

**VEICHI**



# Manual

**AC10 Series AC Drive (Simplified)**

# Catalog

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# 1 General

## 1.1 Safety Precautions

Please read this manual thoroughly before using the product to grasp its functions, operation, and maintenance. Take note of the safety precautions in the manual to ensure proper and safe use.

### Signs and Meanings

The following signs are used in this manual to highlight the key safety points. Failure to observe these points may result in damages to this product and the associated system, or even personal injuries.

|                                                                                                  |                                                                                   |
|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|  <b>DANGER</b>  | <b>DANGER:</b> Incorrect operation may result in death or major safety incidents. |
|  <b>CAUTION</b> | <b>CAUTION:</b> Incorrect operation may result in minor injuries.                 |

### Operator

This product must be installed, operated and maintained by trained professionals. "Trained professionals" means that the personnel working on this product must be trained with specialized skills and knowledge about installation, wiring, operation and maintenance of the equipment, so they can respond correctly to various emergencies that may arise during use.

### Safety Guide

The safety rules and warning signs presented for safety are taken to prevent personal injuries and damages to the products and the associated systems. Please read this manual carefully before use and strictly follow the safety guidelines and warning signs in this manual.

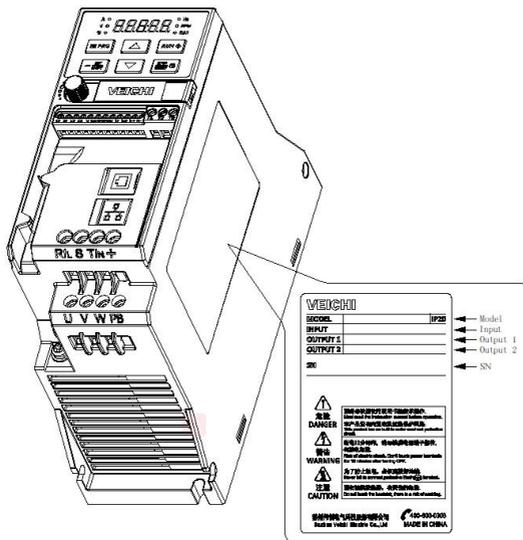
- Correct transportation, storage, installation, as well as careful operation and maintenance, for the safe operation of the AC drive is essential. During transportation and storage, it is crucial to protect the AC drive from shocks and vibrations. Additionally, it should be stored in a dry environment free of corrosive gases and conductive dust below 60°C.
- This product is equipped with hazardous voltage to control potentially dangerous motion mechanisms. Failure to observe the regulations or this manual may lead to damages to the products and associated systems, or even personal injuries and death.
- Do not perform wiring work while the power is on, as there is a risk of death by electric shock. Before performing wiring, inspection, maintenance, etc., disconnect the power supply to all associated equipment and make sure that the DC voltage in the main circuit has dropped to a safe level for 15 minutes.
- The power cable, motor cable, and control cable must all be tightly connected, and the grounding terminal must be grounded with a grounding resistance of lower than 10Ω.
- The static electricity of human body may cause significant harm to internal sensitive devices. So it is crucial for professionals to adhere to the measures and methods outlined in the Electrostatic Discharge Prevention (ESD) guidelines before commencing work on the AC drives.
- Due to the pulse waveform output voltage of the AC drive, it is essential to remove the installed

power factor improvement capacitors, lightning protection varistors or other devices on the output side of the AC drive, or move the devices to the input side.

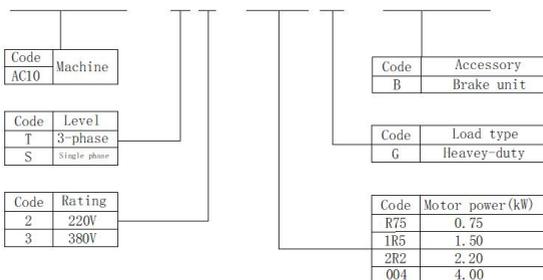
- Do not add switching devices such as circuit breakers and contactors to the output side of the AC drive. (If it is necessary to connect switching devices to the output side, please ensure that the output current of the AC drive is zero when the switch is on or off.)
- Failure of the control device could lead to production halt and significant accidents. Therefore, please apply the necessary external protection measures or backup devices.
- This product is intended for the manufacturer's specified purposes. Unauthorized applications in such as emergency, rescue, marine, medical, aviation, or facility-related settings are seriously prohibited.
- Maintenance of this product can only be carried out by VEICHI or by professionals authorized and licensed by VEICHI. Unauthorized modification or use of accessories not approved by VEICHI may result in product failure. Any defective devices during maintenance must be replaced timely.

## 1.2 Pre-use

Please check the outer packaging for any damage upon receiving the ordered products. And then check the product inside for any damage, scratches, or dirt. (Please note that damage during transportation is not covered by the Three Guarantees warranty policy.) If the product is damaged during shipping, please contact us or the shipping company immediately. If everything is fine, please double-check that the model number of the received drive is the same as the order sheet.



# AC10 - T3-1R5G - B



| Power | Input Voltage (V) | 220 | 380 |
|-------|-------------------|-----|-----|
|       | Output Current(A) |     |     |
|       | 0.4               | 2.5 | -   |
|       | 0.75              | 4   | 3   |
|       | 1.5               | 7   | 4   |
|       | 2.2               | 10  | 5   |
|       | 4.0               | -   | 9.5 |
|       | 5.5               | -   | 13  |
|       | 7.5               | -   | 17  |
|       | 11.0              | -   | 25  |
|       | 15.0              | -   | 32  |
|       | 18.5              | -   | 38  |
|       | 22.0              | -   | 45  |

## 1.3 Technical Specifications

| Item        |                         | Specification                                                                                                            |
|-------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Power Input | Voltage and frequency   | S2: single phase, 200V~240V, 50Hz/60Hz<br>T2: Three phase, 200V~240V, 50Hz/60Hz<br>T3: Three phase, 380V~480V, 50Hz/60Hz |
|             | Allowable fluctuation   | T/S2: -10%~10%; T3: -15%~10%; voltage imbalance rate: <3%;<br>frequency: ±5%                                             |
|             | Switching surge current | <Rated current                                                                                                           |

|                          |                            |                                                                                                                                                                          |
|--------------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Output                   | Voltage                    | Output under rated conditions: Three phase, 0V ~ input voltage, tolerance < 5%                                                                                           |
|                          | Frequency range            | 0Hz~ 600Hz                                                                                                                                                               |
|                          | Frequency accuracy         | ±0.5% of the max. frequency                                                                                                                                              |
|                          | Overload capacity          | T3: 150% of rated current for 90s, 180% of rated current for 10s, and 200% of rated current for 3s<br>T/S2: 150% of rated current for 24s; and 180% of rated current for |
| Main Control Performance | Motor control              | V/F<br>SVC<br>Note: Some models do not support SVC. Please consult the manufacturer for details.                                                                         |
|                          | Modulation                 | PWM                                                                                                                                                                      |
|                          | Carrier frequency          | T/S2: 1kHz~8kHz<br>T3: 1kHz~16kHz<br>(Consider derating for non-default carrier frequency.)                                                                              |
|                          | Speed control range        | SVC: Rated load 1:100;                                                                                                                                                   |
|                          | Speed stabilizing accuracy | SVC: ≤2% rated synchronous speed                                                                                                                                         |
|                          | Starting torque            | SVC: 150% of rated torque at 0.5Hz                                                                                                                                       |
|                          | Torque response            | SVC: <20ms;                                                                                                                                                              |
|                          | Frequency accuracy         | Digit setting: max. frequency × ±0.01%; analog setting: max. frequency × ±0.2 %                                                                                          |
|                          | Frequency resolution       | Digit setting: 0.01Hz; analog setting: Max. frequency × 0.05 %                                                                                                           |
|                          | Torque control             | Torque calculation and speed limit in torque mode                                                                                                                        |

|                       |                                                                                            |                                                                                                                                                                                                                                                                                                                               |
|-----------------------|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Basic Function        | DC brake                                                                                   | Starting frequency: 0.00Hz~50.00Hz; braking time: 0.0s~60.0s; braking current: 0.0%~150.0% of rated current                                                                                                                                                                                                                   |
|                       | Torque boost                                                                               | Auto torque boost: 0.0% ~ 100.0%; manual torque boost: 0.0% ~ 30.0%.                                                                                                                                                                                                                                                          |
|                       | V/F curve                                                                                  | 4 patterns: Linear torque characteristic curve, self-defined V/F curve, torque drop characteristic curve (1.1~1.9 power), and square V/F curve                                                                                                                                                                                |
|                       | ACC/DEC curve                                                                              | 2 patterns: Linear and S-curve acceleration/deceleration<br>4 sets of ACC and DEC times, up to 65,000s.                                                                                                                                                                                                                       |
|                       | Rated output voltage                                                                       | With the power voltage compensation function, it can be set within 50%~100% with the rated voltage of the motor as 100% (the output cannot exceed the input voltage)                                                                                                                                                          |
|                       | Auto voltage regulation                                                                    | The output voltage can be automatically kept constant during the grid voltage fluctuation                                                                                                                                                                                                                                     |
|                       | Auto ECO mode                                                                              | The output voltage is automatically optimized according to the load under V/F control mode to save energy.                                                                                                                                                                                                                    |
|                       | Auto current limit                                                                         | Auto current limit works during operation to prevent frequent tripping due to over-current fault.                                                                                                                                                                                                                             |
|                       | Instantaneous power-down mode                                                              | Uninterrupted operation is realized through bus voltage control in case of instantaneous power down                                                                                                                                                                                                                           |
|                       | Standard function                                                                          | PID control, fly track and restart after power down, jump frequency, upper/lower frequency limit control, programmed operation, multi-frequency, RS485 communication, AO, frequency pulse output, parameter access level, common parameter, monitoring parameter comparator output, counting and timing, and wobble frequency |
|                       | Frequency source                                                                           | Switchable via keypad, keypad potentiometer, voltage/current terminal AI, communication and multi-source terminals, and main and auxiliary combined sources                                                                                                                                                                   |
| Feedback input source | Set via keypad potentiometer, voltage/current terminal AI, communication, and PUL terminal |                                                                                                                                                                                                                                                                                                                               |

|                   |                       |                                                                                                                                                                                                                                           |                                                |
|-------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
|                   | Command source        | Set via operation panel, external terminals and communication                                                                                                                                                                             |                                                |
|                   | Input command signal  | Start, stop, forward and reverse, jog, multi-frequency, free stop, reset, acceleration/deceleration time, frequency source, and external fault alarms.                                                                                    |                                                |
|                   | Output signal         | 1-channel relay output, 1-channel open collector output, and 1-channel AO can be set as 0V~10V, 0mA~20mA or 4mA~                                                                                                                          |                                                |
| Protection        |                       | Over-voltage, under-voltage, current limit, over-current, overload, over-heat, data protection, overspeed, and I/O phase loss                                                                                                             |                                                |
| Keypad Display    | LED display           | Built-in keypad: single line 5-digit display                                                                                                                                                                                              | To monitor the status of 1 AC drive            |
|                   |                       | External keypad: Single/dual line 5-digit display                                                                                                                                                                                         | Dual-line to monitor the status of 2 AC drives |
|                   | Parameter copy        | Upload/download function code information of the drive for fast parameter copying (external keypad only)                                                                                                                                  |                                                |
|                   | Status monitoring     | All parameters of the monitoring parameter group include output frequency, frequency target, output current, input voltage, output voltage, motor speed, PID feedback, PID target, module temperature, torque target, output torque, etc. |                                                |
|                   | Error alarm           | Overvoltage, under-voltage, overcurrent, short-circuit, phase loss, overload, overheat, current limit, data protection damaged, operating conditions of current faults, historical faults                                                 |                                                |
| Ambient Condition | Installation          | <1000 meters, derate 1% for every 100 meters rise when above 1000m.<br>No condensation, icing, rain, snow, hail, etc., solar radiation <700W/m <sup>2</sup> , air pressure 70kPa~106kPa                                                   |                                                |
|                   | Temperature, humidity | -10°C~+50°C, derate above 40°C, 50°C max. (no-load)<br>5%RH~95%RH (non-condensing)                                                                                                                                                        |                                                |
|                   | Vibration             | 5.9m/s <sup>2</sup> (0.6G) at 9Hz~200Hz                                                                                                                                                                                                   |                                                |
|                   | Storage temperature   | -30°C~+60°C                                                                                                                                                                                                                               |                                                |
|                   | Installation method   | Wall-mounting                                                                                                                                                                                                                             |                                                |

|             |                            |                    |
|-------------|----------------------------|--------------------|
|             | IP                         | IP20               |
|             | Pollution degree           | Degree 2           |
|             | Cooling method             | Forced air-cooling |
| CE standard | Overvoltage category (OVC) | III                |
|             | Electric system            | TN                 |
|             | Protection category        | I                  |
|             | Standard                   | EN61800-5-1        |

**Note: Three-phase/single-phase 220V 50/60Hz power input method:**

AC10-T/S2 series drive is designed for single-phase 220VAC voltage input; it is compatible with three-phase 220VAC input, but this may cause R, S, T three-phase current imbalance in the power grid.

## 2 Installation and Wiring

Please refer to this chapter for the installation and wiring of the AC drive for long-life and stable performance.

### Installation direction and space

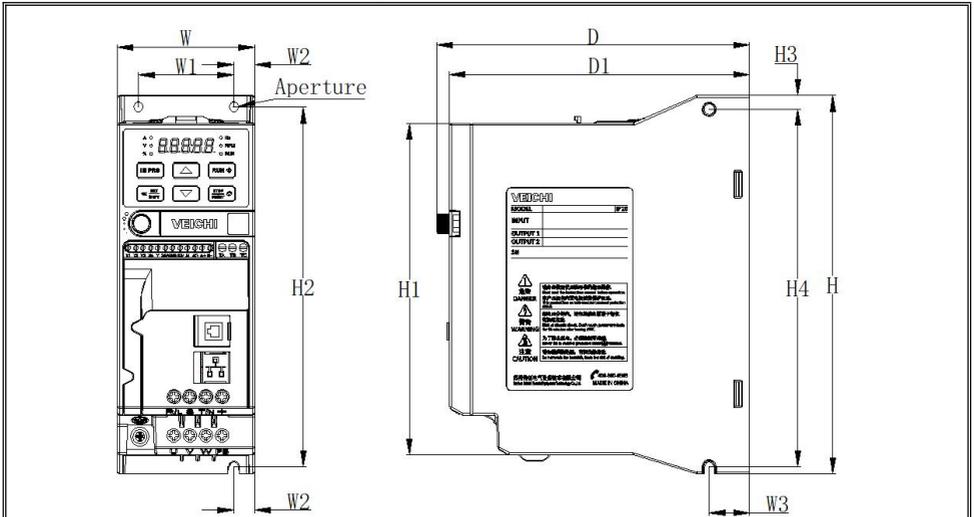
- Direction

Be sure to install the AC drive vertically to ensure the cooling effect.

- Space

To ensure the ventilation space and wiring space required for cooling, please install the AC drive with its back closely attached to the wall to make the cooling air around the cooling fan flow smoothly.

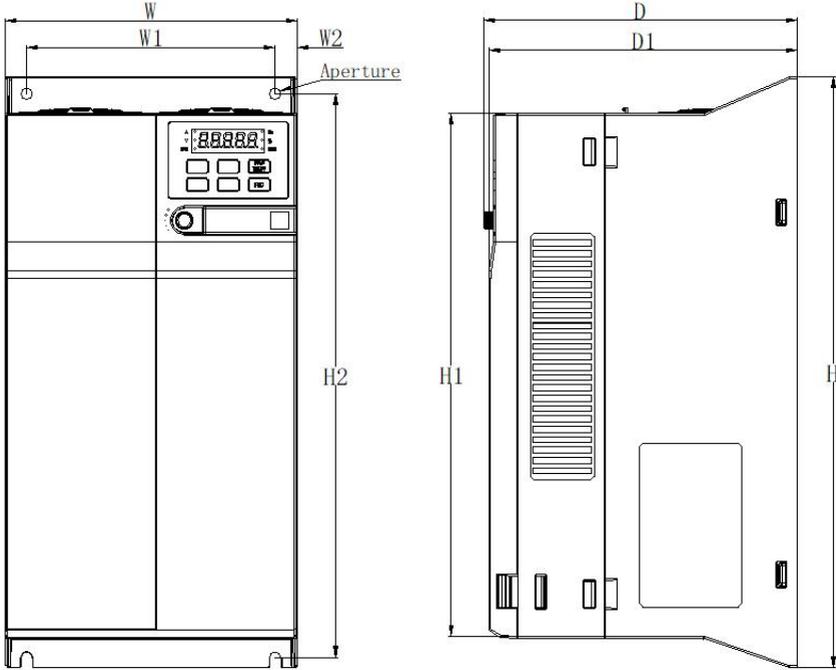
### External dimensions of drive and keypad



0.4kW-5.5kW Installation Dimensions

| Model               | Outer Dimension(mm) |     |     |     | Front Dimension (mm) |    |    | Side Dimension (mm) |    |     | Aperture |      |
|---------------------|---------------------|-----|-----|-----|----------------------|----|----|---------------------|----|-----|----------|------|
|                     | W                   | H   | H1  | D   | D1                   | W1 | W2 | H2                  | W3 | H3  |          | H4   |
| AC10-T/S2-R40G-B    | 65                  | 177 | 155 | 148 | 142                  | 45 | 10 | 168                 | 19 | 6.5 | 167      | 3-M4 |
| AC10-T/S2-R75G-B    |                     |     |     |     |                      |    |    |                     |    |     |          |      |
| AC10-T/S2-R75G-B-VC |                     |     |     |     |                      |    |    |                     |    |     |          |      |
| AC10-T/S2-1R5G-B    | 75                  | 202 | 180 | 163 | 157                  | 55 | 10 | 193                 | 19 | 6.5 | 192      | 3-M4 |
| AC10-T/S2-2R2G-B    |                     |     |     |     |                      |    |    |                     |    |     |          |      |
| AC10-T/S2-1R5G-B-VC |                     |     |     |     |                      |    |    |                     |    |     |          |      |
| AC10-T/S2-2R2G-B-VC |                     |     |     |     |                      |    |    |                     |    |     |          |      |

|                |    |     |     |     |     |    |    |     |    |     |     |      |  |
|----------------|----|-----|-----|-----|-----|----|----|-----|----|-----|-----|------|--|
| AC10-T3-R75G-B |    |     |     |     |     |    |    |     |    |     |     |      |  |
| AC10-T3-1R5G-B | 65 | 177 | 155 | 148 | 142 | 45 | 10 | 168 | 19 | 6.5 | 167 | 3-M4 |  |
| AC10-T3-2R2G-B |    |     |     |     |     |    |    |     |    |     |     |      |  |
| AC10-T3-004G-B | 75 | 202 | 180 | 163 | 157 | 55 | 10 | 193 | 19 | 6.5 | 192 | 3-M4 |  |
| AC10-T3-5R5G-B |    |     |     |     |     |    |    |     |    |     |     |      |  |



7.5kW-22kW Installation Dimension

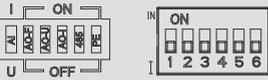
| Model          | Outer Dimension(mm) |       |       |     |     | Front Dimension (mm) |      |       | Side Dimension (mm) |    |    | Aper ture |
|----------------|---------------------|-------|-------|-----|-----|----------------------|------|-------|---------------------|----|----|-----------|
|                | W                   | H     | H1    | D   | D1  | W1                   | W2   | H2    | W3                  | H3 | H4 |           |
| AC10-T3-7R5G-B | 130                 | 320   | 286   | 161 | 158 | 105                  | 12.5 | 302   | -                   | -  | -  | M5        |
| AC10-T3-011G-B |                     |       |       |     |     |                      |      |       |                     |    |    |           |
| AC10-T3-015G-B | 170                 | 342.5 | 303.5 | 183 | 180 | 145                  | 12.5 | 326.5 | -                   | -  | -  | M6        |
| AC10-T3-018G-B |                     |       |       |     |     |                      |      |       |                     |    |    |           |
| AC10-T3-022G-B |                     |       |       |     |     |                      |      |       |                     |    |    |           |

### Switch function diagram and description

#### 0.4kW~ 5.5kW DIP Switch Description

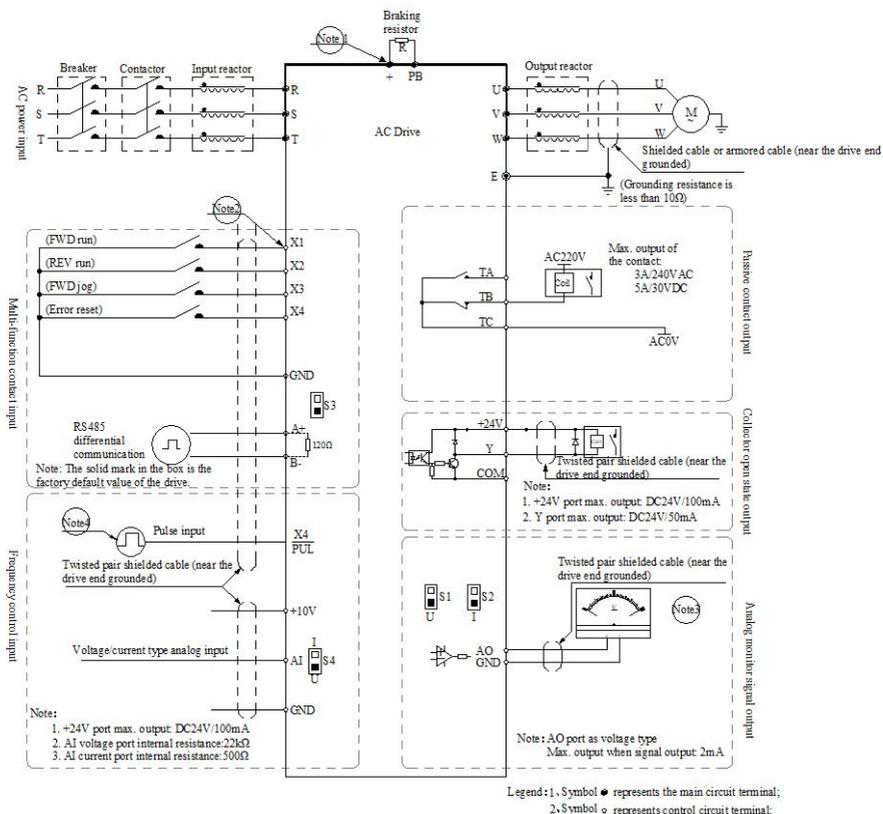
|  | Pin | Position | Function                                       |
|-----------------------------------------------------------------------------------|-----|----------|------------------------------------------------|
|                                                                                   | S1  |          | ON                                             |
| OFF                                                                               |     |          | Disable AO voltage                             |
| S2                                                                                |     | ON       | Enable AO 0mA~20mA or 4mA~20mA                 |
|                                                                                   |     | OFF      | Disable AO current                             |
| S3                                                                                |     | ON       | RS48 connects to 120Ω termination resistor.    |
|                                                                                   |     | OFF      | RS48 disconnects to 120Ω termination resistor. |
| S4                                                                                |     | ON       | AI 0mA~20mA                                    |
|                                                                                   |     | OFF      | AI 0V~10V                                      |

#### 7.5kW~ 22kW DIP Switch Description

|  | Pin | Position | Function                                       |
|-------------------------------------------------------------------------------------|-----|----------|------------------------------------------------|
|                                                                                     | S1  |          | ON                                             |
| OFF                                                                                 |     |          | AI 0V~10V                                      |
| S2                                                                                  |     | ON       | Enable AO 0.0kHz ~ 100.0kHz                    |
|                                                                                     |     | OFF      | Disable AO frequency                           |
| S3                                                                                  |     | ON       | Enable AO 0V~10V                               |
|                                                                                     |     | OFF      | Disable AO voltage                             |
| S4                                                                                  |     | ON       | Enable AO 0mA~20mA or 4mA~20mA                 |
|                                                                                     |     | OFF      | Disable AO current                             |
| S5                                                                                  |     | ON       | RS48 connects to 120Ω termination resistor.    |
|                                                                                     |     | OFF      | RS48 disconnects to 120Ω termination resistor. |
| S6                                                                                  |     | ON       | Control board grounded                         |
|                                                                                     |     | OFF      | Control board not grounded                     |

## Standard wiring

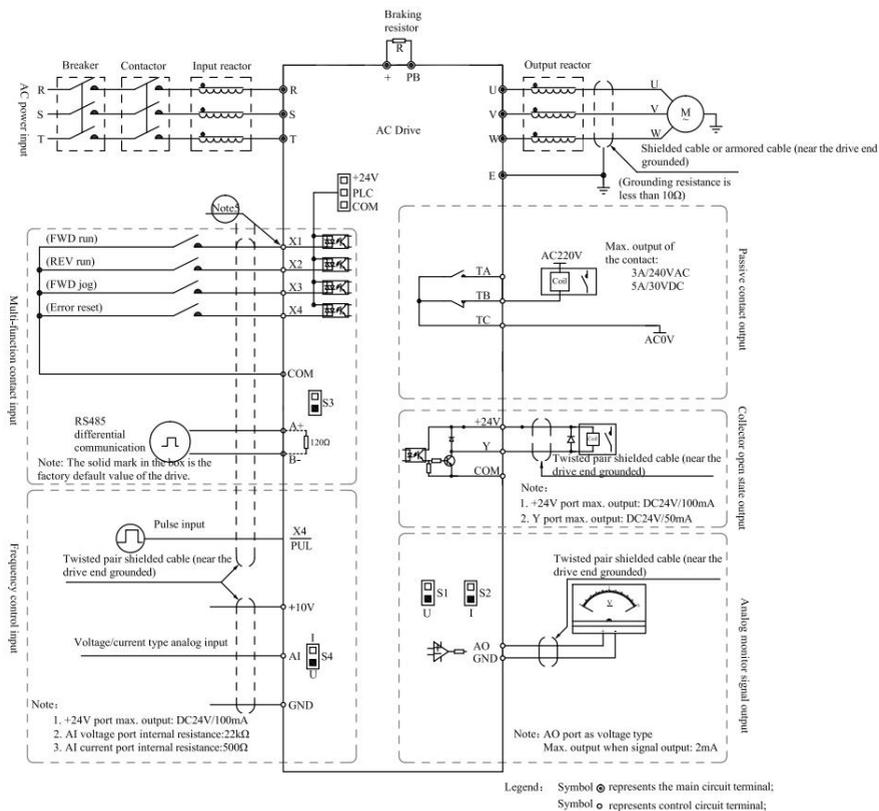
### 0.4kW~5.5kW



Note:

1. Select the appropriate braking resistor according to the site conditions and *Braking Resistor Specification Parameters*.
2. Multi-function input terminal (X1~ X4/PUL) can take the NPN transistor signal as input. For input with PNP transistor signals, the AC10-P model can be selected as an option.
3. Analog monitoring output is dedicated for ammeter, voltmeter and other indication meters, and cannot be used for feedback control or other operations.
4. Please refer to the detailed description for the specific wiring as there are various pulse types in actual use.
5. The COM and GND terminals are combined into a single GND terminal for external use.

