Type FRN□□□G11S- 4HFP

FRENIC5000G11S-HFP
SPECIFICATION
High-frequency Inverter

The content of this specification takes priority over Instruction manual and catalogue. The content which is not described in this specification submits to Instruction manual.

Inverter Design Sec.
Design Dept.
Inverter Value Engineering Center

	Date	Name
Drawn	2004 - 4 - 5	M.KURUMA
Checked		
Approved		
Drawing number	SI27-3723 1/24	

-Contents-

1.Standard Specifications

1) Three-phase 400V series

Type			0.75	2.2	3.7	5.5	7.5	15	18.5
Output ratings	Rated output capacity (*1)		1.1	4.1	6.0	9.1	11	20	21
	Voltage [V] (*2)		3-phase, 380 to 460V (with break voltage-per-frequency ratio control fanction)						
	Frequency [Hz]		1.0～1667Hz						
	Rated current [A] (*8) Value in () is with H07 (PWM switch) set at 1		1.5 (1.5)	5.5 (4.5)	8.0 (5.5)	12 (8.0)	15 (10)	27 (20)	35 (28)
	Overload capability		125% of rated inverter output current for 1 min.						
Input power supply	Phases, voltage, frequency		3-phase, 380 to 480V, 50/60 Hz						
	Voltage/frequency variations		Voltage: +10% to -15% (Imbalance rate between phases (*3): 2% or less), Frequency: +5 to -5%						
	Momentary voltage dip capability (*4)		Operation will continue with 310V or more. If voltage drops below 310V, operation will continue for up to 15 ms. If "Continuous operation" is selected, the output frequency will be lowered to withstand the load until normal voltage is resumed.						
	Rated input current [A] (*5)	With DC reactor	0.87	4.2	6.3	9.2	11.5	24.4	29.8
		Without DC reactor	2.1	9.2	13.2	19.8	23.7	45.8	53.8
	Required power supply capacity [kVA](*6)		0.7	3.0	4.4	6.4	8.0	17	21
Output frequency	Adjustment	Max. frequency	Variable setting between 50 and 1667 Hz						
		Base frequency	Variable setting between 25 and 1667 Hz						
		First frequency	Variable setting between 25 and 1667 Hz						
		Starting frequency	Variable setting between 1.0 and 100 Hz, Continuation time: 0.0 to 10.0 s						
	Accuracy		Analog setting: +/-0.2% (25 +/-10 °C) or less of max. output frequency Digital setting: +/-0.15% (-10 to +50 °C) or less of max. output frequency						
	Setting resolution		Analog setting: 1/1000 of max. output frequency (example: upon setting at 1Hz/1000Hz) Keypad panel setting: 0.1 Hz (999.9 Hz or less), 1 Hz (1000 Hz or over) Link setting: Can be selected from two types; 0.1 Hz (fixed) or 1/20000 of max. output frequency (example:upon setting at 0.05Hz/1000Hz)						
	Voltage/frequency characteristic		The output voltage setting at the base frequency and that at the maximum output frequency can be individually set between 100 and 480V (with AVR control); the output voltage setting at the first frequency is 0 or 20 to 480V.						
	Torque boost		Manual setting,setting code:2.0 to 20.0(Code 2.0 is equivalent to 0V)						
Braking	Standard	Braking torque(*9)	100% or more					About 20% (*7)	
		Braking time [s]	5					No limit	
		Braking duty cycle [%ED]	3		2	3	2	No limit	
	Option	Braking torque(*9)	150% or more						
		Braking time [s]	45	30	20			10	
		Braking duty cycle [%ED]	10	7	5				
	DC braking		Braking starting frequency: 1.0 to 60.0 Hz, Braking time: 0.0 to 30.0s, Braking action level: 0 to 100%. Each value can be variably set.						
Protective structure			IP40 enclosure						
Cooling method			Natural cooling	Fan cooling					
Mass [kg]			2.5	3.8	3.8	6.5	6.5	10	10.5

(*1)：The output rated capacity is for 440V output voltage.
(*2)：An output voltage exceeding the supply voltage cannot be generated.
(*3)：If the imbalance between phases exceeds 2%, use a DC reactor (DCR).

$$\text{Im}\,balance\ rate\ between\ phases = \frac{(Max.Voltage[V] - Min.Voltage[V])}{3 - phase\ average\ voltage[V]} \times 67[\%]\ (Complying\ with\ IEC\ 61800-3\ (5.2.3))$$

(*4)：Test was conducted under the standard load conditions stipulated by the JEMA committee (at the load equivalent to 85% of the nominal applied motor.(4pole,50/60Hz)).
(*5)：Values are calculated under conditions defined by us.
(*6)：Calculation is made in the following equation. Required power supply capacity [kVA] = $\sqrt{3}$ x 400 x Rated input current (with DC reactor)
(*7)：The braking torque varies according to the motor loss.
(*8)：Refer to the item 4.3 for the restriction matter against rated current.
(*9)：This data is driving a general-purpose motor.(4pole,50/60Hz)

2. Common Specifications

Item		Specification
Control	Control method	Sinusoidal wave PWM method; voltage per frequency ratio control
	Operation method	Key operation: Run by FWD or REV key (forward/reverse operation), stop by STOP key
		External signal (digital input): Forward/stop command, reverse/stop command, coast-to-stop command, etc.
		Link operation: Operation by Modbus-RTU
	Frequency setting	・Key operation: Setting by ∧, ∨ keys
		・External potentiometer: External freq. setting POT (VR) (1 to 5kΩ)
		・Analog input: External voltage/current input 0 to +10Vdc(0 to +5Vdc),4 to 20mAdc (Reversible) 0 to +/-10 Vdc(0 to +/-5Vdc)……Reversible operation by polarized signal can be selected. (Inverse) +10 to 0Vdc,20 to 4mAdc……Inverse mode operation can be selected.
		・UP/DOWN control: Frequency increases (UP signal) or decreases (DOWN signal) as long as the digital input signal is turned on.
		・Multistep frequency selection: Up to 7 steps are selectable.
		・Digital signal: Max. 16-bits signal can be used for setting with optional digital interface card DIO.
		・Link operation: Operation by Modbus-RTU (standard)
	Jogging operation	・Operation by FWD or REV key or digital input signals (FWD, REV)
	Operation status signal	・Transistor output (4 signals): Running, frequency arrival, frequency detection, overload detection, under-voltage stop, etc.
		・Relay output (2 signals): Multi-purpose relay output signals, alarm output (for any fault), etc.
		・Analog output (1 signal): Output frequency, output current, output voltage, etc.
		・Pulse output (1 signal): Output frequency, output current, output voltage, etc.
	Accelerating/decelerating time	・1.0 to 3600 s
		• Five accelerating and decelerating time settings are possible independent of each other according to the motor, by combining digital input signals (motor 1 to 5 selection signal).

Item		Specification	
Control	Frequency limiter	The upper and lower frequency limits can be set. Upper or lower frequency limit: 0 to 1667 Hz ・The upper frequency limit can be set independently according to the motor by combining digital input signals (motor 1 to 5 selection signal). ・The lower frequency limit is a common setting for motors 1 through 5.	
	Bias frequency	・The bias frequency can be set. -1667 Hz to +1667 Hz	
	Gain (frequency setting signal)	・The relationship in the proportion between the analog input and the output frequency can be set. Example) For voltage input signals ranging from 0 to +10 Vdc, set the gain at 100% to obtain 10 Vdc at the maximum frequency. For voltage input signals ranging from 0 to +5 Vdc, set the gain at 200% to obtain 5 Vdc at the maximum frequency.	
	Jump frequency	The operation point (3 signals) and the jump width (0 to 30 Hz) common to one signal can be set.	
	Restart after momentary power failure	The inverter is restarted without stopping the motor upon momentary power failure. If "Continued operation" is selected, the inverter decreases the frequency while maintaining the output, to minimize speed reduction.	
	1 to 5 motor setting	Five motors can be switched for one inverter.	
	Cooling fan ON/OFF control	・The internal temperature of the inverter is detected and the cooling fan is stopped at low temperatures.	
		・A signal indicating the ON/OFF state of the cooling fan is output.	
	Universal DI	Existence of an arbitrary external digital signal to a set terminal is sent to the host controller.	
	Universal DO	The command signal issued by the host controller is output.	
Indication	Screen display	LED screen	LCD screen
	During operation	The following items can be displayed according to function setting. ・Output frequency ・Set frequency ・Output current ・Output voltage ・Motor synchronous speed ・Line speed ・Load rotation speed	・Bar graph, - Output frequency, - Output current ・Tester function Digital input/output signals, transistor output signals, (I/O check) analog input/output signals, and magnitude of the pulse output signal are displayed without a tester. ・Maintenance information ・Heat sink temperature ・Run hours ・Main circuit capacitor life ・Run hours of cooling fan ・Life of control PC board The language displayed on the LCD screen can be selected. Standard type, ・Japanese ・English

