



# **WECON VM AC Drive User Manual (V2.0)**

Website: <http://www.we-con.com.cn/en>

Phone: 86-591-8786886

Date: July 13, 2023

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# Preface

Thank you for choosing WECON VM Series AC Drive.

This user manual introduces the technical specifications, installation instructions, functions and performance of VM Series AC Drive properly. Please read this user manual carefully before carrying out works such as installation, commissioning, maintenance, etc.

You are specially warned to read and understand safety precaution items of this manual before using this product, and to ensure that relevant electrical installation testers' professional qualification shall be in line with the provisions of the labor supervision department, and the electrical and environmental conditions for product use shall be in conformity with relevant national standards.

Be sure to verify that the wiring is correct before powering on the product. Before starting the product, it is necessary to debug to ensure correct motor rotating direction.

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# 1 Safety precautions

## ■ Warning sign

 **DANGER:** Indicates that failure to comply with the notice will result in severe personal injury or even death.

 **WARNING:** Indicates that failure to comply with the notice will result in moderate personal injury, property damage or equipment damage.

## **WARNING**

- ◎ Do not install or operate any AC Drive that is damaged or with missing parts. Failing to follow this rule can result in facility damage or severe injury.
- ◎ When installing or handling the AC Drive, please hold the bottom of the product rather than the case only, to prevent its falling and being damaged.
- ◎ Install the AC Drive on nonflammable material like metal, and keep away from flammable or explosive object, heat source, and similar environment. Otherwise, fire may be caused.
- ◎ When AC Drive is installed inside an electrical cabinet or other kind of enclosure, please install fans or other cooling devices, and keep ventilation well enough to ensure the enclosure temperature below 40℃, or the AC Drive may be damaged due to extreme high temperature.
- ◎ Before wiring, ensure the AC Drive rated input voltage and phases are compatible with the input power source, or fire or personal injury may be caused.
- ◎ Never connect the AC power supply to output terminals U, V and W. Otherwise, the AC Drive will be damaged and the warranty is invalid.
- ◎ Never carry out withstand voltage test to the AC Drive, for example by a megohmmeter. Otherwise, it may cause damage to the AC Drive.
- ◎ The connecting cable of the main circuit terminal should use an insulating sleeve.
- ◎ When the cable length between the AC Drive and the motor exceeds 50 meters, an output reactor is recommended to be used.
- ◎ Do not use a circuit breaker to control the start and stop of the AC Drive. Otherwise, the AC Drive may be damaged.
- ◎ Since the AC Drive makes the motor running speed from low to high in a short time, please confirm that the motor and equipment are in the allowed running range before running.
- ◎ Do not touch due to high temperature of the heat sink and braking resistor.
- ◎ The factory parameters of the AC Drive can meet the requirements of most equipment operation. Under normal circumstances, please do not modify the AC Drive parameters at will. Even if there is some special applications need to change the AC Drive parameters, only necessary parameters could be changed. Otherwise, AC Drive damage may be caused.
- ◎ The PCB board has a CMOS integrated circuit. Do not touch it with your hands, otherwise, static electricity will damage the PCB board.

## **DANGER**

- ◎Wiring must be completed by qualified professional electricians, otherwise, there may be electric shock or damage to the AC Drive.
- ◎The power must be disconnected during wiring; otherwise, it may cause electric shock or fire.
- ◎The grounding terminal should be effectively grounded; otherwise, the outer casing of the AC Drive may be energized.
- ◎Do not touch the main circuit terminals, otherwise, it may cause electric shock.
- ◎Terminals for brake resistor are (+) and PB. Do not wire to other terminals, otherwise, fire may be caused.
- ◎It is only allowed to power on the AC Drive after the wiring is finished and its cover is reinstalled. It is strictly prohibited to remove the cover of AC Drive while power is on. Otherwise, it may cause electric shock.
- ◎Before programming the AC Drive with fault auto reset or restart option after power off, the mechanical device need to be implemented with safety protection measures first. Otherwise, personal injury will be caused.
- ◎“ STOP/RESET” key may become invalid as a result of some function setting. It is recommended to install an independent emergency circuit breaker for the AC Drive control system, otherwise, or personal injury may be caused.
- ◎When the power is on, there may be electricity in the AC Drive’s terminals even if it is in stop mode. Do not touch U, V, W terminals and motor connection terminals, or electrical shock may be caused.
- ◎Never touch the AC Drive connection terminals when power is on. Otherwise, it may cause an electrical shock.
- ◎Only qualified electricians can be authorized to do the jobs of maintenance, checking, or parts replacement.
- ◎After the power supply is OFF, make sure the charge LED is OFF and the residual voltage does not exist, or wait for at least 10 minutes before carrying out maintenance or inspection. Otherwise, damage or injury may be caused.
- ◎Modification to the AC Drive without permission is strictly prohibited, otherwise, severe injury may be caused. Arbitrarily modification of AC Drive will result in service warranty invalid.

## 2 Product information

### 2.1 Technical specifications

|                      |                                                                                            |
|----------------------|--------------------------------------------------------------------------------------------|
| Input Frequency (Hz) | 0-50/60 Hz fluctuation range :±5%                                                          |
| Output Voltage       | AC 0~Input Voltage                                                                         |
| Output Frequency     | 0 to 1000Hz                                                                                |
| Control Mode         | V/F Control                                                                                |
| Overload Ability     | 120% Rated Current: 1 min; 150% Rated Current: 10 secs                                     |
| Protection Level     | IP20                                                                                       |
| Altitude             | Normal use below 1000m, derating 1% for every 100m rise above 1000m, up to 3000m           |
| Ambient Temperature  | -10℃ ~ +50℃ ( IF the ambient temperature is between 40℃ and 50℃, please use with derating) |
| Humidity             | <95%RH ,no condensation                                                                    |
| Shock                | <5.9m/s <sup>2</sup> (0.6g)                                                                |
| Storage Temperature  | -25℃ ~ 60℃                                                                                 |

Table 2-1 Technical specifications

### 2.2 Product nameplate

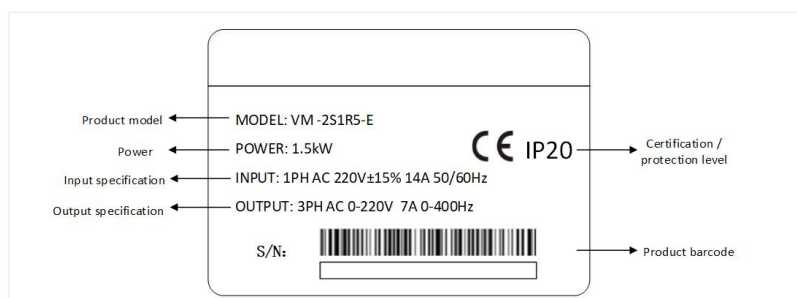


Figure 2-1 Product nameplate

### 2.3 Model description

VM –      2      S      1R5GB  
 ①      ②      ③      ④

| Field           | No. | Identification             | Description                       |
|-----------------|-----|----------------------------|-----------------------------------|
| Product series  | ①   | Product series             | VM series                         |
| Voltage grade   | ②   | Voltage grade              | 2: 220VAC; 4: 380VAC              |
| The input power | ③   | Power phase identification | S: single; T: three-phase         |
| Rated power     | ④   | Power range                | 1R5-1.5kW, R is the decimal point |

Table 2-2 VM series model field commen

## 2.4 Product model

| Model    | Rated Power(kW) | Input Voltage               | Rated Output Current(A) |
|----------|-----------------|-----------------------------|-------------------------|
| VM-2SR75 | 0.75            | Single Phase<br>AC 220V±15% | 4                       |
| VM-2S1R5 | 1.5             |                             | 7                       |
| VM-2S2R2 | 2.2             |                             | 9.6                     |
| VM-4TR75 | 0.75            | 3 Phase<br>AC 380V±15%      | 2.5                     |
| VM-4T1R5 | 1.5             |                             | 3.8                     |
| VM-4T2R2 | 2.2             |                             | 5.1                     |
| VM-4T004 | 4               |                             | 9                       |
| VM-4T5R5 | 5.5             |                             | 13                      |
| VM-4T7R5 | 7.5             |                             | 17                      |