### 7.5kW~22.0kW



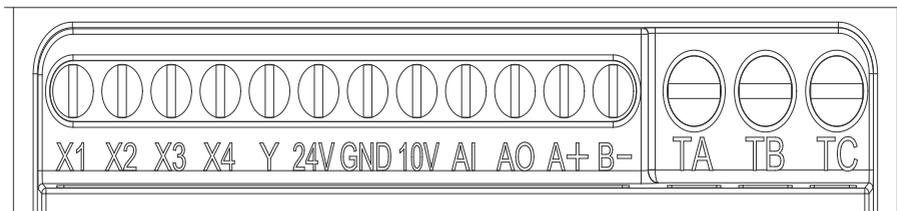
**Note:** 1. Select the appropriate braking resistor according to the site conditions and *Braking Resistor Specification Parameters*.

2. Multi-function input terminal (X1~ X4/PUL) can take the NPN or PNP transistor signal as input.

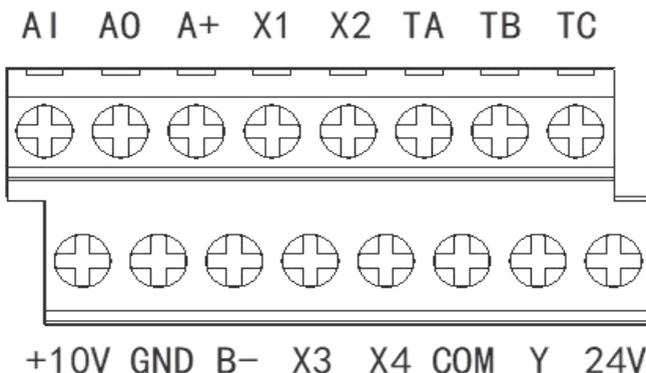
3. Analog monitoring output is dedicated for ammeter, voltmeter and other indication meters, and cannot be used for feedback control or other operations.

4. Please refer to the detailed description for the specific wiring as there are various pulse types in actual use.

● Control loop output capability



Arrangement of 0.4kW- 5.5kW Control Circuit Terminals

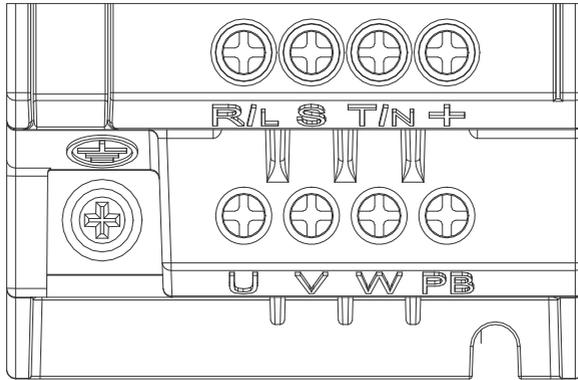


Arrangement of 7.5kW- 22kW Control Circuit Terminals

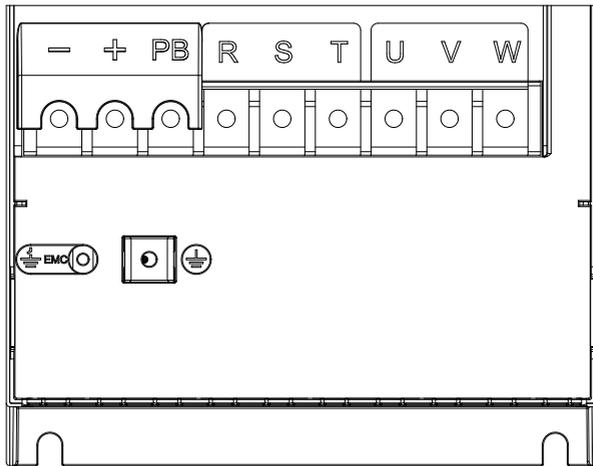
| Type  | Mark                 | Name                            | Description                                                                                                                                                                                                                      |
|-------|----------------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power | +10V-GND             | External +10V power supply      | Provide +10V power supply, with maximum output current of 50mA; generally used as the power supply for external potentiometer with the resistance range of 1kΩ - 5kΩ                                                             |
|       | +24V-GND<br>+24V-COM | External +24V power supply      | Provide +24 V power supply, generally used as the power supply for DI and DO terminals and external sensors<br>0.4kW~ 5.5kW, forming a circuit with GND<br>7.5kW~ 22kW, forming a circuit with COM<br>Max. output current: 100mA |
| AI    | AI-GND               | Voltage/Current AI              | 1. Input current range:<br>DC 0V~10V/0mA~20mA<br>2. Voltage impedance: 22kΩ<br>3. Current impedance: 500Ω                                                                                                                        |
|       | X1-GND               | Multi-function terminal input 1 | 0.75kW to 5.5kW: Supports only unipolar input<br>7.5kW to 22kW: Supports bipolar switching input<br>1. Input impedance: 6.3kΩ<br>2. Voltage range at high-level: 10V ~ 30V<br>3. Voltage range at low-level: 0V ~ 5V             |

|              |            |                                           |                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------|------------|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DI           | X2-GND     | Multi-function terminal input 2           | 0.75kW to 5.5kW: Supports only unipolar input<br>7.5kW to 22kW: Supports bipolar switching input<br>1. Input impedance: 6.3k $\Omega$<br>2. Voltage range at high-level: 10V ~ 30V<br>3. Voltage range at low-level: 0V ~ 5V<br>Except for the features of X1 ~ X3, X4 can be used for PUL input<br>1) 0.75kW ~ 5.5kW supports pulse input up to 100kHz.<br>2) 7.5kW ~ 22kW supports pulse input up to 10kHz. |
|              | X3-GND     | Multi-function terminal input 3           |                                                                                                                                                                                                                                                                                                                                                                                                               |
|              | X4-GND     | Multi-function terminal input 4           |                                                                                                                                                                                                                                                                                                                                                                                                               |
|              | X4/PUL-GND | Multi-function terminal input 4/PUL input |                                                                                                                                                                                                                                                                                                                                                                                                               |
|              | AO-GND     | Analog monitoring output                  |                                                                                                                                                                                                                                                                                                                                                                                                               |
| AO           | Y-GND      | Digital Output                            | Open collector output, action object can be set in the software<br>1. Voltage range: DC 0V ~ 30V<br>2. Max. load current: DC 50mA                                                                                                                                                                                                                                                                             |
| RO           | TA-TC      | Normally open                             | Passive contact output, action object can be set in the software<br>Contact drive capacity:<br>240VAC, 3A      30VDC, 5A                                                                                                                                                                                                                                                                                      |
|              | TB-TC      | Normally closed                           |                                                                                                                                                                                                                                                                                                                                                                                                               |
| COM Terminal | A+         | Communication terminal A+                 | RS485 communication port<br>RS485 communication is connected to the 120 $\Omega$ terminal resistance by toggling DIP switch to S3                                                                                                                                                                                                                                                                             |
|              | B-         | Communication terminal B-                 |                                                                                                                                                                                                                                                                                                                                                                                                               |

● Arrangement and definition of main circuit terminals



Arrangement and Definition of 0.4kW- 5.5kW Main Circuit Terminals



Arrangement and Definition of 7.5kW~ 22kW Main Circuit Terminals

| Mark | Name                                   | Description                                                           |
|------|----------------------------------------|-----------------------------------------------------------------------|
| (+)  | DC power terminal<br>(7.5kW-22kW only) | DC power output<br>(-) for negative DC bus<br>(+) for positive DC bus |
| (-)  |                                        |                                                                       |

|                                                                                   |                         |                                                                        |
|-----------------------------------------------------------------------------------|-------------------------|------------------------------------------------------------------------|
| +                                                                                 | Brake resistor terminal | For connecting to the external braking resistors to realize quick stop |
| PB                                                                                |                         |                                                                        |
| R/L                                                                               | Drive input terminal    | For connecting to AC supply                                            |
| S                                                                                 |                         |                                                                        |
| T/N                                                                               |                         |                                                                        |
| U                                                                                 | Drive output terminal   | For connecting to the motor                                            |
| V                                                                                 |                         |                                                                        |
| W                                                                                 |                         |                                                                        |
|  | Ground                  | Ground terminal, with the grounding resistance < 10Ω                   |

- Recommended brake resistor

The braking resistor resistance and resistor power described in the following table are verified under the common inertia load and intermittent braking mode. If it needs to be used in the occasion with large inertia and frequent braking for a long time, please adjust the braking resistor resistance and resistor power appropriately according to the specifications of the selected drive and the rated parameters of the braking unit. If there is any doubt, please consult the Technical Service Department of Suzhou Veichi Electric Co., Ltd.

| Three Phase 380V        |                |                     |                    |
|-------------------------|----------------|---------------------|--------------------|
| Motor Power             | Resistance (Ω) | Resistor Power (kW) | Braking Torque (%) |
| 0.75                    | 1000           | 0.15                | 100                |
| 1.5                     | 500            | 0.3                 | 100                |
| 2.2                     | 300            | 0.45                | 100                |
| 4.0                     | 200            | 0.8                 | 100                |
| 5.5                     | 150            | 1.1                 | 100                |
| 7.5                     | 100            | 1.5                 | 100                |
| 11                      | 50             | 1.2                 | 100                |
| 15                      | 40             | 1.5                 | 100                |
| 18.5                    | 35             | 2.0                 | 100                |
| 22                      | 32             | 2.5                 | 100                |
| Three/Single Phase 220V |                |                     |                    |
| Motor Power             | Resistance (Ω) | Resistor Power (kW) | Braking Torque (%) |
| 0.4                     | 400            | 0.09                | 100                |
| 0.75                    | 200            | 0.12                | 100                |
| 1.5                     | 100            | 0.3                 | 100                |
| 2.2                     | 75             | 0.3                 | 100                |

### 3 Keypad Layout and Operation Instructions

• Keypad



• Key functions

| Mark                                                                                | Name           | Description                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | Menu           | Enter the function menu interface when standby or running; press the key to exit the modification when in the parameter modification status; long press the key (1s) when in standby or running to enter the status monitoring interface directly.                                                                                                                                      |
|    | Set/<br>Shift  | Press the key to enter the parameter modification status when the menu interface is in operation; press the key again to confirm the modified value after the modification is completed; long press the key in the parameter interface (1s) to shift the parameter; long press the key, then it will shift cyclically, and every bit blink three times before shifting to the next bit. |
|  | Up/Down        | Select the parameter in the menu interface; modify the parameter value in the parameter modification status; modify the frequency target and PID target in the standby or operation monitoring status (when the frequency target and PID target are set by keypad, check [F11.04]).                                                                                                     |
|  | RUN            | When run/stop is controlled by the keypad, press the key to turn the drive forward. The status indicator light is always on when running in forward direction, and flashes when running in reverse direction.                                                                                                                                                                           |
|  | Stop/<br>Reset | When the command source is set to keypad, press the key to stop the drive; expand its effective range through the parameter [F11.03]; press the key to reset the drive when in error status. (It will not be reset when the error is not eliminated).                                                                                                                                   |

|                                                                                  |                        |                                                                                                  |
|----------------------------------------------------------------------------------|------------------------|--------------------------------------------------------------------------------------------------|
|  | Built-in potentiometer | For potentiometer giving. Switch to an external potentiometer via F11.35 [Keypad Potentiometer]. |
|----------------------------------------------------------------------------------|------------------------|--------------------------------------------------------------------------------------------------|

- Indicator meanings

| Name             |     | Status   | Description            |
|------------------|-----|----------|------------------------|
| Unit Indicator   | Hz  | Flash/On | Frequency unit         |
|                  | A   | On       | Current unit           |
|                  | V   | On       | Voltage unit           |
|                  | RPM | On       | Speed unit             |
|                  | %   | Flash/On | Percentage unit        |
| Status Indicator | RUN | On       | Drive in FWD Operation |
|                  | RUN | Flash    | Drive in REV Operation |
|                  | RUN | Off      | Drive in stop          |

## 4 Function Table

This chapter only provides a brief list of functions. Please refer to the AC10 Technical Manual or consult our company for detailed information.

### 4.1 Safety Precautions

| Danger                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Please pay attention to all information in this book regarding safety.                                                                                                                                                                                   |
| Please note that failure to observe the warnings may result in death or serious injuries. VEICHI will not be held liable for injuries and equipment damage caused by your company or your customers' failure to comply with the contents of this manual. |

### 4.2 Reading Method

◆Marks and terms of control modes

| Mark | Content                              | Mark | Content                                             |
|------|--------------------------------------|------|-----------------------------------------------------|
| V/F  | Parameters valid in V/F control mode | RUN  | Parameters that can be modified during operation    |
| SVC  | Parameters valid in SVC              | STOP | Parameters that cannot be modified during operation |
| -    | -                                    | READ | Parameters can only be read, not modified           |

### 4.3 Function Group

| Caution                                                                                                                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Set RS485 or external keypad via [F11.30], this parameter is not restored with [F00.03]. It is strongly recommended that users disconnect the hardware of the other source once it is chosen. |

#### Types of parameters for this product

| Parameter     | Name                             | Parameter | Name                                      |
|---------------|----------------------------------|-----------|-------------------------------------------|
| F00.0x        | Environment Settings             | F07.0x    | Start Control                             |
| F00.1x        | Common Parameters                | F07.1x    | Stop Control                              |
| F01.0x        | Basic Commands                   | F07.2x    | DC Brake and Fly Track                    |
| F01.1x        | Frequency Commands               | F07.3x    | Jogging                                   |
| F01.2x-F01.3x | ACC/DEC Time                     | F07.4x    | Hold and Jump Frequency during Start/Stop |
| F01.4x        | PWM Control                      | F08.0x    | Counting and Timing                       |
| F02.0x        | Basic Parameters and Auto-tuning | F08.1x    | Reserved                                  |
| F02.1x        | AM Advanced Parameters           | F08.2x    | Reserved                                  |

|               |                             |               |                                       |
|---------------|-----------------------------|---------------|---------------------------------------|
| F02.2x        | PM Advanced Parameters      | F08.3x        | Wobble-frequency Control              |
| F02.3x-F02.4x | Reserved                    | F10.0x        | Current Protection                    |
| F02.5x        | Motor Application           | F10.1x        | Voltage Protection                    |
| F03.0x        | ASR                         | F10.2x        | Auxiliary Protection                  |
| F03.1x        | ACR and Torque Limit        | F10.3x        | Load Protection                       |
| F03.2x        | Torque Optimization Control | F10.4x        | Stall Protection                      |
| F03.3x        | Flux Optimization           | F10.5x        | Error Reset and Motor Overload        |
| F03.4x-F03.5x | Torque Control              | F11.0x        | Keys                                  |
| F04.0x        | V/F Control                 | F11.1x        | Cyclic Monitoring of Status Interface |
| F04.1x        | Customized V/F Curve        | F11.2x        | Monitoring Parameter Display          |
| F04.2x        | Reserved                    | F11.3x        | Special Keypad Functions              |
| F04.3x        | V/F ECO Mode                | F12.0x        | Modbus Slave Parameters               |
| F05.0x        | DI Terminal                 | F12.1x        | Modbus Master Parameters              |
| F05.1x        | X1-X4 Detection Delay       | F13.00-F13.06 | PID Target and Feedback               |
| F05.2x        | DI Terminal Mode            | F13.07-F13.24 | PID Target                            |
| F05.3x        | PUL Terminal                | F13.25-F13.28 | PID Feedback Disconnection            |
| F05.4x        | AI Parameters               | F13.29-F13.33 | PID Sleep                             |
| F05.5x        | AI Linear Parameters        | F14.00-F14.14 | Multi-frequency Control               |
| F05.6x        | AI Curve 1                  | F14.15        | PLC Mode                              |
| F05.7x        | AI Curve 2                  | F14.16-F14.30 | PLC Runtime                           |
| F05.8x        | AI as DI Terminal           | F14.31-F14.45 | PLC Direction and ACC/DEC Time        |
| F06.0x        | AO                          | F15.0x        | Reserved                              |
| F06.1x        | Reserved                    | C00.xx        | Basic Monitoring                      |
| F06.2x-F06.3x | DO and RO                   | C01.xx        | Error Monitoring                      |
| F06.4x        | Frequency Detection         | C02.xx        | App Monitoring                        |
| F06.5x        | Comparator Monitoring       | C03.xx        | Maintenance and Tension Monitoring    |
| F06.6x-F06.7x | Virtual I/O Terminals       | -             | -                                     |

## 4.4 F00: Environmental Settings

### F00.0x: Environment Settings

| Code<br>(Address)  | Name                         | Content                                                                                                                                                                                                                                                                | Default<br>(Range) | Property |
|--------------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|
| F00.00<br>(0x0000) | Parameter<br>Access<br>Level | V/F SVC<br>Set the parameter access level according<br>to access restriction.<br>0: Standard parameters (Fxx.yyy,<br>Cxx.yyy)<br>1: Common parameters (F00.00,<br>Pxx.yyy)<br>2: Monitoring parameters (F00.00,<br>Cxx.yyy)<br>3: Modified parameters (F00.00, Hxx.yy) | 0<br>(0~3)         | RUN      |
| F00.03<br>(0x0003) | Initializati<br>on           | V/F SVC<br>Set the initialization mode for the drive.<br>0: Invalid<br>11: Set parameters according to actual<br>needs (motor parameters excl.)<br>22: All parameters initialized<br>33: Clear error records                                                           | 0<br>(0~33)        | STOP     |
| F00.04<br>(0x0004) | Keypad<br>Parameter<br>Copy  | V/F SVC<br>0: Invalid<br>11: Upload parameters to keypad<br>22: Download parameters to the drive<br>Note: Built-in keypad do not support<br>parameter copy.                                                                                                            | 0<br>(0~30)        | STOP     |
| F00.05<br>(0x0005) | Reserved                     | Reserved                                                                                                                                                                                                                                                               | Reserved           | Reserved |
| F00.06<br>(0x0006) | Reserved                     | Reserved                                                                                                                                                                                                                                                               | Reserved           | Reserved |
| F00.07<br>(0x0007) | Free<br>Parameter<br>1       | V/F SVC<br>Used as the machine code or application<br>mode code when multiple drives are<br>used.                                                                                                                                                                      | 0<br>(0~65535)     | RUN      |

|                    |                        |                                                                                                   |                |     |
|--------------------|------------------------|---------------------------------------------------------------------------------------------------|----------------|-----|
| F00.08<br>(0x0008) | Free<br>Parameter<br>2 | V/F SVC<br>Used as the machine code or application<br>mode code when multiple drives are<br>used. | 0<br>(0~65535) | RUN |
|--------------------|------------------------|---------------------------------------------------------------------------------------------------|----------------|-----|

**F00.10~F00.39: Common Parameters**

| Code<br>(Address)                       | Name                           | Content                                                                                                                 | Default<br>(Range)                             | Property |
|-----------------------------------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------|
| F00.1~<br>F00.39<br>(0x0010~<br>0x0027) | Common<br>Parameter<br>Address | V/F SVC<br>Ones-and tens-bit: Set 00~99 to yy in<br>Fxx.yy<br>Hundreds- and thousands-bit: Set 00~31<br>to xx in Fxx.yy | Common<br>default<br>parameters<br>(0000~2999) | RUN      |

**4.5 F01: Basic Settings****F01.0x: Basic Commands**

| Code<br>(Address)  | Name                       | Content                                                                                                                                                                                                                                                                                                                                                                                                  | Default<br>(Range) | Property |
|--------------------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|
| F01.00<br>(0x0100) | Motor 1<br>Control<br>Mode | V/F SVC<br>Set the motor control mode.<br>0: AM- V/F: V/F control<br>1: AM-SVC, open loop vector control,<br>current closed loop control<br>PM:<br>10: PM-V/F: V/F control<br>11: PM-SVC, open loop vector control,<br>current closed loop control<br>Note: T/S2 models without the suffix -VC<br>only support AM-V/F control.<br>T/S2 models with the suffix -VC support<br>both AM-SVC and PM control. | 0<br>(0~11)        | STOP     |
| F01.01<br>(0x0101) | Command<br>Source          | V/F SVC<br>Select the method to send run/stop<br>commands and the direction of operation to<br>the drive.<br>0: Keypad (external keypad first)<br>1: Terminals<br>2: RS485 communication<br>3: Reserved                                                                                                                                                                                                  | 0<br>(0~3)         | RUN      |

|                    |                              |                                                                                                                                                                            |                                                                                                                     |                         |      |
|--------------------|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------|------|
| F01.02<br>(0x0102) | Frequency Source A           | V/F SVC<br>Set frequency giving source.<br>0: Keypad<br>1: Potentiometer<br>2: AI terminal<br>3: Reserved<br>4: Reserved                                                   | 5: PUL terminal<br>6: RS485<br>7: UP/DW terminal<br>8: PID control<br>9: PLC<br>10: Reserved<br>11: Multi-frequency | 0<br>(0~11)             | RUN  |
| F01.03<br>(0x0103) | Frequency Source A Gain      | V/F SVC<br>Set the gain of frequency source A.                                                                                                                             |                                                                                                                     | 100.0%<br>(0.0%~500.0%) | STOP |
| F01.04<br>(0x0104) | Frequency Source B           | V/F SVC<br>Set frequency source. The same as [F01.02]                                                                                                                      |                                                                                                                     | 0<br>(0~11)             | RUN  |
| F01.05<br>(0x0105) | Frequency Source B Gain      | V/F SVC<br>Set the gain of frequency source B.                                                                                                                             |                                                                                                                     | 100.0%<br>(0.0%~500.0%) | STOP |
| F01.06<br>(0x0106) | Frequency Source B Reference | V/F SVC<br>Set the reference for frequency source B.<br>0: Max. output frequency<br>1: Frequency of source A                                                               |                                                                                                                     | 0<br>(0~1)              | RUN  |
| F01.07<br>(0x0107) | Frequency Source Combination | V/F SVC<br>Set the combination method of source A and source B of the drive.<br>0: Source A<br>1: Source B<br>2: A + B<br>3: A - B<br>4: Max. (A or B)<br>5: Min. (A or B) |                                                                                                                     | 0<br>(0~5)              | RUN  |

|                            |                                          |                                                                                                                                                                                                                                                 |                                                                                                                                                                                                   |                                                   |            |
|----------------------------|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------------|
| <p>F01.08<br/>(0x0108)</p> | <p>Frequency /Command Source Binding</p> | <p>V/F SVC<br/>Used to bond each command source to frequency sources.<br/>Ones-bit: Via keypad<br/>Tens-bit: Via terminal<br/>Hundreds-bit: Via communication<br/>Thousands-bit: Reserved<br/>0: Invalid<br/>1: Keypad<br/>2: Potentiometer</p> | <p>3: AI terminal<br/>4: Reserved<br/>5: Reserved<br/>6: PUL terminal<br/>7: Communication<br/>8: UP/DW terminal<br/>9: PID<br/>A: PLC<br/>B: Reserved<br/>C: Multi-frequency<br/>D: Reserved</p> | <p>0x0000<br/>(0x0000~0xDDDD)</p>                 | <p>RUN</p> |
| <p>F01.09<br/>(0x0109)</p> | <p>Keypad Set Frequency</p>              | <p>V/F SVC<br/>Set and modify the frequency via keypad.</p>                                                                                                                                                                                     |                                                                                                                                                                                                   | <p>50.00Hz<br/>(0.00Hz~Upper limit frequency)</p> | <p>RUN</p> |

**F01.1x: Frequency Commands**

| <p><b>Code (Address)</b></p> | <p><b>Name</b></p>                  | <p><b>Content</b></p>                                                                                             |                                                                                     | <p><b>Default (Range)</b></p>                             | <p><b>Property</b></p> |
|------------------------------|-------------------------------------|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------|------------------------|
| <p>F01.10<br/>(0x010A)</p>   | <p>Max. Frequency</p>               | <p>V/F SVC<br/>Set the maximum frequency for the drive.</p>                                                       |                                                                                     | <p>50.00Hz<br/>(Upper limit frequency ~ 500.00Hz)</p>     | <p>STOP</p>            |
| <p>F01.11<br/>(0x010B)</p>   | <p>Upper Limit Frequency Source</p> | <p>V/F SVC<br/>Select the upper limit frequency source.<br/>0: Keypad<br/>1: Potentiometer<br/>2: AI terminal</p> | <p>3: Reserved<br/>4: Reserved<br/>5: PUL terminal<br/>6: RS485<br/>7: Reserved</p> | <p>0<br/>(0~7)</p>                                        | <p>RUN</p>             |
| <p>F01.12<br/>(0x010C)</p>   | <p>Keypad Set UL Frequency</p>      | <p>V/F SVC<br/>The upper limit frequency source when F01.11 is set to 0.</p>                                      |                                                                                     | <p>0.00Hz<br/>(Lower limit frequency~ Max. frequency)</p> | <p>RUN</p>             |

|                    |                                    |                                                                                                     |                                                |      |
|--------------------|------------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------|------|
| F01.13<br>(0x010D) | Lower<br>Limit<br>Frequency        | V/F SVC<br>Set the lower limit to the given frequency.                                              | 0.00Hz<br>(0.00Hz~Upper<br>limit<br>frequency) | RUN  |
| F01.14<br>(0x010E) | Frequency<br>Command<br>Resolution | V/F SVC<br>Set the frequency command resolution<br>0: 0.01Hz 1: 0.1Hz 2: 0.1rpm<br>3: 1rpm 4: 10rpm | 0<br>(0~4)                                     | STOP |

