Appendix 1 Function Description of Multi-segment Instructions

4 command multi-segment function terminals can be combined into 16 states, these 16 states correspond to 16 command setting values. The specific table is as follows

| K4 | K3 | K2 | K1 | Instruction settings | Corresponding parameters |
|---|---|---|---|---|---|
| OFF | OFF | OFF | OFF | Multi-segment instruction 0 | FE-00 |
| OFF | OFF | OFF | ON | Multi-segment instruction 1 | FE-01 |
| OFF | OFF | ON | OFF | Multi-segment instruction 2 | FE-02 |
| OFF | OFF | ON | ON | Multi-segment instruction 3 | FE-03 |
| OFF | ON | OFF | OFF | Multi-segment instruction 4 | FE-04 |
| OFF | ON | OFF | ON | Multi-segment instruction 5 | FE-05 |
| OFF | ON | ON | OFF | Multi-segment instruction 6 | FE-06 |
| OFF | ON | ON | ON | Multi-segment instruction 7 | FE-07 |
| ON | OFF | OFF | OFF | Multi-segment instruction 8 | FE-08 |
| ON | OFF | OFF | ON | Multi-segment instruction 9 | FE-09 |
| ON | OFF | ON | OFF | Multi-segment instruction 10 | FE-10 |
| ON | OFF | ON | ON | Multi-segment instruction 11 | FE-11 |
| ON | ON | OFF | OFF | Multi-segment instruction 12 | FE-12 |
| ON | ON | OFF | ON | Multi-segment instruction 13 | FE-13 |
| ON | ON | ON | OFF | Multi-segment instruction 14 | FE-14 |
| ON | ON | ON | ON | Multi-segment instruction 15 | FE-15 |

When the frequency source is selected as multi-speed, 100.0% of the function code FE-00～FE-15 corresponds to the maximum frequency F0-09. In addition to the multi-step speed function, the multi-step command can also be used as a given source of PID, or as a voltage source of V/F separation control, etc., to meet the needs of switching between different given values.

Appendix 1 Function description of acceleration/deceleration time selection terminal

| Terminal 1 | Terminal 1 | Acceleration or deceleration time selection | Corresponding parameters |
|---|---|---|---|
| OFF | OFF | Acceleration and deceleration time 1 | F0-13、F0-14 |
| OFF | ON | Acceleration and deceleration time 2 | F9-03、F9-04 |
| ON | OFF | Acceleration and deceleration time 3 | F9-05、F9-06 |
| ON | ON | Acceleration and deceleration time 4 | F9-07、F9-08 |

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F6-05 | DI filter time | 0.000s ~ 1.000s | 0.010s | ☆ |

If the DI terminal is disturbed at the application site, the filter time can be appropriately increased; the longer the filter time, the slower the DI action response time.

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| F6-06 | DI1 delay time | 0.0s ~ 3600.0s | 0.0s | ☆ |
| F6-07 | DI2 delay time | 0.0s ~ 3600.0s | 0.0s | ☆ |
| F6-08 | DI3 delay time | 0.0s ~ 3600.0s | 0.0s | ☆ |
| F6-09 | DI4 delay time | 0.0s ~ 3600.0s | 0.0s | ☆ |

After the terminal detects the input signal, it will respond after a delay of this time.

It is used to set the valid state mode of the digital input terminal.

0: When selected as active high level, it is valid when the corresponding DI terminal is short-circuited, and invalid when disconnected.

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F6-10 | DI terminal active mode options | 0: Active high<br>1: Active low<br>Units digit: DI1<br>Tens digit: DI2<br>Hundreds digit: DI3<br>Thousands digit: DI4<br>Ten Thousands digit: DI5 | 0 | ★ |

1: When selected as active low level, the corresponding DI terminal is invalid when short-circuited, and valid when disconnected.

| number of digits | Ten Thousands digit | Thousands digit | Hundreds digit | Tens digit | Units digit |
|---|---|---|---|---|---|
| Defaults | 0 | 0 | 0 | 0 | 0 |
| Corresponding terminal | DI5 | DI4 | DI3 | DI2 | DI1 |

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F6-11 | Terminal command mode | 0: Two-line mode 1<br>1: Two-line mode 2<br>2: Three-line mode 1<br>3: Three-line mode 2 | 0 | ★ |

This parameter defines four different ways to control the VFD to run through external terminals.

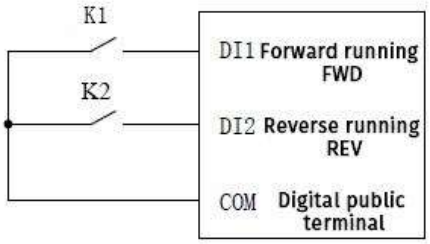
Note: For the convenience of description, DI1\DI2\DI3 in the DI1-DI5 multi-function input terminals are selected as the external terminals. That is, the function of DI1\DI2\DI3 is selected by setting the value of F6-00~F6-02. For details, please refer to function F6-00~F6-04.

0: Two-wire mode 1: The most commonly used two-wire mode for this bit. The forward and reverse rotation of the motor is determined by DI1/DI2.

| Code | Name | Setting value | Function description |
|---|---|---|---|
| F6-11 | Terminal command method | 0 | 2-wire mode 1 |
| F6-00 | DI1 terminal function selection | 1 | Forward running FWD |

| | | | |
|---|---|---|---|
| F6-01 | DI2 terminal function selection | 2 | Reverse running REV |

| K1 | K2 | Run command |
|---|---|---|
| 1 | 0 | FWD |
| 0 | 1 | REV |
| 1 | 1 | STOP |
| 0 | 0 | STOP |



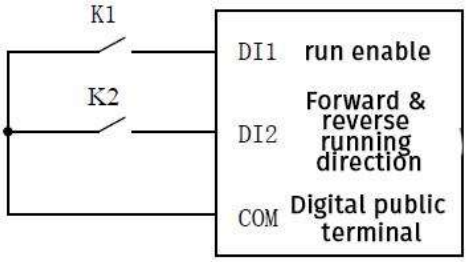

Two-wire mode 1

In this control mode, when K1 is closed, the VFD rotates forward, and when K2 is closed, the VFD rotates reversely. K1/K1 are closed or disconnected at the same time, and the VFD stops running.