Table 2-3 Product model table

## 3Chapter 2 Installation

### 3.1 Overall structural drawing(unit: mm)

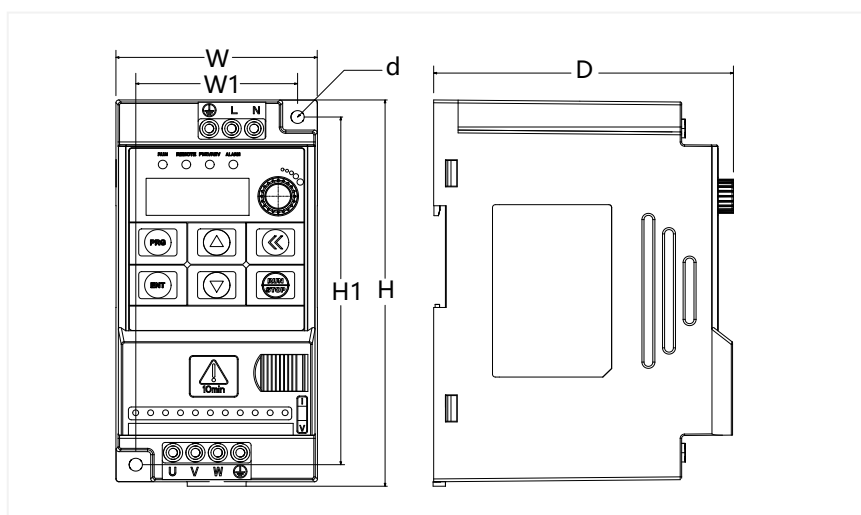


Figure 3-1 Outline dimension diagram

| Model    | Outer Dimension |     |     | Installation Dimension |    | Hole |
|----------|-----------------|-----|-----|------------------------|----|------|
|          | H               | W   | D   | H1                     | W1 | d    |
| VM-2SR75 | 142             | 72  | 116 | 130                    | 59 | 5    |
| VM-2S1R5 |                 |     |     |                        |    |      |
| VM-2S2R2 |                 |     |     |                        |    |      |
| VM-4TR75 |                 |     |     |                        |    |      |
| VM-4T1R5 |                 |     |     |                        |    |      |
| VM-4T2R2 |                 |     |     |                        |    |      |
| VM-4T004 | 196             | 95  | 132 | 179                    | 79 | 5.5  |
| VM-4T5R5 | 225             | 115 | 154 | 208                    | 99 | 5.5  |
| VM-4T7R5 |                 |     |     |                        |    |      |

Table 3-1 Outline dimension

## 3.2 Terminal connection

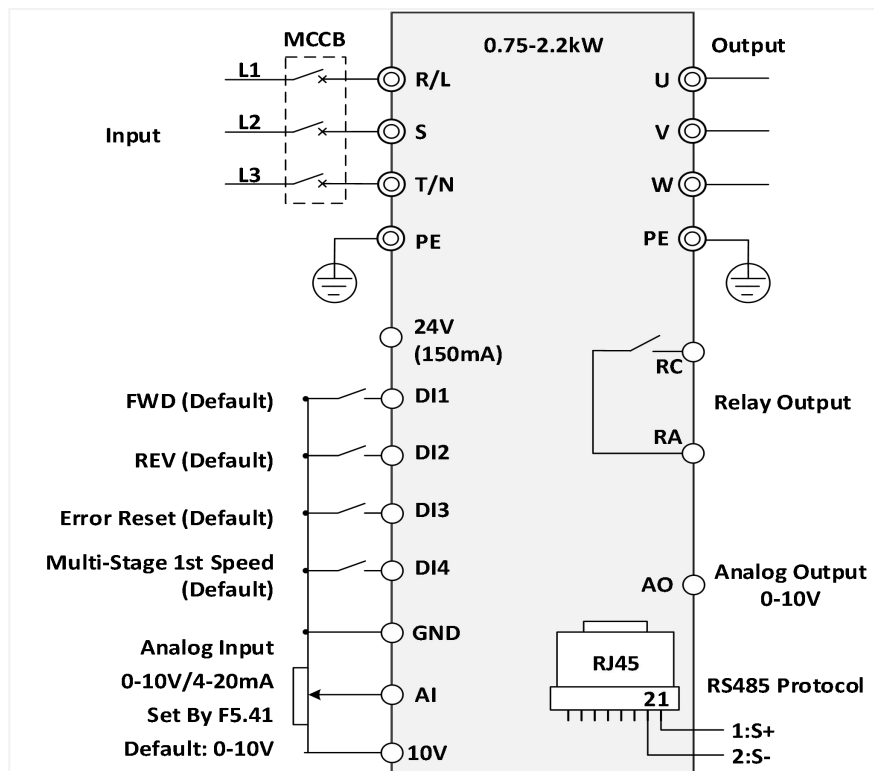


Figure 3-2 Terminal connection

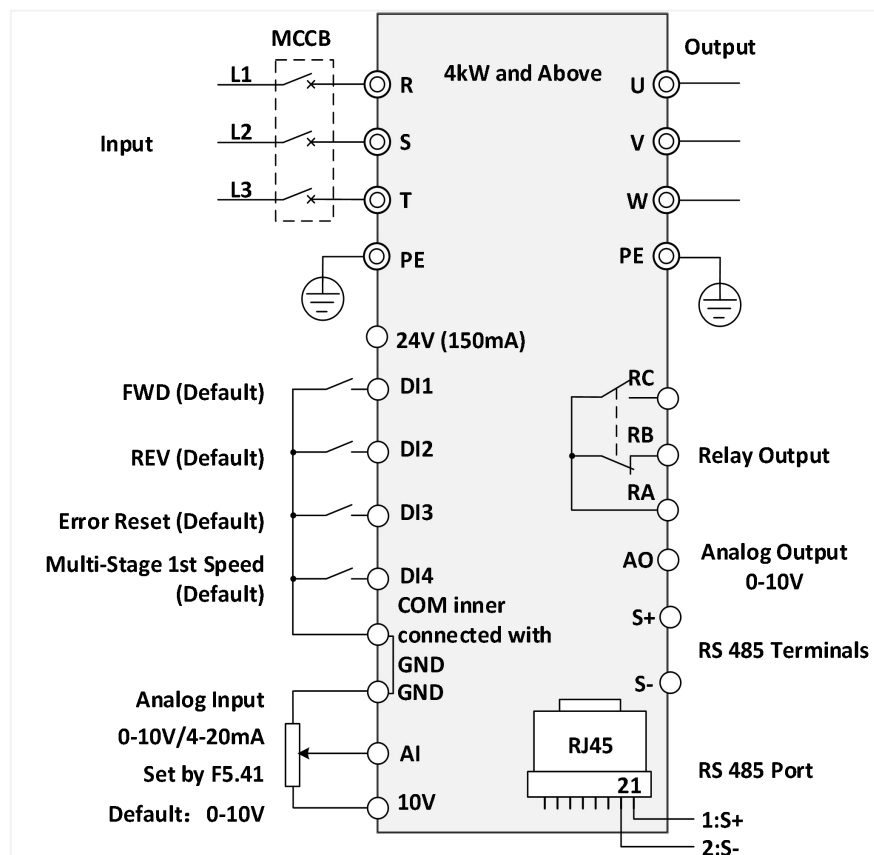


Figure 3-3 Terminal connectio

## 3.3 Main circuit connection

| Terminal                                                                          | Name                   | Description                                                                                  |
|-----------------------------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------------------|
| R/L、S、T/N                                                                         | Input Power            | Connected to input power                                                                     |
| U、V、W                                                                             | Output Power           | Connected to motor                                                                           |
|  | Grounding              | Connected to ground                                                                          |
| 10V/GND                                                                           | 10V Power              | Maximum Current: 20mA                                                                        |
| 24V/COM                                                                           | 24V Power              | Maximum Current: 150mA                                                                       |
| AI/GND                                                                            | Analog Input           | DC 0V ~ 10V or 0/4-20mA,set by parameter F5.41                                               |
| AO/GND                                                                            | Analog Output          | 0-10V                                                                                        |
| DI1/DI2<br>DI3/DI4                                                                | Digital Input          | External digital signal input                                                                |
| RA/RB/RC                                                                          | Relay Output           | RA/RC NO,RA/RB NC                                                                            |
| S+/S-                                                                             | RS485<br>Communication | S+: Positive terminal of differential signal<br>S-: Negative terminal of differential signal |
| RJ45 Port                                                                         |                        | As shown in the figure above; pin 1 is connected to S+,<br>and pin 2 is connected to S-      |

Table 3-2 Main circuit terminals and function

## 4 Display and operation

### 4.1 Keypad

You can modify the parameters, monitor the working status and start or stop the AC Drive by operating the keypad, as shown in the following figure.

