HFinverter

ISO9001 Certified

# Huifeng Inverters

## F1000-G Series

*0.4～400KW*

# Instruction Manual

*DESIGN WITH INDIVIDUATION* *SERVICE WITH ADDED-VALUE*

# CONTENTS

# I. Product

Power range:0.4～400KW; 3 kind of structure mode; ISO9001 certified.

Proper grounding with grounding resistance not exceeding 4Ω; ensure good ventilation; separate wiring between control loop and power loop; shielded wire is used as signal wire.

This manual offers a brief introduction of the installation connection for F1000-G series inverters, parameters setting and operations, and should therefore be properly kept. Please contact manufacturer or dealer in case of any malfunction during application.

## 1.1 Nameplate

Taking for instance the F1000-G series 15KW inverter with three-phase input, its nameplate is illustrated as Fig 1-1.

3Ph: three-phase input; 380V, 50/60Hz: input voltage range and rated frequency.

3Ph: 3-phase output; 32A, 15KW: rated output current and power; 0.50～400.0Hz: output frequency range.

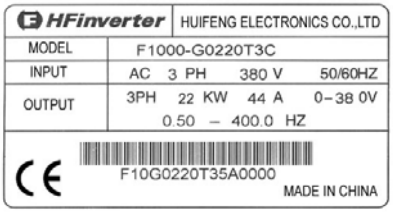



Fig 1-1 Nameplate Illustration

## 1.2 Model Illustration

Taking the same instance of 15KW inverter with three-phase, its model illustration is shown as Fig 1-2.

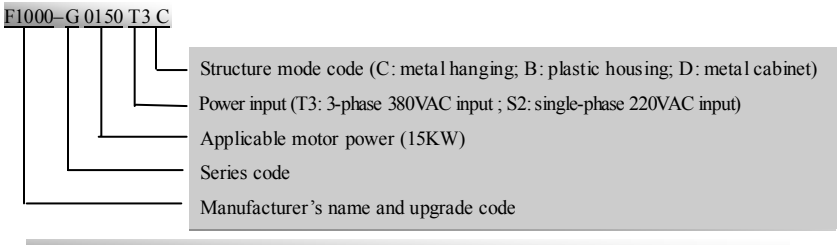



Fig 1-2 Product Model Illustration

## 1.3 Appearance

The external structure of F1000－G series inverter is classified into plastic and metal housings. Only wall hanging type is available for plastic housing while wall hanging type and cabinet type for metal housing.

Good poly-carbon materials are adopted through die-stamping for plastic housing with nice form, good strength and toughness.

Taking F1000－G0015XS2B for instance,

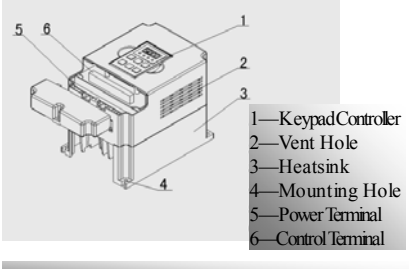
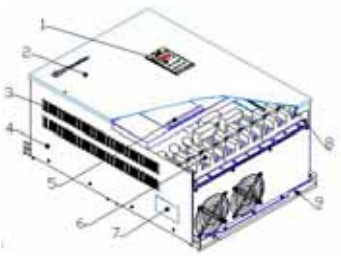



Fig 1-3 Appearance of Plastic Housing

the external appearance and structure are shown as in Fig 1-3. Process of low sheen and silk screen printing are adopted on the housing surface with soft and pleasant gloss. Meanwhile, metal housing uses advanced exterior plastic- spraying and powder-spraying process on the surface with elegant color. Taking F1000－G0220T3C for instance, its appearance and structure are shown as in Fig 1-4, with detachable one-side door hinge structure adopted for front cover, convenient for wiring and maintenance.



1.Keypad Control Unit
2.Front Panel
3.Vent
4.Body
5.Control Terminal
6.Power Terminal
7.Nameplate
8.Outlet Hole
9.Fixed Hole

## 1.4 Technical Specifications

Table1-1 **Technical Specifications for F1000－G Series Inverters**

| | Items | Contents |
|---|---|---|
| Input | Rated Voltage Range | 3-phase 380V±15%; single-phase 220V±15% |
| | Rated Frequency | 50/60Hz |
| Output | Rated Voltage Range | 3-phase 0～380V;3-phase 0～220V |
| | Frequency Range | 0.50～400.0Hz |
| V/FContrtol | Control Mode | Linear V/F control; space voltage vector+random PWM |
| | Frequency Resolution | Max 0.01Hz, adjustment allowed |
| | Torque Promotion | Torque Promotion curve (V/F) can be set within 1～16; |
| | Stall Prevention | Current output is restricted, and threshold current can be adjusted. |
| | Overload Capacity | 150% rated current,1minute |
| Operation Function | Frequency Setting | Potentiometer or external analog signal (0～5V, 0～10V, 0～20mA); keypad (terminal)▲／▼ keys, external control logic and PLC setting. |
| | Start/Stop Control | Passive contact switch control or keypad control |
| | Frequency Change Rate | 0.1～3000S (time required for certain frequency change) |
| Protection Function | Input out-phase, input under-voltage, DC over-voltage, over-current, over-load, current stall, over-heat, external disturbance | |

| | | |
|---|---|---|
| Display | LED nixie tube showing present output frequency, present rotate-speed(rpm), present output current, present output voltage, present linear-velocity, types of faults, and parameters for the system and operation; LED indicators showing the current working status of inverter. | |
| Environment Conditions | Equipment Location | Free of tangy caustic gases or dust |
| | Environment Temperature | -10℃～+50℃ |
| | Environment Humidity | Below 90% (no water-bead coagulation) |
| | Vibration Strength | Below 0.5g (acceleration) |
| | Height above sea level | 1000m or below |
| Applicable Motor | 0.4～400KW | |

## 1.5 Designed Standards for Implementation

*GB/T 12668.2 2002 Stipulation of rated value of AC low voltage electric drive system;

*GB 12668.3 2003 Standard for EMC and the specific experimental methods

*GB 12668.5 security requirements relating to electric, heat and other function.

## 1.6 Precautions

### 1.6.1 Notice for Application

- Installation and application environment should be free of rain, drips, steam, dust and oily dirt; without corrosive or flammable gases or liquids, metal particles or metal powder.
- Environment temperature within the scope of -10℃～+50℃.
- Inverter is installed in a control cabinet, and smooth ventilation should be ensured.
- Do not drop anything into the inverter.
- Never touch the internal elements within 15 minutes after power off. Wait till it is completely discharged.
- Input terminals R, S and T are connected to power supply of 380V while output terminals U, V and W are connected to motor.
- Proper grounding should be ensured with grounding resistance not exceeding 4Ω; separate grounding is required for motor and inverter. No grounding with series connection is allowed.
- No load switch is allowed at output while inverter is in operation.
- AC reactor or/and DC reactor is recommended when your inverter is above 37KW.
- There should be separate wiring between control loop and power loop to avoid

any possible interference.

- Signal line should not be too long to avoid any increase with common mode interference.
- It shall comply with the requirements for surrounding environment as stipulated in Table 1-1 **"Technical Specifications for F1000–G Series Inverter"**.

### 1.6.2 Maintenance

- Cooling fan should be cleaned regularly to check whether it is normal; remove the dust accumulated in the inverter on a regular basis.
- Check inverter's input and output wiring regularly.
- Replace inverter's cooling fan, starting contactor (relay) regularly.
- Check if all terminal wiring screws are fastened and if wirings are aging.

### 1.6.3 Special Warning!!

- Never touch high-voltage terminals inside the inverter to avoid any electric shock.
- All safety covers should be well fixed before inverter is power connected, to avoid any electric shock.
- Only professional personnel are allowed for any maintenance, checking or replacement of parts.
- No live-line job is allowed.

## II. Operation Panel

Two forms and specifications of keypad controllers are available, with "six keys" or "six-key + potentiometer".

Besides the function of "stop" and fault "reset", "stop/reset" key can also be used to switch over of function code in a code group or between two code groups when setting parameters.

Operation panel and monitor screen are both fixed on keypad controller. Two kinds of controllers (with and without potentiometer) are available for F1000-G series inverters, and each keypad controller has two kinds of size. Refer to note for Fig2-1.

### 2.1 Panel Illustration

The panel covers three sections: data display section, status indicating section and keypad operating section, as shown in Fig. 2-1.

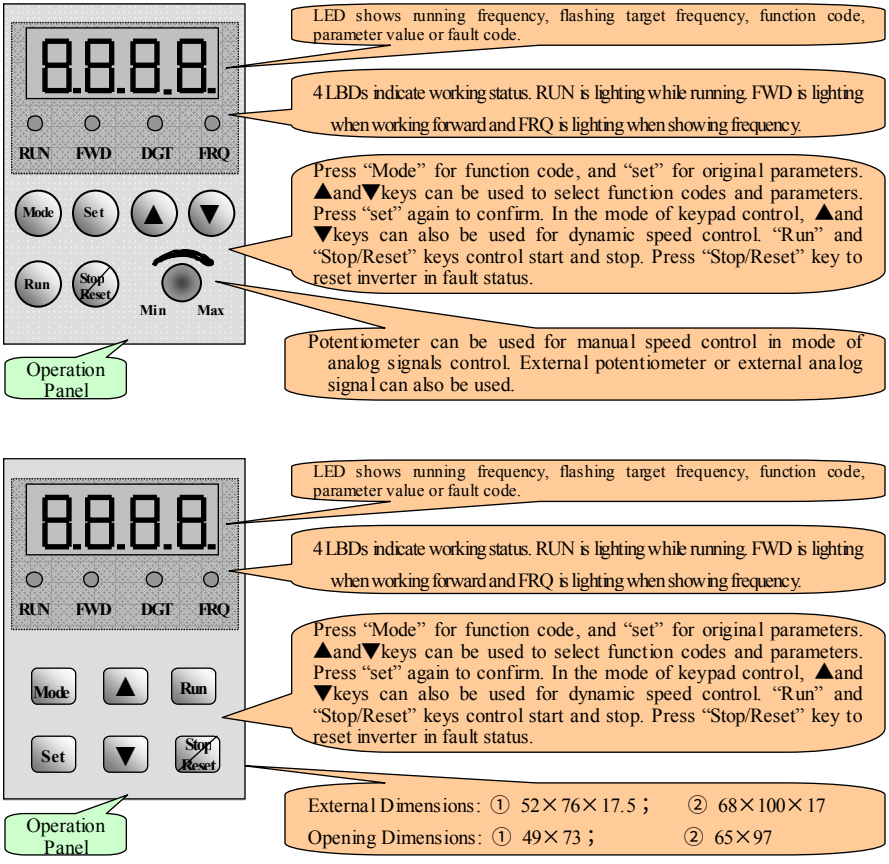



Fig.2-1 Operation Panels in Two Kinds

## 2.2 Panel Operating

All keys on the panel are available for user. Refer to Table 2-1 for their functions.

Table 2-1 **Uses of Keys**

| Keys | Names | Remarks |
|---|---|---|
| Mode | Mode | To call function code and switch over display mode. |
| Set | Set | To call and save data. |
| ▲ | Up | To increase data (speed control or setting parameters) |
| ▼ | Down | To decrease data (speed control or setting parameters) |
| Run | Run | To start inverter; to call jogging operation; to call auto circulating operation; to switch over display mode. |
| Stop/reset | Stop or reset | To stop inverter; to reset in fault status; to change function codes in a code group or between two code groups. |

## 2.3 Parameters Setting

This inverter has numerous function parameters, which the user can modify to effect different modes of operation control. User needs to realize that user's password must be entered first if parameters are to be set after power off or protection is effected, i.e., to call F100 as per the mode in Table 2-2 and enter the correct code. Default value at manufacturer for user's password is 8.

Table 2-2 Steps for Parameters Setting

| Steps | Keys | Operation | Display |
|---|---|---|---|
| 1 | Mode | Press "Mode" key to display function code | F100 |
| 2 | ▲ or ▼ | Press "Up" or "Down" to select required function code | F112 |
| 3 | Set | To read data set in the function code | 5.0 |
| 4 | ▲ or ▼ | To modify data | 9.0 |
| 5 | Set | To show corresponding target frequency by flashing after saving the set data | 50.00 |
| | Mode | To display the current function code | F112 |

## 2.4 Function Codes Switchover in/between Code-Groups

This has more than 140 parameters (function codes) available to user, divided into 9 sections as indicated in Table 2-3.

Table 2-3 **Function Code Partition**

| Group Name | Function Code Range | Group No. | Group Name | Function Code Range | Group No. |
|---|---|---|---|---|---|
| Basic Parameters | F100～F160 | 1 | Reserved | F600～F660 | 6 |
| Run Control Mode | F200～F260 | 2 | Timing control and protection function | F700～F760 | 7 |
| Multi-Speed Parameters | F300～F360 | 3 | | | |
| Terminal Function Definition | F400～F460 | 4 | Analog signals of input/ourput | F800～F860 | 8 |
| V/F Control | F500～F560 | 5 | Communication | F900～F960 | 9 |

As parameters setting costs time due to numerous function codes, such function is specically designed as "Function Code Switchover in a Code Group or between Two Code-Groups" so that parameters setting become convenient and simple.

Press "Mode" key so that the keypad controller will display function code. If press "▲" or "▼" key then, function code will circularly keep increasing or decreasing by degrees within the group; if press again the "stop/reset" key, function code will change circularly between two code groups when operating the "▲" or "▼" key.

e.g. when function code shows F111, DGT indicator will be on. Press "▲"/ "▼" key, function code will keep increasing or decreasing by degrees within F100～F160; press "stop/reset" key again, DGT indicator will be off. When pressing "▲"/ "▼" key, function codes will change circularly among the 9 code-groups, like F211, F311…F911, F111…, Refer to Fig 2-2 (The sparkling "10.00" is indicated the corresponding target frequency values).

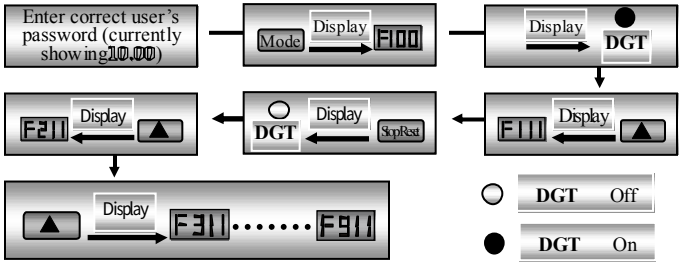



Fig 2-2 Swtich over in a Code Group or between Different Code-Groups

## 2.5 Panel Display

Table 2-4 Items and Remarks Displayed on the Panel

| Items | Remarks |
|---|---|
| HF-0 | This Item will be displayed when you press "Mode" in stopping status, which indicates jogging operation is valid. |
| HF-1,HF-2, HF-3,HF-4 | This Item will be displayed when you press "Mode" in running status. And press "Set' to display relevant contents. HF-1, HF-2, HF-3 and HF-4 correspond to "output current" , "output voltage", "rotate speed" and "linear velocity" respectively. |
| -HF- | It stands for resetting process and will display "0" after reset. |
| O.C.,O.E.,O.L.,O. H.,P.O.,P.F., ERR | Fault code, indicating "over-current", "over-voltage", "over-load", "over-heat", "under-voltage for input", "out-phase for input" and "external interference" respectively. It shows "0" after reset. |
| H.H. | Interruption code, indicating "external intrruption" signal input and showing "0" after reset. |
| F152 | Function code (parameter code). |
| 10.00 | Indicating inverter's current running frequency (or rotate speed) and parameter setting values, etc. |
| 10.00 | Sparkling in stopping status to display target frequency (except for analog signals speed control). |
| 0. | holding time when changing the rotating direction. When "Stop" or "Free Stop" command is ecxcuted, the holding time can be canceled |
| A100、U100 | Output current (100A) and output voltage (100V). Keep one digit of decimal when current is below 100A. |
| Err1 | Indicating error. It shows when parameters are modified; wrong password or no password is entered. |

## 3.1 Installation

Inverter should be installed vertically, as shown in Fig 3-1. Sufficient ventilation space should be ensured in its surrounding. Clearance dimensions (recommended) are available from Table 3-1 for installing the inverter.