0: Two-wire type 2: In this mode, the DI1 terminal is the running enable terminal, and the DI2 function is to confirm the running direction.

| Code | Name | Setting value | Function description |
|---|---|---|---|
| F6-11 | Terminal command method | 1 | two-wire 2 |
| F6-00 | DI1 terminal function selection | 1 | run enable |
| F6-01 | DI2 terminal function selection | 2 | Forward and reverse running direction |

| K1 | K2 | Run command |
|---|---|---|
| 0 | 0 | STOP |
| 0 | 1 | STOP |
| 1 | 0 | FWD |
| 1 | 1 | REV |



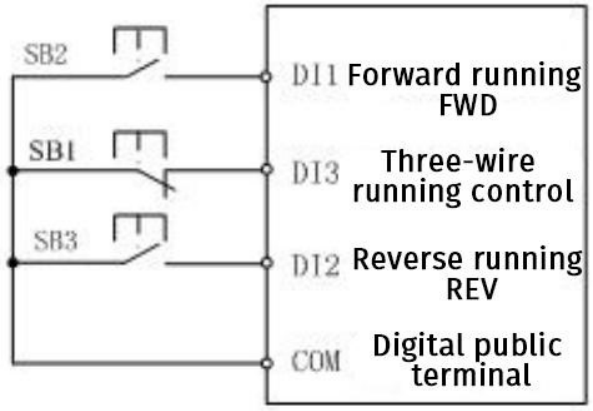

Two-wire mode 2

In this mode, when K1 is closed, K2 disconnects the forward drive of the VFD, and K2 closes the VFD in reverse. K1 is disconnected, and the VFD stops running.

2: Three-wire mode 1, in this mode, the D3 terminal is the enable terminal, and the direction is controlled by DI1/DI2 respectively. The settings are as follows:

| Code | Name | Setting value | Function description |
|---|---|---|---|
| F6-11 | Terminal command method | 2 | three-wire 1 |
| F6-00 | DI1 terminal function selection | 1 | Forward running FWD |
| F6-01 | DI2 terminal function selection | 2 | Run REV in reverse |
| F6-02 | DI3 terminal function | 3 | Three-wire running control |

| | | | |
|---|---|---|---|
| | selection | | |




Three-wire mode 1

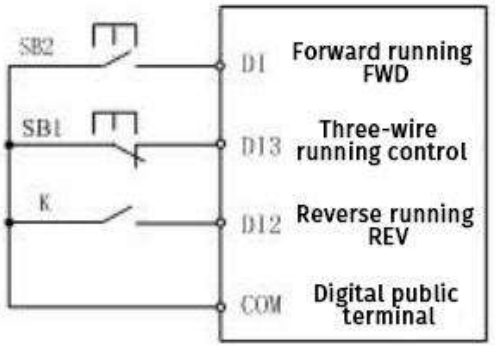
In this control mode, when the SB1 button is in the closed state, press the SB2 button, the VFD will run forward, and press the SB3 button, the VFD will run reversely.

When the SB1 button is disconnected, the VFD stops. During normal start-up and operation, the SB1 button must be kept in the closed state, and the command of the SB2/SB3 button will take effect in the closing action, and the operating state of the VFD is subject to the last status of the three buttons.

3: Three-wire mode 2: In this mode, DI3 is the enable terminal, the running command is given by the DI1 terminal, and the direction is determined by the state of DI2. The settings are as follows:

| Code | Name | Setting value | Function description |
|---|---|---|---|
| F6-11 | Terminal command method | 3 | three-wire 1 |
| F6-00 | DI1 terminal function selection | 1 | run enable |
| F6-01 | DI2 terminal function selection | 2 | Forward and reverse running direction |
| F6-02 | DI3 terminal function selection | 3 | Three-wire enable operation |

| K | Running direction |
|---|---|
| 0 | Forward running FWD |
| 1 | Reverse running REV |




As shown in the figure above, in this control mode, when the SB1 button is closed, press the SB2 button to run the VFD, K disconnects the VFD to run forward, K closes the VFD to reverse; the VFD stops when the SB1 button is disconnected. During normal startup and operation, the SB1 button must be kept closed, and the command of the SB2 button will take effect at the edge of the closing action.

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F6-12 | Terminal UP/DOWN change rate | 0.001Hz/s ~ 65.535Hz/s | 1.000Hz/s | ☆ |

It is used to set the change amount of the frequency per second when the UP/DOWN function is long-pressed to adjust the frequency.

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F6-13 | AI curve 1 minimum input | 0.00V ~ F6-15 | 0.00V | ☆ |
| F6-14 | AI1 curve minimum input corresponding setting | -100.0% ~ +100.0% | 0.0% | ☆ |
| F6-15 | AI curve 1 maximum input | F6-13 ~ +10.00V | 10.00V | ☆ |
| F6-16 | AI1 curve maximum input corresponding setting | -100.0% ~ +100.0% | 100.0% | ☆ |
| F6-17 | AI1 filter time | 0.00s ~ 10.00s | 0.10s | ☆ |

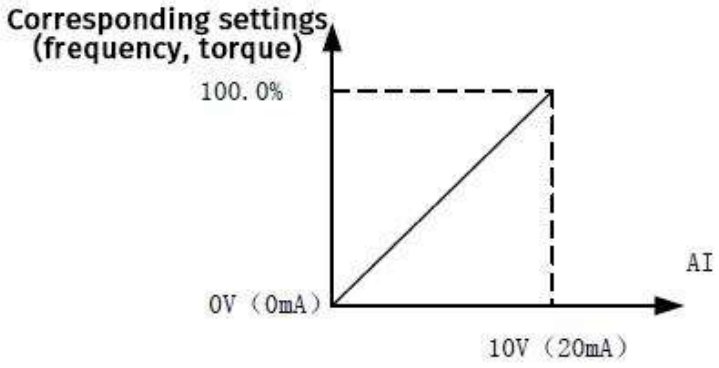
When the analog input voltage is less than "AI curve 1 minimum input F6-13", the setting value of F6-23 will be selected according to the AI lower than the minimum input setting, and it will be determined that AI is equal to the "set AI curve 1 minimum input corresponding setting" F6-13, 100% corresponds to 10V, 0% corresponds to 0V" or "0%".