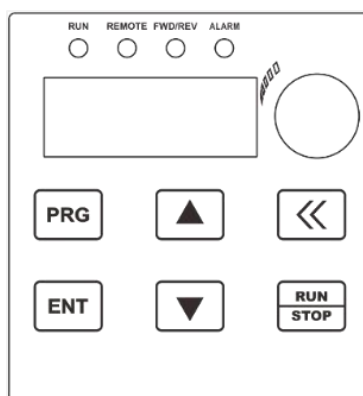


Figure 4-1 Keypad diagram

## 4.2 Keypad Operation

| Item          | Name                          | Function                                                                                                                                                                                         |
|---------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Indicators    | LED Indicators                | RUN: On/Running,Off/Stopped<br>REMOTE: On/Terminal Control,Off/Keypad Control,Blink/Communication Control<br>FWD/REV: On/FWD,Off/REV,Blink/ FWD & REV Switching<br>ALARM: Blink/Error,Off/Normal |
| Button        | PRG                           | Enter or exit parameter setting                                                                                                                                                                  |
|               | ENT                           | Enter the parameters step by step、 save parameter                                                                                                                                                |
|               | △                             | Increase parameter or its value                                                                                                                                                                  |
|               | ▽                             | Decrease parameter or its value                                                                                                                                                                  |
|               | >>                            | During parameter setting, select the modification bit of the parameter<br>During stop/run monitoring, the display parameters can be selected cyclically                                          |
|               | RUN/STOP                      | In keypad operation mode, control run and stop<br>It can be used for error reset when the drive alarms                                                                                           |
| Potentiometer | Speed Adjusting Potentiometer | Can be used for speed(frequency)adjusting                                                                                                                                                        |

Table 4-1 Description of Indicators and key

## 5 Parameter function

“o” indicates that the set value of this parameter can be changed when the VFD is in stop or running state.

“●” indicates that the set value of this parameter cannot be changed when the VFD is running.

“◎” indicates that the value of this parameter is the actual detection record value and cannot be changed.

### 5.1 Functional parameters

| Code  | Name                                             | Range                                                                                                                                                                                                                     | Default | Feature | RAM Address |
|-------|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|-------------|
| F0.00 | Industrial marco                                 | 0: Default<br>1~8: Reserved<br>9: Tile press machine application macro                                                                                                                                                    | 0       | ●       | 0000        |
| F0.01 | Start/Stop chanel                                | 0: Keypad<br>1: DI Terminal<br>2: RS485 Communication                                                                                                                                                                     | 0       | ●       | 0001        |
| F0.02 | UP/DOWN standard                                 | Reserved                                                                                                                                                                                                                  | 1       | ●       | 0002        |
| F0.03 | Main Frequency Source X option                   | 0: F0.08<br>1: Keypad Potentiometer<br>2: AI1<br>3: Reserved<br>4: DI Terminal UP/DW<br>5: Reserved<br>6: Multi-Stage Speed<br>7: Inner Simple PLC<br>8: PID Control<br>9: RS485 Communication(Including External Keypad) | 1       | ●       | 0003        |
| F0.04 | Auxiliary Frequency Source Y option              | Same as F0.03                                                                                                                                                                                                             | 0       | ●       | 0004        |
| F0.05 | Range of Auxiliary Frequency Source Y            | 0: Relative to F0.10<br>1: Relative to Main Frequency Source X (F0.03)                                                                                                                                                    | 0       | o       | 0005        |
| F0.06 | Percentage Range of Auxiliary Frequency Source Y | 0% to 150%                                                                                                                                                                                                                | 100%    | o       | 0006        |

| Code  | Name                                | Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Default | Feature | RAM Address |
|-------|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|-------------|
| F0.07 | Combination Option of F0.03 & F0.04 | <p>LED Ones Place: Frequency Source Selection</p> <p>0: Main Frequency Source</p> <p>1: Main and Auxiliary Operation Results</p> <p>2: Switchover between Main and Auxiliary</p> <p>3: Switchover between X and Main (X) &amp; Auxiliary (Y) Operation</p> <p>4: Switchover between Y and Main (X) &amp; Auxiliary (Y) Operation</p> <p>LED Tens Place: Combination Operation</p> <p>0: Main + Auxiliary</p> <p>1: Main — Auxiliary</p> <p>2: MAX {Main, Auxiliary}</p> <p>3: MIN {Main, Auxiliary}</p> <p>4: Main * Auxiliary</p> <p>LED hundreds Place: Frequency Control direction selection</p> <p>0: Frequency control direction is invalid</p> <p>1: Frequency control direction is valid</p> | 0       | ○       | 0007        |
| F0.08 | Keypad Setting Frequency            | 0.00 to F0.12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 50.00Hz | ○       | 0008        |
| F0.09 | Running Direction                   | <p>0: FWD</p> <p>1: REV</p> <p>2: REV Forbidden</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0       | ○       | 0009        |
| F0.10 | Maximum Output Frequency            | 0.00 to 320.00Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 50.00Hz | ●       | 000A        |
| F0.11 | Upper Limit Frequency Source        | <p>0: F0.12</p> <p>1: AI1</p> <p>2: Reserved</p> <p>3: Reserved</p> <p>4: Reserved</p> <p>5: RS485 Communication</p> <p>6: Reserved</p> <p>7: Keypad Potentiometer</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0       | ●       | 000B        |
| F0.12 | Maximum Running Frequency           | F0.14 to F0.10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 50.00Hz | ○       | 000C        |

| Code  | Name                                       | Range                                                                                                                                                                                                                                                                                                                                                               | Default          | Feature | RAM Address |
|-------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------|-------------|
| F0.13 | Reserved                                   | Reserved                                                                                                                                                                                                                                                                                                                                                            | 0.00Hz           | ○       | 000D        |
| F0.14 | Lower Limit Frequency                      | 0.00 to F0.12                                                                                                                                                                                                                                                                                                                                                       | 0.00Hz           | ○       | 000E        |
| F0.15 | The Function of Frequency Lower Limit      | 0: Stop<br>1: Run at Lower Limit Frequency<br>2: Run at 0 Speed                                                                                                                                                                                                                                                                                                     | 1                | ○       | 000F        |
| F0.16 | Carrier Frequency                          | 0.6 to 15.0kHz                                                                                                                                                                                                                                                                                                                                                      | Due to VFD Model | ●       | 0010        |
| F0.17 | Carrier PWM wave characteristics selection | LED Ones Place:<br>0: Independent of temperature<br>1: Related to temperature, >75, 1.0 Khz<br><br>LED Tens Place:<br>0: Independent of the output frequency<br>1: Related to the output frequency<br><br>LED Hundreds Place:<br>random PWM depth<br>0: Invalid<br>1-8: , adjust depth<br><br>LED Thousands Place: over modulation option<br>0: Invalid<br>1: Valid | 1001             | ●       | 0011        |
| F0.18 | Acceleration Time 1                        | 0.01 to 650.00s                                                                                                                                                                                                                                                                                                                                                     | Due to VFD Model | ○       | 0012        |
| F0.19 | Deceleration Time 1                        | 0.01 to 650.00s                                                                                                                                                                                                                                                                                                                                                     | Due to VFD Model | ○       | 0013        |
| F0.20 | Default Setting Restoring                  | 0: No Option<br>1: Recover Default Settings (Except F2 Team)<br>2: Clear All Error Records<br>3: Recover Default Settings (Including F2 Team)                                                                                                                                                                                                                       | 0                | ●       | 0014        |
| F0.21 | Parameter Lock                             | 0: Invalid (Unlock)<br>1: Valid(Lock)                                                                                                                                                                                                                                                                                                                               | 0                | ○       | 0015        |
| F0.23 | Unit of Acceleration & Deceleration Time   | 0: 1Sec<br>1: 0.1Sec<br>2: 0.01Sec                                                                                                                                                                                                                                                                                                                                  | 2                | ●       | 0017        |