Table 3-1 Clearance Dimensions

| Inverter Model | Clearance Dimensions | |
|---|---|---|
| Hanging (<22KW) | A≥150mm | B≥50mm |
| Hanging (≥22KW) | A≥200mm | B≥75mm |
| Cabinet (110~400KW) | C≥200mm | D≥75mm |

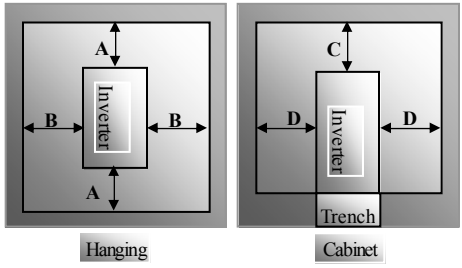
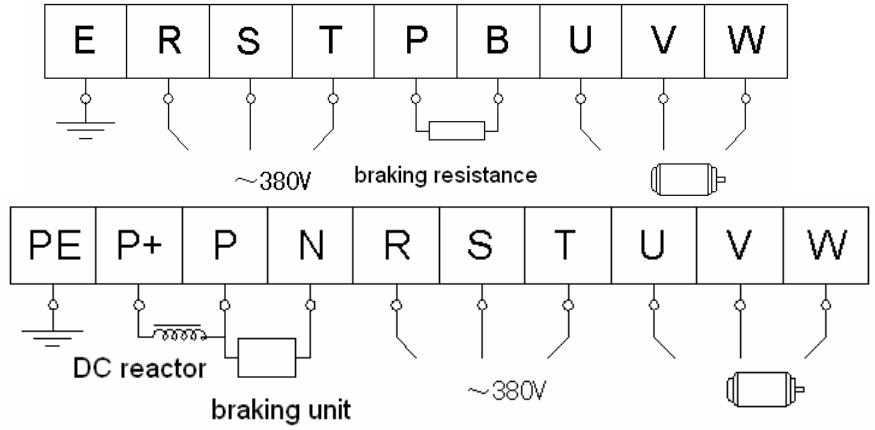



Fig 3-1 Installation Sketch

## 3.2 Connection

- In case of 3-phase input, connect R, S and T terminals (R and T terminals for single-phase) with power source from network and PE(E) to earthing, U, V and W terminals to motor.
- Motor shall have to be ground connected.
- External braking cell may be considered for inverter with single-phase input if load inertia is too large for the built-in braking cell.
- For inverter with 3-phase input and power lower than 15kw, braking cell is also built-in. If the load inertia is moderate, it is Ok to only connect braking resistance with built-in braking cell.




(The figure is only sketch, terminals order of practical products may be different

from the above-mentioned figure. Please pay attention when connecting wires)

Introduction of terminals of power loop

| Terminals | Terminal Marking | **Terminal Function Description** |
|---|---|---|
| Power Input Terminal | R, S, T | Input terminals of three-phase 380V AC voltage (R and T terminals for single-phase) |
| Output Terminal | U, V, W | Inverter power output terminal, connected to motor. |
| Grounding Terminal | PE(E) | Inverter grounding terminal or connected to ground. |
| Braking Terminal | P, B | External braking resistor (Note: no Terminals P or B for inverter without built-in braking unit). |
| | P, N | DC bus-line output, externally connected to braking resistor<br>P connected to input terminal "P" of braking unit or terminal "+", N connected to input terminal of braking unit "N" or terminal "—". |
| | P, P+ | Externally connected to DC reactor |

Wiring for control loop as follows:

A) The following sketch is the control terminals of inverters with single-phase 0.4KW and 0.75KW.

| OUT | 12V | CM | OP1 | OP2 | OP3 | OP4 | OP5 | OP6 | OP7 | OP8 | V1 | V2 | V3 | FM | I2 | TA | TB | TC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

B) The following sketch is the control terminals for single-phase 0.4KW, 0.75KW (built-in braking cell), 1.5KW and 1.5KW (built-in braking cell) inveters.

| A+ | B- | OUT | 12V | CM | OP1 | OP2 | OP3 | OP4 | OP5 | OP6 | OP7 | OP8 | V1 | V2 | V3 | I2 | FM | IM | TA | TB | TC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

C) The following sketch is the control terminals for single-phase 2.2KW inveters.

| OUT | OP5 | OP6 | OP7 | OP8 | V1 | V2 | V3 | I2 | FM |
|---|---|---|---|---|---|---|---|---|---|
| 12V | OP1 | OP2 | OP3 | OP4 | CM | | TA | TB | TC |

D) The following sketch is the control terminals for three-phase 0.75~2.2KW inverters.

| A+ | B- | OUT | 12V | CM | OP1 | OP2 | OP3 | OP4 | OP5 | OP6 | OP7 | OP8 | V1 | V2 | V3 | I2 | FM | TA | TB | TC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

E) The following sketch is the control terminals for three-phase 3.7~400KW inverters.

| OUT1 | OUT2 | +12V | CM | OP1 | OP2 | OP3 | OP4 | OP5 | OP6 | OP7 | OP8 | V1 | V2 | V3 | I2 | FM | IM | TA | TB | TC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

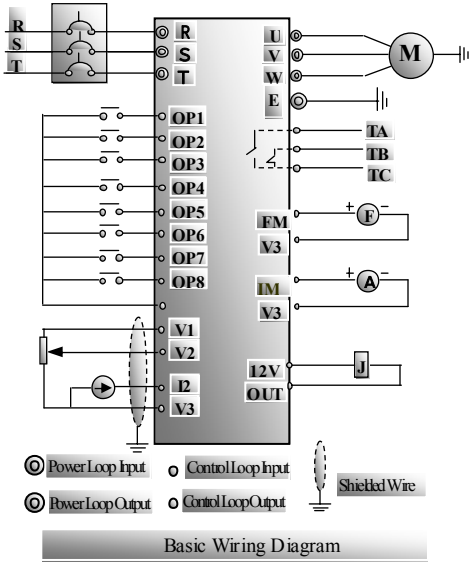
## 3.3 Wiring Recommended

Table 3-2 **Wiring for Power Loop**

| Inverter Model | Lead Section Area($mm^2$) | Inverter Model | Lead Section Area($mm^2$) | Inverter Model | Lead Section Area($mm^2$) |
|---|---|---|---|---|---|
| F1000-G0004S2B | 1.5 | F1000-G0075T3B | 4 | F1000-G1320T3C | 90 |
| F1000-G0007S2B | 2.5 | F1000-G0110T3C | 6.0 | F1000-G1600T3C | 120 |
| F1000-G0007XS2B | 2.5 | F1000-G0150T3C | 10 | F1000-G1100T3D | 90 |
| F1000-G0015S2B | 2.5 | F1000-G0185T3C | 16 | F1000-G1320T3D | 90 |
| F1000-G0015XS2B | 2.5 | F1000-G0220T3C | 16 | F1000-G1600T3D | 120 |
| F1000-G0022S2B | 4.0 | F1000-G0300T3C | 25 | F1000-G2000T3D | 160 |
| F1000-G0007T3B | 1.5 | F1000-G0370T3C | 25 | F1000-G2200T3D | 240 |
| F1000-G0015T3B | 2.5 | F1000-G0450T3C | 35 | F1000-G2500T3D | 270 |
| F1000-G0022T3B | 2.5 | F1000-G0550T3C | 35 | F1000-G2800T3D | 270 |
| F1000-G0037T3B | 2.5 | F1000-G0750T3C | 60 | F1000-G3150T3D | 290 |
| F1000-G0040T3B | 2.5 | F1000-G0900T3C | 60 | F1000-G3550T3D | 325 |
| F1000-G0055T3B | 4 | F1000-G1100T3C | 90 | F1000-G4000T3D | 325 |

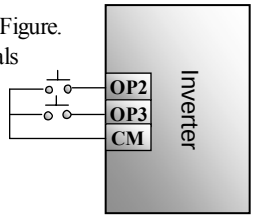
## 3.4 Overall Connection and "Three- Line" Connection

✳ Refer to next figure for overall connection sketch for F1000-G series inverters. Wiring mode is available for various terminals whereas not every terminal needs connection when applied.




Basic Wiring Diagram

"Three-Line" Connection can fulfill start/stop control by using parameter setting and terminal definition, as indicated in the right Figure. If F200=1, F202=1, start/stop command will be excuted by terminals respectively; F409=6, OP2 is defined as running terminal; F410=7, OP3 is defined as stop terminal. When OP2 or OP3 are connected with CM terminal, it will control inverter's start and stop respectively. Take care that these two terminals cannot be connected to CM at the same time.




Three-Line Connection

# IV. Operation

Voltage or current analog signals input; multiple control terminals; coding switch selecting analog singals input range.

Start/stop control terminals, direction terminal, analog signals input/output terminals, function switchover terminal, state-indicating terminal and multiple speed control terminals.

It is essential to correctly and flexibly use control terminals for the operation of inverter. Of course, control terminal are not used separately, but together with corresponding parameter setting. User can make a flexible use of the basic functions of control terminals, with reference to the relevant descriptions in the rest of this manual.

## 4.1 Function of Control Terminal

Table 4-1 Function of Control Terminal

| Terminal | Class | Name | Function | |
|---|---|---|---|---|
| OUT | Output Signal | Running Signal | The value between this terminal and CM during running is 0V, and 12V when it stops. | For function of these output terminals, please refer to mfr's value; it can be changed by modifying the parameter. |
| TA | | Relay Contact | TC: common point; TB-TC: normally closed contact; TA-TC: normally open contact; contact current not exceeding 2A (Voltage not exceeding 250VAC). | |
| TB | | | | |
| TC | | | | |
| FM | | Running Frequency | Real-time output 0～5V or 0～10V; when connected to cymometer, its cathode connected to V3. | |
| IM | | Current Display | Real-time output 0～20mA; when connected to ammeter,showing inverter's output current.(1-phase inverter has no this function) | |
| V1 | Voltage Control | Self-Contained Power Source | 5V self-contained power source available inside inverter for its own use; it can only be used for external use as powersource for voltage control signal with current limit below 20mA. | |
| V2 | | Voltage Analog Signals Input Port | In case of analog signals speed control, voltage signal is input from this terminal. Voltage input range: 0～5V or 0～10V, grounding: V3. When potentiometer is used for speed control, this terminal is connected to iput signals, and grounding to V3. **Cautious: V2 and keypad potentiometer cannot be used at the same time.** | |
| V3 | | Self-contained Power Source Ground | Grounding end of external control signal (voltage control signal or current source control signal), also 5V power source ground of this inverter. | |
| I2 | Current Control | Input Port for Current Analog Signals | In case of analog signals speed control, current signal is input from this terminal. Current input range: 0～20mA, grounding: V3. if 4～20mA is input, lower limit of analog signals input can be adjusted through parameter setting. | |
| 12V | Power Source | Control Power Source | Power: 12± 1.5V, grounding :CM; current for external use: below 100mA. | |
| OP1 | Function Operation | Jogging Terminal | This terminal is connected to CM, inverter will run by jogging. Jogging function of the terminal works both in "Stop" and "Run" states. | The function of these Input terminals is defined as per mfr's value; and may also be defined for other functions by modifying parameters. |
| OP2 | Speed Setting | Multi-Speed Control Terminal | Normally these three terminals are defined to be "three-stage speed" or "seven-stage speed" transfer terminals; and may also use them for other function control. | |
| OP3 | | | | |
| OP4 | | | | |
| OP5 | Function Operation | Free Stop | This terminal is connected to CM during running, inverter will realize free stop | |
| OP6 | | Forward Command | When this terminal is connected to CM, inverter will run forward | |
| OP7 | | Reverse Command | When this terminal is connected to CM, inverter will reverse. | |
| OP8 | | Fault Resetting | Make this terminal connected to CM in fault state to reset inverter | |
| CM | Common Port | Control Power Source Ground | Ground for 12V power source and other control signal. | |

## 4.2 ＊Coding Switch

A red two-digit coding switch SW1 is available around inverter's control terminal block, as shown in Fig 4－1.

The function of coding switch is to select the input range (0～5V/0～10V) of input Terminal V2 for voltage-type analog signals, and must be used together with Function Code F209. F209 is used to select the input channal of analog signals, to be interpreted as:

F209 { 0,select V2 Channel
1,Reserved
2,Select I2 Channel

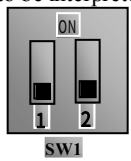



Fig 4-1 Coding Switch

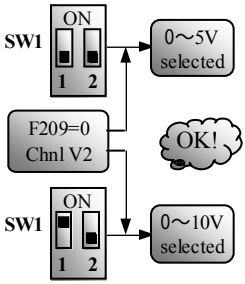



Fig 4-2 Application of Coding Switch

Fig 4-2 shows how the coding switch of inverter selects the range of analog signals. The black blocks in the diagram indicate the position of SW1.

Select Channel V2 in the mode of analog signals speed control, the different position of coding switch can be chosen 0～5V or 0～10V.

**Please note that coding switch can only be used in mode of analog signals speed control and signal of speed control is input from external terminal. When potentiometer of keypad is selected for the input voltage analog speed control, coding switch must select 0～5V. Keypad voltage analog signals and terminal voltage analog signals can not be entered at the same time.**

## 4.3 Main Functioins

There are a total 14 kinds of speed control running modes with F1000－G series inverters covering *jogging, keypad, terminal, "three-stage speed", "seven-stage speed", "auto circulating", analog signal, combination of keypad and terminals, combination of "three-stage and seven-stage speeds" with terminal, combination of "three-stage and seven-stage" with keypad, combination of analog signals and "three-stage speed", combination of analog signals and "seven-stage speed", coding speed control and communication speed control.* All these must work with corresponding parameter setting, as shown in Fig 4-3.

F1000－G series inverters also have other efficient control functions, like switchover of acceleration/deceleration time, acceleration/deceleration forbidden, state token output, interruption control, switchover of display contents, etc. Refer to "Terminal Function Definition " and "Operation Panel".

