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SOURCETRONIC – Quality electronics for service, lab and production

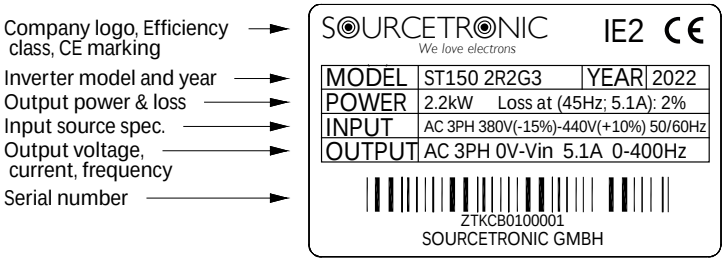
# User Manual

## ST150 Frequency Inverter

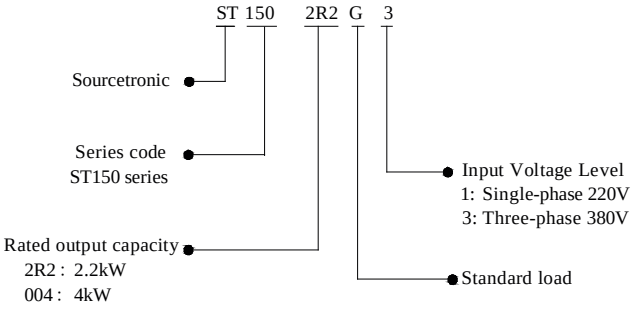
## 1.Foreword

Thank you for choosing our Sourcetronic ST150 series compact frequency inverter.
The diagrams contained in these operating instructions are used for convenience of explanation and may be slightly different from the product due to product upgrades. Please refer to the actual product.
Please hand this manual to the end user and keep it for future reference.
If you have any questions, please get in touch with our company or our agent in time, we will offer dedicated service to you.

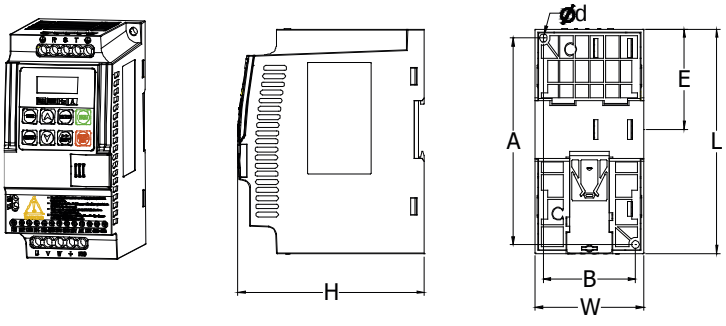
## 2.Explanation of nameplate




**Model designation:**




## 3.Dimension




0.75~5.5kW G1/G3 support rail mounting

**1) Outline dimension drawing and installation dimensions of single phase 220/230 V AC models**

| Model | Output power (kW) | Dimension (mm) | | | Installation (mm) | | | Guide rail installation position (mm) | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|
| | | L | W | H | A | B | d | E | |
| ST150 0R4G1 | 0.4 | 138 | 72 | 123.5 | 127 | 61 | 5 | 62 | 1.1 |
| ST150 0R7G1 | 0.75 | | | | | | | | |
| ST150 1R5G1 | 1.5 | | | | | | | | |
| ST150 2R2G1 | 2.2 | 185 | 72 | 134 | 175 | 45 | 5 | 82 | 1.3 |

**2) Dimensions and installation size of three-phase 380/400V AC models**

| Model | Output power (kW) | Dimension (mm) | | | Installation (mm) | | | Guide rail installation position (mm) | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|
| | | L | W | H | A | B | d | E | |
| ST150 0R7G3 | 0.75 | 138 | 72 | 123.5 | 127 | 61 | 5 | 62 | 1.1 |
| ST150 1R5G3 | 1.5 | | | | | | | | |
| ST150 2R2G3 | 2.2 | | | | | | | | |
| ST150 004G3 | 4 | 185 | 72 | 134 | 175 | 45 | 5 | 82 | 1.3 |
| ST150 5R5G3 | 5.5 | | | | | | | | |

Install in a well-ventilated room. Air inlet is at the bottom side, exhaust at the top. Ensure there is ≥100mm room at the top and bottom for proper airflow.

The devices can be mounted side-by-side without observing a minimum distance.

## 4.Operation of keyboard introduction

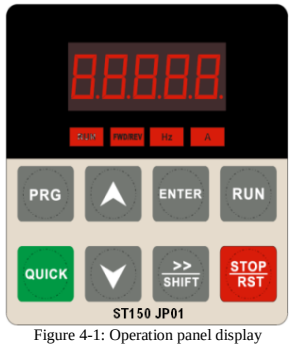



Figure 4-1: Operation panel display

**4.1 Keyboard indicators**

| Indicator light | | Name |
|---|---|---|
| Status light | RUN | Running indicator light<br>* ON: The inverter is working<br>* OFF: The inverter stops |
| | FWD/REV | Forward/reverse running light<br>* ON: In forward status<br>* OFF: In reversal status |
| | Hz | Frequency indicator |
| | A | Current indicator |

**4.2 Operation panel button description**

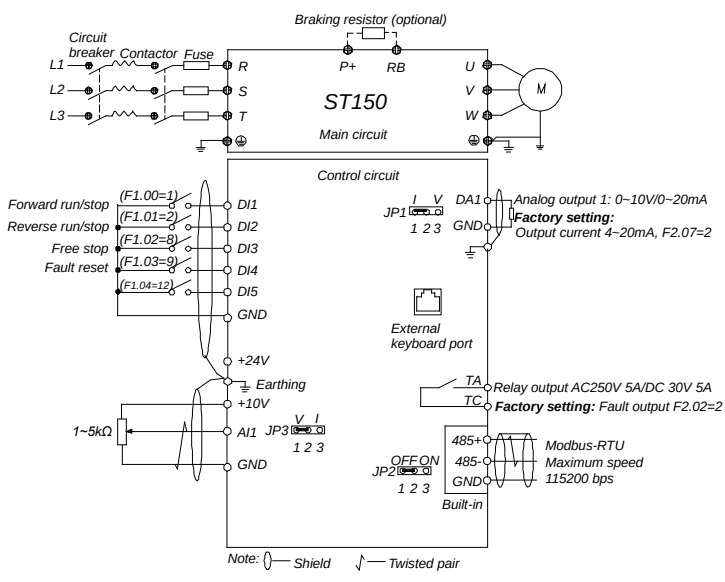
| Sign | Name | Function |
|---|---|---|
| PRG | Parameter setting/esc key | * Enter into the parameter setting status of main menu;<br>* Escape from functional parameter modification;<br>* Escape from submenu or functional menu to status menu |
| >> SHIFT | Shift Key | * Choose displayed parameter circularly under running or stop interface; choose digit position to modify when modifying parameter |
| ∧ | Increasing key | * Increase parameter or function number |
| ∨ | Decreasing key | * Decrease parameter or function number |
| RUN | Running key | * For starting running in keyboard control mode |
| STOP RST | Stop/Reset key | * For stopping running in the running status; for resetting the operation in fault alarm status. The function of the key is subject to the setting in F6.00. |
| ENTER | Enter key | * Descend step by step into the menu structure, confirm setting parameters. Long press together with PRG: Set/unset key lock. |
| QUICK | Quick multi-function key | * This key's function is determined by the function code F6.21. Factory setting: Jog forward. |

## 5.Standard specifications

| Items | | Specifications | |
|---|---|---|---|
| Power Input | Rated voltage | AC 1PH 220V(-15%)~240V(+10%)<br>AC 3PH 380V(-15%)~440V(+10%) | |
| | Input frequency | 50Hz/60Hz | |
| | Allowing fluctuations | Voltage continued volatility: ±10% | Less than 3% of voltage unbalance rate 3%; |
| | | Input frequency fluctuation:±5%; | Distortion satisfy IEC61800-2 standard |
| Control system | Control system | High performance vector control inverter based on DSP | |
| | Control method | V/F control, vector control W/O PG | |
| | Automatic torque boost function | Realize low frequency (1Hz) and large output torque control under the V/F control mode. | |
| | Acceleration/decele-ration control | Straight or S-curve mode. Four time pairs available, time range is 0.0~6500.0s. | |
| | V/F curve mode | Linear, square root/m-th power, custom V/F curve | |
| | Over load capability | G type: Rated current 150% - 1 minute, rated current 180% - 2 seconds | |
| | Maximum frequency | 1. Vector control: 0~300Hz; 2. V/F control: 0~3200Hz | |
| | Carrier frequency | 0.5~16kHz; automatically adjust carrier frequency according to the load characteristics. | |
| | Input frequency resolution | Digital setting: 0.01Hz minimum analog: Maximum frequency*0.025%. | |
| | Start torque | G type: 0.5Hz/150% (Vector control W/O PG) | |
| | Speed range | 1:100 (Vector control W/O PG) | |
| | Steady-speed precision | Vector control W/O PG: ≤± 0.5% (Rated synchronous speed) | |
| | Torque response | ≤ 40ms (Vector control W/O PG) | |
| | Torque boost | Automatic torque boost; manual torque boost (0.1%~30.0%) | |
| | DC braking | The built-in PID adjusts the braking current to ensure sufficient braking torque without over-flow. DC braking frequency: 0.0Hz to max. frequency, braking time: 0.0~100.0 seconds, braking current value: 0.0%~100.0% | |
| | Jogging control | Jog frequency range: 0.00Hz to max. frequency; jog Ac/deceleration time: 0.0~6500.0s. | |
| | Built-in PID | Easy to realize closed-loop control system for process control. | |
| | Automatic voltage regulation(AVR) | Automatically maintain a constant output voltage when the voltage of electricity grid changes. | |
| | Speed tracking method | Automatically track current motor speed when the inverter starts | |

| Items | | | Specifications |
|---|---|---|---|
| Personalization function | Self-inspection of peripherals after power-on | | After powering on, peripheral equipment will perform safety testing, such as ground, short circuit, etc. |
| | Quick current limiting | | The current limiting algorithm is used to reduce the inverter over current probability, and improve whole unit anti-interference capability. |
| | Timing control | | Timing control function: Time setting range (0m~6500m) |
| Running | Input Signal | DI input terminals | 5 digital input terminals |
| | | AI1 analog input | 1 analog input terminal AI1, 0~10V or 0~20mA input selectable |
| | | Multi-speed | At most 16-speed can be set (selected by using the multi-function terminals or program) |
| | | Emergency stop | Interrupt controller output (not certified for STO) |
| | | Fault reset | When the protection function is active, you can automatically or manually reset the fault condition. |
| | | PID feedback signal | Including DC (0~10V), DC (0~20mA) |
| | Output Signal | Output terminals | 1 way relay output terminal; 1 way DA1 analog output terminal |
| | | Relay output | There are 40 kinds of signals to choose from each way. Contact capacity of the relay: Normally open contact 5A/AC 250V; 5A/DC 30V |
| | | DA1 analog output | 1 way analog output, you can select 16 kinds of signals such as frequency, current, voltage, etc. The output signal range can be set arbitrarily within 0~10V/0~20mA. |
| | Running command channel | | Three channels: Operation panel, control terminals and serial communication port. They can be switched through a variety of ways. |
| | Frequency source | | Total 7 frequency sources: Digital, analog voltage, multi-speed, PID, and serial port. |
| | Run function | | Limit frequency, jump frequency, frequency compensation, auto-tuning, PID control |
| Protection function | Inverter protection | | Overvoltage protection, undervoltage protection, overcurrent protection, overload protection, overheat protection, overcurrent stall protection, overvoltage stall protection, phase-loss protection (Optional), communication error, PID feedback signal abnormalities, and short circuit to ground protection. |
| Display | LED display keyboard | Running information | Monitoring objects including: Running frequency, set frequency, bus voltage, output voltage, output current, output power, output torque, input terminal status, output terminal status, analog AI1 value, motor actual running speed, PID set value percentage, PID feedback value percentage. |
| | | Error information | The most recent three error messages are saved, along with time, fault type, voltage, current, frequency and work status at the time of failure. |
| | Key lock and function selection | | Lock part or all of keys, define the function scope of some keys to prevent misuse. |
| | IGBT temperature | | Display current IGBT temperature inside the inverter. |
| Communication | RS485 | | Built-in RS485/Modbus |
| Environment | Environment temperature | | -10~40°C (In environment temperature of 40~50°C, please use derating) |
| | Storage temperature | | -20~65°C |
| | Environment humidity | | Less than 90% R.H, no condensation. |
| | Vibration | | Below 5.9m/s² (= 0.6g) |
| | Application sites | | Indoor, no sunlight or corrosive atmosphere, explosive gas or water vapor, dust, flammable gas, oil mist, drip or salt, etc. |
| | Altitude | | Use below 1000m without derating, 1% for each 100m increasing above 1000m, the highest altitude is 3000m |
| | Protection level | | IP20 |
| Product standard | Product adopts safety standards. | | IEC61800-5-1: |
| | Product adopts EMC standards. | | IEC61800-3:2004, integrated C3 filter |
| Cooling method | | | Forced air cooling |
| Installation method | | | Rail mounting, wall mounting |