| Code  | Name                                                   | Range                                                                                                                                                                                                                                                                                                                                                | Default | Feature | RAM Address |
|-------|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|-------------|
| F0.24 | Acceleration And Deceleration Time Reference Frequency | 0: F0.10<br>1: F0.08<br>2: 100Hz                                                                                                                                                                                                                                                                                                                     | 0       | ●       | 0018        |
| F0.25 | Fan Control Option                                     | Ones Place : Run/Stop Option<br>0: Fan runs when VFD is powered on<br>1: Stop according to VFD temperature, run when VFD is running<br>2: Run according to VFD temperature, stop when VFD is stopped                                                                                                                                                 | 01      | ○       | 0019        |
| F0.26 | Frequency Command Decimal Point                        | 1:One Decimal Place<br>2:Two Decimal Place                                                                                                                                                                                                                                                                                                           | 2       | ●       | 001A        |
| F1.00 | Start Option                                           | Ones Place: Start Option<br>0: Run according to starting<br>1: DC braking first and then star from the starting frequency<br>2: Speed tracking and direction judgment before starting from the starting frequency<br>Tens Place: Speed Tracking Direction<br>0: Same as stopping direction<br>1: Same as starting direction<br>2: Automatic tracking | 0       | ●       | 0100        |
| F1.01 | Reserved                                               |                                                                                                                                                                                                                                                                                                                                                      | 0       | ●       | 0101        |
| F1.02 | Speed Tracking Period                                  | 0.01 to 60.00s                                                                                                                                                                                                                                                                                                                                       | 0.50s   | ○       | 0102        |
| F1.03 | Starting Frequency                                     | 0.00 to 60.00Hz                                                                                                                                                                                                                                                                                                                                      | 0.50Hz  | ○       | 0103        |
| F1.04 | Last Period of Starting Frequency                      | 0.0 to 50.0s                                                                                                                                                                                                                                                                                                                                         | 0.0s    | ●       | 0104        |
| F1.05 | Braking Current of Starting                            | 0.0 to 150.0%                                                                                                                                                                                                                                                                                                                                        | 60.0%   | ●       | 0105        |
| F1.06 | Braking Period before Starting                         | 0.0 to 60.0s                                                                                                                                                                                                                                                                                                                                         | 1.0s    | ●       | 0106        |
| F1.07 | Acceleration & Deceleration Curve                      | 0: Straight Line<br>1: S Curve                                                                                                                                                                                                                                                                                                                       | 00      | ●       | 0107        |
| F1.08 | S-Curve Starting Acceleration Speed                    | 20.0% to 100.0%                                                                                                                                                                                                                                                                                                                                      | 50.0%   | ●       | 0108        |
| F1.09 | S-Curve Starting Deceleration Speed                    | 20.0% to 100.0%                                                                                                                                                                                                                                                                                                                                      | 50.0%   | ●       | 0109        |

| Code  | Name                                      | Range                                                                                                                                                                                                   | Default          | Feature | RAM Address |
|-------|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------|-------------|
| F1.10 | Stopping Option                           | 0: Deceleration Stopping<br>1: Free Stopping(Or Coast to stop, means VFD cuts off its output power immediately when being stopped, leaving the motor and its load to stop totally due to their inertia) | 0                | ○       | 010A        |
| F1.11 | DC Braking Beginning Frequency            | 0.00 to 50.00Hz                                                                                                                                                                                         | 1.00Hz           | ○       | 010B        |
| F1.12 | DC Braking Delay                          | 0.0 to 60.0s                                                                                                                                                                                            | 0.0s             | ○       | 010D        |
| F1.13 | DC Braking Current                        | 0.0 to 150.0%                                                                                                                                                                                           | 60.0%            | ○       | 010C        |
| F1.14 | DC Braking Period                         | 0.0 to 60.0s                                                                                                                                                                                            | 0.0s             | ○       | 010E        |
| F1.15 | Stopping Frequency                        | 0.00 to 60.00Hz                                                                                                                                                                                         | 0.50Hz           | ○       | 010F        |
| F1.16 | Zero Speed Holding Torque Valid Period    | 0.0 to 6000.0sec<br>When it is set to 6000.0s, it will be kept valid all the time                                                                                                                       | 0                | ●       | 0110        |
| F1.17 | Zero Speed Holding Torque                 | 0.0 to 150.0%                                                                                                                                                                                           | Due to VFD Model | ●       | 0111        |
| F2.00 | Type of Motor                             | 0: 3 Phase Asynchronous Motor (AM)<br>1: Permanent Magnet Synchronous Motor (PMSM)<br>2: Single Phase Asynchronous Motor(Can only be used with V/F mode)                                                | 0                | ●       | 0200        |
| F2.01 | Motor Rated Power                         | 0.4 to 1000.0kW                                                                                                                                                                                         | Due to VFD Model | ●       | 0201        |
| F2.02 | Motor Rated Voltage                       | 0 to 440V                                                                                                                                                                                               | Due to VFD Model | ●       | 0202        |
| F2.03 | Motor Rated Current                       | 0.1 to 2000.0A                                                                                                                                                                                          | Due to VFD Model |         | 0203        |
| F2.04 | Motor Rated Frequency                     | 0.01 to F0.10                                                                                                                                                                                           | Due to VFD Model | ●       | 0204        |
| F2.05 | Motor Rated RPM                           | 0 to 65000rpm                                                                                                                                                                                           | Due to VFD Model | ●       | 0205        |
| F2.06 | Motor Stator Resistance                   | 0.001 to 65.000                                                                                                                                                                                         | Due to VFD Model | ●       | 0206        |
| F2.07 | Motor Rotor Resistance                    | 0.001 to 65.000                                                                                                                                                                                         | Due to VFD Model | ●       | 0207        |
| F2.08 | Motor Stator and Rotor Leakage Inductance | 0.1 to 6500.0mH                                                                                                                                                                                         | Due to VFD Model | ●       | 0208        |

| Code  | Name                                                                      | Range                                                                                                                                                                    | Default          | Feature | RAM Address |
|-------|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------|-------------|
| F2.09 | Motor Stator and Rotor Mutual Inductance                                  | 0.1 to 6500.0mH                                                                                                                                                          | Due to VFD Model | ●       | 0209        |
| F2.10 | Motor No-load Current                                                     | 0.1 to 650.0A                                                                                                                                                            | Due to VFD Model | ●       | 020A        |
| F2.11 | Motor Auto Tuning Option                                                  | 0: No Option<br>1: Full-Tuning(Recommended when motor can be fully removed off its load)<br>2: Quiet-Tuning (Recommended when motor can't be fully removed off its load) | 0                | ●       | 020B        |
| F2.12 | G/P Model                                                                 | 0: G Model (for constant torque load)<br>1: P Model (for quadratic torque load)                                                                                          | 0                | ◎       | 020C        |
| F2.13 | Turn Ratio of Main and Auxiliary Coils of Single-Phase Asynchronous Motor | 10 - 200%                                                                                                                                                                | 80%              | ●       | 020D        |
| F2.14 | Single-Phase Motor Current Calibration Factor                             | 50 - 200%                                                                                                                                                                | 120%             | ●       | 020E        |
| F3.00 | ASR (Speed loop) proportional gain 1                                      | 0.00 to 1.00                                                                                                                                                             | 0.20             | ○       | 0x0300      |
| F3.01 | ASR (Velocity ring) integration time 1                                    | 0.01 to 10.00s                                                                                                                                                           | 0.10             | ○       | 0x0301      |
| F3.02 | Loss of velocity protection value                                         | 0 to 5000ms                                                                                                                                                              | 0ms              | ○       | 0x0302      |
| F3.03 | ASR filtering time 1                                                      | 0.000 to 0.100s                                                                                                                                                          | 0.005s           | ○       | 0x0303      |
| F3.04 | ASR switching frequency 1                                                 | 0.00 to 50.00Hz                                                                                                                                                          | 5.00Hz           | ○       | 0x0304      |
| F3.05 | ASR (Speed loop) proportional gain 2                                      | 0.00 to 1.00                                                                                                                                                             | 0.20             | ○       | 0x0305      |
| F3.06 | ASR (Velocity loop) integration time 2                                    | 0.01 to 10.00s                                                                                                                                                           | 0.10             | ○       | 0x0306      |
| F3.07 | Reserve                                                                   |                                                                                                                                                                          |                  |         | 0x0307      |
| F3.08 | ASR filtering time 2                                                      | 0.000 to 0.100s                                                                                                                                                          | 0.005s           | ○       | 0x0308      |
| F3.09 | ASR switching frequency 2                                                 | 0.00 to 50.00Hz                                                                                                                                                          | 10.00Hz          | ○       | 0x0309      |
| F3.10 | Slip compensation coefficient                                             | 0 to 250%                                                                                                                                                                | 100%             | ○       | 0x030A      |