**F01.2x~F01.3x: ACC/DEC Time**

| Code<br>(Address)  | Name                   | Content                                                                                                                                                                                          | Default<br>(Range)                 | Property |
|--------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------|
| F01.20<br>(0x0114) | Reference<br>Frequency | V/F SVC<br>Set the reference frequency to calculate<br>the acceleration and deceleration time.<br>0: Max. frequency<br>1: 50Hz<br>2: Set frequency                                               | 0<br>(0~2)                         | STOP     |
| F01.21<br>(0x0115) | ACC<br>Time<br>Range   | V/F SVC<br>Set the acceleration time range.<br>0: 1s 1: 0.1s                                                                                                                                     | 2<br>(0~2)                         | STOP     |
| F01.22<br>(0x0116) | ACC<br>Time 1          | V/F SVC<br>Set the time required to accelerate the<br>output frequency from 0.00 Hz to the<br>reference frequency.<br>1s~6500s (F01.21=0)<br>0.1s~6500.0s (F01.21=1)<br>0.01s~650.00s (F01.21=2) | Up to model<br>(0.01s~<br>650.00s) | RUN      |
| F01.23<br>(0x0117) | DEC<br>Time 1          | V/F SVC<br>Set the time required to decelerate the<br>output frequency from the reference<br>frequency to 0.00Hz.                                                                                | Up to model<br>(0.01s~<br>650.00s) | RUN      |
| F01.24<br>(0x0118) | ACC<br>Time 2          | V/F SVC<br>Set the time required to accelerate the<br>output frequency from 0.00 Hz to the<br>reference frequency.                                                                               | Up to model<br>(0.01s~<br>650.00s) | RUN      |

|                    |                              |                                                                                                              |                                    |      |
|--------------------|------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------|------|
| F01.25<br>(0x0119) | DEC<br>Time 2                | V/F SVC<br>Set the time required to decelerate the output frequency from the reference frequency to 0.00Hz.  | Up to model<br>(0.01s~<br>650.00s) | RUN  |
| F01.26<br>(0x011A) | ACC<br>Time 3                | V/F SVC<br>Set the time required to accelerate the output frequency from 0.00 Hz to the reference frequency. | Up to model<br>(0.01s~<br>650.00s) | RUN  |
| F01.27<br>(0x011B) | DEC<br>Time 3                | V/F SVC<br>Set the time required to decelerate the output frequency from the reference frequency to 0.00Hz.  | Up to model<br>(0.01s~<br>650.00s) | RUN  |
| F01.28<br>(0x011C) | ACC<br>Time 4                | V/F SVC<br>Set the time required to accelerate the output frequency from 0.00 Hz to the reference frequency. | Up to model<br>(0.01s~<br>650.00s) | RUN  |
| F01.29<br>(0x011D) | DEC<br>Time 4                | V/F SVC<br>Set the time required to decelerate the output frequency from the reference frequency to 0.00Hz.  | Up to model<br>(0.01s~<br>650.00s) | RUN  |
| F01.30<br>(0x011E) | S-Curve<br>ACC/DE<br>C       | V/F SVC<br>Set S-curve acceleration /deceleration.<br>0: OFF<br>1: ON<br>2: Smoother S-curve                 | 1<br>(0~2)                         | STOP |
| F01.31<br>(0x011F) | ACC<br>S-Curve<br>Start Time | V/F SVC<br>Set the start time of s-curve acceleration.                                                       | 0.20s<br>(0.00s~<br>10.00s)        | STOP |
| F01.32<br>(0x0120) | ACC<br>S-Curve<br>End Time   | V/F SVC<br>Set the end time of s-curve acceleration.                                                         | 0.20s<br>(0.00s~<br>10.00s)        | STOP |
| F01.33<br>(0x0121) | DEC<br>S-Curve<br>Start Time | V/F SVC<br>Set the start time of s-curve deceleration.                                                       | 0.20s<br>(0.00s~<br>10.00s)        | STOP |
| F01.34<br>(0x0122) | DEC<br>S-Curve<br>End Time   | V/F SVC<br>Set the end time of s-curve deceleration.                                                         | 0.20s<br>(0.00s~<br>10.00s)        | STOP |

|                    |                                       |                                                                          |                                          |     |
|--------------------|---------------------------------------|--------------------------------------------------------------------------|------------------------------------------|-----|
| F01.35<br>(0x0123) | ACC<br>Time 1/2<br>Shift<br>Frequency | V/F SVC<br>Set the shift frequency between<br>acceleration time 1 and 2. | 0.00Hz<br>(0.00Hz~<br>Max.<br>frequency) | RUN |
|--------------------|---------------------------------------|--------------------------------------------------------------------------|------------------------------------------|-----|

**F01.4x: PWM Control**

| Code<br>(Address)  | Name                          | Content                                                                                                                                                                      |                                                                                                                                                                                                                                                          | Default<br>(Range)                  | Property |
|--------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------|
| F01.40<br>(0x0128) | Carrier<br>Frequency          | V/F SVC<br>Set the switching frequency of the drive's<br>IGBT module.                                                                                                        |                                                                                                                                                                                                                                                          | Up to model<br>(1.0kHz~<br>16.0kHz) | RUN      |
| F01.41<br>(0x0129) | PWM<br>Mode                   | V/F SVC<br>Ones-bit:<br>Carrier-temperature correlation<br>0: Irrelevant<br>1: Relevant<br>Tens-bit:<br>Carrier-output frequency correlation<br>0: Irrelevant<br>1: Relevant | Hundreds-bit:<br>Random PWM enable<br>0: Invalid<br>1: Valid in V/F control mode<br>2: Valid in vector control mode<br>Thousands-bit:<br>PWM modulation mode<br>0: Only three-phase modulation<br>1: Automatic shift of two-phase/three-phase modulation | 1111<br>(0000~1211)                 | RUN      |
| F01.43<br>(0x012B) | Deadband<br>Compensation Gain | V/F SVC<br>Set the deadband compensation gain.                                                                                                                               |                                                                                                                                                                                                                                                          | 306<br>(0~512)                      | RUN      |
| F01.46<br>(0x012E) | Random<br>PWM<br>Depth        | V/F SVC<br>The higher the set point, the greater the<br>carrier fluctuation when random PWM is<br>enabled.                                                                   |                                                                                                                                                                                                                                                          | 0<br>(0~20)                         | RUN      |

## 4.6 F02: Motor 1 Parameters

### F02.0x: Basic Parameters and Auto-tuning

| Code<br>(Address)  | Name               | Content                                                                                                    | Default<br>(Range)                            | Property |
|--------------------|--------------------|------------------------------------------------------------------------------------------------------------|-----------------------------------------------|----------|
| F02.00<br>(0x0200) | Type               | V/F SVC<br>Set the motor type:<br>0: Asynchronous motor (AM)<br>1: Permanent magnet synchronous motor (PM) | 0<br>(0~1)                                    | READ     |
| F02.01<br>(0x0201) | Pole No.           | V/F SVC<br>Set the motor pole number.                                                                      | 4<br>(2~98)                                   | STOP     |
| F02.02<br>(0x0202) | Rated<br>Power     | V/F SVC<br>Set the rated power of the motor.                                                               | Up to model<br>(0.1kW~<br>1000.0kW)           | STOP     |
| F02.03<br>(0x0203) | Rated<br>Frequency | V/F SVC<br>Set the rated frequency of the motor.                                                           | Up to model<br>(0.01Hz~<br>Max.<br>frequency) | STOP     |
| F02.04<br>(0x0204) | Rated<br>Speed     | V/F SVC<br>Set the rated speed of the motor.                                                               | Up to model<br>(0rpm~<br>65000rpm)            | STOP     |
| F02.05<br>(0x0205) | Rated<br>Voltage   | V/F SVC<br>Set the rated voltage of the motor.                                                             | Up to model<br>(0V~2000V)                     | STOP     |
| F02.06<br>(0x0206) | Rated<br>Current   | V/F SVC<br>Set the rated current of the motor.                                                             | Up to model<br>(0.1A~<br>3000.0A)             | STOP     |

|                    |             |                                                                                                                                                                 |            |      |
|--------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------|
| F02.07<br>(0x0207) | Auto-tuning | V/F SVC<br>After the parameter auto-tuning is finished, [F02.07] will be set to "0" automatically.<br>0: OFF<br>1: Dynamic auto-tuning<br>2: Static auto-tuning | 0<br>(0~3) | STOP |
|--------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------|

**Note:** When F02.00 [Motor Type] is a synchronous motor, F02.04 [Motor Rated Speed] is calculated from F02.01 [Motor Poles] and F02.03 [Motor Rated Frequency], please set the corresponding parameters correctly. The calculation formula is:  $F02.04[\text{Motor Rated Speed}] = 60 * F02.03[\text{Motor Rated Frequency}] / (F02.01[\text{Motor Pole}] / 2)$

### F02.1x: AM Advanced Parameters

| Code<br>(Address)  | Name                             | Content                                                                | Default<br>(Range)                         | Property |
|--------------------|----------------------------------|------------------------------------------------------------------------|--------------------------------------------|----------|
| F02.10<br>(0x020A) | No-Load<br>Current               | V/F SVC<br>Set the no-load current for asynchronous motors.            | Up to model<br>(0.1A~<br>3000.0A)          | STOP     |
| F02.11<br>(0x020B) | Stator<br>Resistance             | V/F SVC<br>Set the stator resistance for asynchronous motors.          | Up to model<br>(0.01mΩ~<br>60000.00<br>mΩ) | STOP     |
| F02.12<br>(0x020C) | Rotor<br>Resistance              | V/F SVC<br>Set the rotor resistance for asynchronous motors.           | Up to model<br>(0.01mΩ~<br>60000.00<br>mΩ) | STOP     |
| F02.13<br>(0x020D) | Stator<br>Leakage<br>Inductance  | V/F SVC<br>Set the stator leakage inductance for asynchronous motors.  | Up to model<br>(0.01mH~655<br>35.00mH)     | STOP     |
| F02.14<br>(0x020E) | Stator<br>Inductance             | V/F SVC<br>Set the stator inductance for asynchronous motors.          | Up to model<br>(0.01mH~<br>65535.00<br>mH) | STOP     |
| F02.15<br>(0x020F) | Per-unit<br>Stator<br>Resistance | V/F SVC<br>Set the per-unit stator resistance for asynchronous motors. | Up to model<br>(0.01%~<br>50.00%)          | READ     |
| F02.16<br>(0x0210) | Per-unit<br>Rotor<br>Resistance  | V/F SVC<br>Set the per-unit rotor resistance for asynchronous motors.  | Up to model<br>(0.01%~<br>50.00%)          | READ     |

|                    |                                             |                                                                                   |                                   |      |
|--------------------|---------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------|------|
| F02.17<br>(0x0211) | Per-unit<br>Stator<br>Leakage<br>Inductance | V/F SVC<br>Set the per-unit stator leakage inductance<br>for asynchronous motors. | Up to model<br>(0.01%~<br>50.00%) | READ |
| F02.18<br>(0x0212) | Per-unit<br>Stator<br>Inductance            | V/F SVC<br>Set the per-unit stator inductance for<br>asynchronous motors.         | Up to model<br>(0.1%~<br>999.0%)  | READ |
| F02.19<br>(0x0213) | F02.11~F0<br>2.14<br>Decimal<br>Point       | V/F SVC<br>Set the decimal point of the four<br>parameters from F02.11 to F02.14. | 0x0000<br>(0x0000~<br>0x2222)     | STOP |

**F02.2x: PM Advanced Parameters**

| Code<br>(Address)  | Name                 | Content                                                                                                            | Default<br>(Range)                              | Proport |
|--------------------|----------------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|---------|
| F02.20<br>(0x0214) | Stator Resistance    | V/F SVC<br>Set the stator resistance for<br>permanent magnet synchronous<br>motors.                                | Up to model<br>(0.01<br>mΩ<br>~60000.00<br>mΩ)  | STOP    |
| F02.21<br>(0x0215) | D-axis<br>Inductance | V/F SVC<br>Set the D-axis inductance for<br>permanent magnet synchronous<br>motors.                                | Up to model<br>(0.001<br>mH<br>~6553.500<br>mH) | STOP    |
| F02.22<br>(0x0216) | Q-axis<br>Inductance | V/F SVC<br>Set the Q-axis inductance for<br>permanent magnet synchronous<br>motors.                                | Up to model<br>(0.001<br>mH<br>~6553.500<br>mH) | STOP    |
| F02.23<br>(0x0217) | Back Emf             | V/F SVC<br>Set the back emf for permanent<br>magnet synchronous motors. Only<br>dynamic auto-tuning is recognized. | Up to model<br>(0V~<br>1500V)                   | STOP    |
| F02.24<br>(0x0218) | Encoder Angle        | V/F SVC<br>Set the encoder installation angle<br>for permanent magnet synchronous<br>motors.                       | Up to model<br>(0.0°~360.0°)                    | RUN     |

|                    |                                |                                                                                                 |                                   |      |
|--------------------|--------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------|------|
| F02.25<br>(0x0219) | Per-unit Stator Resistance     | V/F SVC<br>Set the per-unit stator resistance for permanent magnet synchronous motors.          | Up to model<br>(Monitored values) | READ |
| F02.26<br>(0x021A) | Per-unit D-Axis Inductance     | V/F SVC<br>Set the per-unit value of D-axis inductance for permanent magnet synchronous motors. | Up to model<br>(Monitored values) | READ |
| F02.27<br>(0x021B) | Per-unit Q-Axis Inductance     | V/F SVC<br>Set the per-unit value of Q-axis inductance for permanent magnet synchronous motors. | Up to model<br>(Monitored values) | READ |
| F02.28<br>(0x021C) | Pulse Width Coefficient        | V/F SVC<br>Set the pulse width coefficient for permanent magnet synchronous motors.             | Up to model<br>(00.00~99.99)      | STOP |
| F02.29<br>(0x021D) | F02.20~F02.22<br>Decimal Point | V/F SVC<br>Set the decimal point of the three parameters from F02.20 to F02.22.                 | 0x0000<br>(0x0000~0x2222)         | READ |

**F02.3x~F02.4x: Reserved****F02.5x~F02.6x: Motor Application**

| Code<br>(Address)  | Name                                   | Content                                                                              | Default<br>(Range)        | Property |
|--------------------|----------------------------------------|--------------------------------------------------------------------------------------|---------------------------|----------|
| F02.50<br>(0x0232) | Stator Resistance Auto-tuning          | V/F SVC<br>0: Invalid<br>1: Tuning only without updating<br>> 1: Tuning and updating | 0<br>(0~3)                | STOP     |
| F02.51<br>(0x0233) | Stator Resistance Tuning Coefficient 1 | V/F SVC<br>Set the stator resistance tuning coefficient 1.                           | 0<br>(0~1000)             | RUN      |
| F02.52<br>(0x0234) | Stator Resistance Tuning Coefficient 2 | V/F SVC<br>Set the stator resistance tuning coefficient 2.                           | 0.00%<br>(-20.00%~20.00%) | RUN      |
| F02.53<br>(0x0235) | Stator Resistance Tuning Coefficient 3 | V/F SVC<br>Set the stator resistance tuning coefficient 3.                           | 0<br>(0~65535)            | RUN      |

|                    |                              |                                                                                                                                                                                 |                        |      |
|--------------------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------|
| F02.60<br>(0x023C) | PM Pole Position Search      | V/F SVC<br>Ones-bit: Reserved<br>Tens-bit: FVC<br>0: OFF<br>1: ON<br>2: ON during the first power-up<br>Hundreds-bit: V/F<br>0: OFF<br>1: ON<br>2: ON during the first power-up | 0010<br>(0000~3223)    | STOP |
| F02.61<br>(0x023D) | Pole Position Search Current | V/F SVC<br>Set the value of pole search current.                                                                                                                                | 0.0%<br>(0.0%~6553.5%) | STOP |

## 4.7 F03: Vector Control

### F03.0x: ASR (Automatic Speed Regulator)

| Code (Address)     | Name                | Content                                                                       | Default (Range)                   | Property |
|--------------------|---------------------|-------------------------------------------------------------------------------|-----------------------------------|----------|
| F03.00<br>(0x0300) | Rigidity Level      | SVC<br>Set the rigidity level. The higher the level, the better the rigidity. | 32<br>(1~128)                     | RUN      |
| F03.01<br>(0x0301) | Rigidity Mode       | SVC<br>Set the ASR rigidity mode.                                             | 0x0000<br>(0x0000~0x1111)         | RUN      |
| F03.02<br>(0x0302) | Proportional Gain 1 | SVC<br>Set the ASR proportional gain 1.                                       | 10.00<br>(0.01~100.00)            | RUN      |
| F03.03<br>(0x0303) | Integral Time 1     | SVC<br>Set the ASR integral time 1.                                           | 0.100s<br>(0.000s~6.000s)         | RUN      |
| F03.04<br>(0x0304) | Filter Time 1       | SVC<br>Set the ASR filter time 1.                                             | 0.0ms<br>(0.0ms~100.0ms)          | RUN      |
| F03.05<br>(0x0305) | Shift Frequency 1   | SVC<br>Set the ASR shift frequency 1                                          | 0.00Hz<br>(0.00Hz~Max. frequency) | RUN      |

|                    |                        |                                         |                                       |     |
|--------------------|------------------------|-----------------------------------------|---------------------------------------|-----|
| F03.06<br>(0x0306) | Proportional<br>Gain 2 | SVC<br>Set the ASR proportional gain 2. | 10.00<br>(0.01~<br>100.00)            | RUN |
| F03.07<br>(0x0307) | Integral Time<br>2     | SVC<br>Set the ASR integral time 2.     | 0.100s<br>(0.000s~<br>6.000s)         | RUN |
| F03.08<br>(0x0308) | Filter Time 2          | SVC<br>Set the ASR filter time 2.       | 0.0ms<br>(0.0ms~<br>100.0ms)          | RUN |
| F03.09<br>(0x0309) | Shift<br>Frequency 2   | SVC<br>Set the ASR shift frequency 2.   | 0.00Hz<br>(0.00Hz~<br>Max. frequency) | RUN |

### F03.1x: ACR (Automatic Current Regulator) and Torque Limit

| Code<br>(Address)  | Name                           | Content                                                          | Default<br>(Range)          | Property |
|--------------------|--------------------------------|------------------------------------------------------------------|-----------------------------|----------|
| F03.10<br>(0x030A) | D-axis<br>Proportional<br>Gain | SVC<br>Set the D-axis proportional gain<br>for the current loop. | 1.000<br>(0.001~<br>4.000)  | RUN      |
| F03.11<br>(0x030B) | D-axis Integral<br>Gain        | SVC<br>Set the D-axis integral gain for the<br>current loop.     | 1.000<br>(0.001~<br>4.000)  | RUN      |
| F03.12<br>(0x030C) | Q-axis<br>Proportional<br>Gain | SVC<br>Set the Q-axis proportional gain<br>for the current loop. | 1.000<br>(0.001~<br>4.000)  | RUN      |
| F03.13<br>(0x030D) | Q-axis Integral<br>Gain        | SVC<br>Set the Q-axis integral gain for the<br>current loop.     | 1.000<br>(0.001~<br>4.000)  | RUN      |
| F03.15<br>(0x030F) | Motoring<br>Torque Limit       | SVC<br>Set the torque limit during normal<br>motor driving.      | 250.0%<br>(0.0%~<br>400.0%) | RUN      |
| F03.16<br>(0x0310) | Generating<br>Torque Limit     | SVC<br>Set the torque limit in power<br>generation mode.         | 250.0%<br>(0.0%~<br>400.0%) | RUN      |
| F03.17<br>(0x0311) | Regenerative<br>Torque Limit   | SVC<br>Set regenerative torque limit at<br>low speed.            | 0.0%<br>(0.0%~<br>400.0%)   | RUN      |

|                            |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                         |            |
|----------------------------|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|------------|
| <p>F03.18<br/>(0x0312)</p> | <p>Regenerative<br/>Torque Limit<br/>Frequency</p> | <p>SVC<br/>Set the frequency range limited by<br/>torque when at low speed.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <p>6.00Hz<br/>(0.00Hz~<br/>30.00Hz)</p> | <p>RUN</p> |
| <p>F03.19<br/>(0x0313)</p> | <p>Torque Limit</p>                                | <p>SVC<br/>Ones-bit: Torque limit source<br/>during motoring<br/>0: Keypad<br/>1: Potentiometer<br/>2: AI terminal<br/>3: Reserved<br/>4: Reserved<br/>5: PUL terminal<br/>6: RS485 communication<br/>(0x3014)<br/>7: Reserved<br/>Tens-bit: Torque limit source<br/>during generating<br/>0: Keypad<br/>1: Potentiometer<br/>2: AI terminal<br/>3: Reserved<br/>4: Reserved<br/>5: PUL terminal<br/>6: RS485 communication<br/>(0x3014)<br/>7: Reserved<br/>Hundreds-bit: C00.06 displays<br/>0: The torque limit during<br/>motoring<br/>1: The torque limit during<br/>generating<br/>Thousands-bit: Reserved</p> | <p>0x0000<br/>(0x0000~<br/>0x0177)</p>  | <p>RUN</p> |

**F03.2x: Torque Optimization**

| Code (Address)  | Name                    | Content                                                                                              | Default (Range)         | Property |
|-----------------|-------------------------|------------------------------------------------------------------------------------------------------|-------------------------|----------|
| F03.20 (0x0314) | PM LF Drag Current      | SVC<br>When the SVC mode of the PM is on, the larger the drag current, the larger the torque output. | 20.0%<br>(0.0%~50.0%)   | RUN      |
| F03.21 (0x0315) | PM HF Drag Current      | SVC<br>When the SVC mode of the PM is on, the larger the drag current, the larger the torque output. | 10.0%<br>(0.0%~50.0%)   | RUN      |
| F03.22 (0x0316) | PM Drag Frequency       | SVC<br>The set value 100.0% corresponds to F01.10 [Max. Frequency].                                  | 10.0%<br>(0.0%~100.0%)  | RUN      |
| F03.23 (0x0317) | AM Slip Compensation    | SVC<br>Set the AM slip compensation.                                                                 | 100.0%<br>(0.0%~250.0%) | RUN      |
| F03.24 (0x0318) | Initial Starting Torque | SVC<br>Set the initial starting torque.                                                              | 0.0%<br>(0.0%~250.0%)   | RUN      |

**F03.3x: Flux Optimization**

| Code (Address)  | Name                                     | Content                                                               | Default (Range)        | Property |
|-----------------|------------------------------------------|-----------------------------------------------------------------------|------------------------|----------|
| F03.30 (0x031E) | Field-weakening Feed-forward Coefficient | SVC<br>Set the feedforward coefficient under field weakening control. | 10.0%<br>(0.0%~500.0%) | RUN      |
| F03.31 (0x031F) | Field-weakening Gain                     | SVC<br>Set the control gain under field weakening control.            | 10.0%<br>(0.0%~500.0%) | RUN      |
| F03.32 (0x0320) | Field-weakening Current Limit            | SVC<br>Set the current limit under field weakening control.           | 60.0%<br>(0.0%~250.0%) | RUN      |
| F03.33 (0x0321) | Field-weakening Voltage Coefficient      | SVC<br>Set the voltage coefficient under field weakening control.     | 97.0%<br>(0.0%~120.0%) | RUN      |

|                    |                        |                                                  |                               |     |
|--------------------|------------------------|--------------------------------------------------|-------------------------------|-----|
| F03.34<br>(0x0322) | Output Power<br>Limit  | SVC<br>Set the output power limit.               | 250.0%<br>(0.0%~<br>400.0%)   | RUN |
| F03.35<br>(0x0323) | Excitation Gain        | SVC<br>Set the excitation gain.                  | 100.0%<br>(0.0%~<br>500.0%)   | RUN |
| F03.36<br>(0x0324) | Excitation Range       | SVC<br>Set the excitation range.                 | 100.0%<br>(0.0%~<br>250.0%)   | RUN |
| F03.37<br>(0x0325) | ECO Mode               | SVC<br>0: OFF<br>1: ON                           | 0<br>(0~1)                    | RUN |
| F03.38<br>(0x0326) | Min. ECO<br>Excitation | SVC<br>Set the lower limit of eco<br>excitation. | 50.0%<br>(0.0%~<br>80.0%)     | RUN |
| F03.39<br>(0x0327) | ECO Filter Time        | SVC<br>Set the filter time of eco<br>running.    | 0.010s<br>(0.000s~<br>6.000s) | RUN |

#### F03.4x~F03.5x: Torque Control

| Code<br>(Address)  | Name           | Content                                                                           | Default<br>(Range) | Property |
|--------------------|----------------|-----------------------------------------------------------------------------------|--------------------|----------|
| F03.40<br>(0x0328) | Torque<br>Mode | SVC<br>0: Torque limit under speed control<br>1: Speed limit under torque control | 0<br>(0~1)         | RUN      |

|                    |                                   |                                                                                                                                                                                                                         |                                                                                                                                                                                       |                                   |     |
|--------------------|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----|
| F03.41<br>(0x0329) | Torque<br>Command                 | SVC<br>Ones-bit: Source A:<br>0: Keypad<br>1: Integrated<br>keypad&potentiometer<br>2: AI terminal<br>3: Reserved<br>4: Reserved<br>5: PUL terminal<br>6: RS485<br>7: Reserved<br>8: Reserved<br>9: Tension calculation | Tens-bit:<br>Source B:<br>The same<br>as source A<br>Hundreds-bit:<br>combination<br>method<br>0: Source A<br>1: Source B<br>2: A + B<br>3: A - B<br>4: Min. (A,<br>B)<br>5: Max. (A, | 0000<br>(0000~<br>0599)           | RUN |
| F03.42<br>(0x032A) | Keypad<br>Set<br>Torque           | SVC<br>Set the torque via keypad.                                                                                                                                                                                       |                                                                                                                                                                                       | 0.0%<br>(0.0%~<br>100.0%)         | RUN |
| F03.43<br>(0x032B) | Torque<br>Input<br>Lower<br>Limit | SVC<br>Set the torque input lower limit.                                                                                                                                                                                |                                                                                                                                                                                       | 0.00%<br>(0.00%~<br>100.00%)      | RUN |
| F03.44<br>(0x032C) | Lower<br>Limit<br>Percentage      | SVC<br>Set the torque input lower limit<br>percentage.                                                                                                                                                                  |                                                                                                                                                                                       | 0.00%<br>(-250.00%~300.<br>00%)   | RUN |
| F03.45<br>(0x032D) | Torque<br>Input<br>Upper<br>Limit | SVC<br>Set the torque input upper limit.                                                                                                                                                                                |                                                                                                                                                                                       | 100.00%<br>(0.00%~<br>100.00%)    | RUN |
| F03.46<br>(0x032E) | Upper<br>Limit<br>Percentage      | SVC<br>Set the torque input upper limit<br>percentage.                                                                                                                                                                  |                                                                                                                                                                                       | 100.00%<br>(-250.00%~300.<br>00%) | RUN |
| F03.47<br>(0x032F) | Torque<br>Filter<br>Time          | SVC<br>Set the frequency range limited by<br>torque when at low speed.                                                                                                                                                  |                                                                                                                                                                                       | 0.100s<br>(0.000s~<br>6.000s)     | RUN |

|                    |                                   |                                                                                                                                                                                        |                                |     |
|--------------------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-----|
| F03.52<br>(0x0334) | Torque<br>Command<br>Upper Limit  | SVC<br>Set the upper limit for torque command.                                                                                                                                         | 150.0%<br>(0.0%~<br>300.0%)    | RUN |
| F03.53<br>(0x0335) | Torque<br>Command<br>Lower Limit  | SVC<br>Set the lower limit for torque command                                                                                                                                          | 0.0%<br>(0.0%~<br>300.0%)      | RUN |
| F03.54<br>(0x0336) | FWD Speed<br>Limit                | SVC<br>0: F03.56;<br>1: Integrated keypad&<br>potentiometer×F03.56<br>2: AI× F03.56<br>3: Reserved<br>4: Reserved<br>5: PUL× F03.56<br>6: RS485 × F03.56<br>7: Reserved<br>8: Reserved | 0<br>(0~8)                     | RUN |
| F03.55<br>(0x0337) | REV Speed<br>Limit                | SVC<br>0: F03.57<br>1: Integrated keypad&<br>potentiometer×F03.57<br>2: AI× F03.57<br>3: Reserved<br>4: Reserved<br>5: PUL× F03.57<br>6: RS485 × F03.57<br>7: Reserved<br>8: Reserved  | 0<br>(0~8)                     | RUN |
| F03.56<br>(0x0338) | Max. FWD<br>Speed                 | SVC<br>Set the max. forward speed limit in<br>torque control.                                                                                                                          | 100.0%<br>(0.0%~<br>100.0%)    | RUN |
| F03.57<br>(0x0339) | Max. REV<br>Speed                 | SVC<br>Set the max. reverse speed limit in<br>torque control.                                                                                                                          | 100.0%<br>(0.0%~<br>100.0%)    | RUN |
| F03.58<br>(0x033A) | Torque Gain<br>Shift<br>Frequency | SVC<br>Set the torque gain shift frequency.                                                                                                                                            | 1.00Hz<br>(0.00Hz~<br>50.00Hz) | RUN |

|                    |             |                             |                             |     |
|--------------------|-------------|-----------------------------|-----------------------------|-----|
| F03.59<br>(0x033B) | Torque Gain | SVC<br>Set the torque gain. | 100.0%<br>(0.0%~<br>500.0%) | RUN |
|--------------------|-------------|-----------------------------|-----------------------------|-----|