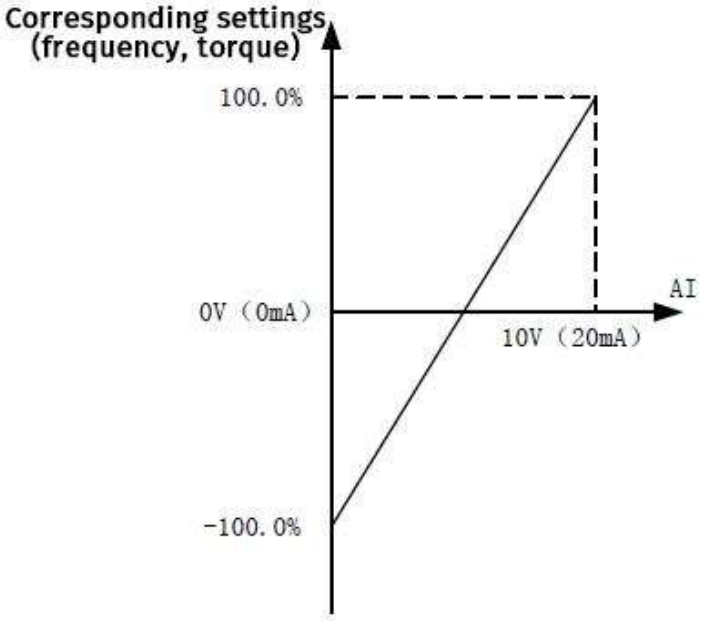
When the analog input voltage is greater than "AI curve 1 maximum input F6-15", it is determined that AI is equal to "set AI curve 1 maximum input corresponding to setting F6-16. When the analog input is current, 1mA current is equivalent to 0.5V voltage. .

AI1 input filter time is used to set the software filter time of AI1. When the on-site analog quantity is easily disturbed, please increase the filter time so that the detected analog quantity tends to be stable. If you want to slow down, how to set it needs to be considered according to the actual application.

In other applications, the 100.0% of the analog setting corresponds to the nominal value with different meanings, please refer to the description of each application section for details.

The following figure shows two typical settings:




| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F6-18 | AI2 curve minimum input | 0.00V ~ F6-20 | 0.00V | ☆ |
| F6-19 | AI2 curve minimum input corresponding setting | -100.0% ~ +100.0% | 100.0% | ☆ |
| F6-20 | AI2 curve maximum input | F6-18 ~ +10.00V | 2.80V | ☆ |
| F6-21 | AI2 curve maximum input corresponding setting | -100.0% ~ +100.0% | 0.0% | ☆ |
| F6-22 | Potentiometer filter time | 0.00s ~ 10.00s | 0.10s | ☆ |

同 AI 曲线 1 的讲解。

| Code | Name | Range | Default | Modification | Code |
|---|---|---|---|---|---|
| F6-23 | AI curve selection | Units digit | AI1 curveselection | 21 | ☆ |
| | | 1 | Curve 1 (2 points, see F6-13 ~ F6-16) | | |
| | | 2 | Curve 2 (2 points, see F6-18 ~ F6-21) | | |

| | | | | | |
|---|---|---|---|---|---|
| | | 3 | Curve 3（6points, see P3-04～P3-15） | | |
| | | Tens digit | AI2 curve selection (same as the unites digit) | | |

Set the input curve selection of AI1/2. The default 21 corresponds to the following:

Units 1 corresponds to AI1 selection curve 1 (2 points, see F6-13～F6-16)

Tens place 2 corresponds to AI2 selection curve 2 (2 points, see F6-18～F6-21)

| Code | Name | Range | Default | Modification | Code |
|---|---|---|---|---|---|
| F6-24 | Options for AI lower than minimum input | Units digit | Option for AI1 lower than the minimum input setting | 00 | ☆ |
| | | 0 | Minimum input setting | | |
| | | 1 | 0.0% | | |
| | | Tens digit | AI2 is lower than the minimum input setting selection (same as the unites digit) | | |

It is set that when AI is less than the minimum value in the curve, it is determined that AI is equal to "corresponding to the minimum input setting" or "0%".

The units/tens from low to high correspond to AI1/AI2 respectively.

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F6-26 | PULSE minimum input | 0.00kHz ~ F6-28 | 0.00kHz | ☆ |
| F6-27 | PULSE minimum input corresponding setting | -100.0% ~ 100.0% | 0.0% | ☆ |
| F6-28 | PULSE maximum input | F6-26 ~ 100.00kHz | 50.00kHz | ☆ |
| F6-29 | PULSE maximum input corresponding setting | -100.0% ~ 100.0% | 100.0% | ☆ |
| F6-30 | PULSE filter time | 0.00s ~ 10.00s | 0.10s | ☆ |

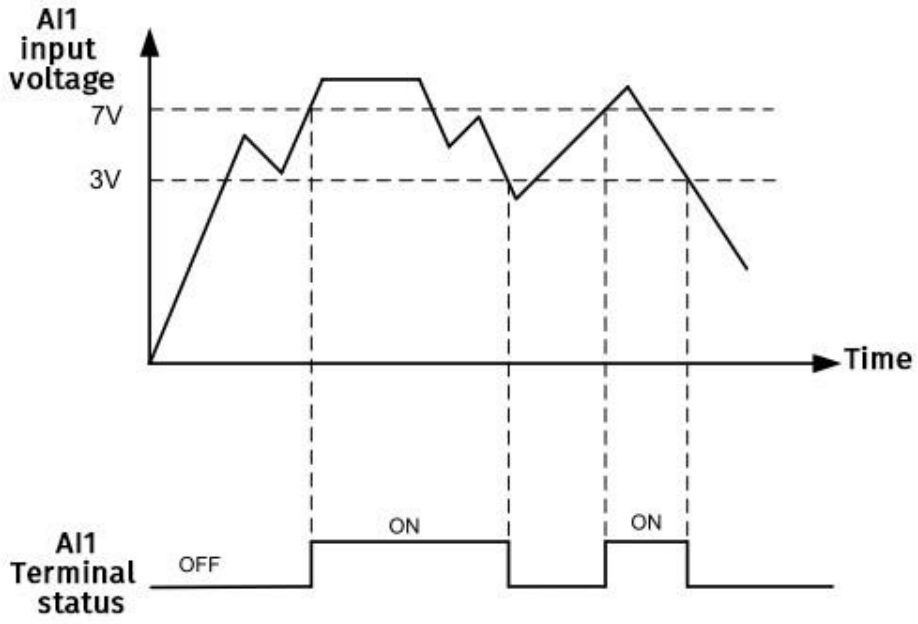
Same as AI curve and AI filter time.