Item		Specification	
Indication	Screen display	LED screen	LCD screen
	When tripping	The cause of tripping is displayed using "codes." ・OC1 (Overcurrent during acceleration) ・OC2 (Overcurrent during deceleration) ・OC3 (Overcurrent during constant speed operation) ・OU1 (Overvoltage during acceleration) ・OU2 (Overvoltage during deceleration) ・OU3 (Overvoltage during constant speed) ・LU (Under-voltage) ・OH1 (Overheated at heat sink) ・OH2 (External alarm) ・OH3 (Overtemperature at inside air) ・dbH (DB resistance thermal relay) ・OL1 (Overloaded motor 1 to 5) ・OLU (Overloaded inverter) ・Er1 (Memory error) ・Er2 (Keypad panel communication error) ・Er3 (CPU error) ・Er4 (Option communication error) ・Er5 (Option error) ・Er8 (Modbus-RTU communication error) ・ErL (Motor switching error)	Detail data immediately before tripping is displayed. ・Output frequency, ・Transistor output terminal status ・Output current, ・Alarm history ・Output voltage, ・Alarms occurring simultaneously ・Setting frequency ・Operation status FWD/REV VL / LU (voltage limit / under-voltage) ・Integrated operation hours ・DC link circuit voltage ・Air temperature inside unit ・Heat sink temperature ・Communication error times (keypad panel) ・Communication error times (Modbus-RTU) ・Communication error times (option) ・Digital input terminal status (remote) ・Digital input terminal status (communication)
	During operation or when tripping	・Alarm history: The cause (code) of tripping of past four alarms is kept and displayed.	
		・The detail data of the cause of tripping of the latest alarm is kept and displayed.	
	Charge lamp	Lights up if there is residual voltage in the capacitor of the main circuit.	
Protection	Overload protection	An electronic thermal relay function and internal temperature detection protect the inverter.	
	Overvoltage protection	The overvoltage applied to the DC link circuit in a braking cycle is detected to stop the inverter.	
	Surge Voltage protection	The inverter is protected against the surge voltage intruding between the power cables of the main circuit and ground.	
	Under-voltage protection	A voltage drop in the DC link circuit is detected to stop the inverter.	
	Overheat protection	The inverter is protected against an overheat detected at the heat sink of the inverter.	
	Short circuit protection	The inverter is protected against an overcurrent caused by a short circuit in the output.	
	Ground fault protection	The inverter is protected against an overcurrent caused by ground fault in the output.	
	Motor protection (overload forecast)	・The electronic thermal overload relay function setting stops the inverter to protect the motor. To switch and operate first through fifth motors, the electronic thermal relay of each motor can be set.	
		・Before stopping the inverter, a forecast signal can be output at a level defined in advance. When switching and operating the first through fifth motors, the overload forecast level for each motor can be set.	
	Braking resistor protection	・7.5 kW or less: Protected by internal function of inverter. ・15 kW or more: A thermal relay installed to the resistor detects and stops discharging electricity.	

<table>
<tr><th colspan="3">Item</th><th>Specification</th></tr>
<tr><td rowspan="2">Protection</td><td colspan="2">PTC Thermistor protection</td><td>A PTC thermistor can protect the motor.</td></tr>
<tr><td colspan="2">Retry function</td><td>The inverter automatically resets itself to restart operation after it has tripped to stop. Retry is not made in the OH2, LU or various Er tripping cases.</td></tr>
<tr><td rowspan="6">Environment</td><td colspan="2">Installation location</td><td>Indoor use only. Free from corrosive and flammable gases, dust and direct sunlight. For compliance with low voltage directive, pollution degree 2 is necessary.</td></tr>
<tr><td colspan="2">Ambient temperature</td><td>2.2kW or more：-10 to +50 °C
(The ventilating cover must be removed at temperatures exceeding 40 °C.)
0.75kW：refer to the item 4.3.</td></tr>
<tr><td colspan="2">Relative humidity</td><td>5 to 95% RH (without dew)</td></tr>
<tr><td colspan="2">Altitude</td><td><table><tr><th>Altitude [m]</th><th>Output, current reduction rate</th></tr><tr><td>1,000 or less</td><td>1.00</td></tr><tr><td>1,000 to 1,500</td><td>0.97</td></tr><tr><td>1,500 to 2,000</td><td>0.95</td></tr><tr><td>2,000 to 2,500</td><td>0.91</td></tr><tr><td>2,500 to 3,000</td><td>0.88</td></tr></table></td></tr>
<tr><td colspan="2">Vibration</td><td>3 mm at from 2 to 9 Hz, 9.8 m/s^2 at from 9 to less than 20 Hz, 2 m/s^2 at from 20 to less than 55 Hz, 1 m/s^2 at from 55 to less than 200 Hz</td></tr>
<tr><td rowspan="2">Storage</td><td>Ambient temperature</td><td>-25 to +65℃</td></tr>
<tr><td>Relative humidity</td><td>5 to 95% RH (without dew)</td></tr>
</table>

3.Terminal Functions

Classification	Terminal symbol	Terminal name	Function	Remarks
Main circuit	L1/R,L2/S,L3/T	Main circuit power terminal	Connects a 3-phase power supply.	
	U,V,W	Inverter output terminal	Connects a 3-phase motor.	
	R0,T0	Auxiliary control-power input terminal	Connects a backup AC power supply to the control circuit. (Not supported for inverter of 0.75Kw)	
	P1,P(+)	DC reactor connecting terminal	Connects the optional power-factor correcting DC reactor.	
	P(+),DB	External braking resistor connecting terminal	Connects the optional external braking resistor. (For inverter of 7.5kW or less)	
	P(+),N(-)	DC link circuit terminal	Supplies DC link circuit voltage to the external braking unit (option) or power regeneration unit (option).	
	⏚ G	Inverter ground terminal	Grounds the inverter chassis (case) to the earth.	
Analog input	13	Potentiometer power supply	Used for +10 Vdc power supply for frequency setting POT (variable resistor of 1 to 5 kΩ)	Max 10mAdc
	12	POT voltage input	Set the frequency according to the power source data given through an external analog input. ・0 to +10 Vdc/0 to 100% (0 to +5 Vdc/0 to 100%) ・Reversible operation using positive and negative signals ・0 to +/-10 Vdc/0 to +/-100% (0 to +5 Vdc/0 to 100%) (However, the setting resolution of 0 to +/-10 Vdc is multiplied by two.) ・Reverse operation: +10 to 0 Vdc/0 to 100% (Switched by digital input signal or function code.)	・Input impedance 22 kΩ ・Up to 15 Vdc can be input. However, voltages larger than 10 Vdc is considered to be 10 Vdc.
	C1	Frequency setting current input	Set the frequency according to the power source data given through an external analog input. ・4 to 20 mAdc/0 to 100% ・Reverse operation: 20 to 4 mAdc/0 to 100% (Switched by digital input signal or function code.)	
		PTC thermistor	Connects a PTC thermistor for the protection of the motor.	
	V2	Voltageinput 2	Cannot be used.	
	11	Analog common	Common terminal for analog input signals	Isolated from CMY and CM
Digital input	FWD	Forward operation /stop command	Used for forward operation (when FWD-CM is on) or deceleration and stop (when FWD-CM is off).	If both signals are input simultaneously, the inverter decelerates and stops.
	REV	Reverse operation /stop command	Used for reverse operation (when REV-CM is on) or deceleration and stop (when REV-CM is off).	
	X1	Digital input1	Selects from the following items.	[ON state] Operating current 2.5mA to 5mA [OFF state] Allowable leakage current 0.5mA or less voltage 22V to 27V
	X2	Digital input2		
	X3	Digital input3		
	X4	Digital input4		
	X5	Digital input5		
	X6	Digital input6		
	X7	Digital input7		
	X8	Digital input8		
	X9	Digital input9		
	(SS1) (SS2) (SS4)	Multistep frequency selection	0 to 7 deifferent frequencies are selectable.	

Classification	Terminal symbol	Terminal name	Function	Remarks
Digital input	(HLD)	Self-hold selection	・Used for 3-wire operation. ・(HLD)-CM:ON⇒FWD or REV signal is self held ・(HLD)-CM:OFF⇒self held is cleared.	
	(BX)	Coast-to-stop command	・(BX)-CM:ON⇒Inverter output is cut off immediately and the motor starts to coast-to-stop ・An alarm signals are not output. ・BX signal is not self-held.	The motor restarts from 0Hz by turning off BX with the operation command ON.
	(RST)	Alarm reset	・(RST)-CM:OFF→ON→OFF ⇒Faults are reset ・This ON signals should be held for more than 0.1S	During normal operating the signal is ignored.
	(THR)	External alarm	・(THR)-CM: OFF⇒Inverter output is cut off(i.e., the motor starts to coast-to-stop) and an alarm OH2 is output. ・This signal is self-held internally and cleared by RST input. ・This function is used to protect an external breke resistor and other components from overheating.	
	(JOG)	Jogging operation	・(JOG))-CM:ON ⇒ JOG frequency is effective. The operation is performed with the jogging frequency while the operation command is on.	This signal is effective only while the inverter is stopping.
	(Hz2/Hz1)	Freq.set.2/Freq.set.1	・(Hz2/Hz1) -CM:ON⇒Freq.set .2 is effective	
	(DCBRK)	DC brake command	・(DCBRK)-CM:ON⇒The DC injection brake is effective	If the operation command is requested while DC braking is effective ,the operation command has priority.
	(UP)	UP command	・(UP) -CM:ON⇒The output frequency increases. ・(DOWN)-CM:ON⇒The output frequency decreases. ・Restarting frequency can be selected 0Hz or setting value at the time of stop	When UP and DOWN is simultaneously ON,output frequency is held .
	(DOWN)	DOWN command		
	(WE-KP)	Write enable for KEYPAD	・(WE-KP)-CM:ON ⇒ The data will be changed by KEYPAD	
	(IVS)	Inverse mode changeover	・(IVS)-CM:ON⇒Analog input mode is changed to inverse mode.	
	(IL)	Interlock signal for 52-2	When a contactor is installed on the output side of the inverter, its auxiliary contact (Form B)of 52-2 is connected to input momentary power failure signal.	
	(LE)	Link eneble	(LE)-CM:ON⇒The link operation is effective. (Modbus-RTU)	For switch link operation to communication.
	(U-DI)	Universal DI	(U-DI)-CM:ON⇒Transmits a digital input signal to the upper level controller.	
	(M1-M5)	Motor 1-5 selection	・When bit selection is selected.(Function code:E10=6) (M1)-CM:ON⇒Setting data for Motor1are effective. (M2)-CM:ON⇒Setting data for Motor2are effective (M3)-CM:ON⇒Setting data for Motor3are effective (M4)-CM:ON⇒Setting data for Motor4are effective (M5)-CM:ON⇒Setting data for Motor5are effective	This switching method is effective only when the inverter is stopped. Motor selection is impossible during inverter operation.