## 6.Wiring diagram



**Notes in main circuit wiring**

(1).Wiring specifications, please implement wiring in accordance with electrical regulations;
(2).Do not connect the AC supply to the output of frequency inverter (U, V, W), otherwise the frequency inverter **will** be damaged;
(3).Power supply wiring, please try to use shielded cables and/or additional shielding tubes, and make sure the shielding is grounded;
(4).Frequency inverter grounding wire should not be grounded together with e.g. welding machine, other high-power motors or high current load, please ground the inverter separately;
(5).Grounding ⏚: Please perform grounding correctly, with grounding resistance less than 10Ω.

**Notes in wiring control circuit**

(1).Please separate the control signal lines from the main circuit line and other power lines;
(2).To prevent misoperation caused by interference, use twisted or double-shielded wires, specification 0.5~2mm²;
(3).Make sure the permissible conditions of each terminal are met, such as power supply, maximum permissible current or voltage, etc;
(4).For the terminal wiring requirements, ensure correct selection of accessories, such as: Voltmeter, input power supply, etc;
(5).After completing the wiring, please check it thoroughly and make sure that it is correct before powering it on.

## 7. Parameter list

In ST150 series frequency inverters, some parameters are “manufacturer reserved”, and their parameter numbers are not listed in the function parameter table, which leads to the discontinuity of some parameter numbers in the table. For the parameters not introduced in the manual, please do not attempt to modify them to avoid causing errors. Parameters marked ★ can only be changed in stopped state, parameters marked ☆ can also be changed in running state.

**7.1. d0 group Monitoring function group (read only)**

| Code | Parameter name | Functional description | Factory setting |
|---|---|---|---|
| d0.00 | Running frequency | Actual inverter operating frequency | 0.01Hz |
| d0.01 | Set frequency | Target frequency | 0.01Hz |
| d0.02 | DC bus voltage | Detected value for DC bus voltage | 0.1V |
| d0.03 | Output voltage | Actual output voltage | 1V |
| d0.04 | Output current | Effective value for actual motor current | 0.01A |
| d0.05 | Output power | Calculated value for motor output power | 0.1kW |
| d0.06 | Output torque | Motor output torque percentage | 0.1% |
| d0.07 | DI input status | DI input status | - |
| d0.08 | DO output status | DO output status | - |
| d0.09 | AI1 voltage | AI1 input voltage value | 0.01V |
| d0.12 | Count value | Actual pulse count value in counting function | - |
| d0.13 | Length value | Actual length in fixed length function | - |
| d0.14 | Actual operating speed | Motor actual running speed | - |
| d0.15 | PID setting | Reference value percentage when PID runs | % |
| d0.16 | PID feedback | Feedback value percentage when PID runs | % |
| d0.17 | PLC stage | PLC Stage display when PLC runs | - |
| d0.19 | Feedback speed | Inverter actual output frequency | 0.01Hz |
| d0.20 | Remaining run time | Remaining run time display, it is for timing run control | 0.1Min |
| d0.22 | Current power-on time | Total time of current inverter power-on | 1Min |
| d0.23 | Current run time | Total time of current inverter run | 0.1Min |
| d0.25 | Communication set value | Frequency, torque or other command values set by communication port | 0.01% |
| d0.27 | Master frequency setting display | Frequency set by F0.03 master frequency setting source | 0.01Hz |
| d0.28 | Auxiliary frequency setting display | Frequency set by F0.04 auxiliary frequency setting source | 0.01Hz |
| d0.35 | Inverter status | Display the running and standby etc. status information | - |
| d0.36 | Inverter type | 1:G type: Suitable for constant torque load | - |
| d0.37 | AI1 voltage before correction | Input voltage value before linear correction of AI1 | 0.01V |

**7.2. F0 group Basic Functional Parameter Group**

| Code | Parameter name | Setting range | Factory setting | Change |
|---|---|---|---|---|
| F0.00 | Motor control mode | 0:Vector control without PG;  2:V/F control | 2 | ★ |
| F0.01 | Keyboard set frequency | 0.00Hz~F0.19 (Maximum frequency) | 50.00Hz | ☆ |
| F0.02 | Frequency command resolution | 1: 0.1Hz (Maximum frequency 3200.0Hz)<br>2: 0.01Hz (Maximum frequency 320.00Hz) | 2 | ★ |
| F0.03 | Frequency source master setting | 0: Keyboard set frequency (F0.01, can be modified with UP/DOWN keys or terminals, offset thereof not saved at power-down)<br>1: Keyboard set frequency (F0.01, can be modified with UP/DOWN, offset created by UP/DOWN saved at power-down);<br>2: Analog AI1 setting;<br>4: Panel potentiometer setting (External keyboard panel only);<br>6: Multi-speed operation setting;<br>7: Simple PLC program setting;<br>8: PID control setting;<br>9: Remote communications setting | 1 | ★ |
| F0.04 | Frequency source auxiliary setting | Same options as F0.03 above, can’t be set to the same value | 0 | ★ |
| F0.05 | Reference object selection for frequency source auxiliary setting | 0: Relative to maximum frequency;<br>1: Relative to master frequency source 1;<br>2: Relative to master frequency source 2 | 0 | ☆ |
| F0.06 | Frequency source auxiliary setting range | 0%~150% | 100% | ☆ |

| | | | | |
|---|---|---|---|---|
| F0.07 | Frequency superimposed selection | Units digit: Frequency source selection;<br>Tens digit: Arithmetic relationship of master and auxiliary for frequency source | 00 | ☆ |
| F0.08 | Auxiliary offset frequency | 0.00Hz~F0.19 (Maximum frequency) | 0.00Hz | ☆ |
| F0.09 | Shut down memory selection | 0:W/O memory of UP/DOWN;<br>1:With memory of UP/DOWN | 1 | ☆ |
| F0.10 | Frequency command UP/DOWN reference when running | 0: Relative to running frequency;<br>1: Relative to set frequency | 0 | ★ |
| F0.11 | Command source selection | 0. Keyboard control (LED off);<br>1. Terminal block control (LED on);<br>2. Communications command control (LED flashes);<br>3. Keyboard control+ Communications command control;<br>4. Keyboard control+ Communications command control+ Terminal block control | 0 | ☆ |
| F0.12 | Binding frequency source for command source | Units digit: Keyboard command binding frequency source selection;<br>0:Not bound;<br>1:Keyboard set frequency;<br>2:AI1 setting;<br>4:Panel potentiometer setting (requires optional external keyboard);<br>6:Multi-speed setting;<br>7:Simple PLC setting;<br>8:PID setting;<br>9:Communications reference;<br>Tens digit: Terminal command binding frequency source selection (0~9, same as units digit);<br>Hundreds digit: Communication command binding frequency source selection (0~9, same as units digit) | 000 | ☆ |
| F0.13 | Acceleration time 1 | 0.0s~6500s | Depends on models | ☆ |
| F0.14 | Deceleration time 1 | 0.0s~6500s | Depends on models | ☆ |
| F0.15 | Ac/Deceleration time unit | 0:1s; 1:0.1s; 2:0.01s | 1 | ★ |
| F0.16 | Ac/deceleration time reference frequency | 0:F0.19 (Maximum frequency);<br>1:Set frequency; 2:100Hz | 0 | ★ |
| F0.17 | Carrier frequency auto adjustment | 0:NO;<br>1:YES | 0 | ☆ |
| F0.18 | Carrier Frequency | 0.5kHz~16.0kHz | Depends on models | ☆ |
| F0.19 | Maximum output frequency | 50.00Hz~320.00Hz / 50.0Hz~3200.0Hz depending on setting of F0.02 | 50.00Hz | ★ |
| F0.20 | Upper limit frequency source | 0: F0.21 setting; 1: Analog AI1 setting;<br>5: Communications reference | 0 | ★ |
| F0.21 | Upper limit frequency | F0.23 (Lower limit frequency) ~F0.19 (Maximum frequency) | 50.00Hz | ☆ |
| F0.22 | Upper limit freq. offset | 0.00Hz~F0.19 (Maximum frequency) | 0.00Hz | ☆ |
| F0.23 | Lower limit frequency | 0.00Hz~F0.21 (Upper limit frequency ) | 0.00Hz | ☆ |
| F0.24 | Running direction | 0: Standard direction; 1: Inverted direction | 0 | ☆ |
| F0.25 | Reserved | | | |
| F0.26 | AI analog accuracy | 0: 0.01Hz; 1: 0.05Hz;<br>2: 0.1Hz; 3: 0.5Hz | 1 | ☆ |

**7.3. F1 group Input terminals**

| Code | Parameter name | Setting range | Factory setting | Change |
|---|---|---|---|---|
| F1.00 | DI1 terminal function selection | 0~51 | 1 | ★ |
| F1.01 | DI2 terminal function selection | | 2 | ★ |
| F1.02 | DI3 terminal function selection | | 8 | ★ |
| F1.03 | DI4 terminal function selection | | 9 | ★ |
| F1.04 | DI5 terminal function selection | | 0 | ★ |

