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Frequency Inverter

FA-1L/FA-3H

User Manual

v. 1.0.0

The notes concerning the relay's operational safety have been indicated with the following symbols. All information and recommendations labeled this way must be observed.

	Risk of electric Shock
	Potentially dangerous situation which may give rise to risks for operators or cause damage to the inverter
Information concerning the structure, operation and service of the inverter	
	Important information or useful hint.
	Practical advice or problem solution.
	Exemplary application or function.

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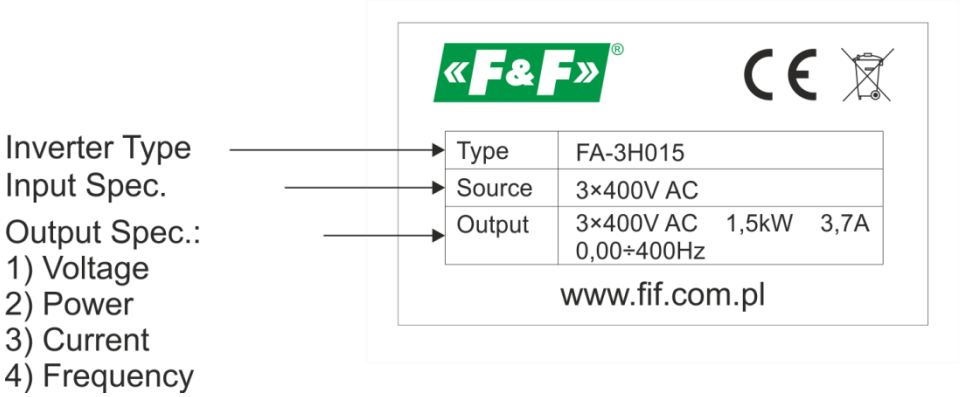
Part 1. Inspection before and after unpacking

1) Before unpacking the product, please check if its package is damaged due to careless transportation, and if the specifications and type of the product complies with the order.
2) Check the nameplate on the side of the frequency inverter to ensure that the product you have received is right the one you ordered.

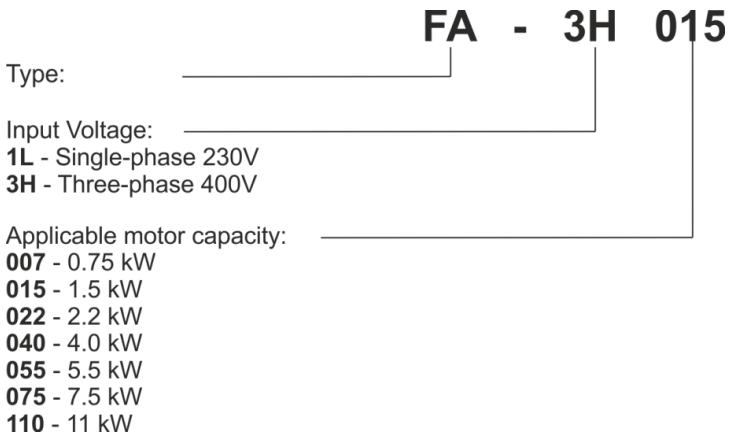
Please contact the supplier of F&F products if any problems are found.

Inverter Specification Label (nameplate)



Pic. 1) Inverter nameplate

Model number convention



Pic. 2) Identification of the type of inverter

⚠	**Particular attention should be given to the difference between the one-phase inverters 230V and 3-phase 400V. Connection of 3-phase 400V for 1-phase inverter can cause serious damage.**	⚠

Part 2. Installation

Safety Precautions

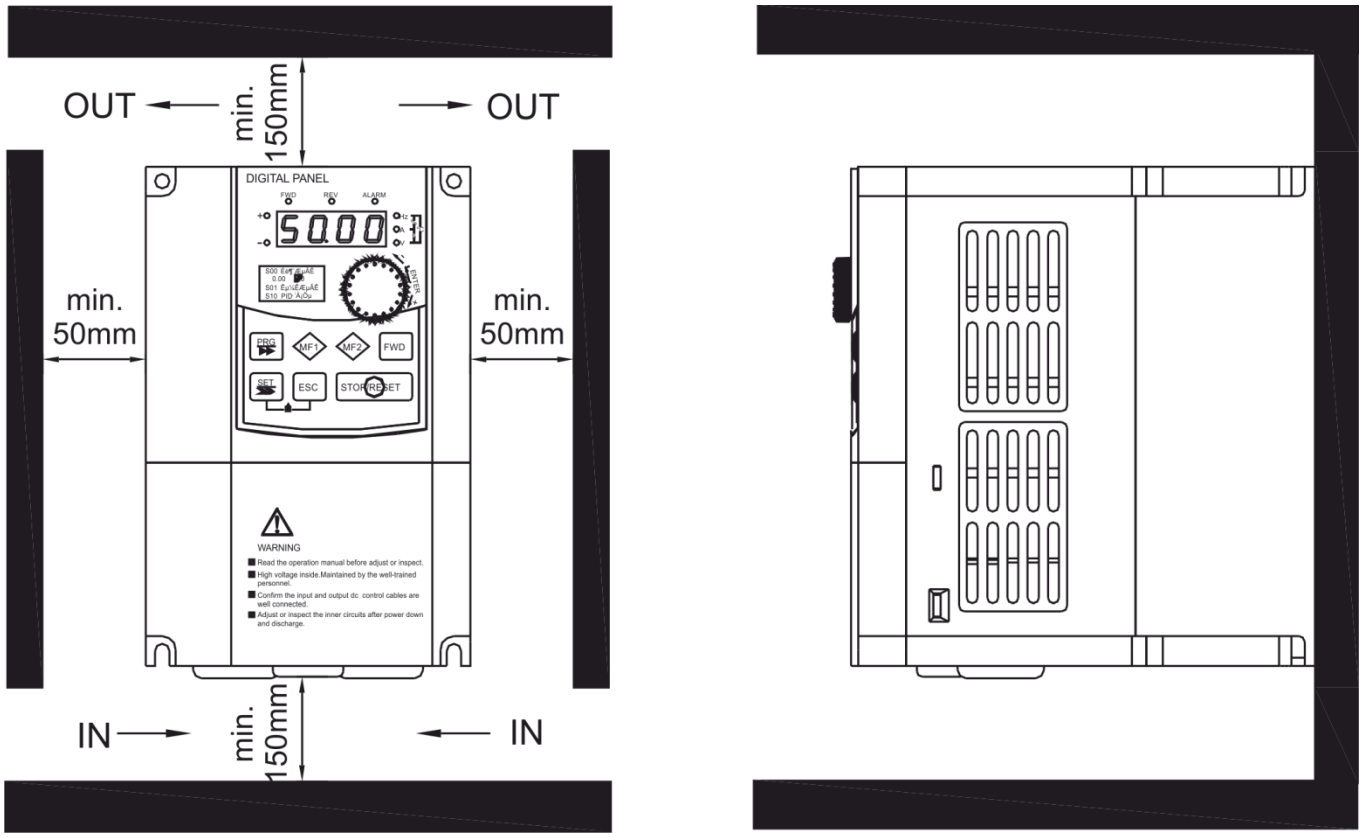
	**Never connect the A.C. power supply to the output terminals (U, V, W) of the frequency inverter.**	
	Fix and lock the panel before supplying power so as to avoid the danger caused by the poor capacity or other components inside the inverter.	
	After the power supply is switched on, do not perform wiring or check, etc.	
	Don't touch the circuit boards or its parts or components in the inverter when it is powered, so as to avoid danger of electric shock.	
	If the power supply is switched off, do not touch the PCB or other parts inside the inverter within 5 minutes after the keyboard indicator lamp goes off, and you must check by using the instrument that the inverter has completely discharged all its capacity before you start to work inside the inverter. Otherwise, there will be the danger of electric shock.	
	The static electricity in human body will cause serious damage to the MOS field effect transistor in the inverter. Please keep your hands away from the PCB, IGBT and other internal parts before taking actions to prevent static electricity. Otherwise, faults may be caused.	
	Please don't shut off the unit by turning off the power supply. Turn off the power supply after the motor has stopped its operation.	
	In use, the earthling terminal (⏚) of the frequency inverter must be grounded to the earthling connections correctly and securely according to the national electrical safety specifications and other applicable standards. . **Attention: The inverter is designed to operate in the power supply TN-S with an effective reset. Failure to do so may lead to the appearance on the metal casing inverter dangerous potentials which are high risk for both manual and inverter**	

Conditions for Use

1. Ambient temperature -10℃~40℃.
2. Avoid electromagnetic interference and keep the unit away from the interference source.
3. Prevent dropping water, steam, dust, powder, cotton fiber or fine metal powder from entering it.
4. Prevent oil, salt and corrosive gas from entering it.
5. Avoid vibration.
6. Avoid high temperature and moisture and avoid being wetted due to raining, with the humidity below 90%RH (not dewing).
7. Prohibit the use in the dangerous environment where inflammable or combustible or explosive gas, liquid or solid exists.

Installation

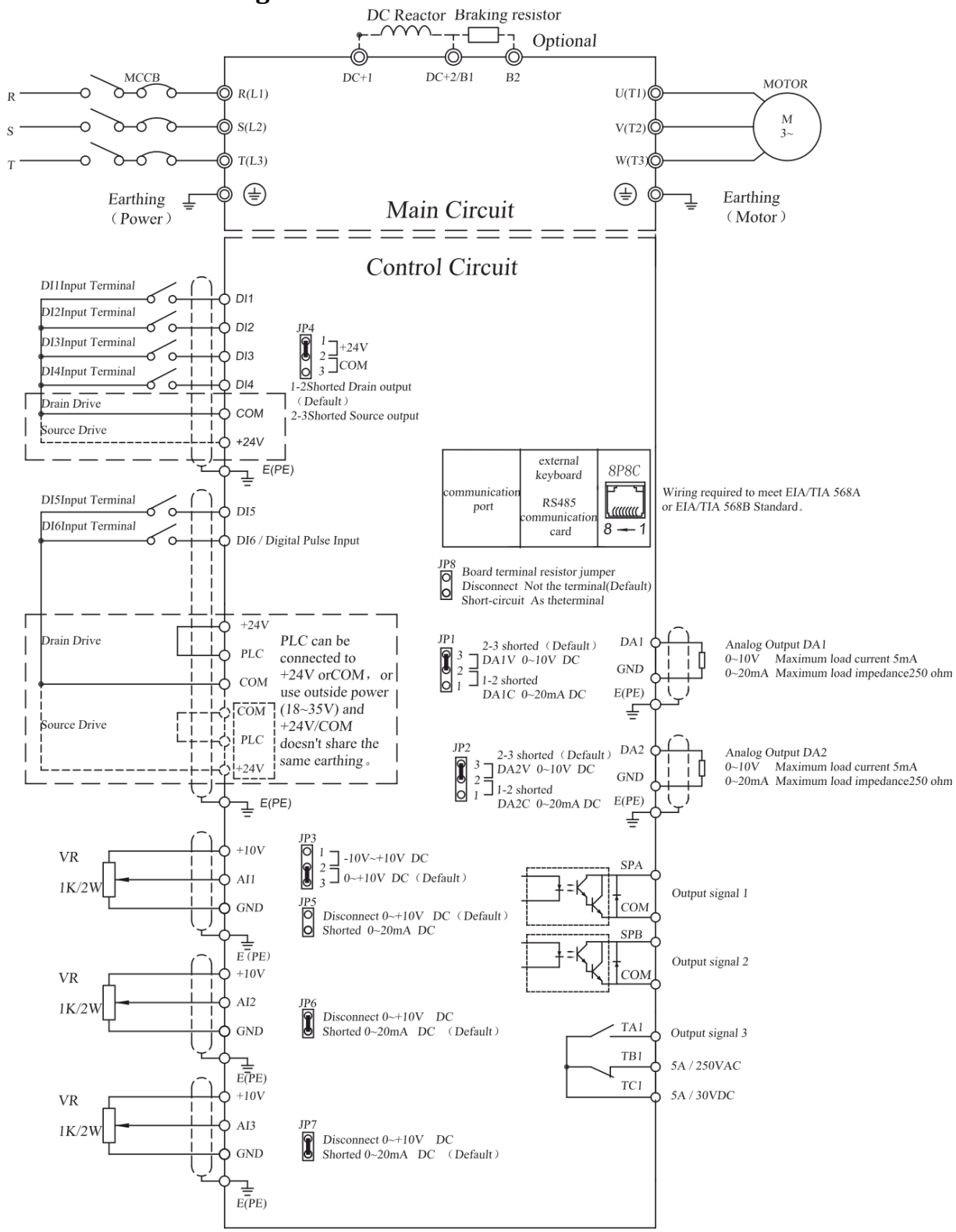
The frequency inverter must be installed by wall hooking in the indoor room with adequate ventilation, with enough space left between it and the adjacent objects or damper (walls) surrounding it, as shown in the below figure:



Pic. 3) Example of appropriate building inverter

Part 3. Wiring

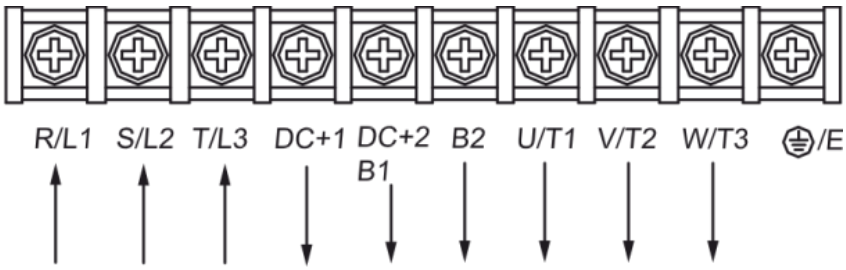
Basic Connection Diagram



Pic. 4) Inverter wiring diagram

Main Circuit Terminals

⚠	For wiring of main circuit, please refer to national rule.
⚠	Don't connect A.C. input power to the output terminals U, V, W of the frequency inverter.
⚠	Don't install power factor capacitance or resistance-capacitance absorbing device between the output terminals U, V, W of the frequency inverter.
⚠	To disassemble or replace the motor, the input power supply must be turned off for the frequency inverter.
⚠	Do not drop Metal scrap foam or lint into the frequency inverter, otherwise the machine will be faulted.
⚠	The motor or power supply can be switched on/off only after the inverter stops its output.
⚠	When the carrier frequency is less than 3kHz, the distance between the frequency inverter and motor must not be greater than 50 meters (maximum). When it is above 4kHz, this distance should be reduced. The cable for this connection had better be laid in metal conduit.
⚠	In order to prevent unexpected accidents, earthling terminal E or ⏚ must be grounded to the earth securely (the grounding resistance should be below 100Ω). The cable size should be greater than half of below- mentioned corresponding cable size; otherwise current leakage will happen possibly
📄	It is recommended to use between the inverter and the motor dedicated shielded motor cables.



Pic. 5) Terminal block to connect the power circuit

Terminal	Function	Description
R/L1	Power input for frequency inverter	Connected to 3-phase power, **(Single input connected to R, T)**
S/L2		
T/L3		⚠ **Particular attention should be given to the difference between the one-phase inverters 230V and 400V 3-phase. Connection of 3-phase 400V for 1-phase inverter can cause serious damage.**
B1, B2	Connection point for braking resistance	Connect brake resistance
DC+2, DC-	DC Bus output	Connect the brake unit.
DC+1, DC+2	DC reactance connection terminal.	Connect DC reactance (No short circuit).

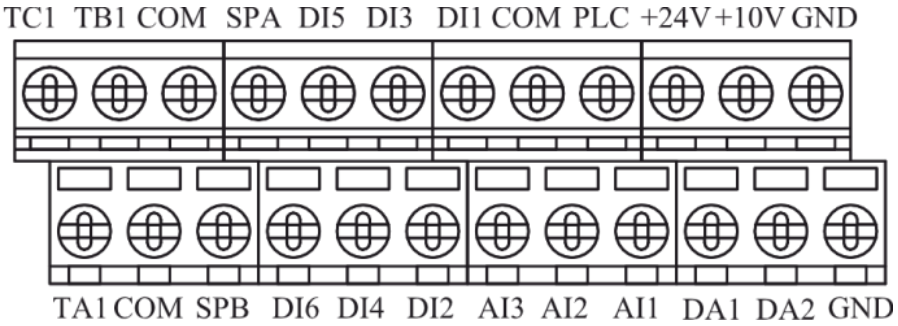
U/T1	3 Phase Output	Connected to 3-phase motor
V/T2		
W/T3		
⏚/PE	Grounding point	Earthling terminal E or ⏚ must be grounded to the earth securely.

Specification of MCCB, and electric cable

Type	Input Current	Output Current	Motor Capacity	MCCB	Power Cable
	A	A	kW	A	mm^2
FA-1L007	9	4	**0.75kW**	16	2,5
FA-1L015	17.5	7	**1.5kW**	25	2,5
FA-1L022	24	10	**2.2kW**	40	4,0
FA-1L040	36	16	**4.0kW**	63	6,0
FA-3H007	3.3	2.5	**0.75kW**	10	1,5
FA-3H015	5	3.7	**1.5kW**	10	1,5
FA-3H022	7A	5A	**2.2kW**	16	2,5
FA-3H040	11A	8.5A	**4.0kW**	25	2,5
FA-3H055	16.5A	13A	**5.5kW**	32	4,0
FA-3H075	20A	16A	**7.5kW**	40	4,0
FA-3H110	28A	25A	**11kW**	63	6,0

Control Circuit Terminals

	Take special attention to the separation of the control circuit of the power circuit. Random combination of the two circuits may cause electric service and / or damage to the drive.	
	Give attention to the maximum allowable voltage which may be applied to the inputs of the inverter control and maximum load controller outputs. Exceeding these values may damage the drive	
	For external control of frequency inverter, an isolation device should be used for the control lines or screened cable should be used.	
	A screened cable should be used as the signal connection line for input command and must be routed separately as well, and it had better be installed far from the main circuit	



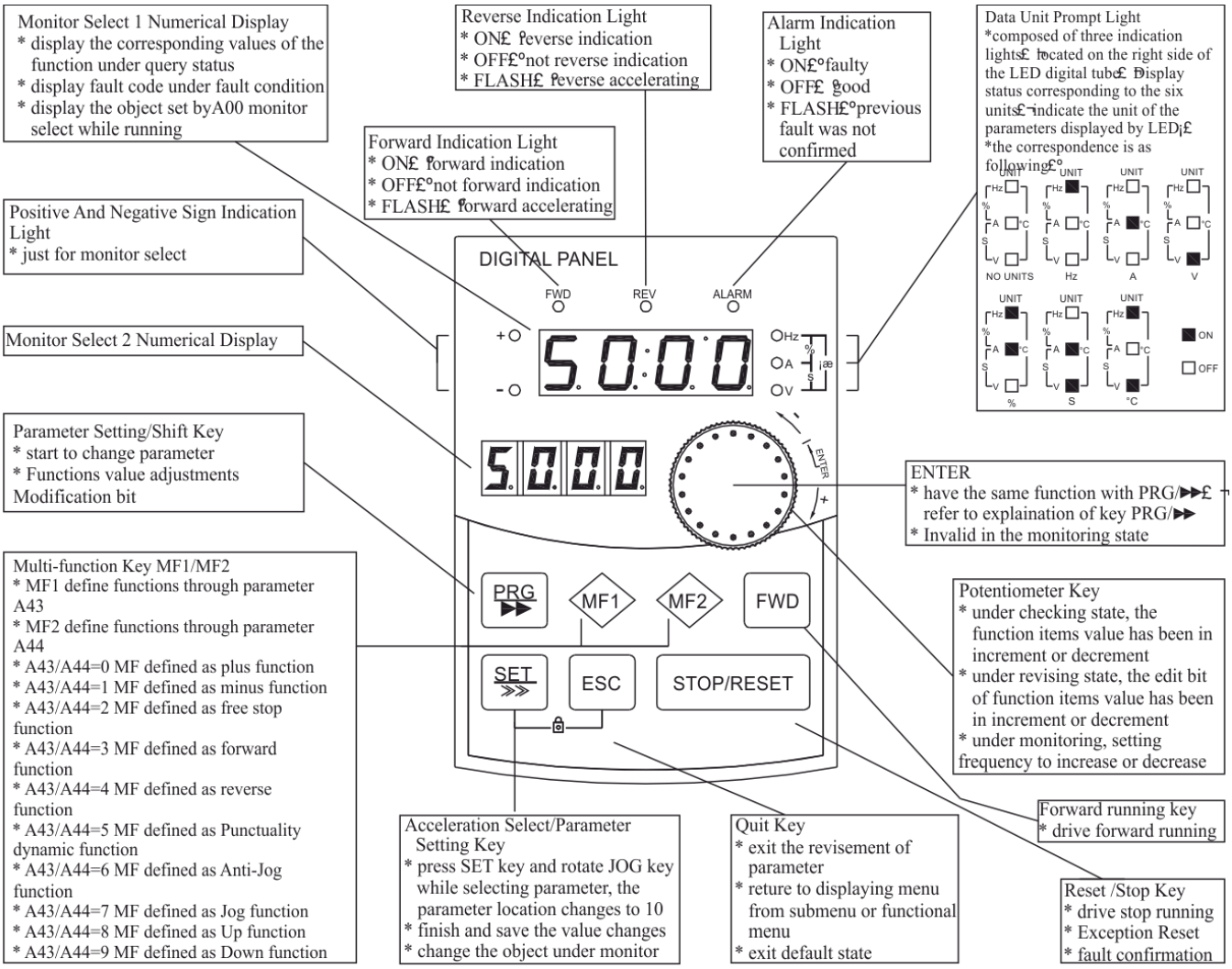
Pic. 6) The control circuit terminal block

	Terminal	Function	Description
Input Signal	DI1	DI1 Input Terminal	**Multi-functions input terminal.** For details Please read **o36~o46** Enter a valid polarity can be controlled by **o47** **DI1~DI4** Drive model can be controlled by **JP4** **DI5~DI6** Drive model can be controlled by PLC output terminal **DI6 can be set as digital pulse input**
	DI2	D2 Input Terminal	
	DI3	DI3 Input Terminal	
	DI4	DI4 Input Terminal	
	DI5	DI5 Input Terminal	
	DI6	DI6 Input Terminal	
	PLC	PLC Control Terminal	**PLC Control DI5-DI6 Drive model** Drain Drive : PLCconnect 24VDC or external lower Source Drive: PLC connect COM
	COM	Common terminal	**The biggest output 24V/200mA.** Cannot connect COM with GND in any situation
	+10V, GND	Analog Power	**The biggest output +10V/50mA.** Cannot connect COM with GND in any situation

	AI1	Multifunction Analog Input Signal 1	**JP5** cut/**JP3** 1-2: -10V~+10V **JP5** cut/**JP3** 2-3: 0~10V **JP5** connect: 0~20mA can be regulated **o00**/**o01** Set the input voltage / current range **o06**/**o07** Set the input signal corresponding to set value
	AI2	Multifunction Analog Input Signal 2	**JP6** cut: 0~10V **JP6** connect: 0~20mA can be regulated **o02**/**o03** can set input voltage/ current arrange **o08**/**o09** set the input signal corresponding to set value
	AI3	Multifunction Analog Input Signal 3	**JP7** cut: 0~10V **JP7** connect: 0~20mA can be regulated **o04**/**o05** can set input voltage/ current arrange **o10**/**o11** set the input signal corresponding to set value
Output Signal	SPA/COM	Output Signal 1	Open Collector signal when the output action (24VDC/50mA) Common terminal COM , the output function can set by **o21**, **o22** SPA, SPB provide hi-speed pulse output fun - ction. After setting functions by **o61~o64** Frequency inver-ter will take effect again.
	SPB/COM	Output Signal 2	
	TA1/TB1/TC1	Output Signal 3	Relay Output - max. 250VAC/5A or 24VDC/5A. TA1-TC1 open, TB1-TC1close, the output function can set by **o23**
Analog Output	DA1	Multifunction Analog Output Signal 1	**JP1** 1-2: 0~20mA **JP1** 2-3: 0~10VDC **o15** set analog output analog functions **o17**/**o18** set the output signal arrange
	DA2	Multifunction Analog Output Signal 2	**JP2** 1-2: 0~20mA **JP2** 2-3: 0~10VDC **o16** Set analog output analog functions **o19**/**o20** set the output signal arrange

Part 4. Operating Keyboard

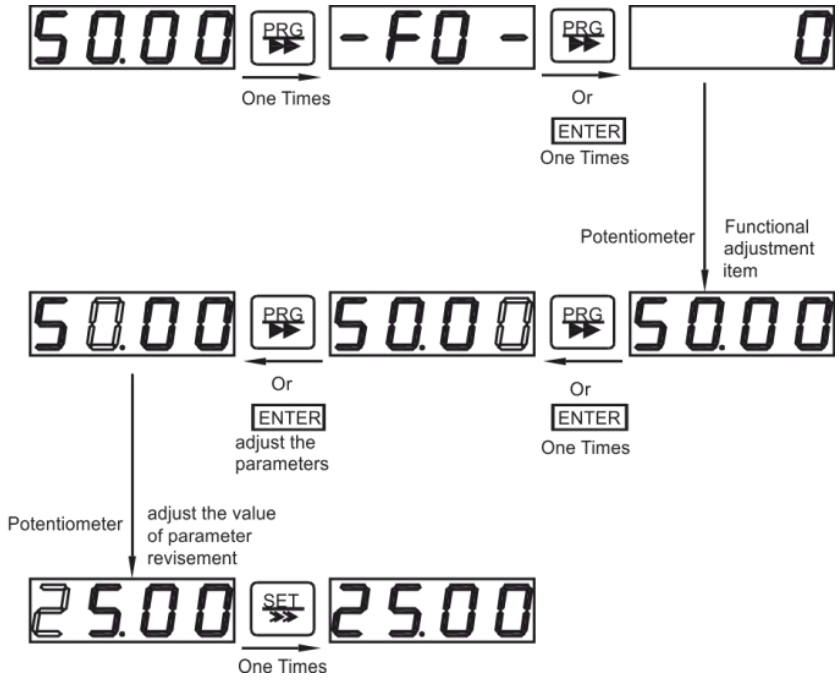
Operating keyboard specification and function description



Pic. 7) An example of the use of the control panel

Example for parameters set

F01 keyboard set the frequency from 50.00Hz to 25.00Hz.