| Code  | Name                                      | Range                                                                                                                                                                                               | Default | Feature | RAM Address |
|-------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|-------------|
| F3.11 | Maximum output torque                     | 0.0 to 250.0%                                                                                                                                                                                       | 150.0%  | ○       | 0x030B      |
| F3.12 | Reserve                                   |                                                                                                                                                                                                     | -       | ○       | 0x030C      |
| F3.13 | Reserve                                   |                                                                                                                                                                                                     | -       | ○       | 0x030D      |
| F3.14 | Reserve                                   |                                                                                                                                                                                                     | -       | ○       | 0x030E      |
| F3.15 | Reserve                                   |                                                                                                                                                                                                     | -       | ○       | 0x030F      |
| F3.16 | Current loop D axis proportional gain     | 0.1 to 10.0                                                                                                                                                                                         | 1.0     | ○       | 0x0310      |
| F3.17 | Current loop D axis integral gain         | 0.1 to 10.0                                                                                                                                                                                         | 1.0     | ○       | 0x0311      |
| F3.18 | Current loop Q axis proportional gain     | 0.1 to 10.0                                                                                                                                                                                         | 1.0     | ○       | 0x0312      |
| F3.19 | Current loop Q axis integral gain         | 0.1 to 10.0                                                                                                                                                                                         | 1.0     | ○       | 0x0313      |
| F3.20 | D-axis feed-forward gain                  | 0.0 to 200.0%                                                                                                                                                                                       | 50.0%   | ○       | 0x0314      |
| F3.21 | Q-axis feed-forward gain                  | 0.0 to 200.0%                                                                                                                                                                                       | 50.0%   | ○       | 0x0315      |
| F3.22 | Optimize the current loop bandwidth       | 0.0 to 99.99ms                                                                                                                                                                                      | 2.00ms  | ○       | 0x0316      |
| F3.23 | Current loop control word                 | bit0: Invalid<br>0:AM-ACR;1:PMACR<br>bit1: 0:old csr;1:new csr<br>bit2: 0: Enable prediction;<br>1: Disable prediction;<br>bit3: 0:old week; 1:new week<br>bit4: AM current loop PI feedback enable | 0       | ○       | 0x0317      |
| F3.24 | Weak magnetic control current upper limit | 0 to 200%                                                                                                                                                                                           | 80%     | ○       | 0x0318      |
| F3.25 | Weak magnetic control feed forward gain   | 0 to 500%                                                                                                                                                                                           | 100%    | ○       | 0x0319      |
| F3.26 | Weak magnetic control proportional gain   | 0 to 9999                                                                                                                                                                                           | 500     | ○       | 0x031A      |
| F3.27 | Weak magnetic control integral gain       | 0 to 9999                                                                                                                                                                                           | 1000    | ○       | 0x031B      |
| F3.28 | MTPA gain                                 | 0.0 to 500.0%                                                                                                                                                                                       | 0.0%    | ○       | 0x031C      |
| F3.29 | MTPAI filtering time                      | 0.0 to 999.9ms                                                                                                                                                                                      | 100.0ms | ○       | 0x031D      |
| F3.30 | Magnetic flux                             | 0 to 500%                                                                                                                                                                                           | 100%    | ○       | 0x031E      |

| Code  | Name                                              | Range                                                                                                                                                                                      | Default | Feature | RAM Address |
|-------|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|-------------|
|       | compensation coefficient                          |                                                                                                                                                                                            |         |         |             |
| F3.31 | Open-loop vector observation gain                 | 0 to 9999                                                                                                                                                                                  | 1024    |         | 0x031F      |
| F3.32 | Open-loop vector observation filtering time       | 1 to 100ms                                                                                                                                                                                 | 10ms    |         | 0x0320      |
| F3.33 | Open-loop vector compensation start frequency     | 0 to 100.0%                                                                                                                                                                                | 1.0%    |         | 0x0321      |
| F3.34 | Open-loop vector control word                     | bit0: Invalid 0:AM-ACR;<br>1:PMACR<br>bit1: 0:old csr;1:new csr<br>bit2: 0:Enable prediction;<br>1:Disable prediction;<br>bit3: Emf compensation enable<br>bit4: Emf compensation integral | 8       |         | 0x0322      |
| F3.35 | Synchronous open-loop starting mode               | 0: Direct start;<br>1: Angle search start;                                                                                                                                                 | 1       |         | 0x0323      |
| F3.36 | Synchronous open-loop vector low-frequency boost  | 0 to 100.0%                                                                                                                                                                                | 50.0%   | ○       | 0x0324      |
| F3.37 | Synchronous open loop vector high-frequency boost | 0.0 to 100.0%                                                                                                                                                                              | 5.0%    | ○       | 0x0325      |
| F3.38 | Low-frequency boost hold frequency                | 0.0 to 100.0%                                                                                                                                                                              | 10.00%  | ○       | 0x0326      |
| F3.39 | Low-frequency boost cutoff frequency              | 0.0 to 100.0%                                                                                                                                                                              | 20.00%  | ○       | 0x0327      |
| F3.40 | High-frequency injection voltage frequency        | 0 to 2000Hz                                                                                                                                                                                | 1000Hz  | ○       | 0x0328      |
| F3.41 | High-frequency injection voltage                  | 1 to 2000 (4096 corresponding to the rated voltage of the motor)                                                                                                                           | 1000    | ○       | 0x0329      |
| F3.42 | Phase-locked loop P                               | 0 to 500.00                                                                                                                                                                                | 50.00   | ●       | 0x032A      |

| Code  | Name                                  | Range                                                                                                                                   | Default          | Feature | RAM Address |
|-------|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------|---------|-------------|
| F3.43 | Phase-locked loop I                   | 0 to 500.00                                                                                                                             | 40.00            | ○       | 0x032B      |
| F3.44 | High-frequency injection control word | bit0: Enable high-frequency injection<br>bit1: Use high-frequency injection angle at low frequency<br>bit2: High-frequency filter depth | 0/3              | ○       | 0x032C      |
| F4.00 | Linear VF Curve Selection             | 0: Linear Curve ;<br>1-9: 1.1-1.9 power VF curve respectively;<br>10: Squared VF Curve;<br>11: Customized VF curve;                     | 0                | ●       | 0400        |
| F4.01 | Manual Torque Boost                   | 0.1 to 30.0%, 0 = Auto Boost                                                                                                            | Due to VFD Model | ○       | 0401        |
| F4.02 | Torque Boost Cut-Off Frequency        | 0.0 to 100.0%                                                                                                                           | 100.0%           | ●       | 0402        |
| F4.03 | Customized VF Point 1 Frequency       | 0.00 to F0.10                                                                                                                           | 3.00Hz           | ●       | 0403        |
| F4.04 | Customized VF Point 1 Voltage         | 0.0 to 100.0%                                                                                                                           | 10.0%            | ●       | 0404        |
| F4.05 | Customized VF Point 2 Frequency       | 0.00 to F0.10                                                                                                                           | 5.00Hz           | ●       | 0405        |
| F4.06 | Customized VF Point 2 Voltage         | 0.0 to 100.0%                                                                                                                           | 15.0%            | ●       | 0406        |
| F4.07 | Customized VF Point 3 Frequency       | 0.00 to F0.10                                                                                                                           | 8.00Hz           | ●       | 0407        |
| F4.08 | Customized VF Point 3 Voltage         | 0.0 to 100.0%                                                                                                                           | 22.0%            | ●       | 0408        |
| F4.09 | Customized VF Point 4 Frequency       | 0.00 to F0.10                                                                                                                           | 12.00Hz          | ●       | 0408        |
| F4.10 | Customized VF Point 4 Voltage         | 0.0 to 100.0%                                                                                                                           | 31.0%            | ●       | 040A        |
| F4.11 | Oscillation Suppression Gain          | 0.0 - 10.0                                                                                                                              | 5.0              | ○       | 041B        |
| F4.12 | Oscillation Suppression Filter Period | 1 - 1000ms                                                                                                                              | 50ms             | ○       | 040C        |
| F4.16 | Auto Voltage Regular Function(AVR)    | 0: Invalid<br>1: Valid                                                                                                                  | 0                | ○       | 0410        |
| F5.00 | DI1 Function Option                   | 0: No function<br>1: Forward running (FWD)<br>2: Reverse running (REV)<br>3: Three-wire operation                                       | 1                | ●       | 0500        |
| F5.01 | DI2 Function Option                   |                                                                                                                                         | 2                | ●       | 0501        |
| F5.02 | DI3 Function Option                   |                                                                                                                                         | 9                | ●       | 0502        |
| F5.03 | DI4 Function Option                   |                                                                                                                                         | 12               | ●       | 0503        |

