

FRENIC-Mini



General Specifications

FECA-TE-117 06/2010

1. Standard Specifications

1) Three-phase 230V series

	Item		Specifications						
Тур	e (FRN□□□C1S	S-2U)	F12	F25	F50	001	002	003	005
Nor	ninal applied moto	or ^{*1} [HP]	1/8	1/4	1/2	1	2	3	5
s	Rated capacity	² [kVA]	0.31	0.59	1.1	1.9	3.1	4.3	6.7
ing	Rated voltage *3	[V]	Three-phase	e, 200 to 240V					
rat	Rated current *9	[A]	0.8	1.5	3.0	5.0	8.0	11.0	17.0
out			(0.7)	(1.4)	(2.5)	(4.2)	(7.0)	(10.0)	(16.5)
utp	Overload capabi	lity	150% of rate	ed current for '	l min, 200% of	rated current	for 0.5s		
0	Rated frequency		50, 60Hz						
	Main power supp	oly	Three-phase	e, 200 to 240V	, 50/60Hz				
	Voltage/frequence	cy	Voltago: 110	to 15% (Val		o ^{*8} · 2% or los		15 to 5%	
SC	variations		voltage. + 10 to - 15% (voltage unbalance . 2% of less) Frequency. +5 to -5%						
tinç	Momentary voltage dip		When the input voltage is 165V or more, the inverter continues operation. If it drops below						
g	capability *4		165V, the inverter operates for 15ms.						
pul	Rated current	(with DCR)	0.57	0.93	1.6	3.0	5.7	8.3	14.0
Ч	[A]	(without DCR)	1.1	1.8	3.1	5.3	9.5	13.2	22.2
	Required power	supply	0.2	03	0.6	1 1	2.0	29	19
	Capacity ⁵ [k	VA]	0.2	0.5	0.0	1.1	2.0	2.5	4.5
5	Torque *6	[%]	15	50	1(00	50	3	0
śiŋ	Torque *7	[%]	-	_			150		
sral	DC injection brai	king	Starting frequency: 0.0 to 60.0Hz, Braking time: 0.0 to 30.0s.						
ш	-	0	Braking level: 0 to 100% of rated current						
Applicable safety standards			UL508C, C22.2 No.14, EN50178: 1997						
Enclosure (IEC60529)			IP20						
Co	oling method	,	Natural cooli	ng			Fan cooling		
Ma	SS	[lbs(kg)]	1.3(0.6)	1.3(0.6)	1.3(0.6)	1.5(0.7)	3.7(1.7)	3.7(1.7)	5.1(2.3)

Note:

*1) Standard 4-pole motor.

*2) The rated capacity is 230V output voltage for 230V series.

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

*4) Tested under the standard load condition specified by JEMA (85% load for nominal applied motor).

*5) Obtained when a DC reactor is used.

*6) Average braking torque obtained with AVR control OFF (Varies with the efficiency of the motor.)

*7) Average braking torque obtained by use of external braking resistor (standard type option)
*8) Voltage unbalance [%] = (Max. voltage [V] – Min. voltage [V])/Three-phase average voltage [V] × 67 (IEC61800-3 (5.2.3)) If this value is 2 to 3%, use AC reactor (option).

*9) Calculated under Fuji-specified conditions.