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F6-31 | AI1 terminal function selection | 0: AI1 is analog input | 0 | ★ |
| | | 1~47: AI1 is used as DI digital input, the function is the same as F6-00 | | |
| F6-33 | AI1 as DI valid state selection | 0: Active high | 0 | ★ |
| | | 1: Active low | | |

Function code F6-31 is used to use AI1 as DI. When AI1 is used as DI, when AI1 input voltage is greater than 7V, AI1 terminal state is high level, when AI1 input voltage is lower than 3V, AI1 terminal state is low power flat. Hysteresis between 3V~7V

F6-33 is used to determine when AI1 is used as DI, whether AI1 high level is valid state or low level is valid state. As for the function setting of AI1 as DI, it is the same as the normal DI setting, please refer to the description of the relevant DI setting of F6 group.

The following figure takes AI1 input voltage as an example to illustrate the relationship between AI1 input voltage and corresponding DI status:




## 6.9 F7 set (Output terminal parameters)

VFDs come standard with one multi-function analog output terminal AO, one multi-function digital output terminal DO, and one multi-function relay output terminal.

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F7-00 | Digital output selection | 0: High-speed pulse output<br>1: Normal digital output | 0 | ☆ |

The DO output terminal is a high-speed pulse output terminal or an open-collector terminal multiplexing port.
When set to high-speed pulses, the output is high-frequency pulses up to 100kHz.
As an open-collector common digital output, its function is set by F7-02.
When used as high-speed pulse output, its function is set by F7-04.

| Code | Name | Default | Modification |
|---|---|---|---|
| F7-01 | RELAY1 output function selection | 0 | ☆ |
| F7-02 | DO output function selection | 1 | ☆ |

These multi-function terminals are described as follows:

| Code | Name | Function description |
|---|---|---|
| 0 | 0: No output | The output terminal has no function. |
| 1 | 1: VFD is running | Indicates that the VFD is in the running (RUN) state. |
| 2 | 2: Fault output (for free stop fault) | Indicates that the VFD has an output fault, and the fault level is free stop (cut off the output). |
| 3 | 3: Frequency level detection FDT1 output | Indicates that the output frequency reaches or exceeds the set value of F9-18/19. |
| 4 | 4: Frequency reached | Indicates that the absolute value of the output frequency reaches the set value of F9-20. |
| 5 | 5: Running at zero speed (no | Indicates that the VFD is in RUN state and the output frequency |

| | | |
|---|---|---|
| | output when VFD stops) | is 0Hz. Although the output frequency is also 0Hz during shutdown, this function terminal will not take effect. |
| 6 | 6: Motor overload pre-alarm | When the motor overload protection is turned on and the motor load exceeds the set value of the motor overload warning coefficient F8-02, the output is valid. |
| 7 | 7: VFD overload pre-alarm | 10s before the VFD overload protection action, the output becomes valid. |
| 8 | 8: Set count value reached | In the counting function, when the count value reaches the set count value FD-08, the output becomes valid. |
| 9 | 9: Designated count value reached | In the counting function, when the count value reaches the specified count value FD-09, the output becomes valid. |
| 10 | 10: Length reached | In the fixed length function, when the actual length FD-06 exceeds the set length FD-05, the output becomes valid. |
| 11 | 11: PLC cycle completed | When the PLC completes a cycle, the output becomes valid, and becomes invalid after 250ms. |
| 12 | 12: Accumulated operation time reached | When the "accumulated running time FA-07" reaches the value set by "set running time F9-16", the output becomes valid. |
| 13 | 13: Frequency being limited | When the given frequency exceeds the upper limit frequency or the lower limit frequency, and the actual frequency exceeds the upper limit frequency or the lower limit frequency (that is, in the swing frequency limit), the output is valid. |
| 14 | 14: Torque being limited | When the VFD runs in the speed control mode, the output is valid when the output torque reaches the upper limit of the speed control torque or the speed deviation exceeds 2Hz. |
| 15 | 15: Operation ready | When the power supply of the main circuit and control circuit of the VFD has been stabilized, and the VFD has detected any fault information, the VFD is in a running state (that is, there is no fault, no undervoltage), and the output is valid. |
| 16 | 16: Upper limit frequency reached | When the running frequency is greater than the upper limit frequency F0-11, the output is valid. |
| 17 | 17: Lower limiting frequency reached(running-related) | When "Running F9-14 with set frequency lower than the lower limiting frequency" is set to "0: Running with lower limiting frequency" or "2: Zero speed running", and the operating frequency is lower than the lower limiting frequency F0-12, the output is valid.<br>When "Running F9-14 with set frequency lower than the lower limiting frequency" is set to "1: Stop", the terminal always keeps the output invalid. When the output frequency is less than the lower limiting frequency during acceleration, the output is valid |
| 18 | 18: Undervoltage status output | When the "set frequency is lower than the lower limit frequency running action F9-14" is set to "1: stop", the terminal always keeps the output invalid. When the output frequency is less than the lower limit frequency during acceleration, the output is valid |