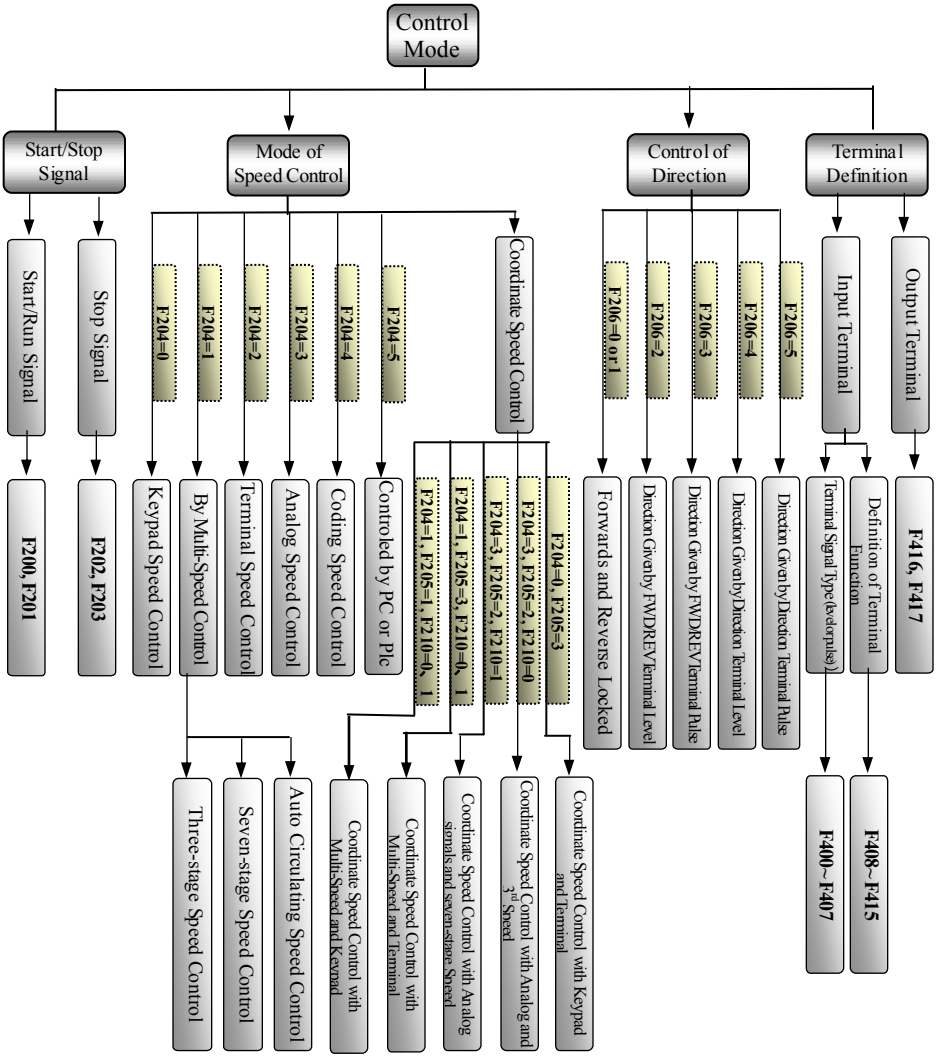



**Fig 4-3 Modes of Operation**

| | | |
|---|---|---|
| F100 User's Password | Setting Range:0～9999 | Mfr's Value:8 |

· Correct user's password must be entered when power is supplied again or parameter modification is intended after fault resetting. Otherwise, parameter setting would not be possible with indicating "Err1".

· User may modify "User's Password", in the same way as modifying other parameters.

| | | |
|---|---|---|
| F103 Inverter's Power (kw) | Setting Range: 0.40～400.0 | Mfr's Value: this inverter's power value |

· This inverter is marked with power, for recording product information.

| | | |
|---|---|---|
| F106 Inverter's Input Voltage Type | Setting Range:<br>0: single phase, 1:three-phase | Mfr's Value: Debugging Value |
| F107 Output Voltage Proportion | Setting Range: 1～100% | Mfr's Value: 100% |
| F111 Max Frequency limit (Hz) | Setting Range:F113～400.0 | Mfr's Value:50.00Hz |

· Indicating inverter's max running frequency (this inveter's max designed frequency: 400.0Hz).

| | | |
|---|---|---|
| F112 Min Frequency Limit(Hz) | Setting Range:0.50～F113 | Mfr's Value:0.50Hz |

· Showing inverter's min running frequency. The value of min frequency limit must be set below F113.

| | | |
|---|---|---|
| F113 Target Frequency (Hz) | Setting Range:F112～F111 | Mfr's Value:10.00Hz |

· Indicating the preset frequency. Inverter will run automatically after startup to this frequency in keypad or terminal control mode.

| | | |
|---|---|---|
| F114/F116 1st and 2nd Acceleration Time(S) | Setting Range:<br>0.1～3000 | Mfr's Value:0.4～3.7KW: 5.0S<br>5.5～30KW:30.0S<br>37～400KW:60.0S |
| F115/F117 1st and 2nd Deceleration Time (S) | | |

· Acceleration/Deceleration Time: The time required for acceleration/deceleration from 0 (50Hz) to 50Hz (0) [Note 1].

| | | |
|---|---|---|
| F118 Turnover Frequency (Hz) | Setting Range:15.00～400.0 | Mfr's Value:50.00Hz |

· Constant torque output when running frequency is below this value, and constant power output when exceeding this value. Turnover Frequency normally adopts 50Hz.

| | | |
|---|---|---|
| F119 Latent Frequency (Hz) | Setting Range:F112～F111 | Mfr's Value:5.00Hz |

· When output frequency exceeds this value, the status of the output terminal may be defined as reverse; the status of terminal will have its state restored when below this frequency.

· When the definable output terminal is defined as the function of "Over Latent Frequency", this parameter setting is valid.

| | | |
|---|---|---|
| F120 Dead-Time of Switch Between Corotation and Reverse (S) | Setting Range:0.0～3000 | Mfr's Value:0.0S |

· If "Stop" signal is given within the"Dead-Time of Switch between Corotation and Reverse", this holding(waiting)time can be terminated, and inverter will immediately switch over to and run in another direction. This function is fit for all modes of speed

control except auto circulating running.

· This function can alleviate the current impact during direction switch process, with manufacturer's setting value at 0S.

| | | |
|---|---|---|
| F121 Stop Mode | Setting Range: 0: Stop at Deceleration Time 1: Free Stop | Mfr's Value:0 |

· "Free Stop" means that motor will have free running with an immediate output cutoff and stop by friction upon receiving the "stop" command.

· This function can be used for "stop" operation in mode of keypad control and interrupting direction signal operation in mode of terminal control.

| | | |
|---|---|---|
| F123 Jogging Function | Setting Range:0:Invalid jogging function 1:Valid jogging function | Mfr's Value: 1 |
| F124 Jogging Frequency (Hz) | Setting Range: F112～F111 | Mfr's Value: 5.00Hz |
| F125 Jogging AccelerationTime(S) | Setting Range: 0.1～3000 | Mfr's Value: 0.4～3.7KW:5.0S<br>5.5～30KW:30.0S<br>37～400KW:60.0S |
| F126 Jogging DecelerationTime(S) | | |

· It includes keypad jogging and terminal jogging. Keypad jogging is only valid in stop state while terminal jogging works both in run and stop states.

· Jogging operation on the keypad (in stop state):

a. Press "Mode" key to display "HF-0", and press "Set" to confirm showing "0".

b. Press "Run", and inverter will run to "Jogging Frequency" ("Keypad Jogging" will be canceled by pressing "Mode" again).

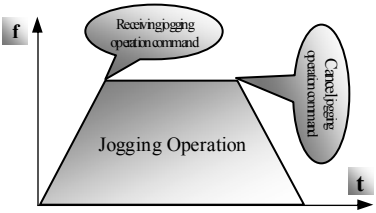



Fig 5-1 Jogging Operation

· In case of terminal jogging, make "Jogging" terminal (like OP1) connected to CM, and inverter will run to the jogging frequency.

Note1 · "Stalling Adjusting" and F120 is invalid in mode of jogging operation.

| | | |
|---|---|---|
| F127/F129 Skip Frequency A, B (Hz) | Setting Range: 0～400.0 | Mfr's Value: 0Hz |
| F128/F130 Skip Area A, B (Hz) | Setting Range:±2.5 | Mfr's Value: 0.5 |

· System resonance will occur around a certain frequency point during motor running. This parameter is set specifically to avoid resonance.

· When output frequency reachs the setting value of this parameter, inverter will automatically run by tripping off this "Skip Frequency".

·"Skip Area" referes to the difference value between upper and lower frequencies of the skip frequency, e.g., with skip frequency of 20Hz, and skip area of ± 0.5Hz, automatic tripping off will happen when inverter has its output within 19.5～20.5Hz (as F1～F2 in Fig 5-2).

· This function is invalid during acceleration / deceleration process.

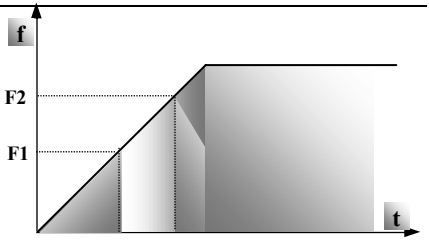



Fig 5-2 Skip Frequency

| | | |
|---|---|---|
| F131 Display Contents | Setting Range: 0: Frequency; 1: Rotate Speed; 2: Linear Velocity; 3: Output Voltage; 4: Output Current | Mfr's Value: 0 |
| F132 Numbers of Motor Poles | Setting Range: 2～100 | Mfr's Value: 4 |
| F133 Drive Ratio of Driven System | Setting Range: 0.10～200.0 | Mfr's Value: 1.00 |
| F134 Range of Linear Velocity | Setting Range: 1～60000 | Mfr's Value: 1800 |

· F131=0, running frequency, Hz; F131=1, theoretic rotate speed of shaft end of driven system, rpm; F131＝2, theoretic linear velocity of shaft end of driven system; F131=3, output voltage, V; F131＝4, output current, A.

· No matter what values F131 is set, corresponding target frequencies will be sparklingly showed on the panel when inverter is stopped.

· Calculation on rotate speed and linear velocity

When inverter operates at max frequency limit, the setting value of F134 shall equal to the product of loaded rotate speed of shaft and its perimeter, with unit subject to user. E.g., max frequency limit F111＝50.00Hz, number of motor poles F132＝4, drive ratio F133＝1.00, radius of drive shaft R＝50mm, then,

Perimeter of drive shaft: 2πr=2×3.14×50=314 (mm)

Rotate speed of drive shaft: 60×running frequency/(number of pole pairs×drive ratio）=60×50/（2×1.00）=1500rpm

shaft linear velocity: rotate speed×perimeter=1500×314＝471000 (mm/minute)

If calculation result exceeds the range of F134 (1～60000), unit conversion will be required. Should a precision of 0.1m/min is needed, F134=4710 can be set. If a value of 1869 is indicated then, it means that the current linear velocity is 1869 decimeter per minute.

| | | |
|---|---|---|
| F137 Frequency Memory | Setting Range: 0: Invalid frequency memory 1: Valid frequency memory | Mfr's Value: 0 |

· "Frequency memory" will only automatically memorize the frequency values that user adjusts, in mode of keypad or terminal speed control.

| | | |
|---|---|---|
| F138 Auto Start of Analog Signals Speed | Setting Range: 0: Auto start; 1: Press "Run" to start | Mfr's Value: 0 |

· "Auto start of analog signal speed control" means, in mode of analog signal speed control, inverter will automatically run without the signals of "RUN", once analog signal is input.

| | | |
|---|---|---|
| F139 Auto Start After Power Resupplied or Reset | Setting Range: 0: Invalid; 1: Valid | Mfr's Value: 0 |

· "Auto start after power resupplied or reset" means whether there will be auto start after power resupplied or fault reset in the mode of keypad speed control or terminal speed control. If "invalid" is selected, inverter can only operate after "Run" signal is given.

| | | |
|---|---|---|
| F140 Start by the Terminal Direction Signal | Setting Range: 0, Invalid; 1, Valid | Mfr's Value: 0 |

· "Start by Terminal Direction Signal" means a direction signal given externally can be used to start inverter directly without giving a separate "Run" signal in case of keypad speed control, terminal speed control or their combined speed control.

| | | |
|---|---|---|
| F160 Restore Mfr's Value | Setting Range: 0: Not Restoring Mfr's Value<br>1: Restoring Mfr's Value | Mfr's Value: 0 |

· When there is any confusion with inverter's parameters, manufacturer's default value should be restored, just by setting F160 to 1. F160 shall have its value set to 0 automatically when "restoring manufacturer's value" is completed.

· Restoring manufacturer's value will not work for the function code in the "Change" column of the Appendix 2 marked with "○". These function codes are properly preset before delivered. Please do not change the parameter of these function codes.

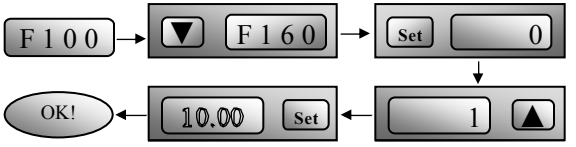



Fig 5-3 Restoring Manufacturer's Values

## 6.1 Parameters Setting

| | | |
|---|---|---|
| F200 Start Control | Setting Range: 0:Keypad control; 1:Terminal control; 2~4:Reserved | Mfr's Value: 0 |
| F201 Additional Start Control | Setting Range: 0: No additional start function;<br>1: Keypad control<br>2: Terminal control<br>3, 4: Reserved | Mfr's Value:0 |

· "Keypad Control" means that start command will be given by the "RUN" key on the keypad; "Terminal Control" means that start command will be given by the defined "RUN" terminal. F200 and F201 can be used in combination.

· Inverter will be started by making the defined "start" terminal connected to CM when using "terminal control".

| | | |
|---|---|---|
| F202 Stop Control | Setting Range: 0: Keypad Control; 1: Terminal Control;<br>2~4: Reserved | Mfr's Value:0 |
| F203 Additional Stop Control | Setting Range: 0: No Additional stop function;<br>1: Keypad control;<br>2: Terminal control;<br>3, 4:Reserved | Mfr's Value:0 |

· "Keypad Control" means that stop command will be given by the "Stop" key on the keypad; "Terminal Control" means that stop command will be given by the defined "Stop" terminal. F202 and F203 can be used in combination.

· Inverter will be stopped by making the defined "stop" terminal connected to CM when using "terminal control".

| | | |
|---|---|---|
| F204 Basic Modes of Speed Control | Setting Range: 0: Keypad Speed Control; 1: Multi-speed Control;<br>2: Terminal Speed Control; 3: Analog Signal Speed Control;<br>4: Coding Speed Control; 5: Computer or PLC Control | Mfr's Value: 0 |
| F205 Additional Mode of Speed Control | Setting Range:0:No Additional Speed Control Mode; 1: Keypad Speed Control 2: Multi-speed Control; 3: Terminal Speed Control | Mfr's Value: 0 |

· "Keypad Speed Control" means that running frequency will be set with the "▲"/"▼" keys on the keypad; "Terminal Speed Control" means that running frequency will be set with the defined "UP"/"DOWN" terminals; and "Multi-speed Control" refers to "three-stage Speed Control", "Seven-stage Speed Control" and auto circulation speed control with reference to Parameter F210.