## 4.8 F04: V/F Control

### F04.0x: V/F Control

| Code<br>(Address)  | Name                          | Content                                                                                                                                                                                               | Default<br>(Range)              | Property |
|--------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------|
| F04.00<br>(0x0400) | V/F Curve                     | V/F<br>Select the type of V/F curve according to different load characteristics.<br>0: Linear V/F curve<br>1~9: 1.1-1.9 power V/F curves respectively<br>10: Square V/F curve<br>11: Custom V/F curve | 0<br>(0~11)                     | STOP     |
| F04.01<br>(0x0401) | Torque Boost                  | V/F<br>0.0%: Automatic torque boost<br>0.1%~30.0%: Manual torque boost                                                                                                                                | Up to model<br>(0.0%~<br>30.0%) | RUN      |
| F04.02<br>(0x0402) | Torque Boost OFF Frequency    | V/F<br>Set the range of the torque boost. The torque boost will be cut off when the output frequency exceeds this value.                                                                              | 100.0%<br>(0.0%~<br>100.0%)     | RUN      |
| F04.03<br>(0x0403) | Slip Compensation Gain        | V/F<br>Set the slip compensation gain.                                                                                                                                                                | 0.0%<br>(0.0%~<br>200.0%)       | RUN      |
| F04.04<br>(0x0404) | Slip Compensation Range       | V/F<br>Set the slip compensation range.                                                                                                                                                               | 100.0%<br>(0.0%~<br>300.0%)     | RUN      |
| F04.05<br>(0x0405) | Slip Compensation Filter Time | V/F<br>Enter the parameters on the motor's nameplate correctly to implement parameter tuning for best effect.                                                                                         | 0.200s<br>(0.000s~<br>6.000s)   | RUN      |
| F04.06<br>(0x0406) | Anti-oscillation Gain         | V/F<br>Adjust this value to suppress low-frequency resonance, but it should not be too large or it will cause instability.                                                                            | 100.0%<br>(0.0%~<br>900.0%)     | RUN      |

|                    |                              |                                              |                              |      |
|--------------------|------------------------------|----------------------------------------------|------------------------------|------|
| F04.07<br>(0x0407) | Anti-oscillation Filter Time | V/F<br>Set the anti-oscillation filter time. | 1.0s<br>(0.0s~<br>100.0s)    | RUN  |
| F04.08<br>(0x0408) | Output Voltage Percentage    | V/F<br>Set the output voltage percentage.    | 100.0%<br>(25.0%~<br>120.0%) | STOP |

**F04.1x: Customized V/F Curve**

| Code<br>(Address)  | Name                           | Content                                     | Default<br>(Range)                        | Property |
|--------------------|--------------------------------|---------------------------------------------|-------------------------------------------|----------|
| F04.10<br>(0x040A) | V1<br>(User-defined Voltage)   | V/F<br>Set the V1 (user-defined voltage).   | 3.0%<br>(0.0%~<br>100.0%)                 | STOP     |
| F04.11<br>(0x040B) | F1<br>(User-defined Frequency) | V/F<br>Set the F1 (user-defined frequency). | 1.00Hz<br>(0.00Hz~<br>Max.<br>frequency)  | STOP     |
| F04.12<br>(0x040C) | V2<br>(User-defined Voltage)   | V/F<br>Set the V2 (user-defined voltage).   | 28.0%<br>(0.0%~<br>100.0%)                | STOP     |
| F04.13<br>(0x040D) | F2<br>(User-defined Frequency) | V/F<br>Set the F2 (user-defined frequency). | 10.00Hz<br>(0.00Hz~<br>Max.<br>frequency) | STOP     |
| F04.14<br>(0x040E) | V3<br>(User-defined Voltage)   | V/F<br>Set the V3 (user-defined voltage).   | 55.0%<br>(0.0%~<br>100.0%)                | STOP     |
| F04.15<br>(0x040F) | F3<br>(User-defined Frequency) | V/F<br>Set the F3 (user-defined frequency). | 25.00Hz<br>(0.00Hz~<br>Max.<br>frequency) | STOP     |
| F04.16<br>(0x0410) | V4<br>(User-defined Voltage)   | V/F<br>Set the V4 (user-defined voltage).   | 78.0%<br>(0.0%~<br>100.0%)                | STOP     |
| F04.17<br>(0x0411) | F4<br>(User-defined Frequency) | V/F<br>Set the F4 (user-defined frequency). | 37.50Hz<br>(0.00Hz~<br>Max.<br>frequency) | STOP     |

|                    |                                |                                           |                                           |      |
|--------------------|--------------------------------|-------------------------------------------|-------------------------------------------|------|
| F04.18<br>(0x0412) | V5<br>(User-defined Voltage).  | V/F<br>Set the V5 (user-defined voltage). | 100.0%<br>(0.0%~<br>100.0%)               | STOP |
| F04.19<br>(0x0413) | F5<br>(User-defined Frequency) | V/F<br>Set the F5 (user-defined voltage). | 50.00Hz<br>(0.00Hz~<br>Max.<br>frequency) | STOP |

**F04.2x: Reserved****F04.3x: V/F ECO Mode**

| Code<br>(Address)  | Name                        | Content                                                  | Default<br>(Range)                     | Property |
|--------------------|-----------------------------|----------------------------------------------------------|----------------------------------------|----------|
| F04.30<br>(0x041E) | V/F ECO<br>Mode             | V/F<br>0: OFF<br>1: ON                                   | 0<br>(0~1)                             | STOP     |
| F04.31<br>(0x041F) | Min.<br>Frequency           | V/F<br>Set the lower frequency limit of the<br>ECO mode. | 15.0Hz<br>(0.0Hz~<br>50.0Hz)           | STOP     |
| F04.32<br>(0x0420) | Min.<br>Voltage             | V/F<br>Set the lower voltage limit of the ECO<br>mode.   | 50.0%<br>(20.0%~<br>100.0%)            | STOP     |
| F04.33<br>(0x0421) | Voltage<br>Decrease<br>Rate | V/F<br>Set the voltage decrease rate in the<br>ECO mode. | 0.010V/ms<br>(0.010V/ms~<br>0.200V/ms) | RUN      |
| F04.34<br>(0x0422) | Voltage<br>Increase<br>Rate | V/F<br>Set the voltage increase rate in the<br>ECO mode. | 0.200V/ms<br>(0.010V/ms~<br>0.200V/ms) | RUN      |

**4.9 F05: Input Terminal****F05.0x: DI Terminal**

| Code<br>(Address)  | Name        | Content                                     | Default<br>(Range) | Property |
|--------------------|-------------|---------------------------------------------|--------------------|----------|
| F05.00<br>(0x0500) | X1 Function | V/F SVC<br>See the functions of terminal X. | 1<br>(0~95)        | STOP     |
| F05.01<br>(0x0501) | X2 Function | V/F SVC<br>See the functions of terminal X. | 2<br>(0~95)        | STOP     |
| F05.02<br>(0x0502) | X3 Function | V/F SVC<br>See the functions of terminal X. | 4<br>(0~95)        | STOP     |

|                    |             |                                             |             |      |
|--------------------|-------------|---------------------------------------------|-------------|------|
| F05.03<br>(0x0503) | X4 Function | V/F SVC<br>See the functions of terminal X. | 8<br>(0~95) | STOP |
|--------------------|-------------|---------------------------------------------|-------------|------|

**F05.1x: X1~X4 Detection Delay**

| Code<br>(Address)  | Name            | Content                                               | Default<br>(Range)            | Property |
|--------------------|-----------------|-------------------------------------------------------|-------------------------------|----------|
| F05.10<br>(0x050A) | X1 ON<br>Delay  | V/F SVC<br>Delay time for terminal X1 from OFF to ON. | 0.010s<br>(0.000s~<br>6.000s) | RUN      |
| F05.11<br>(0x050B) | X1 OFF<br>Delay | V/F SVC<br>Delay time for terminal X1 from ON to OFF. | 0.010s<br>(0.000s~<br>6.000s) | RUN      |
| F05.12<br>(0x050C) | X2 ON<br>Delay  | V/F SVC<br>Delay time for terminal X2 from OFF to ON. | 0.010s<br>(0.000s~<br>6.000s) | RUN      |
| F05.13<br>(0x050D) | X2 OFF<br>Delay | V/F SVC<br>Delay time for terminal X2 from ON to OFF. | 0.010s<br>(0.000s~<br>6.000s) | RUN      |
| F05.14<br>(0x050E) | X3 ON<br>Delay  | V/F SVC<br>Delay time for terminal X3 from OFF to ON. | 0.010s<br>(0.000s~<br>6.000s) | RUN      |
| F05.15<br>(0x050F) | X3 OFF<br>Delay | V/F SVC<br>Delay time for terminal X3 from ON to OFF. | 0.010s<br>(0.000s~<br>6.000s) | RUN      |
| F05.16<br>(0x0510) | X4 ON<br>Delay  | V/F SVC<br>Delay time for terminal X4 from OFF to ON. | 0.330s<br>(0.000s~<br>6.000s) | RUN      |
| F05.17<br>(0x0511) | X4 OFF<br>Delay | V/F SVC<br>Delay time for terminal X4 from ON to OFF. | 0.330s<br>(0.000s~<br>6.000s) | RUN      |

**F05.2x: DI Terminal Mode**

| Code<br>(Address)  | Name                        | Content                                                                         | Default<br>(Range) | Property |
|--------------------|-----------------------------|---------------------------------------------------------------------------------|--------------------|----------|
| F05.20<br>(0x0514) | Terminal<br>Control<br>Mode | V/F SVC<br>0: Two-wire 1<br>1: Two-wire 2<br>2: Three-wire 1<br>3: Three-wire 2 | 0<br>(0~3)         | STOP     |

|                    |                                                   |                                                                                                                          |                                          |      |
|--------------------|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------|
| F05.22<br>(0x0516) | X1~X4<br>Terminal<br>Characteristics              | V/F SVC<br>0: ON when closed<br>1: ON when open<br>Ones-bit: X1<br>Tens-bit: X2<br>Hundreds-bit: X3<br>Thousands-bit: X4 | 0000<br>(0000~<br>1111)                  | RUN  |
| F05.25<br>(0x0519) | Terminal<br>UP/DW                                 | V/F SVC<br>0: Power-down save ON<br>1: Power-down save OFF<br>2: Modifiable during operation, cleared<br>after shutdown  | 0<br>(0~2)                               | STOP |
| F05.26<br>(0x051A) | Terminal<br>UP/DW<br>Frequency<br>ACC/DEC<br>Rate | V/F SVC<br>Set the frequency ACC/DEC rate on the<br>UP/DW terminal.                                                      | 0.50Hz/s<br>(0.01Hz/s~5<br>0.00<br>Hz/s) | RUN  |
| F05.27<br>(0x051B) | Emergency<br>Stop DEC.<br>Time                    | V/F SVC<br>Set the deceleration time once<br>emergency stop command is given via<br>the terminals.                       | 1.00s<br>(0.01s~<br>650.00s)             | RUN  |

**F05.3x: PUL Terminal**

| Code<br>(Address)  | Name                            | Content                                                                                                                                                                    | Default<br>(Range)                  | Property |
|--------------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------|
| F05.31<br>(0x051F) | Min.<br>Frequency               | V/F SVC<br>Set the min. frequency that can be<br>accepted by the PUL terminal. If the<br>frequency given is below this value,<br>drive will still process by this setting. | 0.00kHz<br>(0.00kHz~<br>500.00kHz)  | RUN      |
| F05.32<br>(0x0520) | Min.<br>Frequency<br>Percentage | V/F SVC<br>Set the percentage of the min. input<br>frequency of the PUL terminal.                                                                                          | 0.00%<br>(0.00%~<br>100.00%)        | RUN      |
| F05.33<br>(0x0521) | Max.<br>Frequency               | V/F SVC<br>Set the max. frequency that can be<br>accepted by the PUL terminal. If the<br>frequency given is above this value,<br>drive will still process by this setting. | 50.00kHz<br>(0.00kHz~<br>500.00kHz) | RUN      |

|                    |                                 |                                                                                                                     |                                     |     |
|--------------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------|-----|
| F05.34<br>(0x0522) | Max.<br>Frequency<br>Percentage | V/F SVC<br>Set the percentage of the max. input<br>frequency of the PUL terminal.                                   | 100.00%<br>(0.00%~<br>100.00%)      | RUN |
| F05.35<br>(0x0523) | Filter Time                     | V/F SVC<br>Set the size of the filter applied to the<br>pulse signal to remove interference to the<br>PUL terminal. | 0.100s<br>(0.000s~<br>9.000s)       | RUN |
| F05.36<br>(0x0524) | PUL OFF<br>Frequency            | V/F SVC<br>Frequencies below this parameter are no<br>longer recognized by the drive and are<br>processed as 0Hz.   | 0.010kHz<br>(0.000kHz~<br>1.000kHz) | RUN |

**F05.4x: AI Parameters**

| Code<br>(Address)  | Name                     | Content                                                              |                                                                                               | Default<br>(Range)      | Property |
|--------------------|--------------------------|----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-------------------------|----------|
| F05.40<br>(0x0528) | Signal Type<br>Selection | V/F SVC<br>0: DIP switch<br>1: Reserved                              |                                                                                               | 0<br>(0~1)              | RUN      |
| F05.41<br>(0x0529) | Signal Type              | V/F SVC<br>0: Voltage 0V~10V<br>1: Current 0mA~20mA                  |                                                                                               | 0<br>(0~1)              | RUN      |
| F05.43<br>(0x052B) | Curve                    | V/F SVC<br>0: Straight line<br>(default)<br>1: Curve 1<br>2: Curve 2 | Ones-bit: AI<br>Tens-bit: Reserved<br>Hundreds-bit:<br>Reserved<br>Thousands-bit:<br>Reserved | 0000<br>(0000~<br>2222) | RUN      |

**F05.5x: AI Linear Parameters**

| Code<br>(Address)  | Name        | Content                                                                                                                                                                | Default<br>(Range)        | Property |
|--------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|----------|
| F05.50<br>(0x0532) | Lower Limit | V/F SVC<br>Define the lower limit of the signal<br>received by the terminal. If the voltage<br>given is below this value, drive will still<br>process by this setting. | 0.0%<br>(0.0%~<br>100.0%) | RUN      |

|                    |                           |                                                                                                                                                                        |                                 |     |
|--------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----|
| F05.51<br>(0x0533) | Lower Limit<br>Percentage | V/F SVC<br>Set the percentage of the set value.                                                                                                                        | 0.00%<br>(-100.00%~1<br>00.00%) | RUN |
| F05.52<br>(0x0534) | Upper Limit               | V/F SVC<br>Define the upper limit of the signal<br>received by the terminal. If the voltage<br>given is above this value, drive will still<br>process by this setting. | 100.0%<br>(0.0%~<br>100.0%)     | RUN |
| F05.53<br>(0x0535) | Upper Limit<br>Percentage | V/F SVC<br>Set the percentage of the set value.                                                                                                                        | 100.00%<br>(0.00%~<br>100.00%)  | RUN |
| F05.54<br>(0x0536) | Filter Time               | V/F SVC<br>Define the size of the filter applied to the<br>analog signal to remove interference to<br>the AI terminal.                                                 | 0.100s<br>(0.000s~<br>6.000s)   | RUN |

**F05.6x: AI Curve 1**

| Code<br>(Address)  | Name                                | Content                                                             | Default<br>(Range)               | Property |
|--------------------|-------------------------------------|---------------------------------------------------------------------|----------------------------------|----------|
| F05.60<br>(0x053C) | Lower Limit                         | V/F SVC<br>Set the lower limit for curve 1.                         | 0.0%<br>(0.0%~<br>100.0%)        | RUN      |
| F05.61<br>(0x053D) | Lower Limit<br>Percentage           | V/F SVC<br>Set the percentage of the set value.                     | 0.00%<br>(-100.00%~<br>100.00%)  | RUN      |
| F05.62<br>(0x053E) | Inflection Point<br>1 Input Voltage | V/F SVC<br>Set the inflection point 1 input<br>voltage for curve 1. | 30.0%<br>(0.0%~<br>100.0%)       | RUN      |
| F05.63<br>(0x053F) | Inflection Point<br>1 Percentage    | V/F SVC<br>Set the percentage of the set value.                     | 30.00%<br>(-100.00%~<br>100.00%) | RUN      |
| F05.64<br>(0x0540) | Inflection Point<br>2 Input Voltage | V/F SVC<br>Set the inflection point 2 input<br>voltage for curve 1. | 60.0%<br>(0.0%~<br>100.0%)       | RUN      |
| F05.65<br>(0x0541) | Inflection Point<br>2 Percentage    | V/F SVC<br>Set the percentage of the set value.                     | 60.00%<br>(-100.00%~<br>100.00%) | RUN      |
| F05.66<br>(0x0542) | Upper Limit                         | V/F SVC<br>Set the upper limit for curve 1.                         | 100.0%<br>(0.0%~<br>100.0%)      | RUN      |

|                    |                           |                                                 |                                   |     |
|--------------------|---------------------------|-------------------------------------------------|-----------------------------------|-----|
| F05.67<br>(0x0543) | Upper Limit<br>Percentage | V/F SVC<br>Set the percentage of the set value. | 100.00%<br>(-100.00%~<br>100.00%) | RUN |
|--------------------|---------------------------|-------------------------------------------------|-----------------------------------|-----|

**F05.7x: AI Curve 2**

| Code<br>(Address)  | Name                                | Content                                                             | Default<br>(Range)                | Property |
|--------------------|-------------------------------------|---------------------------------------------------------------------|-----------------------------------|----------|
| F05.70<br>(0x0546) | Lower Limit                         | V/F SVC<br>Set the lower limit for curve 2.                         | 0.0%<br>(0.0%~<br>100.0%)         | RUN      |
| F05.71<br>(0x0547) | Lower Limit<br>Percentage           | V/F SVC<br>Set the percentage of the set value.                     | 0.00%<br>(-100.00%~<br>100.00%)   | RUN      |
| F05.72<br>(0x0548) | Inflection Point<br>1 Input Voltage | V/F SVC<br>Set the inflection point 1 input<br>voltage for curve 2. | 30.0%<br>(0.0%~<br>100.0%)        | RUN      |
| F05.73<br>(0x0549) | Inflection Point<br>1 Percentage    | V/F SVC<br>Set the percentage of the set value.                     | 30.00%<br>(-100.00%~<br>100.00%)  | RUN      |
| F05.74<br>(0x054A) | Inflection Point<br>2 Input Voltage | V/F SVC<br>Set the inflection point 2 input<br>voltage for curve 2. | 60.0%<br>(0.0%~<br>100.0%)        | RUN      |
| F05.75<br>(0x054B) | Inflection Point<br>2 Percentage    | V/F SVC<br>Set the percentage of the set value.                     | 60.00%<br>(-100.00%~<br>100.00%)  | RUN      |
| F05.76<br>(0x054C) | Upper Limit                         | V/F SVC<br>Set the upper limit for curve 2.                         | 100.0%<br>(0.0%~<br>100.0%)       | RUN      |
| F05.77<br>(0x054D) | Upper Limit<br>Percentage           | V/F SVC<br>Set the percentage of the set value.                     | 100.00%<br>(-100.00%~<br>100.00%) | RUN      |

**F05.8x: AI as DI Terminal**

| Code<br>(Address)  | Name                 | Content                                                               | Default<br>(Range)                                                                                          | Property |
|--------------------|----------------------|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------|
| F05.80<br>(0x0550) | AI as DI<br>Terminal | V/F SVC<br>0: ON at low level<br>1: OFF at high level<br>Ones-bit: AI | Tens-bit:<br>Reserved<br>Hundreds-bit:<br>Reserved<br>Thousands-bit:<br>Reserved<br>0000<br>(0000~<br>1111) | RUN      |

|                    |                                |                                                                       |                           |     |
|--------------------|--------------------------------|-----------------------------------------------------------------------|---------------------------|-----|
| F05.81<br>(0x0551) | AI Function<br>(as Terminal X) | V/F SVC<br>See Terminal X Function.                                   | 0<br>(0~95)               | RUN |
| F05.82<br>(0x0552) | High Level                     | V/F SVC<br>Any value beyond this setting is considered as high level. | 70.00%<br>(0.00%~100.00%) | RUN |
| F05.83<br>(0x0553) | Low Level                      | V/F SVC<br>Any value below this setting is considered as low level.   | 30.00%<br>(0.00%~100.00%) | RUN |

## 4.10 F06: Output Terminal

### F06.0x: AO (Analog Output)

| Code<br>(Address)  | Name    | Content                                                                                                                                                                                             |                                                                                                                                                                                                       | Default<br>(Range)      | Property |
|--------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------|
| F06.00<br>(0x0600) | Mode    | V/F SVC<br>0: 0V~10V<br>1: 4.00mA~20.00mA                                                                                                                                                           | 2: 0.00mA~20.00mA<br>3: FM high-speed pulse<br>Note: PUL output is supported for 7.5kW to 22kW.                                                                                                       | 0<br>(0~3)              | RUN      |
| F06.01<br>(0x0601) | Content | V/F SVC<br>0: Target frequency<br>1: Output frequency<br>2: Output current<br>3: Input voltage<br>4: Output voltage<br>5: Mechanical speed<br>6: Target torque<br>7: Output torque<br>8: PID target | 10: Output power<br>11: Bus voltage<br>12: AI value<br>13: Reserved<br>14: Reserved<br>15: PUL input<br>16: Module temperature 1<br>17: Module temperature 2<br>18: RS485<br>19: Virtual terminal vY1 | 0<br>(0~19)             | RUN      |
| F06.02<br>(0x0602) | Gain    | V/F SVC<br>Set the gain value of the analog output.                                                                                                                                                 |                                                                                                                                                                                                       | 100.0%<br>(0.0%~300.0%) | RUN      |

|                     |                      |                                                                                                                  |                                 |     |
|---------------------|----------------------|------------------------------------------------------------------------------------------------------------------|---------------------------------|-----|
| F06.003<br>(0x0603) | Bias                 | V/F SVC<br>Set the bias of the analog output. Used to adjust the zero point of the terminal output.              | 0.0%<br>(-10.0%~10.0%)          | RUN |
| F06.04<br>(0x0604)  | Filter Time          | V/F SVC<br>Define the size of the filter applied to the analog signal to remove interference to the AO terminal. | 0.010s<br>(0.000s~6.000s)       | RUN |
| F06.05<br>(0x0605)  | AO as FM Lower Limit | V/F SVC<br>Set AO as the lower limit of the FM frequency.                                                        | 0.20kHz<br>(0.00kHz~10.00 kHz)  | RUN |
| F06.06<br>(0x0606)  | AO as FM Upper Limit | V/F SVC<br>Set AO as the upper limit of the FM frequency.                                                        | 50.00kHz<br>(0.00kHz~10.00 kHz) | RUN |

**F06.1x: Reserved****F06.2x~ F06.2x: DO and RO**

| Code<br>(Address)  | Name                     | Content                                                       |                                                                              | Default<br>(Range)         | Property |
|--------------------|--------------------------|---------------------------------------------------------------|------------------------------------------------------------------------------|----------------------------|----------|
| F06.20<br>(0x0614) | Output Terminal Polarity | V/F SVC<br>0: Positive<br>1: Negative<br>Ones-bit: Terminal Y | Tens-bit: RO terminal 1<br>Hundreds-bit: Reserved<br>Thousands-bit: Reserved | 0000<br>(0000~1111)        | RUN      |
| F06.21<br>(0x0615) | Output Terminal Y        | V/F SVC<br>See Terminal Y Function.                           |                                                                              | 1<br>(0~63)                | RUN      |
| F06.22<br>(0x0616) | RO 1<br>(TA-TB-TC)       | V/F SVC<br>See Terminal Y Function.                           |                                                                              | 4<br>(0~63)                | RUN      |
| F06.25<br>(0x0619) | Y ON Delay               | V/F SVC<br>Set the delay time when Y is turned on.            |                                                                              | 0.010s<br>(0.000s~60.000s) | RUN      |
| F06.26<br>(0x061A) | Relay 1 ON Delay         | V/F SVC<br>Set the delay time when Relay 1 is turned on.      |                                                                              | 0.010s<br>(0.000s~60.000s) | RUN      |

|                    |                      |                                                              |                                |     |
|--------------------|----------------------|--------------------------------------------------------------|--------------------------------|-----|
| F06.29<br>(0x061D) | Y OFF<br>Delay       | V/F SVC<br>Set the delay time when Y is turned off.          | 0.010s<br>(0.000s~<br>60.000s) | RUN |
| F06.30<br>(0x061E) | Relay 1 OFF<br>Delay | V/F SVC<br>Set the delay time when Relay 1 is<br>turned off. | 0.010s<br>(0.000s~<br>60.000s) | RUN |