| | | |
|---|---|---|
| 19 | 19: Communication settings | When the VFD is in the state of input undervoltage, the output is valid. |
| 20 | 20: Operation at zero speed signal 2 (also output when operation stops) | It indicates that the VFD is in the RUN state and the output frequency is 0Hz or there is no output when it stops. |
| 21 | 21: Accumulated power-on time reached | When "cumulative power-on time FA-09" reaches the set value of "set power-on reaching time F9-15", the output becomes valid. |
| 22 | 22: Frequency level detection FDT2 | The output frequency reaches or exceeds the F9-21/22 set value. |
| 23 | 23: Frequency 1 reached | Indicates that the output frequency of the VFD is within the range of "arbitrary arrival frequency detection value 1 F9-23" ± ("maximum frequency F0-09" × "arbitrary arrival frequency detection width 1 F9-24"). |
| 24 | 24: Frequency 2 reached | Indicates that the output frequency of the VFD is within the range of "arbitrary arrival frequency detection value 1 F9-23" ± ("maximum frequency F0-09" × "arbitrary arrival frequency detection width 2 F9-26"). |
| 25 | 25: Current 1 reached | Indicates that the output current of the VFD is within the range of "arbitrary arrival current 1 F9-31" ± ("motor rated current F3-02" × "arbitrary arrival current 1 detection width F9-32"). |
| 26 | 26: Current 2 reached | Indicates that the output current of the VFD is within the range of "arbitrary arrival current 2 F9-33" ± ("motor rated current F3-02" × "arbitrary arrival current 2 detection width F9-34"). |
| 27 | 27: Time out | When the timing function selection F9-35 is set to 1 to be valid, the output is valid when the "current running time F9-39" reaches the given value of "timed running time F9-36". |
| 28 | 28: AI1 input overloaded | When the AI1 input voltage exceeds the range of "AI1 input voltage protection value lower limit F9-40" ~ "AI1 input voltage protection value upper limit F9-41", the output is valid. |
| 29 | 29: Load dropping | When the drop-load protection is turned on (F8-51 select 1 is valid), and the load is so small that the drop-load detection is triggered, the output is valid. |
| 30 | 30: Reverse running | Indicates that the VFD is running in reverse, and the output U/V/W is in reverse order. |
| 31 | 31: Zero current state | When the output current of the VFD is less than the set value of "zero current detection level F9-27" and the duration exceeds the set value of "zero current detection delay time F9-28", the output is valid. |
| 32 | 32: Module temperature reached | Indicates that the value of the heat sink temperature FA-06 is greater than the value set by "Module temperature reaches F9-38". |
| 33 | 33: Output current limit exceeded | When the output current of the VFD is greater than the set value of "output current over-limit F9-29" and the duration exceeds the set value of "output current over-limit detection delay time F9-30", the output is valid. |

| | | |
|---|---|---|
| 34 | 34: Lower limit frequency reached (also output when the VFD stops) | The output is valid when the running frequency value is less than the lower limit frequency F0-12 or when it stops. |
| 35 | 35: Alarm (all faults) | When the VFD is faulty and the fault level is to continue running, the output is valid. |
| 36 | 36: Operation Times Up | When the current running time is greater than the "current running arrival time setting" |
| 37 | 37 : Fault (only for free stop faults and not for undervoltage faults) | Indicates that the VFD has an output fault (excluding input undervoltage fault), and the fault level is free stop (cut off the output). |

| Code | Name | Default | Modification |
|---|---|---|---|
| F7-03 | AO output function selection | 0 | ☆ |
| F7-04 | High-speed pulse output function selection | 0 | ☆ |

These multi-function terminals are described as follows:

| Code | Name | Function description |
|---|---|---|
| 0 | 0: Operating frequency | 0Hz ~ maximum frequency F0-09 |
| 1 | 1: Set frequency | 0Hz ~ maximum frequency F0-09 |
| 2 | 2: Output current | 0 ~ 2 times the rated current of the motor |
| 3 | 3: Output torque (absolute value of torque) | 0 ~ 2 times the rated torque of the motor |
| 4 | 4: Output power | 0 ~ 2 times motor rated power |
| 5 | 5: Output voltage | 0 ~ 1.2 times the rated voltage of the VFD |
| 6 | 6: PULSE input (100.0% corresponds to 100.0kHz) | 0.01kHz ~ 100.00kHz |
| 7 | 7: AI1 | 0V ~ 10V (0~20mA) |
| 8 | 8: AI2 (keyboard rotary potentiometer) | 0V ~ 10V |
| 9 | 9: Length | 0 ~ set length FD-05 |
| 10 | 10: count value | 0 ~ Set count value FD-08 |
| 11 | 11: Communication settings | 0 ~ 100% output value given by communication command |
| 12 | 12: Motor speed | 0 ~ Speed corresponding to the maximum frequency F0-09 |
| 13 | 13: Output current (100.0% corresponds to 1000.0A) | 0.0A ~ 1000.0A |
| 14 | 14: Output voltage (100.0% corresponds to 1000.0V) | 0.0V ~ 1000.0V |
| 15 | 15: Output torque (actual torque value) | -2×motor rated torque ~ 2×motor rated torque |

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F7-05 | Maximum frequency of high-speed pulse output | 0.01KHz~100.00KHz | 50.00KHz | ☆ |

When the DO1 terminal is set to high-speed pulse, you can set the corresponding frequency when the high-speed pulse output is 100% through this function code.

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F7-06 | AO bias coefficient | -100.0% ~ +100.0% | 0.0% | ☆ |
| F7-07 | AO gain | -10.00 ~ +10.00 | 1.00 | ☆ |

This function code is generally used to correct the zero drift of the analog output and the deviation of the output amplitude. It can also be used to customize the required analog output curve

The calculation relation takes AO1 as an example:

y1 represents the minimum output voltage or current value of AO1; y2 represents the maximum output voltage or current value of AO1

y1 = 10V or 20mA × F7-06 × 100%;

y2 = 10V or 20mA × (F7-06 + F7-07);

The factory default value of F7-06 = 0.0%, F7-07 = 1, so the output 0~10V (or 0~20mA) corresponds to the minimum value of the physical quantity represented by the maximum value of the physical quantity represented.