2) Three-phase 460V series

	Item		Specifications						
Tyr			E50	001	002	003	005		
No	minal applied motor 11 [F	P1	1/2	1	2	3	5		
	Rated capacity ^{*2} [k]	A1	11	1.9	2.9	43	7 1		
b	Rated voltage *3	V1	Three-phase 380	hree-phase 380 to 480V					
ati	Rated current *9	AI	1.5	2.5	3.7	5.5	9.0		
ut r		1		2.0	011	0.0	010		
utp	Overload capability		150% of rated cur	rent for 1min, 200%	of rated current for	r 0.5s			
0	Rated frequency		50, 60Hz						
	Main power supply		Three-phase, 380	to 480V, 50/60Hz					
	Voltage/frequency		Valtage 10 to 1		200 *8, 20(or looo)	Frequency 4 F to F	07		
S	variations		voltage: +10 to -15% (voltage unbalance : 2% or less) Frequency: +5 to -5%						
tinç	Momentary voltage dip		When the input voltage is 300V or more, the inverter continues operation. If it drops below						
ra	capability *4		300V, the inverter operates for 15ms.						
put	Rated current ^{*9} (with DCR)		0.85	1.6	3.0	4.4	7.3		
Ч	[A] (without DC	R)	1.7	3.1	5.9	8.2	13.0		
	Required power supply		0.6	1 1	2.0	29	19		
	Capacity ⁵ [kVA]		0.0	1.1	2.0	2.5	4.5		
0	Torque ^{*6}	%]	10	00	50	30			
kinç	Torque ^{*7} [%]			150				
ßral	DC injection braking		Starting frequency: 0.0 to 60.0Hz, Braking time: 0.0 to 30.0s.						
ш			Braking level: 0 to 100% of rated current						
Applicable safety standards			UL508C, C22.2 No.14, EN50178:1997						
Enclosure (IEC60529)			IP20						
Co	oling method		Natural cooling		Fan cooling				
Ma	ss [lbs(kg)]	2.4(1.1)	2.6(1.2)	3.7(1.7)	3.7(1.7)	5.1(2.3)		

Note:

*1) Standard 4-pole motor.

*2) The rated capacity is 460V output voltage for 460V series.

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

*4) Tested under the standard load condition specified by JEMA (85% load for nominal applied motor).

*5) Obtained when a DC reactor is used.

*6) Average braking torque obtained with AVR control OFF (Varies with the efficiency of the motor.)

*7) Average braking torque obtained by use of external braking resistor (standard type option)

*8) Voltage unbalance [%] = (Max. voltage [V] – Min. voltage [V])/Three-phase average voltage [V] × 67 (IEC61800-3 (5.2.3)) If this value is 2 to 3%, use AC reactor (option).

*9) Calculated under Fuji-specified conditions.

3) Single-phase 230V series

	Item		Specifications						
Туре	e (FRN□□□C1S	-7U)	F12	F25	F50	001	002	003	
Nom	ninal applied moto	or ^{*1} [HP]	1/8	1/4	1/2	1	2	3	
st	Rated capacity *	² [kVA]	0.31	0.59	1.1	1.9	3.1	4.3	
ing	Rated voltage *3	[V]	Three-phase,	200V to 240V					
rat	Rated current *9	[A]	0.8	1.5	3.0	5.0	8.0	11.0	
out			(0.7)	(1.4)	(2.5)	(4.2)	(7.0)	(10.0)	
utb	Overload capabi	lity	150% of rated	current for 1 min	n, 200% of rated	current for 0.5s			
0	Rated frequency	,	50, 60Hz						
	Main power sup	oly	Single-phase,	200 to 240V, 50	/60Hz				
ŝ	Voltage/frequent	cy variations	Voltage: +10 to -10% Frequency: +5 to -5%						
ŋg	Momentary voltage dip		When the input voltage is 165V or more, the inverter continues operation. If it drops below						
ati	capability ⁴		165V, the inverter operates for 15ms.						
r T	Rated current ⁹	(with DCR)	1.1	2.0	3.5	6.4	11.6	17.5	
du	[A]	(without DCR)	1.8	3.3	5.4	9.7	16.4	24.8	
_	Required power Capacity *5	supply [kVA]	0.3	0.4	0.7	1.3	2.4	3.5	
D	Torque *6	[%]	15	50	1(00	50	30	
kinę	Torque *7	[%]	-	_		1:	50		
Bral	DC injection braking		Starting frequency: 0.0 to 60.0Hz, Braking time: 0.0 to 30.0s, Braking current: 0 to 100% of rated current						
Арр	licable safety star	ndards	UL508C, C22.2	UL508C, C22.2 No.14, EN50178:1997					
Enc	losure (IEC60529		IP20						
Coo	ling method		Natural cooling]			Fan cooling		
Mas	S	[lbs(kg)]	1.3(0.6)	1.3(0.6)	1.3(0.6)	1.8(0.8)	3.7(1.6)	5.1(2.3)	

Note:

*1) Standard 4-pole motor.
*2) The rated capacity is 230V output voltage for 230V series.
*3) Output voltage cannot exceed the power supply voltage.