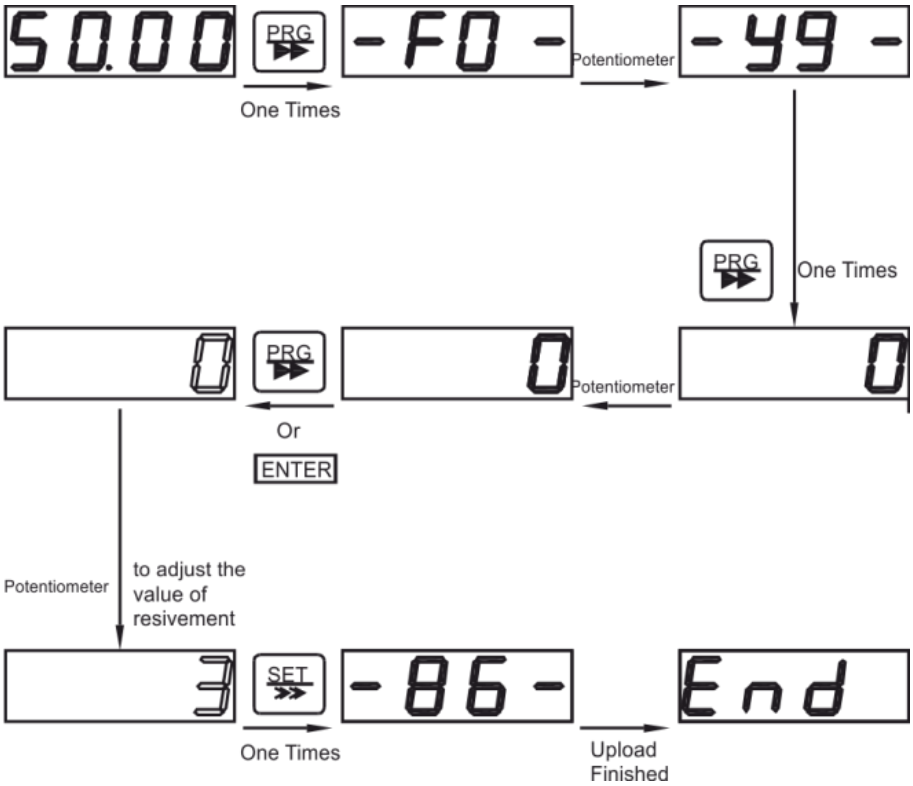
Pic. 8) An example of a parameter edition

1. Under monitoring status, press PRG into parameter group to query status;
2. Through potentiometer Switch to F00-63 Basic FG;
3. Press PRG, or ENTER, enter into F00-63 Basic FG parameter group to query status;
4. Through potentiometer Switch to F01Fre. Set by K;
5. Press PRG, or ENTER, enter into F01 Fre. Set by K parameter modify status;
6. Through PRG, or ENTER, adjust the value is modified bit;
7. Through potentiometer Has been modified to adjust the bit values;
8. Finish the adjustment, press SET;if cancel the change, press ESC to escape to the modify status;
9. Press ESC to exit to previous menu.

Parameter uploads to the keyboard

Parameter Item	Description	
y01 parameter upload to	N function	0

the keyboard	System parameter upload to the memory area1 in the keyboard	1
	System parameter upload to the memory area2 in the keyboard	2
	System parameter upload to the memory area3 in the keyboard	3
	System parameter upload to the memory area4 in the keyboard	4
	Clear memory area in the keyboard1, 2, 3, 4	5



1. Example. System parameter upload to the memory area3 in the keyboard

1. Under monitoring status, press PRG into parameter group to check status;
2. Through potentiometer Switch to y00-23 System FG;
3. Press PRG, or ENTER, enter into y00-23 System FG parameter group to check status;
4. Through potentiometer Switch to y01P Upload To K;
5. Press PRG, or ENTER, enter into y01P Upload To K parameter modify status;
6. Through potentiometer adjust value to be 3 ;

7. Finish the adjustment, press [SET];the speed for upload will display on the LED;if cancel the change, press [ESC] to escape to the modification status;
8. Press [ESC] to exit to previous menu.

Parameters Groups

Code	Function	Description	Refer to page
S	Monitor Function Group	Monitor frequency, current and other 16 monitor objects	**Błąd! Nie zdefiniowano zakładki.**
F	Basic Function Group	Frequency setting, control mode, acceleration time and deceleration time	16
A	User Function Group	Monitor, protection, communication setting	30
O	IO Function Group	Analog, digital input, output function	**Błąd! Nie zdefiniowano zakładki.**
H	Multi-speed PLC Group	Multi-speed running, PLC running	**Błąd! Nie zdefiniowano zakładki.**
U	V/F parameter Group	User defined V/F curve	**Błąd! Nie zdefiniowano zakładki.**
P	PID Function Group	Internal PID parameter setting	**Błąd! Nie zdefiniowano zakładki.**
C	Speed ring function Group	Current ring, speed running, PG parameter	**Błąd! Nie zdefiniowano zakładki.**
b	Motor parameter Group	Motor parameter setting	74
y	System Function Group	Parameter reset, fault query, product information, parameter protection	77

Monitor Function: S00 – S15

Code	Function	Description	Unit	Fact.	Change Limited
S00	Setting Frequency	Current inverter real setting frequency	Hz	-	N
S01	Real Frequency	Current inverter real output frequency	Hz	-	N
S02	Motor real Current	Valid value of motor actual current	A	-	N
S03	Percentage of Motor Current	The percentage of actual motor current and rated current	%		
S04	DC Bus Voltage	Detection value of DC bus voltage	V	-	N
S05	The Output Voltage	The real output voltage	V	-	N

S06	Motor Real Speed	Motor real running speed	$^{obr}/_{min}$	-	N
Under running, the real speed of the motor＝60*the real output frequency *Gain Speed surveillance /pole of the motor. **Example**: the real output frequency 50.00Hz, Gain Speed surveillance **A35**=100.0%, the pole of the motor **b03**/**b16**＝2, the real speed of the motor＝1500rpm. When stop, based Residual voltage test motor speed, renew speed 500ms. The real speed ＝60*residual frequency*Gain Speed surveillance / the pole of the motor Max display of motor real speed 9999rpm.					
S07	Total Running Time	The total running time for every time	hour/ day	-	N
When the output, the frequency inverter calculated the running time. Total running time can be cleared up automatically with **A33** selecting reboot or continue accumu - lation after reboot Total running time of the units can be changed by parameter **A34**, you can choose hours or days as the unit					
S08	IGBT Tempera-ture ℃	Test the temperature of IGBT in the frequency	°C	-	N
S09	PID Set Point	PID Adjust run-time values of the percentage of a given	%	-	N
S10	PID Feedback	PID Adjust run-time values of the percentage of feed back	%	-	N
S11	Motor Output Frequency	The percentage of actual output power of motor	%	-	N
The output frequency of the motor＝the actual frequency of the motor ***A36** the regulate of the motor frequen-cy Max display of the output frequency 2999.9					
S12	Excitation Heft Set Value	Motor's set excitation heft percentage	%	-	N
S13	Excitation Heft Actual Value	Motor's actual excitation heft percentage	%	-	N
S14	Torque Heft Set Value	Motor set torque percentage	%	-	N
S15	Torque Heft Actual Value	Motor actual torque hefts percentage	%	-	N

Basic function Group:F00-F50

Code	Function	Setting Range		Unit	Fact.	Change Limited
F00	Control Mode	V/F control	0	-	0	N
		Sensor less vector control	1			

0. V/F Control

It is not sensitive to motor parameters, can be used as power supply; for motor control, using the combination of vector control and V / F control strategies, appropriately adjusts motor parameters, obtain high-performance control effect; suitable for a inverter driving a motor occasions; suitable for a inverter driving multiple motors occasions; suitable for the inverter as a variable frequency power supplies.

1. Sensor less vector control

High-performance speed sensor less vector control; need to set the appropriate electrical parameters or the motor parameter tuning; truly achieved the decoupled AC motor, so that operational control of DC

<table>
<tr><td colspan="7">motors.</td></tr>
<tr><td>F01</td><td>Keyboard Setting Frequency</td><td colspan="3">Lower frequency~upper frequency</td><td>Hz</td><td>50</td><td>Y</td></tr>
<tr><td colspan="7">The keyboard for a given operating frequency, it can be any frequency between lower frequency and upper frequency.
F02/F03setting to 0, involved in setting frequency calculation.</td></tr>
<tr><td rowspan="7">F02</td><td rowspan="7">Frequency Main Set Mode</td><td colspan="2">Keyboard setting frequency or RS485</td><td>0</td><td rowspan="7">-</td><td rowspan="7">0</td><td rowspan="7">Y</td></tr>
<tr><td colspan="2">AI1 the external analog setting</td><td>1</td></tr>
<tr><td colspan="2">AI2 the external analog setting</td><td>2</td></tr>
<tr><td colspan="2">AI3 the external analog setting</td><td>3</td></tr>
<tr><td colspan="2">Keyboard potentiometer setting</td><td>4</td></tr>
<tr><td colspan="2">Multi-segment digital voltage setting</td><td>5</td></tr>
<tr><td colspan="2">Digital Pulse Setting</td><td>6</td></tr>
<tr><td colspan="7">The main mode of the frequency running frequency:
0 : keyboard setting frequency or RS485 change F01 keyboard setting frequency
Multi-digital voltage terminal effective exchange, change F01keyboard setting value

1 : AI1 the external analog setting
Given the external analog 0~10V,-10V~+10V,0~20mA. For detail please read the o group parameter.
2 : AI2 the external analog setting
3 : AI3 the external analog setting
Given the external analog 0~10V, 0~20mA. For detail please read the o group parameter.

4 : Keyboard potentiometer setting
Keyboard potentiometer setting, keyboard potentiometer for a given start and end values of the corresponding values can be positive role and negative effects. For detail please read the A group parameter.

5 : Multi-segment digital voltage setting
o36~o46 IO input terminal function set to 11, 12, 13, switch H47~H54 Multi-digital voltage setting, 100% corresponding to the maximum frequency.

6 : Digital pulse setting
Digital pulse input frequency Corresponding to the setting frequency. For detail please read the o52 group parameter.
Pulse input terminal and DI8 terminal reset, after using the digital pulse input, o43 set to 0. Otherwise, the function settings will take effect, the pulse input on status of o58 can be checked, be limited to low-speed pulse.
Through o36~o46 IO input terminal set to 14, 15, 16 be configured to switch the source</td></tr>
<tr><td rowspan="8">F03</td><td rowspan="8">Auxiliary Setting Mode Of Frequency</td><td colspan="2">Keyboard setting frequency or RS485</td><td>0</td><td rowspan="8"></td><td rowspan="8"></td><td rowspan="8"></td></tr>
<tr><td colspan="2">AI1 the external analog setting</td><td>1</td></tr>
<tr><td colspan="2">AI2 the external analog setting</td><td>2</td></tr>
<tr><td colspan="2">AI3 the external analog setting</td><td>3</td></tr>
<tr><td colspan="2">Keyboard potentiometer setting</td><td>4</td></tr>
<tr><td colspan="2">Multi-segment digital voltage setting</td><td>5</td></tr>
<tr><td colspan="2">Digital Pulse Set</td><td>6</td></tr>
<tr><td colspan="2">PID regulation mode</td><td>7</td></tr>
<tr><td colspan="7">Auxiliary setting mode of frequency set:
0 : keyboard setting frequency or RS485 change F01 keyboard setting frequency
Multi-digital voltage terminal effective exchange, change F01keyboard setting value

1 : AI1 the external analog setting</td></tr>
</table>

Given the external analog 0~10V,-10V~+10V, 0~20mA. For detail please read the **o** group parameter.

2 : AI2 the external analog setting

3 : AI3 the external analog setting

Given the external analog 0~10V, 0~20mA. For detail please read the **o** group parameter.

4 : Keyboard potentiometer setting

Keyboard potentiometer setting, keyboard potentiometer for a given start and end values of the corresponding values can be positive role and negative effects. For detail please read the **A** group parameter.

5 : Multi-segment digital voltage setting

o36~o46 IO input terminal function set to 11, 12, 13, switch **H47~H54** Multi-digital voltage setting, 100% corresponding to the maximum frequency.

6 : Digital pulse setting

Digital pulse input frequency Corresponding to the setting frequency. For detail please read the **o52** group parameter.

Pulse input terminal and **DI8** terminal reset, after using the digital pulse input, **o43** set to 0. Otherwise, the function settings will take effect, the pulse input on status of **o58** can be checked, be limited to low-speed pulse.

Through **o36~o46** IO input terminal set to 14, 15, 16 be configured to switch the source.

7 : PID regulation mode

The completion of the main to the frequency of common analog feedback loop control. Speed control accuracy requirements applicable to the general occasions. The given value can be given through the keyboard can also be given through the analog. Analog feedback can represent the pressure, flow, temperature. Details see the **P** group of parameters. The completion of the main to the frequency of common analog feedback loop control. Speed control accuracy requirements applicable to the general occasions. For a given value can be given through the keyboard can also be given through the analog. Analog feedback can represent the pressure, flow, temperature. Details see the **P** group of parameters.

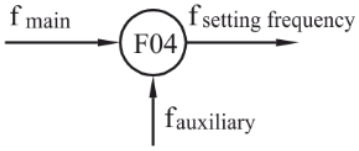
Through **o36~o46** IO input terminal, set to 17, 18, 19 be configured to switch the source for a given ratio.

F04	The Relationship Between Main And Auxiliary Setting Frequency	The main setting individual control	0	-	0	T
		The auxiliary setting individual control	1			
		main + auxiliary	2			
		main -auxiliary	3			
		(main *auxiliary)/maximum frequency	4			
		Maximum {main, auxiliary}	5			
		Minimum {main, auxiliary}	6			

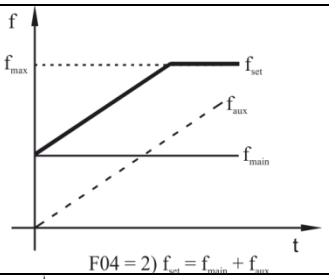
Main given and auxiliary given set frequency relations:

Main given value and auxiliary given value can be added up, subtracted, multiplied, maximum, minimum calculation.

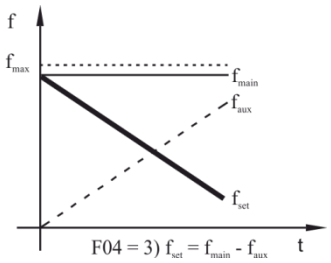
O group parameters can be adjusted to coordinate the main given and auxiliary given proportion, to meet the requirements of the system fine-tuning and bias.



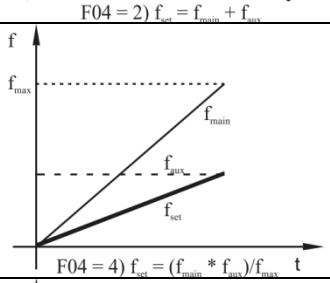
The relationship between main give and auxiliary given



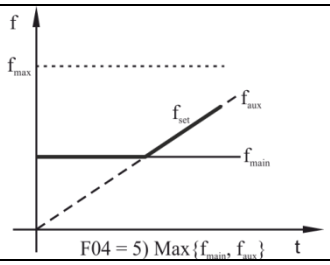
F04 = 2) $f_{set} = f_{main} + f_{aux}$



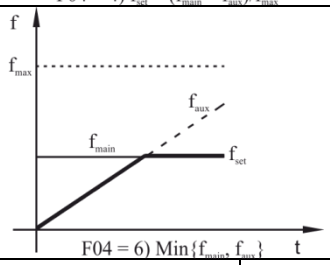
F04 = 3) $f_{set} = f_{main} - f_{aux}$



F04 = 4) $f_{set} = (f_{main} * f_{aux})/f_{max}$



F04 = 5) Max{f_{main}, f_{aux}}



F04 = 6) Min{f_{main}, f_{aux}}

F05	Running Control Mode	Keyboard+RS485	0	-	0	Y
		Keyboard+terminal+RS485	1			
		RS485	2			
		Terminal control	3			
		The proportion linkage control	4			

Stop and running command control mode：

0) Keyboard+RS485 Control

1) Keyboard+Terminal+RS485 Control

Control terminal, edge trigger, falling edge of the implementation of the Forward command FWD / Reverse command REV, rising edge of the implementation of the STOP command.

2) RS485

Under this function, only free stop function is valid under the keyboard control, other operation control is invalid.

3) Terminal control, Level trigger

Under this function, only free stop function is valid under the keyboard control, other operation control is invalid.

4) The proportion linkage control

Select this function; the slave unit would execute the command from the proportion linkage host unit.

Select this function can also use keyboard, terminal, RS485 to control the proportion linkage slave unit to run.

The proportion of linkage running, after stop the proportion linkage slave unit with the keyboard terminal, RS485, the slave unit will not run the proportion linkage host unit's command, it needs once again to respond to host commands through the keyboard, terminal, RS485, or the proportion linkage host sends stop command so that slave unit could respond to run commands.

F06	V/F Boost Mode	1 bit	Beeline V/Fcurve	0	-	000	N
			Power of 1.2 V/Fcurve	1			
			Power of 1.7 power V/Fcurve	2			
			Power of 2 powerV/Fcurve	3			
			Define mode V/Fcurve	4			
		10 bit	Close Automatic torque boost				

			Automatic torque boost	1			
		100 bit	VF mode 0 Speed No Output	0			
			VF mode keep 0 speed	1			

1 Bit: V/F promote curve

0) Line V/F curve: Suitable for ordinary constant torque load

1) Power of 1.2 V/F curve: Appropriate torque down V/F curve - suitable for liquid loads.

2) Power of 1.7 V/F curve: Appropriate torque down V/F curve - suitable for liquid loads.

3) Power of 2 V/F curve: Torque down V/F curve - it is suitable for fans, pumps, centrifugal load.

4) Define mode V/Fcurve: Can be customized appropriate curve according to the actual situation.

10 bit: Auto-torque boost mode

0) Close Automatic torque boost

1) Open automatic torque boost

Parameters which affect automatic torque enhance :

- Actual value torque component **S15**
- **b06**/**b19** stator resistance
- **F07** torque enhance value

Automatic torque enhance value = actual value of torque component * stator resistance *torque enhance value.

100 bit: VF mode 0 speed maintain function

0) VF mode 0 Speed No Output: Output frequency is less than 0.5Hz, stop PWM output to reduce the switching loss.

1) VF mode keep 0 speeds: Output frequency is 0Hz, in accordance with the DC braking current of starting **F26**, keep 0 speeds.

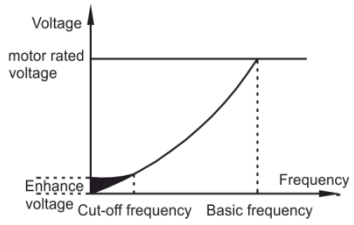
F07	Torque boost Value	0.0 - 30.0	%	0.0	Y
F08	Torque Boost Cut-off Frequency	0.00~Maximum frequency	Hz	15.0	Y

Torque increase is mainly used to improve the low-frequency torque characteristics under sensor less V/F control mode:

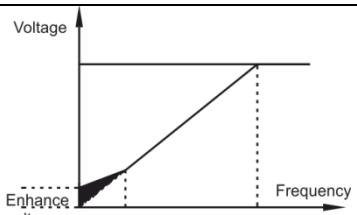
Torque boost is too low, weak low speed motor

Torque boost is too high, motor over-excitation operation, large inverter output current and low efficiency.

The setting frequency of the inverter is lower than the frequency of the torque rising, the torque rising will be valid; over than the setting frequency the torque rising will invalid.



down the torque curve torque boost

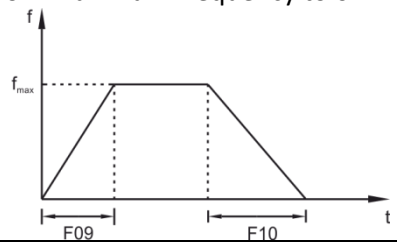


Constant torque curve torque boost

F09	Accelerate Time	0.0 - 3200.0	s	10.0	Y
F10	Decelerate Time	0.0 - 3200.0	s	10.0	Y

F09 – Accelerate time: accelerate time from 0Hz to maximum frequency.

F10 – Decelerate time: decelerate time from maximum frequency to 0Hz



Attention: Too short acceleration / deceleration slows the motor windings and inverter circuitry and may cause tripping over current and overvoltage protection built-in inverter

F11	Percentage Of Output Voltage	50 - 110	%	100	Y

The percentage of the actual output voltage and the rated output voltage.
Used to adjust the output voltage, output voltage＝inverter rated output voltage*percentage of output voltage.

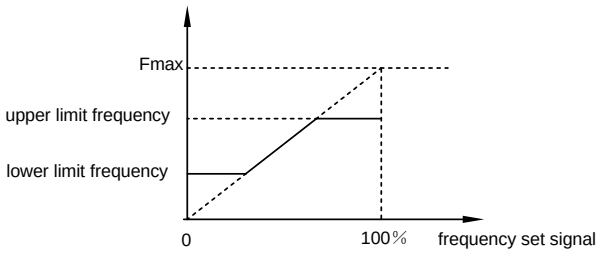
F12	Maximum Frequency	10.00 - 320.00	Hz	50.00	N

Inverter output maximum frequency allowed is also the setting basis of acceleration/deceleration time.
This parameter setting, you should consider characteristics of the motor speed and capacity.

F13	Lower Frequency	0.00 ~ Upper frequency	Hz	0.00	N
F14	Upper Frequency	Lower frequency~Upper frequency	Hz	50.00	N

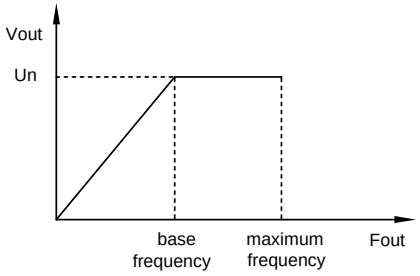
F13 Lower frequency: the lower limit of the output frequency.
F14 Upper frequency: the upper limit of output frequency.

When the frequency setting command is higher than the upper frequency, the operating frequency will be the upper frequency; When the frequency setting command below the lower frequency, the operating frequency is lower frequency. Start the motor that in the status of stopping, the inverter outputs accelerate starting from 0Hz, accordance with the step 1 acceleration time towards the upper or the setting frequency to accelerate. When motor Stop, the operating frequency decelerate according to deceleration time down to 0Hz.



F15	Basic Frequency	5.00~Maximum frequency	Hz	50.00	N

Corresponding to different fundamental frequency of the motor select this function. The basic V / F characteristic curve is as below.



F16	Carrier Frequency	1.0 – 16.0	KHz	8	Y

This function is chiefly used to improve the possible noise and vibration during the operation of frequency converter. When carrier frequency is higher, the output current has better wave, the torque is great at lower frequency and the motor produces light noise. So it is very suitable for use in the applications where great torque is output at low frequency quietly. But in these applications, the damage to the switches of main components and the heat generated by the inverter are great, the efficiency is decreased and the output capacity is reduced. At the same time, more serious radio interference is resulted and special attention must be paid for application where very low EMI is needed, and filter option can be used if necessary. Another problem for application of high carrier frequency is the increase of capacitance-leakage current. The protector for leakage current may invalidate function, and over current is also possibly caused. When low carrier frequency is applied, the case is almost contrary to the above-mentioned one. Different motor has different reflection to the carrier frequency. The best carrier frequency is gained after regulation according to actual conditions. The higher the motor capacity is, the lower the carrier frequency should be selected.