The functions of digital multi-functional input terminal DI1~DI5 can be set by parameter F1.00~F1.04. The functions to choose from are shown in the following table:

| Setting value | Function | Description |
|---|---|---|
| 0 | No function | Unused terminals can be set to “no function” to prevent accidental operation. |
| 1 | Forward run (FWD) | External terminals are used to control the FWD run mode of inverter. |
| 2 | Reverse run (REV) | External terminals are used to control the REV run mode of inverter. |
| 3 | Three-wire operation control | This terminal is used to determine the inverter's three-wire control mode. For details, please refer to the instructions of function code F1.10 (“terminal command mode”). |
| 4 | Forward JOG (FJOG) | FJOG means Forward JOG running, RJOG means Reverse JOG running. For Jog running frequency and Jog Ac/deceleration time, please refer to the description of the function code F7.00, F7.01, F7.02. |
| 5 | Reverse JOG (RJOG) | |
| 6 | Terminal UP | Modify frequency increment/decrement command when the frequency is referenced by external terminal. Adjust up/down the set frequency when the digital setting is selected as the frequency source. |
| 7 | Terminal DOWN | |
| 8 | Free stop | The inverter output is switched off, the parking process of motor is not controlled by the inverter. This is the same as the principle of free stop configured in F3.07. |
| 9 | Fault reset (RESET) | This terminal function performs a fault reset. It has the same function as the RESET key on the keyboard. This function can be used to realize remote fault reset. |
| 10 | Run pausing | When this signal becomes active, the inverter slows down and stops, but all operating parameters are memorized, such as PLC parameters, wobbulate frequency parameters, and PID parameters. When |

| | | |
|---|---|---|
| | | this terminal signal becomes inactive again, the inverter reverts to the previous state of running before parking. |
| 11 | External fault normally open input | When the signal is sent to the inverter, the inverter reports fault Err.15, and performs troubleshooting according to fault protection action (For details, please refer to the function code F8.17). |
| 12 | Multi-speed terminal 1 | The setting of 16 stage speed or 16 kinds of other command can be addressed through the 16 binary states of the four terminals. |
| 13 | Multi-speed terminal 2 | |
| 14 | Multi-speed terminal 3 | |
| 15 | Multi-speed terminal 4 | |
| 16 | Ac/deceleration time selection terminal 1 | The selection of 4 ac/deceleration times can be achieved through the four binary states of the two terminals. |
| 17 | Ac/deceleration time selection terminal 2 | |
| 18 | Frequency source switching | Used to switch between different frequency sources.<br>According to the setting of frequency source selection function code (F0.07) , the terminal is used to switch between two frequency sources |
| 19 | UP/DOWN setting (Terminal, keyboard) | When the frequency reference is the digital frequency, this terminal is used to clear the changed frequency value by terminal UP/DOWN or keyboard UP/DOWN, so that the reference frequency can recover to the set value of F0.01 |
| 20 | Run command switch terminal 1 | When the command source is set to the terminal control (F0.11=1), the terminal can be used to switch between terminal control and keyboard control.<br>When the command source is set to the communication control (F0.11 =2), the terminal can be used to switch between communication control and keyboard control. |
| 21 | Ac/deceleration prohibited | Ensure the inverter is unaffected by external signals (except for shutdown command), maintaining current output frequency. |
| 22 | PID pause | PID is temporarily disabled, the inverter maintains current output frequency, no longer performs PID adjustment of frequency source. |
| 23 | PLC status reset | When PLC pauses and runs again, this terminal is used to reset the inverter to the initial state of simple PLC. |
| 24 | Wobbulate pause | When the inverter outputs at center frequency, Wobbulate will pause |
| 25 | Counter input | Input terminal of the count pulse |
| 26 | Counter reset | Clear counter status |
| 27 | Length count input | Input terminal of the length count. |
| 28 | Length reset | Clear length |
| 29-31 | Reserved | |
| 32 | Immediately DC braking | If the terminal is active, the inverter switches directly to DC braking status. Note: Only use this when the running speed is low enough. |
| 33 | External fault normally closed input | When the signal of external fault normally closed input is input into the inverter, the inverter will report fault Err.15 and shutdown. |
| 34 | Frequency change disable | If the terminal is active, when the frequency changes, the inverter does not respond to frequency changes until the terminal state becomes inactive again. |
| 35 | PID action direction reversal | If the terminal is active, PID action direction becomes opposite to the direction set by E2.03. |
| 36 | External parking terminal 1 | Under keyboard control mode, the terminal can be used to stop the inverter, same as STOP key on the keyboard. |
| 37 | Control command switch terminal 2 | Used to switch between terminal control and communication control. If the command source is selected as terminal control, the system will be switched to the communication control mode when the terminal is active; and vice versa. |
| 38 | PID integral pause | When the terminal is active, the PID integral adjustment function is paused, but the proportion and differential adjustments of PID are still valid. |
| 39 | Switch between frequency source master setting and preset frequency | When the terminal is active, the frequency source A is replaced by the preset frequency (F0.01) |
| 40 | Switch between frequency source auxiliary setting and preset frequency | When the terminal is active, the frequency source B is replaced with the preset frequency (F0.01) |
| 43 | PID parameter switching | When DI terminal is used to switch PID parameters (E2.19 = 1), if the terminal is invalid, PID parameters use E2.13~E2.15; if the terminal is valid, PID parameters use E2.16~E2.18 |
| 44 | Custom fault 1 | When custom fault 1 and custom fault 2 are active, the inverter respectively alarms fault Err.27 and fault Err.28, and deals with them according to the mode selected by the fault protection action F8.19. |
| 45 | Custom fault 2 | |
| 46-47 | Reserved | |
| 48 | External stopping terminal 2 | In any control mode (Keyboard control, terminal control, communication control), the terminal can be used to decelerate the inverter until stop, at the time the deceleration time is fixed for deceleration time 4 (F7.13). |
| 49 | Deceleration DC braking | If the terminal is valid, firstly the inverter decelerates to the initial frequency of DC braking F3.08, and then proceeds directly to DC braking status. |
| 50 | Clear current running time | If the terminal is valid, the inverter's current running time is cleared |

Table 1 Multi command functions description: 4 command terminals can be combined to select 16 binary states, each state corresponds to one of the 16 instruction set values. As shown in Table 1 below:

| K4 | K3 | K2 | K1 | Command Setting | Parameters |
|---|---|---|---|---|---|
| OFF | OFF | OFF | OFF | 0-Stage speed setting 0X | E1.00 |
| OFF | OFF | OFF | ON | 1-Stage speed setting 1X | E1.01 |
| OFF | OFF | ON | OFF | 2-Stage speed setting 2X | E1.02 |
| OFF | OFF | ON | ON | 3-Stage speed setting 3X | E1.03 |
| OFF | ON | OFF | OFF | 4-Stage speed setting 4X | E1.04 |
| OFF | ON | OFF | ON | 5-Stage speed setting 5X | E1.05 |
| OFF | ON | ON | OFF | 6-Stage speed setting 6X | E1.06 |
| OFF | ON | ON | ON | 7-Stage speed setting 7X | E1.07 |
| ON | OFF | OFF | OFF | 8-Stage speed setting 8X | E1.08 |
| ON | OFF | OFF | ON | 9-Stage speed setting 9X | E1.09 |
| ON | OFF | ON | OFF | 10-Stage speed setting 10X | E1.10 |
| ON | OFF | ON | ON | 11-Stage speed setting 11X | E1.11 |
| ON | ON | OFF | OFF | 12-Stage speed setting 12X | E1.12 |
| ON | ON | OFF | ON | 13-Stage speed setting 13X | E1.13 |
| ON | ON | ON | OFF | 14-Stage speed setting 14X | E1.14 |
| ON | ON | ON | ON | 15 Stage speed setting 15X | E1.15 |

| | | | | |
|---|---|---|---|---|
| F1.10 | Terminal command mode | 0: Two-wire type 1; 1: Two-wire type 2;<br>2: Three-wire type 1; 3: Three-wire type 2 | 0 | ★ |

This parameter defines four different modes to control inverter operation through external terminals

**0: Two-wire type 1**

This mode is the most commonly used two-wire mode. The forward/reverse operation of motor is determined by two terminals DIx, DIy.

The terminal function is set as follows:

| Terminals | Set value | Description |
|---|---|---|
| DIx | 1 | Forward run (FWD) |
| DIy | 2 | Reverse run (REV) |

Of which, DIx and DIy are the multi-function input terminals of DI1~DI5, the level is active.

| K1 | K2 | Run Command |
|---|---|---|
| 0 | 0 | Stop |
| 0 | 1 | Reverse |
| 1 | 0 | Forward |
| 1 | 1 | Stop |

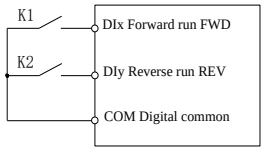



Figure 8-1:Terminal command mode: Two wire mode 1

**1: Two-wire type 2**

In this mode, DIx terminal is used as start/stop, while DIy terminal is used to determine direction.

The terminal function is set as follows:

| Terminals | Set value | Description |
|---|---|---|
| DIx | 1 | Forward run (FWD) |
| DIy | 2 | Reverse run (REV) |

Of which, DIx and DIy are the multi-function input terminals of DI1~DI5, the level is active.

| K1 | K2 | Run Command |
|---|---|---|
| 0 | 0 | Stop |
| 0 | 1 | Stop |
| 1 | 0 | Forward |
| 1 | 1 | Reverse |

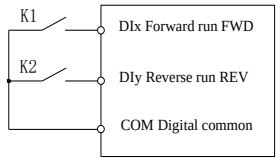



Figure 8-2:Terminal command mode: Two wire mode 2

**2: Three-wire control mode 1**

In the mode, DIn is used as enabled terminal, while DIx, DIy terminal are used to control direction.

The terminal function is set as follows:

| Terminals | Set value | Description |
|---|---|---|
| DIx | 1 | Forward run (FWD) |
| DIy | 2 | Reverse run (REV) |
| DIn | 3 | Three-wire operation control |

To run, firstly close DIn terminal, the forward or reverse start of motor is controlled by the rising edge of DIx or DIy pulse.

To stop, you must disconnect DIn terminal signal. Of which, DIx, DIy and DIn are the multi-function input terminals of DI1~DI5; DIx and DIy are active edge, DIn is active level.

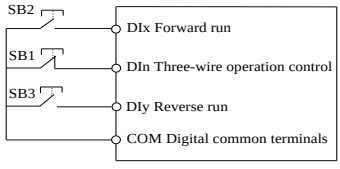



Figure 8-3:Three-wire control mode 1

Of which:SB1: Stop button SB2: Forward button SB3: Reverse button

**3: Three-wire control mode 2**

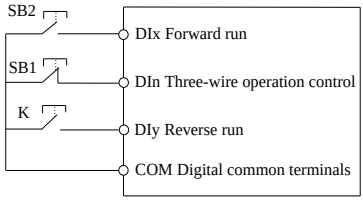
In this mode, DIn is the enabling terminal, the running commands are given by DIx, the direction is determined by the state of DIy.

The terminal function is set as follows:

| Terminals | Set value | Description |
|---|---|---|
| DIx | 1 | Forward run (FWD) |
| DIy | 2 | Reverse run (REV) |
| DIn | 3 | Three-wire operation control |

To run, first close DIn terminal, the motor run signal is generated by the ascendant edge of DIx, the motor direction signal is generated by DIy status

To stop, you must disconnect DIn terminal signals of which, DIx, DIy and DIn are the multi-function input terminals of DI1 to DI5, DIx is for active edge, DIy and DIn are for active level.




| K | Command |
|---|---|
| 0 | FWD |
| 1 | REV |

Figure 8-4:Three-wire control mode 2

Of which: SB1: Stop button SB2: Run button

| | | | | |
|---|---|---|---|---|
| F1.11 | Terminal UP/DOWN | 0.001Hz/s~65.535Hz/s | 1.000Hz/s | ☆ |
| F1.12 | Minimum input for AI1 | 0.00V~F1.14 | 0.30V | ☆ |
| F1.13 | F1.12 corresponding setting | -100.0%~+100.0% | 0.0% | ☆ |
| F1.14 | Maximum input for AI1 | F1.12~+10.00V | 10.00V | ☆ |

| | | | | |
|---|---|---|---|---|
| F1.15 | F1.14 corresponding setting | -100.0%~+100.0% | 100.0% | ☆ |
| F1.25 | AI input setting selection | Units digit: AI1 below the minimum input setting selection;<br>0: Corresponding to the minimum input F1.13<br>1: 0.0% | 000 | ☆ |
| F1.30 | DI filter time | 0.000s~1.000s | 0.010s | ☆ |
| F1.31 | AI1 filter time | 0.00s~10.00s | 0.10s | ☆ |
| F1.35 | DI terminal mode selection 1 | Units digit:DI1:<br>0:High-level active; 1: Low-level active;<br>Tens digit: DI2 (Same as units digit);<br>Hundreds digit:DI3 (Same as units digit);<br>Thousands digit:DI4 (Same as units digit);<br>Ten thousands digit:DI5 (Same as units digit) | 00000 | ★ |
| F1.37 | DI1 delay time | 0.0s~3600.0s | 0.0s | ★ |
| F1.38 | DI2 delay time | 0.0s~3600.0s | 0.0s | ★ |
| F1.39 | DI3 delay time | 0.0s~3600.0s | 0.0s | ★ |
| F1.40 | Define the input terminal repeatability | 0:Unrepeatable; 1:Repeatable, multiple DI can use the same input function | 0 | ★ |