**F06.4x: Frequency Detection**

| Code<br>(Address)  | Name                          | Content                                                        | Default<br>(Range)                       | Property |
|--------------------|-------------------------------|----------------------------------------------------------------|------------------------------------------|----------|
| F06.40<br>(0x0628) | Frequency<br>Level 1          | V/F SVC<br>Set the frequency detection level 1.                | 2.00Hz<br>(0.00Hz~<br>Max.<br>frequency) | RUN      |
| F06.41<br>(0x0629) | Frequency<br>Range 1          | V/F SVC<br>Set the frequency detection range 1.                | 1.00Hz<br>(0.00Hz~<br>Max.)              | RUN      |
| F06.42<br>(0x062A) | Frequency<br>Level 2          | V/F SVC<br>Set the frequency detection level 2.                | 2.00Hz<br>(0.00Hz~<br>Max.<br>frequency) | RUN      |
| F06.43<br>(0x062B) | Frequency<br>Range 2          | V/F SVC<br>Set the frequency detection range 2.                | 1.00Hz<br>(0.00Hz~<br>Max.<br>frequency) | RUN      |
| F06.44<br>(0x062C) | Frequency<br>Arrival<br>Range | V/F SVC<br>Set the detection range of the target<br>frequency. | 2.00Hz<br>(0.00Hz~<br>Max.<br>frequency) | RUN      |

**F06.5x: Comparator Monitoring**

| Code<br>(Address)  | Name      | Content                                                                                                                                                       | Default<br>(Range)      | Property |
|--------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------|
| F06.50<br>(0x0632) | CP 1 Item | V/F SVC<br>Ones- and tens-bit: Set 00~63 to yyy in<br>monitor parameter Cxx.yy<br>Hundreds- and thousands-bit: Set 00~07<br>to xx in monitor parameter Cxx.yy | 0001<br>(0000~<br>0763) | RUN      |

|                    |                     |                                                                                                                                                               |                         |     |
|--------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----|
| F06.51<br>(0x0633) | CP 1 Upper<br>Limit | V/F SVC<br>Set the comparator 1 upper limit.                                                                                                                  | (up to<br>F06.50)       | RUN |
| F06.52<br>(0x0634) | CP 1 Lower<br>Limit | V/F SVC<br>Set the comparator 1 lower limit.                                                                                                                  | (up to<br>F06.50)       | RUN |
| F06.53<br>(0x0635) | CP 1 Bias           | V/F SVC<br>Set the comparator 1 bias.                                                                                                                         | (up to<br>F06.50)       | RUN |
| F06.54<br>(0x0636) | CP 1 Mode           | V/F SVC<br>0: Continue operation (DO terminal<br>only)<br>1: Report alarm and free stop<br>2: Report warning and continue<br>operation<br>3: Force stop       | 0<br>(0~3)              | RUN |
| F06.55<br>(0x0637) | CP 2 Item           | V/F SVC<br>Ones- and tens-bit: Set 00~63 to yyy in<br>monitor parameter Cxx.yy<br>Hundreds- and thousands-bit: Set 00~07<br>to xx in monitor parameter Cxx.yy | 0002<br>(0000~<br>0763) | RUN |
| F06.56<br>(0x0638) | CP 2 Upper<br>Limit | V/F SVC<br>Set the comparator 2 upper limit.                                                                                                                  | (up to<br>F06.55)       | RUN |
| F06.57<br>(0x0639) | CP 2 Lower<br>Limit | V/F SVC<br>Set the comparator 2 lower limit.                                                                                                                  | (up to<br>F06.55)       | RUN |
| F06.58<br>(0x063A) | CP 2 Bias           | V/F SVC<br>Set the comparator 2 bias.                                                                                                                         | (up to<br>F06.55)       | RUN |
| F06.59<br>(0x063B) | CP 2 Mode           | V/F SVC<br>0: Continue operation (DO terminal<br>only)<br>1: Report alarm and free stop<br>2: Report warning and continue<br>operation<br>3: Force stop       | 0<br>(0~3)              | RUN |

**F06.6x~F06.7x: Virtual I/O Terminal**

| <b>Code<br/>(Address)</b>                     | <b>Name</b>                      | <b>Content</b>                                                                                                                 |                                                                                       | <b>Default<br/>(Range)</b>     | <b>Proper<br/>ty</b> |
|-----------------------------------------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------|----------------------|
| F06.60<br>(0x063C)<br>~<br>F06.63<br>(0x063F) | vX1~ vX4<br>Terminal<br>Function | V/F SVC<br>See the functions of terminal X.                                                                                    |                                                                                       | 0<br>(0~95)                    | STOP                 |
| F06.64<br>(0x0640)                            | vX Status<br>Source              | V/F SVC<br>0: Internal<br>connection with<br>vYn terminal<br>1: Physical<br>connection with Xn<br>terminal<br>2: Function code | Ones-bit:<br>vX1<br>Tens-bit:<br>vX2<br>Hundreds-bit:<br>vX3<br>Thousands-bit:<br>vX4 | 0000<br>(0000~<br>2222)        | RUN                  |
| F06.65<br>(0x0641)                            | vX Status<br>from<br>Funcode     | V/F SVC<br>0: OFF<br>1: ON<br>Ones-bit: vX1                                                                                    | Tens-bit: vX2<br>Hundreds-bit:<br>vX3<br>Thousands-bit:<br>vX4                        | 0000<br>(0000~<br>111)         | RUN                  |
| F06.66<br>(0x0642)<br>~<br>F06.69<br>(0x0645) | vY1~vY4<br>Function              | V/F SVC<br>See Terminal Y Function.                                                                                            |                                                                                       | 0<br>(0~63)                    | RUN                  |
| F06.70<br>(0x0646)<br>~<br>F06.73<br>(0x0649) | vY1~vY4<br>ON Delay              | V/F SVC<br>Set delay time from OFF to ON of vY1~<br>vY4.                                                                       |                                                                                       | 0.010s<br>(0.000s~<br>60.000s) | RUN                  |
| F06.74<br>(0x064A)<br>~<br>F06.77<br>(0x064D) | vY1~vY4<br>OFF Delay             | V/F SVC<br>Set delay time from ON to OFF of vY1~<br>vY4.                                                                       |                                                                                       | 0.010s<br>(0.000s~<br>60.000s) | RUN                  |

## 4.11 F07: Operation Control

### F07.0x: Start Control

| Code (Address)     | Name                  | Content                                                                                                                                                                                                                                                                                                                                                              | Default (Range)                                       | Property |
|--------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------|
| F07.00<br>(0x0700) | Start Mode            | V/F SVC<br>0: Start at starting frequency<br>1: Start from DC braking and then at starting frequency<br>2: Start from fly track and direction identification<br>Note: T/S2 models do not support the fly track.                                                                                                                                                      | 0<br>(0~2)                                            | STOP     |
| F07.01<br>(0x0701) | Excitation Start Time | V/F SVC<br>Only asynchronous motors in SVC supports pre-excitation.<br>Note: T/S2 models do not support this parameter.                                                                                                                                                                                                                                              | 0.00s<br>(0.00s~60.00s)                               | STOP     |
| F07.02<br>(0x0702) | Start Frequency       | V/F SVC<br>Stay in standby status instead of starting when the given frequency is lower than this value.                                                                                                                                                                                                                                                             | 0.50Hz<br>(0.00Hz~Up per limit frequency from keypad) | STOP     |
| F07.03<br>(0x0703) | Terminal Protection   | V/F SVC<br>0: OFF<br>1: ON<br>Ones-bit: ON when terminals under abnormal exit<br>Tens-bit: ON when jogging terminals under abnormal exit<br>Hundreds-bit: ON when command source switched to terminals<br>Thousands-bit: Reserved<br><b>Note:</b> The terminal protection is enabled by default when the free stop, emergency stop or forced stop command are valid. | 0111<br>(0000~1111)                                   | STOP     |

|                    |                                         |                                                                                                                                                                                                 |                                                                                                                                                                            |                             |      |
|--------------------|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------|
| F07.05<br>(0x0705) | Operation<br>Direction                  | V/F SVC<br>Ones-bit:<br>Operation<br>Direction<br>0: Keep direction<br>1: Reverse<br>direction<br>Tens-bit:<br>Operation<br>direction disable<br>0: FWD and REV<br>commands are<br>both allowed | 1: Only FWD<br>command allowed<br>2: Only REV<br>command allowed<br>Hundreds-bit:<br>Frequency-based<br>direction control<br>0: ON<br>1: OFF<br>Thousands-bit:<br>Reserved | 0000<br>(0000~<br>1121)     | STOP |
|                    |                                         | <b>Note:</b> This value will not be reset during initialization; and the ones-bit value will not be changed after parameter download.                                                           |                                                                                                                                                                            |                             |      |
| F07.06<br>(0x0706) | Power-OFF<br>Restart                    | V/F SVC<br>0: Invalid<br>1: Start from fly track<br>2: Start as startup mode setting                                                                                                            |                                                                                                                                                                            | 0<br>(0~2)                  | STOP |
| F07.07<br>(0x0707) | Power-OFF<br>Restart<br>Waiting<br>Time | V/F SVC<br>Set the waiting time for restart after<br>power failure.                                                                                                                             |                                                                                                                                                                            | 0.50s<br>(0.00s~<br>60.00s) | STOP |

**F07.1x: Stop Control**

| Code<br>(Address)  | Name                | Content                                                                                                           | Default<br>(Range)                              | Property |
|--------------------|---------------------|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|----------|
| F07.10<br>(0x070A) | Stop Mode           | V/F SVC<br>0: Deceleration stop<br>1: Free stop                                                                   | 0<br>(0~1)                                      | RUN      |
| F07.11<br>(0x070B) | Stop<br>Frequency   | V/F SVC<br>In deceleration stop mode, the drive will<br>stop if the output frequency is lower than<br>this value. | 0.50Hz<br>(0.00Hz~<br>Upper limit<br>frequency) | RUN      |
| F07.12<br>(0x070C) | Restart Min<br>Time | V/F SVC<br>Set waiting time to restart after operation<br>pause.                                                  | 0.000s<br>(0.000s~<br>60.000s)                  | STOP     |

|                    |                                  |                                                                                                                             |                        |      |
|--------------------|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------|------------------------|------|
| F07.15<br>(0x070F) | Under-Lower Limit Frequency Mode | V/F SVC<br>0: Run at frequency command<br>1: Free stop and pause<br>2: Run at lower limit frequency<br>3: Run at zero speed | 2<br>(0~3)             | RUN  |
| F07.16<br>(0x0710) | Zero Frequency Torque            | V/F SVC<br>Set the torque current during zero-frequency operation, 100.0% of the rated drive current.                       | 60.0%<br>(0.0%~150.0%) | RUN  |
| F07.17<br>(0x0711) | Zero Frequency Torque Time       | V/F SVC<br>Set the holding time for zero frequency operation.                                                               | 0.0s<br>(0.0s~6000.0s) | RUN  |
| F07.18<br>(0x0712) | FED/REV Deadband Time            | V/F SVC<br>Set zero frequency holding time during FWD/REV switching.                                                        | 0.0s<br>(0.0s~120.0s)  | STOP |

### F07.2x: DC Brake and Fly Track

| Code (Address)     | Name                     | Content                                                                                                                 | Default (Range)            | Property |
|--------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------|----------------------------|----------|
| F07.20<br>(0x0714) | Start DC Brake Current   | V/F SVC<br>100.0% of the rated motor current, the upper limit of the braking current is the rated current of the drive. | 60.0%<br>(0.0%~150.0%)     | STOP     |
| F07.21<br>(0x0715) | Start DC Brake Hold Time | V/F SVC<br>Set DC braking time before startup.                                                                          | 0.0s<br>(0.0s~60.0s)       | STOP     |
| F07.22<br>(0x0716) | Stop DC Brake Frequency  | V/F SVC<br>Set the DC braking start frequency.                                                                          | 1.00Hz<br>(0.00Hz~50.00Hz) | STOP     |
| F07.23<br>(0x0717) | DC Brake Current         | V/F SVC<br>The reference is the rated current of the motor, and it's limited by the rated drive current.                | 60.0%<br>(0.0%~150.0%)     | STOP     |
| F07.24<br>(0x0718) | Stop DC Brake Hold Time  | V/F SVC<br>Set the DC braking time during stop.                                                                         | 0.0s<br>(0.0s~60.0s)       | STOP     |

|                    |                   |                                                                                                                                          |                                                                                               |                         |      |
|--------------------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-------------------------|------|
| F07.25<br>(0x0719) | Fly Track         | V/F SVC<br>Ones-bit: Search mode<br>0: Search from max. frequency<br>1: Search from stop frequency<br>Tens-bit: Reverse search<br>0: OFF | 1: ON<br>Hundreds-bit: Search source<br>0: Software<br>1: Hardware<br>Thousands-bit: Reserved | 0000<br>(0000~1111)     | STOP |
| F07.26<br>(0x071A) | Fly Track Time    | V/F SVC<br>Set the fly track time.                                                                                                       |                                                                                               | 0.50s<br>(0.00s~60.00s) | STOP |
| F07.27<br>(0x071B) | Fly Track Delay   | V/F SVC<br>Set the fly track stop delay.                                                                                                 |                                                                                               | 1.00s<br>(0.00s~60.00s) | STOP |
| F07.28<br>(0x071C) | Fly Track Current | V/F SVC<br>Set the fly track current.                                                                                                    |                                                                                               | 120.0%<br>(0.0%~400.0%) | STOP |

**F07.3x: Jogging**

| Code (Address)     | Name          | Content                                                               | Default (Range)                   | Property |
|--------------------|---------------|-----------------------------------------------------------------------|-----------------------------------|----------|
| F07.30<br>(0x071E) | Jog Frequency | V/F SVC<br>Set the jogging frequency.                                 | 5.00Hz<br>(0.00Hz~Max. frequency) | RUN      |
| F07.31<br>(0x071F) | Jog ACC Time  | V/F SVC<br>Set the jogging acceleration time.                         | 10.00s<br>(0.00s~650.00s)         | RUN      |
| F07.32<br>(0x0720) | Jog DEC Time  | V/F SVC<br>Set the jogging deceleration time.                         | 10.00s<br>(0.00s~650.00s)         | RUN      |
| F07.33<br>(0x0721) | S-curve Jog   | V/F SVC<br>0: OFF<br>1: ON                                            | 1<br>(0~1)                        | RUN      |
| F07.34<br>(0x0722) | Jog Stop Mode | V/F SVC<br>0: Same as the mode in F07.10<br>1: Deceleration stop only | 0<br>(0~1)                        | RUN      |

**F07.4x: Hold and Jump Frequency during Start/Stop**

| Code (Address)  | Name                 | Content                                                                                                                                                                                                                                                                                       | Default (Range)                                      | Property |
|-----------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|----------|
| F07.40 (0x0728) | Start Hold Frequency | V/F SVC<br>It is higher than the starting frequency and lower than the upper limit frequency set from the keypad.                                                                                                                                                                             | 0.50Hz<br>(0.00Hz~Upper limit frequency from keypad) | STOP     |
| F07.41 (0x0729) | Start Hold Time      | V/F SVC<br>The set value should be greater than the starting frequency, and if it is lower, start at starting frequency.                                                                                                                                                                      | 0.00s<br>(0.00s~60.00s)                              | STOP     |
| F07.42 (0x072A) | Stop Hold Frequency  | V/F SVC<br>Set the stop hold frequency.                                                                                                                                                                                                                                                       | 0.50Hz<br>(0.00Hz~Upper limit frequency from keypad) | STOP     |
| F07.43 (0x072B) | Stop Hold Time       | V/F SVC<br>Invalid during terminal DC braking and jogging. When the stop DC braking is active, it is invalid when the stop hold frequency is lower than the stop DC braking frequency. When inactive, it is invalid when the stop hold frequency is lower than the stop DC braking frequency. | 0.00s<br>(0.00s~60.00s)                              | STOP     |
| F07.44 (0x072C) | Jump Frequency 1     | V/F SVC<br>Set the jump frequency 1.                                                                                                                                                                                                                                                          | 0.00Hz<br>(0.00Hz~Max. frequency)                    | RUN      |
| F07.45 (0x072D) | Jump Frequency Range | V/F SVC<br>Set the range of jump frequency.                                                                                                                                                                                                                                                   | 0.00Hz<br>(0.00Hz~Max. frequency)                    | RUN      |

|                    |                            |                                             |                                          |     |
|--------------------|----------------------------|---------------------------------------------|------------------------------------------|-----|
| F07.46<br>(0x072E) | Jump<br>Frequency<br>2     | V/F SVC<br>Set the jump frequency 2.        | 0.00Hz<br>(0.00Hz~<br>Max.<br>frequency) | RUN |
| F07.47<br>(0x072F) | Jump<br>Frequency<br>Range | V/F SVC<br>Set the range of jump frequency. | 0.00Hz<br>(0.00Hz~<br>Max.<br>frequency) | RUN |

## 4.12 F08: Auxiliary Control

### F08.0x: Counting and Timing

| Code<br>(Address)  | Name                | Content                                                                                       |                                | Default<br>(Range)       | Property |
|--------------------|---------------------|-----------------------------------------------------------------------------------------------|--------------------------------|--------------------------|----------|
| F08.00<br>(0x0800) | Counter<br>Source   | V/F SVC<br>0: Common X<br>terminal                                                            | 1: PUL terminal<br>2: Reserved | 0<br>(0~2)               | RUN      |
| F08.01<br>(0x0801) | Counter<br>Division | V/F SVC<br>Set the counting division for input.                                               |                                | 0<br>(0~6000)            | RUN      |
| F08.02<br>(0x0802) | Max.<br>Counting    | V/F SVC<br>Set the max. value for the counting<br>circuit.                                    |                                | 1000<br>(0~65000)        | RUN      |
| F08.03<br>(0x0803) | Counter<br>Target   | V/F SVC<br>Set the target value for the counting<br>circuit.                                  |                                | 500<br>(0~65000)         | RUN      |
| F08.05<br>(0x0805) | Length              | V/F SVC<br>Increase the length to output, while reset<br>when one terminal length is reached. |                                | 1000m<br>(0m~<br>65535m) | STOP     |
| F08.06<br>(0x0806) | Actual<br>Length    | V/F SVC<br>No power-down storage.                                                             |                                | 0m<br>(0m~<br>65535m)    | STOP     |
| F08.07<br>(0x0807) | Timer Unit          | V/F SVC<br>0: Second (s)                                                                      | 1: Minute (min)<br>2: Hour (h) | 0<br>(0~2)               | STOP     |
| F08.08<br>(0x0808) | Timer<br>Target     | V/F SVC<br>Set the target value for timing.                                                   |                                | 0<br>(0~65000)           | STOP     |

**F08.1x~F08.2x: Reserved****F08.3x: Wobble-frequency Control**

| Code (Address)     | Name                     | Content                                                                                                                                 |                                                                                                                   | Default (Range)                   | Property |
|--------------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------|
| F08.30<br>(0x081E) | Wobble-frequency Control | V/F SVC<br>0: OFF<br>1: ON                                                                                                              |                                                                                                                   | 0<br>(0~1)                        | STOP     |
| F08.31<br>(0x081F) | Mode                     | V/F SVC<br>Ones-bit: Start method<br>0: Auto<br>1: Manual via terminal<br>Tens-bit: Wobble frequency range<br>0: Center frequency-based | 1: Max. frequency-based<br>Hundreds-bit: Preset frequency<br>0: Disabled<br>1: Enabled<br>Thousands-bit: Reserved | 0000<br>(0000~0111)               | STOP     |
| F08.32<br>(0x0820) | Preset Frequency         | V/F SVC<br>Set the preset wobble frequency.                                                                                             |                                                                                                                   | 0.00Hz<br>(0.00Hz~Max. frequency) | STOP     |
| F08.33<br>(0x0821) | Preset Time              | V/F SVC<br>Set the preset wobble frequency waiting time.                                                                                |                                                                                                                   | 0.0s<br>(0.0s~3600.0s)            | STOP     |
| F08.34<br>(0x0822) | Range                    | V/F SVC<br>Set the wobble frequency range value.                                                                                        |                                                                                                                   | 10.0%<br>(0.0%~50.0%)             | STOP     |
| F08.35<br>(0x0823) | Jump Range               | V/F SVC<br>Set the wobble frequency jump range.                                                                                         |                                                                                                                   | 10.0%<br>(0.0%~50.0%)             | STOP     |
| F08.36<br>(0x0824) | ACC Time                 | V/F SVC<br>Set the ACC time for wobble-frequency control.                                                                               |                                                                                                                   | 5.00s<br>(0.00s~650.00s)          | STOP     |
| F08.37<br>(0x0825) | DEC Time                 | V/F SVC<br>Set the DEC time for wobble-frequency control.                                                                               |                                                                                                                   | 5.00s<br>(0.00s~650.00s)          | STOP     |

## 4.13 F09: Auxiliary Control 2

### F09.0x: Maintenance

| Code (Address)     | Name                   | Content                                                                                                                                             | Default (Range)               | Property |
|--------------------|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------|
| F09.02<br>(0x0902) | Maintenance Warning    | V/F SVC<br>Ones-bit: Cooling fan<br>0: OFF<br>1: ON<br>Tens-bit: Main relay<br>0: OFF<br>1: ON<br>Hundreds-bit: Reserved<br>Thousands-bit: Reserved | 0x0000<br>(0x0000~<br>0x1111) | RUN      |
| F09.03<br>(0x0903) | Fan Maintenance        | V/F SVC<br>Set it to 0 when replacing with a new fan, in hour.                                                                                      | 0<br>(0~<br>65535)            | STOP     |
| F09.04<br>(0x0904) | Main Relay Maintenance | V/F SVC<br>Set it to 0.0% when replacing the main relay                                                                                             | 0.0%<br>(0.0%~<br>150.0%)     | STOP     |

## 4.14 F10: Protection Parameters

### F10.0x: Current Protection

| Code (Address)     | Name             | Content                                                                                                                                                                                                                                  | Default (Range)             | Property |
|--------------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|----------|
| F10.00<br>(0x0A00) | Anti-OC Function | V/F SVC<br>Set the auto limit below the set overcurrent suppression point to prevent faults triggered by excessive current.<br>0: Suppression ON<br>1: Suppression ON during acceleration and deceleration and OFF during constant speed | 0<br>(0~1)                  | RUN      |
| F10.01<br>(0x0A01) | Anti-OC Current  | V/F SVC<br>Set load current limit level, 100% of the motor rated current.                                                                                                                                                                | 160.0%<br>(0.0%~<br>300.0%) | RUN      |
| F10.02<br>(0x0A02) | Anti-OC Gain     | V/F SVC<br>Set the response effect of overcurrent suppression.                                                                                                                                                                           | 100.0%<br>(0.0%~<br>500.0%) | RUN      |

|                    |                             |                                                                                                                                                                                                                                                                                                                                                                                                                             |                         |      |
|--------------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------|
| F10.03<br>(0x0A03) | Current Protection<br>1     | V/F SVC<br>Set current-related protection on/off.<br>Ones-bit: CBC<br>0: OFF<br>1: ON<br>Tens-bit: Anti-interference for OC protection<br>0: Normal<br>1: L1 interference suppression<br>2: L2 interference suppression<br>Hundreds-bit: Anti-interference for SC protection<br>0: Normal<br>1: L1 interference suppression<br>2: L2 interference suppression<br>Thousands-bit: SC/OC/OU fault reset delay<br>0: OFF; 1: ON | 0001<br>(0000~<br>F221) | STOP |
| F10.04<br>(0x0A04) | Current Protection<br>2     | V/F SVC<br>Ones-bit: Three-phase current sum protection<br>0: OFF<br>1: ON<br>Tens-bit: Three-phase current imbalance detection, report E. oLF4.<br>0: OFF<br>1: ON                                                                                                                                                                                                                                                         | 0001<br>(0000~<br>0011) | STOP |
| F10.05<br>(0x0A05) | Current Imbalance Threshold | V/F SVC<br>Compare the ratio of the largest to the smallest phase of the three-phase current with the set value here to see if it is current imbalance.                                                                                                                                                                                                                                                                     | 160%<br>(0%~<br>500%)   | STOP |
| F10.06<br>(0x0A06) | Current Imbalance Time      | V/F SVC<br>Increase this parameter under high current fluctuation.                                                                                                                                                                                                                                                                                                                                                          | 2.0<br>(0.0~60.0)       | STOP |

**F10.1x: Voltage Protection**

| Code (Address)     | Name                            | Content                                                                                                                                                                                                                                                                                            | Default (Range)                                                                                           | Property |
|--------------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|----------|
| F10.11<br>(0x0A0B) | Anti-OU<br>Busbar<br>Protection | V/F SVC<br>If the bus voltage is higher than the anti-OU point, acceleration and deceleration will be slowed down or canceled to prevent overvoltage faults.<br>Ones-bit: Anti-OU<br>0: OFF<br>1: ON<br>Tens-bit: Over-excitation<br>0: OFF<br>1: ON during deceleration<br>2: ON during operation | 0011<br>(0000~<br>0021)                                                                                   | STOP     |
| F10.12<br>(0x0A0C) | Anti-OU<br>Busbar<br>Point      | V/F SVC<br>Set the bus voltage value to trigger the anti-OU function.<br><b>Note:</b> T3 overvoltage point: 820V (750V~840V)<br>S2 overvoltage point: 400V (360V~410V)                                                                                                                             | T3: 750V<br>S2: 370V<br>(T3: 650V~800V<br>S2: 340V~380V)<br>Simultaneously limited by overvoltage points. | STOP     |
| F10.13<br>(0x0A0D) | Anti-OU<br>Busbar<br>Gain       | V/F SVC<br>Set the response effect of anti-OU function.                                                                                                                                                                                                                                            | 100.0%<br>(0.0%~<br>500.0%)                                                                               | RUN      |
| F10.14<br>(0x0A0E) | Dynamic<br>Brake                | V/F SVC<br>Set the dynamic brake on or off.<br>0: OFF<br>1: ON, with anti-OU function off<br>2: ON, with anti-OU function on                                                                                                                                                                       | 2<br>(0~2)                                                                                                | RUN      |
| F10.15<br>(0x0A0F) | Dynamic<br>Brake<br>Voltage     | V/F SVC<br>Set the dynamic brake voltage to start when the bus voltage is higher than this value.<br><b>Note:</b> T3 overvoltage point: 820V (750V~840V)<br>S2 overvoltage point: 400V (360V~410V)                                                                                                 | T3: 740V<br>S2: 360V<br>(T3: 650V~800V<br>S2: 350V~390V)<br>Simultaneously limited by overvoltage points. | RUN      |

|                    |                             |                                                                                                                                                                                                                                        |                                                                                                                    |      |
|--------------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|------|
| F10.16<br>(0x0A10) | Anti-LU<br>Function         | V/F SVC<br>Auto adjust the operation frequency<br>when the bus voltage is lower than the<br>anti-LU point to prevent undervoltage<br>fault<br>0: OFF<br>1: ON                                                                          | 0<br>(0~1)                                                                                                         | STOP |
| F10.17<br>(0x0A11) | Anti-LU<br>Voltage          | V/F SVC<br>Set bus voltage value to trigger the<br>anti-LU function.<br><b>Note:</b> T3 overvoltage point: 820V<br>(750V~840V)<br>S2 overvoltage point: 400V<br>(360V~410V)                                                            | T3: 430V<br>S2: 240V<br>(T3: 350V~450V<br>S2: 180V~260V)<br>Simultaneously<br>limited by<br>overvoltage<br>points. | STOP |
| F10.18<br>(0x0A12) | Anti-LU<br>Gain             | V/F SVC<br>Set the response effect of anti-LU<br>function.                                                                                                                                                                             | 100.0%<br>(0.0%~<br>500.0%)                                                                                        | RUN  |
| F10.19<br>(0x0A13) | LU<br>Protection<br>Voltage | V/F SVC<br>Set the lower limit voltage of the<br>busbar voltage allowed, report<br>undervoltage fault when below this<br>value.<br><b>Note:</b> T3 overvoltage point: 820V<br>(750V~840V)<br>S2 overvoltage point: 400V<br>(360V~410V) | T3: 320V<br>S2: 190V<br>(T3: 300V~400V<br>S2: 160V~240V)<br>Simultaneously<br>limited by<br>overvoltage<br>points. | STOP |