The company reserves the right to limit maximum carrier frequency as following:
The relation between carrier frequency and Motor Noise, Electric disturbance, Switch dissipation is expressed as following:

Carrier Frequency	Motor Noise	Electric disturbance	Switch dissipation
1.0 kHz	Big	Small	Small
8.0 kHz	↕	↕	↕
16.0 kHz	Small	Big	Big

F17	Carrier Frequency Adjustment Range	0 .0 – 4.0			kHz	0.0	Y
F18	Carrier Frequency Adjustment Mode	1 bit	No automatic adjustment	0	-	00	Y
			automatic adjustment Mode	1			
		10 bit	automatic adjustment, Fixed mode	0			
			automatic adjustment, random mode	1			

F17 Carrier frequency adjustment range

0.0~4.0kHz, Actual Carrier frequency adjustment range 1.0~16.0kHz

F18 Carrier frequency adjustment mode

1 Bit: Carrier frequency automatic adjustment mode

0) No automatic adjustment - carrier frequency according **F16** to set.

1) Automatic adjustment mode - The carrier frequency automatically adjusts the model 10 can select random mode and fixed pattern.

10 Bit: Stochastic adjustment mode

0) automatic adjustment - fixed mode:

Load current>80% Carrier frequency = **F16** - **F17**

Load current<60% Carrier frequency = **F16** + **F17**

1) automatic adjustment, random mode

Load current >80% Carrier frequency = (**F16** - **F17**) ~ **F16**

Load current <60% Carrier frequency = **F16** ~ (**F16** + **F17**)

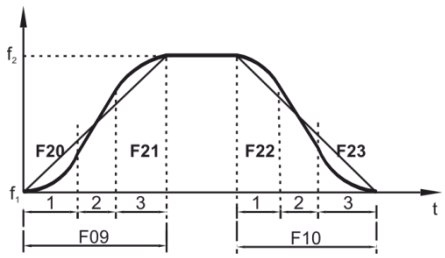
F19	Waveform Generation Mode	Asynchronous space-vector PWM	0	-	0	N
		Steeples & subsection synchronous space vector PWM	1			
		two-phase optimization space vector PWM	2			
F20	S Curve Start Time At The Acceleration Step	0.0~50.0	0.0 – 50.0	%	0.0	T
F21	S Curve Stop Time At	0.0~50.0	0.0 –	%	0.0	T

	The Acceleration Atep		50.0			
F22	S Curve Start Time At The Deceleration Step	0.0~50.0	0.0 – 50.0	%	0.0	T
F23	S Curve Stop Time At The Deceleration Step	0.0~50.0	0.0 – 50.0	%	0.0	T

Such as setting the S curve acceleration and deceleration, acceleration and deceleration time from 0Hz to the maximum frequency is calculated as follows:

Plus acceleration S characteristic time = **F09** * **F20**
Constant extra acceleration S characteristic time = **F09**-(**F09** * **F20** + **F09** * **F21**)
Minus acceleration S characteristic time = **F09** * **F21**
Full acceleration time = **F09** Acceleration time

Velocity S addition and subtraction characteristic time = **F10** * **F22**
Constant deceleration S characteristics time = **F10**-(**F10** * **F22** + **F10** * **F23**)
And reduction rate of S characteristic time = **F10** * **F23**
All deceleration time = **F10** deceleration time

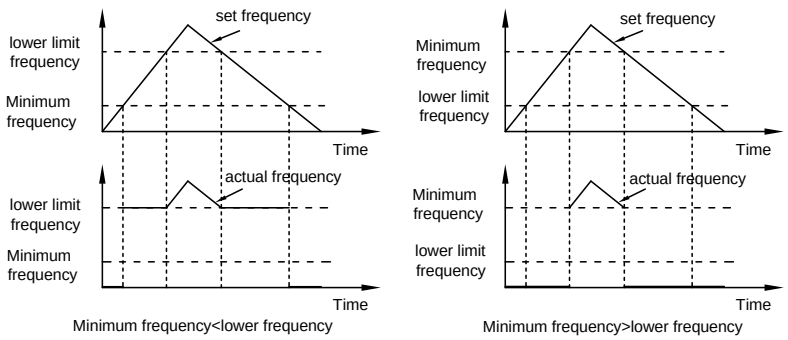


F24	V/F Control Slip Compensation	slip compensation invalid	0	-	0	N
		slip compensation valid	1			

Valid only under V/F control mode.
0) Slip compensation function is invalid.
1) Slip compensation function is valid.
Slip compensation value adjusted by the following parameters to ensure stable speed under load fluctuations and heavy load:
C09 Low Slip Gain
C10 Low Slip switching frequency
C11 High-Speed Slip Gain
Slip C12 high-speed switching frequency

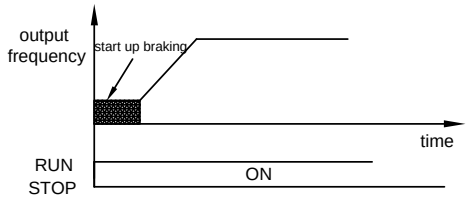
F25	Minimum Running Frequency	0.00~maximum frequency	Hz	0.00	N

The set frequency lower than the minimum running frequency, the converter will stop, that is, when the set frequency is less than the minimum running frequency, are determined that the set frequency is 0.



F26	DC Braking Current When Starting	0 – 135	%	100	Y
F27	Braking Time When Starting	0.0 – 60.0	s	0.0	Y

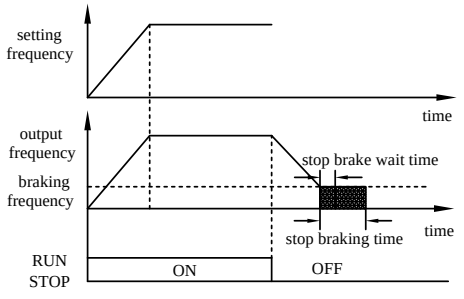
When frequency Inverter starting, the first injection of DC current, the current size is determined by starting to set when the DC braking current and braking time, braking time from the start to set.
Value is based on inverter rated current as the benchmark that is inverter rated current corresponds to 100%. During setting process, be sure to gradually increase, until adequate braking torque, and cannot exceed the motor rated current.



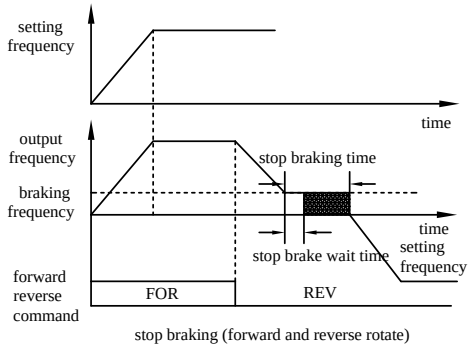
start up braking

F28	Stop When The DC Braking Current	0 – 135	%	100	Y
F29	Stop And Braking Wait Time	0.0 – 60.0	s	0.0	Y
F30	Brake Time Stop	0.0 – 60.0	s	0.0	Y
F31	Stop And Brake Starting Frequency	0.00 ~ maximum frequency	Hz	0.00	T

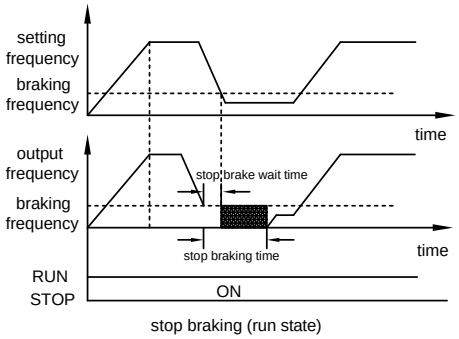
Inverter slowing down to stop braking start frequency, stop the output PWM waveform to begin injection of DC current, the current size by the shutdown of DC braking current setting, braking time, braking time set by the downtime. Value is based on inverter rated current as the benchmark that is inverter rated current corresponds to 100%. Setting process is sure to gradually increase from a small, until adequate braking torque, and cannot exceed the motor rated current.



Stop braking (RUN→STOP)



stop braking (forward and reverse rotate)



stop braking (run state)

F32	Stop Setting Mode	Deceleration stop	0	-	0	N
		Free stop	1			

When the frequency inverter receives the "stop" command, it will set the parameters accordingly to this parameter to set the motor stop mode:

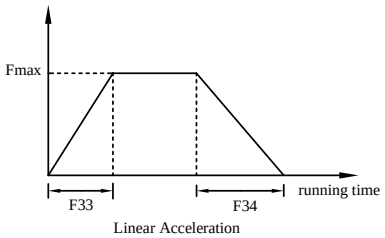
0) Deceleration to stop

Mode converter according to parameters set by the deceleration time to set the deceleration mode to slow down to the lowest frequencies to stop.

1) Free stop mode

Inverter receives "stop" command immediately stop output, according to the load inertia, motor free-run to stop.

F33	Jog Acceleration Time	0.0 – 3200.0		s	1.0	N
F34	Jog Deceleration Time	0.0 – 3200.0		s	1.0	N
		1 bit	Jog direction: forward	0		
			Jog direction: reverse	1		
			Jog direction: direction determined by the main terminal	2		
		10 bit	Jog end mode: Stop Running	0		
			Jog end mode: reset to the former state before jog	1		
		100 bit	Jog end and acceleration deceleration time: reset to the set acceleration and deceleration time before jog	0		
			Jog end and acceleration deceleration time: save the set acceleration and deceleration time before jog	1		
F36	Jog Frequency Setting	Lower frequency ~upper frequency		Hz	6.00	Y



Linear Acceleration

Jog acceleration/deceleration time configuration defines the same section of acceleration/deceleration time.

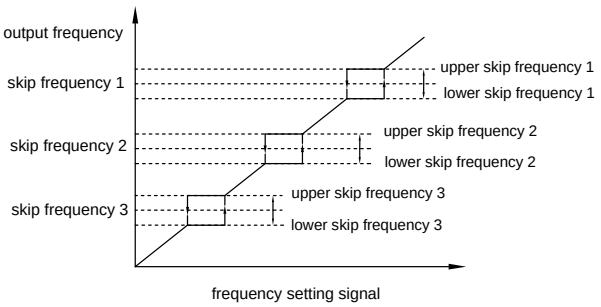
The direction of jog is set by the unit bit of **F35**, when the Jog command does not contain the direction of jog, the direction of job will run as to the unit bit designated by **F35**. It is set to 2, the direction of jog is run by the terminal or current direction.

The running status after jogging is identified by **F35**.

Whether jog acceleration/deceleration time is maintained through the confirmation on hundred bit of **F35** after jogging

F37	Skip Frequency 1 Limit	0.00 ~ Maximum frequency	Hz	0.00	Y
F38	Skip Frequency 1 Upper	0.00 ~ Maximum frequency	Hz	0.00	Y
F39	Skip Frequency 2 Limit	0.00 ~ Maximum frequency	Hz	0.00	Y
F40	Skip Frequency 2 Upper	0.00 ~ Maximum frequency	Hz	0.00	Y
F41	Skip Frequency 3 Limit	0.00 ~ Maximum frequency	Hz	0.00	Y
F42	Skip Frequency 3 Upper	0.00 ~ Maximum frequency	Hz	0.00	Y

During running, to skip resonance produced by the immanent resonance point in the machine systems, skip mode can do this.
At most three resonance points could be set to skip.



Upper skip frequency and lower skip frequency define skip frequency range. In the acceleration and deceleration process, inverter output frequency can normally through skip frequency area.

F43	Preset Frequency	0.00 ~ Maximum frequency	Hz	0.00	Y
F44	Preset Frequency Working Time	0.0 – 60.0 s	s	0.0	Y

After inverter startup, it firstly run with preset frequency, running time is preset frequency time, and then it will run with given frequency. Jog run will not be effective by preset frequency.

F45	Motor Running Direction	1 bit 10 bit	Direction command		-	100	N
			Forward command FWD let motor forward running	0			
			Forward command FWD let motor reverse running	1			
		100 bit	Command prior				
			terminal/keyboard	0			
			Analog given positive and negative values	1			
		1 bit	Reverse allow				
			reverse forbidden	0			
			reverse allow	1			

1 Bit: Change the direction of motor running

0) Forward command FWD is to let motor forward running.
1) Forward command FWD is to let motor reverse running.

10 Bit : **Motor forward reverse running**

Motor forward reverse running can be controlled by the keyboard potentiometer and analog input positive or negative value

0) Prior command: terminal / keyboard, set frequency can be negative value, but running direction decided

by terminal and keyboard command.

1) Prior command: positive or negative value of analog input, setting frequency positive value let motor forward running, setting negative value let motor reverse running.

100 Bit: motor reverse allow.

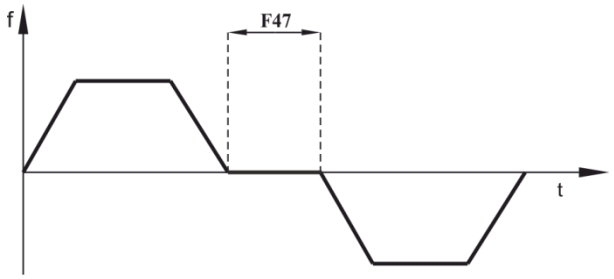
For some producing equipment, the reverse may lead to damage to the equipment, so this feature can be used to prevent motor reverse, Inverter default forbidden reverse. When the motor running direction opposes to equipment required direction, you can exchange the wiring of any two inverter output terminals to let equipment forward running direction is consistent with motor running.

0) Reverse forbidden

1) Reverse allow

F46	Pass 0 Stopping Time	0.0 – 60.0	s	0	N

Setting this parameter to achieve the motor forward to reverse (or from reverse running to forward), the waiting time of motor speed being zero.



F47	Frequency Multiple Setting	Maximum frequency: 10.00 – 320.00 Hz	0	-	0	N
		Maximum frequency: 100.0 – 800 Hz	1			

0) Set frequency display accuracy 0.01Hz

With this accuracy, F12 Maximum frequency setting range 10.00~320.00Hz.

1) Set frequency display accuracy 0.1Hz

With this accuracy, F12 Maximum frequency setting range 100.0~800.0Hz.

After setting this parameter, there must be reset F12 maximum frequency.

F48	Acceleration And Deceleration Configuration Word	1 bit	Adjustment of acceleration time		-	0000
			No adjustment	0		
			AI1 adjustment of the external analog giving	1		
			AI2 adjustment of the external analog giving	2		
			AI3 adjustment of the external analog giving	3		
			Adjustment of keyboard potentiometer giving	4		
			Adjustment of Multi steps digital voltage giving	5		
		10 bit	Adjustment of deceleration time			
			No adjustment	0		
			AI1 adjustment of the external analog giving	1		
			AI2 adjustment of the external analog giving	2		
			AI3 adjustment of the external analog giving	3		
			Adjustment of keyboard potenti-	4		

			ometer giving				
			Adjustment of Multi steps digital voltage giving	5			
		100 bit	Acceleration time unit				
			*s	0			
			*min	1			
			*h	2			
			*day	3			
		1000 bit	Deceleration time unit				
			*s	0			
			*min	1			
			*h	2			
			*day	3			

1 bit - Acceleration time adjustment mode

0	No Adjustment Of Acceleration Time	No adjustment
1	AI1 Adjustment Of The External Analog Giving	Actual Acc. time=Acc. time*AI1 giving percentage
2	AI2 Adjustment Of The External Analog Giving	Actual Acc. time = Acc. time*AI2 giving percentage
3	AI3 Adjustment Of The External Analog Giving	Actual Acc. time = Acc. time*AI3 giving percentage
4	Adjustment Of Keyboard Potentiometer Giving	Actual Acc.time = Acc. time*keyboard potentiometer giving percentage
5	Adjustment Of Multi Steps Digital Voltage Giving	Actual Acc.time=Acc.time*Multi steps digital voltage giving percentage

10 bit - Deceleration time adjustment mode

0	No Adjustment Of Acceleration Time	No adjustment
1	AI1 Adjustment Of The External Analog Giving	Actual Decc. Time = Decc. time*AI1 giving percentage
2	AI2 Adjustment Of The External Analog Giving	Actual Decc. time = Decc. time*AI2 giving percentage
3	AI3 Adjustment Of The External Analog Giving	Actual Decc. time = Decc. time*AI3 giving percentage
4	Adjustment Of Keyboard Potentiometer Giving	Actual Decc. time = Decc. time*keyboard potentiometer giving percentage
5	Adjustment Of Multi Steps Digital Voltage Giving	Actual Decc. time= Decc. time*Multi steps digital voltage giving percentage

100 bit - Acceleration time unit

0	* s	Max. acceleration time **F09** = 3200.0 s
1	* min	Max. acceleration time **F09** = 3200.0 min.
2	* hour	Max. acceleration time **F09** = 3200.0 hours.
3	* day	Max. acceleration time **F09** = 3200.0 days

1000 bit - Decceleration time unit

0	* s	Max. decceleration time **F10** = 3200.0 s
1	* min	Max. decceleration time **F10** = 3200.0 min.

2	* hour	Max. decceleration time **F10** = 3200.0 hours.
3	* day	Max. decceleration time **F10** = 3200.0 days

F49	Running Configuration Word	1 bit	Running direction		-	00	N
			Forward	0			
			Reverse	1			
		10 bit	Running time (H18-H25)				
			Sec	0			
			Min	1			
			Hours	2			
			Day	3			

Unit adjustment of actual running time. It is only valid on program running.

1 bit: Program running on multi-speed running period

Set bit to running direction of "0"step speed

0	Forward
1	Reverse

When running control mode F05＝0/1/2, control direction of "0" step speed.
When running control mode F05＝3, Setting the value and terminal FWD / REV jointly decide the direction of 0 step speed, FWD priority.

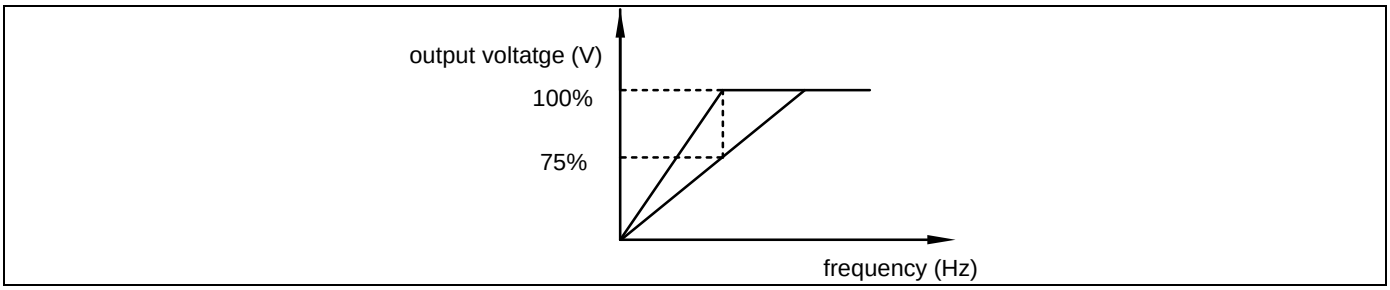
	FWD=1 running direction	REV= 1 running direction
0	FWD	REV
1	REV	FWD

10 bit: unit of time running when on "0" step speed.

0	* sec	**H18-H25** -> 0.0 – 3200.0 s
1	* min	**H18-H25** -> 0.0 – 3200.0 m
2	* hour	**H18-H25** -> 0.0 – 3200.0 h
3	* day	**H18-H25** -> 0.0 – 3200.0 d

F50	Energy Saving Running Percentage	30 – 100	%	100	N

This parameter describes the minimum output voltage percentage of energy-saving operation. In the constant speed operation, the inverter can be automatically calculated the best output voltage by the load conditions. In the process of acceleration and deceleration is not to make such calculations.
Power-saving function is by lowering the output voltage and improve power factor to achieve the purpose of saving energy, this parameter determines the minimum value of reducing of output voltage; This parameter is set to 100%, then energy-saving function will take off.
When energy-saving function in effect, Actual output voltage value of inverter= The inverter rated output voltage*The percentage of output voltage*output voltage percentage of energy saving operation.


output voltatge (V)
100%
75%
frequency (Hz)

User Function Group: A00-A55

Code	Description / LCD	Setting Range		Unit	Factory Setting	Change Limited
A00	Monitor 1	Parameter group	Parameter number	-	0B00	T
A01	Monitor 2	xx--	--xx	-	0B01	T
A02	Monitor 3	00 – 0B	00 – 63 (0x00-0x3F)	-	0B02	T

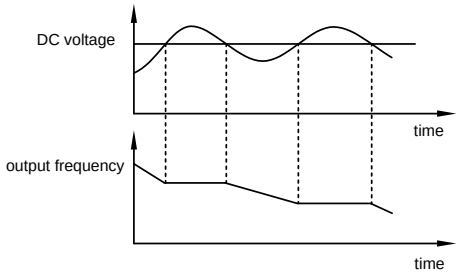
A00/A01/A02 parameter specifies that the inverter parameters will be displayed on the display monitor 1 - Unit 3 located on the control panel inverter. The first two digits identify the parameter group of parameters, and the last two - the number of displayed parameter.

Group	Function	Spec	Number
0B	Monitor Function Group	S	0 – 16 (0x00 – 0x10)
00	Basic Function Group	F	0 – 60 (0x00 – 0x3C)
01	User Function Group	A	0 – 56 (0x00 – 0x38)
02	IO Function Group	o	0 – 61 (0x00 – 0x3D)
03	Multi-step Speed PLC Group	H	0 – 56 (0x038)
04	V/F Curve Group	U	0 – 16 (0x00 – 0x10)
05	PID Function Group	P	0 – 13 (0x00 – 0x0D)
06	Extend Function Group	E	0 – 14 (0x00 – 0x0E)
07	Speed Loop Parameter Group	C	0 – 32 (0x00 – 0x21)
08	Motor Parameter Group	b	0 – 23 (0x00 – 0x17)
09	System Function Group	y	0 – 18 (0x00 – 0x12)

That parameter **Number** should be 16 hex input.
Monitor1 will be valid when first power on, and which decide keyboard display content. Such as:
Monitor 1: **S01** actual frequency, **A00**=0x0B01.
Monitor 2: **o57** DI1~4 terminal status, **A01**=0x0239.
Monitor 3: **H55** multi-steps speed status, **A02**=0x0337.

A03	Over /Less Voltage Stall Protection	Off	0	-	1	Y
		On	1			
A04	Overvoltage Stall Protection Voltage	110%~140%(Standard bus voltage)		%	120	Y

When the inverter deceleration, as the motor load inertia, motor will produce feedback voltage to inverter inside, which will increase DC bus voltage and surpass max voltage. When you choose Over /less voltage stall protection and it is valid, Inverter detects DC side voltage, if the voltage is too high, the inverter to stop deceleration (the output frequency remains unchanged), until the DC side voltage is below the set value, the inverter will re-implement the deceleration
With braking models and external braking resistor, this function should be set to “0”.



A05	Auto Stabilize Voltage	Invalid	0	-	0	Y

		Valid	1			
		Valid, useless for deceleration	2			
CPU automatically detect the inverter DC bus voltage and to make real-time optimized processing, when the grid voltage fluctuate, the output voltage fluctuation is very small, the V / F curve characteristic has always been close to setting state of rated input voltage.						
A06	Dynamic Braking option	Invalid	0	-	0	Y
		Security Type	1			
		General Type	2			
A07	Hysteresis voltage	0 – 10		%	2	Y
A08	Dynamic Braking Voltage	110%~140%(Standard bus voltage)		%	130	Y

Dynamic Braking option:

0) Invalid

1) Security Type

Only in the inverter deceleration process, and detected high-voltageDCbus exceeds a predetermined value, the dynamic braking will be implemented

2) General Type

Under any state, when the inverter detected high-voltage DC bus exceeds a predetermined value, the dynamic braking will be implemented.

When the inverter is running on emergency deceleration state or load great fluctuation, it may appear over-voltage or over-current. This phenomenon is relatively prone to happen when the motor load inertia is heavy. When inverter The inverter internal DC bus detected voltage exceeds a certain value, the output brake signal through an external braking resistor implement energy-braking function. Users can select inverter models with a braking function to apply this feature.

A09	Less Voltage Level	60%~75%(Standard DC bus voltage)		%	70	Y

The definition of allowed the lower limit voltage of normal working inverter DC side .For some low power occasions, inverter less voltage value can be appropriately put down in order to ensure the inverter normal working.. Under normal condition, keeping default setting.

A10	Power-down Tracking Options	N	0	-	0	Y
		Power-off tracking mode	1			
		Startup tracking mode	2			
A11	Power-down tTracking Time	0.0 - 20.0		s	0.0	Y

This parameter is used to select the inverter tracking mode.

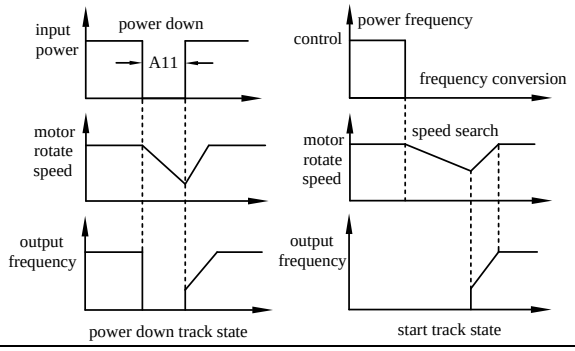
0) N speed tracking means to start tracking from 0 Hz

1) Power-down tracking

When the inverter instantaneous power off and re-start, the motor will continue running with current speed and direction. If the power off time is longer than A11 set time, the inverter will not re-start power on again.