**7.4. F2 group Output terminals**

| Code | Parameter name | Setting range | Factory setting | Change |
|---|---|---|---|---|
| F2.02 | Relay output function selection (TA-TC) | 0~40 | 2 | ☆ |

Relay output function description:

| Setting value | Functions | Description |
|---|---|---|
| 0 | No output | No output action |
| 1 | Inverter running | When the inverter is in running state (the output frequency can be anything including zero), the output signal is ON. |
| 2 | Fault output (Fault down ) | When the drive fails and stops, the output signal is ON. |
| 3 | Frequency level detection FDT1 output | Please refer to the function code F7.23, F7.24's instructions. |
| 4 | Frequency arrival | Please refer to the description of function code F7.25. |
| 5 | Zero-speed running (No output when shutdown) | If the inverter is running and the output frequency is 0, signal is ON. When the drive is shut down, the signal is OFF. |
| 6 | Motor overload pre-alarm | Before motor overload protection, a pre-alarm can be configured. If the load is more than the pre-alarm threshold value, this signal is ON. Motor overload parameter settings refer to function code F8.02~F8.04. |
| 7 | Inverter overload pre-alarm | 10s before inverter overload fault occurs (which happens after 60s at 150% of rated current), this signal is turned ON. |
| 8 | Setup counter arrive | When the count reaches the set value of E0.08, output is ON. Specifies the count value reaches. |
| 9 | Specifies the count value reaches | When the count reaches the set value of E0.09, output is ON. Counting Function Reference E0 group. |
| 10 | Length arrival | When the actual detected length is more than E0.05 set length, output signal is ON. |
| 11 | PLC cycle is complete | After the simple PLC completes one cycle, a pulse with a width of 250ms is output. |
| 12 | Total running time arrival | If the inverter total running time F6.07 is more than F7.21 set time, output signal is ON. |
| 13 | Limited in frequency | When the set frequency exceeds the upper or lower frequency limit, and output frequency is beyond the upper or lower frequency limit, output signal is ON. |
| 14 | Torque limiting | When the drive is in speed control mode, if the output torque reaches the torque limit, and the inverter is stall protection status, the output is ON. |
| 15 | Ready to run | When the inverter main circuit and control circuit power supply has stabilized, and the drive does not detect any fault information, the drive is in an operational state, output is ON. |
| 17 | Upper frequency arrival | When the operating frequency reaches the upper frequency, output signal is ON. |
| 18 | Lower frequency arrival (No output when shutdown) | When the operating frequency reaches the lower frequency, output signal is ON. At stop, signal is OFF. See also 37. |
| 19 | Under voltage state output | When the inverter is in an undervoltage condition, output signal is ON. |
| 20 | Communication setting | Refer to the communication protocol. |
| 23 | Zero-speed operation 2 (also output when shutdown) | The inverter's output frequency is 0, output signal is ON. The signal is also ON when shutdown. |
| 24 | Cumulative power-on time arrival | When the inverter's accumulated power-on time F6.08 is more than F7.20 set time, output signal is ON. |
| 25 | Frequency level detection FDT2 output | Please refer to the function code F7.26, F7.27's instructions. |
| 26 | Frequency 1 reaches output | Please refer to the function code F7.28, F7.29's instructions. |
| 27 | Frequency 2 reaches output | Please refer to the function code F7.30, F7.31's instructions. |
| 28 | Current 1 reaches output | Please refer to the function code F7.36, F7.37's instructions. |
| 29 | Current 2 reaches output | Please refer to the function code F7.38, F7.39's instructions. |
| 30 | Timing reach output | When the timer function selection (F7.42) is valid, and the drive run time reaches the time set in F7.43/44, output is ON. |
| 31 | AI1 input overrun | When the value of analog input AI1 is greater than F7.51 (AI1 input upper limit) or less than F7.50 (AI1 input lower limit), output signal is ON. |
| 32 | Off load | When the inverter is off-load state, output signal is ON. |
| 33 | Reverse operation | If the inverter runs in reverse, output signal is ON |
| 34 | 0 current state | If the output current is lower than F7.32 for a longer time than F7.33, output signal is ON. |
| 35 | Module temperature reached | If inverter module heatsink temperature (F6.06) reaches the set module temperature (F7.40), output signal is ON. |
| 36 | Software current limit | Please refer to the function code F7.34, F7.35's instructions. |
| 37 | Lower limit frequency arrival (Output also in shutdown) | When the set frequency or operating frequency reaches the lower limit frequency, output signal is ON. In shutdown state, the signal is also ON. See also setting 18 above. |
| 38 | Alarm output | When the frequency inverter encounters a failure, and the fault processing mode is set to continue running, output signal is ON. |
| 40 | Current running time arrival | When the inverter running time since the last start is longer than the time set by F7.45, output signal is ON. |

| | | | | |
|---|---|---|---|---|
| F2.07 | DA1 output function selection | 0~17 | 2 | ☆ |

Analog Output DA output range is 0V~10V, or 0mA~20mA, with the corresponding scaling function relationship in the following table

| Setting value | Functions | Description and scaling |
|---|---|---|
| 0 | Running frequency | 0~max. output frequency |
| 1 | Set frequency | 0~max. output frequency |
| 2 | Output current | 0~2 times the motor rated current |
| 3 | Output torque | 0~2 times the motor rated torque |
| 4 | Output power | 0~2 times rated power |
| 5 | Output voltage | 0~1.2 times inverter rated voltage |
| 7 | Analog AI1 | 0V~10V or 0~20mA |
| 10 | Length value | 0~max. setting length |
| 11 | The count value | 0~max. count value |
| 12 | Communication set | 0.0%~100.0% |
| 13 | Motor speed | 0~max. output frequency correspondent speed |
| 14 | Output current | 0.0A~100.0A |
| 15 | DC bus voltage | 0.0V~1000.0V |
| 17 | Frequency source main set | 0~max. output frequency |

| | | | | |
|---|---|---|---|---|
| F2.11 | Relay 1 output delay time | 0.0s~3600.0s | 0.0s | ☆ |
| F2.15 | DO terminal active status selection | Units digit: Reserved;<br>Tens digit: Relay 0:Positive; 1:Negative | 00000 | ☆ |
| F2.16 | DA1 zero bias coefficient | -100.0%~+100.0% | 20.0% | ☆ |
| F2.17 | DA1 gain | -10.00~+10.00 | 0.8 | ☆ |

### 7.5. F3 group Start and stop control group

| Code | Parameter name | Setting range | Factory setting | Change |
|---|---|---|---|---|
| F3.00 | Start-up mode | 0:Direct startup;<br>1:Speed tracking restart;<br>2:Pre-excitation start (AC asynchronous motor) | 0 | ☆ |
| F3.01 | Speed tracking mode | 3:Hard speed tracking mode | 3 | ★ |
| F3.02 | Speed tracking speed | 0~100 | 20 | ☆ |
| F3.03 | Start frequency | 0.00Hz~10.00Hz | 0.00Hz | ☆ |
| F3.04 | Hold time for start frequency | 0.0s~100.0s | 0.0s | ★ |
| F3.05 | DC pre-excitation current | 0%~100% | 0% | ★ |
| F3.06 | DC pre-excitation time | 0.0s~100.0s | 0.0s | ★ |
| F3.07 | Stop mode | 0:Deceleration stop; 1: Free stop | 0 | ☆ |
| F3.08 | DC start frequency | 0.00Hz~F0.19 (Max. frequency) | 0.00Hz | ☆ |
| F3.09 | DC waiting time | 0.0s~100.0s | 0.0s | ☆ |
| F3.10 | Braking current | 0%~100% | 0% | ☆ |
| F3.11 | Braking time | 0.0s~100.0s | 0.0s | ☆ |
| F3.12 | Braking utilization rate | 0%~100% | 100% | ☆ |
| F3.13 | Ac/deceleration mode | 0:Linear acceleration and deceleration;<br>1:S curve acceleration and deceleration A<br>2:S curve acceleration and deceleration B | 0 | ★ |
| F3.14 | Proportion of S curve start-section | 0.0%~(100.0%.~F3.15) | 30.0% | ★ |
| F3.15 | Proportion of S curve end-section | 0.0%~(100.0%.~F3.14) | 30.0% | ★ |

### 7.6. F4 group V/F control parameter group

| Code | Parameter name | Setting range | Factory setting | Change |
|---|---|---|---|---|
| F4.00 | V/F curve setting | 0: Linear V/F;<br>1: Multi-point V/F;<br>2: Square V/F;<br>3: 1.2th power V/F;<br>4: 1.4th power V/F;<br>6: 1.6th power V/F;<br>8: 1.8th power V/F;<br>10: V/F completely separate;<br>11: V/F half separate | 0 | ★ |
| F4.01 | Torque boost | 0.0%: Automatic torque boost<br>0.1~30%: Manual torque boost | 0.0% | ★ |
| F4.02 | Torque boost cut-off frequency | 0.00Hz~F0.19 (Max. Frequency) | 15.00Hz | ★ |
| F4.03 | Multi-point V/F frequency point 1 | 0.00Hz~F4.05 | 0.00Hz | ★ |
| F4.04 | Multi-point V/F voltage point V1 | 0.0%~100.0% | 0.0% | ★ |
| F4.05 | Multi-point V/F frequency point 2 | F4.03~F4.07 | 0.00Hz | ★ |
| F4.06 | Multi-point V/F voltage point V2 | 0.0%~100.0% | 0.0% | ★ |
| F4.07 | Multi-point V/F frequency point 3 | F4.05~b0.04 (Motor rated frequency) | 0.00Hz | ★ |
| F4.08 | Multi-point V/F voltage point V3 | 0.0%~100.0% | 0.0% | ★ |
| F4.09 | V/F slip compensation gain | 0.0%~200.0% | 0.0% | ☆ |
| F4.10 | V/F overexcitation gain | 0~200 | 80 | ☆ |
| F4.11 | V/F oscillation suppression gain | 0~100 | 0 | ☆ |
| F4.12 | V/F separation voltage source | 0~9 | 0 | ☆ |
| F4.13 | V/F separation voltage digital setting | 0V~motor rated voltage | 0V | ☆ |
| F4.14 | V/F separation voltage rise time | 0.0s~1000.0s | 0.0s | ☆ |

### 7.7. F5 group Vector control parameter group

| Code | Parameter name | Setting range | Factory setting | Change |
|---|---|---|---|---|
| F5.00 | Proportion of speed loop G1 | 1 ~ 100 | 30 | ☆ |
| F5.01 | Speed loop integral T1 | 0.01s ~ 10.00s | 0.50s | ☆ |
| F5.02 | Switching frequency 1 | 0.00 ~ F5.05 | 5.00Hz | ☆ |
| F5.03 | Proportion of speed loop G2 | 0 ~ 100 | 20 | ☆ |
| F5.04 | Speed loop integral T2 | 0.01s ~ 10.00s | 1.00s | ☆ |
| F5.05 | Switching frequency 2 | F5.02 ~ F0.19 (Max. frequency) | 10.00Hz | ☆ |
| F5.06 | Speed loop integral | 0: Invalid; 1: Valid | 0 | ☆ |
| F5.07 | Torque limit source under speed control mode | 0: F5.08 set; 1: AI1 set;<br>5: Communication set | 0 | ☆ |
| F5.08 | Torque upper limit digital setting | 0.0% ~ 200.0% | 150.0% | ☆ |
| F5.09 | Vector control differential gain | 50% ~ 200% | 150% | ☆ |
| F5.10 | Speed loop filtering time | 0.000s ~ 0.100s | 0.000s | ☆ |
| F5.11 | Vector control overexcitation gain | 0 ~ 200 | 64 | ☆ |
| F5.12 | Excitation regulator proportional gain | 0 ~ 60000 | 2000 | ☆ |
| F5.13 | Excitation regulator integral gain | 0 ~ 60000 | 1300 | ☆ |
| F5.14 | Torque regulator proportional gain | 0 ~ 60000 | 2000 | ☆ |
| F5.15 | Torque regulator integral gain | 0 ~ 60000 | 1300 | ☆ |

