

Overview

This product is the up-to-date variety of the YTB Series Frequency Inverter manufactured by our Company. Besides keeping the advantages of the products in the original series, this product has strengthened the function of manipulation, operation, control, input and output and etc. And to parts of the instrument models, the RS485 communication function is added, making its use more extensive, agile and practical.

Inspection at Opening the Instrument Box

1. Affirm whether the instrument damage caused in the transport process.
2. Check up the nameplate on the Frequency Inverter to affirm this product is you ordered.
3. Check up whether a primary body of the Frequency Inverter, a copy of operating instruction, a qualified certificate leaving the factory and other articles you choose and buy are in the package box.

Model Explanations

Series Name	YTB-S5-1.5/220-□	
T Three Phase Input		Input Voltage (V)
S Single Phase Input		Output Power Rating (KW)
Model Sequence		

Technical Parameters

Table1

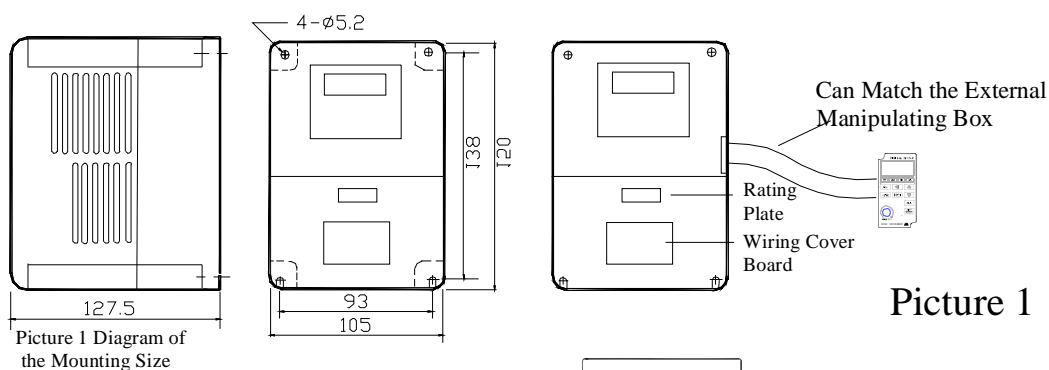
<div>Power Rating (KW)</div> <div>Rated Output Current (A)</div>		S5 Series (Single Phase 220V)	<div>0.4</div> <div>2.5</div>		<div>0.75</div> <div>4.5</div>		<div>1.5</div> <div>7.0</div>		<div>2.2</div> <div>10</div>		
		T5 Series (Three Phase 380V)	<div>0.75</div> <div>2.5</div>	<div>1.5</div> <div>4.2</div>	<div>2.2</div> <div>5.5</div>	<div>3.7</div> <div>8.5</div>	<div>5.5</div> <div>13</div>	<div>7.5</div> <div>18</div>	<div>11</div> <div>24</div>	<div>15</div> <div>32</div>	
Requirement for Input Power		1 Φ 220VAC 、50HZ/60HZ				3 Φ 380VAC 、50HZ/60HZ					
Employing Environment	Location	Without corrupt gas, non-conducting dust in room and well ventilated.									
	Temperature /Humidity	-10℃~+40℃ ，Relative humidity below 90%, Without dew condensing									
	Elevation/ Vibration	Height below 1000meter ，Vibration below 0.5G									
Overload Ability	150% ，60 Sec.		Cooling way		Cooling by wind （0.4KW Cooling naturely）						
Control characteristic	Frequency Range	0.50-400.00HZ									
	Frequency Setting	Press Key, External potentiometer, 0~14V, 4~20mA or 0~10mA									
	Modulation Mode	SVPWM									
	Braking Function	Regenerated braking, Direct current braking									
	Time for speed-up and speed- down	0.1-6550.0 Sec.									
	Protect Function	Over Voltage, Not Enough voltage, Over Current, Over Load, Over Heating, Stall Protect									
Frequency Resolution Ratio	Digital setting: 0.01HZ, Analog setting:0.4%										
Additional Function	16 Section speed, Simple PLC, Timer/Counter Function										

Safety Items

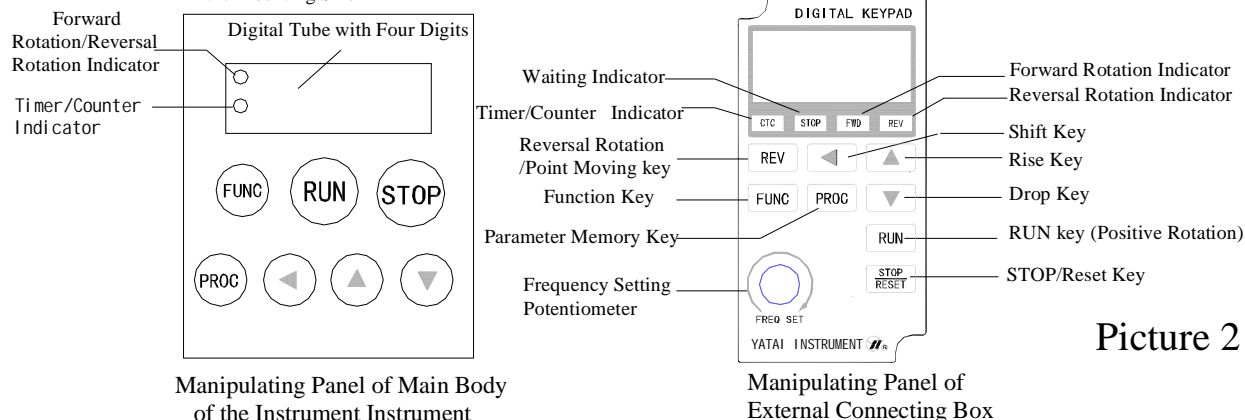
1. The Frequency Inverter can only be used to the three-phase alternating-current induction motor.
2. The Frequency Inverter should be vertical installation onto the metals or the fire-retardant materials so as to avoid the fire.
3. The outer cover of the Frequency Inverter and motor must reliable ground, otherwise it has the danger of getting an electric shock.
4. Before wiring of the Frequency Inverter, the power source must be cut off more than 5 minutes until the LED indicator totally putting out; otherwise the danger of an electric shock can take place.
5. The power line should connect to the air switch and contactor provided with earth leakage protection of same capacity as so to can cut off the power immediately when being urgent.
6. The output terminals of the Frequency Inverter (U, V, W) does not allow connecting to the contactor, the thermal relay, other switch contacts, the compensation condenser and etc., otherwise damaging the Frequency Inverter is possible.
7. The power input terminals R, S, T and the output terminals U, V, W of the Frequency Inverter must not be connected by mistake, otherwise damaging the Frequency Inverter is possible.
8. When using the output frequency above 60Hz, it must fully affirm the securities of the electrical motor and load so as not to threaten the security of equipments and persons.

Installation and Structure

(Take the Model 0.75/1.5KW as Example) Picture 1 Structure Schematic Diagram Picture 2 Arrangement Diagram of the Panel




Picture 1



Picture 2

1 2 3 /



1. Installation

2. Wiring:

Table2

— 3 —

The main body of the external connecting model of S5/T5 is as same as the ordinary model of 0.75KW/1.5KW. With the external connecting socket at the right side of the main body, using the flat cable can connect to the external operating box. If user connects the external operating box, the keys on the original main body will invalid and all manipulations will be in operation through the keys on the external manipulating box

3. The using method of the analog input signal AVI can refer to the explanation on the upper corner in Picture 3

Operating and Manipulating

1 Before power on, user must check carefully whether wiring is connect correctly and firmly. After power on, the digital tube displays the number of “8888” —> “Rated voltage value” —> “Rated current value” —> “Pre-setting waiting display value” (May be Output Frequency/Rotation Speed /Counter Value /Timer Value, etc) successively. If the display of digital tube is twinkle, that is to say, the Frequency Inverter is in the waiting and supervisor state. Under the default state leaving factory, pressing the “RUN” key, the Frequency Inverter operates in positive rotation state; if pressing the “STOP” key, the Frequency Inverter will stop.

2. Pressing the “Rise” key or the “Drop” key can increase or decrease the output frequency while the Frequency Inverter is in operating. Push the memory key of “PROC”, can keep the frequency value setting at present (when the main frequency is setting with digital type and the Frequency Inverter operates with single section speed, the above-mentioned is operated effectively. Pressing the “Rise / Drop” key continuously will quicken the manipulating rate). Under the abnormal state, the digital tube will display the error code. While in the direct current braking state, the digital tube displays “- 6 -” and the various kinds of state indicators point out the present running situation.

Point Moving Function: The point moving function can be setting by the external terminals or by the “REV” key on the panel. The setting method can be consulted the parameter’s schedule.

3. Setting of Parameters:

Under its supervisor state(in operating or waiting state), when pressing the “FUNC” key (the digital tube will display “dXXX” at once) And then press the “Rise” key or “Drop” key to select the parameter’s code(D000~D200). After selecting the parameter’s code, pressing the “FUNC” key again, the digital tube will display the parameter’s value. At that time the user can select the “Place” of the decimal number of the selected parameter to be updated (As an example, if selecting hundred’s Place, the digital tube will display the twinkle hundred’s place number). After modifying the value, pushing the memory key “PROC” can store the parameter’s value and return the state to the supervisor state. If user presses the “FUNC” key, the parameter will not be stored and the state returns to what is used to change the parameter code. If in the course of setting parameter (including modifications of parameter’s code and parameter’s value), pushing the “STOP” key does not keep and modify the parameter’s value and only make the state returning to its supervisor state. (If the updated parameter is just in operating, then the first time of pressing the “STOP” key only withdraws from the parameter’s changing, but will not stop the device running). The concrete parameter’s code and its meaning can refer to Table 3:

Note: Before modifying the parameters, must open the lock (d001 =1) in advance. This Frequency Inverter only uses digital tube with four digits. By shifting the “Place” of decimal point, can display and modify the number with 5 digits by shifting the decimal point. When the maximum parameter’ value is up to 4 or 5 digits and the display unit is equal to 1, then the display will be in the form of “XXXX.”, namely the arithmetic point of the last digit will be lighted. Displaying only “XXXX” expresses that the display unit is 10, namely the real parameter value is “XXXX0”. When pressing the “Shift” key to modify the “Place” of the number, please pay attention to the decimal point which can change to the corresponding location. If the parameter value is less than 4 digits, then the highest digit will not be displayed.