Example 1:

Change 0～20mA output to 4～20mA

The minimum input current value by the formula: y1 = 20mA × F7-06 × 100%,

4 = 20 × F7-06, calculated according to the formula F7-06 = 20%;

The maximum input current value by the formula: y2=20mA × (F7-06 + F7-07);

20=20 × (20% + F7-07), calculated according to the formula F7-07 = 0.8

Example 2:

Change 0～10V output to 0～5V

The minimum input voltage value by the formula: y1 = 10 × F7-06 × 100%,

0=10 × F7-06, calculated according to the formula F7-06 = 0.0%;

The maximum input voltage value by the formula: y2=10 × ( F7-06 + F7-07);

5=10 × (0 + F7-07), calculated according to the formula F7-07 = 0.5

| Code | Name | Default | Modification |
|---|---|---|---|
| F7-08 | AO output filter time | 0.000s～1.000s | ☆ |

If there is a large AO fluctuation and the output needs to be relatively stable, the filter time can be appropriately increased; the longer the filter time, the slower the AO response time.

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F7-10 | RELAY1 output delay time | 0.0s ~ 3600.0s | 0.0s | ☆ |
| F7-11 | DO output delay time | 0.0s ~ 3600.0s | 0.0s | ☆ |

Set the action delay time of the output terminal, the time from the trigger state to the actual output becoming valid.

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F7-12 | DO output valid state selection | 0: Positive logic<br>1: Inverse logic<br>Units digit: RELAY1<br>Tens digit: DO1 | 00 | ☆ |

Set the logic state of the output terminal, such as RELAY, the positive logic is normally open, and it is closed when

it is valid; the negative logic is normally closed, and it is disconnected when it is valid.

## 6.10 F8 set (Fault and protection, accelerated overcurrent)

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F8-00 | Motor overload protection selection | 0: Disable 1: Enable | 1 | ☆ |
| F8-01 | Motor overload protection gain | 0.20 ~ 10.00 | 1.00 | ☆ |

F8-00 Motor overload protection options:

Select whether to enable the overload protection of the VFD to the motor.

If the motor overload protection is turned off, the motor may be overloaded and damaged. It is recommended to install a thermal relay or other motor overheat protection circuit.

F8-01 Motor overload protection gain:

Motor overload time = typical time of motor overload curve × motor overload protection factor

For example, the 145% overload time of the motor is 300s. If you want to modify it to 180s, then F8-01 needs to be modified as: 180/300 = 0.6.

| Typical value of motor overload curve | | | | | | | |
|---|---|---|---|---|---|---|---|
| Current multiple | 1.15 | 1.25 | 1.35 | 1.45 | 1.55 | 1.65 | 1.75 |
| Overload time (sec) | 4800 | 2400 | 900 | 300 | 120 | 120 | 120 |

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F8-02 | Motor overload warning coefficient | 50% ~ 100% | 80% | ☆ |

This coefficient represents that the motor is in the overload state, after the accumulated time of motor overload reaches the percentage of the trigger time of motor overload protection, the motor overload warning state is set, and the function terminal can be used as the warning output.

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F8-07 | Power-on ground short-circuit protection options | 0: Disable 1: Enable | 1 | ☆ |

Select whether the VFD detects output short circuit to ground when power on. If it is valid, there will be a voltage output at the output end of the VFD after power-on.

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F8-08 | Automatic fault reset times | 0 ~ 20 | 0 | ☆ |
| F8-09 | Fault during automatic fault reset | 0: Operation halt | 0 | ☆ |
| | Relay action selection | 1: Operation | | |
| F8-10 | Automatic fault reset interval time | 0.1s ~ 100.0s | 1.0s | ☆ |

F8-08 Fault automatic reset times:

When the VFD fails, it can be automatically reset (equivalent to the RST button function). When the number of automatic resets exceeds the set value, the VFD will keep the fault status when it encounters a fault again.

F8-09 Fault relay action selection during automatic fault reset:

After set to action, the function terminal set as fault state output will be set to valid state in case of failure, and will

return to invalid state after automatic reset.

After it is set to no action, during the fault and automatic reset process, the function terminal of the fault status output always remains in the invalid state.

F8-10 fault automatic reset interval:

Set the delay time of automatic reset after the fault state occurs. During this period, the VFD remains in the fault state.

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F8-12 | Output phase loss protection option | 0: Disable 1: Enable | 1 | ☆ |

Select whether to detect the output phase loss status. If this function is turned off, the VFD will continue to work when the VFD output phase is missing. At this time, the output current may be greater than the displayed current, which is a risk.

If this function is turned on, when the VFD detects that the output phase is missing, the VFD will report the E13/A13 fault, and perform the protection action according to the setting of the fault protection action.

| Code | Name | Default | Modification |
|---|---|---|---|
| F8-13 | Type of first fault | - | ● |
| F8-14 | Type of second fault | - | ● |
| F8-15 | Type of third (latest) fault | - | ● |

Check the fault types as follows:

| Fault type | Function | Fault type | Function |
|---|---|---|---|
| 0 | 0: No fault | 20 | 20: Abnormal Parameter reading and writing |
| 1 | 1: Wave-by-wave current limiting fault | 21 | 21: VFD hardware abnormal |
| 2 | 2: Acceleration overcurrent | 22 | 22: Ground short circuit of motor |
| 3 | 3: Deceleration overcurrent | 23 | 23: Running time reached |
| 4 | 4: Constant speed overcurrent | 24 | 24: User-defined fault 1 |
| 5 | 5: Acceleration overvoltage | 25 | 25: User-defined fault 2 |
| 6 | 6: Deceleration overvoltage | 26 | 26: Power-on time reached |
| 7 | 7: Constant speed overvoltage | 27 | 27: Offload |
| 8 | 8: Buffer resistor overload | 28 | 28: PID feedback lost during operation (frequency source) |
| F9 | 9: Undervoltage | 29 | 29: The speed deviation is too large (the deviation between the given and the feedback) |
| 10 | 10: VFD overload | 30 | 30: Motor overspeed |
| 11 | 11: Motor overload | 31 | 31: VFD unit protection |
| 12 | 12: Input phase loss | 32 | 32: Code disc failure |
| 13 | 13: Output phase loss | 33 | 33: Motor over temperature fault |
| 14 | 14: The module overheated | 34 | 34: SVC stall fault |
| 15 | 15: External fault | 35 | 35: Magnetic pole position detection failed |
| 16 | 16: Communication abnormal | 36 | 36: UVW signal feedback error |
| 17 | 17: Contactor abnormal | 37 | 37: Point-to-point slave failure |
| 18 | 18: Abnormal current detection | 38 | 38: Braking resistor short circuit |
| 19 | 19: Abnormal motor tuning | 39 | 39: Switch the motor while running |