| Code  | Name                | Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Default | Feature | RAM Address |
|-------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|-------------|
| F5.10 | VDI Function Option | control<br>4: Forward point movement (FJOG)<br>5: Reverse point movement (RJOG)<br>6: Terminal UP<br>7: Terminal DOWN<br>8: Free stopping<br>9: Reset<br>10: Run pause<br>11: External faults often open input<br>12: Multi-stage speed instruction terminal 1<br>13: Multi-stage speed instruction terminal 2<br>14: Multi-speed instruction terminal 3<br>15: Multi-speed instruction terminal 4<br>16: Terminal 1 for acceleration/deceleration time selection<br>17: Terminal 2 for acceleration/deceleration time selection<br>18: Frequency source switchover (terminal and keypad)<br>19: UP/DOWN setting clear<br>20: Command source switchover terminal 1<br>21: Acceleration/deceleration prohibited<br>22: PID pause<br>23: Inner PLC status reset<br>32: Immediate DC braking<br>35: Reverse PID action direction<br>36: External stop terminal 1<br>37: Command source switchover terminal 1<br>43: PID parameter switchover terminal | 0       | ●       | 050A        |

| Code  | Name                                                | Range                                                                                                                                          | Default  | Feature | RAM Address |
|-------|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------|-------------|
|       |                                                     | 44: User-defined fault 1<br>45: User-defined fault 2<br>47: Emergent Stop<br>49: Deceleration dc braking<br>50: Clear the current running time |          |         |             |
| F5.15 | DI Terminal Filter Time                             | 0.000 to 60.000s                                                                                                                               | 0.010s   | ○       | 050F        |
| F5.16 | Terminal Control Running Mode                       | 0: 2-wire mode 1<br>1: 2-wire mode 2<br>2: 3-wire mode 1<br>3: 3-wire mode 2                                                                   | 0        | ●       | 0510        |
| F5.17 | UP/DW Control Frequency Increase and Decrease Rate  | 0.01 to 50.00Hz/s                                                                                                                              | 0.50Hz/s | ○       | 0511        |
| F5.18 | AI1 Input Lower Limit                               | 0.00 to 10.00V                                                                                                                                 | 0.00V    | ○       | 0512        |
| F5.19 | AI1 Input Lower Limit Relative Frequency Percentage | 0.00 to 100.00%                                                                                                                                | 0.00%    | ○       | 0513        |
| F5.20 | AI1 Input Upper Limit                               | 0.00 to 10.00V                                                                                                                                 | 10.00V   | ○       | 0514        |
| F5.21 | AI1 Input Upper Limit Relative Frequency Percentage | 0.00 to 100.00%                                                                                                                                | 100.00%  | ○       | 0515        |
| F5.22 | AI1 Filter Time                                     | 0.00-10.00sec                                                                                                                                  | 0. 10sec | ○       | 0516        |
| F5.33 | DI1 Rising Edge Delay                               | 0.0 to 360.0s                                                                                                                                  | 0        | ○       | 0521        |
| F5.34 | DI2 Falling Edge Delay                              | 0.0 to 360.0s                                                                                                                                  | 0        | ○       | 0522        |
| F5.35 | DI2 Rising Edge Delay                               | 0.0 to 360.0s                                                                                                                                  | 0        | ○       | 0523        |
| F5.36 | DI2 Falling Edge Delay                              | 0.0 to 360.0s                                                                                                                                  | 0        | ○       | 0524        |
| F5.37 | DI1-DI4 Terminal Feature Option                     | 0: Closed valid<br>1: Disconnect valid<br>LED Ones Place: DI1<br>LED Tens Place: DI2<br>LED Hundreds Place: DI3<br>LED Thousands Place: DI4    | 0000     | ●       | 0525        |
| F5.41 | Analog Input Signal Option                          | Ones Place: AI1<br>Tens Place: Reserved<br>0: Voltage<br>1: Current                                                                            | 000      | ●       | 0529        |
| F5.42 | Analog Input Curve Option                           | Ones Place: AI1<br>Tens Place: Reserved<br>0: Linear<br>1: Curve                                                                               | 000      | ●       | 052A        |

| Code  | Name                      | Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Default | Feature | RAM Address |
|-------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|-------------|
| F5.60 | Terminal Operation Option | LED Ones Place: Recover Mode after Free Stop<br>0: Restore the original command after signal off<br>1: Not restore the original command after signal off<br>LED Tens Place: Recover Mode after Emergent Stop<br>0: Restore the original command after signal off<br>1: Not restore the original command after signal off<br>LED Hundreds Place: Working Mode after Error Reset<br>0: Can start to run directly<br>1: Must stop first and then run<br>Thousands Place: Reserved | 0110    | ●       | 050E        |
| F6.00 | Reserved                  | Reserved                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0       | ○       | 0600        |
| F6.02 | Relay Output Option       | 0: No option                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2       | ○       | 0602        |
| F6.06 | Virtual VDO Output Option | 1: VFD running<br>2: Alarm (Error)<br>3: Frequency level detection FDT1 output<br>4: Set frequency reached<br>5: VFD running at 0Hz<br>11: Inner PLC cycle completed<br>15: VFD ready for running<br>17: Frequency upper limit reached<br>18: Frequency lower limit reached<br>19: VFD input voltage too low<br>25: Frequency level detection FDT2 output<br>40: Running time reached<br>41: User-defined output 1<br>42: User-defined output 2<br>45: VFD running REV         | 0       | ●       | 0606        |
| F6.11 | Reserved                  | 0: Set Frequency<br>1: Running Frequency<br>2: Output Current                                                                                                                                                                                                                                                                                                                                                                                                                  | 0       | ○       | 060B        |

| Code  | Name                            | Range                                                                                                                                                                                                                     | Default | Feature | RAM Address |
|-------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|-------------|
| F6.12 | AO1 Output Option               | 3: Input Voltage<br>4: Output Voltage<br>5: RPM<br>6: Reserved                                                                                                                                                            | 0       | ○       | 060C        |
| F6.13 | Reserved                        | 7: Reserved<br>8: PID Set Value<br>9: PID Feedback Value<br>10: Output Power<br>11: Bus Voltage<br>12: Reserved<br>13: AI Input Value<br>14: Reserved<br>15: Reserved<br>16: IGBT Temperature 1<br>17: IGBT Temperature 2 | 0       | ○       | 060D        |
| F6.15 | AO1 Output Signal Offset        | -10.0 to 10.0%                                                                                                                                                                                                            | 0.0%    | ○       | 060F        |
| F6.16 | AO1 Output Signal Gain          | 25.0 to 200.0%                                                                                                                                                                                                            | 100.0%  | ●       | 0610        |
| F6.20 | Relay 1 Output Delay            | 0.0 to 360.0s                                                                                                                                                                                                             | 0       | ○       | 0614        |
| F6.22 | Reserved                        | Reserved                                                                                                                                                                                                                  | 0       | ○       | 0616        |
| F6.24 | Relay 1 Off Delay               | 0.0 to 360.0s                                                                                                                                                                                                             | 0       | ○       | 0618        |
| F6.27 | Relay output effective level    | 0: Positive logic<br>1: Negative logic<br>Ones Place: Y<br>Tens Place: RELAY1<br>Hundreds Place: RELAY2<br>Thousands Place: vY1                                                                                           | 0       | ○       | 061B        |
| F6.28 | User Defined Output Option(EX)1 | 0: Running frequency<br>1: Set frequency<br>2: Bus Voltage<br>3: Output Voltage<br>4: Output Current<br>5: Output Power<br>6: Output Torque<br>7-8: Reserved<br>9: AI1 Input<br>10: Reserved                              | 0       | ○       | 061C        |