· "Analog Signal Speed Control" refers to the speed control by adopting anaolog signals of "0～5V", "0～10V" or "0～20mA". See F209.

· "Coding Speed Control" refers to the running frequency given to the inverter by combinations of various switch-statuses of Terminals OP1～OP8.

| | | |
|---|---|---|
| F206 Direction Given | Setting Range: 0: Lock corotation; 1: Lock reverse<br>2: Given direction of forward and reverse terminals level<br>3: Given direction of forward and reverse terminal pulse<br>4: Given direction of direction terminal level<br>5: Given direction of direction terminal pulse | Mfr's Value:0 |

· When F206=0 or 1, running direction is decided internally, not controlled by external signal.

· If a terminal is defined as one to control direction, then its signal form (level or pulse) shall only depend on Function Code F206, without being controlled by F400～F407 (signal type of terminal).

| | | |
|---|---|---|
| F209 Selection of Analog Signal Input Channel | Setting Range: 0:V2 Channel 1: Reserved<br>2: I2 Channel (0～20mA) | Mfr's Value: 0 |

· When F206=2, "forward" and "reverse" are set by the defined "forward terminal" and "reverse terminal", in the mode of "level", i.e., valid when connected to CM and invalid when disconnected, and inverter will stop as well.

· When F206=3, "forward" and "reverse" are given by the defined "forward terminal" and "reverse terminal" respectively in the mode of "pulse", i.e., an instant connection between "forward terminal" and CM give "forward" signal, and another instant connection between "reverse terminal" and CM will give "reverse" signal.

· When F206=4, "forward" and "reverse" are given by the defined "direction terminal" in the mode of "level", i.e., connection between "direction terminal" and CM give "reverse" signal, and "forward" signal is given when disconnected from CM.

· When F206=5, "forward" and "reverse" are given by the defined "direction terminal" in the mode of "pulse", i.e., instant connection between "direction terminal" give "forward" signal, instant connection for one more time give "reverse" signal.

· When delivered by the manufacturer, Terminal OP6 has the signal of forward, and OP7 the signal of reverse.

·Voltage analog signal "0～5V" and "0～10V" are input through V2 channel, the different position of coding switch (SW1) can be chosen "0～5V" or "0～10V".

· Current input signal "0～20mA" is input through I2 channel with grounding of V3.

| | | |
|---|---|---|
| F210 Multi-Speed Types | Setting Range:0:3-stage speed control; 1:7-stage speed control;<br>2: Auto-circulation speed control | Mfr's Value:0 |

· In case of multi-speed control (F204=1), choice must be made from "3-stage speed control", "seven-stage speed control" or "auto-circulation speed control", of which,

"auto-circulation speed control" is further divided into "auto circulation of two-stage speed", "auto circulation of three-stage speed", … "auto circulation of seven-stage speed", subject to F211. Refer to Table 6-1.

Table 6-1 **Selection of Multi-Speed Control Mode**

| F204 | F210 | Operation Mode | Remarks |
|---|---|---|---|
| 1 | 0 | 3-stage Speed Control | Start/stop is not controlled by "Start" and "Run" signals; priority level is successively 1st-stage, 2nd-stage and 3rd-stage speed. 3-stage speed control can be used with analog signal speed control for combined speed control. "3-stage Speed Control" takes priority of analog signal speed control. |
| 1 | 1 | 7-stage Speed Control | Start/stop is not controlled by "Start" and "Run" signals; 7-stage speed control can be used with analog signal speed control for combined speed control. "7-stage Speed Control" takes priority of analog signal speed control. |
| 1 | 2 | Auto-circulation Speed Control | Manual adjustment is not allowed to adjust the running frequency. The running frequency can be set by parameter setting as "2-stage speed auto circulation", "3-stage speed auto circulation", "7-stage speed auto circulation". |

| | | |
|---|---|---|
| F211 Selection of Stage Speed Under Auto-circulation Speed Control | Setting Range: 2～7 | Mfr's Value:7 |
| F212 Selection of Times of Auto-circulation Speed Control | Setting Range:0～9999 | Mfr's Value:0 |
| F213 Status After Auto-circulation Running Finished. | Setting Range: 0: Stop; 1: Run at the speed of last stage | Mfr's Value:0 |

- That the inverter runs at the preset stage speed one by one under the auto-circulation speed control is called as "one time".
- If F212＝0, inverter will run at infinite auto circulation, which will be stopped by "stop" signal.
- If F212>0, inverter will have run at auto circulation conditionally. When auto circulation of the preset times is finished continuously (set by F212), inverter will finish auto-circulation running conditionally. If F213=0, then inverter will stop after auto circulation is finished. If F213=1, then inverter will run at the speed of the last stage after auto-circulation is finished as follows:

F212 { = 0, inverter will run at infinite auto circulation
> 0 { F213=0, inverter will stop after auto circulation is finished.
F213=1, run at the speed of the last stage after auto-circulation is finished.

e.g., F211=3, then the inverter will run at auto circulation of 3-stage speed; F212=100, then the inverter will run 100 times of auto circulation; F213=1, the inverter will run at the speed of the last stage after the auto-circulation running is finished.

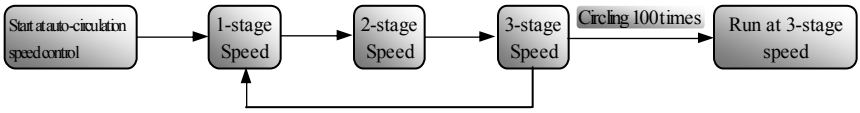



Fig 6-1 Diagram of Auto-circulation running

· The inverter can be stopped by pressing "stop" or sending "stop" signal through terminal during auto-circulation running.

| | | |
|---|---|---|
| F230 Precision of Frequency Showing (Hz) | Setting Range: 0.01～2.00 | Mfr's Value:0.01Hz |

· The change gradient of frequency or speed can be changed by adjusting the value of F230. If F230＝0.03 and inverter shows a rotate speed (F131＝1), then the rotate speed will be increased or decreased by one round each time when ▲/▼keys are pressed. The corresponding frequency will then have a change of 0.03Hz each time.

| | | |
|---|---|---|
| F231 Speed of Frequency Change | Setting Range: 0: Normal;<br>1: Slow 2: Fast | Mfr's Value: 0 |

· In case of keypad speed control and terminal speed control, press▲/▼keys or terminals "UP" and "DOWN" (without releasing), to control the change of frequency.

## 6.2 Basic Modes of Speed Control

With the help of "Basic Speed Control Mode", "Additional Speed Control Mode", "Stop Mode", "Additional Stop Mode", "Start Mode", "Additional Start Mode", "Direction Giving Mode" (F200～F206), numerous various modes of speed control can be produced through free combination, including mutual control by keypad and analog signal (i.e., joint control by keypad and terminal block). User may have more options for speed control through parameter setting based on his own requirements. Hereunder are a few basic operation control modes and operation modes of joint control.

### 6.2.1 Keypad Speed Control

F204＝0.

Keypad speed control is the most basic mode of speed control. Press "Run" to start, inverter will automatically accelerating to the target frequency inverter. After that, it will stably run. During its stable running, the dynamic speed control can be realized by press "▲"/"▼" keys. Keypad speed control is the manufacturer's default mode of speed control.

### 6.2.2 Terminal Speed Control

F204＝2.

Terminal speed control is effected by Terminals "UP" and "DOWN" for dynamic speed

control, the rest of which is the same as those of keypad speed control. Terminals "UP" and "DOWN" are defined by F408～F415. Terminal "UP" works like "▲" key on the keypad and Terminal "DOWN", like "▼" key. If F409=11, OP2 is defined as Terminal "UP". If connected with CM, the frequency will increase. If F410=12, OP3 is defined as Terminal "DOWN". If connected with CM, the frequency will drop.

### 6.2.3 Joint Speed Control with Keypad and Terminal

F204＝0, F205=3.

Speed control is made with "▲"／"▼" keys or "UP"／"DOWN" terminals. F409=11, OP2 is defined as "UP" terminal; F410=12, OP3 is defined as "DOWN" terminal.

### 6.2.4 Analog Signal Speed Control

F204=3.

Inverter's output frequency is regulated by voltage (or current) analog signal. The voltage analog signal may be given by the potentiometer of the keypad controller or by the external potentiometer, or by the analog signal output from other devices. The current analog signal can be given by the corresponding sensors or the output signal of other control equipment.

Analog signal are input through Terminal "V2", potentiometer of keypad or Terminal "I2". The input ports of analog signal are selected by F209, with three kinds of signals for analog input: 0～5V, 0～10V and 0～20mA. Input of 0～5V and 0～10V may also be obtained through external potentiometer, the different position of coding switch (SW1) can be chosen "0～5V" or "0～10V". e.g.

F204=3, F209=0, voltage analog signal is input from Port V2, and grounding is V3.

F204=3, F209=1, Reserved

F204=3, F209=2, current analog signal (0～20mA) is input from Port I2, and grounding is V3.

### 6.2.5 Coding Speed Control

F204=4.

Eight-bit binary digits data are indicated by the different combination of switching states of Terminals OP1～OP8, of which, OP8 is the highest bit and OP1 the lowest bit. It is prescribed that the terminal connected with "CM" gives 1 in binary digit, and "0" in binary digit if disconnected from "CM".

Eight-bit binary digits input through OP1～OP8 are converted into digits of decimal system through CPU. The value of decimal system is divided by 255, and multiplied inverter's upper limiting frequency. Then we will have the actual output frequency of coding speed control. E.g.:

> Upper Limiting Frequency F111＝50Hz, Terminal OP8 and Terminal CM will be connected and the rest of terminals will be disconnected. Enter binary digits 10000000, i.e. digits of decimal system 128. We will therefore have the running frequency of (128／255)×50＝25.10Hz.

### 6.2.6 Computer or PLC Control

F204=5.

Compute or PLC control is adopted for inverters. Function Code F900, F903 and F904 will

be set as the address, parity check and Baud rate of inverter respectively. For the relevant data of computer and PLC, please refer to user's manual and communication protocol.

### 6.2.7 Multi-Speed Control (see next chapter)

### 6.2.8 Example of Speed Control Selection

If F200=0, F201=0, F202=0, F203=0, F204=3, F205=0, F206=2, then the operation control mode: analog signals (or potentiometer) will control output frequency, and the "Run" and "Stop/Reset" keys on the keypad will control "Run" and "Stop". The direction will be given by the defined "Forward Terminal' and "Reverse Terminal" by electrical level.

If F413=13, OP6 will be "Forward Terminal"; F414=14, OP7 will be "Reverse Terminal". The inverter will have forward corotation when OP6 is connected with CM, and reverse corotation when OP7 is connected with CM. OP6 and OP7 cannot be connected with CM at the same time.

# VII. Multi-Speed Control

"Multi-Speed" parameters include accel/decel time, running time, running frequency and running direction.

Three terminals; each terminal controls 1-stage speed on the status of "3-stage speed control"; combination of the three terminals' states will be used for "7-stage speed control"

## 7.1 Parameters Setting

| | | |
|---|---|---|
| F300,F306,F312,F318,F324,F330,F336<br>Multi-Speed Running Direction | Setting Range:<br>0: Forward; 1: Reverse | Mfr's Value:F300=0; F306=1<br>F312=0; F318=1;F324=0;<br>F330=1; F336=0 |

· Direction is given respectively for the 1st-stage speed up to 7th-stage speeds, These parameter s only work in "auto-circulation running".

| | | |
|---|---|---|
| F301,F307,F313,F319,F325,F331,F337<br>Multi-Speed Acceleration Time (S) | Setting Range:<br>0.1～3000 | Mfr's Value:0.4～3.7KW: 5.0S<br>5.5～30KW: 30.0S<br>37～400KW: 60.0S |

· Acceleration time is given respectively for the 1st-stage speed up to 7th-stage speeds.

| | | |
|---|---|---|
| F302,F308,F314,F320,F326,F332,F338<br>Multi-Speed Running Frequency (Hz) | Setting Range:<br>F112～F111 | Mfr's Value: F302=5.00 F308=10.00<br>F314=15.00 F320=20.00 F326=25.00<br>F332=30.00 F338=35.00 |

· Running frequency is given respectively for the 1st-stage speed up to 7th-stage speeds.

| | | |
|---|---|---|
| F303,F309,F315,F321,F327,F333,F339<br>Multi-Speed Running Time (S) | Setting Range:<br>0.1～3000 | Mfr's Value: 0.4～3.7KW: 5.0S<br>5.5～30KW: 30.0S<br>37～400KW: 60.0S |

· Running time is given respectively for 1st-stage speed up to 7th-stage speeds, These parameters only work in "auto-circulation running".

| | | |
|---|---|---|
| F304,F310,F316,F322,F328,F334,F340<br>Multi-Speed Deceleration Time (S) | Setting Range:<br>0.1～3000 | Mfr's Value: 0.4～3.7KW:5.0S<br>5.5～30KW: 30.0S<br>37～400KW: 60.0S |

· Deceleration Time is given respectively for the 1st-stage speed up to 7th-stage speeds. These parameters only work in "auto-circulation running".

| | | |
|---|---|---|
| F305,F311,F317,F323,F329,F335,F341<br>Multi-Speed Interval (S) | Setting Range:<br>0.1～3000 | Mfr's Value: 0.0 |

· It is the interval that the speed of one stage is going to convert to the speed of next stage. If it is "0", it indicates an immediate switchover.

## 7.2 Multi-Speed Control and Joint Speed Control

### 7.2.1 Three-Stage Speed Control

F204=1, F210=0.

"Three-Stage Speed" are the three speeds properly preset inside the inverter (their frequency value, acceleration/deceleration time can be modified through setting parameters). Make the defined "Three-Stage Speed Terminal 1", "Three-Stage Speed Terminal 2" and "Three-Stage Speed Terminal 3" connected with "CM", then you can get

1st-stage, 2nd-stage and 3rd-stage speeds.

The priority order for the three speeds goes from "high" to "low": 1st-stage speed, 2nd-stage speed and 3rd-stage speed. The speed with a higher priority level may interrupt the one with a lower priority level, e.g. when running at the 2nd-stage speed, if "three-stage speed Terminal 1" is connected with "CM", inverter may interrupt the 2nd-stage speed and start the 1st-stage speed. Until the call signal for the 1st-stage speed is canceled, it will not return to the 2nd-stage speed.

e.g.

F409=0, Terminal OP2 is defined as "3-Stage Speed Terminal 1" and connected with CM, which will execute 1st-stage speed;

F410=1, Terminal OP3 is defined as "3-Stage Speed Terminal 2" and connected with CM, which will execute 2nd-stage speed;

F411=2, Terminal OP4 is defined as "3-Stage Speed Terminal 3" and connected with CM, which will execute 3rd-stage speed.

### 7.2.2 7-Stage Speed Control

F204=1, F210=1.