2) **Startup tracking**

It means that when power on, inverter will first inspect motor direction and speed, and then driving motor with current speed and direction. Set startup tracking function, power off tracking function is still valid.

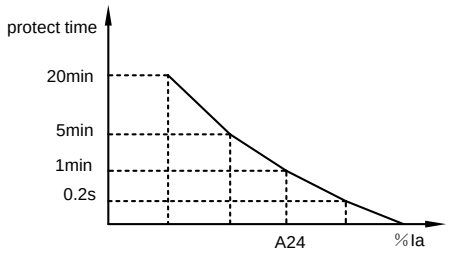


A12	Power Down Frequency Drop Point	65~100%(standard DC bus voltage)		%	75	Y
A13	Power Down Frequency Drop Time	0.1 – 3200.0		s	5.0	Y
Correctly setting this parameter can let inverter does not less voltage stop in case of instantaneous power off. When the DC bus voltage drop to frequency drop point **A12** set, inverter will decelerate according to deceleration time **A13** set and stop outputting power to load. Meanwhile, inverter will use load feedback energy to compensate DC bus voltage dropping and keep inverter working in short time. Power down frequency drop time actually is deceleration time of frequency dropping after power off. If this value set is too large, the load feedback energy is small, and then inverter cannot compensate for voltage dropping in DC. If this value set is too small and there is large energy feedback from load, the excessive energy compensation may cause inverter over-voltage fault. Set **A12** 100% to cancel power off frequency dropping function.						
A14	Current Limit	Off	0	-	0	Y
		On	1			
A15	Limit Fall Time	0.1 – 3200.0		s	10.0	Y
A16	Limit Deceleration Protection Point	10 – 250		%	130	Y
A17	Limit Fix-speed Protection Point	10 – 250		%	120	Y
Current limitation function can effectively restrain over-current caused by motor load fluctuation in the process of acceleration and deceleration or constant speed operation. This function will be good effect for V/F control mode. Under protection of current lost- speed state, the motor speed will drop. so it is not adapted by system which is not allowed to automatically drop speed. In operation process, when the motor current surpass value **A16** set, motor will decelerate according to deceleration time **A15** set until current below value **A16** set. In operation process, when the motor surpass value **A17** set, motor will run with this speed until current below value **A17** set. Deceleration current limitation is prior of constant speed limitation.						
A18	Output Phase Lose Protection	No protection of phase lost	0	-	0	Y
		Warning and constant running	1			
		Warning and deceleration	2			
		Warning and free stopping	3			
A19	Grade Of Phase Lose Protection	10 – 100		%	30	Y
When ratio of unbalance 3phase output surpass **A19** Grade of phase lose protection, the inverter output phase lose protection will action, and the system display fault **PH-O**. Output frequency less than 2.00Hz, there is no output phase loses protection. Phase lost protection grade = max current difference between phases, which will be according to load condition.						
A20	Over Torque Inspected Action	No torque inspection	0	-	0	Y
		Warning and running	1			
		Warning and decelerating stop	2			
		Warning and free stopping	3			
A21	Over Torque Grade	10 – 100		%	130	Y
A22	Over Torque Inspection Time	0.0 – 60.0		s	0.1	Y
Motor output current surpasses value A21 set, Over torque inspection will be force and the system will show OL2 fault.						
A23	Electronic Thermal	Off	0	-	0	Y

	Relay Protection Selection	On	1			
A24	Electronic Thermal Protection Grade	120 – 250		%	120	Y

This function is to protect motor overheating when motor does not use thermal relay. Inverter using some parameters to calculate motor temperature rise, at the same time to determine whether the use of current caused motor overheat. When you choose electronic thermal protection function, the drive output is shutdown after overheating detected also shows information of protection.

A24 set the electronic thermal protection level. When the current is the rated motor current multiplies the parameter, the drive in 1 minute protects thermal protection within one minute that means the actual current is **A24** times of the rated current.



A25	Fault Reset Times	0 – 10	-	0	Y

In the inverter operation process, Over Current expressed by OC、Over Voltage by OU, inverter can automatically recover and run with state of preceding fault. Recovering times will be according to this parameter. It can set 10 times at most. When this parameter is set “0”, inverter will not automatically recover after meeting fault. But if relay in DC main circuit meet fault “MCC” or less voltage “LU” fault, inverter will automatically recover without limitation.
Restarting from fault and normally running over 36s, inverter will automatically recover fault reset times preset.
Restarting from fault and normally running over 36s, inverter will automatically recover to display monitor parameter.
After 10 s of meeting fault, inverter will not recover fault reset function.

A26	Fault Reset Time	0.5 – 20.0	s	1.0	Y

Setting interval of fault reset time. When inverter met fault and stopped outputting, and when it inspected without fault time is longer than fault reset time, Inverter will automatically implement fault reset.

A27	Fan Startup Temperature	0.0~60.0	℃	0.0	Y

Set the fan start temperature. When the actual temperature of theS08is higher than the set temperature the fan starts.
To avoid the fan frequently starts and stops , the fan stop temperature = **A27** fan start temperature -1.0℃

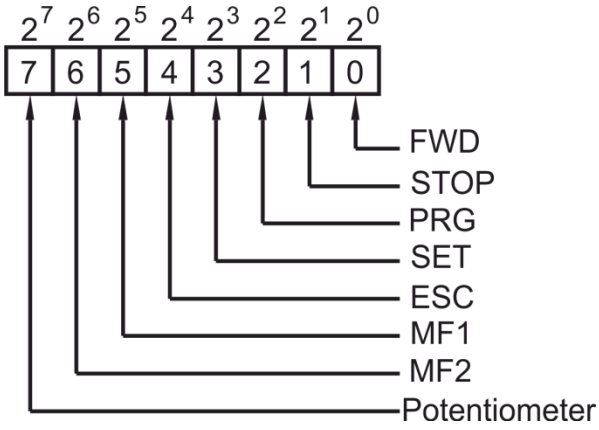
A28	This Inverter Communication Address	1 – 128	-	8	Y

This Inverter communication address: it is the only code to differentiate from other inverters.
Setting range “1~127” is slave inverter address, that can receive command and send out this inverter state. Seeing attachment 1 for detailed specification.
The proportion of linkage function:
The proportion of linkage host inverter:
This inverter communication address=128,.
Communication interface A is set as host inverter communication interface for proportion of linkage.
Communication interface B can be treated as keyboard interface or “PC” Host Computer Interface.
The proportion of linkage slave inverter:

<table>
<tr><td colspan="7">This inverter communication address =1~127.</td></tr>
<tr><td rowspan="6">A29</td><td rowspan="6">Baud Rate</td><td>1200</td><td>0</td><td rowspan="6">bps</td><td rowspan="6">4</td><td rowspan="6">Y</td></tr>
<tr><td>2400</td><td>1</td></tr>
<tr><td>4800</td><td>2</td></tr>
<tr><td>9600</td><td>3</td></tr>
<tr><td>19200</td><td>4</td></tr>
<tr><td>38400</td><td>5</td></tr>
<tr><td colspan="7">The baud rate of communication port A can be set accordingly.
The baud rate of communication port B is fixed 19200bps.</td></tr>
<tr><td rowspan="7">A30</td><td rowspan="7">Communication Format</td><td colspan="2">The number of bits, parity, stop bits</td><td rowspan="7">-</td><td rowspan="7">0</td><td rowspan="7">Y</td></tr>
<tr><td>8, No, 1</td><td>0</td></tr>
<tr><td>8, No, 2</td><td>1</td></tr>
<tr><td>8, Even, 1</td><td>2</td></tr>
<tr><td>8, Odd, 1</td><td>3</td></tr>
<tr><td>8, Even, 2</td><td>4</td></tr>
<tr><td>8, Odd, 2</td><td>5</td></tr>
<tr><td rowspan="4">A31</td><td rowspan="4">Communications Troubleshooting</td><td>N warning for communication fault</td><td>0</td><td rowspan="4">-</td><td rowspan="4">0</td><td rowspan="4">Y</td></tr>
<tr><td>Warning and running</td><td>1</td></tr>
<tr><td>Warning and decelerating stop</td><td>2</td></tr>
<tr><td>Warning and free stopping</td><td>3</td></tr>
<tr><td>A32</td><td>Delay Inspection Time</td><td colspan="2">1 – 250</td><td>s</td><td>10</td><td>Y</td></tr>
<tr><td colspan="7">When communication time between interfaces A or B surpassed A32 delay inspection time, the system will warn according to A31 setting.
After power on, interface without communication will not implement warning.</td></tr>
<tr><td rowspan="2">A33</td><td rowspan="2">Total Running Time Setting</td><td>Auto clear to zero after power on</td><td>0</td><td rowspan="2">-</td><td rowspan="2">1</td><td rowspan="2">Y</td></tr>
<tr><td>Continue to accumulate running time after power on</td><td>1</td></tr>
<tr><td rowspan="2">A34</td><td rowspan="2">Unit Of Total Running Time</td><td>Hour</td><td>0</td><td rowspan="2">-</td><td rowspan="2">0</td><td rowspan="2">Y</td></tr>
<tr><td>Day</td><td>1</td></tr>
<tr><td colspan="7">The set for unit of accumulation running time, only for display of running time.
0) Hour - display range 0~3200.0 hour.
1) Day - display range 0~3200.0 day.</td></tr>
<tr><td>A35</td><td>Motor Output Speed Adjustment</td><td colspan="2">0.1 – 1000.0</td><td>%</td><td>100.0</td><td>Y</td></tr>
<tr><td colspan="7">Using for displaying adjustment of motor actual running speed.SeeingA00~A02 monitor options: 6: motor actual running speed.
Setting 100%, corresponding display unit : rpm.
The max speed of displaying after adjustment is 9999.</td></tr>
<tr><td>A36</td><td>Adjustment Of Motor Output Power</td><td colspan="2">0.1 – 1000.0</td><td>%</td><td>100.0</td><td>Y</td></tr>
<tr><td colspan="7">Used for displaying motor output power of adjustment. Seeing A00~A02 monitor options: 11: motor output power. Setting 100%, corresponding display unit: %.

The max output power of displaying after adjustment is 2999.9.</td></tr>
<tr><td>A37</td><td>Keyboard Lock Function Options</td><td colspan="2">0 – 0FF</td><td>-</td><td>000</td><td>Y</td></tr>
<tr><td colspan="7">Key SET+ESC in Keyboard can activate and cancel keyboard lock function.</td></tr>
</table>

To lock which key will be decided by corresponding parameter :



Bit	Keyboard locked state	
0	Unlock FWD key	0
	Lock FWD key	1
1	Unlock STOP key	0
	Lock STOP key	1
2	Unlock PRG key	0
	Lock PRG key	1
3	unlock SET key	0
	Lock SET key	1
4	Unlock ESC key	0
	Lock ESC key	1
5	Unlock MF1 key	0
	Lock MF1 key	1
6	Unlock MF2 key	0
	Lock MF2 key	1
7	Unlock potentiometer	0
	Lock potentiometer	1

A38	**UP/DN** Control	1 bit	Power down to save	0	-	0000	Y
			Power down to clear saving	1			
		10 bit	saving after stopping	0			
			Stop command to clear saving	1			
			Cleared at the end of stopping	2			
		100 bit	One-direction adjustment	0			
			Double-direction adjustment	1			
		1000 bit	Invalided adjustment	0			
			Valid adjustment	1			
A39	**UP/DN** Time	1 bit	UP fix speed	0			
			UP fix times	1			
		10 bit	DN fix speed	0			
			DN fix times	1			
		100 bit	UP no adjustment of speed ratio	0			
			AI1 adjustment of the external analog giving	1			

			AI2 adjustment of the external analog giving	2			
			AI3 adjustment of the external analog giving	3			
			adjustment of Potentiometer giving	4			
			Adjustment of multi -steps digital voltage	5			
		1000 bit	DN no adjustment of speed ratio	0			
			AI1 adjustment of the external analog giving	1			
			AI2 adjustment of the external analog giving	2			
			AI3 adjustment of the external analog giving	3			
			adjustment of Potentiometer giving	4			
			Adjustment of multi -steps digital voltage	5			

1 bit - UP acceleration mode

0) Fix speed acceleration, according to **A41** fix speed: To increase frequency every 200ms.
1) Fix times acceleration, according to fix times: To increase frequency every triggering.

10 bit - DN deceleration mode

0) Fix speed deceleration, according to **A42** fix speed: To reduce frequency every 200ms.
1) Fix times deceleration, according to **A42** fix times: To reduce frequency every triggering.

100 bit - UP adjustment mode of adjusting speed ratio

0	UP N Adjustment Of Speed Ratio	No adjustment
1	AI1 Adjustment Of The External Analog Giving	Actual UP adjustment ratio= percentage given by **A41*AI1**
2	AI2 Adjustment Of The External Analog Giving	Actual UP adjustment ratio= percentage given by **A41*AI2**
3	AI3 Adjustment Of The External Analog Giving	Actual UP adjustment ratio= percentage given by **A41*AI3**
4	Adjustment Of Potentiometer Giving	Actual UP adjustment ratio= percentage given by **A41*** potentiometer
5	Adjustment Of Multi-steps Digital Voltage	Actual UP adjustment ratio=percentage given by **A41*** multi-steps digital voltage

1000 bit -DN adjustment mode of adjusting speed ratio

0	N Adjustment Of Accele-	No adjustment

	ration Time	
1	AI1 Adjustment Of The External Analog Giving	Actual DN adjustment ratio =percentage given by **A42*****AI1**
2	AI2 Adjustment Of The External Analog Giving	Actual DN adjustment ratio =percentage given by **A42*****AI2**
3	AI3 Adjustment Of The External Analog Giving	Actual DN adjustment ratio=percentage given by **A42*****AI3**.
4	Adjustment Of Potenti-ometer Giving	Actual DN adjustment ratio=percentage given by **A42***potentiometer
5	Adjustment Of Multi-steps Digital Voltage	Actual DN adjustment ratio=percentage given by **A42***multi-steps digital voltage.

A40	**UP/DN** Adjustment Value	-300.00 – 300.00	Hz	0.00	Y
Frequency after adjustment＝set frequency+UP/DN adjustment value.					
A41	**UP** Adjustment Ratio	0.01 – 20.00	Hz	0.01	Y
A42	**DN** Adjustment Ratio	0.01 – 20.00	Hz	0.01	Y
A43 **A44**	The Definition Of Mul-tifunction Keys MF1 And MF2	MF is defined as adding function key 0 MF is defined as reducing function key 1 MF is defined as free stopping key 2 MF is defined as FWD running key 3 MF is defined as REV running key 4 MF is defined as forward JOG function key. 5 MF is defined as reverse JOG function key. 6 MF is defined as JOG function key. 7 MF is defined as UP function key 8 MF is defined as Down function key. 9 UP / DN adjusted value reset 10 keyboard potentiometer setting value reset 11	- -	0 1	Y Y

The user defined keyboard can define MF key functions.

0) MF is defined as adding function key

Under monitor menu, adding function key MF can adding revise frequency **F01** set.
Under parameter choosing menu, adding function key MF can adjust parameter choice.
Under parameter revising menu, adding function key MF can adjust parameter value.

1) MF is defined as reducing function key

Under monitor menu, reducing function key MFcan reducing revise frequency **F01** set
Under parameter choosing menu, reducing function key MF can adjust parameter choice.
Under parameter revising menu, reducing function key MF can adjust parameter value.

2) MF is defined as free stopping key

MF key is valid under monitor menu and select parameter menu, inverter will be free stopping. After free stop, no start command, 1s later, allow running again.

3) MF is defined as FWD running key

Pressing MF key is valid under monitor menu and parameter choosing menu, inverter will be forward running.

4) MF is defined as REV running key
Pressing MF key is valid under monitor menu and parameter choosing menu, inverter will be reverse running.

5) MF is defined as forward JOG function key
Pressing MF key is valid under monitor menu and parameter choosing menu, inverter will be forward JOG running.

6) MF is defined as reverse JOG function key
Pressing MF key is valid under monitor menu and parameter choosing menu, inverter will be reverse JOG running.

7) MF is defined as JOG function key
Pressing MF key is valid under monitor menu and parameter choosing menu, inverter will be JOG running. Running direction decided by **F35** bit setting and terminal state.

8) MF is defined as UP function key
Pressing MF is always valid, inverter will be **UP** control, control parameter decided by **A38~A42**.

9) MF is defined as Down function key
Pressing MF is always valid, inverter will be **DOWN** control, control parameter decided by **A38~A42**.

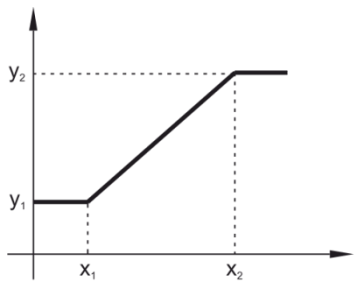
10) **MF is defined as the UP / DN adjusted value reset**
A40 UP / DN adjusted value reset, level-triggered.

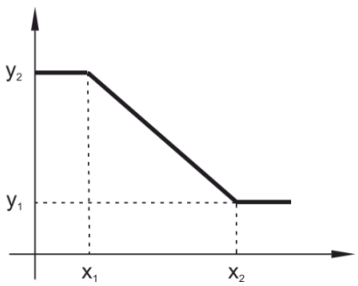
11) MF is defined as the setting value of potentiometer on the keyboard
A47 keyboard potentiometer setting is reset, level-triggered

A45	Keyboard potentiometer – X_1	0.0 – 100.0	%	0.0	Y
A46	Keyboard potentiometer – X_2	0.0 – 100.0	%	100.0	Y
A47	The Value Of Keyboard Potentiometer Set	0.0 – 100.0	%	-	Y

Displaying value potentiometer set, which can be revised by potentiometer under monitor menu?
Value potentiometer set can be regarded as analog of frequency giving , set value = max frequency
*keyboard potentiometer set value.
Potentiometer set value can be regarded as value of PID giving, value of PID giving=keyboard potentiometer set value.

A48	Keyboard potentiometer – Y_1	-100.0 – 100.0	%	0.0	Y
A49	Keyboard potentiometer – Y_2	-100.0 – 100.0	%	100.0	Y





A50	Keyboard Potentiometer Control	1 bit	Saving after power down	0	-	0000	Y
			Cleared after power down	1			
		10 bit	Saving after stopping	0			
			Clear saving after stopping command	1			
			Clear saving at end of stopping	2			

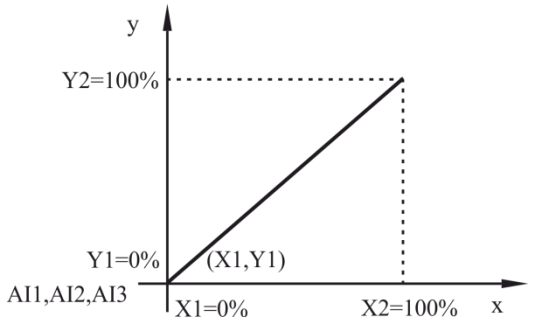
		100 bit	-			
		1000 bit	-			
A51	Temperature Adjustment Of Motor	0.0 – 200.0		%	100.0	N
Being used to revise displaying of A54 motor temperature.						
A52	Over-heat Temperature Of Motor	0.0 – 300.0		°C	120.0	N
A53	Reaction For Motor Over-heat	No reaction for motor over-heat	0	-	0	Y
		Warning and running	1			
		Warning and deceleration stopping	2			
		Warning and free stopping	3			
When the temperature controlled drive, indicated by parameter A54, above the set point in parameter A52 will be executing the action set in parameter A53.						
A54	Display Of Motor Temperature	-50.0 – 300.0		°C	-	N
Shows the motor temperature or temperature at other point. Control card PT100 plug should plug into the optional PT100 thermocouple devices Three lines PT100  						
A55	Proportion Of Linkage Ratio	0.10 – 10.00		-	1.00	T
In application of proportion of linkage, **A55** setting is multiply ratio of that when slave inverter received setting frequency command from host inverter. Setting this inverter as one slave inverter of system for proportion of linkage. Frequency Keyboard **F01** set＝proportion of linkage ratio* frequency **S00** set by host inverter						

IO function group:o00-o68

Code	Description / LCD	Setting Range	Unit	Factory Setting	Change Limited
o00	**AI1** Input – X_1	0.0 – 100.0	%	0.0	Y
o01	**AI1** Input – X_2	0.0 – 100.0	%	100.0	Y
o02	**AI2** Input – X_1	0.0 – 100.0	%	0.0	Y
o03	**AI2** Input – X_2	0.0 – 100.0	%	100.0	Y
o04	**AI3** Input – X_1	0.0 – 100.0	%	0.0	Y
o05	**AI3** Input – X_2	0.0 – 100.0	%	100.0	Y
o06	**AI1** Input – Y_1	0.0 – 100.0	%	0.0	Y
o07	**AI1** Input – Y_2	0.0 – 100.0	%	100.0	Y
o08	**AI2** Input – Y_1	0.0 – 100.0	%	0.0	Y
o09	**AI2** Input – Y_2	0.0 – 100.0	%	100.0	Y
o10	**AI3** Input – Y_1	0.0 – 100.0	%	0.0	Y
o11	**AI3** Input – Y_2	0.0 – 100.0	%	100.0	Y

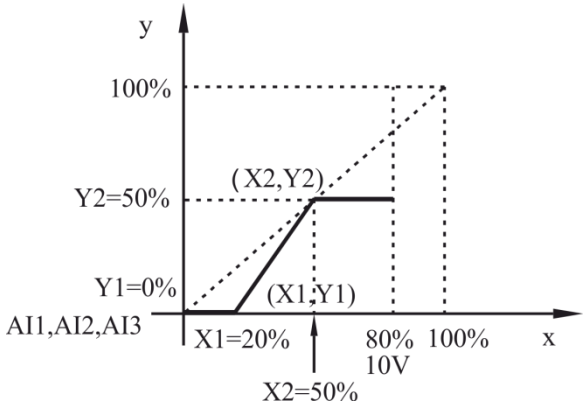
Under the situation Max frequency＝50.00Hz

Example 1



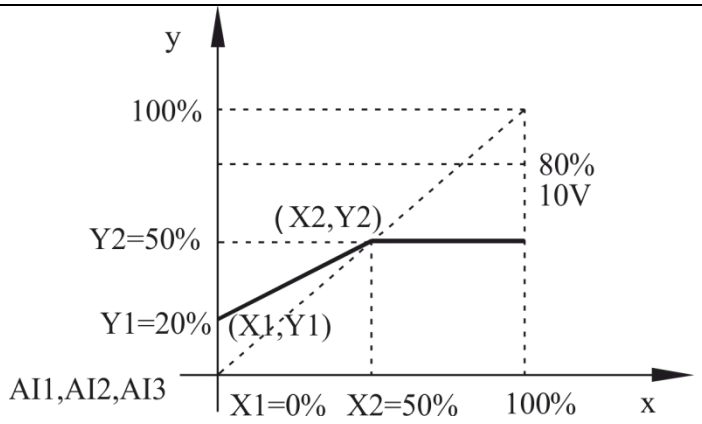
X	Y	$F = F_{max} * Y$
[%]	[%]	[Hz]
0	0	0
50	50	25
100	100	50

Example 2



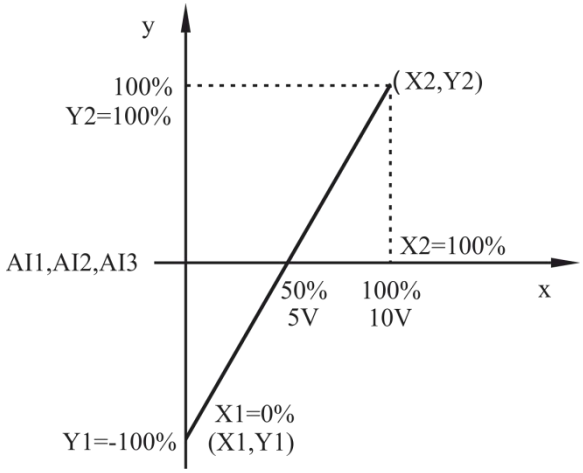
X	Y	$F = F_{max} * Y$
[%]	[%]	[Hz]
0	0	0
20	0	0
35	25	12.5
50	50	25
100	50	25

Example 3



X	Y	$F = F_{max} * Y$
[%]	[%]	[Hz]
0	20	10
25	35	17,5
50	50	125
75	50	25
100	50	25

Example 4



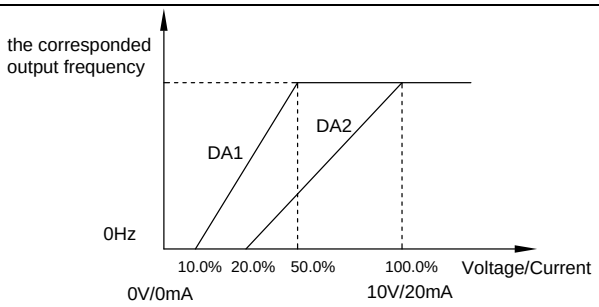
X	Y	$F = F_{max} * Y$
[%]	[%]	[Hz]
0	-100	-50
25	-50	-25
50	0	0
75	50	50
100	100	100