Classification	Terminal symbol	Terminal name	Function	Remarks
Digital input	(MBCD [0]) (MBCD [1]) (MBCD [2]) (MBCD [P])	Motor 1 to 5 selection	・When binary code selection is selected (Function code:E10=7,8,9) Motor 1 to 5 can be selected by using the 3bits-binary code ,MBCD [0],MBCD[1], and MBCD[2]. Parity function can be used by using MBCD[P]. *MBCD[0]:LSB(Least significant bit) MBCD[2]:MSB(Most significant bit)	
	PLC	PLC signal power supply	Connects the output signal power supply of the PLC. (Connect PLC power supply to avoid malfunction of the inveter that has SINK type digital input,when PLC supply is off.)	
	P24	24 Vdc power supply	Terminal for 24 Vdc power supply. (+24V, max. 100 mA)	
	CM	Digital common	Common terminal for digital input signals.	Isolated from terminals CMY and 11.
Analog output	FMA (11)	Analog monitor (Analog common)	Outputs the monitor signals using the analog DC voltages from 0 to +10Vdc. Outputs a DC voltage corresponding to one selected from the following items. ・Output frequency ・Output current ・Output voltage ・DC link circuit voltage	・The maximum allowable current of the connected meter is 2 mAdc. ・Up to two analog voltmeters can be connected. (Input impedance: 5 kΩ)
Pulse output	FMP (CM)	Frequency monitor (pulse waveform output) (Digital common)	Outputs the monitor signal depending on the pulse voltage. Outputs a DC voltage corresponding to one selected from the following items. ・Output frequency ・Output current ・Output voltage ・DC link circuit voltage	・The maximum allowable current of the connected meter is 2 mAdc. ・Up to two analog voltmeters can be connected. (Input impedance: 5 kΩ)
Transistor output	Y1	Transistor output 1	Selects from the following items.	・ON state maximun output voltage :3V (Allowable maximum sink current:50mA) ・OFF state maximun leakage current:0.1mA (Allowable maximum voltage:27V)
	Y2	Transistor output 2		
	Y3	Transistor output 3		
	Y4	Transistor output 4		
	(RUN)	Inverter running	Outputs ON signal when the output frequency is larger than starting frequency.	
	(FAR)	Frequency equivalence signal	Outputs ON signal when the difference between output frequency and setting frequency is smaller than FAR hysteresis width.	
	(FDT)	Frequency level detection	Outputs ON signal when the output frequency exceeds the set operation level. Output OFF signal when the output frequency becomes below"operation level – hysteresis."	Hysteresis width: 0 to 30Hz
	(LU)	Undervoltage detection signal	Outputs ON signal when the inverter stops by under-voltage while the operation command is ON.	

Classification	Terminal symbol	Terminal name	Function	Remarks
Transistor output	(IPF)	Auto-restarting	Outputs ON signal during auto restart operation (Instantaneous power failure) mode. (including “restart time”)	
	(OL)	Overload early warning	Outputs ON signal when the electronic thermal value is larger than preset alarm level. Outputs ON signal when the output current value is larger than preset alarm level.	
	(KP)	Keypad operation mode	Outputs ON signal when the inverter is KEYPAD operation mode.	
	(STP)	Inverter stopping	Outputs ON signal when the inverter is stopping mode or DC braking mode.	
	(RDY)	Ready output	Outputs ON signal when the inverter is ready for operation.	
	(AX)	Terminal AX function for 52-1	Outputs ON signal when an operation command is input . Uses for auxiliary circuit of 52-1.	
	(AL1) (AL2) (AL4) (AL8)	Alarm indication	Trip alarm No. indicate by signal AL1,AL2,AL4,and AL8.	
	(FAN)	Fan operation signal	Output the inverter cooling fan operation status signal.	
	(TRY)	Auto-resetting	Outputs ON signal at auto resetting mode. (Including)	
	(U-DO)	Universal DO	Output command signal from main controller of link operation.	
	(OH)	Overheat early warring	Output the early warning signal of heat sink temperature.	
	(ErL)	Motor selection error	Outputs ON signal when motor selection is faulty.	
	(MCHG)	Motor selection error	Outputs ON signal for 240msec when the motor is changed, power supply is turned on or the alarm is reset.	
	(M1SELL) to (M5SELL)	Motor selection signal (bit indication)	Outputs bit signal of the selected motor number.	
	(MB1) (MB2) (MB4)	Binary signal for selecting motors (binary code indication)	Outputs 3-bits binary signal of the selected motor number.	
	CMY	Transistor output common	Common terminal for transistor output signals.	Insulates from terminals CM and 11
Contact output	30A,30B,30C	Batch alarm output	Outputs a contact signal when a protective function is activated. Contact capacity: 250 VAC, 0.3A, cos ϕ = 0.3 (When complying with low voltage directive:48Vdc,0.5A)	
	Y5A,Y5C	Relay output multi-purpose signal	The signal can be selected similarly to terminals Y1 to Y4. The signal can be used to open or close an electromagnetic **Contact capacity: 250 VAC, 0.3A, cos ϕ = 0.3** (When complying with low voltage directive:48Vdc,0.5A)	
Communication	DX+,DX-,SD	Modbus-RTU communication input-output	Terminal for I/O signals used in Modbus-RTU communication Up to 31 inverters can be connected by means of multi-dropconnection.	

4.Special function

1)Frequency setting (Terminal 12) hold function

< Related function codes >

When you use this function, please set up the following function codes.

[F01] or[C30] (Set value 1,3,4,5,6)

[E01]~[E09] (Set value 26 【Hz-HLD】)

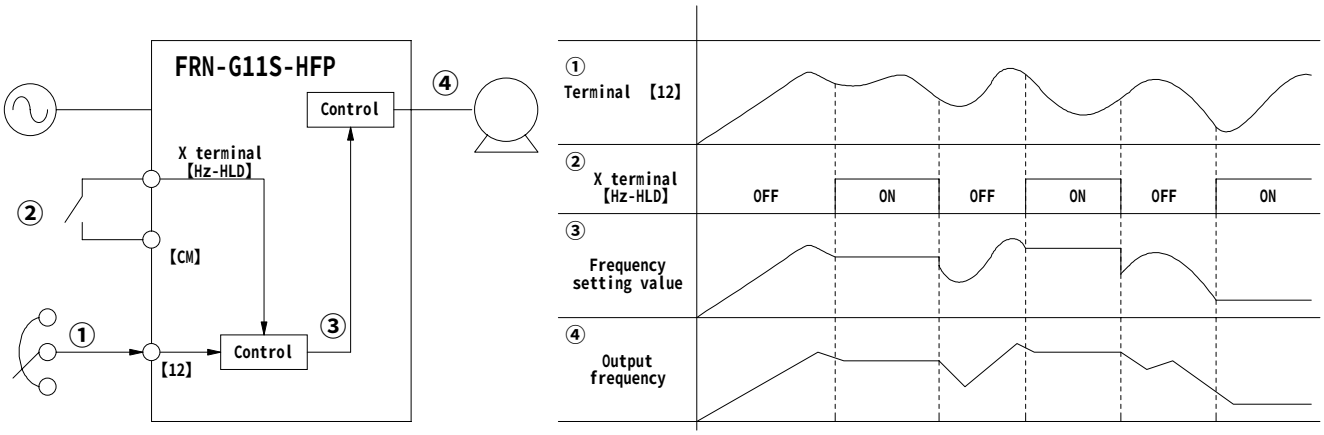
< Function description >

This function can be held the frequency setting value from an analog voltage input (terminal 12).

When X terminal 【Hz-HLD】 is ON , the frequency setting value is held

When X terminal 【Hz-HLD】 is OFF , the frequency setting value determined by terminal 12.

Refer to the following figure.