Table3

	Parameter	Parameter Name	Parameter Value Range and its Explanation	Setting in Factory
Basic Parameters	D000	Main frequency/First section speed	0.01Hz~D002. When output, it is limited by the D002 maximum operating frequency.	50.00Hz
	D001	User Password	0 : Lock(Besides password itself) 1 : Parameters able to be modified	1
	D002	Maximum operating frequency	0.00~400.00Hz (Restrict the maximum output frequency of the Frequency Inverter)	50.00Hz
	D003	Maximum voltage frequency	D005~400.00Hz (The frequency when the output voltage at its maximum. Refer to the Note 8 in picture)	50.00Hz
	D004	Maximum output voltage	D006~255.0/Single Phase 220 ; D006~510.0/Three Phase 400V	220.0/380.0
	D005	Middle frequency Setting	D007~D003	1.5
	D006	Middle voltage Setting	D008~D004	1.7/3.4
	D007	Minimum frequency Setting	0.01~D005	0.50Hz
	D008	The voltage at Minimum frequency	0.1~D006	1.7/3.4
	D009	Output frequency upper limit	D010~400.0Hz	50.0Hz
	D010	Output frequency lower limit	0~D009 (Avoid the overheating phenomenon caused by excess low motor speed)	0
	D011	First speed-up time selection	0.1~6550.0s (The time needed from 0 speed up to maximum voltage frequency)	10.0
	D012	First speed-down time selection	0.1~6550.0s (The time needed from maximum operating frequency fall to 0)	10.0
	D013	Second Speed-up time selection	0.1~6550.0s	10.0
	D014	Second speed-down time selection	0.1~6550.0s	10.0
	D015	Third speed-up time selection	0.1~6550.0s	10.0
	D016	Third speed-down time selection	0.1~6550.0s	10.0
	D017	Fourth Speed-up time selection	0.1~6550.0s	10.0
	D018	Fourth Speed-down time selection	0.1~6550.0s	10.0
	D019	Point Moving Plus Speed-down time	0.1~6550.0s	5.0
	D020	Point Moving frequency	0.0~ Maximum operating frequency(D002)	6.00Hz
	D021	Second maximum voltage frequency	D007~400.0Hz, Specified Second V/F Curve	50.00Hz
	D022~D030	Hold back		
Parameters	D031	Frequency command source setting	0: Digital Setting 1: AVI Terminal (0~10V) 2 : ACI Terminal (Default 4~20mA) 3.Communication Port	0
	D032	Operating command source setting	0: Internal Keyboard 1: External Terminals. 2: Dominated by Communication Port	0
	D033	“STOP” Key valid	0: When the external terminals or the communication port is in operating, the “STOP” Key is invalid. 1 : Valid.	0
	D034	Selection of the parking pattern	0: Deceleration braking. 1: Stop in free operating	0
	D035	“REV” key Point Moving function	0: Invalid 1: Used to the positive Point Moving	1

	D036	Reverse Rotation forbidden	0: Not forbidden 1: forbidden (At the same time, the Reverse rotation key on the keyboard invalid).	0
	D037	Carrier frequency	1~15K (1K: The Maximum output frequency 166.00Hz , 2K: 333.00Hz)	4Khz
	D038	V/F Curve selection	0: First order curve (Can use the low frequency rotation moment compensation); 1:Arbitrary V/F curve(determined by the low, middle and high three points) 2: Second order curve 3 : Third order curve	0
	D039	Display selection	0: Display frequency 1: Display rotation speed 2: CTC Value 3: PLC Period 4: PLC time 5: Hold back 6: Test Mode: Frequency, Current , Angle of power fact, Output voltage AC , Bus DC voltage, the Temperature of the module or the heat sink	0
	D040	Speed Converting Coefficient	1%~200%, Pay attention to the notes	100%
	D041	Main Frequency modify recover function	0 : After braking, keep the frequency setting value after modification. 1 : After braking, recover the setting value before modification.	0
	42~43	Hold back		
	D044	Direct-current braking voltage (Start)	220V S Model : 0.1~255.0V/380V T Model : 0.1~510.0V	100/200
Special Application Parameter 1	D045	Direct-current braking at the exact position	0~100% (Take the rated current of driver as 100%)	30
	D046	Direct-Current Braking time at start	0~25.0s	0
	D047	Direct-Current Braking time at stop	0~25.0s	0
	D048	Jumping frequency1	0~400.00Hz	0
	D049	Jumping frequency2	0~400.00Hz	0
	D050	Jumping frequency3	0~400.00Hz	0
	D051	Jumping frequency range	0~2.55Hz (+-)	0.5
	D052	Selection of the re-operating after the instantaneous parking	0 : Not continue operating after the instantaneous parking 1 : Frequency Tracing (Tracing from the speed before parking)	0
	D053	Waiting time of speed trace	0.3~5.0s	0.5s
	D054	Current exact position of the speed trace	30%~200% of the Rated Current of driver	150%
	D055	Automatic voltage stabilization function (AVR)	0 : Invalid 1 : Valid (Cancel in the braking Deceleration)	1
	56~59	Hold back		
Parameters	D060	Motor rated current setting	30%~120%	100
	D061	Motor non-load current setting	00%~90%	40
	D062	Rotation moment compensation setting	0~20.0, The extra-voltage of the driver output, can get higher rotation moment(Increase low frequency moment)	4.0

	63~69	Hold back		
Special	D070	PID Detection value input terminal	0 : Non-PID function 1 : ACI, Note: the Main Frequency originated from D031, can be set by the panel or by the analogy terminal AVI, but can not the same ACI terminal, else the PID function will be invalid.	0
	D071	PID Detection value gain	0~1000%	100%
	D072	Proportional constant	0~1000%	100%
	D073	Integral time I	0.01~655.00s	1.00s
	D074	Differential time D	0.00~10.00s	0.00s
	D075	Integral value upper limit	00~100% Integral upper limit frequency=Maximum Operating frequency* Original Value	100%
	D076	Hold back		
	D077	PID Output frequency limit	00~110% Output upper limit frequency=Maximum operating frequency*Original Value	100%
	78~79	Hold back		
Protect Function Parameter	D080	Setting of the exact position for software braking	370~430Vdc(230V Series) 740~860V(460V Series)	380/760
	D081	The Avoiding function for speed lost by Over Voltage	0 : Invalid 1 : Valid	1
	D082	The exact position of over current in speed-up	20~250%	155
	D083	The exact position of over current in operating	20~250%	170
	D084	The exact position of over current in Speed-down	20~250%	170
	D085	The exact position of over rotation moment detecting	0~200% Rated Current	150%
	D086	Over rotation moment detecting time	0.1~20.0s, 0 : Not detected	0
	D087	Electronic Thermal Relay function	0 : Non-operating 1 : Open (150%,1 Minute)	0
	D088~089	Hold back		
Output	D090	Current input ACI terminal	0 : 4~20mA 1 : 0~10mA	0
	D091	Analogy quantity low side frequency	0.0~400.00Hz	0
	D092	Analogy quantity low side bias voltage direction	0 : Positive Direction 1 : Negative Direction	0
	D093	Analogy quantity high side frequency	0.0~400.00Hz	50.00Hz
	D094	Analogy quantity high side bias voltage direction	0 : Positive Direction 1 : Negative Direction	0
	D095	Negative bias able reverse rotation	0 : Unable 1 : Able Reverse Rotation	0
	D096	Operating control terminal function	0 : Positive Rotation/Stop , Reverse Rotation/Stop. 1 : Operating/Stop , Positive Rotation/Reverse Rotation 2 : Operating with three-wire system	
Input				

	D097	Hold back		
	D098	Multifunctional input terminal MI1	1~20 Details can see the table below	1
	D099	Multifunctional input terminal MI2		2
	D100	Multifunctional input terminal MI3		3
	D101	Multifunctional input terminal MI4		4
	D102	Hold back		
	D103	Input terminal respond time	1~20ms, Increasing this value can prevent some unknown interference but the respond time will delay	10
	D104	Multifunctional output terminal Mo1	0 : Invalid 1 : In Operating 2 : Malfunction display 3 : Zero Speed 4 : Arbitrary frequency 1 Arrive 5 : Arbitrary frequency 2 Arrive 6 : frequency District Arrive 7 : Counter/Timer arrive 8 : Hold back 9 : Display in program operating 10 : Program period completed(keep0.5s) 11 : Low Voltage Alarm 12 : Overload Alarm 13 : Driver Preparing Completed 14 : Standby 15 : Standby	0
	D105	Multifunctional output terminal Mo2		0
	D106	Multifunctional output terminal (Mo3*)		0
	D107	Multifunctional output terminal (Mo4*)		0
	D108	Multifunctional output terminal(AFM) 0~10V (PWM) Output , maximum load ability 80mA	0 : Frequency Meter(0~ Maximum Operating Frequency) 1 : Ampere Meter (0~200% Rated Current) 2 : Voltage Meter(0~150% Rated Voltage) 3 : Load Power Factor(cos90~cos0) 4 : Frequency reach 1(0 or +10V) 5 : Frequency reach 2(0 or +10V) 6 : Frequency District Reach	0
	D109	AFM Output gain	0~100% (Used in various range of meter)	100%
	D110	Arbitrary frequency reach 1	0~400.00Hz	0.00
	D111	Arbitrary frequency reach 2	0~400.00Hz	0.00
	D112	CTC Setting value	0~65500 (Timer Unit: Sec.) Note: the CT is the abbreviation the Timer/Counter	0
	113~119	Hold back		
Multisectional Speed and PLC Parameter	D120	Simple PLC function	0 : The function without using program 1 : Single time operating 2 : Operating in circulation	0
	D121	Hold back		
	D122	Second section speed	0.01Hz~D002	20.00Hz
	D123	Third section speed	0.01Hz~D002	30.00Hz
	D124	Fourth section speed	0.01Hz~D002	40.00Hz
	D125	Fifth section speed	0.01Hz~D002	0
	D126	Sixth section speed	0.01Hz~D002	0
	D127	Seventh section speed	0.01Hz~D002	0
	D128	Eighth section speed	0.01Hz~D002	0
	D129	Ninth section speed	0.01Hz~D002	0
	D130	Tenth section speed	0.01Hz~D002	0
	D131	11 th section speed	0.01Hz~D002	0
	D132	12 th section speed	0.01Hz~D002	0
	D133	13 th section speed	0.01Hz~D002	0
	D134	14 th section speed	0.01Hz~D002	0
	D135	15 th section speed	0.01Hz~D002	0