"7-Stage Speeds" are the seven speeds properly preset inside the inverter (their frequency values, acceleration/deceleration time can be modified through parameters) and gotten by the defined "7-stage Speed Terminal 1", "7-stage Speed Terminal 2" and "7-stage Speed Terminal 3". The seven stages speed can be respectively gotten according to the state combination of making these three terminals connect or disconnect with "CM".

F409=0, F410=1, F411=2, Terminals OP2, OP3 and OP4 will be defined as "7-stage Speed Terminal 1", "7-stage Speed Terminal 2" and "7-stage Speed Terminal 3" respectively. Refer to Table 7-1 for their combined transfer signal:

Table 7-1 Calling Modes of Seven-Stage Speeds

| 7-stage Speed Terminal 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
|---|---|---|---|---|---|---|---|---|
| 7-stage Speed Terminal 2 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| 7-stage Speed Terminal 3 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| Transfer Speed | Stop | 1st-stage | 2nd-stage | 3rd-stage | 4th-stage | 5th-stage | 6th-stage | 7th-stage |

*Note:1 indicates input signal terminal is connected with CM; 0 shows input signal terminal is disconnected from CM.*

### 7.2.3 Coordinate Speed Control with Aanalog signal and 3-stage Speed

F204=3, F205＝2, F210=0.

Analog signal speed control can be operated with the 3-stage Speed control in the meanwhile. Priority level of 3-stage Speed control is higher than analog signal speed control. 3-stage speed control can be implemented first if it has a valid signal of 3-stage speed in the mode of analog signal speed control.

### 7.2.4 Coordinate Speed Control with Aanalog signal and 3-stage Speed

F204=3, F205＝2, F210=1.

Analog signal speed control can be operated with the 7-stage Speed control in the meanwhile. Priority level of 7-stage Speed control is higher than analog signal speed control. 7-stage speed control can be implemented first if a valid signal of 7-stage speed is input in the mode of analog signal speed control.

### 7.2.5 Coordinate Speed Control with 3-Stage or 7-Stage Speeds and Keypad or Terminal

F204=1, F205＝1 or 3, F210=0 or 1.

Adjustment will be made to the 3-Stage or 7-Stage Speeds by using the "▲"／"▼" keys on the keypad or "UP"／"DOWN" terminals.

### 7.2.6 8-Stage Speed Control

F204=3, F205＝2, F210=1, F807＝ the running frequency for 1st-stage speed of the 8-Stage Speed.

"8-Stage Speeds" are realized by coordinate speed control of 7-Stage Speed control and analog signal speed control, through special setting. If the three stage-speed terminals are all disconnected from "CM", the analog signal input is the lower limit value, and "corresponding frequency of lower limit of analog signal" (F807) is set as the required speed value, then additional stage speed can be obtained (normally using it as the 1st-stage speed).

e.g. F807=5Hz; F409=0, OP2 is defined as "7-Stage Speed Terminal 1"; F410=1, OP3 is defined as "7-Stage Speed Terminal 2"; F411=2, OP4 is defined as "7-Stage Speed Terminal 3", then refer to Table 7-2 for selection of "8-Stage Speeds".

Table 7-2 Methods on Effecting Eight-Stage Speed Control

| Speed | OP4 | OP3 | OP2 | Acceleration Time | Deceleration Time | Frequency of each stage | Direction Setting |
|---|---|---|---|---|---|---|---|
| 1st stage | 0 | 0 | 0 | F114 | F115 | F807 | F206 |
| 2nd stage | 0 | 0 | 1 | F301 | F304 | F302 | |
| 3rd stage | 0 | 1 | 0 | F307 | F310 | F308 | |
| 4th stage | 0 | 1 | 1 | F313 | F316 | F314 | |
| 5th stage | 1 | 0 | 0 | F319 | F322 | F320 | |
| 6th stage | 1 | 0 | 1 | F325 | F328 | F326 | |
| 7th stage | 1 | 1 | 0 | F331 | F334 | F332 | |
| 8th stage | 1 | 1 | 1 | F337 | F340 | F338 | |

*Note:1 indicates input signal terminal is connected with CM; 0 shows input signal terminal is disconnected from CM.*

### 7.2.7 Auto-Circulation Running

F204=1, F210=2.

"Auto-Circulating Running" means auto circulating running at "multi-stage speed", i.e., inverter will automacally change its stage speed and run at the acceleration／deceleration time, running time, running frequency, running direction of the "speeds" properly preset after giving "Run" command; should "Stop" command fail to be given, inverter will keep running in cycles as per the number of circulating times set by F212.

"Auto-Circulation Running" can be started by the "Run" key or the defined "Run" terminal, and canceled by the "Stop" key on the keypad or the defined "Stop" terminal.

"Auto Circulation Running" may effect automatic circulating running at 2nd-stage～7th-stage speeds (set by F211). Inverter will automatically stop or maintain a steady running at the frequency of the last speed (set by F213) after reaching the number of circulating times.

e.g.

F211＝7, select "7-stage speed" auto circulating running.
F212＝1000, auto circulating running for 1,000 times.
F213＝0, automatically stop after circulating running is completed.
F300～F341 set the corresponding parametes of the 7-stage speeds.

# VIII. Terminal Definition

Definable input terminals: OP1～OP8; definable output terminals: OUT, TA, TB, TC.

Each input terminal may have 22 kinds of functions, same function cannot be defined for more than one input terminal. Two output terminals can be defined for same function.

## 8.1 Definable Input Terminal

| F400～F407 Terminal Input Signal | Setting Range 0:Level triggering; 1:Pulse triggering | Mfr's Value: 0 |
|---|---|---|

· Define the input signal of Terminals OP1～OP8 respectively. "Electrical level triggering"shall be valid when this terminal is connected with CM to input stable electrical level signal; "pulse triggering" shall be valid when this terminal is instantly connected with CM to input pulse signal.

· On the state of "pulse triggering", when pulse signal is input once, port function is valid; when pulse signal is input again, port function is invalid.

| F408～F415 Terminal Function Definition | Setting Range :0～22 | Mfr's Value: F408=3; F409=0; F410=1; F411=2; F412=5; F413=13; F414=14; F415=4 |
|---|---|---|

· Functions of Terminals OP1~OP8 shall be defined separately. Only one function code is available to define each terminal.

Table 8-1 **Optional Functions of Definable Input Terminal**

| F408～F415 | Interpretation | F408～F415 | Interpretation |
|---|---|---|---|
| 0 | This terminal is defined as 3-stage/7-stage speed terminal 1 | 11 | This terminal is defined as terminal of "UP" (frequency increase by degrees) |
| 1 | This terminal is defined as 3-stage/7-stage speed terminal 2 | 12 | This terminal is defined as terminal of "DOWN" (frequency decrease by degrees) |
| 2 | This terminal is defined as 3-stage/7-stage speed terminal 3 | 13 | This terminal is defined as "Forward" terminal |
| 3 | This terminal is defined as jogging terminal. | 14 | This terminal is defined as "Reverse" terminal |
| 4 | This terminal is defined as "Reset" terminal. | 15 | This terminal is defined as "Direction" terminal |
| 5 | This terminal is defined as "Free Stop" terminal. | 16 | This terminal is defined as "Acceleration/ Deceleration Time Switchover" terminal |
| 6 | This terminal is defined as "Run" terminal. | 17 | This terminal is defined as "External Interruption" terminal |
| 7 | This terminal is defined as "Stop" terminal. | 18 | This terminal is defined as "Coding Speed Control" input terminal |
| 8 | This terminal is defined as "Acceleration/Deceleration Forbidden" terminal. | 9,10,19~22 Function Reserved | |

- "Run", "Stop" and "Reset" terminal singals are all pulse signals, and are not restricted by the types of signals (F400～F407).
- If "Acceleration/Deceleration Forbidden" terminals is connected with CM during acceleration/deceleration, inverter will stop acceleration/deceleration and maintain its current running frequency; if this terminal is disconnected from CM, acceleration/deceleration will continue. This function is only limited to keypad speed control, terminal speed control and analog signal speed control.
- Terminal "UP" is equivellent to "▲" key on the keypad and Terminal "DOWN" to "▼" key, applicable for terminal speed control.
- "Forward" terminal, "Reverse" terminal and "Direction" terminal"cannot be defined at the same time.
- If the terminal of "acceleration/deceleration time switchover" is connected with CM during acceleration/deceleration, inverter will start the second acceleration/deceleration time. If this terminal is disconnected from CM, and the first acceleration/deceleration time will be used. This function is only restricted to keypad speed conotrol, terminal speed control and analog signal speed control.
- If receiving interruption signal input by the "external interruption" terminal during operation, inverter will make an immediate stop of output and indicate "H.H." in the meantime. Once the exernal interruption signal is canceled, then inverter will restore its running after "Reset".

  e.g. F408＝17, OP1 is set to be "external interuption" terminal. Make an instant connection with CM, inverter will have free stop, and indicate "H.H." at the same time. Interruption will be canceled after "Reset".
- All F408～F415 are set to 18 at time of "Coding Speed Control". As external binary digits input terminals, OP1～OP8 cannot be used for other purpose. Refer to 6.2.5 for "Coding Speed Control".

## 8.2 Definable Output Terminal

| | | |
|---|---|---|
| F416 Token Output of Relay | Setting Range: 0～12 | Mfr's Value: 0 |
| F417 Token Output of Terminal OUT1 | | Mfr's Value: 3 |
| F418 Token Output of Terminal OUT2 | | Mfr's Value: 3 |

- Output terminal including state terminal OUT and relay output Terminals TA, TB and TC can be defined, with 12 optional functions for each. Normally, TA/TC are normally open while TB/TC are normally close; voltage between OUT and CM is 12V.

· When relay works, TA/TC will close and TB/TC will be disconnected; As OUT state overturns, the voltage with CM becomes 0 from 12V.
· Two definable output terminals allow for functions with the same definition.The functions of the definable output terminal are as follows:

Table 8-2 **Optional Functions of the Definable Output Terminals**

| F416, F417,F418 | Significance | F416, F417,F418 | Significance |
|---|---|---|---|
| 0 | Fault Protection Token Output | 4 | DC Braking Token Output |
| 1 | Over Latent Frequency Token Output | 5 | Token Output of Accel/Decel Time Switchover |
| 2 | Free Stop Token Output | 6～12 | Function Reserved |
| 3 | Running Token Output | | |

· F416/F417=0, as inverter has fault protection (OC, OE, PF, PO, OL and OH, etc), this terminal will work.
· F416/F417=1, as running frequency is above the setting value of F119, this terminal will work. As the running frequency is below the setting value, this terminal restores its state.
· F416/F417=2, this terminal will work at time of "Free Stop".
· F416/F417=3, this terminal will work when inverter runs; this terminal will restore its state when inverter stops.
· F416/F417=4, this terminal will work when inverter is in the state of DC braking.
· F416/F417=5, this terminal will work when "Acceleration/Deceleration Time Switches"

## 8.3 Special Output Terminal

| | | |
|---|---|---|
| F419 Duty Ratio of Brake Signal | Setting Range: 0～100 (%) | Mfr's Value: 80 |

· This parameter is used to set the duty ratio of this brake signal.(The single-phase inverters have no the function )

| | | |
|---|---|---|
| F420 Lowest Frequency at Max FM /IM (Hz) | Setting Range: F112～400.0 | Mfr's Value: 50.00Hz |
| F421 FM Output Range Selection | Setting Range:0 :0～5V; 1: 0～10V | Mfr's Value: 0 |
| F422 FM Output Compensation | Setting Range:0～120% | Mfr's Value: 100 |

· "0～5V" and "0～10V" are available for frequency meter connected to Terminal FM.
· F420 means the minimum corresponding running frequency within the range ("0～5V" or "0～10V") at FM's max output value. When running frequency is greater than or equal to this preset frequency, FM will have its max output; When running frequency is smaller than this preset frequency, FM will have its output voltage proportional to the

running frequency. E.g., if F421=0, F420=60Hz, FM will have an output of 5V when running frequency ≥60Hz; if running frequency=30Hz, then FM=2.5V.

· F422 is used to compensate for FM's output error, and compensation value shall be fixed based on the actual measuring.*

| | | |
|---|---|---|
| F423 FM/IM Output Parameter Selection | Setting Range: 0.0～10.0 | Mfr's Value:2.0 |
| F424 IM Output Compensation | Setting Range: 0～120% | Mfr's Value: 100 |
| F425 IM Output Range Selection | Setting Range: 0: 0～20mA 1: 4～20mA | Mfr's Value: 0 |
| F426 FM Function Selection | Setting Range:0:Output Frequency Display<br>1:Output Current Display | Mfr's Value: 0 |
| F427 IM Function Selection | Setting Range:0:Output Frequency Display<br>1:Output Current Display | Mfr's Value: 1 |

· Terminal IM will output 0～20mA signal as per the changes of inverter's output current (between IM and V3).

· F423 is used to rectify the display accuracy of FM/IM's external ammeters with various measuring ranges. If IM is externally connected to an ammeter with an input of 0～20mA and a measuring range of A, and inverter has "I" for its output rated current, then F423 can be set as (A/I), and ammeter will have a correct indication of inverter's output current, i.e. the motor current.

**Note: Manufacturer can only guarantee the correct output of IM when motor current is less than twice of inverter's rated current. Single phase inverter has no this function.**

· F424 is used to compensate the output error of IM, and compensation value shall be fixed based on the actual measuring.*

**IX. V/F Control & Protection**

V/F compensation and carrier-wave frequency impact torque; timing control brings you more convenience in operation

Overload protection value =overload time × overload-protection current. overload protection occurs when accumulated overload value is more than overload protection value

## 9.1 V/F Control

### 9.1.1 V/F Compensation and Carrier-Wave Frequency

| | | |
|---|---|---|
| F500 Compensation of Speed Difference | Setting Range: 0～8 | Mfr's Value: 0 |

· The load is higher, The speed difference is larger. Adjusting the parameter value will make motor's actual rotate-speed close to the rated rotate-speed.

| | | |
|---|---|---|
| F501 Torque Compensation | Setting Range: 0: Beeline type compensation; 1:Reserved; 2:Reserved | Mfr's Value: 0 |
| F502 Beeline-type Torque Compensation Curve | Setting Range: 1～16 | Mfr's Value 0.4～3.7KW: 5; 5.5～30KW: 4; 37～400KW: 3 |
| F503 Reserved | | |

· There are altogether 16 "beeline torque compensation curves", which are used to increase the output torque at low frequency. Compensation will be increased with bigger values, as indicated in Fig 9-1.

· Over-setting values of torque compensation curve may incur current impact during starting process and may further result in inverter's over-current protection.

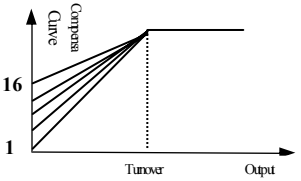


Fig 9-1 Torque Promotion Curve

· A smaller torque compensation curve should be selected when inverter has a bigger power.