**F10.2x: Auxiliary Protection**

| Code<br>(Address)  | Name                            | Content                                                                                                                              | Default<br>(Range)      | Proper<br>ty |
|--------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--------------|
| F10.20<br>(0x0A14) | I/O Phase<br>Loss<br>Protection | V/F SVC<br>Set the I/O phase loss protection<br>function on or off.<br>Ones-bit: Output phase loss<br>protection.<br>0: OFF<br>1: ON | 0021<br>(0000~<br>1121) | STOP         |

|                    |                                  |                                                                                                                                                                                                                                                                                                                                             |                               |      |
|--------------------|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|------|
|                    |                                  | <p>Tens-bit: Input phase loss protection</p> <p>0: OFF</p> <p>1: ON, report A.iLF when input phase loss is detected, continue operation</p> <p>2: ON, report E.iLF when input phase loss is detected, free stop</p> <p>Hundreds-bit: Reserved</p> <p>Thousands-bit: Reserved</p>                                                            |                               |      |
| F10.21<br>(0x0A15) | Input<br>Phase Loss<br>Threshold | <p>V/F SVC</p> <p>Set the voltage detection percentage for the input phase loss detection, 100% of the rated bus voltage.</p>                                                                                                                                                                                                               | 10.0%<br>(0.0%~<br>30.0%)     | STOP |
| F10.22<br>(0x0A16) | Short<br>Ground<br>Protection    | <p>V/F SVC</p> <p>Set the drive output and cooling fan to ground short circuit protection on/off.</p> <p>Ones-bit: Output to ground short circuit protection</p> <p>0: OFF</p> <p>1: ON</p> <p>Tens-bit: Fan to ground short circuit protection</p> <p>0: OFF</p> <p>1: ON</p> <p>Hundreds-bit: Reserved</p> <p>Thousands-bit: Reserved</p> | 11<br>(00~12)                 | STOP |
| F10.23<br>(0x0A17) | Fan<br>ON/OFF                    | <p>Set the drive cooling fan operation mode.</p> <p>0: Fan runs after the drive is powered up;</p> <p>1: Fan runs according to temperature, and runs with the drive;</p> <p>2: Fan runs for the set time of F10.24 and then stops. It relates to temperature.</p>                                                                           | 1<br>(0~2)                    | RUN  |
| F10.24<br>(0x0A18) | Fan Delay                        | <p>V/F SVC</p> <p>Set the time from running command releasing to cooling fan stopping.</p>                                                                                                                                                                                                                                                  | 30.00s<br>(0.00s~<br>600.00s) | STOP |

|                    |                              |                                                                                           |                           |     |
|--------------------|------------------------------|-------------------------------------------------------------------------------------------|---------------------------|-----|
| F10.25<br>(0x0A19) | Drive OH<br>Alarm<br>Level 1 | V/F SVC<br>Set the value for overheating, report<br>an alarm when it is above this value. | 80.0°C<br>(0.0°C~100.0°C) | RUN |
|--------------------|------------------------------|-------------------------------------------------------------------------------------------|---------------------------|-----|

**F10.3x: Load Protection**

| Code<br>(Address)  | Name                     | Content                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Default<br>(Range)          | Property |
|--------------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|----------|
| F10.32<br>(0x0A20) | Load<br>Alarm<br>Mode    | V/F SVC<br>Set the drive load detection mode and the<br>warning mode at this time.<br>Ones-bit: Load alarm 1 function<br>0: OFF<br>1: Detect overload<br>2: Detect overload only at constant speed<br>3: Detect underload<br>4: Detect underload only at constant speed<br>Tens-bit: Load alarm 1 mode<br>0: Continue the operation, report A. LD1<br>1: Free stop, report E. Ld1<br>Hundreds-bit: Load alarm 2 function<br>0: OFF<br>1: Detect overload<br>2: Detect overload only at constant speed<br>3: Detect underload<br>4: Detect underload only at constant speed<br>Thousands-bit: Load alarm 2 function<br>0: continue the operation, report A. LD2<br>1: Free stop, report E. LD2 | 0000<br>(0000~<br>1414)     | STOP     |
| F10.33<br>(0x0A21) | Load<br>Alarm<br>Level 1 | V/F SVC<br>Set the load alarm value 1 for detection.<br>For V/F control, it is 100% of the rated<br>motor current;<br>For vector control, it is 100% of the motor<br>rated output torque.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 130.0%<br>(0.0%~<br>200.0%) | STOP     |
| F10.34<br>(0x0A22) | Load<br>Alarm<br>Time 1  | V/F SVC<br>Set the detection duration of load alarm 1. If<br>the load is higher than the load alarm<br>threshold for the set time here, report load<br>alarm 1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 5.0s<br>(0.0s~<br>60.0s)    | STOP     |

|                    |                          |                                                                                                                                                                                     |                            |      |
|--------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------|
| F10.35<br>(0x0A23) | Load<br>Alarm<br>Level 2 | V/F SVC<br>Set the load alarm value 2 for detection.<br>For V/F control, it is 100% of the rated motor current;<br>For vector control, it is 100% of the motor rated output torque. | 30.0%<br>(0.0%~<br>200.0%) | STOP |
| F10.36<br>(0x0A24) | Load<br>Alarm<br>Time 2  | V/F SVC<br>Set the detection duration of load alarm 2. If the load is higher than the load alarm threshold for the set time here, report load alarm 2.                              | 5.0s<br>(0.0s~<br>60.0s)   | STOP |

**F10.4x: Stall Protection**

| Code<br>(Address)  | Name                                          | Content                                                                                                                                                                                                                                                                                                               | Default<br>(Range)        | Property |
|--------------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|----------|
| F10.40<br>(0x0A28) | Excessive<br>Speed<br>Deviation<br>Protection | SVC<br>Set the detection mode and alarm mode of excessive deviation between the motor's given speed and the feedback speed.<br>Ones-bit: Detection function<br>0: OFF<br>1: Detect only at constant speed<br>2: ON<br>Tens-bit: Alarm mode<br>0: Free stop and report error<br>1: Report alarm and continue operation | 00<br>(00~12)             | STOP     |
| F10.41<br>(0x0A29) | Excessive<br>Speed<br>Deviation<br>Threshold  | V/F SVC<br>Set the detection value for excessive speed deviation, 100% of F01.10 [Max. Frequency].                                                                                                                                                                                                                    | 10.0%<br>(0.0%~<br>60.0%) | STOP     |
| F10.42<br>(0x0A2A) | Excessive<br>Speed<br>Deviation<br>Time       | V/F SVC<br>Set the duration for detecting excessive speed deviation. If the deviation between the given speed and the feedback speed is greater than F10.41 and continues for this time, an excessive speed deviation warning is reported.                                                                            | 2.0s<br>(0.0s~<br>60.0s)  | STOP     |

|                    |                      |                                                                                                                                                                                                                                             |                               |      |
|--------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|------|
| F10.43<br>(0x0A2B) | Overspeed Protection | V/F SVC<br>Set the detection mode and alarm mode.<br>Ones-bit: Detection function<br>0: OFF<br>1: Detect only at constant speed<br>2: ON<br>Tens-bit: Alarm mode<br>0: Free stop and report error<br>1: Report alarm and continue operation | 02<br>(00~12)                 | STOP |
| F10.44<br>(0x0A2C) | Overspeed Threshold  | V/F SVC<br>Set the value of the overspeed detection,<br>100% of F01.10 [Max. Frequency].                                                                                                                                                    | 110.0%<br>(0.0%~<br>150.0%)   | STOP |
| F10.45<br>(0x0A2D) | Overspeed Time       | V/F SVC<br>Set the duration of overspeed detection. If<br>the feedback speed is higher than F10.44<br>and lasts for the set time here, report<br>warning.                                                                                   | 0.100s<br>(0.000s~<br>2.000s) | STOP |

**F10.5x: Error Reset and Motor Overload**

| Code<br>(Address)  | Name                       | Content                                                                                                                                                                | Default<br>(Range)        | Property |
|--------------------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|----------|
| F10.50<br>(0x0A32) | Auto<br>Reset No.          | V/F SVC<br>Set the number of times allowed to perform<br>error auto reset.<br>Note: 0 indicates that the auto reset function<br>is disabled; otherwise, it is enabled. | 0<br>(0~10)               | STOP     |
| F10.51<br>(0x0A33) | Auto<br>Reset<br>Interval  | V/F SVC<br>Set the waiting time after an error occurs<br>until reset.                                                                                                  | 1.0s<br>(0.0s~<br>100.0s) | STOP     |
| F10.52<br>(0x0A34) | Performed<br>Auto<br>Reset | V/F SVC<br>Indicate the times of already performed auto<br>error reset, read-only.                                                                                     | 0                         | STOP     |
| F10.55<br>(0x0A37) | Motor<br>Type              | V/F SVC<br>0: Common motor<br>1: Variable frequency motor (50Hz)<br>2: Variable frequency motor (60Hz)<br>3: Motor without cooling fan                                 | 0<br>(0~3)                | RUN      |

|                    |                              |                                                                                                                                     |                             |      |
|--------------------|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------|
| F10.56<br>(0x0A38) | Insulation<br>Class          | V/F SVC<br>0: Class A; 1: Class E<br>2: Class B; 3: Class F<br>4: Class H; 5: Special class S                                       | 3<br>(0~5)                  | STOP |
| F10.57<br>(0x0A39) | Work<br>Mode                 | V/F SVC<br>0-1: S1 pattern (continuous operation)<br>2: S2 pattern<br>3-9: S3-S9                                                    | 0<br>(0~9)                  | STOP |
| F10.58<br>(0x0A3A) | OL<br>Threshold              | V/F SVC<br>Set the motor overload threshold. Record<br>the overload quantity when actual current is<br>greater than the value here. | 105.0%<br>(0.0%~<br>130.0%) | STOP |
| F10.59<br>(0x0A3B) | Motor OL<br>Coefficient<br>t | V/F SVC<br>Motor overload current=actual current *<br>motor overload coefficient.                                                   | 100.0%<br>(0.0%~<br>250.0%) | STOP |

## 4.15 F11: Keypad Parameters

### F11.0x: Keys

| Code<br>(Address)  | Name                 | Content                                                                                                                                                                    | Default<br>(Range) | Prope<br>rty |
|--------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------|
| F11.00<br>(0x0B00) | Key Lock             | V/F SVC<br>0: OFF<br>1: Lock parameter modified via keypad<br>2: Lock functional parameters and<br>non-Start/Stop key<br>3: Lock all the functional parameters and<br>keys | 0<br>(0~3)         | RUN          |
| F11.01<br>(0x0B01) | Key Lock<br>Password | V/F SVC<br>Use with key lock; please remember the<br>password after setting, otherwise it will not<br>be operated if locked.                                               | 0<br>(0~65535)     | RUN          |

|                            |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |             |
|----------------------------|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------|
| <p>F11.02<br/>(0x0B02)</p> | <p>Multi-function Key Action</p> | <p>V/F SVC<br/>0: Invalid<br/>1: REV<br/>2: FWD jogging<br/>3: REV jogging<br/>4: Command source from keypad to terminal<br/>5: Command source from keypad to communication<br/>6: Command source from terminal to communication<br/>7: Command source to keypad, terminal, and communication circularly</p>                                                                                                                                                                                 | <p>0<br/>(0~7)</p>          | <p>STOP</p> |
| <p>F11.03<br/>(0x0B03)</p> | <p>STOP Key</p>                  | <p>V/F SVC<br/>0: Non-keypad control mode invalid<br/>1: Stop by stop mode setting for non-keypad control mode<br/>2: Stop as free stop for non-keypad control mode</p>                                                                                                                                                                                                                                                                                                                      | <p>0<br/>(0~2)</p>          | <p>STOP</p> |
| <p>F11.04<br/>(0x0B04)</p> | <p>UP/DW (Knob) Key Action</p>   | <p>V/F SVC<br/>Ones-bit: UP/DW modification function<br/>0: Invalid<br/>1: Modify F01.09 given via keypad<br/>2: Modify F13.01 given via keypad and PID<br/>3: Modify Funcode via keypad UP/DW key<br/>Tens-bit: Power-down save<br/>0: OFF<br/>1: ON<br/>Hundreds-bit: Action limit<br/>0: Adjustable during operation and shutdown<br/>1: Adjustable during operation only, keep during shutdown<br/>2: Adjustable during operation, clear during shutdown<br/>Thousands-bit: Reserved</p> | <p>0011<br/>(0000~0213)</p> | <p>STOP</p> |

|                    |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                         |      |
|--------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------|
| F11.05<br>(0x0B05) | UP/DW<br>Key for<br>Modificati<br>on | V/F SVC<br>Ones- and tens-bit: Set 00~99 to yy in<br>function parameter Fxx.yy<br>Hundreds- and thousands-bit: Set 00~15 to<br>xx in function parameter Fxx.yy                                                                                                                                                                                                                                                                                             | 0109<br>(0000~<br>2999) | RUN  |
| F11.06<br>(0x0B06) | Command<br>Key                       | V/F SVC<br>Ones-bits: Internal/external command keys<br>(RUN, STOP and RESET).<br>0: External first, when external is valid,<br>internal is invalid.<br>1: Internal first, when internal is valid,<br>external is invalid.<br>2: When both internal and external are valid,<br>STOP/RESET command first; when both<br>forward and reverse are valid, the command<br>is invalid.<br>Tens-bit: Reserved<br>Hundreds-bit: Reserved<br>Thousands-bit: Reserved | 0000<br>(0000~<br>2122) | STOP |

### F11.1x: Cyclic Monitoring of Status Interface

| Code<br>(Address)  | Name             | Content                                                                                                                                                                                   | Default<br>(Range)      | Prope<br>rty |
|--------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--------------|
| F11.10<br>(0x0B0A) | L/R Shift<br>Key | V/F SVC<br>Ones-bit: Left shift key to adjust the first<br>row of monitoring<br>0: OFF<br>1: ON<br>Tens-bit: Right shift key to adjust the second<br>row of monitoring<br>0: OFF<br>1: ON | 0011<br>(0000~<br>0011) | STOP         |

|                    |                                                    |                                                                                                                                                         |                         |     |
|--------------------|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----|
| F11.11<br>(0x0B0B) | 1st Row<br>Parameter<br>1 for<br>Cyclic<br>Display | V/F SVC<br>Ones- and tens-bit: Set 00~63 to yyy in monitor parameter Cxx.yy<br>Hundreds- and thousands-bit: Set 00~07 to xx in monitor parameter Cxx.yy | 0000<br>(0000~<br>0763) | RUN |
| F11.12<br>(0x0B0C) | 1st Row<br>Parameter<br>2 for<br>Cyclic<br>Display | V/F SVC<br>Ones- and tens-bit: Set 00~63 to yyy in monitor parameter Cxx.yy<br>Hundreds- and thousands-bit: Set 00~07 to xx in monitor parameter Cxx.yy | 0001<br>(0000~<br>0763) | RUN |
| F11.13<br>(0x0B0D) | 1st Row<br>Parameter<br>3 for<br>Cyclic<br>Display | V/F SVC<br>Ones- and tens-bit: Set 00~63 to yyy in monitor parameter Cxx.yy<br>Hundreds- and thousands-bit: Set 00~07 to xx in monitor parameter Cxx.yy | 0002<br>(0000~<br>0763) | RUN |
| F11.14<br>(0x0B0E) | 1st Row<br>Parameter<br>4 for<br>Cyclic<br>Display | V/F SVC<br>Ones- and tens-bit: Set 00~63 to yyy in monitor parameter Cxx.yy<br>Hundreds- and thousands-bit: Set 00~07 to xx in monitor parameter Cxx.yy | 0011<br>(0000~<br>0763) | RUN |
| F11.15<br>(0x0B0F) | 2nd Row<br>Parameter<br>1 for<br>Cyclic<br>Display | V/F SVC<br>Ones- and tens-bit: Set 00~63 to yyy in monitor parameter Cxx.yy<br>Hundreds- and thousands-bit: Set 00~07 to xx in monitor parameter Cxx.yy | 0002<br>(0000~<br>0763) | RUN |
| F11.16<br>(0x0B10) | 2nd Row<br>Parameter<br>2 for<br>Cyclic<br>Display | V/F SVC<br>Ones- and tens-bit: Set 00~63 to yyy in monitor parameter Cxx.yy<br>Hundreds- and thousands-bit: Set 00~07 to xx in monitor parameter Cxx.yy | 0004<br>(0000~<br>0763) | RUN |
| F11.17<br>(0x0B11) | 2nd Row<br>Parameter<br>3 for<br>Cyclic<br>Display | V/F SVC<br>Ones- and tens-bit: Set 00~63 to yyy in monitor parameter Cxx.yy<br>Hundreds- and thousands-bit: Set 00~07 to xx in monitor parameter Cxx.yy | 0010<br>(0000~<br>0763) | RUN |

|                    |                                |                                           |                         |     |
|--------------------|--------------------------------|-------------------------------------------|-------------------------|-----|
| F11.18<br>(0x0B12) | 2nd Row                        | V/F SVC                                   | 0012<br>(0000~<br>0763) | RUN |
|                    | Parameter                      | Ones- and tens-bit: Set 00~63 to yyy in   |                         |     |
|                    | 4 for                          | monitor parameter Cxx.yy                  |                         |     |
|                    | Cyclic                         | Hundreds- and thousands-bit: Set 00~07 to |                         |     |
| Display            | xx in monitor parameter Cxx.yy |                                           |                         |     |

### F11.2x: Monitoring Parameter Display

| Code<br>(Address)  | Name                            | Content                                                                                                                                                                                                                                                                                                                                                                              | Default<br>(Range)            | Prope<br>rty |
|--------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------|
| F11.20<br>(0x0B14) | Keypad<br>Display<br>Item       | V/F SVC<br>Ones-bit: Output frequency display<br>0: Target frequency<br>1: Operation frequency<br>>=2: Operation frequency. The larger the<br>value, the deeper the filter.<br>Tens-bit: Reserved<br>0: Invalid<br>1: Active power with stator resistance<br>losses removed<br>Hundreds-bit: Power display<br>0: In percentage (%)<br>1: In kilowatt (kW)<br>Thousands-bit: Reserved | 0x0002<br>(0x0000~<br>0x111F) | RUN          |
| F11.21<br>(0x0B15) | Speed<br>Display<br>Coefficient | V/F SVC<br>Set the monitoring speed parameter to<br>display in scale factor.                                                                                                                                                                                                                                                                                                         | 100.0%<br>(0.0%~<br>500.0%)   | RUN          |
| F11.22<br>(0x0B16) | Power<br>Display<br>Coefficient | V/F SVC<br>Set the monitoring power parameter to<br>display in scale factor.                                                                                                                                                                                                                                                                                                         | 100.0%<br>(0.0%~<br>500.0%)   | RUN          |
| F11.23<br>(0x0B17) | Parameter<br>Group              | V/F SVC<br>Ones-bit: Reserved<br>0: OFF<br>1: ON<br>Tens-bit: C05<br>0: Auto switching with control modes<br>1: V/F mode related parameters                                                                                                                                                                                                                                          | 0x0000<br>(0x0000~0<br>xFFFF) | RUN          |

|                    |                                 |                                                                                                             |                           |     |
|--------------------|---------------------------------|-------------------------------------------------------------------------------------------------------------|---------------------------|-----|
|                    |                                 | 2: V/C mode related parameters<br>Hundreds-bit: C00.40~C00.63<br>0: OFF<br>1: ON<br>Thousands-bit: Reserved |                           |     |
| F11.24<br>(0x0B18) | Filter<br>Display               | V/F SVC<br>Ones-bit: ON<br>0~F: The larger the value, the deeper the filtering                              | 0x0002<br>(0x0000~0x000F) | RUN |
| F11.25<br>(0x0B19) | Motor<br>Auto-tuning<br>Display | V/F SVC<br>0: ON<br>1: OFF<br>Note: T/S2 models do not support this parameter.                              | 0<br>(0~1)                | RUN |
| F11.27<br>(0x0B1B) | Error<br>Display                | Ones-bit: Display the error during error reset<br>0: OFF<br>1: ON                                           | 0x0001<br>(0x0000~0x0001) | RUN |

### F11.3x: Special Keypad Functions

| Code<br>(Address)  | Name                                                  | Content                                                                                                                                                                                                                | Default<br>(Range)       | Property |
|--------------------|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|----------|
| F11.30<br>(0x0B1E) | AC10 Serial<br>Port Function                          | V/F SVC<br>0: RS485 communication<br>1: External keypad<br>RS485 bus and external keypad are mutually exclusive. RS485 bus (master/slave) is not available when external keypad is selected to be valid and connected. | 0<br>(0~1)               | STOP     |
| F11.31<br>(0x0B1F) | Potentiometer<br>Voltage Lower<br>Limit               | V/F SVC<br>To define the lower limit value of the voltage given by the keypad potentiometer, any value smaller is treated as such.                                                                                     | 0.50V<br>(0.00V~3.00V)   | RUN      |
| F11.32<br>(0x0B20) | Potentiometer<br>Voltage Lower<br>Limit<br>Percentage | V/F SVC<br>Set keypad potentiometer lower voltage limit percentage                                                                                                                                                     | 0.00%<br>(0.00%~100.00%) | RUN      |

|                    |                                                       |                                                                                                                                            |                             |      |
|--------------------|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------|
| F11.33<br>(0x0B21) | Potentiometer<br>Upper Voltage<br>Limit               | V/F SVC<br>To define the upper limit value of the<br>voltage given by the keypad<br>potentiometer, any value larger is treated<br>as such. | 2.80V<br>(0.00V~<br>3.00V)  | RUN  |
| F11.34<br>(0x0B22) | Potentiometer<br>Upper Voltage<br>Limit<br>Percentage | V/F SVC<br>Set the keypad potentiometer upper<br>voltage limit percentage                                                                  | 100.0%<br>(0.0%~<br>100.0%) | RUN  |
| F11.35<br>(0x0B23) | Keypad<br>Potentiometer                               | V/F SVC<br>Set the keypad potentiometer source.<br>0: Built-in potentiometer<br>1: Potentiometer of the external keypad                    | 0<br>(0~1)                  | STOP |

## 4.16 F12: Communication Parameters

### F12.0x: Modbus Slave Parameters

| Code<br>(Address)  | Name                     | Content                                                                                                                                                                                  |                                                                                                                                                                                  | Default<br>(Range) | Propert<br>y |
|--------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------|
| F12.00<br>(0x0C00) | Master/Slave             | V/F SVC<br>0: Slave<br>1: Master                                                                                                                                                         |                                                                                                                                                                                  | 0<br>(0~1)         | STOP         |
| F12.01<br>(0x0C01) | Modbus<br>Address        | V/F SVC<br>Set Modbus slave communication address.                                                                                                                                       |                                                                                                                                                                                  | 1<br>(1~247)       | STOP         |
| F12.02<br>(0x0C02) | Baud Rate                | V/F SVC<br>0: 1200 bps<br>1: 2400 bps<br>2: 4800 bps                                                                                                                                     | 3: 9600 bps<br>4: 19200 bps<br>5: 38400 bps<br>6: 57600 bps                                                                                                                      | 3<br>(0~6)         | STOP         |
| F12.03<br>(0x0C03) | Modbus<br>Data<br>Format | V/F SVC<br>0: (N, 8, 1) no parity<br>Data bit: 8<br>Stop bit: 1<br>1: (E, 8, 1) even<br>parity<br>Data bit: 8<br>Stop bit: 1<br>2: (N, 8, 1) odd<br>parity<br>Data bit: 8<br>Stop bit: 1 | 3: (N, 8, 2) no<br>parity<br>Data bit: 8<br>Stop bit: 2<br>4: (E, 8, 2) even<br>parity<br>Data bit: 8<br>Stop bit: 2<br>5: (O, 8, 2) odd<br>parity<br>Data bit: 8<br>Stop bit: 2 | 0<br>(0~5)         | STOP         |

|                    |                                          |                                                                                                                                      |                              |     |
|--------------------|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----|
| F12.04<br>(0x0C04) | Modbus<br>Response<br>Mode               | V/F SVC<br>0: ON to white operation<br>1: OFF to write operation                                                                     | 0<br>(0~1)                   | RUN |
| F12.05<br>(0x0C05) | Modbus<br>Response<br>Delay              | V/F SVC<br>Set the interval between the completion of receiving data and replying to the master with answer data.                    | 0ms<br>(0ms~<br>5000ms)      | RUN |
| F12.06<br>(0x0C06) | Modbus<br>Failure<br>Timeout             | V/F SVC<br>The time between two communications to determine a communication disconnection.                                           | 1.0s<br>(0.1s~<br>100.0s)    | RUN |
| F12.07<br>(0x0C07) | Communi-<br>cation<br>Disconnec-<br>tion | V/F SVC<br>0: Overtime detection OFF<br>1: Report error and free stop<br>2: Report warning and continue operation<br>3: Force stop   | 0<br>(0~3)                   | RUN |
| F12.08<br>(0x0C08) | Frequency<br>Bias<br>(0x3000)            | V/F SVC<br>Set the bias value for the communication giving frequency (100.00 corresponds to 100.00Hz).                               | 0.00<br>(-100.00~<br>100.00) | RUN |
| F12.09<br>(0x0C09) | Frequency<br>Gain<br>(0x3000)            | V/F SVC<br>Set the gain for the communication giving frequency.<br>Given frequency = Actual communication giving value x Gain + Bias | 100.0%<br>(0.0%~<br>500.0%)  | RUN |