| Code  | Name                                      | Range                                                                                                                                                                                                                                               | Default | Feature | RAM Address |
|-------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|-------------|
| F6.29 | User Defined Comparison Option 1          | Ones Place: Comparison Option<br>0: EX == X1(F6.31)<br>1: EX ≥ X1<br>2: EX ≤ X1<br>3: X1 ≤ EX ≤ X2<br>4: EX & X1=X2<br>Tens Place: Output Option<br>0: False Output<br>1: Truth Output                                                              | 0       | ○       | 061D        |
| F6.30 | User Defined Dead Zone 1                  | 0 to 65535                                                                                                                                                                                                                                          | 0       | ○       | 061E        |
| F6.31 | User Defined Output Option 1 Comparison 1 | 0 to 65535                                                                                                                                                                                                                                          | 0       | ○       | 061F        |
| F6.32 | User Defined Output Option 1 Comparison 2 | 0 to 65535                                                                                                                                                                                                                                          | 0       | ○       | 0620        |
| F6.33 | User Defined Output Option(EX)2           | Same as F6.28                                                                                                                                                                                                                                       | 0       | ○       | 0621        |
| F6.34 | User Defined Comparison Option 2          | Same as F6.29                                                                                                                                                                                                                                       | 0       | ○       | 0622        |
| F6.35 | User Defined Dead Zone 2                  | 0 to 65535                                                                                                                                                                                                                                          | 0       | ○       | 0623        |
| F6.36 | User Defined Output Option 2 Comparison 1 | 0 to 65535                                                                                                                                                                                                                                          | 0       | ○       | 0624        |
| F6.37 | User Defined Output Option 2 Comparison 2 | 0 to 65535                                                                                                                                                                                                                                          | 0       | ○       | 0625        |
| F7.00 | Parameters Copy Option                    | 0: No Option<br>1: Download Parameters from Keypad to VFD<br>2: Upload Parameters from VFD to Keypad                                                                                                                                                | 0       | ○       | 0700        |
| F7.02 | Keypad Stop Button Priority Option        | LED Ones Place: Priority at Terminal Control Mode(F0.01=1)<br>0: Invalid<br>1: Valid<br>LED Tens Place: Priority at Communication Control Mode (F0.01=2)<br>0: Invalid<br>1: Valid<br>LED Hundreds Place: Reserved<br>LED Thousands Place: Reserved | 0       | ○       | 0702        |

| Code  | Name                                   | Range                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Default | Feature | RAM Address |
|-------|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|-------------|
| F7.03 | Keypad Display Value 1(Running Status) | LED Ones Place: 1st Display Value<br>0: Running frequency<br>1: Set frequency<br>2: Bus Voltage<br>3: Output Voltage<br>4: Output Current<br>5: Output Power<br>6: Output Torque<br>7: DI Status<br>8: DO Status<br>9: AI1 Input<br>A: Reserved<br>B: Reserved<br>C: Reserved<br>D: Reserved<br>E: Motor RPM<br>F: PID Set Value<br>LED Tens Place: 2nd Display Value<br>LED Hundreds Place: 3rd Display Value<br>LED Thousands Place: 4th Display Value | 3420    | ○       | 0703        |

| Code  | Name                                    | Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Default | Feature | RAM Address |
|-------|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|-------------|
| F7.04 | Keypad Display Value 2 (Running Status) | LED Ones Place: 1st Display Value<br>0: PID Feedback Value<br>1: PLC Stage<br>2: Reserved<br>3: Feedback Speed<br>4: Reserved<br>5: Reserved<br>6: Reserved<br>7: Reserved<br>8: Reserved<br>9: Currently Power-on Period<br>A: Currently Running Period<br>B: Reserved<br>C: Reserved<br>D: Reserved<br>E: Main Frequency Source X<br>F: Auxiliary Frequency Source Y<br>LED Tens Place: 2nd Display Value<br>LED Hundreds Place: 3rd Display Value LED<br>Thousands Place: 4th Display Value | 0       | ○       | 0704        |
| F7.05 | Keypad Display Value 1 (Stop Status)    | Same as F7.03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3421    | ○       | 0705        |
| F7.06 | RPM Display Coefficient                 | 0.0 to 5000.0%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 100.0%  | ○       | 0706        |
| F7.07 | IGBT Temperature                        | 0 to 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -       | ⊙       | 0707        |
| F7.08 | Rectifier Temperature                   | 0 to 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -       | ⊙       | 0708        |
| F7.09 | Accumulated Running Time                | 0 to 65535h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -       | ⊙       | 0709        |
| F7.10 | Product Item Number                     | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | -       | ⊙       | 070A        |
| F7.11 | Software Version                        | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | -       | ⊙       | 070B        |
| F7.12 | Reserved                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |         | ○       | 070C        |
| F7.13 | Accumulated Power-on Time               | 0 to 65535h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -       | ⊙       | 070D        |
| F7.14 | Accumulated Power Consumption           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | -       | ⊙       | 070E        |
| F8.00 | Set Frequency of Jog Run                | 0.00 to F0.10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 5.00Hz  | ○       | 0800        |

| Code  | Name                                             | Range                                                                                                       | Default | Feature | RAM Address |
|-------|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------|---------|---------|-------------|
| F8.01 | Jog Run Acceleration Time                        | 0.01 to 650.00s                                                                                             | 10.00s  | ○       | 0801        |
| F8.02 | Jog Run Deceleration Time                        | 0.01 to 650.00s                                                                                             | 10.00s  | ○       | 0802        |
| F8.03 | Acceleration Time 2                              | 0.01 to 650.00s                                                                                             | 10.00s  | ○       | 0803        |
| F8.04 | Deceleration Time 2                              | 0.01 to 650.00s                                                                                             | 10.00s  | ○       | 0804        |
| F8.05 | Acceleration Time 3                              | 0.01 to 650.00s                                                                                             | 10.00s  | ○       | 0805        |
| F8.06 | Deceleration Time 3                              | 0.01 to 650.00s                                                                                             | 10.00s  | ○       | 0806        |
| F8.07 | Acceleration Time 4                              | 0.01 to 650.00s                                                                                             | 10.00s  | ○       | 0807        |
| F8.08 | Deceleration Time 4                              | 0.01 to 650.00s                                                                                             | 10.00s  | ○       | 0808        |
| F8.09 | Deceleration Time of Emergent Stop               | 0.01 to 650.00s                                                                                             | 10.00s  | ○       | 0809        |
| F8.10 | Hopping Frequency Point                          | 0.00 to F0.10                                                                                               | 0.00Hz  | ○       | 080A        |
| F8.11 | Hopping Range                                    | 0.00 to F0.10                                                                                               | 0.00Hz  | ○       | 080B        |
| F8.12 | Dead Zone Time for Forward and Reverse Switching | 0.0 to 120.0s                                                                                               | 0.0s    | ○       | 080C        |
| F8.13 | Set Value of Running Period                      | 0 to 65000min                                                                                               | 0min    | ○       | 080D        |
| F8.14 | Option for Set Value of Running Period           | 0: Keep Running<br>1: Alarm                                                                                 | 0       | ○       | 080E        |
| F8.15 | Terminal Jog Run Priority                        | 0: Invalid<br>1: Valid                                                                                      | 1       | ○       | 080F        |
| F8.16 | PID Preset Switching Condition Option            | 0: Due to Time<br>1: Due to Deviation                                                                       | 0       | ○       | 0810        |
| F8.17 | PID Preset Switching Range                       | 0.0-100.0%                                                                                                  | 3.0%    | ○       | 0811        |
| F9.00 | PID Set Value Source                             | 0: F9.02<br>1: Reserved<br>2: AI1<br>3: Reserved<br>4: Reserved<br>5: RS485 Communication<br>6: Reserved    | 0       | ○       | 0900        |
| F9.01 | PID Set Value                                    | 0.00 to 100.0%                                                                                              | 50.0%   | ○       | 0901        |
| F9.02 | PID Feedback Value Source                        | 0: Reserved<br>1: Reserved<br>2: AI1<br>3: Reserved<br>4: Reserved<br>5: Reserved<br>6: RS485 Communication | 2       | ○       | 0902        |