· Carrier-Wave Frequency" should also be considered when selecting "Torque Compensation Curve". Normally, compensation curve can be increased to a certain extent with a high carrier-wave frequency.

| | | |
|---|---|---|
| F512 Setting Carrier-Wave Frequency | Setting Range 0.4～3.7KW: 1000～10000<br>5.5～30KW: 1000～9000<br>37～110KW: 1000～6000 | Mfr's Value<br>0.4～3.7KW: 1000<br>5.5～30KW: 1000<br>37～110KW: 1000 |

· Motor will have a lower electromagnetic noise with a higher carrier-wave frequency. But inverter will have its temperature increased and output torque decreaed.

· Normally, there will be significant reduction with motor noise when carrier-wave frequency is higher than 5KHz. "Carrier-wave frequency" can be set as "7000" for low-power (below 7.5KW) inverters where "mute" running is required. It is recommended that carrier-wave frequency should not be set above 6KHz for a high-power inverter.

· Recommended setting range for carrier-wave frequency: 1000～6000.

### On Torque Compensation and Carier-Wave Frequency

The output torque and carrier capacity of an inverter are closely related with "Torque Compensation Curve" and carrier-wave frequency. This inverter will automatically start "random carier-wave PWM" control below 3KHz for purpose of reducing the noise at low carrier-wave frequency.

"Torque Compensation Curve" and "Carrier-Wave Frequency" should be well matched in actual application. Torque compensation can be higher comparatively when there is a higher carrier-wave frequency; torque compensation can be lower comparatively when there is a lower carrier-wave frequency. However, higher power inverter is not advisable to adopt a higher carrier-wave frequency or higher torque compensation curve. The following value range is recommended for F502 and F512:

F502: 3～8　　F512: 1000～6000

## 9.1.2 DC Braking

| | | |
|---|---|---|
| F514 DC Braking Function Selection | Setting Range<br>0: DC braking function forbidden<br>1: Braking before starting<br>2: Braking during stopping<br>3: Braking before start & during stop | Mfr's Value: 0 |
| F515 Initial Frequency of DC Braking (Hz) | Setting Range: 1.00～5.00 | Mfr's Value:1.00Hz |
| F516 DC Braking Voltage (V) | Setting Range: 0～60 | Mfr's Value: 10V |
| F517 Braking Duration Before Starting (S) | Setting Range: 0.0～10.0 | Mfr's Value: 0.5S |
| F518 Stop-Braking Duration (S) | Setting Range: 0.0～10.0 | Mfr's Value: 0.5S |

· In case where a blower fan is used, adopting "Braking before Starting" will ensure that the fan stays in a static state before starting.

· Parameters related to "DC Braking": F515, F516, F517 and F518, interpreted as follows:

a. F515: Initial frequency of DC braking. DC braking will start to work as inverter's output frequency is lower than this value.

b. F516: DC braking voltage. The bigger value will result in a quicker braking.However, motor will overheat with too big value.

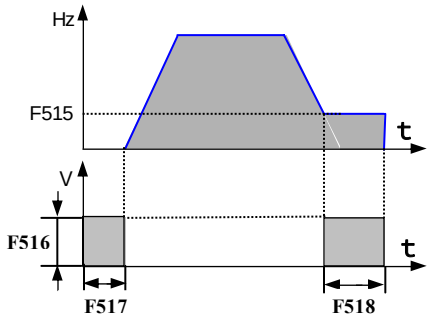



Fig 9-2　DC Braking

c. F517: Braking duration before starting. The time lasted for DC braking before

inverter starts.

d. F518: Braking duration when stopping. The time lasted for DC braking while inverter stops.

· Refer to Fig 9-2 for DC braking process.

### 9.1.3 Stalling Adjusting

| | | |
|---|---|---|
| F525 Selecting Function of Stalling Adjusting | Setting Range 0:Invalid; 1:Valid | Mfr's Value:0 |
| F526 Stalling Adjusting Function during Acceleration | Setting Range 0:Invalid; 1:Valid | Mfr's Value:0 |
| F527 Stalling Adjusting Function during Running | Setting Range 0:Invalid; 1:Valid | Mfr's Value:0 |
| F528 Stalling Adjusting Function during Deceleration | Setting Range 0:Invalid; 1:Valid | Mfr's Value:0 |
| F529 Stalling Adjusting Function during Stopping | Setting Range 0:Invalid; 1:Valid | Mfr's Value:0 |
| F530 Fluctuation Removing Time when Stalling Setting Starts (S) | Setting Range:0.1～50.0 | Mfr's Value:1.0 |
| F531 Time for Stalling Adjusting to Start (S) | Setting Range:0.1～150.0 | Mfr's Value<br>0.4～3.7KW:5.0S<br>5.5～30KW:30.0S<br>37～400KW:60.0S |
| F532 Lower Frequency Limit of Stall Setting (Hz) | Setting Range:F112～F111 | Mfr's Value:5.00 |
| F533 Fluctuation Removing Time when Stalling Setting Quits (S) | Setting Range: 0.0～50.0 | Mfr's Value:1.0 |
| F534 Quiting Time of Stalling Adjusting (S) | Setting Range:0.1～150.0 | Mfr's Value<br>0.4～3.7KW:5.0S<br>5.5～30KW:30.0S<br>37～400KW:60.0S |
| F535 Protection Time of Stalling Adjusting (S) | Setting Range:0.1～100.0 | Mfr's Value:4.0 |

· When "Stalling Adjusting" function is valid, inverter will adjust output frequency automatically, restricting the output current within a certain range. The frequency will therefore fluctuate within a smaller range.

· **Conditions for "Stalling Adjusting":** when output current is higher than "Initial Overload Current", "Stalling Adjusting" starts to work. Refer to "Overload Protection" for "Initial Overload Current".

· **"Fluctuation Removing":** the fluctuation of output current for a short time during stalling adjusting is considered "fluctuation" and is ignored, which can increase the stability of output frequency. The effect of "fluctuation removing" is subject to "the time of removing fluctuation". The longer it is, the more stable with output. However, the effect of Stalling Adjusting wil be influenced. "Mfr's Value" is normally adopted.

· **"Time to Remove Fluctuation" when Stalling Adjusting Starts (F530):** "Stalling Adjusting" will not happen immediately when inverter's output current exceeds the "Initial Overload Current", but will wait for a certain period of time (setting value of F530). If output current is higher than "Initial Overload Current" all the time during waiting time, inverter will start

"Stalling Adjusting".

· **"Time to Remove Fluctuation" when Stalling Adjusting Quits (F533):** when output current is lower than "Initial Overload Current" during stalling adjusting, "Stalling Adjusting" will not stop immediately but wait for a certain period of time (setting value of F533). If output current is lower than "Initial Overload Current" all the time during waiting time, inverter will quit "Stalling Adjusting" function.

· **Lower Frequency Limit of Stalling Adjusting (F532):** Output Frequency will drop automatically during "Stalling Adjusting" till it reaches the "Lower Frequency Limit of stalling adjusting". Inverter will maintain this frequency should the stalling fail to be eliminated.

· **Protection Time of Stalling Adjusting (F535):** When Output Frequency drops to the "Lower Frequency Limit of Stalling Adjusting" during "Stalling Adjusting", and if stalling still continues after waiting for a certain period of time (setting value of F535), inverter will enter "Overload" (OL) protection state. This period of time shall be the protection time of Stalling Adjusting.

· **Action Time and Quiting Time of Stalling Adjusting (F531, F534):** In case of "stalling", the time of frequency drop will be the acting time of "Stalling Adjusting"; when "stalling" is canceled, the time of frequency raising will be the quiting time of "Stalling Adjusting".

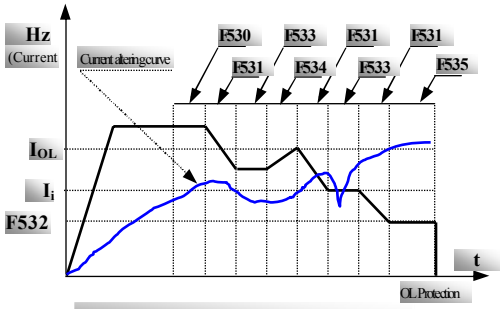



Fig 9-3 Stalling Adjusting

· Fig 9-3 indicates the process of Stalling Adjusting:

**a.** "$I_i$" is initial overload current. When output current is higher than this value, the inverter will judge the fluctuation-removing time. If current does not become smaller during the fluctuation-removing time (F530), then the Stalling Adjusting start.

**b.** After Stalling Adjusting starts to work, decelerate as per the time Stalling Adjusting works (Deceleration Time)(F531); before dropping to the Lower Frequency Limit(F532) of Stalling Adjusting, if current drops below $I_i$, the inverter will judge the fluctuation-removing time(F533) when Stalling Adjusting quits. If current remains below $I_i$ within this time, then quit Stalling Adjusting.

**c.** If current rises above $I_i$ before completely quiting Stalling Adjusting, Stalling Adjusting will continue to work. The inverter will judge the protection time (F535) of

Stalling Adjusting when current continues to rise and frequency keeps dropping until it reaches the Lower Frequency Limit（F532）of Stalling Adjusting. If the current remains high during this time, overload protection will occur.

## 9.2 Timing Control

"Timing Control" mainly refers to "Timing of Free Stop" and "Timing Action" of the corresponding output terminal. E.g.

| | | |
|---|---|---|
| F700 Selection of Free-Stop Mode | Setting Range: 0: Immediate free-stop 1: Delayed free-stop | Mfr's Value:0 |
| F701 Action Delay Time of Free Stop and Output Terminal (S) | Setting Range:0.0～60.0 | Mfr's Value:0 |

- "Selection of Free Stop Mode" is only used for "Free Stop" mode of terminal control. When selecting "Immediate Free-Stop", delay time (F701) will not work; when delay time is 0 (i.e. F701=0), it works as immediate free stop.
- "Delayed Free-Stop" means that inverter will not stop immediately upon receiving the signal of "Free Stop", but will wait for some time before implementing the command of "Free Stop", delay time is subject to F701.
- When F701>0, delay time is valid, and the corresponding output terminal will carry out its delay action or delay overturn as per this time.

| | | | |
|---|---|---|---|
| F702 | Fan control mode (only valid for the power 90-400kw) | 0:controlled by termperature 1:controlled by inverter's power | Mfr's Value:1 |

- F702=0;Fan's run is controlled by the radiator;Fun will be run if inverter's termperature is up to stated temperature;
- F702=1; Fan will run when power is supplied to the inverter..And fan will not stop until pwer off.

## 9.3 Programmable Protection Function

### 9.3.1 Under-Voltage Protection and Out-Phase Protection

| | | |
|---|---|---|
| F708 Function Selection of Under-Voltage | Setting Range: 0:Invalid; 1:Valid | Mfr's Value: Setting Value |
| F709 Under-Voltage Protected Voltage (V) | Setting Range:200～400 | Mfr's Value: Setting Value |
| F710 Filtering Constant of Under-Voltage | Setting Range:0.0～60.0 | Mfr's Value: Setting Value |
| F711 Function Selection of Out-phase | Setting Range 0:Invalid; 1:Valid | Mfr's Value: Setting Value |
| F712 Filtering Constant of Out-phase | Setting Range: 0.0～60.0 | Mfr's Value: Setting Value |

- **"Under-Voltage" means too low voltage at AC input**. "Out-Phase" means lack of phase of the input 3-phase power.
- Filtering constant of "Under-Voltage"／"Out-Phase" signals are used to remove

interference to avoid mis-protection. The greater the setting values are, the longer the constants of filtering time, and the better filtering effect

### 9.3.2 Overload Protection

| | | |
|---|---|---|
| F715 Overload Duration (S) | Setting Range: 0.0～100.0 | Mfr's Value: Setting Value |
| F716 Overload Coefficient | Setting Range: 0.0～1.8 | Mfr's Value: Setting Value |
| F717 Overload Interruption Time(S) | Setting Range: 0.0～60.0 | Mfr's Value: Setting Value |
| F718 Inverter's Rated Current (A) | Setting Range: 1.0～1000 | Mfr's Value: Setting Value |
| F719 Current Compensation Coefficient | Setting Range: 0.0～2.0 | Mfr's Value: Setting Value |
| F720 Relative Overload Value | Setting Range: 1～4 | Mfr's Value: Setting Value |

- Inverter will have "overload protection" when output current is accumulated to the set "overload accumulation value".
- **Overload Lasting Time:** the time from the moment when output current is greater than "Initial Overload Current" to the moment when "Overload Protection" occurs.
- **Overload coefficient:** the ratio of the current when overload protection occurs over the rated current. The values to be taken shall be subject to the actual load.
- **Overload Interuption Time:**
  a. **"Initial Overload Current"** refers to the current starting to calculate the overload time.
  b. **Overload Ampere-Second Value** refers to the product of the current exceeding "Initial Overload Current" values and time. The accumulation (integral) of overload ampere-second value is called **accumulated overload value**. Overload protection value is actually understood as "current×time".
  c. If output current remains higher than the value of "Initial Overload Current", then the system will accumulate the overload Ampere-Second Value; if output current suddenly drops below "Initial Overload Current", then **overload Ampere-Second Value** will stop its accumulation. If the current is still lower than "Initial Overload Current" after a certain period of time (setting value of F717), then the accumulated overload value made before will be eliminated. If output current exceeds again "Initial Overload Current" value during this time, then **Overload Ampere-Second Value** will be continuously accumulated on basis of the previous accumulation value.
  d. Therefore, the setting time of F717 is called "Overload Interruption Time".
- **Current Compensation Coefficient:**
  a. There may be some errors between the current value that inverter has obtained through galvanoscopy and the value actually measured. Compensation can be made by setting F719.
  b. 0.1～0.9 are negative compensation. The current display will have a smaller

value with a smaller coefficient;

c. 1.1～2.0 are positive compensation. The current will display a bigger value with a bigger coefficient;

d. F719=1.0, no compensation.

· **Relative Overload Value:**

a. This parameter indicates the difference value between overload protection current and "Initial Overload Current", adopting positive integer. Relative Overload Value=[(overload protection current – initial overload current) /rated current]×10

b. E.g, overload coefficient =1.5, relative overload value =2, rated current＝30A; then the initial overload current value= （1.5-0.2）×30=1.3×30＝39A. i.e., overload time is calculated from the moment when output current is 39A.

· **Diagram of Overload Protection:**

Refer to Fig 9-4 for overload protection.

a. $I_i$: initial overload current, $I_{OL}$: overload protection current; F717 in the frame shows overload interruption time.

b. Sum of shaded area equals to the accumulated overload value; overload protection value=F715×overload protection current.

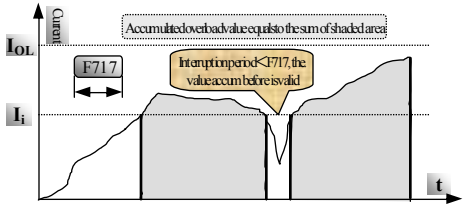



Fig 9-4 Overload Protection

c. When sum of shaded area is more than overload protection value, overload protection occurs.

## X. Analog Input & Frequency Output

Lower and upper limits may change output frequency range; input compensation affects output frequency accuracy.

"Relation between analog change and output frequency" may bring convenience to your operation.