### F12.1x: Modbus Master Parameters

| Code<br>(Address)  | Name           | Content                                                                                                                                                                                                       |                                                                                                                                        | Default<br>(Range)           | Prope-<br>rty |
|--------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------|
| F12.10<br>(0x0C0A) | Master<br>Text | V/F SVC<br>Ones, tens, hundreds,<br>and thousands-bit all<br>can be set with:<br>0: None<br>1: Master command<br>2: Target frequency<br>3: Output frequency<br>4: Upper limit<br>frequency<br>5: Given torque | 6: Output torque<br>7: Reserved<br>8: Reserved<br>9: PID target<br>10: PID feedback<br>11: Reserved<br>12: Active current<br>component | 0x0031<br>(0x0000~<br>xCCCC) | RUN           |

|                    |                                      |                                                                                                                           |                               |     |
|--------------------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----|
| F12.11<br>(0x0C0B) | User-Defined<br>Frequency<br>Address | V/F SVC<br>Set this parameter to a non-zero value to replace the communication giving frequency address 0x3000 or 0x2000. | 0x0000<br>(0x0000~<br>0xFFFF) | RUN |
| F12.12<br>(0x0C0C) | User-Defined<br>Command<br>Address   | V/F SVC<br>Set this parameter to a non-zero value to replace the communication giving frequency address 0x3001 or 0x2001. | 0x0000<br>(0x0000~<br>0xFFFF) | RUN |
| F12.13<br>(0x0C0D) | FWD<br>Command<br>Value              | V/F SVC<br>Set this parameter to replace the communication command setting data 0001H: forward operation.                 | 0x0001<br>(0x0000~<br>0xFFFF) | RUN |
| F12.14<br>(0x0C0E) | REV<br>Command<br>Value              | V/F SVC<br>Set this parameter to replace the communication command setting data 0002H: reverse operation.                 | 0x0002<br>(0x0000~<br>0xFFFF) | RUN |
| F12.15<br>(0x0C0F) | Stop<br>Command<br>Value             | V/F SVC<br>Set this parameter to replace the communication command setting data 00025H: deceleration stop.                | 0x0005<br>(0x0000~<br>0xFFFF) | RUN |
| F12.16<br>(0x0C10) | Reset<br>Command<br>Value            | V/F SVC<br>Set this parameter to replace the communication command setting data 0007H: error reset.                       | 0x0007<br>(0x0000~<br>0xFFFF) | RUN |
| F12.19<br>(0x0C13) | Master<br>Command                    | V/F SVC<br>Set the master command.<br>0: Send running command<br>1: Send running status                                   | 0<br>(0~1)                    | RUN |

## 4.17 F13: PID Control

### F13.00~F13.06: PID Target and Feedback

| Code<br>(Address)  | Name                                     | Content                                                                                                                 |                                                                                                                            | Default<br>(Range)            | Property |
|--------------------|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------|
| F13.00<br>(0x0D00) | PID<br>Controller<br>Source              | V/F SVC<br>0: Keypad<br>1: Keypad<br>potentiometer<br>2: Analog<br>current/voltage AI<br>3: Reserved                    | 4: Reserved<br>5: PUL terminal<br>6: RS485<br>7: Reserved<br>8: Terminals<br>9:<br>Communication-gi<br>ving active current | 0<br>(0~9)                    | RUN      |
| F13.01<br>(0x0D01) | Keypad<br>Set PID<br>Target<br>/Feedback | V/F SVC<br>This parameter is valid when F13.00 or<br>F13.03 is set to [0: Keypad].                                      |                                                                                                                            | 50.0%<br>(0.0%~<br>100.0%)    | RUN      |
| F13.02<br>(0x0D02) | PID Target<br>Change<br>Time             | V/F SVC<br>Set the time required when PID target<br>increase from 0.0% to 100.0%.                                       |                                                                                                                            | 1.00s<br>(0.00s~<br>60.00s)   | RUN      |
| F13.03<br>(0x0D03) | PID<br>Feedback<br>Source                | V/F SVC<br>0: Keypad<br>1: Keypad<br>potentiometer<br>2: Analog<br>current/voltage AI<br>3: Reserved<br>4: Reserved     | 5: PUL terminal<br>6: RS485<br>7: Reserved<br>8: Terminals<br>9: Local active<br>current                                   | 2<br>(0~9)                    | RUN      |
| F13.04<br>(0x0D04) | Feedback<br>Filter<br>Time               | V/F SVC<br>The longer the filter time, the greater the<br>anti-interference effect, but the response<br>becomes slower. |                                                                                                                            | 0.010s<br>(0.000s~<br>6.000s) | RUN      |
| F13.05<br>(0x0D05) | Feedback<br>Gain                         | V/F SVC<br>Set for linear proportional regulation of the<br>feedback input signal.                                      |                                                                                                                            | 1.00<br>(0.00~<br>10.00)      | RUN      |
| F13.06<br>(0x0D06) | Feedback<br>Range                        | V/F SVC<br>The PID feedback signal range is<br>dimensionless units which are used to                                    |                                                                                                                            | 100.0<br>(0.0~<br>100.0)      | RUN      |

**F13.07~F13.24: PID Target**

| <b>Code<br/>(Address)</b> | <b>Name</b>               | <b>Content</b>                                                                                                                                                                                                                  | <b>Default<br/>(Range)</b>    | <b>Prope<br/>rty</b> |
|---------------------------|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------------------|
| F13.07<br>(0x0D07)        | PID Control<br>Property   | V/F SVC<br>Ones-bit: Feedback property<br>0: Positive<br>1: Negative<br>Tens-bit: Reserved<br>Hundreds-bit: Reserved<br>Thousands-bit: Differential regulation<br>0: Differential for deviation<br>1: Differential for feedback | 0100<br>(0000~<br>1111)       | RUN                  |
| F13.08<br>(0x0D08)        | PID Preset                | V/F SVC<br>When PID operation is initiated, output<br>as the pre-settings.                                                                                                                                                      | 100.0%<br>(0.0%~<br>100.0%)   | RUN                  |
| F13.09<br>(0x0D09)        | PID Preset<br>Time        | V/F SVC<br>Set the time for the PID preset output,<br>and performs as the normal PID target<br>after it is finished.                                                                                                            | 0.0s<br>(0.0s~<br>6500.0s)    | RUN                  |
| F13.10<br>(0x0D0A)        | PID<br>Deviation<br>Limit | V/F SVC<br>Set the maximum deviation of PID<br>feedback from PID target.                                                                                                                                                        | 0.0%<br>(0.0%~<br>100.0%)     | RUN                  |
| F13.11<br>(0x0D0B)        | Proportional<br>Gain P1   | V/F SVC<br>Set the proportional gain of PID<br>parameter group 1.                                                                                                                                                               | 0.100<br>(0.000~<br>4.000)    | RUN                  |
| F13.12<br>(0x0D0C)        | Integral<br>Time I1       | V/F SVC<br>Set the integral time of PID parameter<br>group 1.                                                                                                                                                                   | 1.0s<br>(0.0s~<br>600.0s)     | RUN                  |
| F13.13<br>(0x0D0D)        | Differential<br>Time D1   | V/F SVC<br>Set the differential time of PID parameter<br>group 1.                                                                                                                                                               | 0.000s<br>(0.000s~<br>6.000s) | RUN                  |
| F13.14<br>(0x0D0E)        | Proportional<br>Gain P2   | V/F SVC<br>Set the proportional gain of PID<br>parameter group 2.                                                                                                                                                               | 0.100<br>(0.000~<br>4.000)    | RUN                  |
| F13.15<br>(0x0D0F)        | Integral<br>Time I2       | V/F SVC<br>Set the integral time of PID parameter<br>group 2.                                                                                                                                                                   | 1.0s<br>(0.0s~<br>600.0s)     | RUN                  |

|                    |                            |                                                                                           |                               |     |
|--------------------|----------------------------|-------------------------------------------------------------------------------------------|-------------------------------|-----|
| F13.16<br>(0x0D10) | Differential<br>Time D2    | V/F SVC<br>Set the differential time of PID parameter<br>group 2.                         | 0.000s<br>(0.000s~<br>6.000s) | RUN |
| F13.17<br>(0x0D11) | PID Shift<br>Condition     | V/F SVC<br>0: OFF<br>1: ON via DI terminal<br>2: ON according to deviation                | 0<br>(0~2)                    | RUN |
| F13.18<br>(0x0D12) | Shift<br>Deviation<br>Low  | V/F SVC<br>Gain 1 parameter is used when the PID<br>deviation is lower than this value.   | 20.0%<br>(0.0%~<br>100.0%)    | RUN |
| F13.19<br>(0x0D13) | Shift<br>Deviation<br>High | V/F SVC<br>Gain 2 parameter is used when the PID<br>deviation is greater than this value. | 80.0%<br>(0.0%~<br>100.0%)    | RUN |
| F13.21<br>(0x0D15) | Differentiati<br>on Range  | V/F SVC<br>This parameter is used to set the range of<br>the PID differential output.     | 5.0%<br>(0.0%~<br>100.0%)     | RUN |
| F13.22<br>(0x0D16) | Max. PID<br>Output         | V/F SVC<br>Set the PID output upper limit.                                                | 100.0%<br>(0.0%~<br>100.0%)   | RUN |
| F13.23<br>(0x0D17) | Min. PID<br>Output         | V/F SVC<br>Set the PID output lower limit.                                                | 0.0%<br>(-100.0%~F<br>13.22)  | RUN |
| F13.24<br>(0x0D18) | PID Filter<br>Time         | V/F SVC<br>Set the PID output filter time.                                                | 0.000s<br>(0.000s~<br>6.000s) | RUN |

### F13.25~F13.28: PID Feedback Disconnection

| Code<br>(Address)  | Name                               | Content                                                                                                                                                                                           | Default<br>(Range) | Prope<br>rty |
|--------------------|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------|
| F13.25<br>(0x0D19) | Feedback<br>Disconnecti<br>on Mode | V/F SVC<br>0: Continue PID operation without<br>reporting error<br>1: Stop and report error<br>2: Continue PID operation, and report<br>alarm<br>3: Run at current frequency, and report<br>alarm | 0<br>(0~3)         | STOP         |

|                    |                                  |                                                                                                                                   |                             |     |
|--------------------|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----|
| F13.26<br>(0x0D1A) | Feedback<br>Break Time           | V/F SVC<br>Set the PID feedback disconnection<br>detection duration.                                                              | 1.0s<br>(0.0s~<br>120.0s)   | RUN |
| F13.27<br>(0x0D1B) | Feedback<br>Break Upper<br>Limit | V/F SVC<br>If the feedback signal exceeds this value<br>and continues for F13.26, the sensor is<br>considered disconnected.       | 100.0%<br>(0.0%~<br>100.0%) | RUN |
| F13.28<br>(0x0D1C) | Feedback<br>Break<br>Lower Limit | V/F SVC<br>If the feedback signal is lower than this<br>value and continues for F13.26, the<br>sensor is considered disconnected. | 0.0%<br>(0.0%~<br>100.0%)   | RUN |

**F13.29~F13.33: PID Sleep**

| Code<br>(Address)  | Name                | Content                                                                                                                                                                                               | Default<br>(Range)                        | Prope<br>rty |
|--------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------------|
| F13.29<br>(0x0D1D) | Sleep               | V/F SVC<br>0: OFF<br>1: ON                                                                                                                                                                            | 0<br>(0~1)                                | RUN          |
| F13.30<br>(0x0D1E) | Sleep<br>Frequency  | V/F SVC<br>When the sleep function is valid, the PID<br>output frequency is lower than [F13.30]<br>and continues for F13.31 [Sleep Delay],<br>then sleep function works.                              | 10.00Hz<br>(0.00Hz~<br>Max.<br>frequency) | RUN          |
| F13.31<br>(0x0D1F) | Sleep Delay         | V/F SVC<br>Set the sleep delay time.                                                                                                                                                                  | 60.0s<br>(0.0s~<br>3600.0s)               | RUN          |
| F13.32<br>(0x0D20) | Wakeup<br>Deviation | V/F SVC<br>When PID feedback is smaller/greater<br>than (positive characteristic/negative<br>characteristic) PID target minus/plus                                                                    | 5.0%<br>(0.0%~<br>50.0%)                  | RUN          |
| F13.33<br>(0x0D21) | Wakeup<br>Delay     | (positive characteristic/negative<br>characteristic) F13.32 [Wakeup<br>Deviation] and continues for F13.33<br>[Wakeup Delay], the drive exits from<br>sleep status and start the normal<br>operation. | 1.0s<br>(0.0s~<br>60.0s)                  | RUN          |

## 4.18 F14: Simulation PLC for Multi-frequency Control

### F14.00~F14.14: Multi-frequency Control

| Code (Address)                          | Name                 | Content                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Default (Range)                            | Property |
|-----------------------------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|----------|
| F14.00 (0x0E00)<br>~<br>F14.14 (0x0E0E) | Multi-frequency 1~15 | <p>V/F SVC</p> <p>[F01.02] Frequency giving source 9: given by program control (PLC), frequency and running direction of the drive are controlled by built-in PLC, and up to 15-seg frequency can be controlled; the running mode is shown in the [F14.15] setting. If the running time of a segment is set to "0", the segment is skipped when the program is executed.</p> <p>[F01.02] Frequency giving source 11: The setting frequency is selected by "Multi-frequency terminal," the running direction and acceleration/deceleration time are set by [F14.31~F14.45]. If all the multi-frequency terminals are invalid, the multi-frequency setting is set to zero. For the "Multi-frequency terminal" setting, see parameters [F5.00 to F5.03]. The default values are set as shown below:</p> <p>F14.00 Multi-frequency 1= 10.00Hz<br/>           F14.08 Multi-frequency 9= 10.00Hz<br/>           F14.01 Multi-frequency 2= 20.00Hz<br/>           F14.09 Multi-frequency 10= 20.00Hz<br/>           F14.02 Multi-frequency 3= 30.00Hz<br/>           F14.10 Multi-frequency 11= 30.00Hz<br/>           F14.03 Multi-frequency 4= 40.00Hz<br/>           F14.11 Multi-frequency 12= 40.00Hz<br/>           F14.04 Multi-frequency 5= 50.00Hz<br/>           F14.12 Multi-frequency 13= 50.00Hz<br/>           F14.05 Multi-frequency 6= 40.00Hz<br/>           F14.13 Multi-frequency 14= 40.00Hz<br/>           F14.06 Multi-frequency 7= 30.00Hz<br/>           F14.14 Multi-frequency 15= 30.00Hz<br/>           PLC Multi-frequency 8= 20.00Hz</p> | See the left side (0.00Hz~ Max. frequency) | RUN      |

**F14.15: PLC Mode**

| Code (Address)     | Name               | Content                                                                                                                                                                                                       |                                                                                                                                                                                                                                   | Default (Range)     | Property |
|--------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------|
| F14.15<br>(0x0E0F) | PLC Operation Mode | V/F SVC<br>Ones-bit: Cycle mode<br>0: Stop after single cycle<br>1: Cycle continuously<br>2: Hold to final value after single cycle<br>Tens-bit: Timing unit<br>0: Second (s)<br>1: Minute (m)<br>2: Hour (h) | Hundreds-bit:<br>Power-down save<br>0: OFF<br>1: ON<br>Thousands-bit: Start mode<br>0: Restart from the first stage<br>1: Restart from the stage upon stop last time<br>2: Continue operation for the remaining of the stop stage | 0000<br>(0000~2122) | RUN      |

**F14.16~F14.30: PLC Runtime**

| Code (Address)                                | Name                         | Content                                  |  | Default (Range)                                          | Property |
|-----------------------------------------------|------------------------------|------------------------------------------|--|----------------------------------------------------------|----------|
| F14.16<br>(0x0E10)<br>~<br>F14.30<br>(0x0E1E) | Multi-frequency 1~15 Runtime | V/F SVC<br>Set the 1~15 segments runtime |  | 10.0<br>(s/m/h)<br>0.0<br>(s/m/h)~<br>6500.0<br>(s/m/h)) | RUN      |

**F14.31~F14.45: PLC Direction and ACC/DEC Time**

| Code (Address)                          | Name                                            | Content                                                                                                                                                                                                                                                                                                 | Default (Range)     | Property |
|-----------------------------------------|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------|
| F14.31 (0x0E1F)<br>~<br>F14.45 (0x0E2D) | Multi-frequency 1~15 Direction and ACC/DEC Time | V/F SVC<br>Ones-bit: Direction of the current stage (compared with operation command)<br>0: Same<br>1: Opposite<br>Tens-bit: ACC/DEC time of the current stage<br>0: ACC/DEC time 1<br>2: ACC/DEC time 3<br>1: ACC/DEC time 2<br>3: ACC/DEC time 4<br>Hundreds-bit: Reserved<br>Thousands-bit: Reserved | 0000<br>(0000~0031) | RUN      |

**4.19 F15: Reserved****4.20 F25: AI and AO Correction**

This group of funcodes and descriptions are described in detail in the corresponding technical manuals.

**4.21 C0x: Monitoring Parameters****C00: Basic Monitoring**

| Code (Address)  | Name             | Code (Address)  | Name                     | Code (Address)  | Name             |
|-----------------|------------------|-----------------|--------------------------|-----------------|------------------|
| C00.00(0x2100)  | Given Frequency  | C00.14 (0x210E) | Input Terminal X Status  | C00.28 (0x211C) | Software Version |
| C00.01(0x2101)  | Output Frequency | C00.15 (0x210F) | Output Terminal Y Status | C00.29 (0x211D) | Reserved         |
| C00.02 (0x2102) | Output Current   | C00.16 (0x2110) | AI Value                 | C00.30 (0x211E) | Timer Record     |
| C00.03(0x2103)  | Input Voltage    | C00.17 (0x2111) | Reserved                 | C00.31 (0x211F) | PID Output       |

|                |                      |                 |                            |                 |                                |
|----------------|----------------------|-----------------|----------------------------|-----------------|--------------------------------|
| C00.04(0x2104) | Output Voltage       | C00.18 (0x2112) | Keypad Potentiometer Input | C00.32 (0x2120) | AC Drive Software Sub-version  |
| C00.05(0x2105) | Mechanical Speed     | C00.19 (0x2113) | PUL Input                  | C00.33 (0x2121) | Reserved                       |
| C00.06(0x2106) | Given Torque         | C00.20 (0x2114) | AO Value                   | C00.34 (0x2122) | Reserved                       |
| C00.07(0x2107) | Output Torque        | C00.21 (0x2115) | Reserved                   | C00.35 (0x2123) | Reserved                       |
| C00.08(0x2108) | PID Target           | C00.22 (0x2116) | Counter Record             | C00.36 (0x2124) | Error Code                     |
| C00.09(0x2109) | PID Feedback         | C00.23 (0x2117) | Current Power-ON           | C00.37 (0x2125) | Total Power Consumption (Low)  |
| C00.10(0x210A) | Output Power         | C00.24 (0x2118) | Total Runtime              | C00.38 (0x2126) | Total Power Consumption (High) |
| C00.11(0x210B) | Bus Voltage          | C00.25 (0x2119) | AC Drive Power             | C00.39 (0x2127) | Power Factor Angle             |
| C00.12(0x210C) | Module Temperature 1 | C00.26 (0x211A) | AC Drive Rated Voltage     | -               | -                              |
| C00.13(0x210D) | Module Temperature 2 | C00.27 (0x211B) | AC Drive Rated Current     | -               | -                              |

### C01: Error Monitoring

| Code (Address) | Name         | Code (Address)  | Name                    | Code (Address)  | Name                          |
|----------------|--------------|-----------------|-------------------------|-----------------|-------------------------------|
| C01.00(0x2200) | Error Type   | C01.08 (0x2208) | Error X Terminal Status | C01.16 (0x2210) | Previous 1 Error Module Temp. |
| C01.01(0x2201) | Errcode Info | C01.09 (0x2209) | Error Y Terminal Record | C01.17 (0x2211) | Previous 1 Error Drive Status |

|                |                        |                 |                                   |                 |                                    |
|----------------|------------------------|-----------------|-----------------------------------|-----------------|------------------------------------|
| C01.02(0x2202) | Error Output Frequency | C01.10 (0x220A) | Previous 1 Error Type             | C01.18 (0x2212) | Previous 1 Error X Terminal Status |
| C01.03(0x2203) | Error Output Voltage   | C01.11 (0x220B) | Previous 1 Errcode Info           | C01.19 (0x2213) | Previous 1 Error Y Terminal Status |
| C01.04(0x2204) | Error Output Current   | C01.12 (0x220C) | Previous 1 Error Output Frequency | C01.20 (0x2214) | Previous 2 Error Type              |
| C01.05(0x2205) | Error Bus Voltage      | C01.13 (0x220D) | Previous 1 Error Output Voltage   | C01.21 (0x2215) | Previous 2 Errcode Info            |
| C01.06(0x2206) | Error Module Temp.     | C01.14 (0x220E) | Previous 1 Error Output Current   | C01.22 (0x2216) | Previous 3 Error Type              |
| C01.07(0x2207) | Error Drive Status     | C01.15 (0x220F) | Previous 1 Error Bus Voltage      | C01.23 (0x2217) | Previous 3 Errcode Info            |

Note: Error drive status bit meaning:

**Ones-bit: Operation direction 0: Forward; 1: Reverse**

**Tens-bit: Operation status 0: Stop; 1: Steady speed**

**2: ACC; 3: DEC**

**Hundreds-bit: OV/OC 0: Normal 1: OV**

**2: OC 3: OV/OC**

**Thousands-bit: Reserved**

### C02: App Monitoring

| Code (Address) | Name                | Code (Address)                    | Name                         |
|----------------|---------------------|-----------------------------------|------------------------------|
| C02.00(0x2300) | PID Target          | C02.13 (0x230D) ~ C02.14 (0x230E) | Reserved                     |
| C02.01(0x2301) | PID Feedback        | C02.15(0x230F)                    | Drive Overload Timing Factor |
| C02.02(0x2302) | PID Output          | C02.16(0x2310)                    | Motor Overload Timing Factor |
| C02.03(0x2303) | PID Control Status  | C02.17 (0x2311) ~ C02.18(0x2312)  | Reserved                     |
| C02.05(0x2305) | PLC Operation Stage | C02.19(0x2313)                    | CBC Count                    |

|                |                                         |                                     |                                   |
|----------------|-----------------------------------------|-------------------------------------|-----------------------------------|
| C02.06(0x2306) | PLC Stage Frequency                     | C02.20 (0x2314) ~<br>C02.31(0x231F) | Reserved                          |
| C02.07(0x2307) | PLC Stage Runtime                       | C02.32 (0x2320) ~<br>C02.47(0x232F) | Power-down Save<br>Parameter 1~16 |
| C02.08(0x2308) | FWD/REV Command                         | C02.48 (0x2330) ~<br>C02.49(0x2331) | Reserved                          |
| C02.09(0x2309) | Jogging Command                         | C02.50 (0x2332) ~<br>C02.59(0x233B) | Cache Register<br>0~9             |
| C02.10(0x230A) | Voltage/Current before<br>AI Correction | C02.60 (0x233C) ~<br>C02.61(0x233D) | Reserved                          |
| C02.11(0x230B) | Reserved                                | C02.62(0x233E)                      | External Keypad<br>Version        |
| C02.12(0x230C) | Voltage/Current before<br>AO Correction | -                                   | -                                 |

### C03: Maintenance and Tension Monitoring

| Code (Address)                     | Name                   | Code (Address)                     | Name           |
|------------------------------------|------------------------|------------------------------------|----------------|
| C03.00(0x2400)                     | Current Runtime        | C03.23(0x2417)                     | Reserved       |
| C03.01(0x2401)                     | Total Runtime (hour)   | C03.24(0x2418)                     | Reserved       |
| C03.02(0x2402)                     | Total Power-ON (hour)  | C03.25(0x2419)                     | Reserved       |
| C03.03(0x2403)                     | Total Power-ON (min)   | C03.26(0x241A)                     | Reserved       |
| C03.04(0x2404)                     | Fan Runtime            | C03.27(0x241B)                     | Reserved       |
| C03.05(0x2405)                     | Fan Maintenance        | C03.28(0x241C)                     | Reserved       |
| C03.06(0x2406)                     | Reserved               | C03.29(0x241D)                     | Reserved       |
| C03.07(0x2407)                     | Main Relay Maintenance | C03.30(0x241E)                     | Reserved       |
| C03.08 (0x2408)~<br>C03.19(0x2413) | Reserved               | C03.31 (0x241F)~<br>C03.39(0x2427) | Reserved       |
| C03.20(0x2414)                     | Reserved               | C03.50(0x2432)                     | Machine Code 1 |
| C03.21(0x2415)                     | Reserved               | C03.51(0x2433)                     | Machine Code 2 |
| C03.22(0x2416)                     | Reserved               | C03.52(0x2434)                     | Machine Code 3 |

## 4.22 Terminal I/O Function

| X  | Description                           | X  | Description              | X     | Description                             |
|----|---------------------------------------|----|--------------------------|-------|-----------------------------------------|
| 0  | None;                                 | 24 | PID Target Switching 1   | 48    | Command Source to Keypad                |
| 1  | FWD                                   | 25 | PID Target Switching 2   | 49    | Command Source to Terminal              |
| 2  | REV                                   | 26 | PID Target Switching 3   | 50    | Command Source to Communication         |
| 3  | Three-wire Operation Control          | 27 | PID Feedback Switching 1 | 51    | Reserved                                |
| 4  | FWD Jog                               | 28 | PID Feedback Switching   | 52    | Operation Disable                       |
| 5  | REV Jog                               | 29 | PID Feedback Switching   | 53    | FWD Operation                           |
| 6  | Free Stop                             | 30 | Program (PLC) Pause      | 54    | REV Operation                           |
| 7  | E-stop                                | 31 | Program (PLC) Restart    | 55    | Reserved                                |
| 8  | Error Reset                           | 32 | ACC/DEC Time Terminal 1  | 56    | Reserved                                |
| 9  | External Error Input                  | 33 | ACC/DEC Time Terminal 2  | 57    | Reserved                                |
| 10 | Frequency Increase (UP)               | 34 | ACC/DEC Pause            | 58    | Reserved                                |
| 11 | Frequency Decrease (DW)               | 35 | Wobble Frequency Trigger | 59    | Reserved                                |
| 12 | Frequency Reset (UP/DW Reset)         | 36 | Wobble Frequency Pause   | 60    | Speed/Torque Control Switching          |
| 13 | Source A to Source B                  | 37 | Wobble Frequency Reset   | 62    | Torque Frequency Limit by Jog Frequency |
| 14 | Combined Frequency Source to Source A | 38 | Keypad & Display Check   | 63~87 | Reserved                                |

|          |                                               |          |                                |          |                                |
|----------|-----------------------------------------------|----------|--------------------------------|----------|--------------------------------|
| 15       | Combined Frequency Source to Source B         | 39       | X4 Frequency Measurement       | 88       | Reserved                       |
| 16       | Multi-frequency Terminal 1                    | 40       | Timer Trigger Terminal         | 89       | Reserved                       |
| 17       | Multi-frequency Terminal 2                    | 41       | Timer Reset Terminal           | 90       | Reserved                       |
| 18       | Multi-frequency Terminal 3                    | 42       | Counter Signal Input Terminal  | 91       | Reserved                       |
| 19       | Multi-frequency Terminal 4                    | 43       | Counter Reset Terminal         | 92       | Reserved                       |
| 20       | PID Control Cancel                            | 44       | DC Brake Command               | 93       | Reserved                       |
| 21       | PID Control Pause                             | 45       | Excitation Command Terminal    | 94       | Reserved                       |
| 22       | PID Property Switching                        | 46       | Reserved                       | 95       | Reserved                       |
| 23       | PID Parameter Switching                       | 47       | Reserved                       | —        | —                              |
| <b>Y</b> | <b>Description</b>                            | <b>Y</b> | <b>Description</b>             | <b>Y</b> | <b>Description</b>             |
| 0        | No Output                                     | 13       | Upper Limit Frequency Arrival  | 26       | Emergency Stopping             |
| 1        | Drive in Operation                            | 14       | Lower Limit Frequency Arrival  | 27       | Overload Warning 1             |
| 2        | Drive in REV Operation                        | 15       | Program Cycle Completion       | 28       | Underload Warning 2            |
| 3        | Drive in FWD Operation                        | 16       | Program Stage Completion       | 29       | Drive in Warning               |
| 4        | Error Trip Alarm 1 (report during auto reset) | 17       | PID Feedback above Upper Limit | 30       | Address: 0x3018 Control Output |

|    |                                                     |    |                                |       |                        |
|----|-----------------------------------------------------|----|--------------------------------|-------|------------------------|
| 5  | Error Trip Alarm 2<br>(no report during auto reset) | 18 | PID Feedback below Lower Limit | 31    | Drive Overheat         |
| 6  | External Error Stop                                 | 19 | PID Feedback Sensor Break      | 32    | Reserved               |
| 7  | Drive Low Voltage                                   | 20 | Reserved                       | 33~36 | Reserved               |
| 8  | Drive Ready                                         | 21 | Timer Target Arrival           | 37    | Comparator 1 Detection |
| 9  | Output Frequency Detection 1 (FDT1)                 | 22 | Counter Maximum Arrival        | 38    | Comparator 2 Detection |
| 10 | Output Frequency Detection 2 (FDT2)                 | 23 | Counter Target Arrival         | 39~63 | Reserved               |
| 11 | Given Frequency Arrival                             | 24 | Dynamic Braking                | -     | -                      |
| 12 | Zero-frequency Operating Now                        | 25 | Reserved                       | -     | -                      |