### 7.8. F6 group Keyboard and display

| Code | Parameter name | Setting range | Factory setting | Change |
|---|---|---|---|---|
| F6.00 | STOP/RESET key functions | 0:STOP/RESET key is enabled only under keyboard operation mode<br>1:STOP/RESET key is enabled under any operation mode | 1 | ☆ |
| F6.01 | Running status display parameters 1 | 0x0000 ~ 0xFFFF | 001F | ☆ |
| F6.02 | Running status display parameters 2 | 0x0000 ~ 0xFFFF | 0000 | ☆ |
| F6.03 | Stop status display parameters | 0x0001 ~ 0xFFFF | 0033 | ☆ |
| F6.04 | Load speed display coefficient | 0.0001 ~ 6.5000 | 3.0000 | ☆ |
| F6.05 | Decimal places for load speed display | 0:0 decimal place; 2:2 decimal place;<br>1:1 decimal place; 3:3 decimal place | 1 | ☆ |
| F6.06 | Inverter module radiator temperature | 0.0°C ~ 100.0°C | - | ● |
| F6.07 | Total running time | 0h ~ 65535h | - | ● |
| F6.08 | Total power-on time | 0h ~ 65535h | - | ● |
| F6.09 | Total power consumption | 0kWh ~ 65535kWh | - | ● |
| F6.10 | Product number | Inverter product number | - | ● |
| F6.11 | Software version | Software version of control board | - | ● |
| F6.13 | Communication read and write data selection | Single digit: CRC etc. error selection:<br>0: Reply on verification error;<br>1: No reply on verification error;<br>Ten digit: Broadcast message processing selection: 0: allowed; 1: filtered<br>Hundred digit: Inverter fault information read selection: 0: readable; 1: no read | 011 | ☆ |
| F6.17 | Power correction coefficient | 0.00 ~ 10.00 | 1.00 | ☆ |
| F6.20 | Keyboard lock selection | 0:Only RUN and STOP keys are valid;<br>2:Only RUN, STOP, UP, DOWN keys are valid;<br>3:Only STOP key is valid | 0 | ☆ |
| F6.21 | QUICK key Function Selection | 0:No function;<br>1:Jog running;<br>2:Shift key;<br>3:Forward/reverse running switching;<br>4:Clear UP/DOWN setting;<br>5:Free stop;<br>6:Cycle through command source settings | 1 | ☆ |

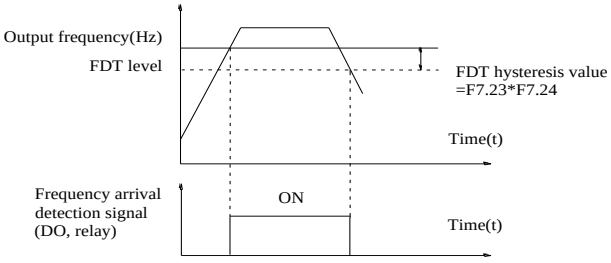
1:Jog running: while pressing QUICK key, the inverter will make jog running in the default direction.
2:Shift key: Cycle through the display status parameters allowed by F6.01/2/3 under running or stop interface
3:Forward/Reverse running switching: under keyboard command, change running direction.
4:Clear UP/DOWN setting: remove the offset accumulated with the UP/DOWN keys or terminals.
5:Free stop: use the QUICK key to stop the inverter output and let the motor decelerate on its own, regardless of the setting of F3.07.
6:Cycle through the running command source settings by pressing QUICK key: Command source will change in the following sequence: Keyboard setting→terminal setting→communications setting→repeat.

### 7.9. F7 group Auxiliary function parameter group

| Code | Parameter name | Setting range | Factory setting | Change |
|---|---|---|---|---|
| F7.00 | Jog running frequency | 0.00Hz ~ F0.19 (Max. frequency) | 6.00Hz | ☆ |
| F7.01 | Jog acceleration time | 0.0s ~ 6500.0s | 5.0s | ☆ |
| F7.02 | Jog deceleration time | 0.0s ~ 6500.0s | 5.0s | ☆ |
| F7.03 | Jog priority | 0:Invalid; 1:Valid | 1 | ☆ |
| F7.04 | Jump frequency 1 | 0.00Hz ~ F0.19 (Max. frequency) | 0.00Hz | ☆ |
| F7.05 | Jump frequency 2 | 0.00Hz ~ F0.19 (Max. frequency) | 0.00Hz | ☆ |
| F7.06 | Jump frequency range | 0.00Hz ~ F0.19 (Max. frequency) | 0.00Hz | ☆ |
| F7.07 | Jump frequency availability | 0:Invalid; 1:Valid | 0 | ☆ |
| F7.08 | Acceleration time 2 | 0.0s ~ 6500.0s | Depends on models | ☆ |

| | | | | |
|---|---|---|---|---|
| F7.09 | Deceleration time 2 | 0.0s ~ 6500.0s | Depends on models | ☆ |
| F7.10 | Acceleration time 3 | 0.0s ~ 6500.0s | | ☆ |
| F7.11 | Deceleration time 3 | 0.0s ~ 6500.0s | | ☆ |
| F7.12 | Acceleration time 4 | 0.0s ~ 6500.0s | | ☆ |
| F7.13 | Deceleration time 4 | 0.0s ~ 6500.0s | | ☆ |
| F7.14 | Switching frequency point between acceleration time 1 and acceleration time 2 | 0.00Hz ~ F0.19 (Max. frequency)<br>Active only when set to >0.00Hz and no DI is used to switch groups | 0.00Hz | ☆ |
| F7.15 | Switching frequency point between deceleration time 1 and deceleration time 2 | 0.00Hz ~ F0.19 (Max. frequency)<br>Active only when set to >0.00Hz and no DI is used to switch groups | 0.00Hz | ☆ |
| F7.16 | Forward/reverse rotation dead-band | 0.00s ~ 3600.0s | 0.00s | ☆ |
| F7.17 | Reverse rotation control | 0:Allow; 1:Prohibit | 0 | ☆ |
| F7.18 | Mode under lower limit frequency | 0: Keep running at lower limit frequency;<br>1: Stop; 2: Run at zero speed | 0 | ☆ |
| F7.19 | Droop control | 0.00Hz ~ 10.00Hz | 0.00Hz | ☆ |
| F7.20 | Setting of power-on arrival time | 0h ~ 36000h | 0h | ☆ |
| F7.21 | Setting of running arrival time | 0h ~ 36000h | 0h | ☆ |
| F7.22 | Power-on start protection selection | 0:OFF; 1:ON | 0 | ☆ |
| F7.23 | FDT1 detection value | 0.00Hz ~ F0.19 (Max. frequency) | 50.00Hz | ☆ |
| F7.24 | FDT1 detection hysteresis value | 0.0% ~ 100.0% (FDT1 level) | 5.0% | ☆ |

The inverter's multifunction output DO will output ON signal when the operating frequency is higher than the configured frequency detection threshold, and the output is reset to OFF when the operating frequency drops below the configured level minus the hysteresis value.
The above parameters are used to set the threshold level of output frequency, and the hysteresis value below which the output is canceled. F7.24 is the hysteresis percentage of the frequency threshold level (F7.23). The below figure is the schematic diagram of FDT operation.




| | | | | |
|---|---|---|---|---|
| F7.25 | Frequency reached detection width | 0.00 ~ 100% (Max. frequency) | 0.0% | ☆ |
| F7.26 | FDT2 detection value | 0.00Hz ~ F0.19 (Max. frequency) | 50.00Hz | ☆ |
| F7.27 | FDT2 detection hysteresis value | 0.0% ~ 100.0% (FDT2 level) | 5.0% | ☆ |
| F7.28 | Frequency detection value 1 | 0.00Hz ~ F0.19 (Max. frequency) | 50.00Hz | ☆ |
| F7.29 | Frequency detection width 1 | 0.0% ~ 100.0% (Max. frequency) | 0.0% | ☆ |
| F7.30 | Frequency detection value 2 | 0.00Hz ~ F0.19 (Max. frequency) | 50.00Hz | ☆ |
| F7.31 | Frequency detection width 2 | 0.0% ~ 100.0% (Max. frequency) | 0.0% | ☆ |
| F7.32 | 0 current detection | 0.0% ~ 300.0% (Motor rated current) | 5.0% | ☆ |
| F7.33 | 0 current delay | 0.01s ~ 360.00s | 0.10s | ☆ |
| F7.34 | Current over-run value | 0.0% (Not detected);<br>0.1% ~ 300.0% (Motor rated curr.) | 200.0% | ☆ |
| F7.35 | Current over-run time | 0.00s ~ 360.00s | 0.00s | ☆ |
| F7.36 | Arrival current 1 | 0.0% ~ 300.0% (Motor rated current) | 100.0% | ☆ |
| F7.37 | Current 1 width | 0.0% ~ 300.0% (Motor rated current) | 0.0% | ☆ |
| F7.38 | Arrival current 2 | 0.0% ~ 300.0% (Motor rated current) | 100.0% | ☆ |
| F7.39 | Current 2 width | 0.0% ~ 300.0% (Motor rated current) | 0.0% | ☆ |
| F7.40 | Module temperature limit | 0°C ~ 100°C | 75°C | ☆ |
| F7.41 | Cooling fan control | 0: Fan runs only when inverter is running or heatsink >40°C;<br>1: Fan always running | 0 | ☆ |
| F7.42 | Timing function selection | 0: Invalid; 1: Valid | 0 | ★ |
| F7.43 | Timing run time selection | 0: F7.44 set; 1: AI1 set;<br>Note: 100% of AI1 input range corresponds to 100% of F7.44 | 0 | ★ |
| F7.44 | Timing run time | 0.0Min ~ 6500.0Min | 0.0Min | ★ |
| F7.45 | Running time arrive | 0.0Min ~ 6500.0Min | 0.0Min | ★ |
| F7.46 | Wakeup frequency | Dormancy frequency F7.48 ~ maximum frequency F0.19 | 0.00Hz | ☆ |
| F7.47 | Wakeup delay time | 0.0s ~ 6500.0s | 0.0s | ☆ |
| F7.48 | Dormancy frequency | 0.00Hz ~ wakeup frequency F7.46 | 0.00Hz | ☆ |
| F7.49 | Dormancy delay time | 0.0s ~ 6500.0s | 0.0s | ☆ |
| F7.50 | AI1 input voltage lower limit | 0.00V ~ F7.51 | 3.1V | ☆ |

| | | | | |
|---|---|---|---|---|
| F7.51 | AI1 input voltage upper limit | F7.50 ~ 10.00V | 6.8V | ☆ |