In analog speed control mode, moderate adjustment is sometimes required for an ideal effect on the lower and upper limits of input analog, the relation between analog changes and output frequency, and the corresponding output frequency as min analog is input.

If **F204＝3**, then select **Analog Speed Control**.

| | | | |
|---|---|---|---|
| F800 | Lower Limit of Analog Input | Setting Range:0～1023 | Mfr's Value:20 |
| F801 | Upper Limit of Analog Input | Setting Range:0～1023 | Mfr's Value:1000 |
| F806 | Analog Input Compensation | Setting Range:0～100 | Mfr's Value:0 |
| F807 | Corresponding Frequency of Lower Limit of Analog Signal (Hz) | Setting Range: 0～F111 | Mfr's Value:0 |
| F808 | Relation Between Analog Changesand Output Frequency | Setting Range 0:Direct proportion; 1:Inverse proportion | Mfr's Value:0 |

- **Setting the Lower and Upper Limits of Analog:**
  a. If analog reaches the max input but running frequency still fails to reach the upper limiting frequency, then reduce the F801 value gradually until requirement is met.
  b. In case of min input with analog while inverter cannot have its output drop to 0Hz, then increase the value of F800 gradually until meeting the requirements.
  c. Parameter F806 is used for fine adjustment of inverter's running frequency.
- **Corresponding Frequency to the Lower Limit**: as the value of F807 is higher than Lower Frequency Limit（F112）, inverter will still keep running at a certain frequency even if a min analog value is input.
- **Analog Speed Control:**
  a. As F808=0, direct ratio between input analog and output frequency, i.e. 0～5V (or 0～10V or 0～20mA) corresponds to 0～upper limiting frequency.
  b. As F808=1, inverse proportion between input analog quantity and output frequency, i.e. 5～0V (or 10～0V or 20～0mA) corresponds to 0～upper limiting frequency.

## Appendix 1 Trouble Shooting

When malfunction occurs to inverter, don't run by resetting immediately. Check any causes and get it removed if there is any.

Take counter measures by referring to this manual in case of any malfunctions on inverter. Should it still be unsolved, contact the manufacturer. Never attempt any repairing without due authorization.

Table 1-1 **Inverter's Common Cases of Malfunctions**

| Fault | Description | Causes | Countermeasures |
|---|---|---|---|
| O.C. | Overcurrent | * too short acceleration time<br>* short circuit at output side<br>* locked rotor with motor | *prolong acceleration time;<br>*whether motor cable is broken;<br>*check if motor overloads;<br>*reduce V/F compensation value |
| O.L. | Overload | * load too heavy | *reduce load; *check drive ratio;<br>*increase inverter's capacity |
| O.E. | DC Over-Voltage | *supply voltage too high;<br>*load inertia too big<br>*deceleration time too short;<br>*motor inertia rise again | *check if rated voltage is input;<br>*add braking resistance(optional);<br>*increase deceleration time |
| P.F. | Out-Phase Protection | *out-phase with input power | *check if power input is normal;<br>*check if parameter setting is correct. |
| P.O. | Under-Voltage Protection | *input voltage on the low side | *check if supply voltage is normal<br>*check if parameter setting is correct. |
| O.H. | Radiator Overheat | *environment temperature too high; *radiator too dirty<br>*install place not good for ventilation; *fan damaged | *improve ventilation;<br>*clean air inlet and outlet and radiator;<br>*install as required;<br>*change fan |
| C.B. | Contactor does not suck | *Too low voltage of power network<br>*AC contactor damaged | *check the voltage<br>*check the AC contactor |
| Motor not Running | | *wrong wiring;<br>*wrong setting;<br>* too heavy load; | *check input, output and control line;<br>*check parameter setting;<br>*increase inverter's output capacity |
| Power Trips | Line-Current Too Big | *short circuit at input side;<br>*too small capacity with air switch;*motor overload | *check input line;<br>*check air switch capacity;<br>*reduce load |

* No P.F. protection for single-phase and three-phase under 3.7KW.

* C.B. protection only for cabinet-type inverters from 110KW to 400KW.

Table 1-2 **Motor Malfunction and Counter Measures**

| Malfunction | Items to Be Checked | Counter Measures |
|---|---|---|
| Motor not Running | Supply voltage is on or normal? Normal with U,V,W 3-phase output? Locked rotor with motor? Panel with trouble indication? | Get connected with power; Check wiring; Disconnect and Reconnect; Reduce load; Check against Table 1-1 |
| Wrong Direction of Motor Running | U, V, W wiring correct? | To correct wiring |

| | | |
|---|---|---|
| Motor Turning but Speed Change not Possible | Wiring correct for lines with given frequency? Correct setting of running mode? Too big with load? | To correct wiring; To correct setting; Reduce load |
| Motor Speed Too High or Too Low | Motor's rated value corrrect? Drive ratio correct? Max output frequency value correct? Check if voltage drops between motor terminals too high? | Check motor nameplate data; Check speed change mechanism; Check setting; Check V/F Characteristic value |
| Motor Running Unstable | Too big load? Too big with load change? Single-phase or 3-phase for power?Out-phase? | Reduce load;reduce load change, increase capacity; Reactor to be added for single -phase power input. |

## Appendix 2 Zoom Table of Function Code

| Function Section | Function Code | Function Definition | Setting Range | Mfr's Value | Change |
|---|---|---|---|---|---|
| Basic Parameters | F100 | User's Password | 0～9999 | 8 | √ |
| | F101, F102 | Reserved | | | |
| | F103 | Inverter's Power | 0.40～400.0 | This inverter's power value | △ |
| | F104 | Reserved | | | |
| | F105 | Software Version No | | | △ |
| | F106 | Inverter's Input Voltage Type | 0:Single-phase 1:3-phase | | △ |
| | F107 | Output Voltage Proportion | 1～100% | 100% | × |
| | F108～F110 | Reserved | | | |
| | F111 | Max Frequency Limit | F113～400.0 | 50.00 | × |
| | F112 | Min Frequency Limit | 0.50～F113 | 0.50 | × |
| | F113 | Target Frequency | F112～F111 | 10.00 | × |
| | F114 | 1st Acceleration Time | 0.1～3000 | 5.0S for 0.4～3.7KW 30.0S for 5.5～30KW 60.0S for 37～400KW | × |
| | F115 | 1st Deceleration Time | 0.1～3000 | 5.0S for 0.4～3.7KW 30.0S for 5.5～30KW 60.0S for 37～400KW | × |
| | F116 | 2nd Acceleration Time | 0.1～3000 | 5.0S for 0.4～3.7KW 30.0S for 5.5～30KW 60.0S for 37～400KW | × |
| | F117 | 2nd Deceleration Time | 0.1～3000 | 5.0S for 0.4～3.7KW 30.0S for 5.5～30KW 60.0S for 37～400KW | × |
| | F118 | Turnover Frequency | 15.00～400.0 | 50.00 | × |
| | F119 | Latent Frequency | F112～F111 | 5.00 | × |
| | F120 | Dead-Time of Switch Between Corotation and Reverse | 0.0～3000 | 0.0 | × |
| | F121 | Stop Mode Selection | 0: Stop by deceleration time 1: Free stop | 0 | × |
| | F122 | Reserved | | | |

| | | | | | |
|---|---|---|---|---|---|
| **Basic Parameters** | F123 | Jogging Function | 0: Invalid jogging function<br>1: Valid jogging function | 1 | × |
| | F124 | Jogging Frequency | F112～F111 | 5.00 | √ |
| | F125 | Jogging Acceleration Time | 0.1～3000 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400KW | √ |
| | F126 | Jogging Deceleration Time | 0.1～3000 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400KW | √ |
| | F127 | Skip Frequency A | 0.00～400.0 | 0.00 | × |
| | F128 | Skip Area A | ±2.5 | 0.5 | × |
| | F129 | Skip Frequency B | 0.00～400.0 | 0.00 | × |
| | F130 | Skip Area B | ±2.5 | 0.5 | × |
| | F131 | Display Contents | 0:Frequency;<br>1:Rotate speed<br>2:Linear velocity;<br>3:Output voltage;<br>4: Output current | 0 | √ |
| | F132 | Number of Motor Poles | 2～100 | 4 | × |
| | F133 | Drive Ratio of Driven System | 0.10～200.0 | 1.00 | × |
| | F134 | Range of Linear Velocity | 1～60000 | 1800 | × |
| | F135、 | Reserved | | | |
| | F137 | Frequency Memory | 0:Invalid 1:Valid | 0 | × |
| | F138 | Auto Start of Analog Signals Speed Control | 0:Auto start<br>1:Press “Run” to start | 0 | × |
| | F139 | Auto Start After Power Resupplied or Reset | 0:Invalid restart<br>1:Valid restart | 0 | × |
| | F140 | Start by the Terminal Direction Signal | 0:Invalid<br>1:Valid | 0 | × |
| | F141～F159 | Reserved | | | |
| | F160 | Restore Mfr’s Value | 0:Not restoring Mfr’s Value<br>1:Restoring Mfr’s Value | 0 | × |
| **Running Control Mode** | F200 | Start Control | 0:Keypad command<br>1:Terminal command<br>2,3,4:Reserved | 0 | × |
| | F201 | Additional Start Control | 0:No additional start function<br>1:Keypad command<br>2:Terminal command<br>3,4:Reserved | 0 | × |

| | | | | | |
|---|---|---|---|---|---|
| Running Control Mode | F202 | Stop Control | 0: Keypad Command<br>1: Terminal Command<br>2,3,4: Reserved | 0 | × |
| | F203 | Additional Stop Control | 0: No additional start function<br>1:Keypad command<br>2:Terminal command<br>3,4:Reserved | 0 | × |
| | F204 | Basic Modes of Speed Control | 0: Keypad speed control<br>1: Multi speed control<br>2: Terminal speed control<br>3: Analog speed control<br>4: Coding speed control<br>5:Upper computer control | 0 | × |
| | F205 | Additional Modes of Speed Control | 0: No additional start function<br>1:Keypad speed control<br>2: Multi speed control<br>3:Terminal speed control | 0 | × |
| | F206 | Direction Given | 0～5 | 0 | × |
| | F07/F208 | Reserved | | | |
| | F209 | Selection of Analog Signal Input Channel | 0:V2 channel<br>1:Reserved<br>2:I2 channel | 0 | × |
| | F210 | Multi-Speed Types | 0: 3-stage speed running<br>1: 7-stage speed running<br>2: Auto circulating running | 0 | × |
| | F211 | Selection of Stage Speed Under Auto-circulation Speed Control | 2～7 | 7 | × |
| | F212 | Selection of Times of Auto-irculation Speed Control | 0～9999 | 0 | × |
| | F213 | Status After Auto-circulation Running Finished. | 0:Stop<br>1:Run at the speed of last stage | 0 | × |
| | F214～F229 | Reserved | | | |
| | F230 | Precision of Frequency Showing | 0.01～2.00 | 0.01 | × |
| | F231 | Speed of Frequency Change | 0:Normal<br>1:Slow 2:Fast | 0 | × |
| | F232～F260 | Reserved | | | |
| Multi-Speed Parameters | F300 | 1st Speed Running Direction | 0:Forward; 1:Reverse | 0 | √ |
| | F301 | 1st Speed Acceleration Time | 0.1～3000 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400KW | √ |
| | F302 | 1st Speed Running Frequency | F112～F111 | 5.00 | √ |

| | | | | | |
|---|---|---|---|---|---|
| **Multi-Speed Parameters** | F303 | 1st Speed Running Time | 0.1～3000 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400KW | √ |
| | F304 | 1st Speed Deceleration Time | 0.1～3000 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400KW | √ |
| | F305 | 1st Speed Interval | 0.0～3000 | 0.0 | √ |
| | F306 | 2nd Speed Running Direction | 0:Forward; 1:Reverse | 1 | √ |
| | F307 | 2nd Speed Acceleration Time | 0.1～3000 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400KW | √ |
| | F308 | 2nd Speed Running Frequency | F112～F111 | 10.00 | √ |
| | F309 | 2nd Speed Running Time | 0.1～3000 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400KW | √ |
| | F310 | 2nd Speed Deceleration Time | 0.1～3000 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400KW | √ |
| | F311 | 2nd Speed Interval | 0.0～3000 | 0.0 | √ |
| | F312 | 3rd Speed Running Direction | 0:Forward; 1:Reverse | 0 | √ |
| | F313 | 3rd Speed Acceleration Time | 0.1～3000 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400KW | √ |
| | F314 | 3rd Speed Running Frequency | F112～F111 | 15.00 | √ |
| | F315 | 3rd Speed Running Time | 0.1～3000 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400KW | √ |
| | F316 | 3rd Speed Deceleration Time | 0.1～3000 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400KW | √ |
| | F317 | 3rd Speed Interval | 0.0～3000 | 0.0 | √ |
| | F318 | 4th Speed Running Direction | 0: Forward; 1: Reverse | 1 | √ |
| | F319 | 4th Speed Acceleration Time | 0.1～3000 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400KW | √ |
| | F320 | 4th Speed Running Frequency | F112～F111 | 20.00 | √ |
| | F321 | 4th Speed Running Time | 0.1～3000 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400KW | √ |
| | F322 | 4th Speed Deceleration Time | 0.1～3000 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400KW | √ |
| | F323 | 4th Speed Interval | 0.0～3000 | 0.0 | √ |
| | F324 | 5th Speed Running Direction | 0:Forward;1:Reverse | 0 | √ |

| | | | | | |
|---|---|---|---|---|---|
| Multi-Speed Parameters | F325 | 5th Speed Acceleration Time | 0.1～3000 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400KW | √ |
| | F326 | 5th Speed Running Frequency | F112～F111 | 25.00 | √ |
| | F327 | 5th Speed Running Time | 0.1～3000 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400KW | √ |
| | F328 | 5th Speed Deceleration Time | 0.1～3000 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400KW | √ |
| | F329 | 5th Speed Interval | 0.0～3000 | 0.0 | √ |
| | F330 | 6th Speed Running Direction | 0:Forward; 1:Reverse | 1 | √ |
| | F331 | 6th Speed Acceleration Time | 0.1～3000 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400KW | √ |
| | F332 | 6th Speed Running Frequency | F112～F111 | 30.00 | √ |
| | F333 | 6th Speed Running Time | 0.1～3000 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400KW | √ |
| | F334 | 6th Speed Deceleration Time | 0.1～3000 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400KW | √ |
| | F335 | 6th Speed Interval | 0.0～3000 | 0.0 | √ |
| | F336 | 7th Speed Running Direction | 0:Forward; 1:Reverse | 0 | √ |
| | F337 | 7th Speed Acceleration Time | 0.1～3000 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400KW | √ |
| | F338 | 7th Speed Running Frequency | F112～F111 | 35.00 | √ |
| | F339 | 7th Speed Running Time | 0.1～3000 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400KW | √ |
| | F340 | 7th Speed Deceleration Time | 0.1～3000 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400kw | √ |
| | F341 | 7th Speed Interval | 0.0～3000 | 0.0 | √ |
| | F342～F360 | Reserved | | | |
| Terminal Functions Parameter | F400 | OP1 terminal input signal type | 0:Level touch off<br>1:Pulse touch off | 0 | × |
| | F401 | OP2 terminal input signal type | 0:Level touch off<br>1:Pulse touch off | 0 | × |
| | F402 | OP3 terminal input signal type | 0:Level touch off<br>1:Pulse touch off | 0 | × |
| | F403 | OP4 terminal input signal type | 0:Level touch off<br>1:Pulse touch off | 0 | × |