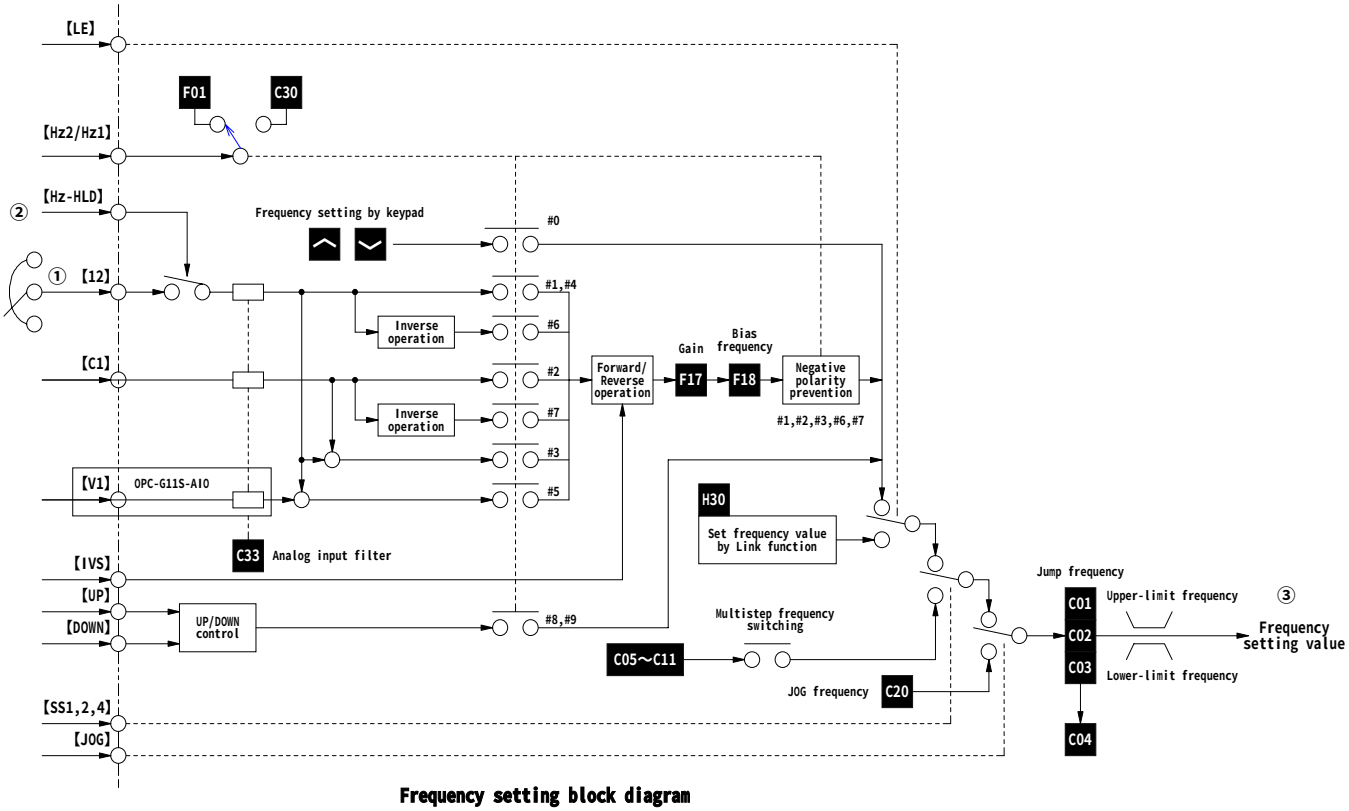


< Caution >

When the following function is operated , this function is invalid.

・Multistep frequency selection ・Jogging operation ・Jump frequency

・Link function(frequency setting value)



Frequency setting block diagram

2) Modbus-RTU

For details, refer to RS485 RTU protocol specification (SI27- 3656).

The CPU software number of FRN□□□G11-HFP is as follows.

Refer to the maintenance data (inside the program menu) of the keypad panel for the CPU software number.

CPU software Number	Capacity range
A07007 or later	18.5kW or less

3)Caution in operation

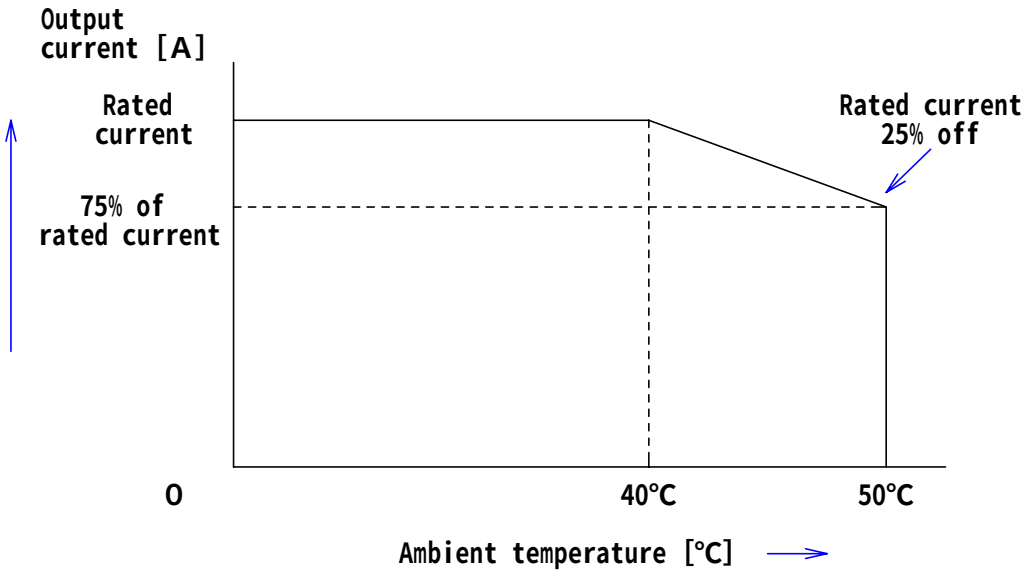
・FRN0.75G11S-4HFP

The ventilating cover (Protect structure)	PWM switch (H07)	Ambient Temperature
With:(IP40)	0	-10 to +35℃
	1	-10 to +30℃
Without:(IP20)	0	-10 to +40℃
	1	-10 to +30℃

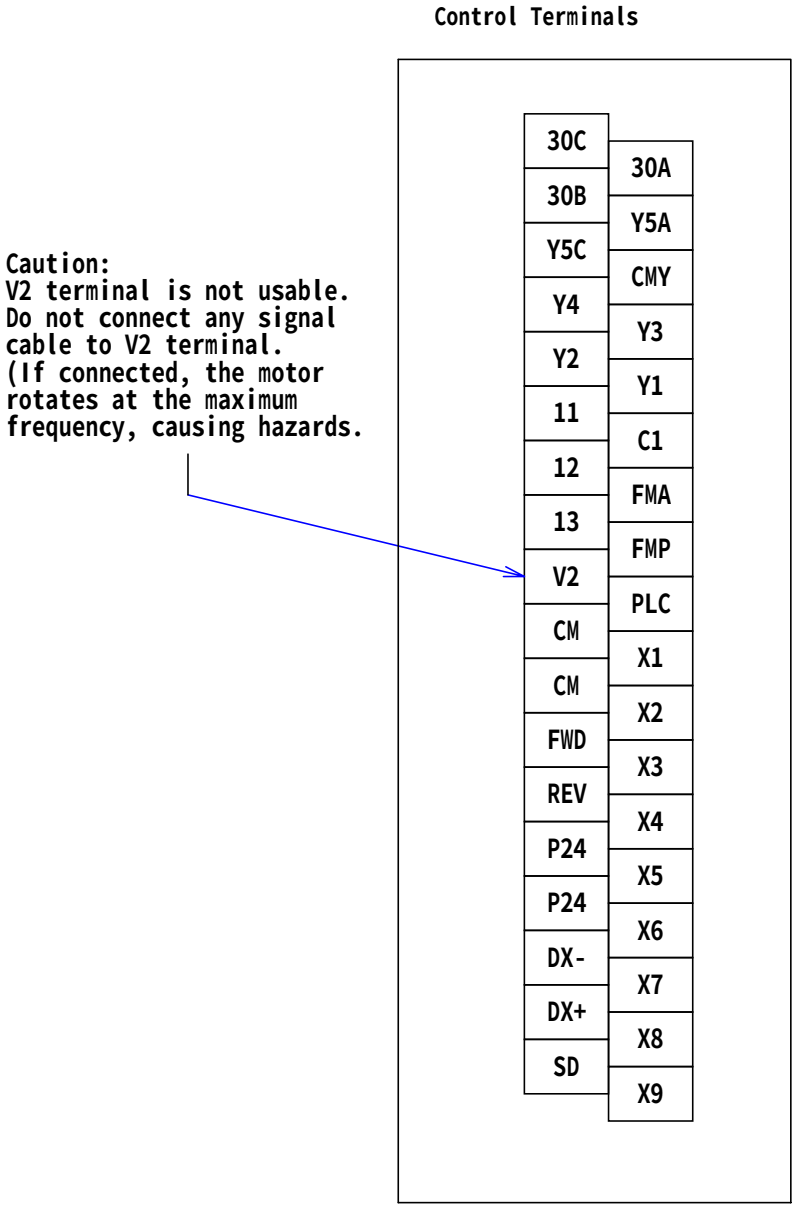
Factory setting :With the ventilating cover.
For details, refer to the Instruction manual (INR-SI47- 0808b-E).
Refer to the instruction manual about the details of Removing the ventilating covers.

・FRN2.2G11S-4HFP to FRN18.5G11S-4HFP

If the working ambient temperature is 50℃, the rated current should be reduced to 75% (25% less than the normal rated current).



5.Control Terminal Arrangement



Control terminal connection method:

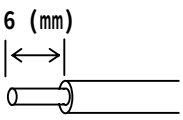
Use the cable AWG:24-18 for the control terminal. When using the cable after removing insulation at the end, ensure that the cutting length is 6mm.