**7.10. F8 group Fault and protection parameter group**

| Code | Parameter name | Setting range | Factory setting | Change |
|---|---|---|---|---|
| F8.00 | Overcurrent stall gain | 0~100 | 20 | ☆ |
| F8.01 | Lost speed stall protection current | 100%~200% | - | ☆ |
| F8.02 | Overload protection | 0:Prohibit; 1:Allow | 1 | ☆ |
| F8.03 | Motor overload protection gain | 0.20~10.00 | 1.00 | ☆ |
| F8.04 | Motor overload pre-alarm coefficient | 50%~100% | 80% | ☆ |
| F8.05 | Overvoltage stall gain | 0(No overvoltage stall)~100 | 0 | ☆ |
| F8.06 | Overvoltage stall protection voltage /energy consumption brake voltage | 120%~150%(Three-phase) | 130% | ☆ |
| F8.08 | Output phase loss protection | 0:Prohibit; 1:Allow | 1 | ☆ |
| F8.09 | Short to ground protection | 0:Invalid; 1:Valid | 1 | ☆ |
| F8.10 | Number of automatic fault resets | 0 ~ 32767 | 0 | ☆ |
| F8.11 | Fault DO action selection during automatic fault | 0:OFF; 1:ON | 0 | ☆ |
| F8.12 | Automatic fault reset | 0.1s ~ 100.0s | 1.0s | ☆ |
| F8.13 ~ F8.16 | Reserved | | | |
| F8.17 | Fault protection action selection 1 | Units digit: Motor overload (Fault ID Err.11)<br>Free stop: 0<br>Stop at the selected mode: 1<br>Continue to run: 2<br>Tens digit: input phase loss (Err.12) (same as units digit)<br>Hundred digit: output phase loss (Err.13) (same as units digit)<br>Thousand digit: external fault (Err.15) (same as units digit)<br>Ten thousands digit: Communication abnormal (Err.16) (same as units digit) | 00000 | ☆ |
| F8.18 | Fault protection action selection 2 | Units digit: Reserved<br>Tens digit: function code read and write abnormal (Err.21)<br>Free stop: 0<br>Stop at the selected mode: 1<br>Hundreds digit: Reserved<br>Thousands digit: Reserved<br>Ten thousands digit: Running time arrival(Err.26)(same as F8.17 units digit) | 00000 | ☆ |
| F8.19 | Fault protection action selection 3 | Units digit: User-defined fault 1(Err.27) (same as F8.17 units digit)<br>Tens digit: User-defined fault 2(Err.28) (same as F8.17 units digit)<br>Hundreds digit: Power-on time arrival (Err.29) (same as F8.17 units digit)<br>Thousands digit: Load drop (Err.30)<br>Free stop: 0<br>stop at select mode: 1<br>Deceleration up to 7% of the rated motor frequency, and then continue running, automatically return to the set frequency to run if the load has returned: 2<br>Ten thousands digit: PID feedback loss when running (Err.31) (same as F8.17 units digit) | 00000 | ☆ |
| F8.20 | Fault protection action selection 4 | Units digit: Too large speed deviation (Err.42) (same as F8.17 units digit)<br>Tens digit: Reserved<br>Hundreds digit: Initial position error (Err.51) (same as F8.17 units digit)<br>Thousands digit: Reserved<br>Ten thousands digit: Reserved | 00000 | ☆ |
| When "free stop" is selected, the inverter displays Err. *, and directly stops. When "Stop at the selected mode" is selected, the inverter displays Arr. *, firstly stops at the selected mode and then displays | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Err. *. When "continue to run" is selected, the inverter continues to run and displays Arr. *, the operating frequency is set by F8.24. | | | | | |
| F8.21 ~ F8.23 | Reserved | | | | |
| F8.24 | Fault running frequency | Current running frequency | 0 | 0 | ☆ |
| | | Set frequency | 1 | | |
| | | Upper limit frequency | 2 | | |
| | | Lower limit frequency | 3 | | |
| | | Abnormal reserve frequency | 4 | | |
| F8.25 | Abnormal reserve frequency | 60.0% ~ 100.0% | | 100% | ☆ |
| F8.26 | Momentary power cut action selection | 0: Invalid; 1: Deceleration; 2: Deceleration and stop | | 0 | ☆ |
| F8.28 | Recovery voltage judgment time of momentary power cut | 0.00s ~ 100.00s | | 0.50s | ☆ |
| F8.29 | Judgment voltage of momentary power cut | 50.0% ~ 100.0%(Standard bus voltage | | 80% | ☆ |
| F8.30 | Load drop protection | 0:Prohibit; 1:Allow | | 0 | ☆ |
| F8.31 | Judgment current of load drop | 0.0% ~ 100.0% of motor rated current | | | ☆ |
| F8.32 | Detection time for load drop | 0.0s ~ 60.0s | | | ☆ |

**7.11. F9 group Communication parameter group**

| Code | Parameter name | Setting range | Factory setting | Change |
|---|---|---|---|---|
| F9.00 | Baud rate | Unit: Modbus<br>2: 1200BPS;<br>3: 2400BPS;<br>4: 4800BPS;<br>5: 9600BPS;<br>6: 19200BPS;<br>7: 38400BPS;<br>8: 57600BPS;<br>9: 115200BPS<br>Tens digit: Reserved;<br>Hundreds digit: Reserved<br>Thousands digit: Reserved | 6005 | ☆ |
| F9.01 | Data format | 0: No parity (8-N-2);<br>1: Even parity (8-E-1)<br>2: Odd parity (8-O-1)<br>3: No parity (8-N-1) | 0 | ☆ |
| F9.02 | This unit address | 1 ~ 250, 0 for broadcast address | 1 | ☆ |
| F9.03 | Response delay | 0ms ~ 20ms | 2ms | ☆ |
| F9.04 | Communication timeout time | 0.0 (Invalid ); 0.1 ~ 60.0s | 0.0 | ☆ |
| F9.05 | Data transfer format selection | Units digit: Modbus<br>0: Non-standard Modbus protocol;<br>1: Standard Modbus protocol<br>Tens digit: Reserved | 31 | ☆ |
| F9.06 | Communication read current resolution | 0: 0.01A; 1: 0.1A | 0 | ☆ |

**7.12. Fb group Control parameter optimization group**

| Code | Parameter name | Setting range | Factory setting | Change |
|---|---|---|---|---|
| Fb.00 | Fast current limiting manner | 0: Disable; 1: Enable | 1 | ☆ |
| Fb.01 | Undervoltage point setting | 50.0% ~ 140.0% | 100.0% | ☆ |
| Fb.02 | Overvoltage point setting | 200.0 ~ 2500.0V | - | ★ |
| Fb.03 | Deadband compensation mode selection | 0: No compensation;<br>1: Compensation mode 1;<br>2: Compensation mode 2 | 1 | ☆ |
| Fb.04 | Current detection compensation | 0 ~ 100 | 5 | ☆ |
| Fb.05 | Vector optimization without PG mode selection | 0: No compensation;<br>1: Compensation mode 1;<br>2: Compensation mode 2 | 1 | ★ |
| Fb.06 | Upper limiting frequency for DPWM switching | 0.00 ~ 15.00Hz | 12.00Hz | ☆ |
| Fb.07 | PWM modulation mode | 0: Asynchronous; 1: Synchronous | 0 | ☆ |
| Fb.08 | Random PWM depth | 0: Invalid<br>1 ~10: PWM carrier frequency random depth | 0 | ☆ |

**7.13. E0 group Wobbulate, fixed-length and counting group**

| Code | Parameter name | Setting range | Factory setting | Change |
|---|---|---|---|---|
| E0.00 | Swing setting manner | 0: Relative to center frequency;<br>1: Relative to maximum frequency | 0 | ☆ |
| E0.01 | Wobbulate range | 0.0% ~ 100.0% | 0.0% | ☆ |
| E0.02 | Sudden jump frequency range | 0.0% ~ 50.0% | 0.0% | ☆ |
| E0.03 | Wobbulate cycle | 0.1s ~ 3000.0s | 10.0s | ☆ |
| E0.04 | Triangle wave rise time coefficient | 0.1% ~ 100.0% | 50.0% | ☆ |
| E0.05 | Set length | 0m ~ 65535m | 1000m | ☆ |
| E0.06 | Actual length | 0m ~ 65535m | 0m | ☆ |
| E0.07 | Pulse per meter | 0.1 ~ 6553.5 | 100.0 | ☆ |
| E0.08 | Set count value | 1 ~ 65535 | 1000 | ☆ |
| E0.09 | Specified count value | 1 ~ 65535 | 1000 | ☆ |

**7.14. E1 group Multi-speed, sample PLC parameter**

| Code | Parameter name | Setting range | Factory setting | Change |
|---|---|---|---|---|
| E1.00 | 0 stage speed setting 0X | -100.0%~100.0% | 0.0% | ☆ |
| E1.01 | 1 stage speed setting 1X | -100.0%~100.0% | 0.0% | ☆ |
| E1.02 | 2 stage speed setting 2X | -100.0%~100.0% | 0.0% | ☆ |
| E1.03 | 3 stage speed setting 3X | -100.0%~100.0% | 0.0% | ☆ |
| E1.04 | 4 stage speed setting 4X | -100.0%~100.0% | 0.0% | ☆ |
| E1.05 | 5 stage speed setting 5X | -100.0%~100.0% | 0.0% | ☆ |
| E1.06 | 6 stage speed setting 6X | -100.0%~100.0% | 0.0% | ☆ |
| E1.07 | 7 stage speed setting 7X | -100.0%~100.0% | 0.0% | ☆ |
| E1.08 | 8 stage speed setting 8X | -100.0%~100.0% | 0.0% | ☆ |
| E1.09 | 9 stage speed setting 9X | -100.0%~100.0% | 0.0% | ☆ |
| E1.10 | 10 stage speed setting 10X | -100.0%~100.0% | 0.0% | ☆ |
| E1.11 | 11 stage speed setting 11X | -100.0%~100.0% | 0.0% | ☆ |
| E1.12 | 12 stage speed setting 12X | -100.0%~100.0% | 0.0% | ☆ |
| E1.13 | 13 stage speed setting 13X | -100.0%~100.0% | 0.0% | ☆ |
| E1.14 | 14 stage speed setting 14X | -100.0%~100.0% | 0.0% | ☆ |
| E1.15 | 15 stage speed setting 15X | -100.0%~100.0% | 0.0% | ☆ |
| E1.16 | PLC Simple PLC running mode | 0: Stop after single run;<br>1: Hold final value after single run;<br>2: Circular | 0 | ☆ |
| E1.17 | PLC memory selection | Units: power-down memory;<br>0: Power-down without memory;<br>1: Power-down with memory;<br>Tens: stop memory;<br>0: Stop without memory;<br>1: Stop with memory | 11 | ☆ |
| E1.18 | 0 stage running time ~ | 0.0s(h) ~ 6500.0s(h) | 0.0s(h) | ☆ |
| E1.19 | 0 stage ac/deceleration time pair selection | 0: F0.13, F0.14; 1: F7.08, F7.09;<br>2: F7.10, F7.11; 3: F7.12, F7.13 | 0 | ☆ |
| E1.20 | 1 stage running time T1 | 0.0s(h) ~ 6500.0s(h) | 0.0s(h) | ☆ |
| E1.21 | 1 stage ac/deceleration time selection | Same to E1.19 | 0 | ☆ |
| E1.22 | 2 stage running time T2 | 0.0s(h) ~ 6500.0s(h) | 0.0s(h) | ☆ |
| E1.23 | 2 stage ac/deceleration time selection | Same to E1.19 | 0 | ☆ |
| E1.24 | 3 stage running time T3 | 0.0s(h) ~ 6500.0s(h) | 0.0s(h) | ☆ |
| E1.25 | 3 stage ac/deceleration time selection | Same to E1.19 | 0 | ☆ |
| E1.26 | 4 stage running time T4 | 0.0s(h) ~ 6500.0s(h) | 0.0s(h) | ☆ |
| E1.27 | 4 stage ac/deceleration time selection | Same to E1.19 | 0 | ☆ |
| E1.28 | 5 stage running time T5 | 0.0s(h) ~ 6500.0s(h) | 0.0s(h) | ☆ |
| E1.29 | 5 stage ac/deceleration time selection | Same to E1.19 | 0 | ☆ |
| E1.30 | 6 stage running time T6 | 0.0s(h) ~ 6500.0s(h) | 0.0s(h) | ☆ |
| E1.31 | 6 stage ac/deceleration time selection | Same to E1.19 | 0 | ☆ |
| E1.32 | 7 stage running time T7 | 0.0s(h) ~ 6500.0s(h) | 0.0s(h) | ☆ |
| E1.33 | 7 stage ac/deceleration time selection | Same to E1.19 | 0 | ☆ |
| E1.34 | 8 stage running time T8 | 0.0s(h) ~ 6500.0s(h) | 0.0s(h) | ☆ |
| E1.35 | 8 stage ac/deceleration time selection | Same to E1.19 | 0 | ☆ |
| E1.36 | 9 stage running time T9 | 0.0s(h) ~ 6500.0s(h) | 0.0s(h) | ☆ |
| E1.37 | 9 stage ac/deceleration time selection | Same to E1.19 | 0 | ☆ |
| E1.38 | 10 stage running time T10 | 0.0s(h) ~ 6500.0s(h) | 0.0s(h) | ☆ |
| E1.39 | 10 stage ac/deceleration time selection | Same to E1.19 | 0 | ☆ |
| E1.40 | 11 stage running time T11 | 0.0s(h) ~ 6500.0s(h) | 0.0s(h) | ☆ |
| E1.41 | 11 stage ac/deceleration time selection | Same to E1.19 | 0 | ☆ |
| E1.42 | 12 stage running time T12 | 0.0s(h) ~ 6500.0s(h) | 0.0s(h) | ☆ |
| E1.43 | 12 stage ac/deceleration time selection | Same to E1.19 | 0 | ☆ |
| E1.44 | 13 stage running time T13 | 0.0s(h) ~ 6500.0s(h) | 0.0s(h) | ☆ |
| E1.45 | 13 stage ac/deceleration time selection | Same to E1.19 | 0 | ☆ |
| E1.46 | 14 stage running time T14 | 0.0s(h) ~ 6500.0s(h) | 0.0s(h) | ☆ |
| E1.47 | 14 stage ac/deceleration time selection | Same to E1.19 | 0 | ☆ |
| E1.48 | 15 stage running time T15 | 0.0s(h) ~ 6500.0s(h) | 0.0s(h) | ☆ |
| E1.49 | 15 stage ac/deceleration time selection | Same to E1.19 | 0 | ☆ |
| E1.50 | Simple PLC run-time unit | 0:S(seconds); 1:H(hours) | 0 | ☆ |
| E1.51 | Multi-stage command 0 reference manner | 0: Function code E1.00 reference;<br>1: Analog AI1 reference;<br>5: PID control setting;<br>6: Keyboard set frequency (F0.01) setting, can be modified with UP/DOWN | 0 | ☆ |