	D136	16 th section speed	0.01Hz~D002	0
	D137	First~8 th section speed operating direction	0~255, 8 bits binary number specified the operating direction of first~8 th section speed. See the paragraph of using method of the PLC.	0
	D138	Ninth~16 th section speed operating direction	0~255, 8 bits binary number specified the operating direction of ninth~16 th section speed. See the paragraph of using method of the PLC.	0
	D139	Hold back		
	D140	Hold back		
	D141	First section running time	0~65000s	0
	D142	Second section running time	0~65000s	0
	D143	Third section running time	0~65000s	0
	D144	Fourth running time	0~65000s	0
	D145	Fifth section running time	0~65000s	0
	D146	Sixth section running time	0~65000s	0
	D147	Seventh section running time	0~65000s	0
	D148	Eighth section running time	0~65000s	0
	D149	Ninth section running time	0~65000s	0
	D150	Tenth section running time	0~65000s	0
	D151	11th section running time	0~65000s	0
	D152	12th section running time	0~65000s	0
	D153	13th section running time	0~65000s	0
	D154	14th section running time	0~65000s	0
	D155	15th section running time	0~65000s	0
	D156	16th section running time	0~65000s	0
Communication Parameters	D157 D159	Hold back		
	D160	Communication address	01-254	1
	D161	Communication Speed (Baud rate)	0 : 4800Band/s 1 : 9600 Band/s 2 : 19200Band/s 3 : 38400Band/s	1
	D162	Treat of the error of transmission	0 : Operating keep on 1 : Warming and Deceleration Parking 2 : Hold back 3 : Hold back	0
	D163	Communication Pattern	0 : 7,N,2 for ASCII 1 : 7,E,1 for ASCII 2 : 7,O,1 for ASCII 3 : 8,N,2 for RTU 4 : 8,E,1 for RTU 5 : 8,O,1 for RTU	3
	D164 ~ D167	Hold back		
	D168	Total running time(Hours)	Record the total operating time.	0
Others	D169	Total running time(Sec.)	Record the total operating time.	0
	D170	Error record 1	Up-to-date error record(Refer to the check list table for the error code at the last part of this Operating Instruction)	--
	D171	Error record 2	Last error record °	--
	D172	Error record 3	secondary error record °	--

D173	Clear error	After setting to 1, pressing the“PROC” key will clear the error record	0
D174	The reset times for error	0~5, 0 : Means without limiting the times	5
D175	Hold back		
D176	Recover the values in manufactured	When this Parameter is set to 1, Pressing the PROC key can recover the default parameters in manufactured.	0
D177	Hold back		0
D178	Version number	03.11	Unable to update
D179	Driver code	0~30	Unable to update
D180~D200	Hold back		

Functions, Parameter's Explanation

D000	Main frequency/First section speed		50.00Hz
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When the user's setting operating frequency is originated from the digital setting method, D000 being the Main Frequency, in running can press the “Rise” or “Down” key to change it, and press the “PROC” key to store its modified value. In multi-section speed operating, D000 is acted as the first section speed. (If the setting operating frequency is originated from the analogy AVI/ACI, and then the first section speed is determined by the external ACI or AVI analogy setting value. The setting of the Main Frequency is limited by the maximum operating frequency.)

D001	User's password		1
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This parameter primarily is used to avoid mistaking setting by non-operating person. If this parameter is 0, the parameters will be locked (besides the password itself) else if this parameter is 1, then the parameters can be modified.

D002	Maximum operating frequency	0.00~400.00	50.00Hz
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This parameter limits the maximum frequency of the Frequency Inverter to avoid damaging the machine and equipment from the excess high speed.

D003	Maximum voltage frequency	D005~400.00Hz	50.00Hz
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This parameter is the corresponding frequency of the maximum output voltage and must be set up according to the motor's Rated Voltage expressed on its nameplate. Its practical meaning can see the explanation of D038.

D004	Maximum output voltage	D006~255.0/Single phase 220, D006~510.0/ Three phase 400V	220.0/380.0
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Its setting value must equal to or less than the motor's Rated Voltage expressed on its nameplate. Its practical meaning can see the explanation of D038.

D005	Middle frequency setting	D007~D003	1.5
D006	Middle voltage setting	D008~D004	1.7/3.4

Those two parameters set the middle point on the arbitrary V/F curve. Its practical meaning can see the explanation of D038.

D007	Minimum frequency setting	0.01~D005	0.50Hz
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This parameter is used to set the minimum start frequency value on the V/F curve.

D008	Minimum frequency voltage	0.1~D006	1.7/3.4
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This parameter is used to set the minimum start voltage value on the V/F curve; its practical meaning can see the explanation of D038.

D009	Output frequency upper limit	D010~400.0Hz,	50.0Hz
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Ordinarily, this value=D002(Maximum operating frequency).

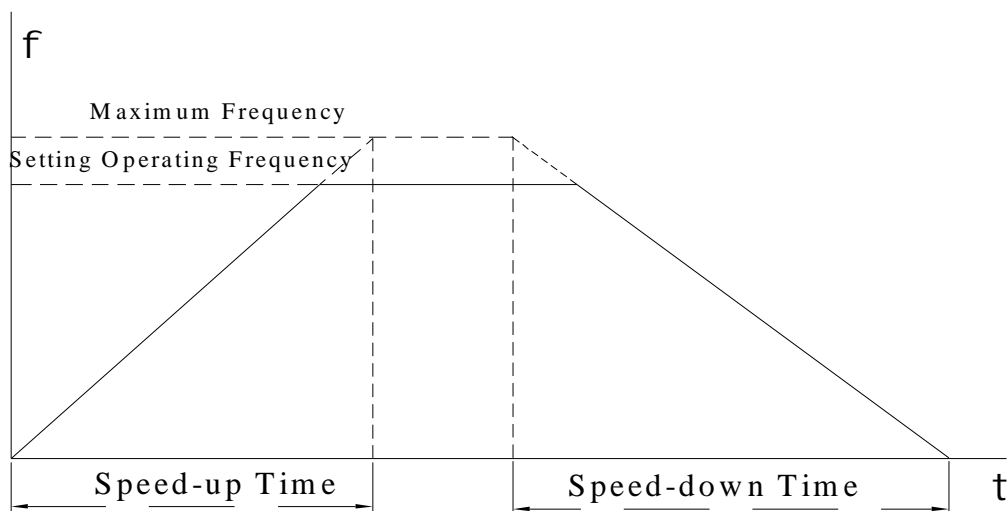
D010	Output frequency lower limit	0~D009	0
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When the operating frequency is less than this frequency, the output of the Frequency Inverter will fall to zero to avoid the over heating phenomenon caused by the excess low motor speed.

D011	0.1~6550.0s	10.0
D012	0.1~6550.0s	10.0
D013	0.1~6550.0s	10.0
D014	0.1~6550.0s	10.0
D015	0.1~6550.0s	10.0
D016	0.1~6550.0s	10.0
D017	0.1~6550.0s	10.0
D018	0.1~6550.0s	10.0

The Speed-up time is the time of the period from zero speed to the maximum voltage frequency and the Speed-down time is the time of the period from the maximum voltage frequency to zero speed. In default state, the Frequency Inverter uses D011/D012 to control the Speed-up/Speed-down rate. The less is the D011/D012, the more is the rate of the speed-up /speed-down. But the motor speeds up too quickly can cause over current, and speeds down too quickly can cause over voltage from the pump process of the motor voltage (the mechanical energy transforms to the electro energy). So the user should set the appropriate Speed-up/Speed-down time. Using multifunctional terminals can set different Speed-up time and Speed-down time. (Refer to the explanation of D098~D101)

the terminal state of setting switch 2 to the Speed-up/Speed-down	the terminal state of setting switch 1 to the Speed-up/Speed-down	Valid Speed-up/Speed-down value	Notes:
0	0	D011,D012	0 means the terminal is not connect to the COM 1 express the terminal is connect to the COM (MI1~4 function take 07 as switch 1 and take 08 as switch 2)
0	1	D013,D014	
1	0	D015,D016	
1	1	D017,D018	



D019	Speed-up/Speed-down time of Point Moving	0.1~6550.0s	1.0
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Specified the speed-up and speed-down rate of Point Moving l. (The Speed-up time is identical with the Speed-down time)

D020	Point Moving frequency	0.0~ Maximum operating frequency(D002)	6.00Hz
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D021	Second maximum voltage frequency	D007~400.0Hz	50.0Hz
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Utilizing the multifunctional terminal can select different maximum voltage frequency , its physical meaning is as same as the maximum voltage frequency

D022~D030	Hold back		
D031	Frequency command source setting		0

0 : Digital Setting , Main Speed/First section speed, is determined by the D000, In running can update it's value by the "Rise" and "Down" keys.

1 : Main Speed/First section speed, is determined by the AVI terminal (0~10V) or the potentiometer.

2 : Main Speed/First section speed, is determined by the ACI terminal (default 4~20mA).

3 : The Operating Speed is determined by RS485 frequency register (2001), which is written by the communication port.

When employing the analogy signal as the source of main frequency(D031=1 or 2) , ought to note the setting of D090~D095. If the setting maximum operating frequency is not the default 50.00Hz, ought to change the value of D093 to the maximum frequency needed at same time.

D032	Operating command source Setting		0
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0: Using the "RUN" key can start the positive rotation, and the "REV" key can start the reversal rotation and the "STOP" key to stop.

1: Start and Stop using the external FWD/REV terminals

2: The RS485 command register (2000) is written by the Communication Port.

D033	The "STOP" key is valid		0
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0: When the operations is controlled by the external terminal or communication port, the "STOP" key is invalid

1: When the operations is controlled by the external terminal or communication port, pressing the "STOP" key only one time can suspend the output, and then makes the motor speeds down to zero, pressing it again can recover its operation, so that it is convenience for manipulating the Frequency Inverter in two different locations.

D034	Select the Parking Method		0
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0: Parking with speed-down

1: Free parking, namely, the Frequency Inverter stops the output at once, and speeds down to stop by the inertia of the motor and load.

D035	Function of the "REV" Key	0 : Invalid 1 : Using enough the Positive Point Moving l	1
------	---------------------------	---	---

0: Using the "REV" key on the panel to reversely start the Frequency Inverter

1: Used as the positive point moving l

D036	Reverse rotation forbidden	0 : Not forbidden 1 : Forbidden (At same time the "Reverse rotation" on the keyboard is invalid).	0
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D037	Carrier frequency	1~15K (At 1K , maximum output frequency is 166.00Hz , at 2K,is 330.00Hz)	4KHz
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Choosing the higher signal carrier frequency can reduce the motor noise, but it may produce the phenomenon of increasing thermal loss (the temperature rising of the motor and Frequency Inverter may also increase.). Meantime, it also increases the interference to the external environment. Otherwise choosing lower signal carrier frequency can add the output efficiency. We recommend the user choosing the carrier frequency setting value below 4KHZ at the power of Frequency Inverter more than 7.5KW. In addition, when adopt the lower carrier frequency (1, 2, 3 K), ought to limit the maximum operating frequency being 100HZ, 200HZ and 300HZ respectively, as so to get the better output wave shape.