Skipping thread of AI1, AI2, AI3 respectively are JP3/JP5, JP6, JP7, seeing the following detailed specification:

o12	**AI1** Input Filter Time	0.00 – 2.00	s	0.1	Y

o13	**AI2** Input Filter Time	0.00 – 2.00	s	0.1	Y
o14	**AI3** Input Filter Time	0.00 – 2.00	s	0.1	Y
Filter time constant of analog signal input, that is 0.00~2.00s. If time parameter is set too long, the changement of setting frequency will be stable, but responding speed will be slow. If time parameter is set too short, the changement of setting frequency will not be stable, but responding speed will be quick.					
o15 **o16**	**DA1** Analog Output **DA2** Analog Output	No reaction 0 Setting frequency 1 Actual frequency 2 Actual current 3 Output voltage 4 DC bus voltage 5 IGBT temperature 6 Output power 7 Output RPM 8 Actual value of torque 9	- -	- -	Y Y
o17	**DA1** Adjustment Of Lower Limit Output	0.0 – 100. 0	%	0.0	T
o18	**DA1** Adjustment Of Upper Limit Of Output	0.0 – 100.0	%	100.0	T
o19	**DA2** Adjustment Of Lower Limit Output	0.0 – 100.0	%	0.0	T
o20	**DA2** Adjustment Of Upper Limit Output	0.0 – 100.0	%	100.0	T

Output Content	**Setting Value**	**Giving Output Signal Range**
N Reaction	0	No output
Setting Frequency	1	0~Max frequency
Actual Frequency	2	0~Max frequency
Actual Current	3	0~200%, corresponding parameter: S03 percentage of output current
Output Voltage	4	0~200%, corresponding parameter: b02、b15 rate voltage of motor
DC Bus Voltage	5	0~1000VDC, DC voltage
IGBT Temperature	6	0~100.0℃
Output Power	7	0~200%
Output RPM	8	0~Max RPM
Actual Value Of Torque	9	0~200% torque



This parameter is used for setting upper/lower limitation of **DA1**/**DA2** output signal.
Such as:

If **DA1** output 1~5V voltage, setting parameter as: **o17**＝10.0%, **o18**＝50.0%

If **DA2** output 4~20mA current, setting parameter as: **o19**＝20.0%, **o20**＝100.0%

DA1, DA2 Skipping thread:

Caution: Every terminal has choice of voltage output and current output, the default setting is voltage output. When the voltage output is needed, please connect **JP1**/**JP2** and **DA1V**/**DA2V** (seeing the panel). When the current output is needed, please connect **JP1**/**JP2** and **DA1C**/**DA2C**.

o21 **o22** **o23** **o24**	O1 Output Signal O2 Output Signal O3 Output Signal O4 Output Signal	No function	0			
		Fault warning	1			
		Over current inspection	2			
		Over load inspection	3			
		Over voltage inspection	4			
		Less voltage inspection	5			
		Low load inspection	6			
		Over heat inspection	7			
		Running state with command	8			
		Abnormal PID feedback signal	9			
		Motor state of REW running	10			
		Arrival of setting the frequency	11	-	0	Y
		Arrival of Upper frequency	12	-	0	Y
		Arrival of Lower frequency	13	-	1	Y
		Arrival of FDT setting frequency 1	14	-	8	Y
		Arrival of FDT setting frequency 2	15			
		FDT frequency level inspection	16			
		Arrival of preset counter value	17			
		Arrival of upper limit counter	18			
		Program running one period completed	19			
		Speed tricking mode inspection	20			
		N command running state	21			
		REV running from inverter command	22			
		Deceleration running	23			
		Acceleration running	24			

		Arrival of high pressure	25			
		Arrival of low pressure	26			
		Arrival of inverter rate current	27			
		Arrival of motor rate current	28			
		Arrival of input frequency lower limitation	29			
		Arrival of current upper limitation	30			
		Arrival of current lower limitation	31			
		Time to reach limit time 1	32			
		Time to reach limit time 2	33			
		Inverter ready to run	34			

Value	Output Content	Specification Explanation
0	No function	Setting “0”, N output reaction, but inverter can be controlled by theoretical terminal.
1	Fault warning	Inverter at fault or after fault with unconfirmed status.
2	Over current inspection	Inverter met fault of over current
3	Over load inspection	Inverter met fault of over load of heat protection
4	Over voltage inspection	Inverter met fault of over voltage
5	Less voltage inspection	Inverter met fault of less voltage
6	Low load inspection	Inverter met fault of lower load
7	Over heat inspection	Inverter met fault of over heat.
8	Running state with command	Inverter is under running state of command
9	Abnormal PID feedback signal	PID feedback signal is abnormal
10	Motor state of REW running	Motor is reverse running
11	Arrival of setting the frequency	Arrive at set frequency
12	Arrival of Upper frequency	Arrive at upper frequency
13	Arrival of Lower frequency	Arrive at lower frequency
14	Arrival of FDT setting frequency 1	Arrive at frequency 1 FDT set
15	Arrival of FDT setting frequency 2	Arrive at frequency 2 FDT set
16	FDT frequency level inspection	FDT frequency levels to meet the inspection conditions,o29~ o31
17	Arrival of preset counter value	Present counting value arrives at preset counting value
18	Arrival of upper limit counter	Present counting value arrives at upper limitation of counting value.
19	Program running one period completed	Program runs one period to complete.
20	Speed tricking mode inspection	Inverter is under speed trick state, the valid time is A11

21	N command running state	Inverter is under N command running state
22	REV running from inverter command	Inverter is under reverse running command
23	Deceleration running	Inverter is under deceleration running
24	Acceleration running	Inverter is under acceleration running
25	Arrival of high pressure	Arrival at high pressure
26	Arrival of low pressure	Arrival at low pressure
27	Arrival of inverter rate current	Arrival at inverter rate current
28	Arrival of motor rate current	Arrival at motor rate current
29	Arrival of input frequency lower limitation	Present set frequency is less than frequency lower limitation
30	Arrival of current upper limitation	Arrive at current of upper limitation
31	Arrival of current lower limitation	Arrive at current of lower limitation
32	Time to reach limit time 1	Timing action mode refer to **o65** configuration
33	Time to reach limit time 2	Timing action mode refer to **o66** configuration
34	Inverter ready to run	The end of initialization when the drive is power on and running command is acceptable

o25	**O1** Output Signal Delay	0 – 32000	s	0	Y
o26	**O2** Output Signal Delay	0 – 32000	s	0	Y
o27	**O3** Output Signal Delay	0 – 32000	s	0	Y
o28	**O4** Output Signal Delay	0 – 32000	s	0	Y
o25~o28 defines **o21~o24** output signal reaction delay time, unit is s. Output signal cut off action without delay.					
o29	FDT Set Frequency 1	**o30** – Max frequency	Hz	0.00	Y
o30	FDT Set Frequency 2	Min frequency – **o29**	Hz	0.00	Y
o31	FDT	0.00 – 5.00	Hz	0.00	Y

When the choice of output signal (**o21~o24**) is set as 14, inverter output frequency arrives at or surpass **FDT set frequency 1**, the corresponding signal output terminal will react. When inverter output frequency is below of **FDT frequency set 1**, the corresponding signal output terminal will not react.

When the output signal options(**o21~o24**) is set as 15, inverter output frequency reaches or surpass **FDT set frequency 2**, the corresponding signal output terminal will react. When inverter output frequency is below of FDT frequency set 3, the corresponding signal output terminal will not react.

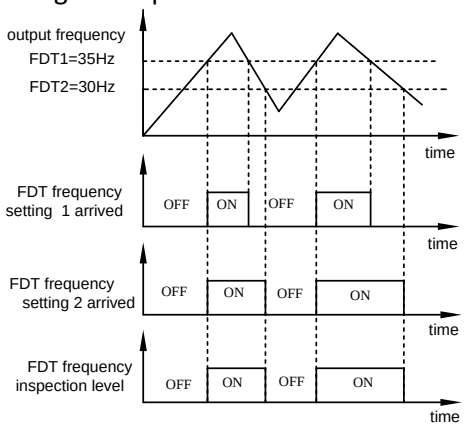
When the output signal options (**o21~o24**)is set as 16, inverter will firstly inspect **FDT set frequency 1**, then inverter output frequency arrives at or surpass **FDT set frequency 1**, the corresponding signal output terminal will react. After terminal reaction, inverter will inspect **FDT set frequency 2** -when inverter output frequency is below of FDT set frequency 2, the corresponding signal output terminal will not react.

o31 - Frequency inspection range

This parameter is used to define inspection range. When the difference of actual frequency and inspected frequency has surpassed inspection range, terminal will output react.

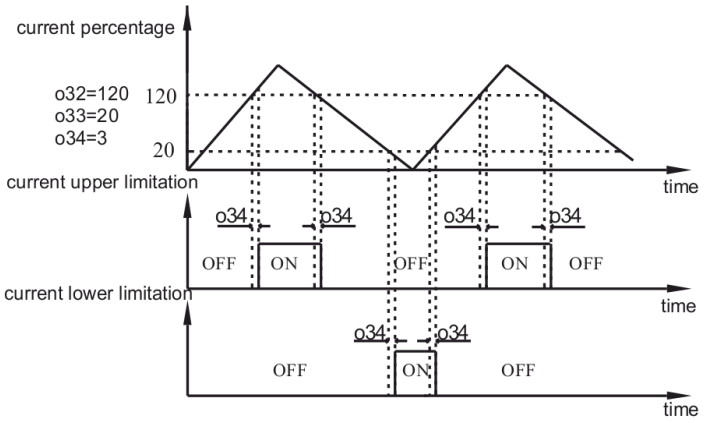
e.g.: FDT set frequency 1 as 35Hz, FDT set frequency 2 as 30Hz,

Frequency inspection range is 0, the signal output terminal will react as below:



ON means signal will react, OFF means signal will not react

o32	Arrival Of Current Upper Limitation	**o33** – 200%	%	120	Y
o33	Arrival Of Current Lower Limitation	0 – **o32**	%	20	Y
o34	Current Inspection Range	**o32** – **o33**	%	3	Y



ON means signal will react, OFF means signal will not react

When the output signal options (**o21~o24**) is set as 30, and inverter output current reach or surpass **o32**+**o34**, the corresponding output signal terminal will react. When the inverter output current is less than **o32**-**o34**, The corresponding output signal terminal will not react.

When the output signal options (**o21~o24**) is set as 31, and inverter output frequency reach or less than **o33**-**o34**, the corresponding output signal terminal will react. When the inverter output current is more than **o33**+**o34**, the corresponding output signal terminal will not react.

o34 is used to define current inspection range. When the difference of actual current and inspected current has surpassed inspection range, the output terminal will react.

o35	Terminal Control Mode	1 bit	Two-wire running control 1	0	-	0000	N
			Two-wire running control 2	1			
			Three-wire running control 1	2			
			Three-wire running control 2	3			

			One-shot operation control 1	4			
			One-shot operation control 2	5			
		10 bit	Terminal command is invalid after power on running	0			
			Terminal command is valid after power on running	1			

Setting terminal running mode by this parameter.

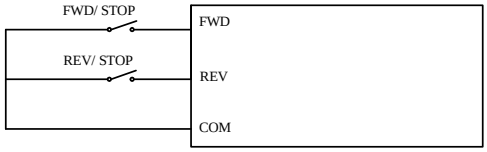
1 Bit - Set terminal running mode

The polarity of electrical level is o47 default setting polarity. Low electrical level or falling edge is valid, and the terminal is leakage-source driving mode.

X can be used to express high or low electrical level, rising or falling edge.

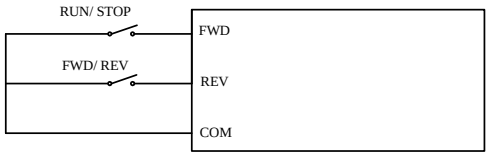
Running Control Mode	Keyboard Running Control	Prior Running	Prior Direction
Edge Trigger	Valid	Same	Same
E-level Trigger	Invalid	Prior running	Prior FWD

0) Two wire running control 1



F05=1 or F05=4		F05=3		Command
FWD	REV	FWD	REV	
Falling edge	X	Low E Level	X	FWD running
X	Falling edge	High E-level	Low E-level	REV running
Rising edge	Rising edge	High E-level	High E-level	STOP running
Rising edge	Rising edge	High E-level	High E-level	STOP running

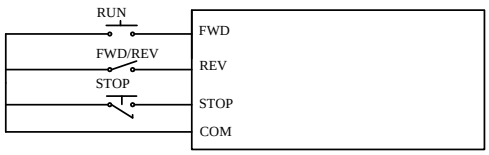
1) Two wire running control 2



F05=1 or F05=4		F05=3		Command
FWD	REV	FWD	REV	

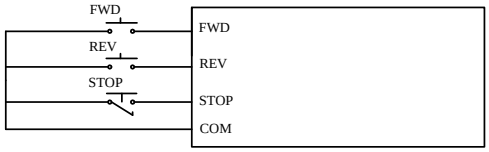
Falling edge	Falling edge	Low e-level	Low e-level	FWD running
Falling edge	Rising edge	Low e-level	High e-level	REV running
Rising edge	X	High e-level	X	STOP running

2) Three wire running control 1



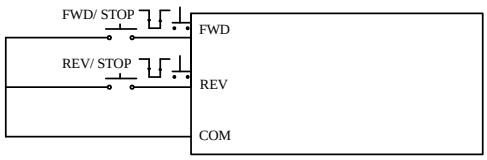
F05=1; F05=3; F05=4			**Command**
FWD	**REV**	**STOP**	
Falling edge	Low e-level	Low e-level	FWD running
Falling edge	High e-level	Low e-level	REV running
X	X	High e-level	STOP running

3) Three wire running control 2



F05=1; F05=3; F05=4			**Command**
FWD	**REV**	**STOP**	
Falling edge	X	Low e-level	FWD running
X	Falling edge	Low e-level	REV running
X	X	High e-level	STOP running

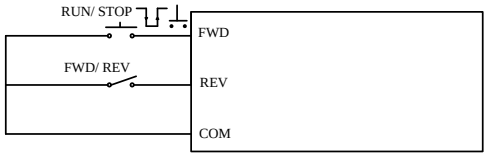
4) One-shot operation control 1



F05=1 ; F05=4 ; F05=3	**Command**	**Current state**

FWD	REV		
⊓⊔⊥	X	FWD running	STOP running
Keep	⊓⊔⊥	REV running	STOP running
⊓⊔⊥	X	STOP running	FWD running
Keep	⊓⊔⊥	REV running	FWD running
⊓⊔⊥	X	FWD running	REV running
Keep	⊓⊔⊥	STOP running	REV running

5) One-shot operation control 2



F05=1 ; F05=4 ; F05=3		Command	Current state
FWD	REV		
⊓⊔⊥	Low e-level	FWD running	STOP running
⊓⊔⊥	High e-level	REV running	STOP running
⊓⊔⊥	X	STOP running	FWD running
⊓⊔⊥	X	STOP running	REV running

10 bit - Set the terminal status when power on

0) Terminal run command invalid when Power on

Terminal run command invalid when Power on,. Only run 3s later after power on and set terminals invalid.

1) Terminal run command valid when Power on

Terminal status is effective when Power on, inverter will run immediately, in some cases such status will not be allowable.

o36	**DI1** Input Terminal Function Selection	No function	0	-	0	Y
o37		Forward running FWD	1	-	0	Y
o38		Reverse running REV	2	-	0	Y
o39	**DI2** Input Terminal Function Selection	3-line mode running STOP	3	-	0	Y
o40		Multi-segment command 1	4	-	0	Y
o41		Multi-segment command 2	5	-	0	Y
o42	**DI3** Input Terminal Function Selection	Multi-segment command 3	6	-	0	Y
o43		Multi-segment command	7	-	0	Y
o44		Multi-segment speed command 1	8	-	0	Y
o45	**DI4** Input Terminal Function Selection	Multi-segment speed command	9	-	0	Y
o46		Multi-segment speed command 3	10	-	0	Y

	DI5 Input Terminal Function Selection **DI6** Input Terminal Function Selection **DI7** Input Terminal Function Selection **DI8** Input Terminal Function Selection **AI1** Input Terminal Function Selection **AI2** Input Terminal Function Selection **AI3** Input Terminal Function Selection	Multi-segment digital voltage 1	11			
		Multi-segment digital voltage 2	12			
		Multi-segment digital voltage 3	13			
		The main set mode 1 of set frequency	14			
		The main set mode 2 of set frequency	15			
		The main set mode 3 of set frequency	16			
		The auxiliary setting mode 1 of frequency set	17			
		The auxiliary setting mode 2 of frequency set	18			
		The auxiliary setting mode 3 of frequency set	19			
		MSS time running 1	20			
		MSS time running 2	21			
		MSS time running 3	22			
		Operation control mode shift 1	23			
		Operation control mode shift 2	24			
		Operation control mode shift 3	25			
		Forward torque limit shift 1	26			
		Forward torque limit shift 2	27			
		Forward torque limit shift 3	28			
		Reverse torque limit shift 1	29			
		Reverse torque limit shift 2	30			
		Reverse torque limit shift 3	31			
		Torque speed shift	32			
		fault reset command	33			
		FWD JOG command	34			
		REV JOG command	35			
		JOG order (as F35setting)	36			
		Acceleration and deceleration prohibition command	37			
		Motor 1、2 shift	38			
		Free stop	39			
		Up command	40			
		Down command	41			
		Automation program running faction cancel	42			
		Automation program running stop	43			
		Program running start mode	44			
		Program running stop mode	45			
		Pulse counter clearance	46			
		Pulse counter input	47			
		Counter loading	48			
		Upper counter loading	49			
		External default signal input (level)	50			
		1pump soft-start	51			
		1 pump stop	52			
		2pump soft-start	53			
		2 pump stop	54			
		3pump soft-start	55			
		3 pump stop	56			
		4pump soft-start	57			
		4 pump stop	58			
		hand rotate command	59			

		Timing Water Supply change to zero	60			
		Extruder acceleration and deceleration direction	61			
		Extruder acceleration and deceleration allowable	62			
		Limit time 1 input	63			
		Limit time 2 input	64			
		Program switching to the next segment	65			
		UP/DN adjusted value reset	66			
		Keyboard potentiometer set value reset	67			
		External default signal input (edge)	68			

Setting Value	Output Detail	Specification Explanation
0	No- function	No function
1	Forward command FWD	Forward command FWD, Can be set to edge triggered or level-triggered
2	Reverse command REV	Reverse command REV, Can be set to edge triggered or level-triggered
3	Three line running STOP	o35 setting 3 line running, STOP function
4	Multi-speed command 1	Synthes is of16 multi-speed settings. See H parameter Group
5	Multi-speed command 2	
6	Multi-speed command 3	
7	Multi-speed command 4	
8	multi-acceleration command 1	Synthes is of 8 acceleration settings. See H parameter Group
9	multi-acceleration command 2	
10	multi-acceleration command 3	
11	multi-segment digital voltage 1	Synthes is of8digital voltage settings. See H parameter Group

	12	multi-segment digital voltage 2	
	13	multi-segment digital voltage 3	
	14	The main set mode 1 of set frequency	Synthesized frequency given to the way the main switch. See F parameter group
	15	The main set mode 2 of set frequency	
	16	The main set mode 3 of set frequency	
	17	The auxiliary setting mode 1 of frequency set 1	Synthesized frequency secondary to the way a given switch. See F parameter set
	18	The auxiliary setting mode 2 of frequency set	
	19	The auxiliary setting mode 3 of frequency set	
	20	MSS timing running 1	Synthes is of segment8 run time setting. See H parameter set.
	21	MSS timing running 2	
	22	MSS timing running 3	
	23	Operation control mode shift 1	Synthes is of operation mode switching. Read F05 parameter
	24	Operation control mode shift 2	
	25	Operation control mode shift 3	
	26	Forward torque limit shift 1	Synthes is of reverse torque limit switch. See C parameter set C15 Group
	27	Forward torque limit shift 2	
	28	Forward torque limit	

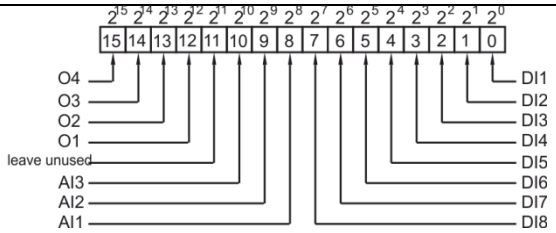
		shift 3	
	29	Reverse torque limit shift 1	Synthes is of reverse torque limit switch. See C parameter set C16 Group
	30	Reverse torque limit shift 2	
	31	Reverse torque limit shift 3	
	32	Torque speed shift	Vector control mode, speed control mode and torque control mode switching. Disconnected status: Speed Control Closed Status: torque control Detail C parameter set C18
	33	Fault reset command	Edge-triggered, the fault occurred on the current failure to confirm or not confirm
	34	FWD JOG command	JOG forward running command
	35	REV JOG command	JOG reverse running command
	36	JOG command(as F35 setting)	JOG running command, direction, set a direction in accordance with F35.
	37	Acceleration and deceleration forbid command	To maintain the current state to prohibit the acceleration and deceleration movements.
	38	Motor 1、2 shift	Motor 1、2 change Invalid status : Motor 1 Valid status : Motor 2
	39	Free stop	Free stop:After free stop, no start command, after 1s, allows running again
	40	Up command	Up order, detail A38~A42
	41	Down command	Down order, detail A38~A42
	42	Auto-run feature programs canceled	Cancel program running function
	43	Automatic procedures	program running pause

		to suspend operation	
	44	program running start mode	program running start mode
	45	program running stop mode	program running stop mode
	46	pulse count clearance	Edge-triggered, frequency inverter pulse counter o53Clearance
	47	pulse count input	Edge-triggered, set the pulse counter input terminal
	48	before count loading	Edge-triggered, pulse-load preset counter o53counts to o54
	49	upper count loading	Edge-triggered pulse counter counts o5 maximum load o53
	50	External default signal input (level)	External default signal input(level), level trigger , the system will alarm E_Set after valid
	51	1 pump soft-start	Electric level spring, control 1 pump soft-start or stop. Soft-start control must use 2 terminal controls, stop priority. Need to set E01 load model 9, E12 1pump is soft-start control pump.
	52	1 pump stop	
	53	2 pump soft-start	Electric level spring, control 2 pump soft-start or stop. Soft-start control must use 2 terminal controls, stop priority. Need to set E01 load model 9, E12 2pump is soft-start control pump.
	54	2 pump stop	
	55	3pump soft-start	Electric level spring, control 3 pump soft-start or stop. Soft-start control must use 2 terminal controls, stop priority. Need to set E01 load model 9, E12 3pump is soft-start control pump.
	56	3 pump stop	

57	4 pump start	Electric level spring, control 4 pump soft-start or stop. Soft-start control must use two terminal controls, stop has the priority. Need setting E01 load style 9, E12 4 pump is soft - start control pump.
58	4 pump stop	
59	Hand change order	electric level spring, automation multi-pump constant water changed
60	the period of time water supply change to zero	electric level spring the period of time water supply change to zero
61	Extruder acceleration and deceleration direction	DIx input terminal function selection, read o36-046
62	Extruder acceleration and deceleration allowable	DIx input terminal function selection, read o36-046.
63	Limit time 1 input	DIx input timing - limit time 1, refer to o65, o67.
64	Limit time 2 input	DIx input timing - limit time 2, refer to o66, o68
65	Program switching to the next segment	Program running controlled, single trigger switch to the next segment
66	UP/DN adjusted value reset	A40 UP/DN adjusted value reset, level trigger.
67	Keyboard potentiometer set value reset	A47keyboard potentiometer setting value reset level trigger.
68	External default signal input (edge)	External default signal input, edge trigger (falling edge),the system will alarm E-Set after valid

o47	Polarity of input and output terminals	0000 – F7FF	-	0000	Y

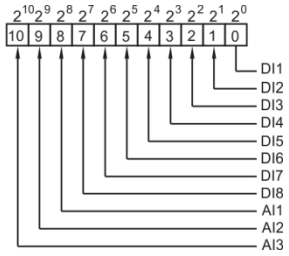
This parameter used to select every IO terminal is valid in which polarity and terminal running command is valid or not when power on.