*4) Tested under the standard load condition specified by JEMA (85% load for nominal applied motor).
*5) Obtained when a DC reactor is used.

*6) Average braking torque obtained with AVR control OFF (Varies with the efficiency of the motor.)

*7) Average braking torque obtained by use of external braking resistor (standard type option)

*9) Calculated under Fuji-specified conditions.

4) Single-phase 115V series

	Item		Specifications					
Туре	e (FRN□□□C1S	-6U)	F12	F25	F50	001		
Nom	ninal applied moto	or ^{*1} [HP]	1/8	1/4	1/2	1		
st	Rated capacity *2	² [kVA]	0.27	0.55	0.99	1.6		
ting	Rated voltage	³ [V]	Three-phase, 200 to 24	Three-phase, 200 to 240V				
ut rat	Rated current [A]	0.7	1.4	2.5	4.2		
utp	Overload capabi	lity	150% of rated current	for 1 min, 200% of rated	current for 0.5s	·		
0	Rated frequency		50, 60Hz					
	Main power supply		Single-phase, 100 to 1	20V, 50/60Hz				
S	Voltage/frequency variations		Voltage: +10 to -10% Frequency: +5 to -5%					
atinç	Momentary voltage dip		When the input voltage is 85V or more, the inverter continues operation. If it drops below 85V, the inverter operates for 15ms					
ut r	Rated current *9	(with DCR)		2 9	6.4	12.0		
ıdu	[A]		2.2	3.0	0.4	12.0		
-		(without DCR)	3.6	5.9	9.5	16.1		
	Required power	supply [°]	0.3	0.5	0.7	1.3		
D	Torque °		150		100			
kin	Torque 7		— 150					
Bra	DC injection braking		Starting frequency: 0.0 to 60.0Hz, Braking time: 0.0 to 30.0s, Braking current: 0 to 100% of rated current					
Applicable safety standards			UL508C, C22.2 No.14					
Enclosure (IEC60529)			IP20					
Coo	ling method		Natural cooling					
Mas	S	[lbs(kg)]	1.3(0.6)	1.3(0.6)	1.5(0.7)	2.6(1.2)		

Note 1:

*1) Standard 4-pole motor.

*2) The rated capacity is 230V output voltage for 115V series.

*3)The inverter cannot output voltage that is 2 or more times its rated voltage.

*4) Tested under the standard load condition specified by JEMA (85% load for nominal applied motor).

*5) Obtained when a DC reactor is used.

*6) Average braking torque obtained with AVR control OFF (Varies with the efficiency of the motor.)

*7) Average braking torque obtained by use of external braking resistor (standard type option)

*9) Calculated under Fuji-specified conditions.

Note 2:

When driven by 100 VAC, the single-phase 115 V series of inverters limit their shaft output and maximum output torque as listed below. This is to prevent their output voltage from decreasing when load is applied.

	Shaft output (%)	Maximum torque (%)
w/o DC reactor (DCR)	90	150
w/ DC reactor (DCR)	85	120