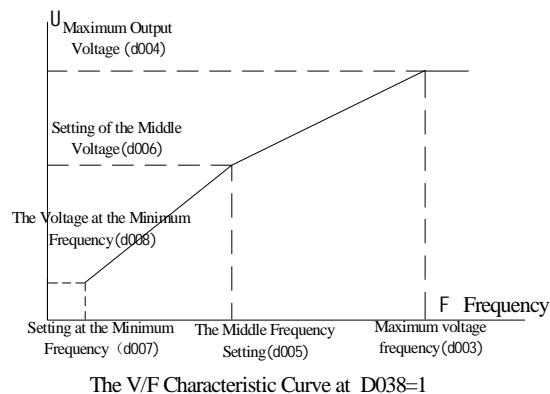
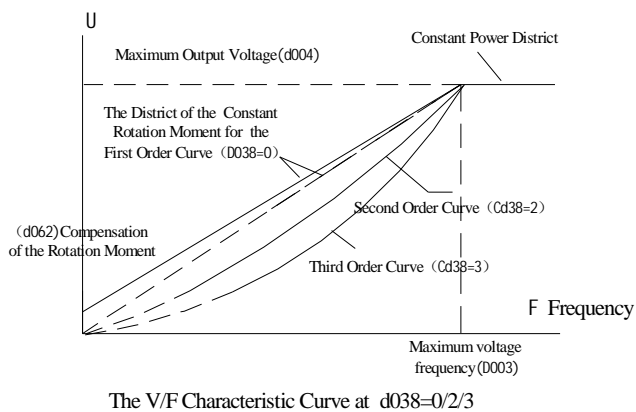


Note: Changing the carrier frequency parameter D037 does not go into effect at once. It is needed to execute the stop command one time and start the Frequency Inverter again, and then the changing can go into effect.

D038	V/F Curve selection	0 : First order curve (Constant rotation moment load) (Can use the DO62 to compensate the rotation moment in the low frequency) 1 : Arbitrary V/F curve (The curve is determined by low, middle and high three points) 2 : Second order curve 3 : Third order curve	0
------	---------------------	---	---

Simply to say, V/F, namely the ratio of “Output voltage /Output frequency” is proportional to the output rotation moment. For most of the motors, the ratio of Output voltage /Output frequency is equal to the ratio of Rated voltage /Rated frequency. This product has four V/F curves for user selecting. Among them the D038=0 is for the constant rotation moment, is more ordinary, the D038=2 is for the characteristics of the machine of blast blower and pump. When the D038=0, if the motor is start with some difficulty or the force moment at low frequency is not enough, can increase the value of D062 (Rotation Moment Compensation Setting) to get higher start moment at low speed. But increasing the value of DO62, should not over do to avoid that the too large compensation will bring about the current impact, then to cause the over current alarm or limit tripping operation.

When D038=0, if using terminals to switch the driver as the second maximum voltage, the D003 in following picture will be replaced by the D021 (Only at D038=0 the second maximum voltage is valid). D038=1 provides three setting points to determine the V/F curve (in the right side of following picture, the middle point can either ascending or drop-down), is provided only for the experiential users.



D039	Display Selection	0 : Display frequency 1 : Display rotation speed 2 : CTC Value 3 : PLC Period 4 : PLC time 5 : Hold back 6 : Test Pattern: Frequency, Current, Power Factor, Output AC Voltage 、 Bus line DC voltage, Module Temperature	0
------	-------------------	---	---

This Frequency Inverter only uses the digital tube with four digits and uses the method of shifting the decimal point to display the five “place” number. If the display unit is 1, then the decimal point of last digit will be bright. If the decimal point of last digit is not bright, that is say the unit of display is 10.

If D039=3 and PLC not in running, the type of display is $P \angle _$, and if D039=3 and PLC is in running, the type of display is $P \angle _X$;

If D039=4 and PLC not in running, the type of display is $P \angle _$, and if D039=3 and PLC is in running, the type of display is the PLC time.

The D039=6 means the Frequency Inverter is in its test mode, can use the “Shift” key to switch the display of various physical parameters such as current($P \angle XXX$, and for part of the product model is the bus line current for reference), Power Factor($\angle X.XX$, and for the model without this function, always display $\angle 1.00$), output alternating voltage ($\angle XXX$), DC bus line voltage($\angle XXX$) and the module temperature.

D040	Speed converting coefficient	1%~200% Pay respects to the notes	100%
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Cooperating with the parameter D039=1 to display the rotation speed, the value of display= Output frequency *60*D040 %. If Output Frequency=50.00Hz and D040=100, then the display value =3000 rad/min. If the motor has more than two pairs of the elect-poles or the error of rotation speed existed, can adjust this parameter to display the rotation speed.

D041	The function of the main frequency modify recovering	0 : After braking, preserve the modified frequency setting value 1 : After braking, recover the setting value before modified	0
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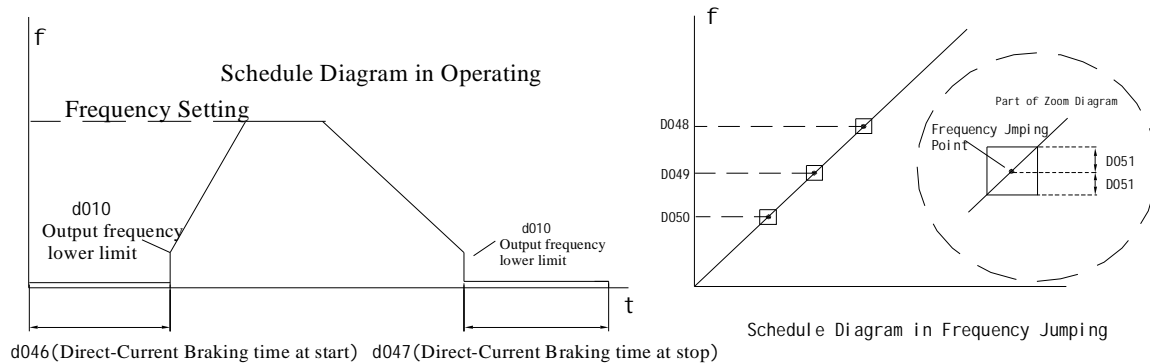
Sometimes, user has modified the main frequency, but he expects to recover the original setting main frequency after stop. At that time, he can set the value D041=1. But in the operating process if he has pressed the “PROC” key to store the main frequency then no matter the value of D041, after stop the display value will be still the main frequency value modified.

D042~43	Hold back		
D044	Direct-current braking voltage	220V Mode : 0.1~255.0/380V Mode : 0.1~510.0V	100/200
D045	Direct-current braking at exact position	0~100% (take the rated current of the driver as 100%)	30

The D044 parameter determines the direct-current braking start voltage, but in the process of direct-current braking, the direct-current braking voltage would be changed by the braking current D045. But the maximum output voltage will not exceed D044.

D046	Direct-Current Braking time at start	0~25.0s	0
D047	Direct-Current Braking time at stop	0~25.0s	0

Those two parameters control the braking current. D046/D047=0 expresses the cancel of this braking period, see following left picture.



D048	Jumping frequency 1	0~400.00Hz	0
D049	Jumping frequency 2	0~400.00Hz	0
D050	Jumping frequency 3	0~400.00Hz	0
D051	Jumping frequency range	0~2.55Hz(+/-)	0.5

For avoiding the point of the mechanical resonance, those three points of frequency Jumping are provided. Its schedule diagram is shown as the upper right picture. The practical frequency range is the twice of the D051.

D052	The re-operating selection after instantaneous braking	0 : Not continue operating after instantaneous braking 1 : Frequency trace(Tracing down from the speed before the power cutoff)	0
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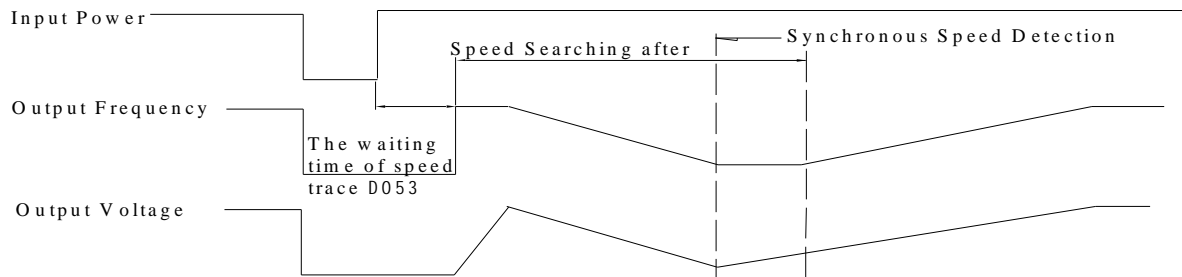
If the power break for a moment is taken place in the running of the Frequency Inverter, in the ordinary situation, the Frequency Inverter will stop its output and wait for the power recovering and, receiving the operating command, then restart the Frequency Inverter from the zero speed. But for the large inertial load, restarting the Frequency Inverter will waste too much time. Employing the frequency tracing function (D052=1) can make the machine needing not stop completely, and tracing the frequency from the value before the power break, up to down. After tracing, the machine will speed up to its setting frequency.

D053	The waiting time of speed trace	0.3~5.0s	0.5s
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When the Frequency Inverter has sensed the power break, its driver will stop output and wait a constant time D053, then begin its trace. It would be better that this parameter should set at the remnant voltage (Near to 0V) on the output side before the driver starting

D054	The exact position of speed tracing current	The 30%~200% of the Rated Current of the driver	150%
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When in the speed tracing process, only if the driver's output current is more than setting value of D054, it can begin the executing of the speed searching after. The V/F curve in tracing process is determined by the D038=1



D055	Automatic voltage stabilization function (AVR)	0 : Invalid 1 : Valid (Cancel in Parking deceleration)	1
------	--	---	---

For the input voltage would change frequently, the motor rotation moment also would change together with it. If the input voltage is excess high, the temperature of the motor will increase in the situation of exceeding the rated voltage, then the insulation may be damaged and the output moment may not stabilize. Employing the automatic voltage stabilization function can make the output voltage to the motor stabilize at its Rated Voltage. Because the output voltage cannot larger than the input voltage, when the input voltage is excess low, the output voltage will be proportional to the input voltage. If this parameter is equal to zero, the output voltage will be fluctuating.

D056~DO59	Hold back		
D060	Motor rated current setting	30%~120%	100

This parameter must be set according to the specification on the motor nameplate. The setting value leaving factory is 100% of the Frequency Inverter's nominal output current, allowing the experiential person fine tuning it according to reality.

D061	Motor non-load setting	00%~90%	40
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This parameter set the current in the situation of the motor without load; take the value of D060 as 100%

D062	Setting of the rotation moment compensation	0~20.0, the extra-voltage of the driver output to get higher rotation moment(increase the low frequency moment)	6
------	---	--	---

This value is the compensating quantity for low frequency moment on the V/F curve when the D038=0, taking the output voltage as 100%; please refer to the explanation of D038.

