated capacity[kVA]	0.30	0.57	1.3	2.0	3.5	4.5	7.2
	Rated voltage[V]	Three-phase 200 to 240V (With AVR)						
	Rated current[A](*1)	0.8 (0.7)	1.5 (1.4)	3.5 (2.5)	5.5 (4.2)	9.2 (7.0)	12.0 (10.0)	19.1 (16.5)
	Overload capability	150% of rated current for 1min 150% of rated current for 1min or 200% of rated current for 0.5s (If the rated current is in parenthesis)						
	Rated frequency[Hz]	50, 60Hz						
Input ratings	Phases, voltage, frequency	Three-phase, 200 to 240V, 50/60Hz						
	Voltage/frequency variations	Voltage: +10 to -15% (Voltage unbalance : 2% or less) Frequency: +5 to -5%						
	Momentary voltage dip capability	When the input voltage is 165V or more, the inverter continues operation. If it drops less than 165V, the inverter operates for 15ms.						
	Rated current[A] (with DCR)	0.57	0.93	1.6	3.0	5.7	8.3	14.0
	(without DCR)	1.1	1.8	3.1	5.3	9.5	13.2	22.2
	Required power supply capacity[kVA]	0.2	0.3	0.6	1.1	2.0	2.9	4.9
Braking	Torque[%]	150		100		50	30	
	DC injection braking	Starting frequency: 0.0 to 60.0Hz Braking time: 0.0 to 30.0s Braking level: 0 to 100% of rated current						
	Braking transistor	–		Built-in				
Applicable safety standards		UL508C, EN 61800-5-1:2007						
Enclosure (IEC 60529)		IP20 (IEC 60529:1989) / UL open type (UL50)						
Cooling method		Natural cooling				Fan cooling		
Weight / Mass[kg]		0.6	0.6	0.7	0.8	1.7	1.7	2.5

*1 The load shall be reduced so that the continuous operating current is the rated current in parenthesis or less if the carrier frequency is set to 3kHz or above or ambient temperature exceeds 40°C.

Features

Specifications

Terminal functions

External dimensions

Standard Specifications

Standard specifications

■ Three-phase 400V series (0.4 to 3.7kW)

Item			Specifications				
Input power source			Three-phase 400V				
Type (FRN□□□ C2S-4□)			0002	0004	0005	0007	0011
Applicable motor rating[kW]			0.4	0.75	1.5	2.2	3.7/4.0
Output ratings	Rated capacity[kVA]		1.3	2.3	3.2	4.8	8.0
	Rated voltage[V]		Three-phase 380 to 480V (With AVR)				
	Rated current[A](*1)		1.8 (1.5)	3.1 (2.5)	4.3 (3.7)	6.3 (5.5)	10.5 (9.0)
	Overload capability		150% of rated current for 1min 150% of rated current for 1min or 200% of rated current for 0.5s (If the rated current is in parenthesis)				
	Rated frequency[Hz]		50, 60Hz				
Input ratings	Phases, voltage, frequency		Three-phase, 380 to 480V, 50/60Hz				
	Voltage/frequency variations		Voltage: +10 to -15% (Voltage unbalance : 2% or less) Frequency: +5 to -5%				
	Momentary voltage dip capability		When the input voltage is 300V or more, the inverter continues operation. If it drops less than 300V, the inverter operates for 15ms.				
	Rated current[A]	(with DCR)	0.85	1.6	3.0	4.4	7.3
		(without DCR)	1.7	3.1	5.9	8.2	13.0
	Required power supply capacity[kVA]		0.6	1.1	2.0	2.9	4.9
Braking	Torque[%]		100		50	30	
	DC injection braking		Starting frequency: 0.0 to 60.0Hz, Braking time: 0.0 to 30.0s Braking level: 0 to 100%				
	Braking transistor		Built-in				
Applicable safety standards			UL508C, EN 61800-5-1:2007				
Enclosure (IEC 60529)			IP20 (IEC 60529:1989) / UL open type (UL50)				
Cooling method			Natural cooling		Fan cooling		
Weight / Mass[kg]			1.1	1.2	1.7	1.7	2.5

*1 The load shall be reduced so that the continuous operating current is the rated current in parenthesis or less if the carrier frequency is set to 3kHz or above or ambient temperature exceeds 40°C.

■ Single-phase 200V series (0.1 to 2.2kW)