2. Common specifications

Item		Item	Explanation				
	,	_Φ Maximum	25.0 to 400.0Hz				
	rang	P frequency					
		Base frequency	25.0 to 400.0Hz				
		Starting frequency	0.1 to 60.0Hz				
C		Carrier frequency	0.75 to 15kHz				
Jer	Ľ	"	(Frequency may drop automatically to protect the inverter running at 7kHz or over.)				
edi	Α	ccuracy (Stability)	Analog setting: ±2% of max. freq. (at 25°C(77°F)), temperature drift: ±0.2% of max. freq.				
it fr			$(at 25\pm10^{\circ}C(7/\pm50^{\circ}F))$				
tpu			Reppad Setting: $\pm 0.01\%$ of max. freq. (at 25°C(77 \pm 50°F)), temperature drift: $\pm 0.01\%$ of max. freq. (at 10 to $\pm 50\%$ C(14 to 122%E))				
no	S	Setting resolution	Analog setting: 1/1000 of max_freg				
	Γ	Jotang recolution	Keypad setting: 0.01Hz (99.99Hz or less), 0.1Hz (100.0 to 400.0Hz)				
			Link setting: Selectable from 2 types				
			- 1/20000 of max. freq. (ex. 0.003Hz at 60Hz, 0.006Hz at 120Hz, 0.02Hz at 400Hz)				
			- 0.01Hz (fixed)				
	С	Control method	V/f control (Simplified torque-vector control)				
	V	/oltage/freq.	230V Output voltage between 80 and 240V can be set at base frequency and at				
	С	haracteristic	series maximum output frequency. AVR control can be turned ON or OFF.				
			Desired 1 point on non-linear V/f curve: 0 to 240V, 0 to 400Hz can be set.				
			460V Output voltage between 160 and 500V can be set at base frequency and at				
			series				
	Torque boost		Auto torque boost (constant torque load)				
	Ľ	01400 00000	Manual torque boost (Constant torque load or variable torque load can be selected.)				
	Starting torgue		150% or over (Auto torque boost in 5Hz operation)				
	S	Start/Stop	Keypad operation: Start and stop with 🖦, 🞯 keys.				
			External signal: FWD-stop (REV-stop) [3-wire operation possible],				
			(Digital input) coast-to-stop command, external alarm, alarm reset, etc.				
			Timer operation: Stop after elapse of the time set with the keypad.				
	F		Link operation: Communication via RS-485 (option)				
	ŀ	requency setting	- Can be set with \bigcirc , \bigcirc keys.				
0			- Can be set with built-in potentiometer.				
ont			- Can be set with variable resistor (External potentiometer: 1 to $5K\Omega 1/2W$)				
Ŭ		(Analog input)	- 10 + 10 + 10 DC (+50 DC) (+50 DC) (+50 DC) by changing the setting of analog input gain (200%))				
			- 4 to 20mADC				
		(Multisten freg. setting)	- Multistep speed operation: Selectable from 8 steps by 3-bit external signal				
		(Link operation)	- Can be set with communication via RS-485 (option)				
	(Freq. setting change)	- Two types of freq. settings can be switched with an external signal (digital input).				
		(Freq. aux. setting)	- Built-in potentiometer, terminal [12] input, or terminal [C1] input can be selected to add				
			the frequency.				
		(Inverse operation)	- Possible to switch (0 to +10VDC) / (0 to 100%) to (+10 to 0VDC) / (0 to 100%) with an				
			external signal.				
			Possible to switch (4 to 20mADC) / (0 to 100%) to (20 to 4mADC) / (0 to 100%) with an				
	_	acceleration/	external signal.				
	L H	leceleration time	deceleration can be set internally)				
	ľ		- Acceleration and deceleration pattern can be selected from 4 kinds: Linear. S-curve				
			(weak), S-curve (strong), Non-linear (Max. constant output).				
	C	C injection braking	- Starting frequency: 0.0 to 60.0Hz, Braking time: 0.0 to 30.0s, Braking level: 5 to 100%				
of rated current							

Item		Explanation	Remarks
	Frequency limiter	High and low limiters [Hz] can be set. (Setting range: 0 to 400Hz)	
	Bias frequency	Biases of set freq. and PID command can be set between 0 and ±100%.	
	Gain for frequency	- Analog input gain can be set within the range from 0 to 200%.	
	setting	At voltage input, proportional frequency can be set to 10.5V and 21mA by adjusting gain.	
	Jump frequency control	Three operation points and their jump hysteresis width (0 to 30Hz) can be set.	
	Jogging operation	 Operation by the RUN key or digital input signal (FWD / REV) (Frequency setting and ACC/DEC time common setting exclusive for jogging) 	
	Auto-restart after momentary power failure	Restarts the inverter without stopping the motor after instantaneous power failure.	
_	Slip compensation	Compensates for decrease in speed according to the load during constant speed operation.	
	Current limit		
	(By hardware)	- Limits the current to prevent overcurrent trip caused by rapid load change or instantaneous power failure when current limitation by the software is impossible.	
Contro	(By software)	 Automatically reduces the frequency to make output current under the preset value. (Current limit condition can be selected from between "constant speed operation only" and "acceleration and constant speed operation".) 	
	PID control	 Process PID control can be made. Process command: Keypad, built-in potentiometer, analog input ([12], [C1]), RS-485 communication Feedback signal: Analog input ([12], [C1]) 	
	Automatic deceleration	 Makes the deceleration time 3 times longer to avoid OV trip when DC link circuit voltage exceeds the overvoltage limit. 	
	Auto energy saving operation	 Controls output voltage to minimize motor loss during constant speed operation. (Torque boost during acceleration can be selected from manual variable torque, manual constant torque, and auto torque.) 	
	Overload prevention control	 Decreases the output frequency automatically to prevent tripping before the inverter's overload preventive function is activated by ambient temperature rise, frequent use, or large motor load. 	
	Cooling fan stop operation	Detects inverter inside temperature and stops cooling fan when the temperature is low.	
	Motor overload memory retention	This is Motor overload memory retention at power up. Both "Electrical thermal overload protection for motor" and "Overload early warning" are retention.	