0 – 10 bit	Input Terminal Polarity	12 – 15 bit	Output Terminal Polarity
0	Low level valid(closed)	0	Low level valid(closed)
1	Falling edge valid, rising edge invalid	1	High level valid(cut off)

o48	Input Terminal Reponse **Time 0**	0.001 – 30.000	s	0.005	Y
o49	Input Terminal Reponse **Time 1**	0.001 – 30.000	s	0.005	Y
o50	Input Terminal Reponse Time Selection	0000 – 07FF	-	0	Y

o48 - **o49** define Input terminal reponse time, through o50 select the reponse time according the terminal.
The delay time of the input terminal is valid to the close and cut off action!
Set the parameter choose Input terminal response time according every terminal.



o50 0 – 10 bit	The polarity of input terminal
0	o48 input terminal response time 0
1	o49 input terminal response time 1

o51	Counter Collocation	1 bit	Circle counter operating	0	-	0	Y
			Single cycle counter running	1			
		10 bit	Arrive at upper counter value and reload	0			
			Arrive at upper counter value and clear savings	1			
		100 bit	Power on to reload	0			
			power on to clear savings	1			
			power on to keep previous count status	2			
		1000 bit	Count period	0			
			Output signal valid time 20ms	1			

			Output signal valid time 100ms	2			
			Output signal valid time 500ms	3			

1 bit - Control count mode

0) Circulate count, Arrive at upper counter value, output the arrival pulse(output terminal setting)

1) Single circulates count, after arrive at upper counter value, output the arrival pulse, and stop running.

10 bit - Operating after circulate mode reach upper limit count

0) Reload

1) Clear up

100 bit - Define the status of the counter after power on

0) Reload after power on

1) Clear up after power on

2) Keep the status of the previous count

1000 bit - Define o21~o24 is set to reach the preset count or counts to reach the maximum output signal delay time

0) Count period, when reach this digital, keep this status valid, direct the change of the count.

1) The valid time of the output signal10ms, when reach this count, fixed keep the output status valid 10ms.

2) The valid time of the output signal 100ms, when reach this count, fixed keep the output status valid 100ms.

3) The valid time of the output signal 500ms, when reach this count, fixed keep the output status valid 500ms.

o52	Maximum Pulse Input Frequency	0.1 – 50.0	kHz	20.0	Y

This parameter defines the most pulse input frequency of analog setting frequency.
Input high signal frequency, only through multi-function input terminal **DI8** as the pulse input terminal.
Input pulse setting frequency according the the most input upper limit.
Input pulse setting frequency, most input pulse frequency **o52** according the most output frequency **F12**.
Pulse input frequency f_pulse corresponding setting frequency f_set formula: f_set＝f_pulse/o52*F12.
Pulse input analog setting, input most pulse frequency **o52** according 100.0%.
Pulse input frequency f_pulse corresponding analog p_set formula: p_set＝f_pulse/**o52***100.0%.

o53	Current Counter Status	0 – 9999	-	0	Y
o54	Preset Counter Setting	0 – **o55**	-	0	Y
o55	Upper Limit Counter Setting	**o54** – 9999	-	9999	Y

When the pulse signal of the input terminal satisfies with the preset condition, Yi terminal output the corresponding indication.

1) Selection of Input terminal DiX（X=1~8）

Input terminal is set to “pulse count input”, and set o54, o55.

Input terminal is set to “pulse counter clear”, after terminal works, counter is cleared.

Input terminal is set to “upload of pulse count value”, after terminal works, counter uploads preset count value.

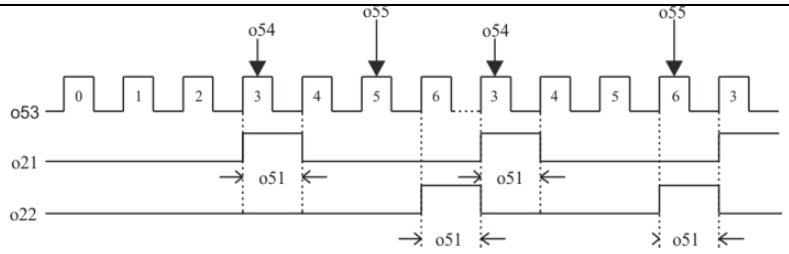
Input terminal is set to „upload of upper count value”, after terminal works, counter uploads the upper count value.

2) Selection of Output Terminal o21~o24

o21set the arrival of preset count, the effective time of output signal after reaching up count value is set by o51.

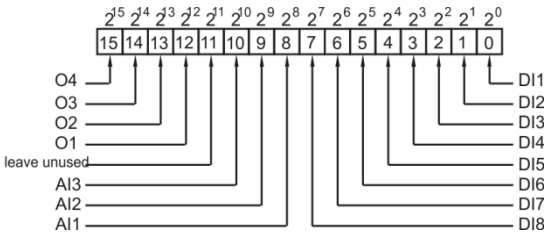
o22 set the arrival of up count value, the effective time of output signal after arriving at the upper count value is set by o51.

Frequency range of counting pulse signal: 0~100Hz.



o56	Virtual Terminal Effective Selection	0000 – F7FF	-	0000	Y

Another parameter O56 bits allow attach virtual input terminals corresponding to the actual input inverter.



Setting	Virtual terminal valid choose
0	Actual input terminal valid
1	Virtual input terminal valid

o57	DI1~DI4 Terminal Status	0000 – 1111	-	-	Y
o58	DI5~DI8 Terminal Status	0000 – 1111	-	-	Y
o59	AI1~AI3 Terminal Status	000 – 111	-	-	Y
o60	O1~O4 Terminal Status	0000 – 1111	-	-	Y

Make the actual terminal can only be effective check terminal state.
Make the Virtual terminal can only be effective through register check terminal state.

o61	PL1 Pulse Output	No action	0	-	0	Y
		Set frequency	1			
		Actual frequency	2			
		Actual current	3			
		Output voltage	4			
o62	PL2 Pulse Output	DC bus voltage	5	-	0	Y
		IGBT temperature	6			
		Output power	7			
		Output rpm	8			
		Actual torque	9			
o63	SPA pulse output ratio	1 – 1000		-	1	Y
o64	SPB pulse output ratio	1 – 1000		-	1	Y

SPA, SPB provide two isolated pulse output signal can be analogical multiple analog output signals.

SPA, SPB provide high speed pulse output function. Set by o61~o64 and set functions valid when inverter power on again.

SPA corresponding output signal 1, this function selected, o21 DO1 output action is invalid.

SPB corresponding output signal 2, this function selected, o22 DO2 output action is invalid.

Pulse output ratio = 1, output signal range 0 ~ 50hz.

Maximum pulse output frequency 50 KHz, minimum frequency 1hz.

for example

SPA pulse output options = 2 Actual frequency ;

SPA pulse output options = 10
The actual output pulse frequency = actual frequency / maximum frequency * 50hzx10.
SPA pulse output options =3 Actual current
SPB pulse output ratio=20
The actual output pulse frequency = actual current percentage 200*50hz*20

Value	Output	Output Signal Range Definition
0	No action	No output
1	Set frequency	0~Max frequency
2	Actual frequency	0~Max frequency
3	Actual current	0~200%, corresponding parameter: S03 output current percentage
4	Output voltage	0~200%, correlation parameter: b02、b15 motor rated voltage
5	Bus voltage	0~1000V DC voltage
6	IGBT temperature	0~100.0℃
7	Output power	0~200%
8	Output torque	0~Max torque
9	Actual torque value	0~200% torque

o65 **o66**	Limit time 1 configuration Limit time 2 configuration	1 Bit	Boot time	0	- -	0000 0000	Y Y
			Running timing	1			
		10 Bit	Reserved	-			
		100 Bit	Reserved	-			
		1000 Bit	Reserved	-			

1 Bit - Timing mode
0) Boot time - timing of running and breaking
1) Running timing - only timing of running
10 Bit - Reserved
100 Bit - Reserved
1000 Bit - Reserved

o67	Limit Time 1	0.0 – 3200.0	s	2.0	Y
o68	Limit Time 2	0.0 – 3200.0	s	2.0	Y

Set timing of Limit Time 1 and Limit Time 2
Actual limit time on the basis of the set time multiplied by a run time multiple, such time multiple set by the ten bit of **F49**, refer to **F49** instructions.

Multi-speed PLC Group: H00-H55

Code	Description / LCD	Setting Range			Unit	Factory Setting	Change Limited
H00	Multi-speed Collocation	1 bit	Program running function cancel	0	-	0000	Y
			Program running function	1			
		10 bit	Direction decided by H40~H46	0			
			Direction decides by Terminal and keyboard	1			
		100 bit	Deceleration and acceleration time decides by H26~H39	0			

			Time of acceleration and deceleration is decided by terminal	1			
		1000 bit	Running time decides by H18~H25	0			
			Running time decides by terminal	1			

1 bit - Program running functions intelligent

To use the program to run PLC functionality requires setting the bit to 1.

Multi-segment speed run only need to set the corresponding multi-stage **o36** ~ **o46** speed switching can be used without the need to set this parameter.

0) Program running functions cancel

1) Program running function intelligent

10 bit - Define program runs or direction settings of multi-segment speed running

0) the direction decided by the **H40** ~ **H46**

1) The direction decided by the keyboard or terminal

100 bit - Define program runs or acceleration and deceleration time settings of multi-segment speed running

0) deceleration time decided by the **H26** ~ **H39**

1) The acceleration and deceleration time determined by terminal

1000 bit - Set running time of defined program running

0) running-time decided by the **H18** ~ **H25**

1) Running time decided by terminal

H01	Program Running Configuration	1 bit	sequence control	0	-	0710	Y
			terminal control	1			
		10 bit	Program running start segment	0 - 15			
		100 bit	Program running end segment	0 - 15			
		1000 bit	Output signal valid time 8ms	0			
			Output signal valid time 20ms	1			
			Output signal valid time 100ms	2			
			Output signal valid time 500ms	3			

1 bit - Program run control mode

0) sequential control - run automatically according to the start segment, end segment and program running time of program running. You can use **o36** ~ **o46** switchover next function, switchover to the next program running.

1) Terminal control - use multi segment control terminal **o36** ~ **o46** multi segment instruction 1, 2, 3, 4, Control program segment, running time arrives. Running based on the 0 paragraph speed. After Multi - Stage speed control terminal switchover, reevaluate running time. Do not use of multi - stage speed control terminal **o36** ~ **o46** multi - speed instruction. You can use **o36** ~ **o46** switchover next function. The terminal control for single trigger, triggered once, program running to next paragraph, running time recalculated. Running time of arrival, running based on the 0 paragraph speed.

10 bit - Defining the start running of the Program

100 bit - Defines the end of the program period

1000 bit - Define effective time of the program output signal

H02	Program Running Mode	1 bit	Single-cycle	0	-	0000	Y
			Continuous Cycle	1			
			One-cycle command running	2			
		10 bit	The zero speed running when pause	0			

			Fixed-speed running when the suspension	1			
		100 bit	Stop with the parameters set when stop	0			
			Stop with the settings of start up	1			
		1000 bit	Running at the speed when start up segment	0			
			Running at the speed before the machine stopped	1			

1 bit - Running cycle

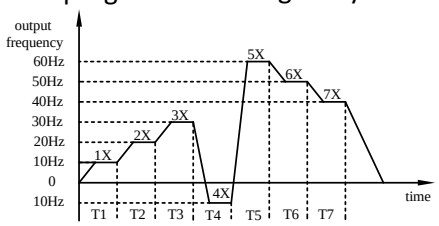
0) Single cycle

1) Continuous cycle

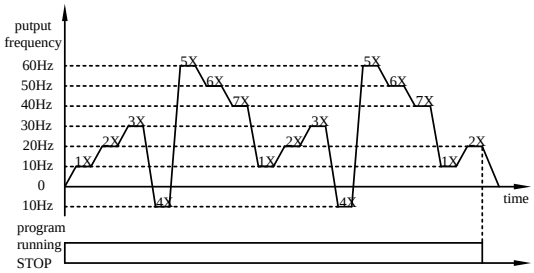
2: Single cycle, running according to H01 speed of the end, stop after accepted the stopped orders.

The program runs three styles as following:

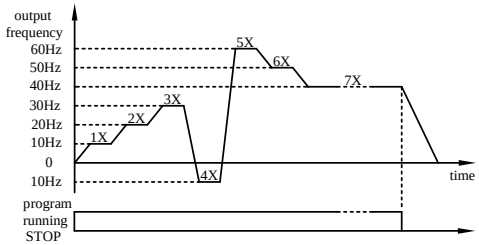
Eg1:The program is run single - cycle modes



Eg2:program run Continuous cycle modes



Eg3:Program is running in single cycle, According to Paragraph seventh of Speed mode



10 bit - Running condition when pause

0) Speed run when pause

1) Fixed Segment Speed operation when pause

100 bit - Running Segment when stop

0) Set stopping according to the parameters of stop segment.

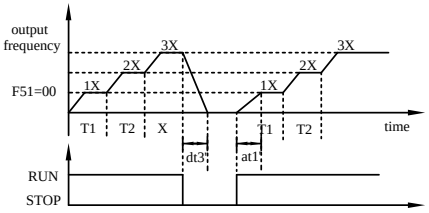
1) Set down to the initial segment

1000 bit - Start Running Segment

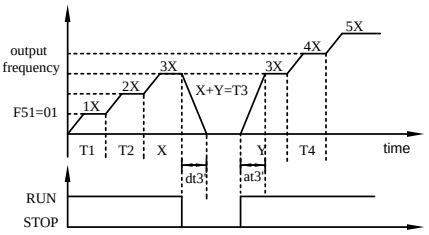
0) Set down to the speed running

1) Running at the speed before the machine stopped

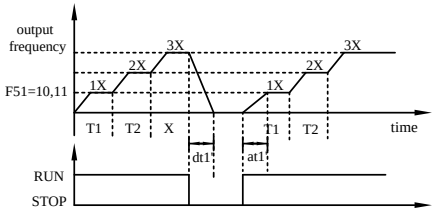
Eg: 100 bit = 0 Set stopping according to the parameters of stop segment, 1000 bit=0 running at Start Segment



Eg:100 bit==0 Set stopping according to the parameters of stop segment, 1000 bit==1 Running at the speed before the machine stopped.



Eg:100 bit=1 Set down to the initial segment, 1000 bit=1 Running at the speed before the machine stopped.



Note:

at1 - at the time of segment 1 acceleration time;
dt1 - at the time of segment 1 deceleration time;
at3 - at the time of segment 3 acceleration time;
dt3 - at the time of segment 3 deceleration time.

H03	Speed – Step 1x	Lower frequency ~ upper frequency	Hz	3.00	Y
H04	Speed – Step 2x		Hz	6.00	Y
H05	Speed – Step 3x		Hz	9.00	Y
H06	Speed – Step 4x		Hz	12.00	Y
H07	Speed – Step 5x		Hz	15.00	Y
H08	Speed – Step 6x		Hz	18.00	Y
H09	Speed – Step 7x		Hz	21.00	Y
H10	Speed – Step 8x		Hz	24.00	Y
H11	Speed – Step 9x		Hz	27.00	Y
H12	Speed – Step 10x		Hz	30.00	Y
H13	Speed – Step 11x		Hz	33.00	Y
H14	Speed – Step 12x		Hz	36.00	Y
H15	Speed – Step 13x		Hz	39.00	Y
H16	Speed – Step 14x		Hz	42.00	Y
H17	Speed – Step 15x		Hz	45.00	Y

Set the frequency of program running and the running frequency of 7-segment speed respectively. Short-circuit the multi-terminal command 1, 2, 3, 4 with COM combinatorial to realize the 16-segment speed/acceleration speed.

0x speed is the regular running mode, setting source can be adjusted by **F02**, **F03** and other parameters, running time is controlled by the **H18**.

Terminal multi-segment speed is defined as follows(shorted with COM it is ON, disconnected then it is OFF):

Speed / Terminal	0x	1x	2x	3x	4x	5x	6x	7x
Bit 1	OFF	**ON**	OFF	**ON**	OFF	**ON**	OFF	**ON**
Bit 2	OFF	OFF	**ON**	**ON**	OFF	OFF	**ON**	**ON**
Bit 3	OFF	OFF	OFF	OFF	**ON**	**ON**	**ON**	**ON**
Bit 4	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

Speed / Terminal	8x	9x	10x	11x	12x	13x	14x	15x
Bit 1	OFF	**ON**	OFF	**ON**	OFF	ON	OFF	**ON**
Bit 2	OFF	OFF	**ON**	**ON**	OFF	OFF	**ON**	**ON**
Bit 3	OFF	OFF	OFF	OFF	**ON**	**ON**	**ON**	**ON**
Bit 4	**ON**	**ON**	**ON**	**ON**	**ON**	**ON**	**ON**	**ON**

Acceleration and deceleration time and the direction of running

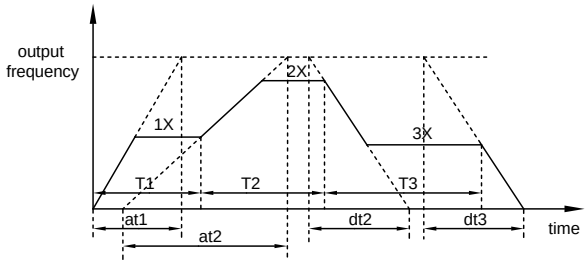
H00		**0x – 7x**	**8x – 15x**
10 bit	0	0x -7x Direction controlled by parameter	8x-15x Direction controlled by keyboard and terminal
	1	0x -7x Direction controlled by keyboard and terminal	
100 bit	0	0x -7x Deceleration and acceleration time controlled by parameter	8x-15x Deceleration and acceleration time controlled by keyboard and terminal
	1	0x -7x Deceleration and acceleration time controlled by terminal	
1000 bit	0	0x -7x Running time controlled by parameter	8x-15x Running time controlled by terminal
	1	0x -7x Running time controlled by terminal	

H18	0 Step Running Time T0	0.0 – 3200.0	s	2.0	Y
H19	1 Step Running Time T1	0.0 – 3200.0	s	2.0	Y
H20	2 Step Running Time T2	0.0 – 3200.0	s	2.0	Y
H21	3 Step Running Time T3	0.0 – 3200.0	s	2.0	Y
H22	4 Step Running Time T4	0.0 – 3200.0	s	2.0	Y
H23	5 Step Running Time T5	0.0 – 3200.0	s	2.0	Y
H24	6 Step Running Time T6	0.0 – 3200.0	s	2.0	Y

H25	7 Step Running Time T7	0.0 – 3200.0	s	2.0	Y
Actual running time equals to the set multi-segment running time multiples a time which is times of speed running time, and such actual running time decided by the tens digit of **H40~H46**. Please refer to **H40~H46**.					
H26	1 Step Acceleration Time at_1	0.0 – 3200.0	s	10.0	Y
H27	1 Step Deceleration Time dt_1	0.0 – 3200.0	s	10.0	Y
H28	2 Step Acceleration Time at_2	0.0 – 3200.0	s	10.0	Y
H29	2 Step Deceleration Time dt_2	0.0 – 3200.0	s	10.0	Y
H30	3 Step Acceleration Time at_3	0.0 – 3200.0	s	10.0	Y
H31	3 Step Deceleration Time dt_3	0.0 – 3200.0	s	10.0	Y
H32	4 Step Acceleration Time at_4	0.0 – 3200.0	s	10.0	Y
H33	4 Step Deceleration Time dt_4	0.0 – 3200.0	s	10.0	Y
H34	5 Step Acceleration Time at_5	0.0 – 3200.0	s	10.0	Y
H35	5 Step Deceleration Time dt_5	0.0 – 3200.0	s	10.0	Y
H36	6 Step Acceleration Time at_6	0.0 – 3200.0	s	10.0	Y
H37	6 Step Deceleration Time dt_6	0.0 – 3200.0	s	10.0	Y
H38	7 Step Acceleration Time at_7	0.0 – 3200.0	s	10.0	Y
H39	7 Step Deceleration Time dt_7	0.0 – 3200.0	s	10.0	T

Set the Acc/Dec time of 7 steps respectively. They determine the time needed to reach the speed, respectively depending on the acceleration time for acceleration or on the deceleration time for deceleration, but the time is not the actual time needed. Actual acc/dec time equals to the set acc/dec time multiples a time multiple which is decided by the hundreds and thousands digit of **H40~H46**. Please refer to **H40~H46**.

Definite acceleration and deceleration time for multi-step speed:



Definition of multi-step speed acceleration/deceleration time

Remark:

at1 - 1 Step acceleration time;

at2 - 2 Step acceleration time;

dt2 - 2 Step deceleration time;
dt3 - 3 Step deceleration time.

H40 **H41** **H42** **H43** **H44** **H45** **H46**	1 Step Speed Configuration Word 2 Step Speed Configuration Word 3 Step Speed Configuration Word 4 Step Speed Configuration Word 5 Step Speed Configuration Word 6 Step Speed Configuration Word 7 Step Speed Configuration Word	1 bit	Running direction: forward	0	-	0000	Y
			Running direction: reverse	1	-	0000	Y
		10 bit	Running time: *seconds	0	-	0000	Y
			Running time: *minutes	1	-	0000	Y
			Running time: *hours	2	-	0000	Y
			Running time: *days	3	-	0000	Y
		100 bit	Acceleration time: *seconds	0	-	0000	Y
			Acceleration time: *minutes	1	-	0000	Y
			Acceleration time: *hours	2	-	0000	Y
			Acceleration time: *days	3	-	0000	Y
		1000 bit	Deceleration time: *seconds	0	-	0000	Y
			Deceleration time: *minutes	1			
			Deceleration time: *hours	2			
			Deceleration time: *days				

H47	Digital reference level – Step 0	-100.0 – 100.0	%	0.0	T
H48	Digital reference level – Step 1	-100.0 – 100.0	%	10.0	T
H49	Digital reference level – Step 2	-100.0 – 100.0	%	20.0	T
H50	Digital reference level – Step 3	-100.0 – 100.0	%	30.0	T
H51	Digital reference level – Step 4	-100.0 – 100.0	%	40.0	T
H52	Digital reference level – Step 5	-100.0 – 100.0	%	50.0	T
H53	Digital reference level – Step 6	-100.0 – 100.0	%	60.0	T
H54	Digital reference level – Step 7	-100.0 – 100.0	%	70.0	T

Digital reference may serve a similar level as any analog source, which can be used as primary and secondary frequency source, the source of the PID feedback signal, etc.
Digital reference level is realized by configuring the number of digital inputs (parameters O36 - o46) for the operations of digital reference level (function code 11-13) and triggering the inputs

Step	0	1	2	3	4	5	6	7
Digital reference level	(**H47**)	(**H48**)	(**H49**)	(**H50**)	(**H51**)	(**H52**)	(**H53**)	(**H54**)
Bit 1	OFF	**ON**	OFF	**ON**	OFF	**ON**	OFF	**ON**
Bit 2	OFF	OFF	**ON**	**ON**	OFF	OFF	**ON**	**ON**
Bit 3	OFF	OFF	OFF	OFF	**ON**	**ON**	**ON**	**ON**

1 bit - Under multi-segment program running.
The“1 bit „parameter decides the direction of each segment speed.

Running Direction	**Setting**
forward	0
reverse	1

When running control mode **F05**＝0/1/2, these parameters decide the direction of each segment speed. When running control mode **F05**＝3, the setting value and terminal FWD/REV decide the direction of each segment speed together. FWD is prior.

FWD=1 Running direction	**REW =1 Running direction**	**Setting Value**
forward	reverse	0
reverse	forward	1

10 bit - Unit of multi-segment speed program running time.

Running Time	**10 bit**	**Range(e.g.H18~H25=3200.0)**
*seconds	0	3200.0 seconds
*minutes	1	3200.0 minutes
*hours	2	3200.0 hours
*days	3	3200.0 days

100 bit, 1000 bit - Unit of acc/deceleration time of multi-segment speed program running

Acceleration Deceleration	**1000 bit, 100 bit**	**Range(e.g.H26~H39=3200.0)**
*seconds	0	3200.0 seconds
*minutes	1	3200.0 minutes
*hours	2	3200.0 hours
*days	3	3200.0 days

H55	Multi-speed Status	1 bit	Current speed step	0 – 0xF	-	-	N
		10 bit	Current acceleration segment	0 – 0x7			
		100 bit	Current running time segment	0 – 0x7			
		1000 bit	Current digit voltage segment	0 – 0x7			

1 bit - Current speed segment

0~16 segment, In hex, can be shifted t by o36~o46

10 bit - Current acceleration segment

0~7 segment, in hex, can be shifted by o36~o46

100 bit - Current running time segment

0~7 segment, in hex, can be shifted by o36~o46, valid when program running

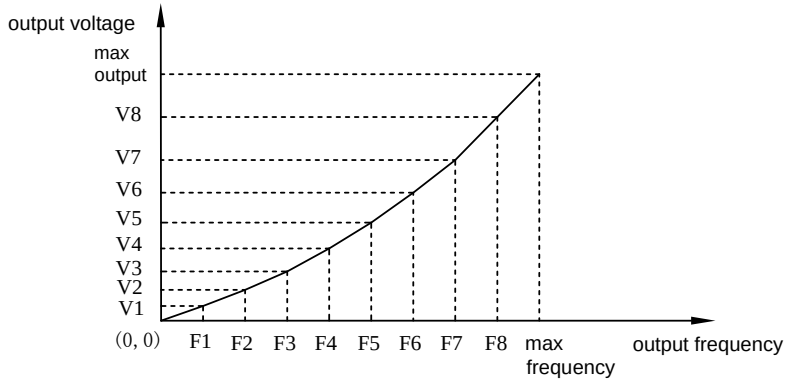
1000 bit - Current digital voltage segment

0~7 segment, in hex, can by shifted by terminal o36~o46

V/F Curve Group:U00-U15

Code	Description / LCD	Setting Range	Unit	Factory Setting	Change Limited
U00	V/F – Frequency F1	0.00 – **U02**	Hz	5.00	N
U01	U/F – Voltage V1	0.00 – **U03**	%	10	N

User-defined the first frequency value of V / F curve, corresponding to V1.