Item			Specifications				
Input power source			Single-phase 200V				
Type (FRN□□□ C2S-7□)			0001	0002	0004	0006	0010	0012
Applicable motor rating[kW]			0.1	0.2	0.4	0.75	1.5	2.2
Output ratings	Rated capacity[kVA]		0.30	0.57	1.3	2.0	3.5	4.5
	Rated voltage[V]		Three-phase 200 to 240V (With AVR)					
	Rated current[A] (*1)		0.8 (0.7)	1.5 (1.4)	3.5 (2.5)	5.5 (4.2)	9.2 (7.0)	12.0 (10.0)
	Overload capability		150% of rated current for 1min 150% of rated current for 1min or 200% of rated current for 0.5s (If the rated current is in parenthesis)					
	Rated frequency[Hz]		50, 60Hz					
Input ratings	Phases, voltage, frequency		Single-phase, 200 to 240V, 50/60Hz					
	Voltage/frequency variations		Voltage: +10 to -10%, Frequency: +5 to -5%					
	Momentary voltage dip capability		When the input voltage is 165V or more, the inverter continues operation. If it drops less than 165V, the inverter operates for 15ms.					
	Rated current[A]	(with DCR)	1.1	2.0	3.5	6.4	11.6	17.5
		(without DCR)	1.8	3.3	5.4	9.7	16.4	24.0
	Required power supply capacity[kVA]		0.3	0.4	0.7	1.3	2.4	3.5
Braking	Torque[%]		150		100		50	30
	DC injection braking		Starting frequency: 0.0 to 60.0Hz, Braking time: 0.0 to 30.0s, Braking level: 0 to 100%					
	Braking transistor		–		Built-in			
Applicable safety standards			UL508C, EN 61800-5-1:2007					
Enclosure (IEC 60529)			IP20 (IEC 60529:1989) / UL open type (UL50)					
Cooling method			Natural cooling				Fan cooling	
Weight / Mass[kg]			0.6	0.6	0.7	0.8	1.7	2.5

*1 The load shall be reduced so that the continuous operating current is the rated current in parenthesis or less if the carrier frequency is set to 3kHz or above or ambient temperature exceeds 40°C.

Common Specifications

Common specifications

Item			Explanation	Remarks
Output frequency	Setting range	Maximum frequency	25 to 400Hz	
		Base frequency	25 to 400Hz	
		Starting frequency	0.1 to 60.0Hz	
		Carrier frequency	0.75 to 16kHz Note: The unit is equipped with an automatic reduction/stop function that may automatically drop the carrier frequency to protect the inverter when it is running at frequencies above 6 kHz, depending on ambient temperature, output current, and other conditions. (*1) · Under modulated carrier conditions, the system scatters carrier frequency to reduce noise	
	Accuracy (stability)		· Analog setting:　　　: Absolute accuracy within ± 2% (at 25°C), temperature drift within ± 0.2% (25 ± 10°C) · Keypad setting:　　　: Absolute accuracy within ± 0.01% (at 25°C), temperature drift within ± 0.01% (25 ± 10°C)	
	Setting resolution		· Analog setting　　: 1/1000 of maximum frequency · Keypad setting　　: 0.01Hz (99.99Hz or less), 0.1Hz (100.0Hz to 400.0Hz) · Link operation　　: 1/20000 of maximum frequency or 0.01Hz (fixed)	
Control	Control method		Induction motor drive · V/f control　· Slip compensation　· Automatic torque boost · Dynamic torque vector control　· Automatic energy-saving function	
			Synchronous motor drive (*2) · Sensorless magnetic positioning (speed control range: 10% of base frequency and up)	(Under development)
	Voltage/freq. characteristic	200V series	Base frequency and maximum output frequency can each be set between :80 to 240 AVR control (*1) can be turned ON or OFF Allowable non-linear V/f (*1) settings (2): optional voltage (0–240V) and frequency (0–400Hz)	
		400V series	Base frequency and maximum output frequency can each be set between :160 to 500 AVR control (*1) can be turned ON or OFF Allowable non-linear V/f (*1) settings (2): optional voltage (0–500V) and frequency (0–400Hz)	
	Torque boost (*1)		· Automatic torque boost (for constant torque loads)	
			· Manual torque boost: Optional torque boost value can be set between 0.0 and 20.0%	
			· Application load can be selected (for constant and variable torque loads)	
	Starting torque (*1)		150% or more/frequency set to 3Hz Slip compensation /automatic torque boost active	
	Start/stop		Keypad operation　　　: Start and stop with [RUN], [STOP] keys (standard keypad) 　　　　　　　　　　　: Start and stop with [RUN], [STOP] keys (remote keypad: optional)	
			External signals　　　: FWD (REV) operation/stop command [3-wire operation enabled] (digital input)　　　　　Coast-to-stop command, trip command (external fault), fault reset, etc.	
			Link operation　　　: Communication via RS-485	
			Changing run command : Communications used to change run command	
	Frequency setting		Keypad operation　　　: Can be set with [∧] or [∨] key (with save data function)	
			Set based on built-in volume	
			Analog input　　　　　: 0 to +10V DC/0 to 100% (terminal 12) 　　　　　　　　　　　: 4 to +20mA DC/0 to 100%, 0 to +20mA DC/0 to 100% (terminal C1)	
			Multistep frequency　　: Selectable from 16 steps (step 0 to 15)	
			UP/DOWN operation　　: Raises or lowers frequency while digital input signal is ON	
			Link operation:　　　　: Frequency set through RS-485 communication	
			Changing frequency settings　: Two types of frequency settings can be changed using external signals (digital input) : frequency settings and multistep frequency settings	
			Auxiliary frequency setting　: Built-in potentiometer, Inputs at terminal 12, C1 can be added to the main setting as auxiliary frequency settings.	
			Inverse operation　　　: Can be switched from (DC 0 to +10V/0 to 100%) to (DC +10 to 0V/0 to 100%) externally 　　　　　　　　　　　: Can be switched from (DC 4 to 20mA (DC 0–20mA)/0 to 100%) to (DC 20 to 4mA (DC 20–0mA)/0 to 100%) externally	
	Acceleration/deceleration time		· Can be set between 0.00 and 3600s · There are two independent settings that can be selected for acceleration/deceleration time (can be switched while running) · Pattern : The following four acceleration/deceleration types can be selected 　Linear, S-curve (weak/strong), non-linear (constant output maximum capacity acceleration/deceleration) · Coast-to-stop acceleration/deceleration is enabled when run commands are OFF · Acceleration/deceleration time can be set during jogging operation (between 0.00 and 3600s)	