| | | | | | | |
|---|---|---|---|---|---|---|
| Terminal Functions Parameter | F404 | OP5 terminal input signal type | 0:Level touch off<br>1:Pulse touch off | | 0 | × |
| | F405 | OP6 terminal input signal type | 0:Level touch off<br>1:Pulse touch off | | 0 | × |
| | F406 | OP7 terminal input signal type | 0:Level touch off<br>1:Pulse touch off | | 0 | × |
| | F407 | OP8 terminal input signal type | 0:Level touch off<br>1:Pulse touch off | | 0 | × |
| | F408 | OP1 Function Setting | 0:3rd/7th speed terminal1<br>1:3rd/7th speed terminal2<br>2:3rd/7th speed terminal3<br>3:jogging terminal<br>4:reset terminal<br>5:free-stop terminal<br>6:run terminal<br>7:stop terminal<br>8:acce/decel forbidden terminal<br>11:Up frequency increase teminal<br>12:DOWN frequency decrease teminal<br>13:corotationterminal<br>14: reverseterminal<br>15:direction terminal<br>16:acce/deceleration time switch terminal<br>17:external interruption terminal<br>18:input terminal of codingsped control<br>9,10,19～22:Reserved | | 3 | × |
| | F409 | OP2 Function Setting | | | 0 | × |
| | F410 | OP3 Function Setting | | | 1 | × |
| | F411 | OP4 Function Setting | | | 2 | × |
| | F412 | OP5 Function Setting | | | 5 | × |
| | F413 | OP6 Function Setting | | | 13 | × |
| | F414 | OP7 Function Setting | | | 14 | × |
| | F415 | OP8 Function Setting | | | 4 | × |
| | F416 | Token Output of Relay | 0～12（See Table 8-2） | | 0 | × |
| | F417 | Token Output of Terminal OUT1 | | | 3 | × |
| | F418 | Token Output of Terminal OUT2 | | | 3 | × |
| | F419 | Duty Ratio of Brake Signal | 0～100(%) | | 80 | √ |
| | F420 | Lowest Frequency at Max FM/IM | F112～400.0 | | 50.00 | × |
| | F421 | FM Output Range Selection | 0:0～5V; 1:0～10V | | 0 | × |
| | F422 | FM Output Compensation | 0～120% | | 0 | √ |
| | F423 | FM/IM Output Parameter Selection | 0.0～10.0 | | 2.0 | × |
| | F424 | IM Output Compensation | 0～120% | | 0 | √ |
| | F425 | IM Output Range Selection | 0: 0～20mA<br>1: 4～20mA | | 0 | × |
| | F426 | FM Function Selection | 0:Output Frequency Display<br>1:Output Current Display | | 0 | × |
| | F427 | IM Function Selection | 0:Output Frequency Display<br>1:Output Current Display | | 1 | × |
| | F428～F460 | Reserved | | | | |

| | | | | | |
|---|---|---|---|---|---|
| V/F Control | F500 | Compensation of Speed Difference | 0～8 | 0 | × |
| | F501 | Torque Compensation | 0:Beeline type compensation<br>1:Reserved; 2:Reserved | 0 | × |
| | F502 | Beeline-type Torque Compensation Curve | 1～16 | 0.4～3.7KW:5<br>5.5～30KW:4<br>37～110KW:3 | × |
| | F503～F511 | Reserved | | | |
| | F512 | Setting Carrier-Wave Frequency | 0.4～3.7KW:1000-10000<br>5.5～30KW:1000-9000<br>37～110KW:1000-6000 | 0.4～3.7KW:1000<br>5.5～30KW:1000<br>37～400KW:1000 | × |
| | F513 | Reserved | | | |
| | F514 | DC Braking Function Selection | 0: DC braking function forbidding<br>1: Braking before start<br>2: Braking during stop<br>3: Braking both before start &during stop | 0 | × |
| | F515 | Initial Frequency of DC Braking | 1.00～5.00 | 1.00 | √ |
| | F516 | DC BrakingVoltage | 0～60 | 10 | √ |
| | F517 | Braking Duration Before Starting | 0.0～10.0 | 0.5 | √ |
| | F518 | Stop-Braking Duration | 0.0～10.0 | 0.5 | √ |
| | F519～F524 | Reserved | | | |
| | F525 | Selection Function of Stalling Adjusting | 0:Invalid; 1:Valid | 0 | × |
| | F526 | Stalling Adjusting Function During Accelerationion | 0:Invalid; 1:Valid | 0 | × |
| | F527 | Stalling Adjusting Function During Running | 0:Invalid; 1:Valid | 0 | × |
| | F528 | Stalling Adjusting Function in During Deceleration | 0:Invalid; 1:Valid | 0 | × |
| | F529 | Stalling Adjusting Function during Stopping | 0:Invalid; 1:Valid | 0 | × |
| | F530 | Fluctuation Removing Time When Stalling Setting Starts | 0.1～50.0 | 1.0 | √ |
| | F531 | Time for Stalling Adjusting to Start | 0.1～150.0 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400KW | √ |
| | F532 | Lower Frequency Limit of Stalling Setting | F112～F111 | 5.00 | √ |
| V/F Control | F533 | Fluctuation Removing Time When Stalling | 0.0～50.0 | 1.0 | √ |

| | | | | | |
|---|---|---|---|---|---|
| | F534 | Quiting Time of Stalling Adjusting | 0.1～150.0 | 5.0S for 0.4～3.7KW<br>30.0S for 5.5～30KW<br>60.0S for 37～400KW | √ |
| | F535 | Protection Time of Stalling Adjusting | 0.0～100.0 | 4.0 | √ |
| | F536～F560 | Reserved | | | |
| | F600～F660 | Reserved | | | |
| Timing Control and Protection Function | F700 | Selection of Free Stop Mode | 0: Immediate free stop<br>1: Delayed free stop | 0 | × |
| | F701 | Action Delay Time of Free Stop and Output Terminal | 0.0～60.0S | 0.0 | × |
| | F702 | Fan control mode (only valid for the power 90-400kw) | 0:controlled by termperature<br>1:controlled by inverter's power | 1 | × |
| | F703～F707 | Reserved | | | |
| | F708 | Function Selection of Under-Voltage | 0:Invalid 1:Valid | Setting Value | ○ |
| | F709 | Under-Voltage Protection Voltage | 200～400 | Setting Value | ○ |
| | F710 | Filtering Constant of Under-voltage | 0.0～60.0 | Setting Value | ○ |
| | F711 | Function Selection of Out-phase | 0:Invalid; 1:Valid | Setting Value | ○ |
| | F712 | Filtering Constant of Out-phase | 0.0～60.0 | Setting Value | ○ |
| | F713、F714 | Reserved | | | |
| | F715 | Overload Duration | 0～100.0S | Setting Value | ○ |
| | F716 | Overload Coefficient | 0.0～1.8 | Setting Value | ○ |
| | F717 | Overload Interruption | 0～60.0S | Setting Value | ○ |
| | F718 | Inverter's Rated Current | 1.0～1000A | Setting Value | ○ |
| | F719 | Current Compensation Coefficient | 0.0～2.0 | Setting Value | ○ |
| | F720 | Relative Overload Value | 1～4 | Setting Value | ○ |
| | F721～F760 | Reserved | | | |
| Input Analog Parameters | F800 | Lower Limit of Analog Input | 0～1023 | 20 | √ |
| | F801 | Upper Limit of Analog Input | 0～1023 | 1000 | √ |
| | F802～F805 | Reserved | | | |

| | | | | | |
|---|---|---|---|---|---|
| | F806 | Analog Input Compensation | 0～100 | 0 | √ |
| Input Analog Parameters | F807 | Corresponding Frequency of Lower Limit of Analog Signal | 0～F111 | 0 | × |
| | F808 | Relation Between Analog Changes and Output Frequency | 0: Direct proportion<br>1: Inverse proportion | 0 | × |
| | F809～F860 | Reserved | | | |
| Communication Function | F900 | Inverter's Address | 0～254 | 1 | × |
| | F901～F902 | Reserved | | | |
| | F903 | Parity Check Selection | 0:No checkout<br>1:Odd<br>2:Even | 0 | × |
| | F904 | Baud Rate Selection | 0:1200<br>1:2400<br>2:4800<br>3:9600 | 1 | × |
| | F905～F960 | Reserved | | | |

Note: × indicating that function code can only be modified in stop state.

√ indicating that function code can be modified both in stop and run state.

△ indicating that function code can only be checked in stop or run state but cannot be modified.

○ indicating that function code cannot be initialized as inverter restores manufacturer's value but can only be modified manually.

## Appendix 3 Products & Structures

F1000-G series inverter has its power range between 0.4～110KW. Refer to Tables 3-1 and3-2 for main data. There may be two (or more than two) kinds of structures for certain products. Please make a clear indication when placing your order.

Inverter should operate under the rated output current, with overload permitted for a short time. However, it shall not exceed the allowable values at working time.

Table 3-1 Product Summary of F1000-G

| Model | Applicable Motor (kw) | Rated Current Output (A) | Structure Code | Cooling Mode | Remarks |
|---|---|---|---|---|---|
| F1000-G0004S2B | 0.4 | 2.5 | B0 | Self-cooling | Single-Phase Plastic Hanging |
| F1000-G0007S2B | 0.75 | 4.5 | B0 | Air Cooling | |
| F1000-G0007XS2B | 0.75 | 4.5 | B0 | Air Cooling | |
| F1000-G0015S2B | 1.5 | 7 | B2 | Air Cooling | |
| F1000-G0015XS2B | 1.5 | 7 | B2 | Air Cooling | |
| F1000-G0022S2B | 2.2 | 10 | B3 | Air Cooling | |
| F1000-G0007T3B | 0.75 | 2 | B2 | Air Cooling | Three-Phase Plastic Hanging |
| F1000-G0015T3B | 1.5 | 4 | B2 | Air Cooling | |
| F1000-G0022T3B | 2.2 | 6.5 | B2 | Air Cooling | |
| F1000-G0037T3B | 3.7 | 8 | B4 | Air Cooling | |
| F1000-G0040T3B | 4.0 | 9 | B4 | Air Cooling | |
| F1000-G0055T3B | 5.5 | 12 | B5 | Air Cooling | |
| F1000-G0075T3B | 7.5 | 17 | B5 | Air Cooling | |
| F1000-G0110T3C | 11 | 23 | C1 | Air Cooling | Three-Phase Metal Hanging |
| F1000-G0150T3C | 15 | 32 | C2 | Air Cooling | |
| F1000-G0185T3C | 18.5 | 38 | C3 | Air Cooling | |
| F1000-G0220T3C | 22 | 44 | C3 | Air Cooling | |
| F1000-G0300T3C | 30 | 60 | C4 | Air Cooling | |
| F1000-G0370T3C | 37 | 75 | C5 | Air Cooling | |
| F1000-G0450T3C | 45 | 90 | C5 | Air Cooling | |
| F1000-G0550T3C | 55 | 110 | C6 | Air Cooling | |
| F1000-G0750T3C | 75 | 150 | C6 | Air Cooling | |
| F1000-G0900T3C | 90 | 180 | C7 | Air Cooling | |

| | | | | | |
|---|---|---|---|---|---|
| F1000-G1100T3C | 110 | 220 | C7 | Air Cooling | |
| F1000-G1320T3C | 132 | 265 | C8 | Air Cooling | |
| F1000-G1600T3C | 160 | 320 | C8 | Air Cooling | |
| F1000-G1100T3D | 110 | 220 | D0 | Air Cooling | Three-Phase Metal Cabinet |
| F1000-G1320T3D | 132 | 265 | D1 | Air Cooling | |
| F1000-G1600T3D | 160 | 320 | D1 | Air Cooling | |
| F1000-G2000T3D | 200 | 400 | D2 | Air Cooling | |
| F1000-G2200T3D | 220 | 440 | D2 | Air Cooling | |
| F1000-G2500T3D | 250 | 490 | D3 | Air Cooling | |
| F1000-G2800T3D | 280 | 550 | D3 | Air Cooling | |
| F1000-G3150T3D | 315 | 620 | D3 | Air Cooling | |
| F1000-G3550T3D | 355 | 700 | D3 | Air Cooling | |
| F1000-G4000T3D | 400 | 800 | D4 | Air Cooling | |

Note: The “X” in the F1000-G0007XS2B and F1000-G0015XS2B is built-in braking unit!

Table 3-2 F1000-G Types of Product Structure

| Structure Code | External Dimension (A×B×H) | Mounting Size(W×L) | Mounting Bolt | Remarks |
|---|---|---|---|---|
| B0 | 105×120×150 | 94×139 | M4 | Plastic Housing |
| B2 | 125×140×170 | 114×160 | M5 | |
| B3 | 143×148×200 | 132×187 | M5 | |
| B4 | 162×150×250 | 145×233 | M5 | |
| B5 | 200×160×300 | 182×282 | M6 | |
| C1 | 225×220×340 | 160×322 | M6 | Metal Hanging |
| C2 | 230×225×380 | 186×362 | M6 | |
| C3 | 265×235×435 | 235×412 | M6 | |
| C4 | 314×235×480 | 274×464 | M6 | |
| C5 | 360×265×555 | 320×530 | M8 | |
| C6 | 411×300×630 | 370×600 | M10 | |
| C7 | 516×326×760 | 360×735 | M12 | |
| C8 | 560×326×1000 | 390×970 | M12 | |
| D0 | 580×500×1500 | 410×300 | M16 | Metal Cabinet |
| D1 | 600×500×1730 | 400×300 | M16 | |
| D2 | 660×500×1950 | 450×300 | M16 | |
| D3 | 800×600×2045 | 520×340 | M16 | |
| D4 | 1000×550×2000 | 800×350 | M16 | |

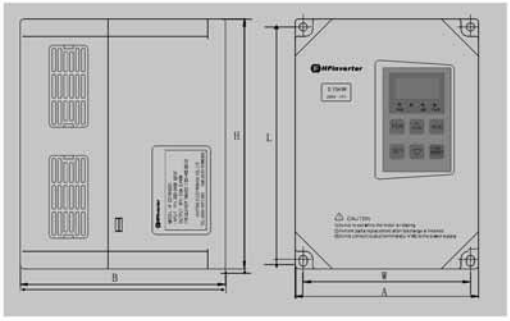


Fig 3-1 Plastic Profile

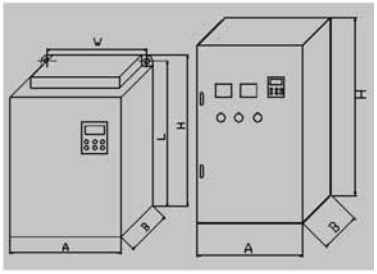


Fig 3-2 Metal Profile

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