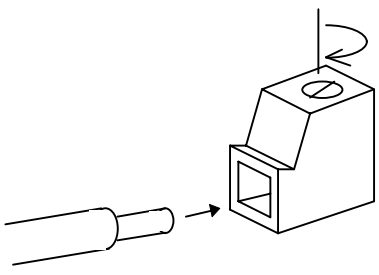
When using a crimped terminal, select a viny-insulated bar type terminal.

Connection method:

Insert the cable into the metal block on the terminal base and tighten the screw to fix it.

[Cable size]
AWG：24-18



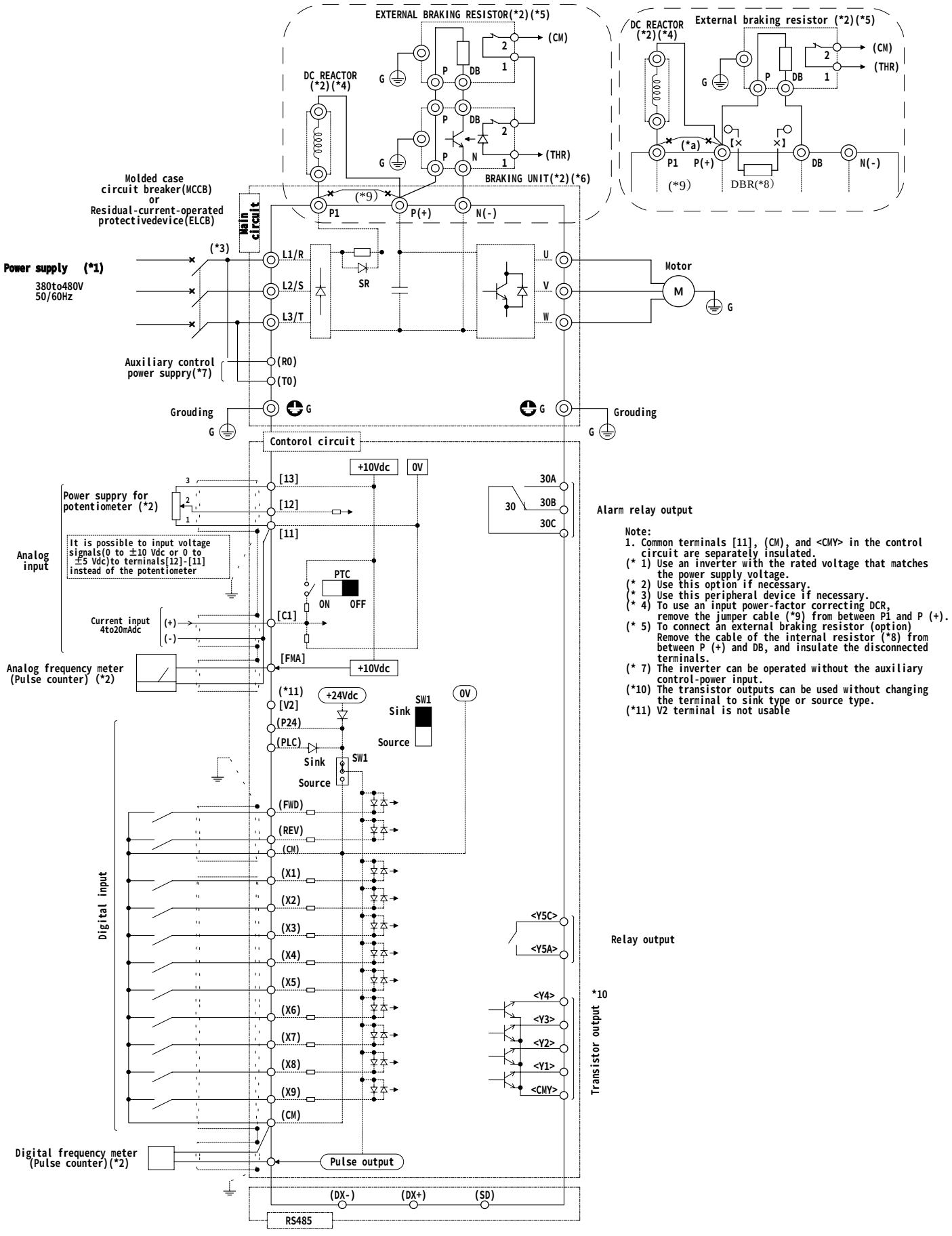


Wiring connecting on the control terminal side

6.Basic connection diagram

6.1.SW 1 (Sink side) Factory shipment state

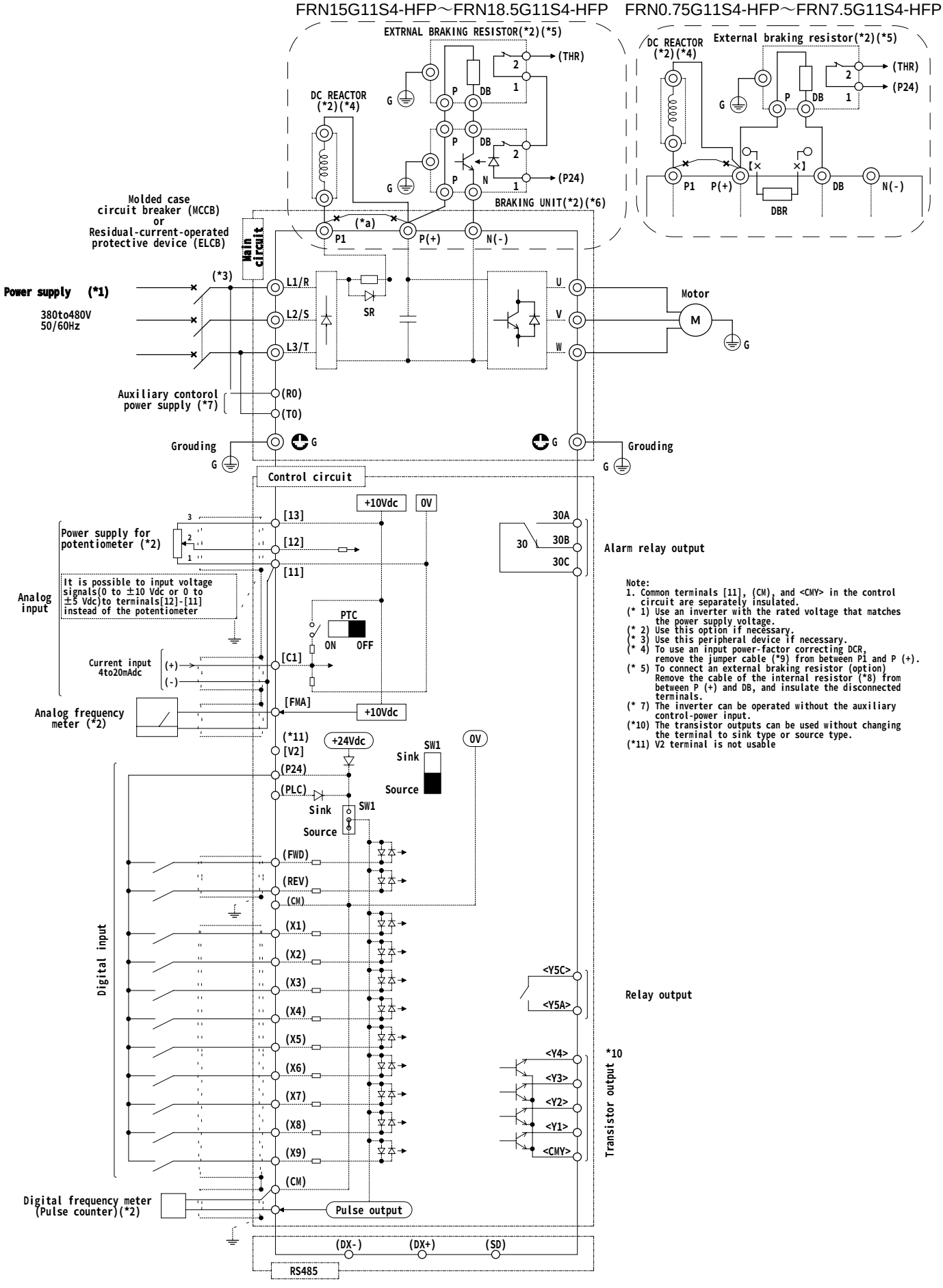
FRN15G11S4-HFP～FRN18.5G11S4-HFP FRN0.75G11S4-HFP～FRN7.5G11S4-HFP



Note:
1. Common terminals [11], (CM), and <CMY> in the control circuit are separately insulated.
(* 1) Use an inverter with the rated voltage that matches the power supply voltage.
(* 2) Use this option if necessary.
(* 3) Use this peripheral device if necessary.
(* 4) To use an input power-factor correcting DCR, remove the jumper cable (*9) from between P1 and P (+).
(* 5) To connect an external braking resistor (option) Remove the cable of the internal resistor (*8) from between P (+) and DB, and insulate the disconnected terminals.
(* 7) The inverter can be operated without the auxiliary control-power input.
(*10) The transistor outputs can be used without changing the terminal to sink type or source type.
(*11) V2 terminal is not usable