*1 Only valid when induction motor drive is in operation
*2 Compatibility planned with next software version upgrade

7

Common Specifications

Common specifications

	Item	Explanation	Remarks
Control	Frequency limiter (Peak/bottom frequency limit)	High and low limiters can be set in addition to Hz values (0–400Hz)	
	Bias frequency	Bias of set frequency and PID command can be set separately between 0 and ±100%	
	Gain for frequency setting	Analog input gain can be set between 0 and 200%	
	Jump frequency control	Three operation points and their common jump hysteresis width can be set (0–30Hz)	
	Timer operation	Operation starts and stops at the time set from keypad (1 cycle)	
	Jogging operation (*1)	Operated using the RUN key (on the standard or remote keypad) or digital contact point input (acceleration and deceleration time--same duration used only for jogging)	
	Auto-restart after momentary power failure (*1)	· Restarts inverter without stopping the motor when power is restored · Startup can be selected from frequency prior to startup/momentary power failure when power is restored	
	Current limit by hardware (*1)	Uses hardware to limit current and prevent overcurrent trips resulting from sudden load changes, momentary power failures, and similar events that cannot be handled by software current limiters (can be canceled)	
	Slip compensation (*1)	Compensates for decrease in speed according to the load, enabling stable operation	
	Current limit	Keeps the current under the preset value during operation	
	PID control	Process PID regulator · PID command, keyboard, analog input (terminal 12, C1), RS-485 communication · Feedback value: Analog input (terminal 12, C1) · Low liquid level stop function · Switch forward/reverse operation · Integration reset/hold function	
	Automatic deceleration	· Automatically limits output frequency, limits energy generated by the inverter, and avoids overcurrent trips when torque relay value is exceeded (*1) · Makes deceleration time three times longer to avoid OU trip when DC link circuit voltage exceeds overage limit	
	Deceleration characteristics (improved braking capacity)	Increases motor loss and reduces energy generated by the inverter during deceleration to avoid overcurrent trips	
	Energy saving operation (*1)	Restricts output voltage to minimize total motor and inverter loss during constant speed operation	
	Overload prevention control	Lowers frequency when IGBT junction temperature and ambient temperature rise due to overloading to avoid further overload	
	Offline tuning (*1)	Performs r1, Xσ, and excitation current tuning	
	Fan stop operation	Detects inverter internal temperature and stops cooling fan when the temperature is low	

	Secondary motor settings	· Switching between two motors in the same inverter is enabled (switching cannot be performed while the inverter is running)
		  Induction motor settings can only be applied to the second motor
		  Data settings (base frequency, rated current, torque boost, electronic thermal, and slip compensation, etc.) can be entered for the second motor
		· Constants can be set within the second motor. Auto-tuning is also enabled.	

	Rotational direction limits	Select either prevent reverse or prevent forward operation	
Indication	Running/stopping	Speed monitor, output current [A], output voltage [V], input power [kW], PID reference, PID feedback value, PID output, timer value (for timer operation) [s], total power amount Select the speed monitor to be displayed from the following: Output frequency (before slip compensation) [Hz], output frequency (after slip compensation) [Hz], set frequency [Hz], load shaft speed [min^{-1}], line speed [m/min], constant rate of feeding time [min]	
	Lifetime alarm	Displays the lifetime alarm for the main circuit condenser, PCB condenser, and cooling fan. External output is enabled for lifetime alarm information.	
	Total running time	Can display total motor running time, total inverter running time, and total power use	
	I/O check	Displays control circuit terminal output status	
	Energy saving monitor	Power consumption, power consumption x coefficient	
	Trip mode	Displays cause of trip: · $OC1$: Overcurrent during acceleration · $OC2$: Overcurrent during deceleration · $OC3$: Overcurrent at constant speed · Lin : Input phase loss · LU : Undervoltage · OPL : Output phase loss · $OU1$: Overvoltage during acceleration · $OU2$: Overvoltage during deceleration · $OU3$: Overvoltage during constant speed · $OH1$: Overheating of the heat sink · $OH2$: External thermal relay tripped · $OH4$: Motor protection (PTC thermistor) · dbH : Overheating of the DB circuit · CoF : PID feedback break detected · $OL1$: Overload in motor 1 · $OL2$: Overload in motor 2 · OLU : Inverter unit overload · $Er1$: Memory error · $Er2$: Keypad communication error · $Er3$: CPU error · $Er6$: Operation procedure error · $Er7$: Tuning error · $Er8$: RS485 error · ErF : Data save error due to undervoltage · Erd : Step out detected (for synchronous motor drive) (*2) · Err : Mock error	
	Running or trip mode	Trip history: Saves and displays the last 4 trip codes and their detailed description Saves and displays detailed data for each section on up to four past trips	
Protection	Overcurrent	Stops the inverter to protect against overcurrent due to overload	LED display OC1 OC2 OC3
	Short-circuit	Stops the inverter to protect against overcurrent due to a short circuit in the output circuit	
	Ground fault	Stops the inverter to protect against overcurrent due to a ground fault (initial ground circuit only) in the output circuit	
	Overvoltage	Detects excess voltage in DC link circuit (200V: DC 400V,400V: DC 800V) and stops the inverter Cannot protect against significantly large voltage input mistakenly applied	OU1 OU2 OU3