Item			Explanation				
	Ru	nning/stopping	- Speed monitor, output current [A], output voltage [V], input power [kW], PID reference, PID				
			feedback value				
			- 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], motor speed [r/min.], load shaft speed [r/min.], line speed [m/min.], constant rate of feeding time.				
	Trip	n mode	Displays the cause of trip by codes as follows 1				
		pillode	OC1 (Overcurrent during acceleration)				
			OC2 (Overcurrent during deceleration)				
			OC3 (Overcurrent during running at constant speed)				
			Lin (Input phase loss)				
			LU (Undervoltage)				
_			OPL (Output phase loss)				
tior			OUT (Overvoltage during acceleration)				
ica			OU3 (Overvoltage during deceleration)				
Ind			OH1 (Overheating at heat sink)				
			OH2 (External thermal relay tripped)				
			OH4 (Motor protection (PTC thermistor))				
			dbH (Overheating at DB circuit)				
			OL1 (Motor overload)				
			OLU (Inverter unit overload) Er1 (Memory error)				
			Er2 (Remote keypad communication error)				
			Er3 (CPU error)				
			Er6 (Operation procedure error)				
			Er8 (RS-485 error)				
	_		ErF (Data save error due to undervoltage)				
	Ru	nning or	Trip history: Saves and displays the last 4 trip cause (codes) and their detailed description.				
	unp		Stope the inverter by detecting overcurrent equiped by everland in the output circuit				
	Sh	ort-circuit	Stops the inverter by detecting overcurrent caused by overload in the output circuit.				
	Gro	ound fault	ind fault Stops the inverter by detecting overcurrent caused by short-circuit in the output circuit.				
	(Detected when the inverter is started.)						
	Ov	ervoltage	Stops the inverter by detecting overvoltage (230V, 115V series: 400V DC, 460V series:				
		Ū.	800V) in DC link circuit.				
	Inc	oming surge	Protects the inverter from surge voltage entering between main circuit power cable and earth				
			cable.				
	Undervoltage		Stops the inverter by detecting voltage drop (230V, 115V series: 200V DC, 460V series:				
			400V) IN DC INK CIrcuit.				
	Input phase loss		capacitor)				
	Ou	tout phase loss	Stops the inverter by detecting output cable's phase loss at the start of operation or during				
_			operation.				
tior	Ov	erheating	Stop the inverter by detecting inverter heat sink temperature caused by a failure or overload				
tec			of the cooling fan.				
50			Stops the inverter and built-in braking transistor if "discharging capability" or "allowable loss"				
_	_		set for the braking resistor is exceeded more frequency than the set number of times.				
	Ov	erload	Stops the inverter by calculating the IGBT internal temperature from the output current and				
	ç	Electric	Stops the inverter to protect the motor when the set output current is exceeded				
	ctio	thermal	(Thermal time constant can be adjusted 0.5 to 75 0min.)				
	ote	PTC	A PTC thermistor stops the inverter to protect the motor				
	pre	thermistor					
	tor	Overload	Warning signal can be output based on the preset level before stopping the inverter.				
	Mc	early warning					
	Sta	all	Lowers output frequency to prevent overcurrent trip when output current exceeds the limit				
	L		value during acceleration, deceleration, or constant speed operation.				
	Re	try function	When the motor is tripped and stopped, this function automatically reset the tripping state				
			and restants operation. (Waiting time before resetting and the number of retry times can be set.)				
	1		waiting time before resetting and the number of retry times call be set.)				