D063~069	Hold back		0
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D070	PID Detective value input terminal	0 : Non-PID function 1 : ACI	0
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When D070=1, the PID function will go into operation, the source of the main frequency D031 should be the value of the panel setting or the analogy terminal AVI input, but should not be the ACI, otherwise the PID function is invalid. The minimum signal of ACI is corresponding with 0Hz and the maximum signal is corresponding with the maximum operating frequency D002.

D071	PID Detective value gain	0~1000%	100%
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This parameter can adjust the detection of PID to satisfy the requirement of the error with the target value.

D072	Proportional constant P	0~1000%	100%
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If I and D are all equal zero, only the proportional control is executed.

D073	Integral time I	0.01~655.00s	1.00s
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Larger the integral time, more slow the respond. If the integral time is too small, then the oscillation will be taken place.

D074	Differential time D	0.00~10.00s	0.00s
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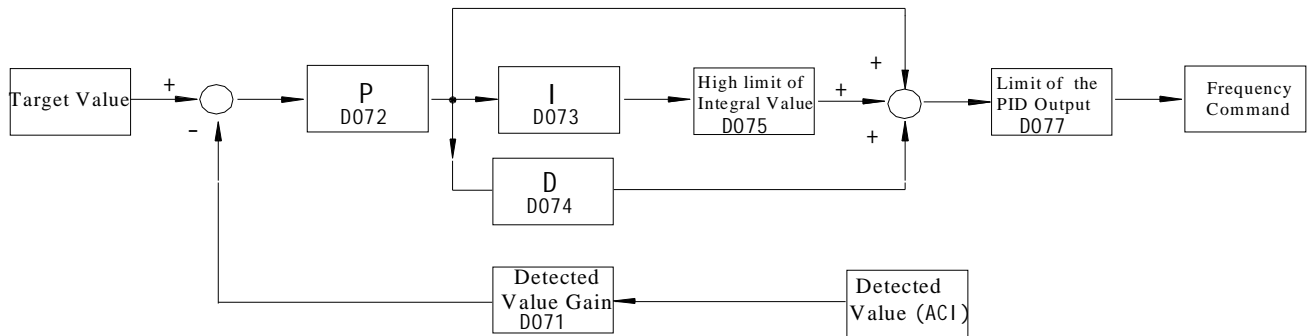
Increasing the value of D will increase the responding rate, but easy to produce the situation of over compensation.

D075	Integral Value upper limit	00~100%.	100%
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The Integral upper limit frequency=the maximum operating frequency* Original Value

D076	Hold back		
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D077	PID Output frequency limit	00~110% Output upper limit frequency=Maximum operating frequency*Original Value	100%
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D080	Setting of the exact position of braking by software	370~430Vdc(220V Series) 640~760V(380V Series)	380/690
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When the Frequency Inverter is in speed-down or braking, the voltage of DC bus will raise. If this voltage \geq D080, can switch on the braking transistor, releasing the excess energy to realize quick braking or speed-down.

D081	Over voltage Speed lost function	0 : Invalid 1 : Valid	1
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While the D081=1, the Frequency Inverter will suspend the speed-down until the DC voltage begin drop. If the D081=0, it will not produce the action of pause, except appearing the over voltage protection (E_OU).

D082	The exact position of over current in speed-up	20~250%	170
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When the driver executes speed-up, if the speed-up is too quick or the motor load is too high, the output current will rise quickly and exceed the value of D082, at that time the driver will suspend its speed-up until the current less than this setting value, the driver can continue its speed-up.

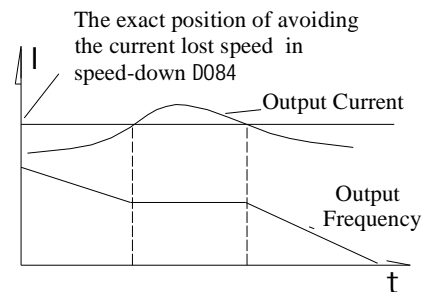
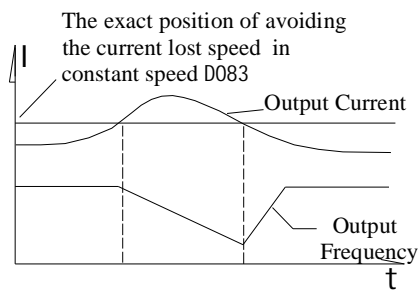
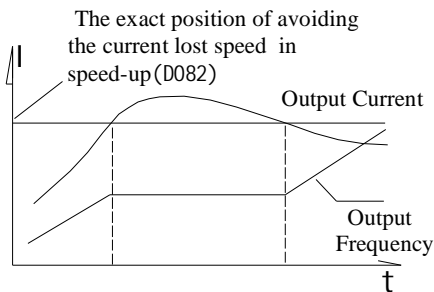
D083	The exact position of over current in operating	20~250%	170
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In the running of the driver, when the output current exceeds the value of D083, the driver can decrease the output frequency to avoid the motor lost its speed. Only after the current dropping, the speed-up then can be re-started, raising the frequency to its setting value.

D084	The exact position of over current in speed-down	20~250%	170
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If the driver is in speed-down and the output current exceeds the value of D084, the driver can suspend the speed-down to avoid the motor lost its speed. Only after the current dropping, the driver can speed down again.



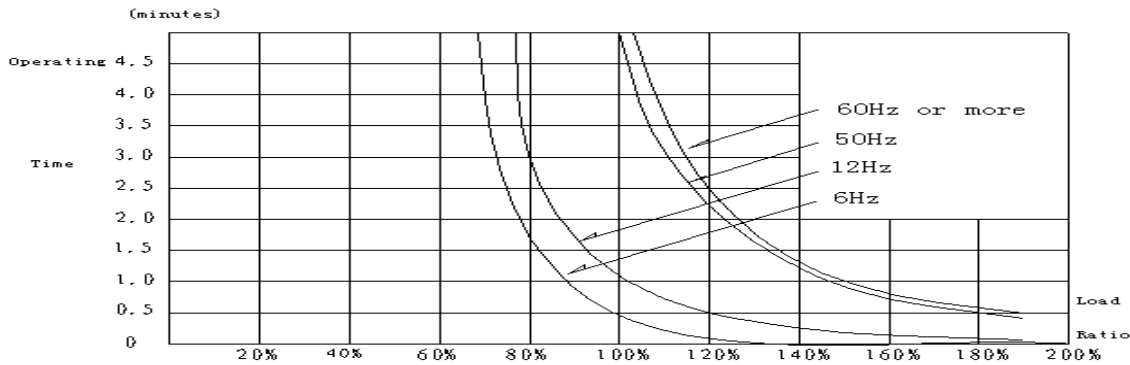
D085	The exact position Of over rotation moment	0~200% Rated Current	150%
D086	Over rotation moment detected time	0.1~20.0s, (D086=0 Not detected)	0

When the output current of the Frequency Inverter is more than D085 and its lasting time more than D086, will stop the motor and give out the over rotation moment indication E_0L2. But if D086=0, will not detect the over rotation moment.

D087	Electronic thermal relay function	0:Non-operating 1 : Open (150%,1 Minute)	0
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The overload protect characteristic of the electronic thermal relay is shown in following diagram:

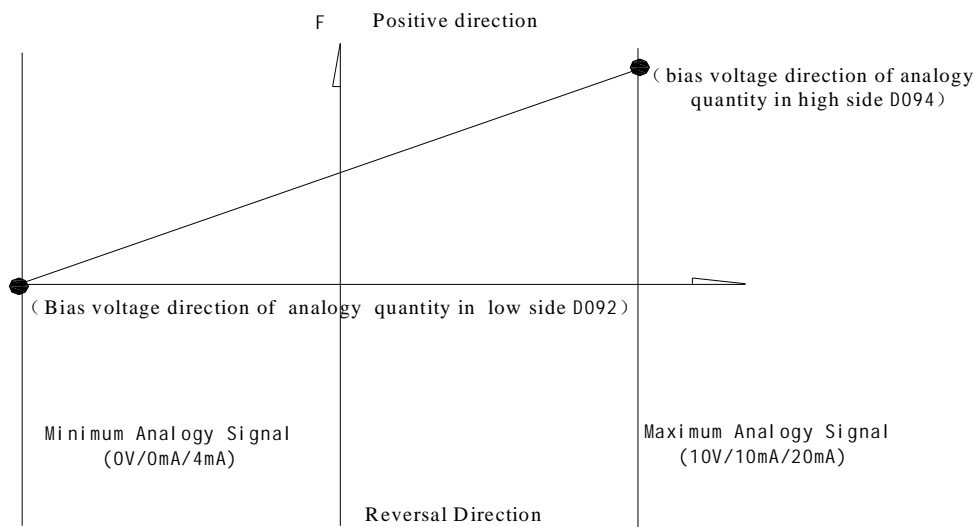


D088~D089	Hold back		
D090	Current input ACI terminal	0 : 4~20mA 1 : 0~10mA	0

When D031=2 this parameter is valid. Besides, when employing PID and the function parameter D070=1, this parameter is also valid. If the input is 0~20mA, can set the D090=1 and take a 500 ohms resistor connecting between the terminals of ACI and COM.

D091	Frequency of analogy quantity in low side	0.0~400.00Hz	0
D092	Bias voltage direction of analogy quantity in low side	0 : Positive direction 1 : Negative direction	0
D093	Frequency of analogy quantity in High side	0.0~400.00Hz	50.00Hz
D094	bias voltage direction of analogy quantity in high side	0 : Positive direction 1 : Negative direction	0
D095	Able Reverse of the negative bias	0 : Unable 1 : Able reverse rotation	0

The former four parameters determine the corresponding relation of the analogy signal ACI/AVI and frequency (including directions).



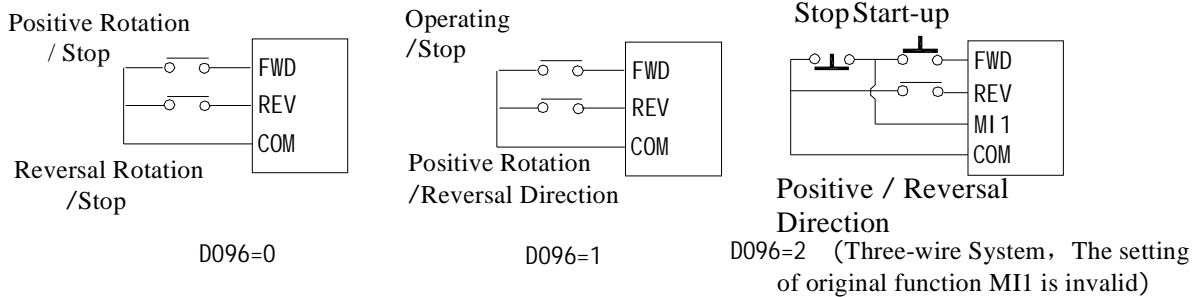
Taking arbitrarily two points on the each vertical axis both of right and left sides can constitute various corresponding relations between the analogy signal and frequency. Combining with other devices these curves can constitute the varieties of some complex applications easily.