Fig.2-3-1

6. 2. SW1-Source



Note:
1. Common terminals [11], (CM), and <CMY> in the control circuit are separately insulated.
(* 1) Use an inverter with the rated voltage that matches the power supply voltage.
(* 2) Use this option if necessary.
(* 3) Use this peripheral device if necessary.
(* 4) To use an input power-factor correcting DCR, remove the jumper cable (*9) from between P1 and P (+).
(* 5) To connect an external braking resistor (option) Remove the cable of the internal resistor (*8) from between P (+) and DB, and insulate the disconnected terminals.
(* 7) The inverter can be operated without the auxiliary control-power input.
(*10) The transistor outputs can be used without changing the terminal to sink type or source type.
(*11) V2 terminal is not usable

Fig.2-3-2

7. Function Select List

F: Fundamental Functions

Func No.	NAME	LCD Display	Setting range	Unit	Min. Unit	Factory setting	Change during op
F00	Data protection	F00 DATA PRTC	0:Data Change eable 1:Data Protection	-	-	0	no
F01	Frequency command 1	F01 FREQ CMD 1	0:KEYPAD operation (∧ , ∨ key) 1:Voltage input (Terminal12)(0to+10Vdc) 2:Current input (Terminal C1)(4to+20mAdc) 3:Voltage+Current inputs (Terminalss 12+C1) 4:Voltage input(Terminal12) 5:Voltage input(Terminal12+V1) 6:inverse mode operation (Terminal12)(+10to-0Vdc) 7:inverse mode operation (Terminal C1)(20to-4mAdc) 8:UP/DOWNcontrol1 (initial freq.=0Hz) 9:UP/DOWNcontrol2 (initial freq.=last value) 10:D/I(option)	-	-	0	no
F02	Operation method	F02 OPR METHOD	0:KEYPAD operation (FWD , REV or STOP key) 1:FWD or REV command signal operation	-	-	0	no
F03	Maximum frequency 1	F03 MAX Hz-1	50 to 1667Hz	Hz	1	1667	no
F04	Base frequency 1	F04 BASE Hz-1	25 to 1667Hz	Hz	1	1667	no
F05	First frequency1	F05 FIRST_Hz1	25 to 1667Hz	Hz	1	1667	no
F06	First voltage1 (for first frequency 1)	F06 FIRST_V1	0V: First V/F is not used. 20 to 480V: AVR operation	V	1	0	no
F07	Rated voltage 1 (at base frequency 1)	F07 RATED_Hz1	0V: A voltage proportional to the source voltage is output. 100 to 480V: AVR operation	V	1	400	no
F08	Maximum voltage 1 (at maximum frequency 1)	F08 MAX_V-1	100 to 480V: AVR operation	V	1	400	no
F09	Acceleration time 1	F09 ACC_TIME1	1.00 to 3600s	s	0.01	40.00	yes
F10	Deceleration time 1	F10 DEC_TIME1	1.00 to 3600s	s	0.01	40.00	yes
F11	Torque boost 1	F11 TRQ_BOOST1	2.0 to 20.0 For constant torque load	-	0.1	2.0	yes
F12	Electronic thermal over relay 1 (Select)	F12 ELCTRN_OL1	0:Inactive 1:Active	-	-	1	yes
F13	(Level)	F13 OL_LEVEL1	1.00 to 100A	A	0.01	Rated inverter current	yes
F14	(Thermal time constant)	F14 TIME_CNST1	0.1 to 300.0 s	s	0.1	5.0	yes

Func No.	NAME	LCD Display	Setting range	Unit	Min. Unit	Factory setting	Change during op
F15	Frequency limiter (High1)	**F15** H _LIMITER1	0 to 1667Hz	Hz	1	1667	yes
F16	Staring frequency 1	**F16** START_Hz1	1.0 to 100.0Hz	Hz	0.1	1.0	no
F17	FAR function 1 (Hysteresis)	**F17** FAR_HYSTR	0.0 to 10.0 Hz	Hz	0.1	2.5	yes
F18	OL1 function (Level) signal	**F18** OL1_LEVEL	1.00 to 100 A	A	0.01	Rated inverter current	yes
F20	(timer)	**F20** OL1_TIMER	0.0 to 60.0s	s	0.1	0.0	yes
F21	Electronic thermal overload relay (for braking resistor)	**F21** DBR_OL	[Up to 7.5 kW] 0:Inactive 1:Active(built-in braking resister) 2:Active(exdemal dreking resister) [15 kW or more] 0:Inactive	- 	- 	1 0	yes
F22	Frequency limiter (Low)	**F22** L_LIMITER	0 to 1667Hz	Hz	1	0	yes
F23	Staring frequency (Holding time)	**F23** HOLDING_t	0.0 to 10 s	s	0.1	0.0	no
F24	OL1 function (Mode select)	**F24** OL_WARNING	0:Electronic thermal 1:Output current	- -	- -	1	yes
F25	Stop frequency	**F25** STOP_Hz	1.0 to 6.0 Hz	Hz	0.1	1.0	no
F26	Gain (for freq set signal)	**F26** FRQ_GAIN	0.0 to 200.0 %	%	0.1	100.0	yes
F27	Bias frequency	**F27** FREQ_BIAS	-1667 to +1667 Hz	Hz	1	0	yes
F30	Restart mode after momentary power failure	**F30** RESTART	0:Inactive(Intermediate inverter trip) 1:Inactive(I inverter trip at recovery) 2:Inactive(Inverter trip after deceleration to a stop at power failure) 3:Active(Operation continued, for high-inertia loads) 4:Active(Restart with the frequency at power failure) 5:Active(Restart with the start frequency for low-inertia loads)	-	-	1	no
F31	DC brake (Starting freq.)	**F31** DC_BRK_Hz	1.0 to 60.0 Hz	Hz	0.1	1.0	yes
F33	(Braking level)	**F33** DC_BRK_LVL	0 to 100%	%	1	0	yes
F34	(Braking time)	**F34** DC_BRK_t	0.0s,0.1 to 30.0s	s	0.1	0.0	yes
F35	FMA (Voltage adjust)	**F35** FMA_V-ADJ	0 to 200%	%	1	100	yes
F36	(Function)	**F36** FMA_FUMC	0:Output frequency 1:Output current 2:Output voltage 3:DC link circuit voltage	-	-	0	yes
F37	FMP (Pulse rate)	**F37** FMP_PULSES	300 to 6000p/s(Pulse rate at 100%)	p/s	1	1440	yes
F38	(Voltage adjust)	**F38** FMP_V_ADJ	0%:Pulse rate output (50%duty) 1to200%:Voltage adjust (2670p/s,duty adjust)	%	1	0	yes
F39	(Function)	**F39** FMP_FUNC	0:Output frequency 1:Output current 2:Output voltage 3:DC link circuit voltage	-	-	0	yes

E : Extension Terminal Functions

Func No.	NAME	LCD Display	Setting range	Unit	Min. Unit	Factory setting	Change during op
E01	X1 terminal function	**E01** X1 FUNC	Selects from following items.	-	-	0	no
E02	X2 terminal function	**E02** X2 FUNC				1	no
E03	X3 terminal function	**E03** X3 FUNC				2	no
E04	X4 terminal function	**E04** X4 FUNC				5	no
E05	X5 terminal function	**E05** X5 FUNC				17	no
E06	X6 terminal function	**E06** X6 FUNC				18	no
E07	X7 terminal function	**E07** X7 FUNC				19	no
E08	X8 terminal function	**E08** X8 FUNC				20	no
E09	X9 terminal function	**E09** X9 FUNC				21	no
			0:Moltistep frequency selection[SS1] 1:Moltistep frequency selection[SS2] 2:Moltistep frequency selection[SS4] 3:Self-hold selection [HLD] 4:Coast-to-stop command[BX] 5:Alarm reset[RST] 6:Extemal alarm[THR] 7:Jogging operation[JOG] 8:Freq.set.2/Freq.set.1[Hz2/Hz1] 9:DC brake command[DCBRK] 10:Up command[UP] 11.Down command[DOWN] 12.Write enable(RS485)[LE] 13:Inverse mode changeover[IVS] 14:Interlock signal for 52-2[IL] 15:Link enable(RS485)[LE] 16:Universal DI [U-DI] 17:Motor selection signal(M1)[M1] 18:Motor selection signal(M2)[M2] 19:Motor selection signal(M3)[M3] 20:Motor selection signal(M4)[M4] 21:Motor selection signal(M5)[M5] 22:Motor selection signal Bit 0 (Least significant bit)[MBCD(0)] 23:Motor selection signal Bit1[MBCD(1)] 24:Motor selection signal Bit 0 (Mostt significant bit)[MBCD(2)] 25:Motor selection signal Parity bit[MBCD(P)] 26:Frequency setting (Terminal 12) hold function[Hz-HLD]				
E10	Motor switch selection	**E10** MTR_SELECT	1:Switching on the KEYPAD panel:Motor1 2:Switching on the KEYPAD panel:Motor2 3:Switching on the KEYPAD panel:Motor3 4:Switching on the KEYPAD panel:Motor4 5:Switching on the KEYPAD panel:Motor5 6:Switching on the terminal base: Bit selection 7:Switching on the terminal base: Binary code selection (no parity function) 8:Switching on the terminal base: code selection (even parity function) 9:Switching on the terminal base: code selection (odd parity function)	-	-	1	no