*2 Compatibility planned with next software version upgrade

Common specifications

	Item	Explanation	Remarks
	Undervoltage	Detects drops in DC link circuit voltage (200V: DC 200V,400V: DC400V) and stops the inverter Note that no alarm will sound if auto-restart after momentary power failure is selected	LU
	Input phase loss	Stops or protects the inverter against input phase loss Even when there is input phase loss, the loss may not be detected if the connected load is light or a DC reactor is connected to the inverter	Lin
	Output phase loss detected	Detects loss from breaks in output wiring while running or during startup and stops the inverter	OPL
	Overheating	Stops the inverter by detecting the temperature of the inverter cooling system (e.g. when the cooling fan is malfunctioning or there is an overload)	OH1
		Protects against overheating during braking resistance based on braking resistor electronic thermal function settings	dbH
	Overload	Stops the inverter based on the temperature of the cooling system and the switching element calculated from output current flow	OLU
	External alarm input	Stops the inverter alarm through digital input (THR)	OH2
Motor protection	Electronic thermal	Stops running the inverter to protect the motor according to electronic thermal function settings Protects the standard motor and inverter motor over the full frequency range. The second motor can also be protected. (Operation level and thermal time constant can be set between 0.5 and 75.0 minutes)	OL1 OL2
	PTC thermistor	· Stops running the inverter to protect the motor when the PTC thermistor detects motor temperature A PTC thermistor is connected between terminals C1 and 11, and a resistor is connected between terminals 13 and C1. Set function code.	OH4
	Overload early warning	Outputs a preliminary alarm at a preset level before the electronic thermal stops the inverter	—
Protection	Memory error	Checks data when the power is turned on and data is being written, and stops the inverter if a memory malfunction is detected.	Er1
	Keypad communication error	Stops the inverter if a communication malfunction is detected between the keypad and inverter unit while an operation command is in progress from the remote keypad	Er2
	CPU error	Stops the inverter if a CPU malfunction caused by noise or similar factors is detected	Er3
	Operation error	(STOP) key priority: Pressing the (STOP) key on the keypad forces the inverter to stop, even if run commands are being delivered via terminals or communications. Er6 is displayed once stop is complete.	Er6
		Start check: Prohibits run operations and displays Er6 if a run command is given while any of the following status changes are occurring: · Powering up · Canceling an alarm · Switching run command methods via link operation	
	Tuning error (*1)	Stops the inverter when there is a tuning failure, interruption, or abnormality in tuning results during motor constant tuning	Er7
	RS-485 communication error	Stops the inverter if a communications malfunction is detected in RS-485 communication with the inverter unit	Er8
	Data save error during undervoltage	Displays an error if data save cannot proceed normally because an undervoltage protection function is activated	ErF
	Step out detected (*2)	Stops the inverter when a synchronous motor step out is detected	Erd
	PID feedback break detected	Stops the inverter when a break is detected during current input (C1 terminal) distribution to PID feedback (can be enabled/disabled)	CoF
	Stall prevention	Output frequency is reduced to avoid an overcurrent trip when output current exceeds the limit during acceleration/deceleration or constant speed operation	
	Alarm output (for any fault)	· Outputs a relay signal when the inverter is stopped due to an alarm · Alarm stop status can be canceled by pressing the PRG/RESET key or by inputting a digital signal (RST)	
	Retry	Inverter can be automatically reset and restarted after stopping due to a trip (the number of retries and wait time until reset can also be set)	
	Incoming surge	Protects the inverter from surge voltage between the main circuit and ground terminal	
	Momentary power failure	· Launches a protective function (stops the inverter) when there is a momentary power failure of 15ms or more · Restarts and restores voltage within the set time when momentary power failure restart is selected	
	Mock malfunction	Can output a mock alarm to check malfunction sequences	Err
Environment	Installation location	· Must be indoors and free of corrosive gases, flammable gases, dust, and oil mist (contamination level 2 (IEC 60664-1: 2007) · Keep out of direct sunlight	
	Ambient temperature	Open: –10 to +50°C (IP20)	
	Ambient humidity	5 to 95%RH (no condensation)	