D096	Operating control terminal function	0~2	0
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When adopting the external terminals as the main control (D032=1), the terminals FWD and REV are taken as the operating control terminals. There are three operating modes, among them, the REV



terminal in the mode of three-wire system is only valid in starting-up and changing it in operating will have no action.



D097	Hold back		
D098	Multifunctional input terminal MI1	1~20 (Definitions can see the Table below)	1
D099	Multifunctional input terminal MI2		2
D100	Multifunctional input terminal MI3		3
D101	Multifunctional input terminal MI4		4

The D098~D101 can be used to configure the use of the multifunctional input terminals; there are 20 kinds of function can be used in common.

MI1~MI4 functions (If without special explanation the terminal connecting to the terminal "COM" is valid)	00 : Non- function
	01 : Multi-section speed command 1
	02 : Multi-section speed command 2
	03 : Multi-section speed command 3
	04 : Multi-section speed command 4
	05 : Error-reset :
	06 : Speed-up/speed-down forbidden command
	07 : Speed-up/Speed-down time Switch 1
	08 : Speed-up/Speed-down time Switch 2 (The current Speed-up/Speed-down rate is determined by D011~D018)
	09 : Pause, speed-down to 0 , (After close out, keep 0 speed, the PLC will suspend the timing) When the signal is removed, then recover the original operating frequency.
	10 : Urgent Stop (The Frequency Inverter will cut off its output immediately, namely braking with free slide)
	11 : Catenation (normal close) , That is say, if this terminal is connected to COM, the operating is normal, otherwise is braking freely and send out the E_CH error signal.
	12 : Stop
	13 : Positive Point Moving I 14 : Negative Point Moving I
	15 : Second VF curve(as the current maximum voltage frequency, at the same time the Speed-up /speed-down rate will be calculated again)

16,17 :	Hold back
18 :	Counter function (Only in the setting of MI3 and the PLC in running, this function is invalid) the MI3 is fixed allocation as the counter input and MI4 is used to clear away the counter
19 :	Timer function (Only in the setting of MI3 and the PLC in running, this function is invalid) the MI3 is fixed allocation as the counter input and MI4 is used to clear away the counter
20 :	PLC Control (Only in the setting of MI3, this function is valid) the MI3 is fixed allocation as the trigger start-up(single time operating) and the MI4 will stop the PLC..

The using method of the multi-section speed commands: After setting the function number as 01, 02, 03 and 04, can employ the multi-section speed to adjust the motor speed. Now, assume D098=1, D099=2 , D100=3 and D101=4.

Input terminal state of setting to 04 function (MI4)	Input terminal state of setting to 03 function, (MI3)	Input terminal state of setting to 02 function, (MI2)	Input terminal state of setting to 01 function, (MI1)	Corresponding section speed	Input terminal state of setting to 04 function, (MI4)	Input terminal state of setting to 03 function, (MI3)	Input terminal state of setting to 02 function, (MI2)	Input terminal State of setting to 01 function, (MI1)	Corresponding section speed
0	0	0	0	First section speed	1	0	0	0	Ninth section speed
0	0	0	1	Second section speed	1	0	0	1	Tenth section speed
0	0	1	0	Third section speed	1	0	1	0	11 th section speed
0	0	1	1	Fourth section speed	1	0	1	1	12 th section speed
0	1	0	0	Fifth section speed	1	1	0	0	13 th section speed
0	1	0	1	Sixth section speed	1	1	0	1	14 th section speed
0	1	1	0	Seventh section speed	1	1	1	0	15 th section speed
0	1	1	1	Eighth section speed	1	1	1	1	16 th section speed

Note: Connecting the terminal to COM is the state “1” and not connecting the terminal to COM is the state “0”. Above-mentioned is consonant with the rule of binary number. If the user only use 1~3 terminals, then the bits of corresponding place is equal to 0. Consulting above table can get the needed section speed. For example, if only the MI1 function is set as “0”or “1”, and all the other terminals as “0”, at that time if the terminal MI1 and COM are not connected, the corresponding state is the first section speed; else if the terminal MI1 and COM are connected, the corresponding state is the second section speed. Others are as same as the above example. The operating direction and orders of the multi-section speed also determined by the “Run” and “Rev” key or the terminals FWD and REV on the panel. See the D032, D096 and other related parameters.

D103	input terminal respond time	1~20ms, Increasing this value can prevent some unknown interference, but the respond time will delay	10
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This parameter will treat the signal of the numerical digit input terminal as delay and affirm, its unit is 1ms.Increasing this value can prevent the unknown interference causing the error action, but the respond time will delay.



D104	Multifunctional output terminal(Mo1)	0 : Invalid	0
D105	Multifunctional output terminal(Mo2)	1 : In operating	0
D106	Multifunctional output terminal(Mo3)*	2 : Malfunction display	0
D107	Multifunctional output terminal(Mo4)*	3 : Zero speed	0
		4 : Arbitrary frequency 1 Arrive	
		5 : Arbitrary frequency 2 Arrive	
		6 : frequency district Arrive	
		7 : Counter/Timer arrive	
		8 : Hold back	
		9 : Display in program operating	
		10 : Program period completed(keep0.5s)	
		11 : Low voltage alarm	
		12 : Overload alarm	
		13 : Driver preparing completed 14 : Standby 15 : Standby	

Those four parameters can be used to set the output terminal's function. According to various models can be configured either as the relay output or the output of optical coupler OC (* for some models the Mo3/Mo4 is not draw out). The concrete details can see the wiring schedule diagram. The valid action is "Relay Switch on" or "the Optical Coupler OC is break-over".

D108	Multifunctional output terminal(AFM), 0~10V output. maximum load ability 80mA	0 : Frequency meter(0~ maximum operating frequency) 1 : Ampere meter (0~200% rated current) 2 : Voltage meter(0~150% rated voltage) 3 : The power factor of the load (cos90~cos0) 4 : Frequency reach 1(0 or +10V) 5 : Frequency reach 2(0 or +10V) 6 : Frequency district reached	0
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The AFM output is the PWM signal; function 0~3 is for the continuous PWM signal; function 4~6 is for 0V/10V, utilizing this terminal can connect to the indicate meter.

D109	AFM Output gain	0~100%	100%
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This parameter can make the AFM output to fit the various range of measuring meter.

D110	Arbitrary frequency reaches 1	0~400.00Hz	0.00
D111	Arbitrary frequency reaches 2	0~400.00Hz	0.00

The compared values of frequency 1 and 2 are used to the 4 and 5 functions of multifunctional terminal. When the output frequency of the Frequency Inverter is more than or equal to this value, the corresponding output terminals operate, and then can convenient the user make the corresponding control connecting line. When employing the output terminal function 6, only the output frequency of the Frequency Inverter being between D110 and D111 then can make the output terminal operates.

D112	CTC Setting value	0~65500 (Timer unit: Sec.) Note: the CTC is the abbreviation of the Timer/Counter	0
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Used to the setting value of Timer/Counter, cooperating with the use of multi-functional input terminal function 18/19.

113~119	Hold back		
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D120	Simple PLC function	0 : The function without using program 1 : Single time operating 2 : Operating in circulation	0
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Simple PLC Programmable Operating Mode

Employing the PLC can let the Frequency Inverter Operating in different periods (time) with various speeds, according to its program.

When setting the d120=1 or 2, the PLC can be used.



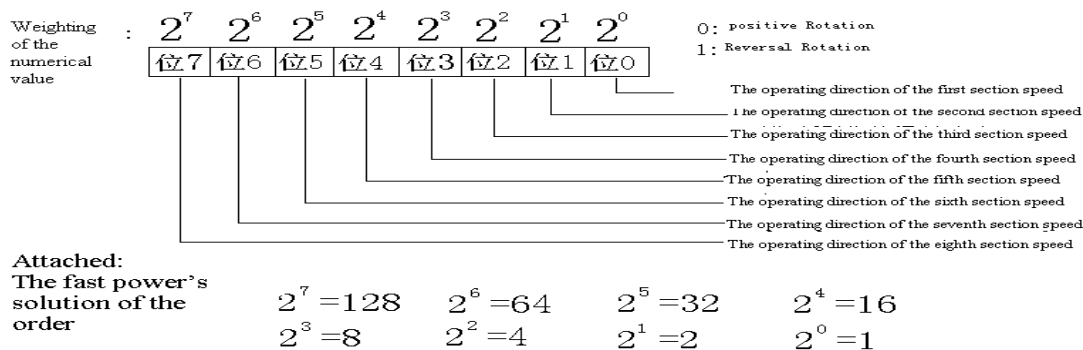
1. When setting the operating command source d032=0, the start-up and stop of the Frequency Inverter is controlled by the “RUN/STOP” key on the panel(the affect of “REV” key is as same as the “RUN” key really)

2. When setting d032=1, the simple PLC can be start-up.

Note: If setting the external terminals as the main control, then D096=0/1 and the PLC is in the one time's operating mode. After the one time's operating is finished, if start-up again is needed, it is required to send out a stop signal and then an operating signal. Only satisfying this condition, the start-up then can be valid. (In external terminal control state, the meaning of the reverse rotation command is as same as that of the positive rotation because the practical operating direction is determined by the direction set in advance). When the operating of PLC is finished, the indicator CTC will be bright.

I The using method of the PLC:

1. First of all, should set the d000 ~ d122~d136 to the speed value needed, the operating direction of each section speed is determined by the corresponding bits of the parameter d137(for the direction of the first~8th section speed) and d138(for the direction of the 8th~16th section speed) as the following picture. The parameters d137 and d138 are the binary number, but in setting, these two parameters should be converted to decimal number.



Example: Setting the first, second, third, fourth and seventh section speed being positive rotation and the fifth, sixth and eighth section being reversal rotation, then the Cd67 expressing in binary is (10110000).