	Item	Explanation	Remarks
	Installation location	Shall be free from corrosive gases, flammable gases, oil mist, dust, and direct sunlight. (Pollution degree 2) Indoor use only	
	Ambient temperature	Open air : -10 to +50°C (14 to 122°F)	
ient	Ambient humidity	5 to 95%RH (no condensation)	
mm	Altitude	3300ft (1000m) or lower	
Envirc	Vibration	$\begin{array}{l} 3mm & : 2 \text{ to less than 9Hz} \\ 9.8m/s^2 : 9 \text{ to less than 20Hz} \\ 2m/s^2 & : 20 \text{ to less than 55Hz} \\ 1m/s^2 & : 55 \text{ to less than 200Hz} \end{array}$	
	Storage ambient temp.	-25 to +70°C (-13 to 158°F)	
	Storage ambient humidity	5 to 95%RH (no condensation)	

3. Terminal Functions

Symbol		Terminal name	Functions	Remarks
	L1/R L2/S L3/T	Power input	Connect a 3-phase power supply.	
cuit	L1/L L2/N		Connect a single-phase power supply.	
n circu	U,V,W	Inverter output	Connect a 3-phase induction motor.	
lair	P(+),P1	For DC reactor	Connect the DC reactor.	
2	P(+),DB	For external braking resistor	Used for connection of the optional external braking resistor.	
	P(+),N(-)	For DC bus connection	Used for DC bus connection system.	
	₿G	Grounding	Ground terminal for inverter chassis.	
	[13]	Potentiometer power supply	 Power supply (+10VDC) for frequency setting potentiometer. (Potentiometer: 1 to 5kΩ) Allowable output current : 10mADC 	
It	[12]	Voltage input (Inverse operation) (PID control)	 0 to +10VDC / 0 to 100% (0 to +5VDC / 0 to 100%) +10 to 0VDC / 0 to 100% Used for reference signal (PID process command) or PID feedback signal. 	Input impedance: 22kΩ
g inpu		(Frequency aux. setting)	 Used as additional auxiliary setting to various main settings of frequency. 	
aloc	[C1]	Current input	• 4 to 20mADC / 0 to 100%	Input impedance: 250Ω
Ani		(Inverse operation) (PID control)	 20 to 4mADC / 0 to 100% Used for reference signal (PID process command) or PID feedback signal. 	
		(For PTC thermistor)	 Connects PTC thermistor for motor protection. 	
		(Frequency aux. setting)	 Used as additional auxiliary setting to various main settings of frequency. 	
	[11]	Analog common	Common terminal for analog input and output signals. ([12], [13], [C1], [FMA])	Isolated from terminal [CM] and [CME].
Analog output	[FMA]	Analog monitor	 One of the following items can be output with DC voltage: 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 Calibration Up to two analog voltmeters (0 to +10VDC, input impedance: 10kΩ) can be connected. Gain adjustable range: 0 to 200% 	