Func No.	NAME	LCD Display	Setting range	Unit	Min. Unit	Factory setting	Change during op
E11	30RY operation mode	**E11** 30RY_MODE	0:The relay (30)excites on trip mode 1:The relay (30)excites on normal mode	-	-	0	no
E20	Y1 terminal function	**E20** Y1 FUNC	Selects from the following items.	-	-	0	no
E21	Y2 terminal function	**E21** Y2 FUNC				1	no
E22	Y3 terminal function	**E22** Y3 FUNC				2	no
E23	Y4 terminal function	**E23** Y4 FUNC				5	no
E24	Y5A, Y5C terminal function. (RY output)	**E24** Y5 FUNC				9	no
		0:Inverter running[RUN] 1:Frequency equivalence signal[FAR] 2:Frequency level detection[FDT] 3:Undervoltage detection signal[LU] 4:Auto-restarting[IPF] 5:Overload early warning[OL] 6:KEYPAD operation mode[KP] 7:Inverter stopping[STP] 8:Ready output[RDY] 9:Terminal AX function for 52-1[AX] 10:Alarm inductiom 1[AL1] 11:Alarm inductiom 1[AL2] 12:Alarm inductiom 1[AL4] 13:Alarm inductiom 1[AL8]	14:Fan operation signal[FAN] 15:Auto-resetting[TRY] 16:Universal DO[U-DO] 17:Overload early warning[OH] 18:Motor selection error signal[ErL] 19:Motor changeover signal[MCHG] 20:Motor1 selection signal[M1SEL] 21:Motor1 selection signal[M2SEL] 22:Motor1 selection signal[M3SEL] 23:Motor1 selection signal[M4SEL] 24:Motor1 selection signal[M5SEL] 25:Binary signal 1 for selecting motor[MB1] 26:Binary signal 1 for selecting motor[MB1] 27:Binary signal 1 for selecting motor[MB1]				
E25	Y5 RY operation mode	**E25** Y5RY MODE	0:Y5Ry excites at "ON signal "mode 1:Y5Ry excites at "OFF signal "mode	-	-	0	no
E31	FDT 1 function signal(Level)	**E31** FDT1_LEVEL	0 to 1667Hz	Hz	1	60	yes
E32	(Hysteresis)	**E32** FDT_HYSTR	0.0 to 30.0Hz	Hz	0.1	1.0	yes
E40	Display coefficient A	**E40** COEF A	-999.00 to 999.00	-	0.01	0.01	yes
E41	Display coefficient B	**E41** COEF B	-999.00 to 999.00	-	0.01	0.00	yes
E42	LED Display filter	**E42** DISPLAY_FL	0.0 to 5.0s	s	0.1	0.5	yes
E43	LED Monitor (Function)	**E43** LED_MNTR	0:Output frequency 1:Set frequency value 2:Output current 3:Output voltage 4:Motor synchronous speed 5:Line speed 6:Load shaft speed	-	-	0	yes
E44	(Display at STOP mode)	**E44** LED_MNTR2	0:Setting value 1:Output value	-	-	0	yes
E45	LCD Monitor (Function)	**E45** LCD_MNTR	0:Displays aperation guidance 1:Bar graph (Output freq. Output current)	-	-	0	yes
E46	(Language)	**E46** LANGUAGE	0:Japanese 1:English	-	-	1	yes
E47	(Contrast)	**E47** CONTRAST	0(dim) to 10(clear)	-	-	5	yes

C：Control Functions of Frequency

Func No.	NAME	LCD Display	Setting range	Unit	Min. Unit	Factory setting	Change during op
C01	jump frequency 1	**C01** JUMP_Hz 1	0 to 1667Hz	Hz	1	0	yes
C02	jump frequency 2	**C02** JUMP_Hz 2	0 to 1667Hz	Hz	1	0	yes
C03	jump frequency 3	**C03** JUMP_Hz 3	0 to 1667Hz	Hz	1	0	yes
C04	jump frequency(Hysteresis)	**C04** JUMP_HYSTR	0 to 30Hz	Hz	1	3	yes
C05	Multistep (Freq. 1)	**C05** MULTI_Hz-1	0.0 to 1667.0Hz	Hz	0.1	0.0	yes
C06	frequency (Freq. 2)	**C06** MULTI_Hz-2				0.0	yes
C07	setting (Freq. 3)	**C07** MULTI_Hz-3				0.0	yes
C08	(Freq. 4)	**C08** MULTI_Hz-4				0.0	yes
C09	(Freq. 5)	**C09** MULTI_Hz-5				0.0	yes
C10	(Freq. 6)	**C10** MULTI_Hz-6				0.0	yes
C11	(Freq. 7)	**C11** MULTI_Hz-7				0.0	yes
C20	Jog frequency	**C20** JOG_Hz	0.0 to 1667.0Hz	Hz	0.1	5.0	yes
C28	Analog input resolution setting	**C28** RESOLUTION	0 to 20 Hz 0:Inactive ,1to 20:Active	Hz	1	0	yes
C30	Frequency setting 2	**C30** FREQ_CMD2	0:KEYPAD operation 1：Voltage input (Terminal12)(0to+10Vdc) 2：Current input (Terminal C1)(4to+20mAdc) 3：Voltage+Current inputs(Terminalss 12+C1) 4：Voltage input(Terminal12) 5：Voltage input(Terminal12+V1) 6：inverse mode operation (Terminal12)(+10to-0Vdc) 7：inverse mode operation (Terminal C1)(20to-4mAdc) 8:UP/DOWNcontrol1 (initial freq.=0Hz) 9:UP/DOWNcontrol2 (initial freq.=last value) 10:D/I(option)	-	-	2	no
C31	Bias gain (Terminal [12])	**C31** OFFSET_12	-5.0 to +5.0 %	%	0.1	0.0	yes
C32	(Terminal [C1])	**C32** OFFSET_C1	-5.0 to +5.0 %	%	0.1	0.0	yes
C33	Analog setting signal filter	**C33** REF_FILTER	0.00 to 5.00s	s	0.01	0.05	yes

P：Motor Parameters

Func No.	NAME	LCD Display	Setting range	Unit	Min. Unit	Factory setting	Change during op
P01	Motor (Pole)	P01 M-POLES	2 to 14	pole	2	2	no
P02	(Capacity)	P02 M-CAP	0.01 to 45.00kW	kW	0.01	Inveter capacity	no
P03	(Rated current)	P03 M-Ir	0.00 to 2000A	A	0.01	Rated inverter current	no
P04	Maximum frequency 2	P04 MAX_Hz2	50 to 1667Hz	Hz	1	1300	no
P05	Base frequency 2	P05 BASE_Hz2	25 to 1667Hz	Hz	1	1300	no
P06	First frequency 2	P06 FIRST_Hz2	25 to 1667Hz	Hz	1	1667	no
P07	First voltage 2 (for first frequency 2)	P07 FIRST_V2	0V: First V/F is not used. 20 to 480V: AVR operation	V	1	0	no
P08	Rated voltage 2 (for base frequency 2)	P08 RATED_V2	0V: A voltage proportional to the source voltage is output. 100 to 480V: AVR operation	V	1	400	no
P09	Maximum voltage 2 (for maximum frequency 2)	P09 MAX _V2	100 to 480V: AVR operation	V	1	400	no
P10	Acceleration time 2	P10 ACC_TIME2	1.00 to 3600 s	s	0.01	30.00	yes
P11	Deceleration time 2	P11 DEC_TIME2	1.00 to 3600s	s	0.01	30.00	yes
P12	Torque boost 2	P12 TRQ_BOOST2	2.0 to 20.0 For constant torque load	-	0.1	2.0	yes
P13	Electronic (Select) thermal	P13 ELCTRN_OL2	0:Inactive 1:Active	-	-	1	yes
P14	over relay 2 (Level)	P14 OL_LEVEL2	1.0 to 100A	A	0.01	Rated inverter current	yes
P15	(Thermal time constant)	P15 TIME_CNST2	0.1 to 300.0 s	s	0.1	5.0	yes
P16	Frequency limiter (High2)	P16 H _LIMITER2	0 to 1667Hz	Hz	1	1300	yes
P17	Staring frequency 2	P17 START_Hz2	1.0 to 100Hz	Hz	0.1	1.0	no
P18	FAR function 2 (Hysteresis)	P18 FAR_HYSTR2	0.0 to 10.0 Hz	Hz	0.1	2.5	yes
P19	OL2 function (Level) signal	P19 OL2_LEVEL	1.00 to 100 A	A	0.01	Rated inverter current	yes
P20	(timer)	P20 OL2_TIMER	0.0 to 60.0s	s	0.1	0.0	yes
P21	Maximum frequency 3	P21 MAX_Hz3	50 to 1667Hz	Hz	1	1200	no
P22	Base frequency 3	P22 BASE_Hz3	25 to 1667Hz	Hz	1	1200	no
P23	First frequency 3	P23 FIRST_Hz3	25 to 1667Hz	Hz	1	1667	no
P24	First voltage 3 (for first frequency 3)	P24 FIRST_V3	0V: First V/F is not used. 20 to 480V: AVR operation	V	1	0	no
P25	Rated voltage 3 (for base frequency 3)	P25 RATED_V3	0V: A voltage proportional to the source voltage is output. 100 to 480V: AVR operation	V	1	400	no
P26	Maximum voltage 3 (for maximum frequency 3)	P26 MAX _V3	100 to 480V: AVR operation	V	1	400	no
P27	Acceleration time 3	P27 ACC_TIME3	1.0 to 3600 s	s	0.01	25.00	yes
P28	Deceleration time 3	P28 DEC_TIME3	1.0 to 3600s	s	0.01	25.00	yes
P29	Torque boost 3	P29 TRQ_BOOST3	2.0 to 20.0 For constant torque load	-	0.1	2.0	yes
P30	Electronic (Select) thermal	P30 ELCTRN_OL3	0:Inactive 1:Active	-	-	1	yes
P31	over relay 3 (Level)	P31 OL_LEVEL3	1.00 to 100A	A	0.01	Rated inverter current	yes
P32	(Thermal time constant)	P32 TIME_CNST3	0.1 to 300.0 s	s	0.1	5.0	yes
P33	Frequency limiter (High3)	P33 H _LIMITER3	0 to 1667Hz	Hz	1	1200	yes
P34	Staring frequency 3	P34 START_Hz3	1.0 to 100Hz	Hz	0.1	1.0	no
P35	FAR function 3 (Hysteresis)	P35 FAR_HYSTR3	0.0 to 10.0 Hz	Hz	0.1	2.5	yes
P36	OL3 function (Level) signal	P36 OL3_LEVEL	1.00 to 100 A	A	0.01	Rated inverter current	yes
P37	(timer)	P37 OL3_TIMER	0.0 to 60.0s	s	0.1	0.0	yes