Convert it to decimal number, the value is:

The decimal number converted=(1×2⁷)+(0×2⁶)+(1×2⁵)+(1×2⁴)+(0×2³)+(0×2²)+(0×2¹)+(0×2⁰)

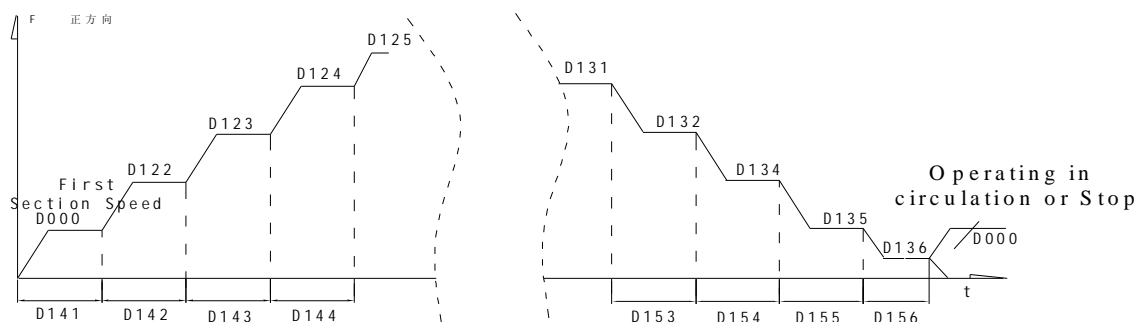
According to powers of the every bit, the above value should be:

The decimal number = 128+0+32+16+0+0+0+0=176.

2. If requiring the PLC operating in circulation after start-up, should set d120=2.

3. Setting the running time of each section speed d141~d156. If the user does not require the most 16 sections speeds, can merge the sections so as to extend the range of the running time. If setting certain section speed time=0, that is to say, in practical operating the Frequency Inverter would jump over this section speed and execute the next section speed immediately.

4. The schedule diagram for the PLC operating:





Note:

1. If the setting main frequency is originated from d031=1 or 2(Analogy Setting), the above-mentioned D000 (first section speed) will be replaced by variable analogy signal.
2. The running time is counted from arriving of the command of the changing frequency and includes the time of speed-up and down. The above diagram assumes the operation only in one direction. If in running the operating direction has changed one or more than one times, therefore the time of wasting on the speed-up and down become more considerable. When the user is strict with the timing, it is needed to consider these additional time.
3. If the user has defined the pause terminal, the pause signal is also valid for the PLC. Connecting the pause terminal to COM, the Frequency Inverter will speed down to zero and suspend the timing inside. Once the connecting line between the pause terminal and COM is break, the Frequency Inverter will continue its operating from the foregoing break point
4. In the PLC operating, the indicator CTC will be twinkling and after the PLC operating the indicator CTC will be bright normally.

D121	Hold back		
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D122 ~D13 6	Second~16 th section speed	0.01Hz~D002	
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D137	First~8 th section speed Operating Direction	0~255, First~8 th section speed operating direction, can see the paragraph of the using method of the PLC.	0
D138	Ninth~16 th section speed operating direction	0~255, 9 th ~16 th section speed operating direction, can see the paragraph of using method of the PLC.	0

D139 ~D14 0	Hold back		
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D141 ~D15 6	Second~16 th section speed running time See the using method of PLC	0~65000s	0
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D157 D159	Hold back		
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D160	Communication Address	01-254	1
D161	Communication Rate(Baud rate)	0 : 4800 Band/s 1 : 9600 Band/s 2 : 19200 Band/s 3 : 38400 Band/s	1
D162	Transmitting Error Treatment	0 : Continue Operating 1 : Warming and Deceleration braking 2 : Hold back 3 : Hold back	0
D163	Communication Pattern	0 : 7,N,2 for ASCII 1 : 7,E,1 for ASCII 2 : 7,O,1 for ASCII 3 : 8,N,2 for RTU 4 : 8,E,1 for RTU 5 : 8, O,1 for RTU	0

Note: The RS485 Communication Port of 0.75/1.5KW model does not be drawn out; the others can see the paragraph of RS485 in the last part of this Operating Instruction

D164~D1 67	Hold back		
---------------	-----------	--	--

D168	Total running time(Hours)	Record the operating total time	0
D169	Total running time(Sec.)	Record the operating total time	0



Once the Frequency Inverter is online, the Timing begins its operation to record the total time in operating. The total time =D168 (Hours) +D169 (Sec.), the initializing value manufactured is 0.

D170	Error record 1	Up-to-date error record °	--
D171	Error record 2	The last error record °	--
D172	Error record 3	The last but one error record °	--

When the Frequency Inverter is in fault, it will record the error signal automatically. The users can see the following Error-Code contrast table.

D173	Clear the error	When Setting to 1, pressing the “PROC” key will clear the error record	0
------	-----------------	--	---

This function will make the D170~D172=0.

D174	The times of Error Reset	0~5, 0: Means not limit the times	5
------	--------------------------	-----------------------------------	---

Sometimes the Frequency Inverter may produce the serious errors such as the short circuit of the motor, machinery blocking up and etc. For avoiding reset and start-up repeatedly in the error state so as to damage the Frequency Inverter, you can set this value to 1~5. When the times of reset and start-up reach this value, the Frequency Inverter will be locked. Only after power cutting off and putting on again, the operating can be recovered.

D175	Hold back		
------	-----------	--	--

D176	Recover the values manufactured	When setting this parameter to 1, Press the “PROC” key will recover the default parameters to the values leaving factory.	0
------	---------------------------------	---	---

Because the parameters of the Frequency Inverter are so much, that may make the user easily to adjust it in disorder, employing the function of D176 can recover the parameters quickly to the values manufactured. But needing note, that before setting the parameters again, make sure the D001=1

D177	Hold back		0
------	-----------	--	---

D178	Version number	03.11	Unable to change
D179	Driver code	0~30	Unable to change

The code of the driver determines the capability and specification of the Frequency Inverter. The display of the current in starting up is the rated current of the driver model.

20V Series Power(KW)	0.4	0.75	1.5	2.2	3.7	5.5	7.5	10.0				
Driver Code	0	1	2	3	4	5	6	7				
Rated Current (A)	2.5	5.0	7.0	10.0	17.0	25.0	33.0	49.0				
80V Series Power(KW)	0.75	1.5	2.2	3.7	5.5	7.5	11.0	15	18.5	22	30	37
Driver Code	8	9	10	11	12	13	14	15	16	17	18	19
Rated Current (A)	3.0	4.2	5.5	8.5	13.0	18.0	24.0	32.0	38.0	45.0	60.0	73.0
80V Series Power(KW)	45	55	75	90	110	132	160	185	200	220	300	
Driver Code	20	21	22	23	24	25	26	27	28	29	30	
Rated Current (A)	91.0	110	152	176	210	253	304	340	380	426	605	

D180 ~D200	Hold back		
---------------	-----------	--	--

Employing the Braking Resistor

The braking resistor is mainly used in the places of frequently manipulation of rapidly speed-down and stops or used to shorten the speed-down time for the large inertial load. Users may purchase it from our company according to their requirement or purchase the appropriate resistors in market by yourselves. The table below can be referred.



Motor power(220VS model)	0.75Kw	1.5KW	2.2KW	3.7KW	5.5KW
Braking resistor	80W-200Ω	300W-100Ω	300W-70Ω	400W-40Ω	500W-30Ω
Motor power (380VT model)	0.75KW	1.5KW	2.2KW	3.7KW	5.5KW
Braking resistor	80W-750Ω	300W-400Ω	300W-250Ω	400W-150Ω	500W-100Ω

For the users who have no the braking requirement can use the Frequency Inverter without braking resistor. But they ought to adjust appropriately the drop-out time (D012), preventing over voltage protect、 over current protect and urgent current limiting protect.

Notes:

1. The terminals P and PR should not be in short circuit; otherwise the discharge transistor inside the Frequency Inverter will be burned up.
2. The braking resistor should be put in high-temperature resistant and unflammable place, otherwise may lead to the danger of fire.

Abnormity Protect and Processing Method

When the Frequency Inverter present itself malfunctions, it will stop automatically. At that time the digital tube display the error code, which list below is provided for the reference for user taking the processing measures:

Table4 Error Code

Code Displayed	Code Meaning	Processing Method	Error Record No.
	Non-exception record		0
E o	Hardware protection	Inspect whether existing short-circuit, rotation block up, and the situation of the starting quickly but the motor has not stop to steady.	1
E o L A	Over current in speed-up	Commonly caused by the too quickly speed-up , note adjust the speed-up time.	2
E o L n	Over current in constant speed	Attention to if provided a sudden load.	3
E o L d	Over in speed-down	Commonly caused by the too quickly speed-down, attention to adjust the speed-down time.	4
E o U	Over voltage	Inspect whether the power is over-voltage, speed-down or parking is too quick as so to cause the pump up voltage is too high(can increase the value of the speed-down time)	5
E o H	Driver over heating	Inspect whether the ambient temperature is too high or the Frequency Inverter is well heat elimination and well ventilated or the load is too high .	6
E o L	Electronic thermal relay In action	Inspect whether the motor power is over that of the Frequency Inverter, or under the state of low speed and large current (Pay respects to the characteristic diagram of the Electronic Thermal Relay and over load protection)	7
E o L 2	Over-moment protection action	Over the setting value of the rotation moment, please check the values of the related parameter of the over rotation moment and external rotation moment.	8
E L U	Low voltage	The power voltage is too low and whether existing the voltage drop of bus and taking place the power cutting off.	9
E L H	Operating catenation break	The catenation terminals in D098~D101 breaks, need connect it on and reset the Frequency Inverter, and then the normal operation can recover..	10

RS485 Communication

In employing the RS-485 communication,you need set the communication address of each Frequency Inverter and the address must not same with each other in a home-concatenation. The communication protocol adopts the MODBUS ASCII pattern. Each Byte is consisted of 2's ASCII characters. As 64Hex express '64', is consisted of '6' (36Hex) and '4' (34Hex) respectively.