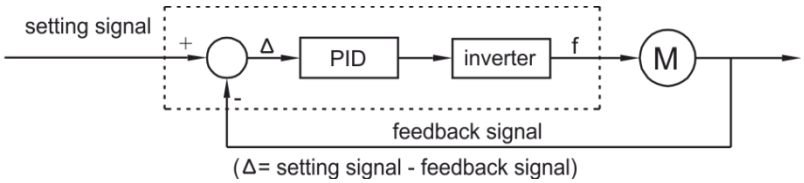
U02	V/F – Frequency F2	**U00** – **U04**	Hz	10	N
U03	U/F – Voltage V2	**U01** – **U05**	%	20	N
U04	V/F – Frequency F3	**U02** – **U06**	Hz	15	N
U05	U/F – Voltage V3	**U03** – **U07**	%	30	N
U06	V/F – Frequency F4	**U04** – **U08**	Hz	20	N
U07	U/F – Voltage V4	**U05** – **U09**	%	40	N
U08	V/F – Frequency F5	**U06** – **U10**	Hz	25	N
U09	U/F – Voltage V5	**U07** – **U11**	%	50	N
U10	V/F – Frequency F6	**U08** – **U12**	Hz	30	N
U11	U/F – Voltage V6	**U09** – **U13**	%	60	N
U12	V/F – Frequency F7	**U10** – **U14**	Hz	35	N
U13	U/F – Voltage V7	**U11** – **U15**	%	70	N
U14	V/F – Frequency F8	**U12** – Max Frequency	Hz	40	N
U15	U/F – Voltage V8	**U15** – 100	%	80	N

PID parameter: P00-P12

Code	Description / LCD	Setting Range			Unit	Factory Setting	Change Limited
P00	PID Configuration	1 bit	Unidirectional regulation	0	-	0000	N
			Bidirectional regulation	1			
		10 bit	Negative effect	0			
			Positive effect	1			

		100 bit	PID fault, N action	0			
			Warning & Continuous running	1			
			Warning & Decelerating stop	2			
			Warning & Free stop	3			
		1000 bit	-	-			
			-	-			

When the inverter receives running command, it can control output frequency automatically in the PID regulation mode after comparing the setting signal and feedback signal from terminal.
The process is explained as following:

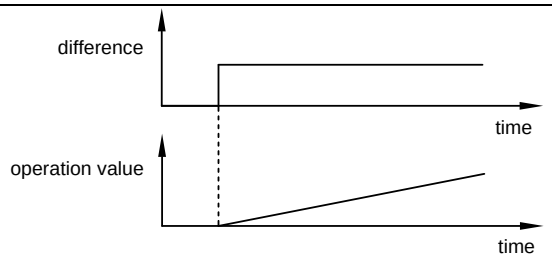


0) Negative action, when Δ＞0 is positive, frequency rises and when Δ＜0 is negative, frequency falls.
1) Positive action, when Δ＞0 is positive, frequency falls and when Δ＜0 is negative, frequency rises.

PID abnormity treatment:
1) Warning & Continuous running - continue running g after abnormity feedback signal.
2) Warning & Decelerating stop - decelerate and stop after abnormity feedback signal.
3) Warning & Free stop - free stop after abnormity feedback signal

P01	PID Output Limit	0 – 100		%	100	Y
P02	Feedback Signal Selection	Set frequency by keyboard or RS485	0	-	1	Y
		AI1 external analogy giving	1			
		AI2 external analogy giving	2			
		AI3 external analogy giving	3			
		Keyboard potentiometer giving	4			
		multi-step digital voltage giving	5			
		Digital pulse set	6			
P03	Setting Signal Selection	Set frequency by keyboard or RS485	0	-	2	Y
		AI1 external analogy giving	1			
		AI2 external analogy giving	2			
		AI3 external analogy giving	3			
		Keyboard potentiometer giving	4			
		Multi-step digital voltage giving	5			
		Digital pulse set	6			
P04	Keyboard Set Signal	0 – 100		%	50	Y
When **P03** is 0, the setting pressure set by the keyboard. 0.0~100.0% is 0 to the maximum pressure respectively.						
P05	PID integral time	0.002 – 10.000		s	0.250	Y

The PID integral time determines the integral regulation speed, the regulation acts on the difference between PID feedback and setting value by PID regulator.
When the difference between PID feedback and setting value is 100%, integral regulator PID regulator output= (**P01*F12*12.5**%) Hz (single direction PID regulation, ignores proportion and differential effect).
If the value is great, the control is stable but response is slow. If the value is little, the system response is rapid but perhaps surge occurs.

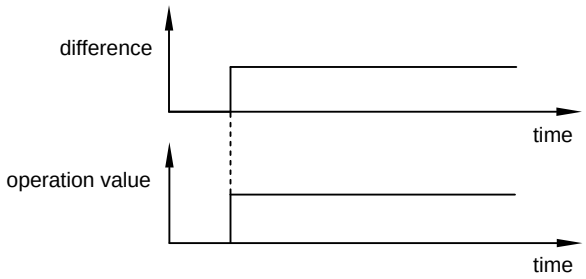


P06	PID Differential Time	0.000 – 10.000	s	0.000	Y

The parameter determines the regulation intensity, the regulation acts on the change ratio of the difference between PID feedback and setting value by PID regulator.
When the change ratio of the difference between PID feedback and setting value is 100% in the differential time, PID regulator regulates output to (**P01*****F12***12.5%) Hz (single direction PID regulation, ignores proportion and integral effect).
If the value is great, the greater the intensity is, the system surge is to occur more easily.

P07	PID Proportion Gain	0.0 – 1000.0	%	100.0	Y

The PID Proportion Gain defines regulation intensity of PID regulator, the larger the P is, the more the intensity is.
When proportion gain is 100%, and the difference between PID feedback and getting value is 100%, PID regulator's output is (P01*F12*12.5%) Hz (single direction PID regulation, ignores differential and integral effect).
Proportion gain is the parameter decides PID regulator's response extent.
If the gain is great, the response is rapid, but if too great, the surge will occur. If the gain is little, the response will lag.



P08	PID Sampling Period	0.002 – 10.000	s	0.010	Y

Set Sampling period of feedback signal.
When set this parameter small, the system response speed to the giving and feedback deviation is slow, but control is stable.
When set this parameter low, the system response speed to the giving and feedback deviation is slow, but easy to cause vibration.

P09	Deviation Limit	0.0 – 20.0	%	5.0	Y

Deviation limit effects system control accuracy and stability.
When the deviation of feedback signal and giving signal <deviation limit, PID N regulation, keep output stable.
When the deviation of feedback signal and giving signal >deviation limit, PID regulates according to deviation, update output

P10	PID Fault Detect Time	0.0 – 3200.0	s	0.0	N
P11	PID Fault Detected Value	0.0 – 100.0	%	10.0	N

Set **P10** to 0. 0 for N fault inspection.
When PID feedback signal <**P11** set PID fault inspection value, last **P10** set time, regard it as PID regulation fault.

P12	PID Display Range	0.00 – 100.00	-	1.00	Y

A09 PID set value＝PID set value(%)***P12**
A10 PID feedback value＝PID feedback value(%)***P12**

If PID feedback 10V corresponding 4.0 MPa pressure, if need **A09**, **A10** to display actual value, only need to set **P12** = 0.04.

Speed-loop parameter: C00-C31

Code	Description / LCD	Setting Range	Unit	Factory Setting	Change Limited
C00	Filter Time Of Speed-loop	2 – 200	s	10	Y
It defines the filter time of the speed-loop. The range is 0.01~100s.If the value is too great, the control is stable but response is slow; if the value is too little, the system response is rapid but perhaps is unstable. So it is necessary to consider the stability and the response speed at the same time when setting the value.					
C01	Speed-loop Low Speed Ti	0.01 – 100.00	s	0.25	Y
It defines the integral time of the speed-loop low speed. The range is 0.01~100.00s. If the integral time is too great, response is slow and the control of external disturbing signal become bad; if the time is too little, response is rapid, but perhaps brings the surge.					
C02	Speed-loop Low Speed Td	0.000 – 1.000	s	0.000	Y
It defines the differential time of the speed-loop low speed segment and the range is 0.000~1.000s. If the time is great enough, the surge which is caused by P action when difference occurring can attenuate quickly. But too great, the surge will happen contrary. When the time is little, the attenuation function is little too.					
C03	Speed-loop Low Speed P	0 – 150	%	100	Y
It defines the proportion gain of speed loop low speed segment. And the range is 0~1000%.If the gain is great, the response is rapid, but too great, surge perhaps occurs; if the gain is too little, response is slower.					
C04	Speed-loop Low Speed Shift Frequency	0.0 – **C08**	Hz	7.00	Y
It defines low-speed loop switching frequency, the parameter and switching frequency at high-speed optimize Speed-loop PID parameter.					
C05	Speed Loop High Speed Ti	0.01 – 100.00	s	0.5	Y
It defines integration time of High-speed section of the speed loop. Range is 0.01~100.00s. Integration time too large and unresponsive, external interference control variation becomes weak. Integration time is small the reaction speed, oscillation occurs when it is too small.					
C06	Speed Loop High Speed Td	0.000 – 1.000	s	0.000	Y
It defines the differential time of the speed-loop high speed segment and the range is 0.000~1.000s. If the time is great enough, the surge which is caused by P action when difference occurring can attenuate quickly. But too great, the surge will happen contrary. When the time is little, the attenuation function is little too.					
C07	Speed Loop High Speed P	0 – 150	%	75	Y
It defines the proportion gain of speed loop high-speed section, range from 0~1000%. Gain is large, response speed, but too large gain will occur vibration; if the gain is small, the reaction lags.					
C08	Speed Loop And High-speed Switching Frequency	C04 – Max frequency	Hz	30.00	Y
It defines Integral time of speed loop high speed , the parameter and switching frequency at low - speed optimize the speed-loop PID parameter					
C09	Low-speed Slip Gain	0 – 200	%	100	Y

Low-speed segment slip compensation gain						
C10	Low Speed Slip Switching Frequency	0 – C12		Hz	5.00	Y
Low speed segment slip compensation switching frequency						
C11	High Speed Slip Gain	0 – 200		%	100	Y
High speed segment slip compensation gain						
C12	High Speed Slip Switching Frequency	C10 – Max frequency		Hz	30.00	Y
High speed segment slip compensation switching frequency						
C13	Upper Froward Torque	0.0 – 300.0		%	250.0	Y
The parameter is a ratio, setting value is 100%. Responding to motor rated output torque. Set forward torque mode through **C15**. In speed control mode, it's upper forward torque. In torque control mode, it's forward torque setting value.						
C14	Upper Reverse Torque	0.0 – 300.0		%	250.0	Y
The parameter is a ratio setting value is 100%. Set reverse torque mode through **C16**. In speed control mode, it's upper reverse torque. In torque control mode, it's reverse torque setting value.						
C15	Forward Torque setting mode	1 bit	Set by keyboard or RS485	0	-	0000	Y
			AI1 external analogy giving	1			
			AI2 external analogy giving	2			
			AI3 external analogy giving	3			
			Keypad potentiometer giving	4			
			Multi-step digital voltage giving	5			
			Digital pulse set	6			
		10 bit	Direction uncontrolled	0			
			Direction controlled	1			
C16	Reverse Torque setting mode	1 bit	Set by keyboard or RS485	0	-	0000	Y
			AI1 external analogy	1			
			AI2 external analogy giving	2			
			AI3 external analogy giving	3			
			Keypad potentiometer giving	4			
			Multi-step digital voltage giving	5			
			Digital pulse set	6			
		10 bit	Direction uncontrolled	0			
			Direction controlled	1			
C17	Torque Set Gain	0.0 – 300.0			%	200	Y

C15 1 bit - Setting mode
C16 1 bit - Setting mode

0	Set by keyboard or RS485	Responding to C13/C14
1	AI1 external analog setting	As per AI1 external analog setting
2	AI2 external analog set-	As per AI2 external analog

	ting	setting
3	AI3 external analog set-ting	As per AI3 external analog setting
4	Keyboard potentiometer setting	As per keyboard potenti-ometer setting
5	Multi segment digital voltage setting	As per multi segment digital voltage setting
6	Digital Pulse Setting	As per digital pulse setting

While the unit digital of C15, C16 is 1—6, the torque up-limit of C13, C14 is for checking.

C15 10 bit - Direction Control
C16 10 bit - Direction Control

0) No control Direction - Direction is controlled by terminal or keyboard
1) Control Direction - Setting value of forward torque > setting value of reverse torque, forward direction. Set-ting value of forward torque < setting value of reverse torque, reverse direction.

C13 upper forward torque =setting value percentage * **C17** torque given gain.
C14 upper reverse torque =setting value percentage * **C17** torque given gain.

Such as:
C15 forward torque setting way=4 keyboard potentiometer setting.
C16 reverse torque setting way=4 keyboard potentiometer setting.
Forward/reverse both can control direction, **C15** = 0x14, **C16** = 0x14.
Potentiometer corresponding setting value **A48** = -100%, A49 = 100%
Keyboard potentiometer set **A47** = 100%, **C17** = 200.0%
C13 forward torque up-limit=100%*200.0%=200.0%, control direction forward 200% torque
Keyboard potentiometer set **A47**=100%, **C17**=200.0%
C14 reverse torque up-limit=100%*200.0%=200.0%, control direction reverse 200% torque

C18	Speed /Torque Control Shift	Speed control		0	-	0	Y
		Torque control		1			
F00 control method is to s select senseless vector control or sensor feedback close loop vector control, can change speed or torque control through input terminal. After setting IP terminal change, keyboard set invalid, only for query.							
C19	Upper speed Setting mode	1 bit	keyboard or RS485 setting	0		0000	Y
			AI1 external analog setting	1			
			AI2 external analog setting	2			
			AI3 external analog setting	3			
			Keyboard potentiometer setting	4			
			Multi-segment digital voltage setting	5			
			Digital Pulse Setting	6			
		10 bit	C19 Unit bit setting	0			
			S00 Setting Frequency	1			
C20	Reverse Speed Limit	0 – Maximum Frequency			Hz	50	Y
While torque control, setting upper speed.							

C19 1 bit - Separate setting mode

0	keyboard or RS485 setting	As per C20 setting
1	AI1 external analog setting	As per AI1 external analog setting
2	AI2 external analog setting	As per AI2 external analog setting
3	AI3 external analog setting	As per AI3 external analog setting
4	Keyboard potentiometer setting	As per keyboard potentiometer setting
5	Multi-step digital voltage setting	As per Multi-step digital voltage setting
6	Digital Pulse Setting	As per Digital Pulse Setting

While the unit digital of C19 is 1—6, the speed up-limit of C20 is for checking.

C19 10 bit - Select Speed Up-limit Setting Ways

0) Separate setting, as per the selection of **C19** units digital.

1) Setting frequency is according to **S00**, and affected by the following parameters.

F02 frequency main setting ways / **F03** frequency secondary setting ways / **F04** frequency setting main and secondary.

C21	Torque Acceleration Time	0.0 – 200.0	s	1.0	Y
C22	Torque Deceleration Time	0.0 – 200.0	s	1.0	Y
C21, **C22** torque acceleration time, turning moment deceleration torque control mode and effective. Torque acceleration time, torque accelerated from 0 to 300 hours. Torque speed, torque, from 300 down to 0.					
C23	Low Speed Excitation	0 – 100	%	30	Y
Under low speed, compensate excitation quantity, increase torque feature, in case of meeting the requirement, try to make it lower, could reduce the motor heating up caused by magnetic path full.					
C24	Current Loop Ti	0 – 9999	ms	500	Y
Define the current loop integral time. When integral time is too long, response is inactive; the ability to control external jamming becomes weak. When integral time is short, response is fast, if too short, vibration will occur.					
C25	Current Loop P	0 – 1000	%	100	Y
Define current loop proportion gain, When select big gain, response fast, but too big will occur vibration. When select low gain, response lag.					

Motor parameter: b00-b22

Code	Description / LCD	Setting Range		Unit	Factory Setting	Change Limited
b00	Motor 1 Rated Frequency	0.00 – Maximum Frequency		Hz	50.00	Y
b01	Motor 1 Rated Current	y09 * (50% … 100%)		A	*	Y
b02	Motor 1 Rated Voltage	100 – 1140		V	*	Y
b03	Motor 1 Pole-pairs	1 – 8		-	2	Y
b04	Motor 1 Rated Speed	500 – 5000		$^{obr}/_{min}$	1480	Y
b00 ~ **b04** are the motor's nameplate parameters which touch the precision. Set the parameters according to the motor's nameplate. **b00** ~ **b04** motor nameplate in parameters, it is necessary to recalculate motor parameters by using **b11**. Excellent vector control performance requires exact motor parameters. Exact parameters are base on the correct setting of motor's rated parameters. To assure the control performance, please match the right motor as per the inverter's standard, motor rated currents limited between 30%~120% of inverter rated current. The rated current can be set, but can't be more than the rated current of the inverter. The parameter confirms the OL protection capability of the motor and energy-saving running. To prevent self-cooled motor form overheat when running in a low speed, and the motor capacity change when motor character change little, the user can correct the parameter to protect the motor. The number of motor pole pairs, such as the four pole motor, the number of pole pairs is set to 2.						
b05	Motor 1 N Load Current	0.0 – **b01**		A	*	Y
b06	Motor 1 Stator Resistance	0.000 – 30.000		Ω	*	Y
b07	Motor 1 Rotor Resistance	0.000 – 30.000		Ω	*	Y
b08	Motor 1 Stator Inductance	0.0 – 3200.0		mH	*	Y
b09	Motor 1 Mutual Inductance	0.0 – 3200.0		mH	*	Y
b05 ~ **b09** can by input by motor actual parameters value, also can define motor parameter by **b11** parameter measure function. And save automatically. If know the correct motor parameter, can input by hand. When **b11** is 1, 2, 3, the system calculates and measures automatically. **b05** ~ **b09** is the motor's basic electric parameters, these parameters is essential to achieve vector control calculation.						
b10	Motor Selection	Motor 1	0	-	0	N
		Motor 2	1			
The system can select any group motor parameters. Motor parameter measurements modify and save to corresponding motor parameter area automatically.						
b11	Motor Parameter Measurement	No measurement	0	-	0	N
		calculate by label data	1			
		inverter static measurement	2			
		inverter rotation measurement	3			

Set whether the measurement of electrical parameters in order to b10 motors choose motor 1 as an example.

0) No measurement

1) Calculate by label data

According to the motor nameplate parameters **b00** ~ **b04** , automatic calculation **b05** ~ **b09** and other electrical parameters, the advantage does not require power-on self tuning, suitable for general-purpose Y series of four pole motor, the other type motor can be adjusted based on this parameter.

2) Inverter static measurement

If the motor parameters cannot be measured without load, you can choose static frequency converter measurement. Make sure that motor in a static status, after static measurement, it can be manually adjusted some parameters, optimal control.

The b11 is set to 2, the inverter automatically start parameter determination.

Keyboard figures area show "-RUN": waiting to run the command, start the measurement.
Keyboard figures area show "CAL1", inverter without output.
Keyboard figures area show "CAL2", inverter with output, static state.
Keyboard figures area show "-END": measuring ends.
Keyboard figures area show "E. CAL": the measurement process errors.
Process can be measured through the STOP key to stop.

3) Inverter rotation measurement

Motor can be measured without load, can choose the rotation measurement. Measurements started, make sure the motor is static.

Static measurement converter, the output DC voltage, pays attention to safety.

The b11 is set to 3, the inverter automatically start parameter determination.

Keyboard figures show that the regional show "-RUN": waiting to run the command, start the measurement.
Keyboard figures area show "CAL1", "CAL3": N output inverter.
Keyboard figures area show "CAL2", inverter with output, under static state.
Keyboard figures area show "CAL4", inverter with output, the motor forward in high-speed.
Keyboard figures area show "-END": measuring the end.
Keyboard figures area show "E. CAL": the measurement process errors.
Process can be measured through the STOP key to stop.

Set this parameter, the motor parameters will be determined dynamically. Be sure the motor is without load (N-load operation).

Before setting, be sure to run well prepared, the motor will run in high speed during the measurement

Measurement is completed, b11 return to 0. The measured parameters will select parameters on the base of b10 motor parameters which is automatically saved to the b05 ~ b09 or b18 ~ b22.

Note: Before auto-measure the motor parameter, must input motor rated parameter b00~b04or b13~17 correctly

Please regulate accelerating and deceleration time or torque increasing parameter, if there is over - current or over voltage faults while auto- measurement.

When automatic regulation, motor should be in stop status.

b12	Vector Control initial Inspection R1	Not inspection R1	0	-	+	N
		Inspection R1	1			
b13	Motor 2 Rated Frequency	0.00~Maxmum frequency		Hz	50.00	T
b14	Motor 2 Rated Current	y09*(50%~100%)		A	*	T
b15	Motor 2 Rated Voltage	100~1140		V	*	T
b16	Motor 2 Pole Pairs	1~8		-	2	T
b17	Motor 2 Rated Speed	500~5000		rpm	1480	T
b18	Motor 2 N Load Current	0.0~b14		A	*	T

b19	Motor 2 Stator Resistance	0.000 – 30.000	Ω	*	T
b20	Motor 2 Rotator Resistance	0.000 – 30.000	Ω	*	T
b21	Motor 2 Stator Inductance	0.0 – 3200.0	mH	*	T
b22	Motor 2 Mutual Inductance	0.0 – 3200.0	mH	*	T
The 2nd group motor parameters can be set by system. The definition is same with group 1.					

System parameter: y00 - y17

Code	Description / LCD	Setting Range		Unit	Factory Setting	Change Limited
y00	Reset System Parameter	No action	0	-	0	N
		Reset system parameter with keyboard storage1	1			
		Reset system parameter with keyboard storage 2	2			
		Reset system parameter with keyboard storage 3	3			
		Reset system parameter with keyboard storage 4	4			
		Reset system parameter with factory set value	5			
0) No action 1) Reset system parameter with keyboard storage 1 2) Reset system parameter with keyboard storage 2 3) Reset system parameter with keyboard storage 3 4) Reset system parameter with keyboard storage 4 5)Reset system parameter with factory set value When this parameter set valid, all the function parameter reset to factory setting. The parameters without factory setting will save the previous setting value.						
y01	Parameter Upload To Keyboard	No action	0	-	0	N
		Reset system parameter with keyboard memory area1	1			
		Reset system parameter with keyboard memory area2	2			
		Reset system parameter with keyboard memory area3	3			
		Reset system parameter with keyboard memory area4	4			
		Clear up keyboard memory area 1, 2, 3, 4	5			
y02	Latest Fault record	0 – 4		-	0	Y
y03	Fault Record 1	Press [PRG] and [▲/▼] key the frequency, current and running status of fault time can be known.		-	0	Y
y04	Fault Record 2					
y05	Fault Record 3					
y06	Fault Record 4					
y07	Fault Record 5					
These parameters register fault which happen in the last several times, and can inquire about the value of monitor						

object at the time of fault by 'PRG' and "plus or minus" key.
The monitor object of fault state:
0) Fault type

The fault code is expressed as following:

Serial number	**LED display**	**Fault**
0	**E.OCP**	System is disturbed or impacted by instant over current
1	Reserved	
2	**E.OC3**	Over current or over voltage signal from drive circuit.
3	Reversed	
4	**E.OU**	Over voltage
5	**E.LU**	Under voltage
6	**E.OL**	Over load
7	**E.UL**	Under load warm
8	**E.PHI**	Power input Phase loss
9	**E.EEP**	EEPROM error
10	**E.ntC**	Over heat
11	**E.dAt**	Time limit fault
12	**E.Set**	External fault
13	Reserved	
14	Reserved	
15	Reserved	
16	**E.PID**	PID regulate fault
17	**E. OHt**	Motor over heat fault
18	**E.OL2**	Motor over load fault
19	**E.PG**	PG fault
20	**E.Pho**	Inverter output phase-lost
21	**E.COA**	RS485 communication terminal A failure

22	**E.Cob**	RS485 communication terminal B failure
23	**E.CAL**	Parameter identification problems.