| Code | Name | Default | Modification |
|---|---|---|---|
| F8-16 | Frequency at the third (latest) fault | - | ● |
| F8-17 | Current at the third (latest) fault | - | ● |
| F8-18 | Bus voltage at the third (latest) fault | - | ● |
| F8-19 | Input status at the third (latest) fault | - | ● |
| F8-20 | Output status at the third (latest) fault | - | ● |
| F8-21 | VFD status at the third (latest) fault | - | ● |
| F8-22 | Power-on time at the third (latest) fault | - | ● |
| F8-23 | Operation time at the third (latest) fault | - | ● |
| F8-24 | Frequency at the second fault | - | ● |
| F8-25 | Current at the second fault | - | ● |
| F8-26 | Bus voltage at the second fault | - | ● |
| F8-27 | Input status at the second fault | - | ● |
| F8-28 | Output status at the second fault | - | ● |
| F8-29 | VFD status at the second fault | - | ● |
| F8-30 | Power-on time at the second fault | - | ● |
| F8-31 | Operation time at the second fault | - | ● |
| F8-32 | Frequency at the first fault | - | ● |
| F8-33 | Current at the first fault | - | ● |
| F8-34 | Bus voltage at the first fault | - | ● |
| F8-35 | Input status at the first fault | - | ● |
| F8-36 | Output status at the first fault | - | ● |
| F8-37 | VFD status at the first fault | - | ● |
| F8-38 | Power-on time at the first fault | - | ● |
| F8-39 | Operation time at the first fault | - | ● |

The above can view various information at the time of failure.

| Code | Name | Range | Default | Modification | Code |
|---|---|---|---|---|---|
| F8-40 | Fault protection action selection 1 | Units digit | Motor overload (E11) | 00000 | ☆ |
| | | 0 | Free stop | | |
| | | 1 | Stop by shutdown sequence | | |
| | | 2 | Continue operation | | |
| | | Tens digit | Input phase loss (E12) | | |

| | | | | | |
|---|---|---|---|---|---|
| | | Hundreds digit | Output phase loss (E13)（As same as the unit digit） | | |
| | | Thousands digit | External failure (E15)（As same as the unit digit） | | |
| | | Ten Thousands digit | Communication abnormal (E16)（As same as the unit digit） | | |

| Code | Name | Range | Default | Modification | Code |
|---|---|---|---|---|---|
| F8-41 | Fault protection action selection 2 | Units digit | Function code reading and writing abnormal (E20) | 00000 | ☆ |
| | | 0 | Free stop | | |
| | | 1 | Stop by shutdown sequence | | |
| | | Tens digit | Operation time reached (E23)（As same as the F8-40 unit digit） | | |
| | | Hundreds digit | User-defined fault 1(E24)（As same as the F8-40 unit digit） | | |
| | | Thousands digit | User-defined fault 2(E25)（As same as the F8-40 unit digit） | | |
| | | Ten Thousands digit | Power-on time reach(E26)（As same as the F8-40 unit digit） | | |

| Code | Name | Range | Default | Modification | Code |
|---|---|---|---|---|---|
| F8-42 | Fault protection action selection 3 | Units digit | Offload(E27)（As same as the F8-40 unit digit） | 00000 | ☆ |
| | | Tens digit | PID feedback lost during operation (E28)（As same as the F8-40 unit digit） | | |
| | | Hundreds digit | The speed deviation is too large (E29) (same as F8-40 digit) | | |
| | | Thousands digit | Motor overspeed (E30) (same as F8-40 digit) | | |
| | | Ten Thousands digit | Magnetic pole position detection failure (E35) (same as F8-40 digit) | | |

| Code | Name | Range | Default | Modification | Code |
|---|---|---|---|---|---|
| F8-43 | Fault protection action selection 4 | Units digit | Code disc fault (E32) (same as F8-40 digit) | 00000 | ☆ |
| | | Tens digit | Reserved | | |
| | | Hundreds digit | Reserved | | |
| | | Thousands digit | Reserved | | |

| | | | | | |
|---|---|---|---|---|---|
| | | Ten Thousands digit | Reserved | | |

Coast to stop: The VFD displays fault code E** and stops directly, and the motor coasts to stop.
Stop according to the stop mode: the VFD displays the fault code A**, stops according to the set stop mode, and displays the fault code E** after the stop.
Continue to run: The VFD displays the fault code A** and continues to run. The state of continued running is determined by the setting value of the frequency selection F8-45 when the fault occurs.

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F8-45 | Frequency selection for continuous operation in spite of faults | 0: Current operating frequency<br>1: Set frequency<br>2: Upper limit frequency<br>3: Lower limit frequency<br>4: Abnormal standby frequency | 0 | ☆ |

0: Run at the fault frequency.
1: Run at the frequency given by the frequency source F0-06.
2: Run at the frequency given by the upper limit frequency source F0-10.
3: Run at the frequency given by the lower limit frequency F0-12.
4: Run at the frequency given by the abnormal standby frequency F8-46.

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F8-46 | Abnormal backup frequency | 0.0% ~ 100.0%<br>(100.0% corresponding to F0-09) | 100.0% | ☆ |

100.0% corresponds to the maximum frequency F0-09.