	Symbol	Terminal name	Functions	Remarks
	[X1]	Digital input 1	• The following functions can be set at terminals [X1] to [X3],	
	[X2]	Digital input 2	[FWD], and [REV] for signal input.	
	[X3]	Digital input 3	<common function=""></common>	
	[FWD]	Forward operation	 Sink and source are changeable using the built-in jumper autitab 	
		command	SWICH.	
	[REV]	Reverse operation	[X1] and [CM] and open circuit of them. The same setting is	
		command	possible between ICMI and any of the terminals among IX21.	
			[X3], [FWD], and [REV].	
	(FWD)	Forward operation	(FWD): ONThe motor runs in the forward direction.	This function can be set
		command	(FWD): OFFThe motor decelerates and stops.	only for the terminals
	(REV)	Reverse operation	(REV): ONThe motor runs in the reverse direction.	[FWD] and [REV].
		command	(FWD): OFFThe motor decelerates and stops.	
	(SS1)	Multistep freq.	8 different frequencies are selectable with the ON/OFF	
	(SS2)	selection	signals of (SS1) to (SS4).	
	(554) (PT1)		(PT1): ON ACC/DEC time 2 is offertive	
	(RTT)	ACC/DEC liftle	(RT1): ORACC/DEC time 2 is effective.	
		3-wire operation stop	Used for 3-wire operation	
		command	(HI D) [·] ON The inverter self-holds FWD or REV signal	
		oommana	(HLD): OFFThe inverter releases self-holding.	
1	(BX)	Coast-to-stop	(BX): ONThe inverter output is cut off immediately and the	
ndu	. ,	command	motor will coast-to-stop. (No alarm signal will be output.)	
al ir	(RST)	Alarm reset	(RST): ONFaults are reset.	
igit	(THR)	Trip command	(THR): OFFThe inverter output is cut off immediately and	
		(External fault)	the motor will coast-to-stop. (Alarm signal OH2 will be output.)	
	(JOG)	Jogging operation	(JOG): ONJOG frequency is effective.	
			RUN key: ON, (FWD): ON, or (REV): ONThe inverter	
	(11-2/11-1)	Frag. act 2/Frag. act 1	(Uz2/Uz1): ON Frequency.	
		Write enable for	(MZZ/HZT). ONFIEQ. Set Z is effective.	
			by the keypad.	
	(Hz/PID)	PID control cancel	(Hz/PID): ON The PID control is canceled and frequency	
	(1.12/1.12)		setting by multistep frequency, keypad or analog input is	
			effective.	
	(IVS)	Inverse mode	(IVS): ONInverse operation.	
		changeover	Operation mode (normal operation/inverse operation) can be	
	<i></i>		changed.	
	(LE)	Link enable (RS-485,	(LE): ONThe link operation is effective. (RS-485 (option))	
		BUS)	(DID DST); ON DID integration and differentiation are reast	
	(FID-KST)	/differential reset		
1	(PID-HI D)	PID integral hold	(PID-HI D): ON PID integration is temporarily stopped	
	(PLC)	PLC terminal	Connect to PLC output signal nower supply Common for	+24VDC 50mA max
1	L. = • 1		+24VDC power.	
	[CM]	Digital common	Common terminal for digital input signal.	Isolated from terminal
				[11] and [Y1E].

Symbol		Terminal name	Functions	Remarks
	PLC Transistor output (P24) power		 Power source of +24VDC to be fed to the transistor output circuit load. To enable the source ,it is necessary to short-circuit between terminals [Y1E] and [CM]. 	
	Y1	Transistor output	 Outputs a selected signal from the following functions. Contact activation mode changeover function: ON timing can be changed between short-circuit of terminals [Y1] and [Y1E] and open circuit of them. (+27VDC, 50mADC) 	
	(RUN)	Inverter running (speed exists)	 Comes ON when the output frequency is higher than starting frequency. 	
	(RUN2)	Inverter output on	 Comes ON when the main circuit (gate) in inverter is turned on. 	
	(FAR)	Speed/freq. arrival	• Comes ON when the difference between the set freq. and output freq. is under the detectable level (2.5Hz).	
nsistor output	(FDT)	Speed/freq. detection	 Comes ON when the output freq. is above the preset detectable level and goes OFF when under the detectable level (hysteresis width: 1Hz). 	
	(LU) Undervoltage detection		 Comes ON when the inverter stops undervoltage while the operation command is ON. 	
	(IOL) Inverter output limit (limit on current)		Comes ON when the inverter is limiting the current.	
Tra	(IPF)	Auto-restarting	 Comes ON during auto restart operation (after momentary power failure until completion of restart). 	
	(OL)	Overload early warning (motor)	 Comes ON when the electronic thermal relay value is higher than the preset alarm level. 	
	(TRY)	Auto-resetting mode	Comes ON at auto resetting mode.	
	(LIFE)	Lifetime alarm	Outputs alarm signal according to the preset lifetime judgment level.	
	(OLP)	Overload preventive control	Comes ON during inverter control for avoiding overload.	
	(ID)	Current detection	• Comes ON when the current larger than the set value has been detected for the timer-set time.	
	(IDL)	Small current detection	 Comes ON when the current smaller than the set value has been detected for the timer-set time. 	
	(ALM)	Alarm relay (for any fault)	 Alarm relay signal is output as the transistor output signal. 	
	Y1E	Transistor output common	Common terminal for transistor output signal.	Isolated from terminal [11] and [CM].
Relay output	30A,30B, 30C	Alarm relay output (for any fault)	 An alarm relay signal (SPDT) is output when the inverter stops with an alarm. This terminal can be used as the multi-purpose relay output signal. (Possible to select a terminal similar to [Y1] for transistor output signal and use it for signal output.) Contact rating: 250VAC, 0.3A, cosΦ=0.3, 48VDC, 0.5A Alarm output condition can be switched between excitation and no excitation. 	