**7.15. E2 group PID function parameter group**

| Code | Parameter name | Setting range | Factory setting | Change |
|---|---|---|---|---|
| E2.00 | PID setting source | 0: E2.01 setting;<br>1: Analog AI1 reference | 0 | ☆ |

| | | | | |
|---|---|---|---|---|
| | | 5: Communications reference;<br>6: Multi-stage command reference | | |
| E2.01 | PID keyboard reference | 0.0% ~ 100.0% | 50.0% | ☆ |
| E2.02 | PID feedback source | 0: Analog A1 given;<br>5: Communications given; | 0 | ☆ |
| E2.03 | PID action direction | 0:Positive; 1:Negative | 0 | ☆ |
| E2.04 | PID setting feedback range | 0 ~ 65535 | 1000 | ☆ |
| E2.05 | PID inversion cutoff frequency | 0.00 ~ F0.19 (Maximum frequency) | 0.00Hz | ☆ |
| E2.06 | PID deviation limit | 0.0% ~ 100.0% | 2.0% | ☆ |
| E2.07 | PID differential limiting | 0.00% ~ 100.00% | 0.10% | ☆ |
| E2.08 | PID reference change time | 0.00s ~ 650.00s | 0.00s | ☆ |
| E2.09 | PID feedback filter time | 0.00s ~ 60.00s | 0.00s | ☆ |
| E2.10 | PID output filter time | 0.00s ~ 60.00s | 0.00s | ☆ |
| E2.11 | PID feedback loss detection value | 0.0%: Not judging feedback loss;<br>0.1% ~ 100.0% | 0.0% | ☆ |
| E2.12 | PID feedback loss detection time | 0.0s to 20.0s | 0.0s | ☆ |
| E2.13 | Proportional gain KP1 | 0.0 to 200.0 | 80.0 | ☆ |
| E2.14 | Integration time Ti1 | 0.01s to 10.00s | 0.50s | ☆ |
| E2.15 | Differential time Td1 | 0.00s to 10.000s | 0.000s | ☆ |
| E2.16 | Proportional gain KP2 | 0.0 to 200.0 | 20.0 | ☆ |
| E2.17 | Integration time Ti2 | 0.01s to 10.00s | 2.00s | ☆ |
| E2.18 | Differential time Td2 | 0.00 to 10.000 | 0.000s | ☆ |
| E2.19 | PID parameter set 1/2 switching conditions | 0: No switching;<br>1: Switching via terminals;<br>2: Automatically switching according to deviation E2.20/21, interpolation in between | 0 | ☆ |
| E2.20 | PID parameter switching deviation 1 | 0.0% to E2.21 | 20.0% | ☆ |
| E2.21 | PID parameter switching deviation 2 | E2.20 to 100.0% | 80.0% | ☆ |
| E2.22 | PID integral properties | Units digit: Integral separation<br>0: Invalid; 1: Valid<br>Tens digit: Whether to stop integration when output reaches limit<br>0: Continue; 1: Stop | 00 | ☆ |
| E2.23 | PID initial value | 0.0% to 100.0% | 0.0% | ☆ |
| E2.24 | PID initial value hold time | 0.00s to 360.00s | 0.00s | ☆ |
| E2.25 | Maximum deviation of consecutive outputs (Forward) | 0.00% to 100.00% | 1.00% | ☆ |
| E2.26 | Maximum deviation of consecutive outputs (Backward) | 0.00% to 100.00% | 1.00% | ☆ |
| E2.27 | Computing status after PID stop | 0: No computing while stopped;<br>1: Continue computing (needed for wakeup) | 1 | ☆ |
| E2.29 | PID automatic decrease frequency selection | 0: Invalid;<br>1: Valid | 1 | ☆ |
| E2.30 | PID stop frequency | 0.00Hz to maximum frequency (F0.19) | 25 | ☆ |
| E2.31 | PID checking time | 0s to 3600s | 10 | ☆ |
| E2.32 | PID checking times | 10 to 500 | 20 | ☆ |

**7.16. b0 group Motor parameters**

| Code | Parameter name | Setting range | Factory setting | Change |
|---|---|---|---|---|
| b0.00 | Motor type selection | 0: General asynchronous motor<br>1: Asynchronous inverter motor | 0 | ★ |
| b0.01 | Rated power | 0.1kW to 1000.0kW | Depends on models | ★ |
| b0.02 | Rated voltage | 1V to 2000V | Depends on models | ★ |
| b0.03 | Rated current | 0.01A to 655.35A | Depends on models | ★ |
| b0.04 | Rated frequency | 0.01Hz to F0.19 (Maximum frequency) | Depends on models | ★ |
| b0.05 | Rated speed | 1rpm to 36000rpm | Depends on models | ★ |
| b0.06 | Asynchronous motor stator resistance | 0.001Ω to 65.535Ω | Motor parameters | ★ |
| b0.07 | Asynchronous motor rotor resistance | 0.001Ω to 65.535Ω | Motor parameters | ★ |
| b0.08 | Asynchronous motor leakage inductance | 0.01mH to 655.35mH | Motor parameters | ★ |
| b0.09 | Asynchronous motor mutual inductance | 0.1mH to 6553.5mH | Motor parameters | ★ |
| b0.10 | Asynchronous motor no-load current | 0.01A to b0.03 | Motor parameters | ★ |
| b0.27 | Motor parameter auto tuning | 0: No operation;<br>1: Asynchronous motor parameters still auto tuning;<br>2: Asynchronous motor comprehensive auto tuning | 0 | ★ |

**7.17. y0 group Function code management**

| Code | Parameter name | Setting range | Factory setting | Change |
|---|---|---|---|---|
| y0.00 | Parameter initialization | 0: No operation; | 0 | ★ |

| | | | | |
|---|---|---|---|---|
| | Remember that, after setting, focus will automatically change to the next parameter. Be careful not to accidentally set a password in y0.01. | 1 :Restore default parameter values, not including motor parameters;<br>2: Clear history;<br>3: Restore default parameter values, including motor parameters;<br>4: Backup current user parameters;<br>5: Restore from backup user parameters | | |
| y0.01 | User password | 0 to 65535 | 0 | ☆ |
| y0.02 | Function parameter group display selection | Units digit: d group display selection<br>0: Do not display; 1: Display<br>Tens digit: E group display selection(same as above)<br>Hundreds digit: b group display selection(see above)<br>Thousands digit: y group display selection(as above)<br>Tens thousands digit: L group display selection(same as above) | 11111 | ★ |
| y0.03 | Personality parameter group display selection | Units digit: Reserved<br>Tens digit: User's change parameter display selection<br>0: Do not display; 1: Display | 00 | ☆ |
| y0.04 | Function code modification properties | 0: Modifiable;<br>1: Not modifiable | 0 | ☆ |

**7.18. y1 group Fault query parameter group**

| Code | Parameter name | Setting range | Factory setting | Change |
|---|---|---|---|---|
| y1.00 | Type of the first fault | 0: No fault<br>1: Inverter unit protection<br>2: Acceleration overcurrent<br>3: Deceleration overcurrent<br>4: Constant speed overcurrent<br>5: Acceleration overvoltage<br>6: Deceleration overvoltage<br>7: Constant speed overvoltage<br>8: 24V control power failure<br>9: Undervoltage<br>10: Inverter overload<br>11: Motor Overload<br>13: Output phase loss<br>14: Module overheating<br>15: External fault<br>16: Communication abnormal<br>17: Contactor abnormal<br>18: Current detection abnormal<br>19: Motor self-learning abnormal<br>21: Parameter read and write abnormal<br>22: Inverter hardware abnormal<br>23: Motor short to ground<br>24: Reserved<br>25: Reserved<br>26: Running time arrival<br>27: Custom fault 1<br>28: Custom fault 2<br>29; Power-on time arrival<br>30: Load drop<br>31: PID feedback loss when running<br>40: Fast current limiting timeout<br>42: Too large speed deviation<br>51: Initial position error<br>COF: communication failure | - | ● |
| y1.01 | Type of the second fault | | - | ● |
| y1.02 | Type of the third (most recent) fault | | - | ● |
| y1.03 | Frequency of the third (most recent) fault | - | - | ● |
| y1.04 | Current of the third (most recent) fault | - | - | ● |
| y1.05 | Bus voltage of the third (most recent) fault | - | - | ● |
| y1.06 | Input terminal status of the third (last) fault | - | - | ● |
| y1.07 | Output terminal status of the third (last) fault | - | - | ● |
| y1.08 | Reserved | - | | |
| y1.09 | Power-on time of the third (last) fault | | - | ● |
| y1.10 | Running time of the third (last) fault | - | - | ● |
| y1.13 | Frequency of the second fault | | - | ● |
| y1.14 | Current of the second fault | - | - | ● |
| y1.15 | Bus voltage of the second fault | - | - | ● |
| y1.16 | Input terminal status of the second fault | - | - | ● |
| y1.17 | Output terminal status of the second fault | - | - | ● |
| y1.19 | Power-on time of the second fault | | - | ● |
| y1.20 | Running time of the second fault | - | - | ● |
| y1.23 | Frequency of the first (oldest) fault | | - | ● |
| y1.24 | Current of the first (oldest) fault | - | - | ● |
| y1.25 | Bus voltage of the first (oldest) fault | - | - | ● |
| y1.26 | Input terminal status of the first fault | - | - | ● |
| y1.27 | Output terminal status of the first fault | - | - | ● |
| y1.29 | Power-on time of the first (oldest) fault | | - | ● |
| y1.30 | Running time of the first (oldest) fault | | - | ● |