	Altitude	1000m or below No output reduction
		1000–less than 3000m Output reduced
		  1000–less than 1500m: 0.97, 1500–less than 2000m: 0.95
		  2000–less than 2500m: 0.91, 2500–less than 3000m: 0.88	

	Vibration	3mm: 2 to less than 9Hz, 9.8m/s2: 9 to less than 20Hz, 2m/s2: 20 to less than 55Hz, 1m/s2: 55 to less than 200Hz	
	Saved temperature	-25 to +70°C	
	Saved humidity	5 to 95%RH (no condensation)	

*1 Only valid when induction motor drive is in operation

*2 Compatibility planned with next software version upgrade

Terminal Functions

Terminal functions

Category	Symbol	Terminal name	Functions	Remarks
Main circuit	L1/R,L2/S,L3/T	Power input	Connect a three-phase power supply (three-phase 200V,400V)	
	U,V,W	Inverter output	Connect a three-phase induction motor	
	P(+) ,P1	For DC REACTOR	Connect the DC REACTOR	
	P(+) ,N(-)	For DC bus connection	Used for DC bus connection system	
	P(+) ,DB	For EXTERNAL BRAKING RESISTOR	Connect external braking resistor	Only for 0.4kW and above. Connections are enabled for 0.2kW and below, but operation will not work.
	⏚G(2-terminal)	Grounding	Ground terminal for inverter chassis	
Frequency setting	13	Potentiometer power supply	Power supply for frequency setting potentiometer (1 to 5kΩ)	DC10V
	12	Voltage input	· Used as voltage input for frequency setting 0 to +10V DC/0 to 100%	
		(Inverse operation) (PID control) (Frequency aux. setting)	· +10 to +0V DC/0 to 100% · Used for reference signal (PID process command) or feedback signal · Used as additional auxiliary setting to various main settings of frequency	
	C1	Current input	· Used as current input for frequency setting +4 to +20mA DC (0 to +20mA DC)/0 to 100%	
		(Inverse operation) (PID control) (Frequency aux. setting)	· +4 to +20mA DC (0 to +20mA DC)/0 to 100% · Used for reference signal (PID process command) or feedback signal · Used as additional auxiliary setting to various main settings of frequency	
		(For PTC thermistor)	· Connects PTC thermistor for motor protection	
	11(2-terminal)	Common	Common terminal for frequency setting signal (12, 13, C1, FMA)	Isolated from terminal CM and Y1E
Digital input	X1	Digital input 1	The following functions can be set at terminals X1 to X3, FWD, and REV for signal input. - Common function · Switch between synch/source using the built-in switches on the unit · Short-circuit ON or open circuit ON settings are enabled between the terminal X1 and CM The same setting is possible between CM and any of the terminals among X2, X3, FWD, and REV.	
	X2	Digital input 2		
	X3	Digital input 3		
	FWD	Forward operation command		
	REV	Reverse operation command		
	(FWD)	Forward operation command	The motor runs in the forward direction when (FWD) is ON, stops after deceleration when FWD is OFF	Only terminal FWD/REV settings are allowed, only short circuit ON
	(REV)	Reverse operation command	The motor runs in the reverse direction when (REV) is ON, stops after deceleration when REV is OFF	do.
	(SS1) (SS2) (SS4) (SS8)	Multistep freq. selection	16-speed operation is enabled using the ON/OFF signal from (SS1) through (SS8) (table below)	
	(RT1)	ACC/DEC selection	Acceleration/deceleration time setting 1 is active when RT1 is OFF Acceleration/deceleration time setting 2 is active when RT1 is ON	
	(HLD)	3-wire operation stop command	· Used as an automatic hold signal during 3-wire operation · The FWD or REV signal is automatically stopped when HLD is ON, and the hold is removed when HLD is OFF	
	(BX)	Coast-to-stop command	When BX is ON, inverter output is shut off immediately and the motor coasts-to-stop (no alarm output)	
	(RST)	Alarm reset	Alarm hold status is removed when RST is ON	Signal at 0.1s or higher
	(THR)	Trip command (External fault)	When THR is OFF, inverter output is shut off immediately and the motor coasts-to-stop (alarm output enabled: OH2)	
	(JOG)	Jogging operation	Turn JOG ON to enable jogging operation: switches the running mode to jogging mode, the frequency setting to jogging frequency, and acceleration/deceleration time to jogging running use	(*1)
	(Hz2/Hz1)	Freq. set 2/ Freq. set 1	Frequency setting 2 is selected when Hz2/Hz1 is ON	
	(M2/M1)	Motor 2/Motor 1	Motor 1 settings take effect when M2/M1 is OFF. Motor 2 settings take effect when M2/M1 is ON.	