Connector		Name	Functions	Remarks
communication	RS-485 port *	RS-485 communications I/O	 Used to connect the inverter with PC or PLC using RS-485 port. Used to connect the inverter with the remote keypad. The inverter supplies the power to the remote keypad through the extension cable. RJ-45 connector used. 	

* This terminal is valid when the standard inverter is equipped with RS-485 communications card (option).

4. Wiring diagram

1) Basic wiring diagram



- *1) Ensure the power supply voltage conforms to the inverter rated voltage.
- *2) Use this optional device if necessary.
- *3) Use RCD/GFCI with overcurrent protection function when it used alone.
- *4) When connecting a DC reactor (DCR), remove the jumper bar from across the terminals [P1] and [P+].
- *5) (THR) can be used by assigning data "9" to any of the terminals [X1] to [X3], [FWD] or [REV]. (Function code E01 to E03, E98 or E99)

Standard Models:









Power supply	Inverter type	Dimensions [inch(mm)]			
voltage		D	D1	D2	
Three-phase	FRN002C1S-2U	5.47 (139) 5.87 (149)	2.95 (75) 2 (3.35 (85)	2.52 (64)	
230 V	FRN003C1S-2U				
Three-phase	FRN002C1S-4U				
460 V	FRN003C1S-4U				
Single-phase 230 V	FRN002C1S-7U				





FIGURE A

FIGURE B

Turne	Dimensions: Inches (mm)			F igure
Туре	W	Н	D	Figure
FRNF12C1S-2U + NEMA1-0.2C1-2 FRNF25C1S-2U + NEMA1-0.2C1-2 FRNF12C1S-7U + NEMA1-0.2C1-2 FRNF25C1S-7U + NEMA1-0.2C1-2	3.27	6.69	3.21 (81.5)	A
FRNF50C1S-2U + NEMA1-0.4C1-2 FRNF50C1S-2U + NEMA1-0.4C1-2	(03)	(170)	3.80 (96.5)	
FRN001C1S-2U + NEMA1-0.75C1-2			4.80 (121.5)	
FRN002C1S-2U + NEMA1-2.2C1-2 FRN003C1S-2U + NEMA1-2.2C1-2 FRN002C1S-4U + NEMA1-2.2C1-2 FRN003C1S-4U + NEMA1-2.2C1-2	4.45 (113)	7.15 (181.6)	5.53 (140.5)	В
FRN005C1S-2U + NEMA1-3.7C1-2 FRN005C1S-4U + NEMA1-3.7C1-2 FRN003C1S-7U + NEMA1-3.7C1-2	5.63 (143)	9.91 (251.6)		
FRNF50C1S-4U + NEMA1-0.4C1-4	4.45	7.09	4.59 (116.5)	
FRN001C1S-4U + NEMA1-0.75C1-4	(113)	(180)	5.53 (140.5)	Λ
FRN001C1S-7U + NEMA1-0.75C1-7	3.27 (83)	6.69 (170)	5.57 (141.5)	7
FRN002C1S-7U + NEMA1-1.5C1-7	4.45 (113)	7.15 (181.6)	5.93 (150.5)	В
FRNF12C1S-6U + NEMA1-0.2C1-6 FRNF25C1S-6U + NEMA1-0.2C1-6	3.27	6.69	4.00 (101.5)	
FRNF50C1S-6U + NEMA1-0.4C1-6	(00)	(170)	4.59 (116.5)	A
FRN001C1S-6U + NEMA1-0.75C1-6	4.45 (113)	7.09 (180)	5.53 (140.5)	