## 8. Fault alarm and countermeasures

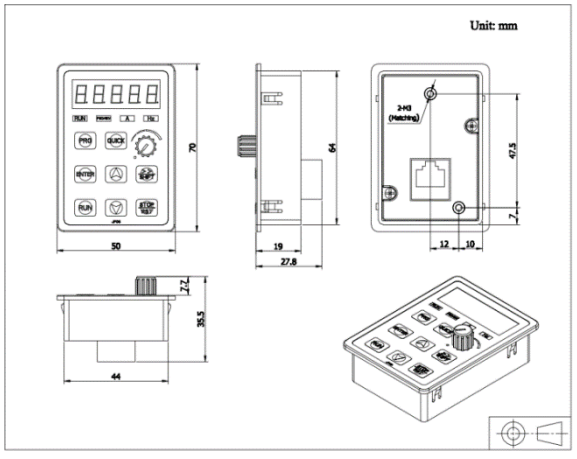
ST150 can provide effective protection against a number of fault situations. In case of abnormal operation, if a protection function is invoked, the inverter will stop output, the fault relay contact (in factory configuration) of the inverter will engage, and the fault code will be displayed on the display panel of the inverter. Before consulting the service department, user can perform a self-check, analyze the fault cause and find out the solution according to the instructions of this chapter. If the fault is caused by any of the reasons described in the right column as requiring technical support, please consult your sales contact or directly contact our company's support department by phone or at info@sourcetronic.com.

| No. | Fault ID | Failure type | Possible causes | Solutions |
|---|---|---|---|---|
| 1 | Err.01 | Inverter unit protection | 1.Short circuit at inverter output<br>2.The wiring for the motor and the inverter is too long<br>3.Module overheating<br>4.The internal wiring of inverter is loose<br>5.The main control panel is abnormal<br>6.The drive panel is abnormal.<br>7.The inverter module is abnormal | 1.Eliminate peripheral faults<br>2.Additionally install a reactor or output filter<br>3.Check whether air duct is blocked and if the fan is working normally, and eliminate airflow problems<br>4.Correctly plug all cables<br>5-7.Contact technical support |
| 2 | Err.02 | Acceleration overcurrent | 1.The acceleration time is too short<br>2.Manual torque boost or V/F curve is not suitable<br>3.The voltage is low<br>4.Short-circuit or short to earth of inverter output<br>5.The control mode is vector without identification of parameters<br>6.A motor that is still rotating is started unexpectedly.<br>7.Sudden increase of the load in the process of acceleration.<br>8.The power of inverter is too small | 1.Increase acceleration time<br>2.Adjust manual torque boost or V/F curve<br>3.Set the voltage to the normal range<br>4.Eliminate peripheral faults<br>5.Perform identification for the motor parameters<br>6.Select Speed Tracking Start or restart after stopping the motor.<br>7.Cancel the sudden load<br>8.Choose an inverter with larger power level |
| 3 | Err.03 | Deceleration overcurrent | 1.Short-circuit or short to earth of inverter output<br>2.The control mode is vector and without identification of parameters<br>3.The deceleration time is too short<br>4.The voltage is low<br>5.Sudden increase of load in the process of deceleration.<br>6.No braking resistor installed | 1.Eliminate peripheral faults<br>2.Perform identification for the motor parameters<br>3.Increase the deceleration time<br>4.Set the voltage to the normal range<br>5.Cancel the sudden load<br>6.Install brake resistor |
| 4 | Err.04 | Constant speed overcurrent | 1.Short-circuit or short to earth of inverter output<br>2.The control mode is vector and without identification of parameters<br>3.The voltage is low<br>4, Whether suddenly increase the load when running<br>5.The power of inverter is too small | 1.Eliminate peripheral faults<br>2.Perform identification for the motor parameters<br>3.Set the voltage to the normal range<br>4.Cancel the sudden load<br>5.Choose an inverter with larger power level |
| 5 | Err.05 | Acceleration overvoltage | 1.Didn't install braking resistor<br>2.The input voltage is too high<br>3.There is external force to drag the motor to run when accelerating.<br>4.The acceleration time is too short | 1.Install brake resistor<br>2.Set the voltage to the normal range<br>3.Cancel the external force or install braking resistor.<br>4.Increase acceleration time |
| 6 | Err.06 | Deceleration overvoltage | 1.The input voltage is too high<br>2.There is external force to drag the motor to run when decelerating.<br>3.The deceleration time is too short<br>4.No braking resistor installed | 1.Set the voltage to the normal range<br>2.Cancel the external force or install braking resistor.<br>3.Increase the deceleration time<br>4.Install brake resistor |
| 7 | Err.07 | Constant speed overvoltage | 1.There is external force to drag the motor to run when running<br>2.The input voltage is high | 1.Cancel the external force or install braking resistor.<br>2.Set the voltage to the normal range |
| 8 | Err.08 | Control power failure | The range of input voltage is not within the specification | Adjust the voltage to the range of the requirements of specification |
| 9 | Err.09 | Undervoltage fault | 1.Momentary power cut<br>2.The inverter's input voltage is not within the specification<br>3.The bus voltage is not normal<br>4.The rectifier bridge and buffer resistance are abnormal<br>5.The drive panel is abnormal.<br>6.The control panel is abnormal | 1.Reset fault<br>2.Adjust the voltage to the normal range<br>3-6.Contact technical support |
| 10 | Err.10 | Inverter overload | 1.The power of inverter is too small<br>2.The load is too large or motor stall occurs | 1.Choose an inverter with larger power level<br>2.Reduce the load and check the motor and its mechanical conditions |
| 11 | Err.11 | Motor Overload | 1.Power grid voltage is too low<br>2.The motor protection parameter setting (F8.03) is not appropriate<br>3.The load is too large or motor stall occurs | 1.Check the power grid voltage<br>2.Correctly set this parameter.<br>3.Reduce the load and check the motor and its mechanical conditions |
| 13 | Err.13 | Output phase loss | 1.The lead wires from the inverter to the motor are not normal<br>2.The three phase output is unbal-anced when the motor is running<br>3.The drive panel is abnormal.<br>4.The module is abnormal | 1.Eliminate peripheral faults<br>2.Check the motor's three-phase winding is normal or not and eliminate faults<br>3.Contact technical support |
| 14 | Err.14 | Module overheating | 1.The air duct is blocked<br>2.The fan is damaged<br>3.Ambient temperature is too high<br>4.The module thermistor is damaged<br>5.The inverter module is damaged | 1.Clean up the air duct<br>2.Replace the fan<br>3.Decrease the ambient temperature<br>4.Replace the thermistor<br>5.Replace the inverter module |
| 15 | Err.15 | External equipment fault | Input external fault signal through the multi-function terminal DI | Reset fault |
| 16 | Err.16 | Communication fault | 1.The communication cable is not normal<br>2.The settings for communication expansion card F9.07 are incorrect<br>3.The settings for communication parameters F9 group are incorrect<br>4.The host computer is not working properly | 1.Check the communication cable<br>2.Correctly set the communications expansion card type<br>3.Correctly set the communication parameters<br>4.Check the wiring of host computer |
| 17 | Err.17 | Contactor fault | 1.Input phase loss<br>2.The drive plate and the contact are not normal | 1.Check and eliminate existing problems in the supply lines<br>2.Replace the drive, the power board or contactor |
| 18 | Err.18 | Current detection fault | 1.Check Hall device<br>2.The drive panel is abnormal. | 1.Replace hall device<br>2.Replace the drive panel |
| 19 | Err.19 | Motor parameter auto tuning fault | 1.The motor parameters were not set according to the nameplate<br>2.The identification process of parameter did time out | 1.Correctly set motor parameter according to the nameplate<br>2.Check the wires from the inverter to the motor |

| | | | | |
|---|---|---|---|---|
| 21 | Err.21 | EEPROM read and write fault | EEPROM chip is damaged | Replace the main control board |
| 22 | Err.22 | Inverter hardware fault | 1.Overvoltage<br>2.Overcurrent | 1.Eliminate overvoltage fault<br>2.Eliminate overcurrent fault |
| 23 | Err.23 | Short-circuit to ground fault | Motor short to ground | Replace the cable or motor |
| 26 | Err.26 | Cumulative running time arrival fault | Cumulative running time arrival fault | Clear history information by using initialization function parameters |
| 27 | Err.27 | Custom fault 1 | Input custom fault 1 signal through the multi-function terminal DI | Reset fault |
| 28 | Err.28 | Custom fault 2 | Input custom fault 2 signal through the multi-function terminal DI | Reset run |
| 29 | Err.29 | Total power-on time arrival fault | Total power-on time reaches the set value F7.20 | Clear history information by using initialization function parameters |
| 30 | Err.30 | Load drop fault | Current smaller than F8.31, motor has lost its load | 1.Check and reattach load<br>2.Correctly set F8.30-32 |
| 31 | Err.31 | PID feedback loss when running fault | PID feedback is less than the set value of E2.11 | Check PID feedback signal or set E2.11 to an appropriate value |
| 40 | Err.40 | Quick current limiting fault | 1.The load is too large or motor stall occurs<br>2.The type selection of inverter is small | 1.Reduce the load and check the motor and its mechanical conditions<br>2.Choose the inverter with large power level |
| 42 | Err.42 | Too large speed deviation fault | The parameter was not identified | Perform identification for the motor parameters |
| 51 | Err.51 | Initial position error | The deviation between the motor parameters and the actual parameters is too large | Reconfirm the correct motor parameters, focus on whether the rated current is set to too small. |
| - | COF | Communication failure | 1.Keyboard interface, control board interface;<br>2.Keyboard unit or connector;<br>3.Control board or keyboard hardware damage;<br>4.Keyboard line is too long, causing the interference. | 1.Detection of keyboard interface, control board interface is abnormal.<br>2.Detect keyboard, connector joints are abnormal.<br>3.Replace control board or keyboard.<br>4. Consult support for help. |
| - | LoC | Not an error | Password set, see y0.01 | Enter password |
| - | A… | On key press, A appears at the first position | Keyboard locked | Press PRG and ENTER simul-taneously to set/reset key lock |

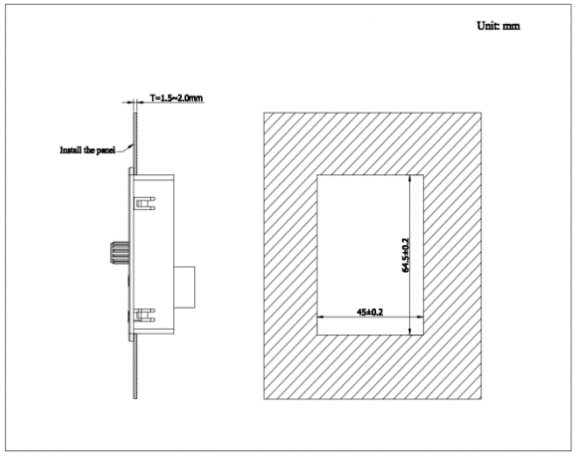
**Figure:**

**Installation dimension drawing of ST150 external keyboard:**




Outline dimension drawing of keyboard

**Dimension drawing of ST150 external keyboard installation compartment:**




Dimension drawing of keyboard compartment