Multistep freq. selection table:

Digital input	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
(SS1)	—	ON	—	ON	—	ON	—	ON	—	ON	—	ON	—	ON	—	ON
(SS2)	—	—	ON	ON	—	—	ON	ON	—	—	ON	ON	—	—	ON	ON
(SS4)	—	—	—	—	ON	ON	ON	ON	—	—	—	—	ON	ON	ON	ON
(SS8)	—	—	—	—	—	—	—	—	ON	ON	ON	ON	ON	ON	ON	ON

*1 Only valid when induction motor drive is in operation

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Terminal functions

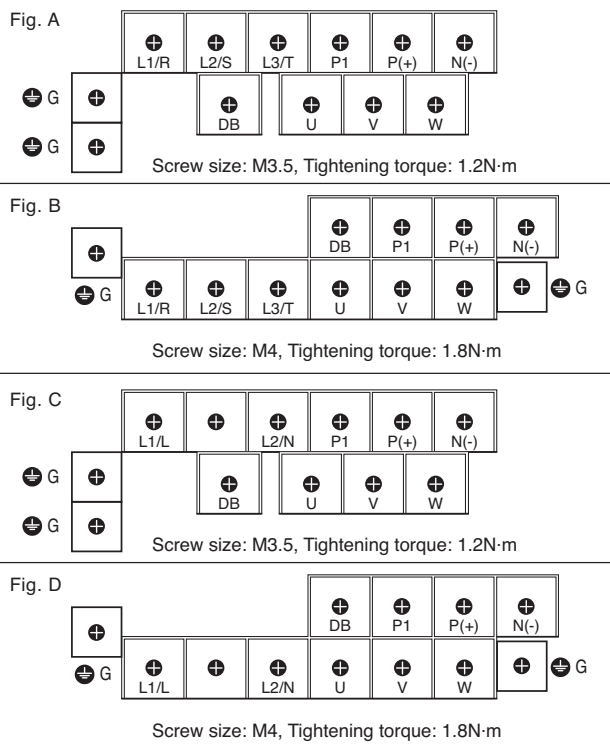| Category	Symbol	Terminal name	Functions	Remarks
Digital input	(DCBRK)	DC brake command	Turn DCBRK ON to start direct current braking	
	(WE-KP)	Write enable for KEYPAD	Function code data changes can only be made when the keypad is turned ON with WE-KP	
	(UP)	UP command	Output frequency increases while UP is ON	
	(DOWN)	DOWN command	Output frequency decreases while DOWN is ON	
	(Hz/PID)	PID control cancel	PID control is canceled when Hz/PID is ON (runs based on multistep frequency/keypad/analog input etc.)	
	(IVS)	Inverse mode changeover	Switch from analog frequency setting or PID control output signal (frequency setting) operation mode to forward/reverse operation. Reverse operation enabled when IVS is ON.	
	(LE)	Link enable (RS485, Bus)	Operates according to commands from RS-485 when LE is ON	
	(PID-RST)	PID integral/differential reset	Turn PID-RST ON to reset PID integration and differential values	
	(PID-HLD)	PID integral hold	Turn PID-HLD ON to hold PID differentiation	
	PLC	PLC terminal	Connect to PLC output signal power supply Common for 24V power	+24V (22–27V) Max 50mA
	CM(2-terminal)	Common	Common for digital input signal	Isolated from terminal 11 and Y1E
Transistor output	(PLC)	Transistor output power	Power supply for transistor output load (Max: DC 24V DC 50mA) (Caution: Same terminal as digital input PLC terminal)	Short circuit between terminal CM and Y1E is used
	Y1	Transistor output	Select one of the following signals for output: Short circuit when ON signal is output or open circuit when ON signal is output	Max. voltage: 27Vdc, max. current: 50mA, leak current: 0.1mA$^{max.}$, ON voltage: within 2V(at 50mA)
	(RUN)	Inverter running (speed exists)	Comes ON when the output frequency is higher than starting frequency	
	(FAR)	Speed/freq. arrival	Comes ON when the difference between output frequency and set frequency rises above the frequency arrival detection range (function code E30)	
	(FDT)	Speed/freq. detection	Comes ON when output frequency falls below operational level (function code E31). Turns OFF when it falls below operational level (function code E31) or hysteresis width (function code E32).	
	(LU)	Undervoltage detection	Comes ON when there is a run command and running has stopped due to insufficient voltage	
	(IOL)	Inverter output limit	Comes ON when the inverter is experiencing limited current, automatic deceleration, or limited torque operation	
	(IPF)	Auto-restarting	Comes ON during auto restart operation (after momentary power failure and until completion of restart).	
	(OL)	Overload early warning	Comes ON when the electronic thermal relay value is higher than the preset alarm level	
	(SWM2)	Switch to Motor 2	Comes ON when Motor 2 is selected by inputting a motor switch signal (M2/M1)	
	(TRY)	Auto-resetting mode	Comes ON during auto reset mode	
	(LIFE)	Lifetime alarm	Alarm signal is output according to lifetime assessment standards inside the inverter	
	(PID-CTL)	PID control in progress	Comes ON when PID control is in effect	
	(PID-STP)	PID low water volume stop in progress	Comes ON when low liquid level stop is in effect in PID control (also stops based on the status of input run command)	
	(RUN2)	Inverter output in progress	Comes ON when the inverter is running above startup frequency and DC braking is also in operation (Comes ON when the inverter main circuit (gate) is ON)	
	(OLP)	Overload preventive control	Comes ON when overload prevention control is operating	
	(ID2)	Current detection 2	Comes ON when a current larger than the set value (for ID2) is continuously detected for longer than the time set on the timer	
	(THM)	Thermistor detected	Comes ON when motor overheating is detected by the PTC/NTC thermistor	(*1)
	(BRKS)	Brake signal	Outputs a brake engage/release signal	
	(FARFDT)	Frequency arrival/frequency detected	Comes ON when both (FAR) and (FDT) are ON	
	(C1OFF)	C1 terminal break detected	Comes ON when the system determines that a break will occur if terminal C1 input falls below 2mA	
	(ID)	Current detection	Comes ON when a current larger than the set value has been detected for the timer-set time	