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F8-47 | Instantaneous failure tolerance function selection | 0: Invalid<br>1: Decelerate<br>2: Decelerate to stop | 1 | ★ |

In the event of an instantaneous power failure or a sudden drop in voltage, the VFD reduces the output speed to compensate the decrease in the DC bus voltage of the VFD with the load feedback energy, so as to keep the VFD running.
There are three state options: 0-invalid; 1-deceleration; 2-deceleration to stop
When the selection of 0 is invalid, the voltage is lower than the undervoltage of the VFD, and the VFD directly reports the undervoltage fault;
When selecting 1 to decelerate, and the voltage is lower than the set value of F8-50, the VFD decelerates to keep the bus voltage constant until it runs at 0Hz;
When selecting 2 to decelerate, the voltage is lower than the set value of F8-50, the VFD decelerates to stop, and the time of deceleration process is given by the setting of instantaneous stop non-stop time F8-60.

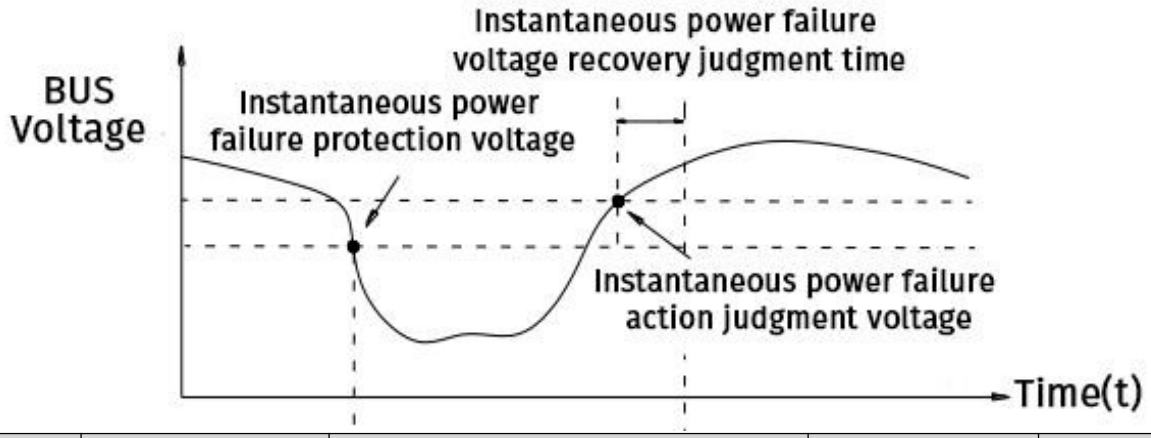
| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F8-48 | Voltage set for suspending operation in case of instantaneous failure | 80.0% ~ 100.0% | 85.0% | ★ |
| F8-49 | Voltage recovery waiting time for continuing operation in case of instantaneous failure | 0.00s ~ 100.00s | 0.50s | ★ |
| F8-50 | Voltage set for continuing operation in case of instantaneous failure | 60.0% ~ 100.0%(Standard bus voltage) | 80.0% | ★ |

The reference voltage of the instantaneous power failure and non-stop pause action voltage and the judgment voltage are the rated bus voltage (single-phase: 311Vdc, three-phase: 540Vdc).

When the busbar voltage drops to the set value of F8-50, the VFD enters the logic of instantaneous stop and non-stop operation.

When the bus voltage rises back to the set value of F8-48, the VFD stops the instantaneous stop and non-stop action (that is, stops frequency reduction), and after delaying the time of F8-49, the VFD exits the instantaneous stop non-stop working logic, and returns to run at a given frequency.

Instantaneous power failure non-stop voltage recovery judgment time F8-49 is to prevent the VFD from repeatedly entering and exiting the instantaneous power failure non-stop logic when the input voltage is unstable, thereby setting a certain hysteresis time.




| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F8-51 | Offload protection options | 0: Disable<br>1: Enable | 0 | ☆ |

After this function is turned on, when the output current of the VFD is less than the set value of F8-52 of the load loss detection level, and the duration is longer than the set time of the load loss detection time F8-53, the VFD will report the E27/A27 fault, and the fault will be protected according to the fault. Action setting performs protection action.

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F8-52 | Offload detection level | 0.0% ~ 100.0% | 10.0% | ☆ |

Load loss detection current, when the output current of the VFD is less than this set value, it will determine the load loss, and 100% corresponds to the rated current of the motor.

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F8-53 | Offload detection time | 0.0s ~ 60.0s | 1.0s | ☆ |

During the load loss detection time, if the load returns to above the set value of F8-52, the VFD will automatically return to the given frequency to run.

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F8-54 | Overspeed detection value | 0.0% ~ 50.0%(Maximum frequency) | 20.0% | ☆ |
| F8-55 | Overspeed detection time | 0.0s: No detection<br>0.1 ~ 60.0s | 1.0s | ☆ |

When the VFD detects that the actual speed of the motor exceeds (1 + F8-54) × maximum frequency F0-09, and the duration exceeds the set value of the overspeed detection time F8-55, the VFD will report E30 and act according to the fault protection set to perform protection action.

If F8-55 is set to 0.0s, the over-speed detection function is closed.

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F8-56 | Excessive speed deviation detection value | 0.0% ~ 50.0%(Maximum frequency) | 20.0% | ☆ |
| F8-57 | Excessive speed deviation detection time | 0.0s: No detection<br>0.1 ~ 60.0s | 5.0s | ☆ |

When the VFD detects that the absolute value of the difference between the actual speed of the motor and the given speed exceeds F8-56 × maximum frequency F0-09, and the duration speed deviation is too large to detect the given value of F8-57, the VFD will Report E30, and perform protection action according to the setting of fault protection action.

If F8-57 is set to 0.0s, the detection function of excessive speed deviation is disabled.

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F8-58 | Deceleration to stop Kp | 0~100 | 30 | ★ |
| F8-59 | Deceleration to stop Ki | 0.0~300.0 | 20.0 | ★ |

If the instantaneous power failure does not stop in the working state of "1: Deceleration", it is easy to trigger undervoltage, and Kp&Ki can be appropriately increased.

| Code | Name | Range | Default | Modification |
|---|---|---|---|---|
| F8-60 | Time setting of Deceleration to stop | 0~6500.0s | 10.0s | ☆ |

Set the deceleration time during which the momentary stop does not stop in the working state of "2: Deceleration to stop".