1) Set frequency at the time of fault
The output frequency of the inverter at the time of fault
2) Output frequency at the time of fault
The output frequency of the inverter at the time of fault
3) Output current at the time of fault
The actual output current at the time of fault
4) Output DC voltage at the time of fault
The actual output voltage at the time of fault
5) Running state at the time of fault
The running state at the time of fault

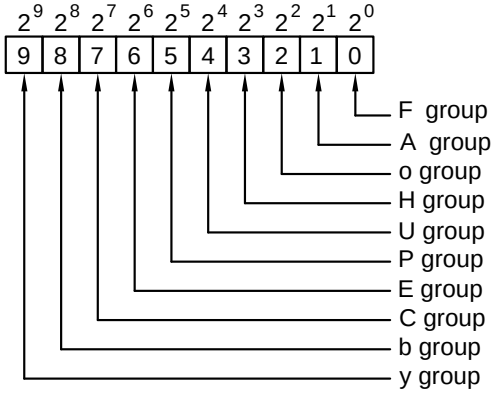
LED display is below

The first LED		**The second LED**		**The third LED**	**the fourth LED**	
F	forward command	F	forward status	separator	A	accele-rating
R	Reverse command	R	Reverse status		D	deccele-rating
S	Stop command	S	Stop sta-tus		E	running in a even speed
					S	Stop status

6) running time at the time of fault
The running time at the time of fault
7) Inverter IGBT temperature at the time of fault
Inverter IGBT temperature

y08	Fault Record Reset	No action	0	-	0	Y
		Reset	1			
0) No action, the fault records retains 1) the fault records resets						
y09	Rated Output Current	0.1 – 1000.0		A	*	N
y10	Rated Input Voltage	100 – 1140		V	*	N
y11	Product Series			-	*	N
y12	Software Version			-	*	N
y13	Product Date - Year			-	*	N
y14	Product Date - Month/Day			-	*	N
y15	User Decode Input	0 – 9999		-	-	Y

In the state of locked parameter, LED displays the times of error input. There are three input limit, if input is wrong in continuous three times, the systems will prohibit input of the password. It can prevent testing password in an illegal way, and need restart the machine to input again. Once the input is right in any time during three times input limit, the parameter is unlocked.					
y16	User password key-in	0 – 9999	-	-	Y
The parameter sets the password, and the range is 0 ~ 9999. After setting the password, parameter locks and keyboard displays “code”; if the password is unlocked or password input is right, the keyboard will display “deco”. Set password to 0, reset user password set, after re-electrify status is decode.					
y17	Parameter Group Protection	Corresponding parameter group protection after set password Set to 0: change is not allowed Set to 1: change is allowed	-	0000	Y



Part 5 – Fault Diagnosis & Solutions

Problems and solutions – error codes

Problems	Possible causes	Solutions
Keyboard cannot control	Running control mode setting is wrong	Check F05
	Frequency setting is wrong	Check F03、F04
Potentiometer can’t regulate speed	Control mode setting is wrong	Check F05
	Frequency setting is wrong	Check F03、F04
The motor Does not rotate	LED monitor display fault	Press RESET or terminal for fault reset, learn and fix the fault according to the fault info
	No voltage in terminals DC+1 and DC+2	Check the voltage at R, S or T and charging circuit.
	U, V or W terminals produce No	Check the control mode and frequency parameter. Check the terminal condition if it is operat-

	output or abnormal output.	ed by an external terminal.
	Re-start after powering down or free run	Remember the set operating state.
	Too much load on the motor	Check the load condition, and confirm the model selection is right
Over current **E.OC**	Fault display E.OCP	System is disturbed or instant over current
	Fault display E.OC3	Motor over current, protect action when motor actual current is 3 times over than the motor rated current
	Over current during acceleration	Reset or adjust F09, F20, and F21.
	Over current during deceleration	Reset or adjust F10, F22, and F23.
	During starting, the low-frequency jitter over-current	Modify F06 setting
	Over current during operation	Check the load change and eliminate it.
	Over current during starting or operation sometime	Check if there is slight short circuit or grounding.
	Disturbance	Check the earthling wire, screened cable grounding and terminals.
Over load **E.OL**	Too much load	Lower the load. Or enlarge b04, b14 in the allowable load range or enlarge A24 to raise the thermal protection level.
	Inappropriate parameter is set	Modify b04、b14 in case of the motor over - load allowed
Over voltage **E.OU**	Power voltage exceeds the limit	Check voltage is right or not. Frequency inverter rated voltage setting is Y or N.
	Too fast deceleration	Modify F10.
	The load has too much inertia	Reduce the load inertia, or raise the capacity of frequency converter, or add a braking resistor.
Low voltage **E.LU**	Too low power voltage	Checking voltage is normal or not. Frequency inverter rated voltage setting is Y or N.

	Power off transiently	Add options of capacitor boxes.
	The line has too small capacity or great rush current exists on the lines.	Make renovation on power supply system.
Over heat E.OHt	Too high ambient temperature	Improve ambient conditions
	Cooling fans do not work.	Check A27, reduce fan starting temperature (when there is fan control)
	The carrier frequency is too high	Check the setting value of function F16

	After switching off the supply voltage to the inverter internal circuit voltage may still be life threatening. To prevent electric shock, wait at least 5 minutes after the power is turned off and extinguish the lights on the operator.	
	Static electricity accumulated in the body can be a major threat to the inverter electronics. To avoid the risk of damaging the inverter, do not touch your hands PCBs and electronic components inside the case.	

Part 6 – Specification

Items		**Specifications**		
Power	Voltage and frequency	Single-phase 200~240V, 50/60Hz Three-phase 380~415V, 50/60Hz		
	Allowable Fluctuation range	voltage: ±15% frequency: ±5%		
Control	Control system	high performance vector control inverter based on 32 bit DSP		
	Output frequency	0.00~800.0Hz, maximum frequency can be set between 10.00 and 800.0Hz		
	control method	V/F con-trol	Sensor less vector control	Sensor close loop vector control
	Start torque	0.50Hz 180%	0.25Hz 180%	0.00Hz 180%
	speed adjustable	1: 100	1: 200	1: 2000

	range			
	Speed stabilizing precision	±0.5%	±0.2%	±0.02%
	waveform produce methods	Asynchronous space vector PWM, N-class sub-synchronous space vector PWM, two-phase optimization of space vector PWM.		
	Auto torque boost function	Achieve low frequency (1Hz) and high output torque control under V.F control mode.		
	Accelerate /decelerate control	Sub-set S curve acceleration and deceleration mode, maximum acceleration and deceleration time is 3200 days		
	Long running time control	16 segments speed run, maximum running time is 3200 days		
	frequency setting accuracy	Digit: 0.01Hz(below 300Hz), 0.1Hz(above 300Hz); analogue: 1% of maximum frequency		
	frequency accuracy	Speed control tolerance 0.01 %(25℃±10℃).		
	V/F curve mode	Linear, 1.2 times the power, 1.7 times the power, 2 times power, user-set 8 V / F Curve.		
	Over load capability	150% rated current -1 minute, rated current 200% -0.1 second		
	slip compensation	V / F control can automatically compensate for deterioration.		
Running	Running method	Keyboard/terminal/communication		
	Starting signal	Forward, reverse, jog (parameter control direction), forward jog, and reverse jog.		
	Emergency stop	Interrupt controller output.		
	fault reset	When the protection function is active, you can automatically or manually reset the fault condition.		
	Running status	Motor status display, stop, acceleration and deceleration, constant speed, the program running.		
	DC brake	Built-in PID regulator brake current flow in the premise, however, to ensure adequate braking torque.		
Protection	Inverter protection	Overvoltage protection, under voltage protection, over current protection, overload protection, over-temperature protection, over the loss of speed protection, over-voltage stall protection, phase protection (optional), external fault, communication error, PID feedback		

		signal abnormalities, PG failure
	IGBT temperature display	Display current IGBT temperature
	Inverter fan control	The fan starting temperature can be set(optional)
	Instant power-down re-start	Less than 15 milliseconds: continuous operation. Greater than 15 milliseconds: Automatic detection of motor speed, instantaneous power-down re-starts.
	Speed starting track method	automatically track motor speed when inverter starts
	Parameter protection function	Protect inverter parameters by setting the password and decoding
IO	8 way switch input	Can be customized into 68 kinds of functions, to achieve forward, reverse, forward jog, and reverse jog, emergency stop, reset, speed, acceleration speed, run-time switch, and pulse counting.
	3 way analog inputs	Can be defined as a switch input; To allow for maximum input range-10V ~ +10V, 0 ~ 20mA
	2 way analog output	Can achieve output range 0 ~ +10V, 0 ~ 20mA
	Virtual terminal func-tion	Can be set to a virtual terminal, using communication or keyboard IO port, and with the IO port status display.
Keyboard	Frequency set	In 6 main ways + to 7 kinds of auxiliary to the way of the keyboard, three way analog input, pulse input, digital potentiometers.
	Keyboard cable	8-core cable, in line with EIA T568A, EIA T568B standards.
	Double keyboard port	Supports dual-keyboard, synchronous control, independently of each other.
	Double and multi function keys	MF1, MF2 can be customized as addition and subtraction, forward, reverse, forward jog, and reverse jog, emergency stop, rise and fall, and other 9 kinds of ways.
	4-parameter storages	Control panel can be realized four groups of inverter parameters of upload, download, with manufacturer password to reset factory setting.
	Running info	At most display 3 monitoring parameters. Select by A00, A01, A02
	Fault info	Store 5 groups error messages at most, you can check the type of failure time when failure occurs, set frequency, output frequency,

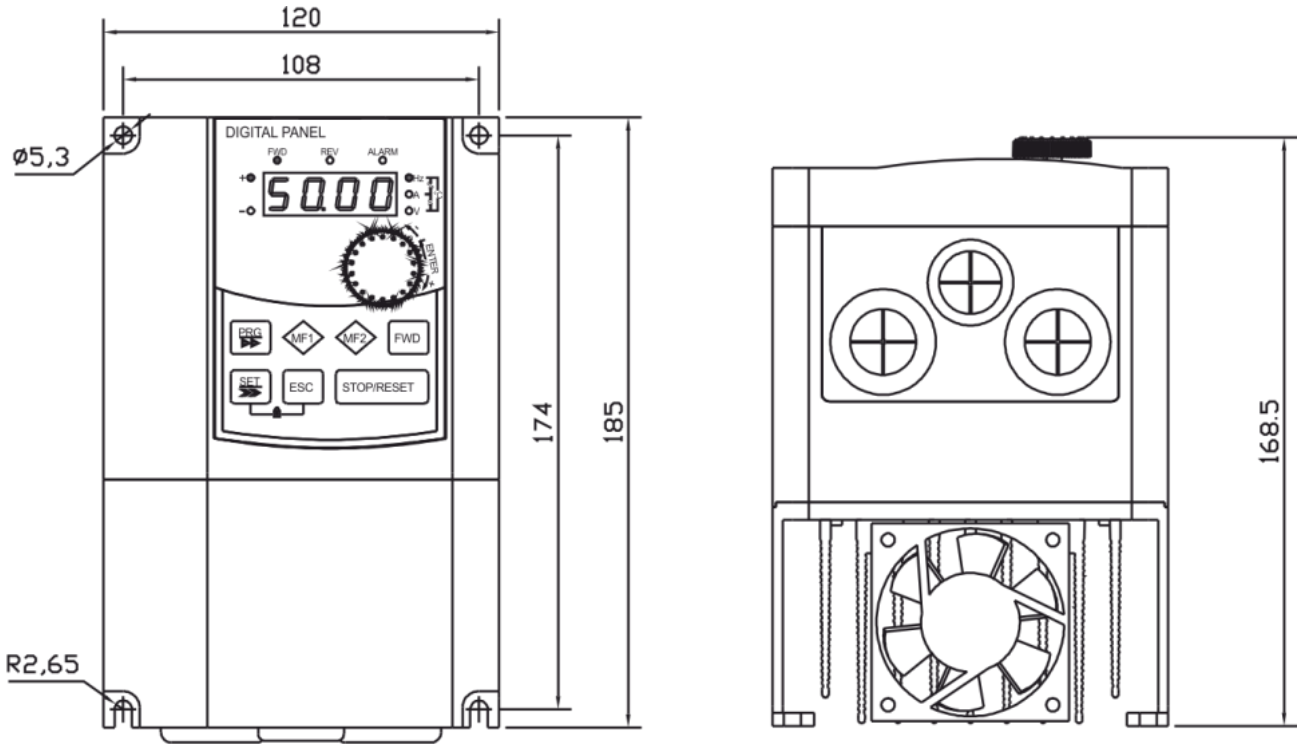
		output voltage, output current, running state, running time, IGBT temperature.
Commu-nication	Double RS485 port	Rs485 port and an optional keyboard completely isolated RS485 communication module.
	CAN BUS	Can select can-bus module.
Speed	16-segment speed	At most 16 segments can be set (use multi-functional terminal to shift or program runs).
	8-segment running time	At most8segment running time can be set(multi-functional terminal can be used to shift)
	8 segment accelera-tion speed	At most 8 acceleration speeds (can use the multi-functional terminal to switch).
	Seven-Segment Speed Configuration	At most 7 segment speed configuration can be set (multi-functional terminal can be used to switch).
PID	PID feedback signal	Six kinds of ways, keyboard, three way analog input, pulse input, digital potentiometers.
	PID giving signal	Six kinds of ways, keyboard, three way analog input, pulse input, digital potentiometers.
Motor	2 groups of motor parameters	With the motor parameters, parameter can be selected, parameter identification automatic storage.
	3 identification me-thod	Name plate calculation, static measurement, rotation measure-ments.
	5 name plate parame-ters	Rated frequency, rated current, rated voltage, the number of pole pairs, rated speed.
	5 identification para-meters	N-load current, stator resistance, rotor resistance, stator inductance, mutual inductance.
Environ-ment	Environment tempera-ture	-10℃ ~ 40℃, 40 ~ 50℃ derating between the use is increased by 1 ℃, rated output current decrease of 1%.
	Store temperature	-40℃~+70℃
	Environment humidity	5~ 95 %, No condensation
	Height·vibration	0 ~ 2000 meters, 1000 meters above derating use, increased by 100 m, rated input decreased%
	Application location	Mounted vertically inside the control cabinet with good ventilation, do not allow the level, or other installation method. The cooling

		medium is air. Installed in the absence of direct sunlight, N dust, N corrosive and explosive gas, N oil mist, N steam, N drip environment
	Cooling method	Forced air cooling and natural air cooling.

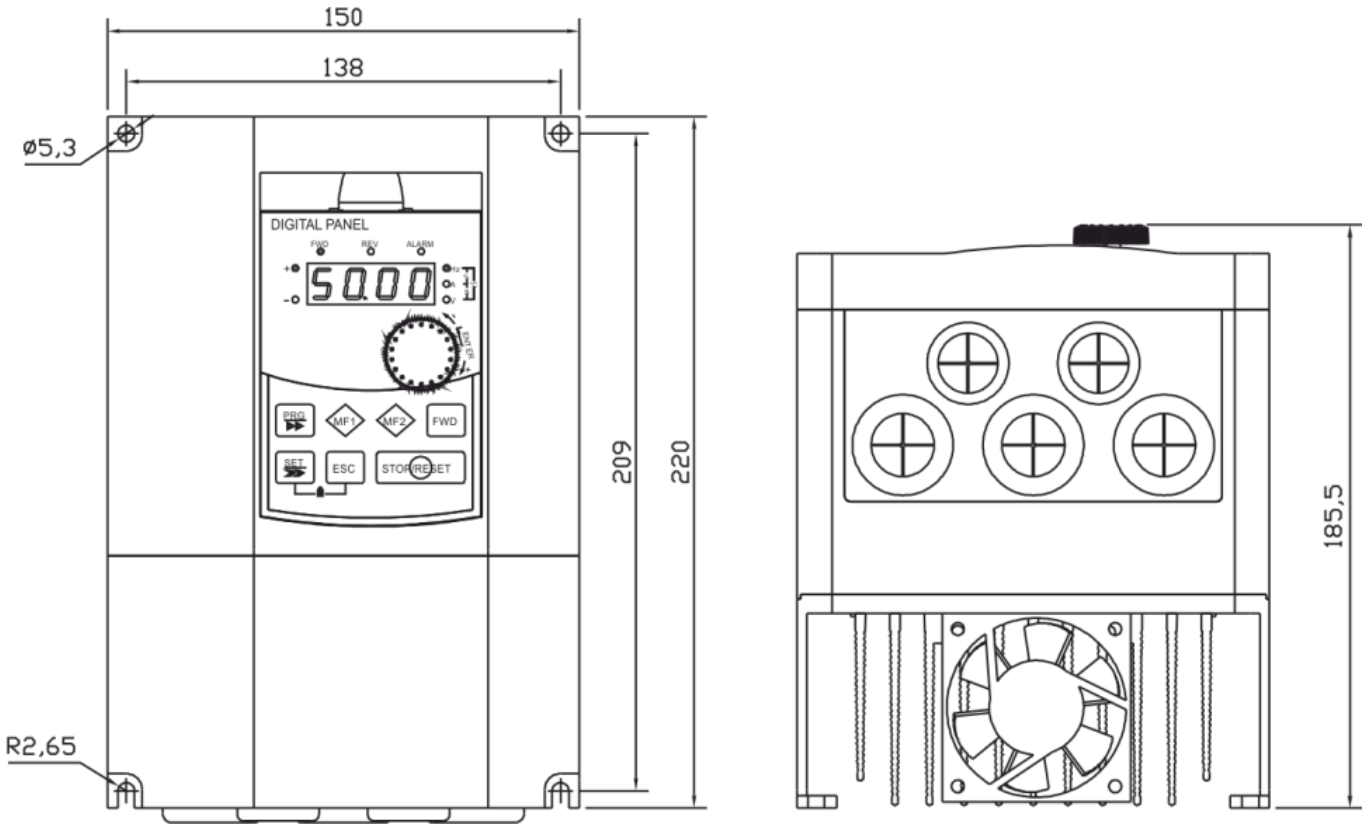
Types table

Type	Input Voltage	Input Current	Output Voltage	Output Current	Load	Pict.
	V	A	V	A	kW	
FA-1L007	1x230V	9A	3x230V	4A	**0.75kW**	Pict. 9
FA-1L015	1x230V	17.5A	3x230V	7A	**1.5kW**	Pict. 9
FA-1L022	1x230V	24A	3x230V	10A	**2.2kW**	Pict. 10
FA-1L040	1x230V	36A	3x230V	16A	**4.0kW**	Pict. 10
FA-3H007	3x400V	3.3A	3x400V	2.5A	**0.75kW**	Pict. 9
FA-3H015	3x400V	5A	3x400V	3.7A	**1.5kW**	Pict. 9
FA-3H022	3x400V	7A	3x400V	5A	**2.2kW**	Pict. 9
FA-3H040	3x400V	11A	3x400V	8.5A	**4.0kW**	Pict. 8
FA-3H055	3x400V	16.5A	3x400V	13A	**5.5kW**	Pict. 10
FA-3H075	3x400V	20A	3x400V	16A	**7.5kW**	Pict. 11
FA-3H110	3x400V	28A	3x400V	25A	**11kW**	Pict. 11

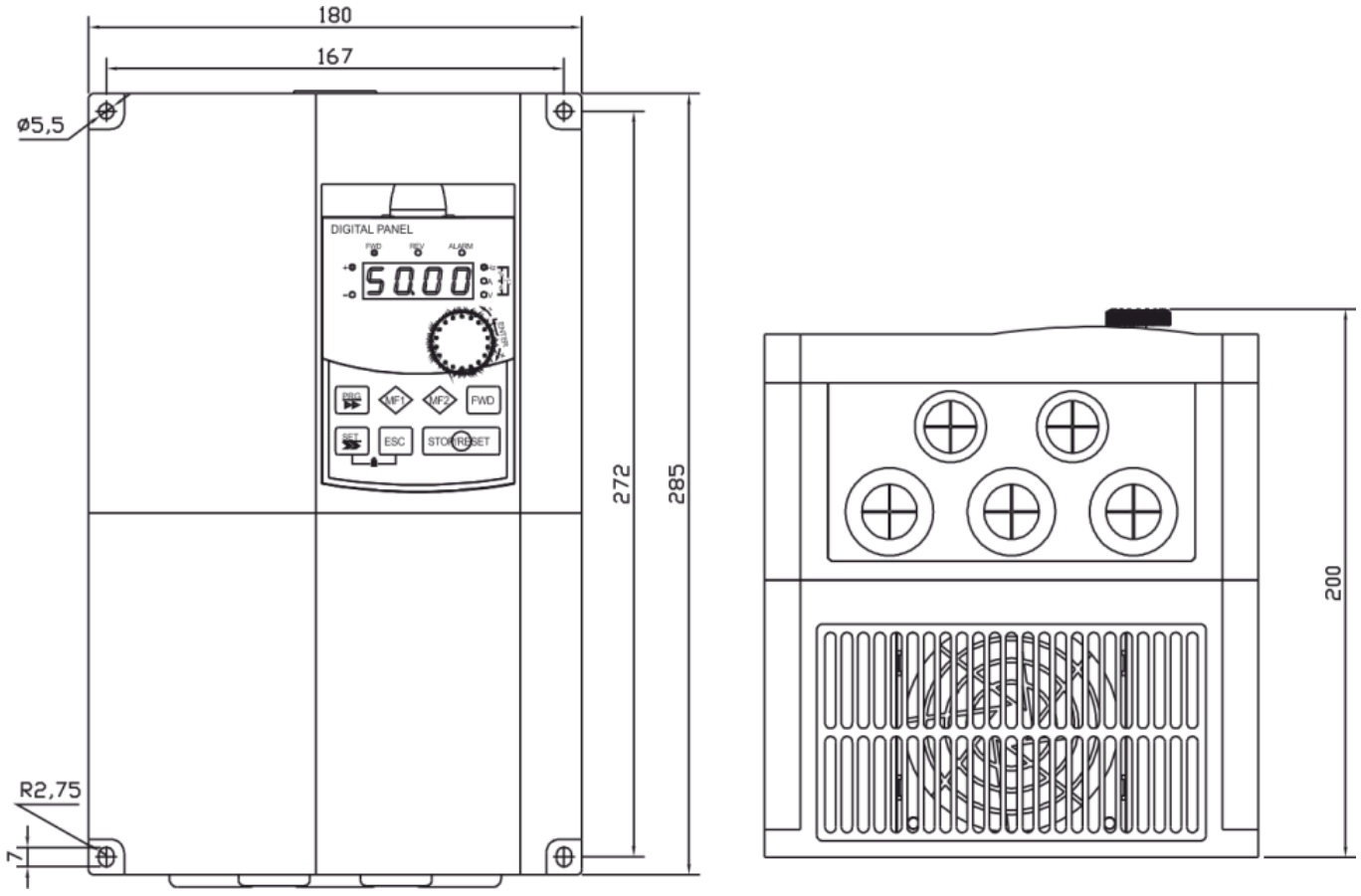
Assembly Drawings



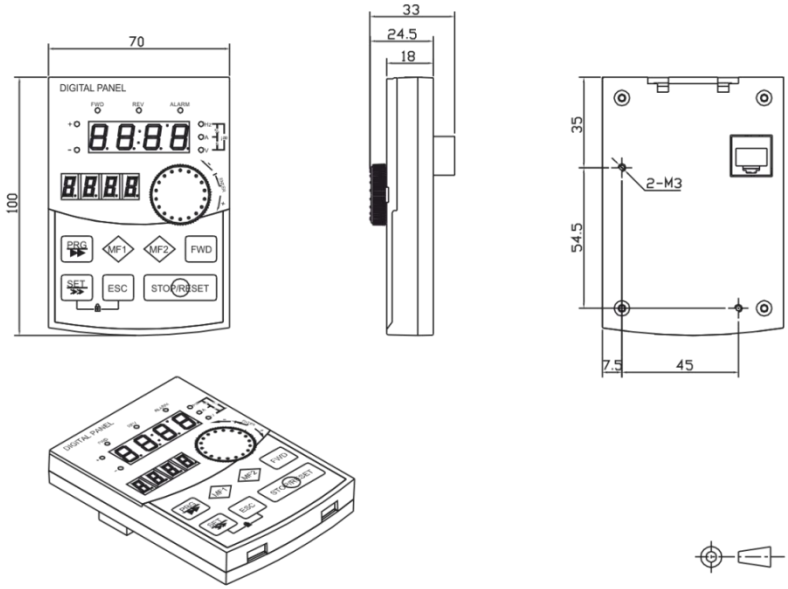
Pict. 9) 1-phase inverter to 1.5kW and 3-phase inerter to 2.2kW



Pict. 10) 1-phase inverter 2.2-4kW and 3-phase inverter 4-5.5kW



Pict. 11) 3-phase inverter 7.5-11kW



Pict. 12) Operating panel

Braking Unit

There is braking unit inside when using “B” type frequency converter, the maximum braking torque is 50%. Please choose braking resistor according to the following table:

⚠	In no case you use resistors with less resistance, and less powerful than that shown in the table below. Failure to do so may result in damage to the inverter and there is danger of fire

Type	Power	Braking resitor	Resistor Power
	kW	Ω	W
FA-1L007	0.75kW	200	*120*
FA-1L015	1.5kW	100	*300*
FA-1L022	2.2kW	70	*300*
FA-1L040	4kW	40	*500*
FA-3H007	0.75kW	750	*120*
FA-3H015	1.5kW	400	*300*
FA-3H022	2.2kW	250	*300*
FA-3H040	4kW	150	*500*
FA-3H055	5.5kW	100	*500*
FA-3H075	7.5kW	75	*800*
FA-3H110	11kW	50	*1000*