*1 Only valid when induction motor drive is in operation

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Terminal Functions

Terminal functions

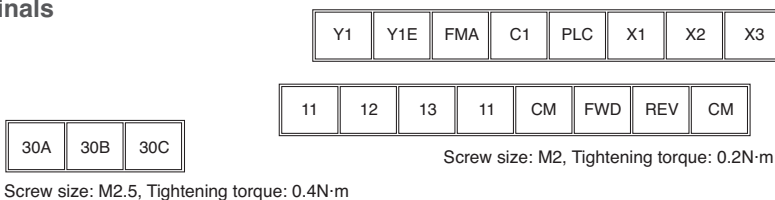| Category	Symbol	Terminal name	Functions	Remarks
Transistor output	(IDL)	Small current detection	Comes ON when a current smaller than the set value has been detected for the timer-set time	
Transistor output	(ALM)	Alarm relay (for any fault)	Alarm signal is output as the transistor output signal	
Transistor output	Y1E	Transistor output common	Common terminal for transistor output	Isolated from terminal 11 and CM
Relay output	30A, 30B, 30C	Alarm relay output (for any fault)	Outputs a no-voltage contact signal (1c) when the inverter stops the alarm Can select the same signal as the Y1 signal for multipurpose relay output · Can switch between alarm output through excitation operation and alarm output through non-excitation operation	Contact rating : AC250V, 0.3A, cosφ=0.3 DC48V, 0.5A
Analog output	FMA	Analog monitor	Output format: DC voltage (0–10V) Output can be performed in one of the following selected analog formats · Output frequency 1 (Before slip compensation) · Output frequency 2 (After slip compensation) · Output current · Output voltage · Input power · PID feedback value · DC link circuit voltage · Analog output test · PID command · PID output	Gain setting between 0 and 300%
LINK		Built-in RJ-45 connector (RS-485 communication)	Any of the following protocols can be selected: · Dedicated keypad protocol (automatically selected) · Modbus RTU · Fuji dedicated inverter protocol · SX protocol (for PC loader)	Provides power to the keypad Includes terminator ON/OFF switch

Terminal Arrangement

■Main circuit terminals

Power source	Nominal applied motor (kW)	Inverter type	Reference
Three-phase 200V	0.1	FRN0001C2S-2□	Fig. A
Three-phase 200V	0.2	FRN0002C2S-2□	Fig. A
Three-phase 200V	0.4	FRN0004C2S-2□	Fig. A
Three-phase 200V	0.75	FRN0006C2S-2□	Fig. A
Three-phase 200V	1.5	FRN0010C2S-2□	Fig. B
Three-phase 200V	2.2	FRN0012C2S-2□	Fig. B
Three-phase 200V	3.7	FRN0020C2S-2□	Fig. B
Three-phase 400V	0.4	FRN0002C2S-4□	Fig. B
Three-phase 400V	0.75	FRN0004C2S-4□	Fig. B
Three-phase 400V	1.5	FRN0005C2S-4□	Fig. B
Three-phase 400V	2.2	FRN0007C2S-4□	Fig. B
Three-phase 400V	3.7	FRN0011C2S-4□	Fig. B
Single-phase 200V	0.1	FRN0001C2S-7□	Fig. C
Single-phase 200V	0.2	FRN0002C2S-7□	Fig. C
Single-phase 200V	0.4	FRN0004C2S-7□	Fig. C
Single-phase 200V	0.75	FRN0006C2S-7□	Fig. C
Single-phase 200V	1.5	FRN0010C2S-7□	Fig. D
Single-phase 200V	2.2	FRN0012C2S-7□	Fig. D

Fig. A
G G
L1/R L2/S L3/T P1 P(+) N(-)
DB U V W
Screw size: M3.5, Tightening torque: 1.2N·m

Fig. B
DB P1 P(+) N(-)
G L1/R L2/S L3/T U V W G
Screw size: M4, Tightening torque: 1.8N·m

Fig. C
G G
L1/L L2/N P1 P(+) N(-)
DB U V W
Screw size: M3.5, Tightening torque: 1.2N·m

Fig. D
DB P1 P(+) N(-)
G L1/L L2/N U V W G
Screw size: M4, Tightening torque: 1.8N·m