A: Alternative Motor Parameters

Func No.	NAME	LCD Display	Setting range	Unit	Min. Unit	Factory setting	Change during op
A01	Maximum frequency 4	A01 MAX_Hz4	50 to 1667Hz	Hz	1	1000	no
A02	Base frequency 4	A02 BASE_Hz4	25 to 1667Hz	Hz	1	1000	no
A03	First frequency 4	A03 FIRST_Hz4	25 to 1667Hz	Hz	1	1667	no
A04	First voltage 4 (for first frequency 4)	A04 FIRST_V4	0V: First V/F is not used. 20 to 480V: AVR operation	V	1	0	no
A05	Rated voltage 4 (for base frequency 4)	A05 RATED_V4	0V: A voltage proportional to the source voltage is output. 100 to 480V: AVR operation	V	1	400	no
A06	Maximum voltage 4 (for maximum frequency 4)	A06 MAX _V4	100 to 480V: AVR operation	V	1	400	no
A07	Acceleration time 4	A07 ACC_TIME4	1.0 to 3600 s	s	0.01	20.00	yes
A08	Deceleration time 4	A08 DEC_TIME4	1.0 to 3600 s	s	0.01	20.00	yes
A09	Torque boost 4	A09 TRQ_BOOST4	2.0 to 20.0 For constant torque load	-	0.1	2.0	yes
A10	Electronic thermal (Select)	A10 ELCTRN_OL4	0:Inactive 1:Active	-	-	1	yes
A11	over relay 4 (Level)	A11 OL_LEVEL4	1.00 to 100A	A	0.01	Rated inverter current	yes
A12	(Thermal time constant)	A12 TIME_CNST4	0.1 to 300.0 s	s	0.1	5.0	yes
A13	Frequency limiter (High4)	A13 H _LIMITER4	0 to 1667Hz	Hz	1	1000	yes
A14	Staring frequency 4	A14 START_Hz4	1.0 to 100Hz	Hz	0.1	1.0	no
A15	FAR function 4 (Hysteresis)	A15 FAR_HYSTR4	0.0 to 10.0 Hz	Hz	0.1	2.5	yes
A16	OL4 function signal (Level)	A16 OL4_LEVEL	1.00 to 100 A	A	0.01	Rated inverter current	yes
A17	(timer)	A17 OL4_TIMER	0.0 to 60.0s	s	0.1	0.0	yes
A18	Maximum frequency 5	A18 MAX_Hz5	50 to 1667Hz	Hz	1	500	no
A19	Base frequency 5	A19 BASE_Hz5	25 to 1667Hz	Hz	1	500	no
A20	First frequency 5	A20 FIRST_Hz5	25 to 1667Hz	Hz	1	1667	no
A21	First voltage 5 (for first frequency 5)	A21 FIRST_V5	0V: First V/F is not used. 20 to 480V: AVR operation	V	1	0	no
A22	Rated voltage 5 (for base frequency 5)	A22 RATED_V5	0V: A voltage proportional to the source voltage is output. 100 to 480V: AVR operation	V	1	400	no
A23	Maximum voltage 5 (for maximum frequency 5)	A23 MAX _V5	100 to 480V: AVR operation	V	1	400	no
A24	Acceleration time 5	A24 ACC_TIME5	1.0 to 3600 s	s	0.01	10.00	yes
A25	Deceleration time 5	A25 DEC_TIME5	1.0 to 3600 s	s	0.01	10.00	yes
A26	Torque boost 5	A26 TRQ_BOOST5	2.0 to 20.0 For constant torque load	-	0.1	2.0	yes
A27	Electronic thermal (Select)	A27 ELCTRN_OL5	0:Inactive 1:Active	-	-	1	yes
A28	over relay 5 (Level)	A28 OL_LEVEL5	1.00 to 100A	A	0.01	Rated inverter current	yes
A29	(Thermal time constant)	A29 TIME_CNST5	0.1 to 300.0 s	s	0.1	5.0	yes
A30	Frequency limiter (High5)	A30 H _LIMITER5	0 to 1667Hz	Hz	1	500	yes
A31	Staring frequency 5	A31 START_Hz5	1.0 to 100Hz	Hz	0.1	1.0	no
A32	FAR function 5 (Hysteresis)	A32 FAR_HYSTR5	0.0 to 10.0 Hz	Hz	0.1	2.5	yes
A33	OL5 function signal (Level)	A33 OL5_LEVEL	1.00 to 100 A	A	0.01	Rated inverter current	yes
A34	(timer)	A34 OL5_TIMER	0.0 to 60.0s	s	0.1	0.0	yes

H : High Performance Functions

Func No.	NAME	LCD Display	Setting range	Unit	Min. Unit	Factory setting	Change during op
H03	Data initializing	**H03** DATA_INIT	0:Manual set value 1.Return to factory set value	-	-	0	no
H04	Auto-reset (Times)	**H04** AUTO_RESET	0:Inactive 1-10times	times	1	0	yes
H05	(Reset interval)	**H05** RESET_INT	2 to 20s	s	1	5	yes
H06	Fan stop operation	**H06** FAN_STOP	0:Inactive 1:Active(2.2kW or more)	-	-	0	yes
H07	PWM switch	**H07** PWM_SELECT	0:PWM-1 1:PWM-2	-	-	0	no
H08	Rev. phase sequence lock	**H08** REV _LOCK	0:Inactive 1:Active	-	-	0	no
H11	DEC mode	**H11** DEC_MODE	0:Normal(according to "H07"mode) 1:Coast-to-stop	-	-	0	yes
H13	Auto-restart (Restart time)	**H13** RESTART_t	0.1 to 10.0s	s	0.1	0.5	no
H14	(Freq. fall rate)	**H14** FALL_RATE	0.00 to 100.00Hz/s	Hz/s	0.01	10.00	yes
H15	(Holding DC voltage)	**H15** HOLD_V	400 to 600V	V	1	470	yes
H16	(OPR command selfhold time)	**H16** SELFHOLD_t	0.0 to 30.0s, 999	s	0.1	999	no
H26	PTC thermistor (Mode select)	**H26** PTC_MODE	0:Inactive 1:Active	-	-	0	yes
H27	(level)	**H27** PTC_LEVEL	0.00 to 5.00V	V	0.01	1.60	yes
H30	Serial link (Function select)	**H30** LINK_FUNC	Monitor / Freq command / Operation command **0**: ○ × × ○:**Enabled** **1**: ○ ○ × ×:**Disabled** **2**: ○ × ○ **3**: ○ ○ ○	-	-	0	yes
H31	RS485 (Address)	**H31** 485ADDRESS	1 to 31	-	1	1	no
H32	(Mode select on no response error)	**H32** MODE_ON ER	0:Trip and alarm(Er8) 1:Opertion for H33 timer. and alarm(Er8) 2:Opertion for H33 timer. and retry to communicate .If theretry fails,then the inverter trips("Er8") 3:Continuous operation	-	-	0	yes
H33	(Timer)	**H33** TIMER	0.0 to 60.0s	s	0.1	2.0	yes
H34	(Baud rate)	**H34** BAUD_RATE	0:19200[bit/s] 1:9600 3:2400 2:4800 4:1200	-	-	1	yes
H35	(Data length)	**H35** LENGTH	0:8bit 1:7bit	-	-	0	yes
H36	(Parity check)	**H36** PARITY	0:Nochecking 1:Even parity 2:Odd parity	-	-	0	yes
H37	(Stop bits)	**H37** STOP BITS	0(2bits), 1(1bit)	-	-	0	yes
H38	(No response error detection time)	**H38** NO_RES_t	0(No detection), 1 to 60s	s	1	0	yes
H39	(Response interval)	**H39** INTERVAL	0.00 to 1.00s	s	0.01	0.01	yes

Factory setting:F13,F18,P03,P14,P19,P31,P36,A11,A16,A28,A33

Inverter	Factory setting
FRN0.75G11S-4HFP	2.50A
FRN2.2G11S-4HFP	5.50A
FRN3.7G11S-4HFP	8.00A
FRN5.5G11S-4HFP	12.00A
FRN7.5G11S-4HFP	15.00A
FRN15G11S-4HFP	27.00A
FRN18.5G11S-4HFP	35.00A