## 4.23 Errcode List

Note: The numbers in brackets in the code column are error codes and warning codes. (DEC. indicates decimal).

| Display (DEC.) | Name                                 | Error Type | Display (DEC.)    | Name                 | Error Type |
|----------------|--------------------------------------|------------|-------------------|----------------------|------------|
| E.SC1 (1)      | System failure during acceleration   | Error      | E.Ld2 (80)        | Load protection 2    | Error      |
| E.SC2 (2)      | System failure during deceleration   | Error      | E.CPu (81)        | CPU timeout          | Error      |
| E.SC3 (3)      | System failure during constant speed | Error      | Reserved (82- 84) | Reserved             | Error      |
| E.SC4 (4)      | System failure during stop           | Error      | E.LoC (85)        | Locked chip          | Error      |
| E.oC1 (5)      | Overcurrent during acceleration      | Error      | E.EEP (86)        | Parameter save error | Error      |

|               |                                   |       |                    |                            |       |
|---------------|-----------------------------------|-------|--------------------|----------------------------|-------|
| E.oC2 (6)     | Overcurrent during deceleration   | Error | Reserved(87-96)    | Reserved                   | Error |
| E.oC3 (7)     | Overcurrent during constant speed | Error | E.CP1 (97)         | Monitor comparator 1 error | Error |
| E.oC4 (8)     | AC10 software overcurrent         | Error | E.CP2 (98)         | Monitor comparator 2 error | Error |
| E.ou1 (9)     | Overvoltage during acceleration   | Error | E.dAT (99)         | Parameter error            | Error |
| E.ou2 (10)    | Overvoltage during deceleration   | Error | Reserved (100~109) | Reserved                   | Error |
| E.ou3 (11)    | Overvoltage during constant speed | Error | E.FA1 (110)        | Reserved for expansion 1   | Error |
| Reserved (12) | Reserved                          | Error | E.FA2 (111)        | Reserved for expansion 2   | Error |
| E.Lu (13)     | Low-voltage during operation      | Error | E.FA3 (112)        | Reserved for expansion 3   | Error |
| E.oL1 (14)    | Motor overload                    | Error | E.FA4 (113)        | Reserved for expansion 4   | Error |
| E.oL2 (15)    | Drive overload 1                  | Error | E.FA5 (114)        | Reserved for expansion 5   | Error |
| E.oL3 (16)    | Drive overload 2                  | Error | E.FA6 (115)        | Reserved for expansion 6   | Error |
| E.oL4 (17)    | Drive overload 3                  | Error | E.FA7 (116)        | Reserved for expansion 7   | Error |
| E.iLF (18)    | Input phase loss                  | Error | E.FA8 (117)        | Reserved for expansion 8   | Error |
| E.oLF (19)    | Three-phase output phase loss     | Error | E.FrA (118)        | Material fracture          | Error |
| E.oLF1 (20)   | U phase loss                      | Error | <b>Alarm</b>       |                            |       |

|                   |                                   |       |                |                                    |       |
|-------------------|-----------------------------------|-------|----------------|------------------------------------|-------|
| E.oLF2 (21)       | V phase loss                      | Error | A.Lu1 (128)    | Low-voltage during stop            | Alarm |
| E.oLF3 (22)       | W phase loss                      | Error | A.ou (129)     | Over-voltage during stop           | Alarm |
| Reserved (23- 29) | Reserved                          | Error | A.iLF (130)    | Input phase loss                   | Alarm |
| E.oH1 (30)        | Rectifier module overheat         | Error | A.Pid (131)    | PID feedback disconnection         | Alarm |
| E.oH2 (31)        | IGBT module overheat              | Error | A.EEP (132)    | Parameter save alarm               | Alarm |
| Reserved (32)     | Reserved                          | Error | A.dEF (133)    | Excessive speed deviation          | Alarm |
| E.EF (33)         | External error                    | Error | A.SPd (134)    | Overspeed                          | Alarm |
| E.CE (34)         | Modbus communication error        | Error | A.GPS1 (135)   | GPS lockout                        | Alarm |
| E.HAL1 (35)       | Large U-phase zero drift          | Error | A.GPS2 (136)   | GPS disconnection                  | Alarm |
| E.HAL2 (36)       | Large V-phase zero drift          | Error | A.CE (137)     | Modbus communication disconnection | Alarm |
| E.HAL (37)        | Non-0 current sum of three phases | Error | A.Ld1 (138)    | Load protection 1                  | Alarm |
| E.HAL3 (38)       | Large W-phase zero drift          | Error | A.Ld2 (139)    | Load protection 2                  | Alarm |
| Reserved(39 )     | Reserved                          | Error | Reserved(140 ) | Reserved                           | Alarm |
| E.SGxx (40)       | Short circuit to ground           | Error | A.oH1 (141)    | Module overheat                    | Alarm |
| E.FSG (41)        | Fan short circuit                 | Error | Reserved(142 ) | Reserved                           | Alarm |
| E.Pid (42)        | PID feedback disconnection        | Error | A.run1 (143)   | Alarm 1 during operation           | Alarm |
| E.CoP (43)        | Parameter copy error              | Error | A.PA2 (144)    | External keypad disconnection      | Alarm |
| E.PG(44)          | Wrong PG setting                  | Error | A.CoP (145)    | Parameter copy alarm               | Alarm |
| Reserved (45- 49) | Reserved                          | Error | A.CP1 (146)    | Monitor comparator 1 alarm         | Alarm |
| E.bru (50)        | Braking unit error                | Error | A.CP2 (147)    | Monitor comparator 2 alarm         | Alarm |
| Reserved (51)     | Reserved                          | Error | A.run2 (148)   | Alarm 2 during operation           | Alarm |
| E.TExx (52)       | Auto-tuning error                 | Error | A.run3 (149)   | Alarm 3 during operation           | Alarm |

|                  |                            |       |             |                          |       |
|------------------|----------------------------|-------|-------------|--------------------------|-------|
| Reserved (53~70) | Reserved                   | Error | A.FA1 (150) | Reserved for expansion 1 | Alarm |
| E.iAE1 (71)      | Motor angle tuning error 1 | Error | A.FA2 (151) | Reserved for expansion 2 | Alarm |
| E.iAE2 (72)      | Motor angle tuning error 2 | Error | A.FA3 (152) | Reserved for expansion 3 | Alarm |
| E.iAE3 (73)      | Motor angle tuning error 3 | Error | A.FA4 (153) | Reserved for expansion 4 | Alarm |
| E.PST1 (74)      | PM step loss 1             | Error | A.FA5 (154) | Reserved for expansion 5 | Alarm |
| E.PST2 (75)      | PM step loss 2             | Error | A.FA6 (155) | Reserved for expansion 6 | Alarm |
| E.PST3 (76)      | PM step loss 3             | Error | A.FrA (157) | Material fracture        | Alarm |
| E.dEF (77)       | Excessive speed deviation  | Error | A.161 (161) | Fan span                 | Alarm |
| E.SPd (78)       | Overspeed                  | Error | A.163 (163) | Main relay span          | Alarm |
| E.Ld1 (79)       | Load protection 1          | Error | -           | -                        | -     |

## 5 Regular Inspection and Maintenance

### 5.1 Inspection

The drives consist of semiconductor devices, passive electronic devices, and motion devices, all of which have a service life, and even under normal operating conditions, some of the devices may change in property or fail if their service life is exceeded. To prevent malfunction, preventive inspections and maintenance such as daily inspections, periodic inspections, and device replacement must be performed. It is recommended that inspections be performed every 3 to 4 months after the machine is installed.

**Daily inspection:** To avoid damage to the drive and shortening of its service life, check the following items on a daily basis.

| Item           | Content                                                                                                                             | Solutions                                                                                                        |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Power Supply   | Check that the supply voltage meets the requirements and that there is no phase loss in the supply.                                 | Solve the problem in accordance with the requirements of the nameplate.                                          |
| Surroundings   | Check whether the installation environment meets the requirements.                                                                  | Confirm the source and solve it properly.                                                                        |
| Cooling system | Check whether there is abnormal heating and discoloration of the drive and motor, and check the working condition of the fan.       | Confirm whether there is overload, whether the heat sink is dirty and the fan is blocked, and tighten the screws |
| Motor          | Check whether the motor has abnormal vibration or sound.                                                                            | Tighten mechanical and electrical connections and lubricate mechanical parts.                                    |
| Load           | Check whether the output current of the drive is higher than the rated value of the motor and it runs for a certain period of time. | Confirm that overload has not occurred and that the drive model is correct.                                      |

- **Periodic inspection:** In general, it is appropriate to conduct periodic inspections every 3 to 4 months, however, please determine the actual inspection period for each machine based on its usage and working environment.

| Item                     | Content                                                                                                                                                                                                                                                     | Solutions                                                                                                                                                                                                                              |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Overall                  | Insulation resistance check; environment check.                                                                                                                                                                                                             | Tighten parts and replace defective ones;<br>Clean and improve the operating environment.                                                                                                                                              |
| Electrical connection    | <ul style="list-style-type: none"> <li>● The wires and connections are free of discoloration, broken insulation, cracks and signs of deterioration;</li> <li>● Connection terminals are not worn, damaged, or loose;</li> <li>● Grounding check.</li> </ul> | <ul style="list-style-type: none"> <li>● Replace damaged wires;</li> <li>● Tighten loose terminals and replace damaged ones;</li> <li>● Measure the grounding resistance and tighten the corresponding grounding terminals.</li> </ul> |
| Mechanical connection    | <ul style="list-style-type: none"> <li>● Check for abnormal vibrations and noises, and for loose fixing.</li> </ul>                                                                                                                                         | <ul style="list-style-type: none"> <li>● Tighten and lubricate parts, and replace defective ones.</li> </ul>                                                                                                                           |
| Semiconductor or devices | <ul style="list-style-type: none"> <li>● Check for dirt and dust;</li> <li>● Check for visible changes in appearance.</li> </ul>                                                                                                                            | <ul style="list-style-type: none"> <li>● Clean the operating environment;</li> <li>● Replace the damaged parts;</li> </ul>                                                                                                             |
| Electrolytic capacitor   | <ul style="list-style-type: none"> <li>● Check for fluid leakage, discoloration, cracks, and exposed, expanded, ruptured, or leaked valves.</li> </ul>                                                                                                      | <ul style="list-style-type: none"> <li>● Replace the damaged parts;</li> </ul>                                                                                                                                                         |

|                        |                                                                                                                                                                                                                                                                    |                                                                                                                                                                          |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Peripherals protection | <ul style="list-style-type: none"> <li>● Appearance and insulation inspection of peripheral equipment.</li> </ul>                                                                                                                                                  | <ul style="list-style-type: none"> <li>● Clean the environment and replace damaged parts.</li> </ul>                                                                     |
| Printed circuit board  | <ul style="list-style-type: none"> <li>● Check for odor, discoloration, and severe rust, and whether connectors are correct and reliable.</li> </ul>                                                                                                               | <ul style="list-style-type: none"> <li>● Fasten connectors;</li> <li>● Clean the printed circuit board;</li> <li>● Replace the damaged printed circuit board.</li> </ul> |
| Cooling system         | <ul style="list-style-type: none"> <li>● Check the cooling fan for damage and blockage;</li> <li>● Check for dirt and dust on the heatsinks;</li> <li>● Check that the air inlet and exhaust ports are not clogged or contaminated with foreign matter.</li> </ul> | <ul style="list-style-type: none"> <li>● Clean the operating environment;</li> <li>● Replace the damaged parts;</li> </ul>                                               |
| Keypad                 | <ul style="list-style-type: none"> <li>● Check the keypad for damage and blockage;</li> </ul>                                                                                                                                                                      | <ul style="list-style-type: none"> <li>● Replace the damaged parts;</li> </ul>                                                                                           |
| Motor                  | <ul style="list-style-type: none"> <li>● Check whether the motor has abnormal vibration or sound.</li> </ul>                                                                                                                                                       | <ul style="list-style-type: none"> <li>● Tighten mechanical and electrical connections and lubricate mechanical parts.</li> </ul>                                        |



Do not carry out work with the power supply on, as there is a risk of electric shock and death. Before performing operation, disconnect the power supply and make sure that the DC voltage in the main circuit has dropped to a safe level for 15 minutes.

## 5.2 Maintenance

All equipment and components have a service life, proper maintenance can prolong the life, but it does not fix the damage of the equipment and devices, please replace the devices according to the requirements.

| Name | Life      | Name                   | Life      | Name                  | Life       |
|------|-----------|------------------------|-----------|-----------------------|------------|
| Fan  | 2~3 years | Electrolytic capacitor | 4~5 years | Printed circuit board | 8~10 years |

Replacement of other devices requires maintenance techniques and product knowledge, and replacement must be strictly tested before it is put into use, so we do not recommend users to replace other internal devices. If replacement is indeed necessary, please contact the agent from whom you purchased the product or our Sales Department.

## 5.3 Product Warranty

1. If the product malfunctions during the warranty period, please see the warranty terms in the warranty card for coverage.
2. Primary troubleshooting will be carried out by your company, but the service can be provided by VEICHI or its service network for a fee at your request. If the cause of malfunction is found to be on VEICHI, the service will be free of charge according to mutual negotiation.
3. Liability exemption: The inconvenience caused to your company or your customers due to the failure of VEICHI products and the damage caused to the non-VEICHI products, regardless of whether they are within the warranty period, should not be attributable to VEICHI.

## Appendix I: Modbus Communication Protocol

### • Communication frame structure

The communication data format is as follows:

Composition of bytes: Start bit, 8 data bits, parity bit and stop bit.

|           |      |      |      |      |      |      |      |      |            |          |
|-----------|------|------|------|------|------|------|------|------|------------|----------|
| Start bit | Bit1 | Bit2 | Bit3 | Bit4 | Bit5 | Bit6 | Bit7 | Bit8 | Parity bit | Stop bit |
|-----------|------|------|------|------|------|------|------|------|------------|----------|

The information of a frame must be transmitted in one continuous data stream, and if it is longer than 1.5 bytes of interval before the end of transmission of the entire frame, the receiving device will clear this incomplete information and incorrectly assume that the subsequent byte is the address field of the next new frame. Similarly, if the start of a new frame is shorter than 3.5 bytes interval from the previous frame, the receiving device will consider it to be the sequent part of the previous frame. The final CRC parity will be incorrect due to the misalignment of the frame, resulting in a communication error.

### • Communication control parameter group address description

| Function                       | Address          | Description                                                                         |                                                                                                          | R/W Property         |   |
|--------------------------------|------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|----------------------|---|
| Communication giving frequency | 0X3000 or 0x2000 | 0~50000 corresponds to 0.00Hz~500.00Hz                                              |                                                                                                          | W/R                  |   |
| Communication command          | 0X3000 or 0x2001 | 0000H: None<br>0001H: FWD<br>0002H: REV<br>0003H: FWD jogging<br>0004H: REV jogging | 0005H: DEC stop<br>0006H: Free stop<br>0007H: Error reset<br>0008H: Operation off<br>0009H: Operation on | W/R                  |   |
| Drive status                   | 0x3002 or 0x2002 | Bit0                                                                                | 0: Stop                                                                                                  | 1: Operating         | R |
|                                |                  | Bit1                                                                                | 0: Non-accelerating;                                                                                     | 1: Accelerating      |   |
|                                |                  | Bit2                                                                                | 0: Non-decelerating;                                                                                     | 1: Decelerating      |   |
|                                |                  | Bit3                                                                                | 0: Forward;                                                                                              | 1: Reverse           |   |
|                                |                  | Bit4                                                                                | 0: No error;                                                                                             | 1: Drive error       |   |
|                                |                  | Bit5                                                                                | 0: GPRS unlocked;                                                                                        | 1: GPRS locked       |   |
|                                |                  | Bit6                                                                                | 0: No warning;                                                                                           | 1: Drive in warning  |   |
|                                |                  | Bit7                                                                                | 0: Operation not allowed                                                                                 | 1: Operation allowed |   |

|                                            |                  |                                                    |                                       |     |
|--------------------------------------------|------------------|----------------------------------------------------|---------------------------------------|-----|
| Drive error code                           | 0X3000 or 0x2003 | Current error code (see error code list)           |                                       | R   |
| Communication giving upper limit frequency | 0X3004 or 0x2004 | 0~32000 corresponds to 0.00Hz~320.00Hz             |                                       | W/R |
| Communication set torque                   | 0X3000 or 0x2005 | 0~1000 corresponds to 0.0%~100.0%                  |                                       | W/R |
| FWD upper frequency limit in torque mode   | 0x3006 or 0x2006 | 0~1000 corresponds to 0.0%~100.0%                  |                                       | W/R |
| REV upper frequency limit in torque mode   | 0x3007 or 0x2007 | 0~1000 corresponds to 0.0%~100.0%                  |                                       | W/R |
| Communication giving PID target            | 0x3008 or 0x2008 | 0~1000 corresponds to 0.0%~100.0%                  |                                       | W/R |
| Communication giving PID feedback          | 0x3009 or 0x2009 | 0~1000 corresponds to 0.0%~100.0%                  |                                       | W/R |
| Error/Alarm code reading                   | 0x3010 or 0x2010 | 0~63 are error codes<br>64~ are alarm codes        |                                       | R   |
| Output terminal status                     | 0x3018 or 0x2018 | Drive output terminals externally occupied, BIT0-Y | BIT1--TA1-TB1-TC1<br>BIT2-TA2-TB2-TC2 | W   |
| AO                                         | 0x3019 or 0x2019 | 0~10000 corresponds to output 0V~10V, 0mA~20mA     |                                       | W   |

**Note:** Other function code addresses are listed in the "Communication Address" column of the function code list.

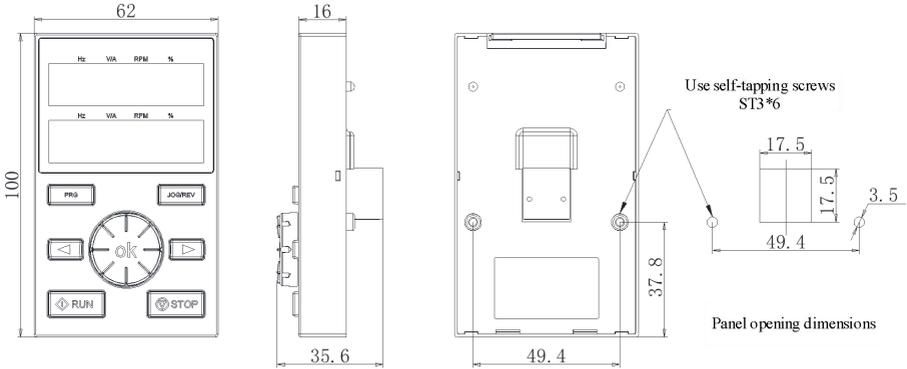
- When write command (06H) is used to write the F00~F15 parameters, if the highest bit of the address field of function code parameter is 0, it will be written into the RAM of drive only, and will not be stored during power down; if the high half byte of the address field of function code parameter is 1, it will be written into EEPROM, that is to say, it will be stored during power down. Like F00: 0x00XX (write into RAM), 0x10XX (store in EEPROM).
- When write command (06H) is used to write the F16~F29 parameters, if the highest bit of the address field of function code parameter is 5, it will be written into the RAM of drive only, and will not be stored during power down; if the high half byte of the address field of function code parameter is D, it will be written into EEPROM, that is to say, it will be stored during power down. Like F16: 0x50XX (write into RAM), 0xD0XX (store in EEPROM); F17: 0x51XX (write into RAM), 0xD1XX (store in EEPROM).
- Meaning of error codes of the abnormal response messages from slave

| <b>Error Code</b> | <b>Description</b>   | <b>Error Code</b> | <b>Description</b>                               | <b>Error Code</b> | <b>Description</b>               |
|-------------------|----------------------|-------------------|--------------------------------------------------|-------------------|----------------------------------|
| 1                 | Command code error   | 3                 | CRC parity error                                 | 4                 | Illegal address                  |
| 5                 | Illegal data         | 6                 | Parameters not for modification during operation | 8                 | Drive busy (saving to EEPROM)    |
| 9                 | Parameter over range | 10                | Reserved parameters not for modification         | 11                | Error in reading parameter bytes |

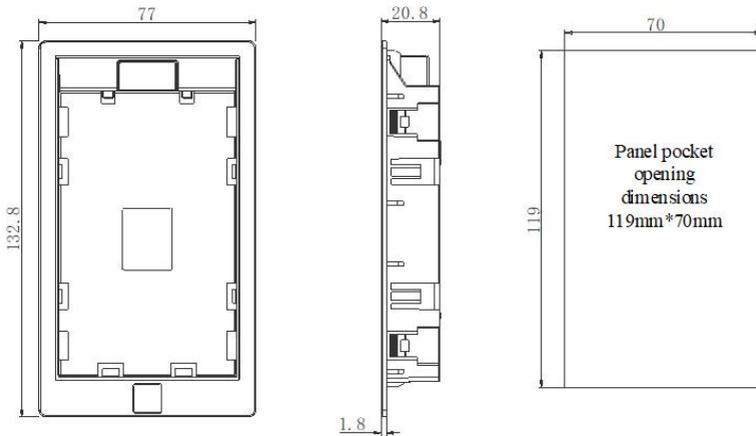
# Appendix II: External Keypad Dimensions and Models

## ● External dual-row keypad and opening dimensions

Model: KBD300-25 (Note: LCD and LED keypad external dimensions and opening dimensions are fully compatible (unit in the drawing: mm)).



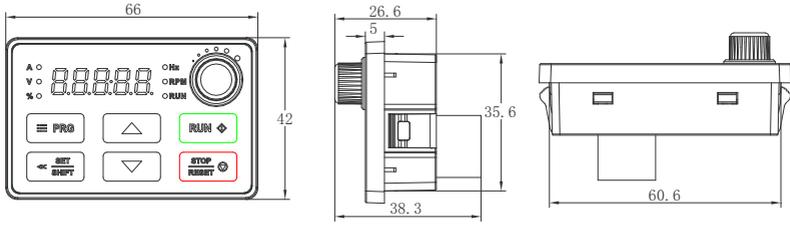
AC10 External Dual-row Keypad Dimensions



AC10 External Dual-row Keypad Pocket and Opening Dimensions

## ● External single-row keypad and opening dimensions

Model: KBD10-15 (Note: mounting plate opening dimensions: 61mmx36mm. (unit in drawing: mm))



## Version Change Log

| Date    | Version | Content                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2018.12 | V1.0    | First version issued                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 2019.02 | V1.1    | <ol style="list-style-type: none"> <li>1. Modified the standard wiring diagram.</li> <li>2. Removed some contents of the Keypad Layout and Operation Instructions.</li> <li>3. Changed the icons and terms for control modes.</li> <li>4. Modified the parameter note to property.</li> <li>5. Deleted parameters F01.42, F05.30, and F11.24.</li> <li>6. Modified descriptions for F06.60-F06.63, F06.70-F06.77.</li> <li>7. Added parameter descriptions for F11.21, F11.22, F12.01, F12.05, F12.06, F12.08, F12.09, F13.08-F13.16, F13.20-F13.24, F13.26-F13.28.</li> <li>8. Modified descriptions for F14.00-F14.14, F14.16-F14.30, F14.31-F14.45.</li> <li>9. Removed the signal levels for multi-function analog output from the monitoring parameters.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 2019.08 | V1.2    | Adjusted the font and standardized terminology.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 2024.11 | V1.3    | <ol style="list-style-type: none"> <li>1. Modified the technical specifications and protection function descriptions.</li> <li>2. Changed the rated current for 380V, 4kW to 10A.</li> <li>3. Modified parameters F10.32, F07.34, F01.10, F02.0x, F00.05, F00.06, F05.31, F05.33.</li> <li>4. Modified the fault alarm descriptions on the keypad display.</li> <li>5. Modified the overload capacity time.</li> <li>6. Modified the descriptions for recommended braking resistor specifications.</li> <li>7. Modified the F10.40 Excessive Speed Deviation Protection to be effective only for SVC, and deleted VF control.</li> <li>8. Deleted auxiliary terminal output capability, and added control circuit output capability.</li> <li>9. Changed the parameter attributes of F02.19, F02.11-F02.14 from READ to STOP, and deleted the read-only description for these parameters.</li> <li>10. Modified the standard wiring diagram and its explanations.</li> <li>11. Modified the explanations for motor control modes.</li> <li>12. Added explanations for control circuit and main circuit terminal connections.</li> <li>13. Added related descriptions to technical parameters.</li> </ol> |

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