■Control circuit terminals

Y1	Y1E	FMA	C1	PLC	X1	X2	X3

11	12	13	11	CM	FWD	REV	CM

Screw size: M2, Tightening torque: 0.2N·m

30A	30B	30C

Screw size: M2.5, Tightening torque: 0.4N·m
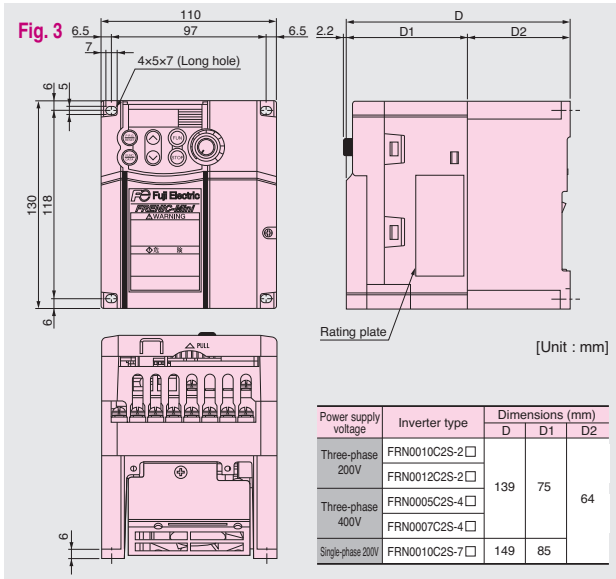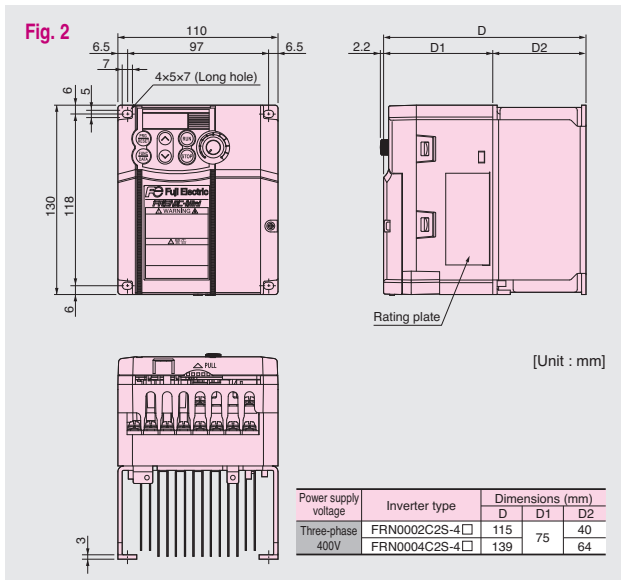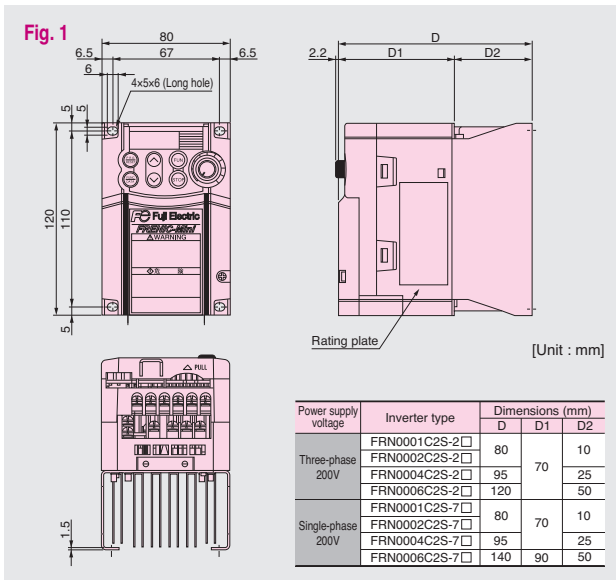
External Dimensions

Three-phase 200V series (0.1 to 3.7 kW), Three-phase 400V series (0.4 to 3.7kW), Single-phase 200V series (0.1 to 2.2kW)

Fig. 1

Power supply voltage	Inverter type	Dimensions (mm)		
		D	D1	D2
Three-phase 200V	FRN0001C2S-2□	80	70	10
	FRN0002C2S-2□	80		10
	FRN0004C2S-2□	95		25
	FRN0006C2S-2□	120		50
Single-phase 200V	FRN0001C2S-7□	80	70	10
	FRN0002C2S-7□	80		10
	FRN0004C2S-7□	95		25
	FRN0006C2S-7□	140	90	50

Fig. 2

Power supply voltage	Inverter type	Dimensions (mm)		
		D	D1	D2
Three-phase 400V	FRN0002C2S-4□	115	75	40
	FRN0004C2S-4□	139		64

Fig. 3

Power supply voltage	Inverter type	Dimensions (mm)		
		D	D1	D2
Three-phase 200V	FRN0010C2S-2□	139	75	64
	FRN0012C2S-2□			
Three-phase 400V	FRN0005C2S-4□			
	FRN0007C2S-4□			
Single-phase 200V	FRN0010C2S-7□	149	85	

Fig. 4

Power supply voltage	Inverter type	Dimensions (mm)		
		D	D1	D2
Three-phase 200V	FRN0020C2S-2□	139	75	64
Three-phase 400V	FRN0011C2S-4□			
Single-phase 200V	FRN0012C2S-7□			

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