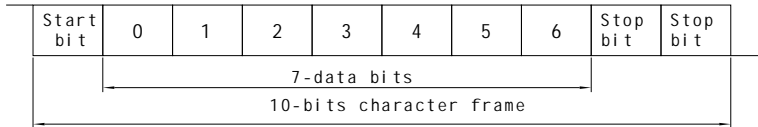
1. Coding Meaning:

Character	'0'	'1'	'2'	'3'	'4'	'5'	'6'	'7'
ASCII Code	30H	31H	32H	33H	34H	35H	36H	37H
Character	'8'	'9'	'A'	'B'	'C'	'D'	'E'	'F'
ASCII Code	38H	39H	41H	42H	43H	44H	45H	46H

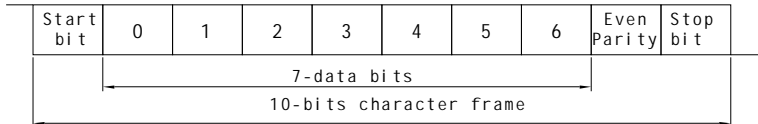
2 Character Structure:

2.1 10-bit Character Frame (For ASCII)

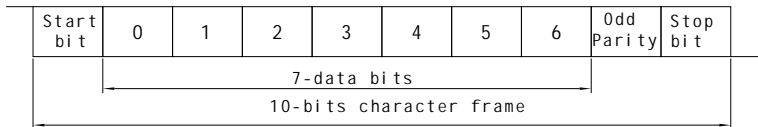
Data Pattern 7. N. 2



Data Pattern 7. E. 1

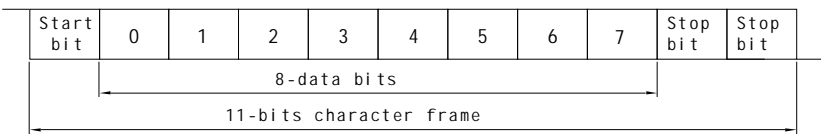


Data Pattern 7. O. 1

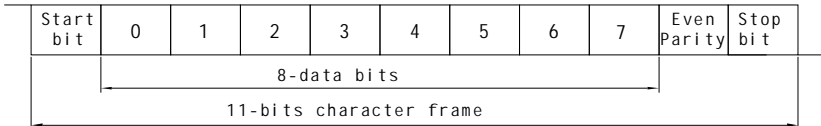


2.2 11-bit Character Frame(For RTU)

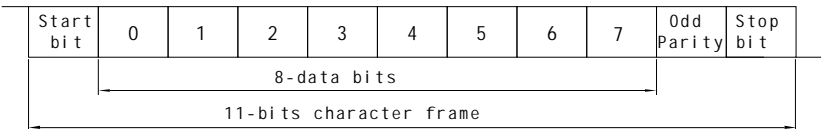
Data Pattern 8. N. 2



Data Pattern 8. E. 1



Data Pattern 8. O. 1



3 Pattern of the Communication Data :

ASCII Pattern:

STX	Start Character=':' (3AH)
Address Hi	Communication Address: consisted of 2 Binary codes of 8-bit
Address Lo	
Function Hi	Function Code: consisted of 2 Binary codes of 8-bit
Function Lo	
Data(n-1)	Data Content : n*8-bit Data Content . consisted of 2 Binary codes of 8-bit (n<=25)
.....	
Data0	
LRC CHK Hi	LRC inspect code, consisted of 2 Binary codes of 8-bit
LRC CHK Lo	
END Hi	End character: END Hi =CR(0DH) , END Lo =LF(0AH)
END Lo	



3.2 RTU Mode :

START	Keep the non-input signal $\geq 20\text{ms}$
Address	Communication Address: 8-bit address Binary bit
Function	function Code: 8-bit, Binary bit address
Data(n-1)	Data Content : n*8-bit Data content (n ≤ 16)
.....	
Data0	
CRC CHK Low	CRC inspect code, consisted of 2 Binary codes of 8-bit
CRC CHK High	
END Hi	Keep the non-input signal $\geq 20\text{ms}$

3.3 function Code:

03H: Read out the content of register; 06H: Write a WORD to register; 08H: Loop Surveillance

3.3.1 Function Code=08H, Loop Surveillance

RTU Mode: Inquire Pattern:

Answer Pattern:

Address	01H		Address	01H
Function	08H		Function	08H
Sub-Func-Hi	00H(arbitrarily)		Sub-Func-Hi	00H
Sub-Func-Lo	00H(arbitrarily)		Sub-Func-Lo	00H
Data content	12H(arbitrarily)		Data content	12H
	34H(arbitrarily)			34H
CRC Lo	EDH		CRC Lo	EDH
CRC Hi	7CH		CRC Hi	7CH

ASCII Mode: Inquire Pattern:

Answer Pattern:

STX	‘.’(3AH)		STX	‘.’
Address	‘0’		Address	‘0’
	‘1’			‘1’
Function	‘0’		Function	‘0’
	‘8’			‘8’
Sub-FunHi	‘0’		Sub-FunHi	‘0’
	‘0’			‘0’
Sub-FunLo	‘0’		Sub-FunLo	‘0’
	‘0’			‘0’
Data (arbitrarily)	‘1’		Data (arbitrarily)	‘1’
	‘2’			‘2’
	‘3’			‘3’
	‘4’			‘4’
LRC Check	‘B’		LRC Check	‘B’
	‘1’			‘1’
END	CR (0DH)		END	CR
	LF (0AH)			LF

3.3.2 Function Code =03H, for reading out the content in the register.

Example: from the Start Register (address is 2000) reading out 2 numbers of data contents in succession, and assuming the register (2000) =0, (2001) =1388H, the RTU Mode of this example is shown as below and the ASCII pattern can see the ASCII pattern in 3.3.1.

RTU Mode: Inquire Pattern:

Answer Pattern:

Address	01H		Address	01H
Function	03H		Function	03H
Data address	20H		Number of data (Count by byte)	04H
	00H		Content of data (Address 2000)	00H
Number of data (Count By word)	00H			00H
	02H		Content of data (Address 2001)	13H
CRC Low	CFH			88H
CRC High	CBH		CRC CHK low	F7H
			CRC CHK high	65H



3.3.3 Function Code=06H, for writing a WORD in the temporary register

Example : For the address 01H of driver, write 1388H to parameter d000 ◦

RTU Mode: Inquire Pattern

Answer Pattern::

Address	01H		Address	01H
Function	06H		Function	06H
Data address	00H		Data address	00H
	00H			00H
Data content	13H		Data content	13H
	88H			88H
CRC low	84H		CRC CHK low	84H
CRC high	9CH		CRC CHK high	9CH

3.4 The extra-answer of the Error –Communication

As an example: Writing in a not existed address will answer the following error-information.

RTU Mode:

Address	01H
Function	86H
Except code	02H
CRC CHK low	C3H
CRC CHK high	A1H

Communication Error Code	Explanation	Communication Error Code	Explanation
01H	Function data Error		
02H	Address error		
03H	Numerical value error		
04H	System busy		

Inside, take the original function Number (AND 80H) to return, (AND is the symbol of “logic and”); and return the error code from Except Code (See right-upper table)

3.5.1 ASCII Mode Check Code (LRC Check)

The Data is the 2’s base complement of the sum from Address to Data Content.

As $01H+08H+00H+00H+12H+34H=4FH$,

Taking the base complement=B1H ◦ (Refer the Example of Loop Surveillance)



3.5.2 RTU Mode Check Code(CRC Check)

From Address to Data Content, the Computer program using C language is as below:

```
unsigned char* data;
unsigned char length;
unsigned int crc_chk(unsigned char * data, unsigned char length)
{ int j;
  unsigned int reg_crc=0xffff;
  while(length--) {
    reg_crc^=*data++;
    for(j=0; j<8;j++){
      if(reg_crc&0x01)
        { reg_crc=(reg_crc>>1)^0xa001;}
      else { reg_crc=reg_crc>>1; }
    }
  }
  return reg_crc;}
```

3.6 Definition of the Parameter's Address

The Power0000~00FF are the parameters of d000~d255.

2000: RS485 Operating Command Register, the meaning of each bit is as below:

bit0/1: 00:Non-function 01:Stop 10:Start-up 11:JOG Start-up

bit4/5: 00:Non-function 01:Positive Direction 10:Negative Direction 11:Alter Direction

bit6 =1: Urgent Stop (Free Parking) bit7=1: Reset Bit2/3 Not-used Ought to setting them 0

2001: RS485 frequency Register (50.00Hz express as 5000d, namely 0x1388)

2002: Hold back

2100: Operating State Register: bit0: In Point Moving ; bit1: In Direct-Current Braking

bit2: Frequency tracking; bit3: In Operating;

bit4: Operating Direction,0 is Positive; bit5/6/7; Not Care

2101: Error Number Register: Refer the table of Error Code

2102: Indicator State: bit0: Bright at Positive Rotation; bit1: Bright at Reversal Rotation;

bit2: CTC indicator bright; bit3: Communication Indicator

2103: Operation staying frequency (Unit: 0.01Hz)

2104: Output frequency (Unit: 0.01Hz)

2105: Output Current (Unit: 0.1A)

2106: Direct Current Bus Line Voltage (Unit: 0.1Vdc)

2107: Output Voltage (Unit: 0.1Vac)

2108: C OS(Angle of Factor)(Unit:0.01)

2109: The Temperature of the Drive Module(Unit:1℃)

210A: Hold back

210B: Hold back



Guarantee Period and After-Sale Service

1. The range of guarantee period only appoints the main body of the Frequency Inverter.
2. The guarantee period is during the time that YTB series Frequency Inverter is used normally in 12 months after buying the invoice (according to the invoice date or the date of the product leaving factory). If the products are broken down or damaged when it is used normally and the date is in the guarantee period, our company will maintain it free of charge. But our company will give paid maintenance to the product exceed guarantee period.
3. Even in guarantee period, such as the following situations are taken place, our company will collect certain maintenance cost:
 - ▲ Mechanical disorder or damage caused by operations which are not according to the requests of the Operating Instructions.
 - ▲ Damage is caused by drop or transport course after buying.
 - ▲ Mechanical disorder or damage caused in the unusual situation such as the earthquake 、 fire 、 flood 、 lighting strike and other irreversible natural calamity or the abnormal power voltage.
 - ▲ Damage is caused by using the Frequency Inverter in the nonnorma function.
4. Within the 30 days after buying, if the damage is really for the product quality problems (not belong to the above-mentioned four situations) and the outward appearance has no obvious phenomenon of defiling, our company will change the product with same specification.
5. User's on-the-spot service charge is calculated according to the real expenses, is undertaken by the user. If there are other contracts, deal with the principle that the contract has priority.
6. Keep the guarantee card well. And at the after-sale service, please give the guaranteeing card to the maintenance unit for checking.
7. If user has any question, please touch with the office or agent of our company nearby, or contact with the general headquarters of our company directly.

Guarantee Card

The Guarantee Card of the YTB Series Frequency Inverter

User Unit:	
Address in Detail: Mail Code:	
Tel. (Fax) :	Related Person:
The Model, Specification and Power of the Frequency Inverter :	Manufacturing No.:
Equipment Name and Manufacturing Plant:	Purchase Date:
Failure Cause and Phenomenon:	
Record On-Site by the Service Person:	
The Matters Serviced :	
Sign of the Service Person: Tel: Month: Date: Year:	
Valuation to the Service quality By User: <input type="checkbox"/> Good <input type="checkbox"/> Better <input type="checkbox"/> Ordinary <input type="checkbox"/> Bad	
Other Opinion:	
Sign of User: Month: Date: Year	
Record of Return Visit by the User Service Center	
<input type="checkbox"/> Return Visit By Telephone <input type="checkbox"/> Return Visit By letter	
Others:	
Sign of the Head of Technical Service: Month : Date: Year:	