| Code  | Name                                             | Range                                                                                                                                                                                                                                                                  | Default | Feature | RAM Address |
|-------|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|-------------|
| F9.03 | PID Control Option                               | LED Ones Place: PID Control Feature<br>0: Positive      1: Negative<br>LED Tens Place: PID Control Option<br>0: REV Forbidden<br>1: REV Permit<br>LED Hundreds Place: Alignment selection<br>0: Non-center alignment<br>1: center aligned<br>Thousands Place: Reserved | 0100    | ○       | 0903        |
| F9.04 | Feedback Signal Maximum Range                    | 0 to 100.0                                                                                                                                                                                                                                                             | 100.0   | ○       | 0904        |
| F9.05 | Proportional Gain (P)                            | 0.00 to 100.00                                                                                                                                                                                                                                                         | 1.00    | ○       | 0905        |
| F9.06 | Integration Time (I)                             | 0.00 to 10.00s                                                                                                                                                                                                                                                         | 0.10s   | ○       | 0906        |
| F9.07 | Differential Gain (D)                            | 0.00 to 10.00s                                                                                                                                                                                                                                                         | 0.00s   | ○       | 0907        |
| F9.08 | REV Cutoff Frequency                             | 0.0 to F0.10                                                                                                                                                                                                                                                           | 0.00Hz  | ○       | 0908        |
| F9.09 | PID Control Deviation Limit                      | 0.0 to 100.0%                                                                                                                                                                                                                                                          | 0.0%    | ○       | 0909        |
| F9.10 | Differential Clipping                            | 0.00 to 100.00%                                                                                                                                                                                                                                                        | 0.10%   | ○       | 090A        |
| F9.11 | Reserved                                         | Reserved                                                                                                                                                                                                                                                               | 0.10s   | ○       | 090B        |
| F9.12 | PID Feedback Filter Time                         | 0.00 to 100.00s                                                                                                                                                                                                                                                        | 0.00s   | ○       | 090C        |
| F9.13 | PID Output Filter Time                           | 0.00 to 60.00s                                                                                                                                                                                                                                                         | 0.00s   | ○       | 090D        |
| F9.14 | Proportional Gain (P2)                           | 0.00 to 100.00                                                                                                                                                                                                                                                         | 1.00    | ○       | 090E        |
| F9.15 | Integration Time (I2)                            | 0.00 to 10.00s                                                                                                                                                                                                                                                         | 0.10s   | ○       | 090F        |
| F9.16 | Differential Gain (D2)                           | 0.00 to 10.00s                                                                                                                                                                                                                                                         | 0.00s   | ○       | 0910        |
| F9.17 | PID Switching Condition                          | 0: Switching Forbidden<br>1: Switching with DI Input Signal<br>2: Automatic switching based on deviation                                                                                                                                                               | 0       | ○       | 0911        |
| F9.18 | Switching Deviation 1                            | 0.0 to F9.19                                                                                                                                                                                                                                                           | 20.0%   | ○       | 0912        |
| F9.19 | Switching Deviation 2                            | F9.18 to 100.0%                                                                                                                                                                                                                                                        | 80.0%   | ○       | 0913        |
| F9.20 | PID Preset Output                                | 0.0 to 100.0%                                                                                                                                                                                                                                                          | 100.0%  | ○       | 0914        |
| F9.21 | PID Preset Output Period                         | 0.0 to 6500.0s                                                                                                                                                                                                                                                         | 0.0s    | ○       | 0915        |
| F9.22 | Positive Maximum Value of Twice Output Deviation | 0.00 to 100.00%                                                                                                                                                                                                                                                        | 1.00%   | ○       | 0916        |
| F9.23 | Negative Maximum Value of Twice Output Deviation | 0.00 to 100.00%                                                                                                                                                                                                                                                        | 1.00%   | ○       | 0917        |

| Code  | Name                                     | Range                                                                                                                                                                                              | Default | Feature | RAM Address |
|-------|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|-------------|
| F9.24 | Integral Property                        | Ones Place: Integral separation<br>0: Invalid<br>1: Valid<br>Tens Place: When the output reaches the limit value, whether to stop the integration<br>0: Keep on integration<br>1: Stop integration | 0       | ○       | 0918        |
| F9.25 | Feedback Offline Alarm Point             | 0.0 to 100.0%                                                                                                                                                                                      | 0.0%    | ○       | 0919        |
| F9.26 | Feedback Offline Alarm Delay             | 0.0 to 120.0s                                                                                                                                                                                      | 1.0s    | ○       | 091A        |
| F9.27 | Feedback Offline Alarm Option            | 0: Keep on PID running without alarming<br>1: Stop and alarm<br>2: Keep on PID running with alarming<br>3: Keep on running at present running frequency with alarming                              | 0       | ○       | 091B        |
| F9.28 | PID Option                               | 0: Normal PID<br>1: Sleepable PID                                                                                                                                                                  | 0       | ○       | 091C        |
| F9.29 | Sleep Threshold                          | 0.0% to 100.0%                                                                                                                                                                                     | 60.0%   | ○       | 091D        |
| F9.30 | Sleep Delay                              | 0.0 to 3600.0s                                                                                                                                                                                     | 3.0s    | ○       | 091E        |
| F9.31 | Wakeup Threshold                         | 0.0% to 100.0%                                                                                                                                                                                     | 20.0%   | ○       | 091F        |
| F9.32 | Wakeup Delay                             | 0.0 to 3600.0s                                                                                                                                                                                     | 3.0s    | ○       | 0920        |
| F9.33 | Minimum Output                           | 0: F0.14<br>1: 0Hz                                                                                                                                                                                 | 0       | ●       | 0921        |
| FA.00 | Motor Overload Protection Option         | 0: Invalid<br>1: Valid                                                                                                                                                                             | 1       | ○       | 0A00        |
| FA.01 | Motor Overload Protection Level          | 0.0 to 250.0%                                                                                                                                                                                      | 100.0%  | ○       | 0A01        |
| FA.02 | Motor Overload Warning Level             | 20.0 to 250.0%                                                                                                                                                                                     | 80.0%   | ○       | 0A02        |
| FA.03 | Frequency Limit                          | 0.00Hz - 99.99Hz                                                                                                                                                                                   | 0.00Hz  | ○       | 0A03        |
| FA.04 | Overvoltage Stall Protection Gain        | 0 - 500%                                                                                                                                                                                           | 100%    | ○       | 0A04        |
| FA.05 | Overvoltage Stall Protection Point       | 110% - 150% * Motor Rated Voltage                                                                                                                                                                  | 135%    | ○       | 0A05        |
| FA.06 | Overvoltage Stall Protection Filter Time | 1 - 1000ms                                                                                                                                                                                         | 5ms     | ○       | 0A06        |
| FA.07 | Overcurrent Stall Protection Gain        | 0 - 500%                                                                                                                                                                                           | 20%     | ○       | 0A07        |

| Code  | Name                                         | Range                                                                                                                                                                                                                                       | Default | Feature | RAM Address |
|-------|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|-------------|
| FA.08 | Overcurrent Stall Protection Point           | 100% - 200% * VFD Rated Current                                                                                                                                                                                                             | 150%    | ○       | 0A08        |
| FA.09 | Overcurrent Stall Protection Filter Time     | 1 - 1000ms                                                                                                                                                                                                                                  | 20ms    | ○       | 0A09        |
| FA.10 | Short-circuit to Ground Protection Option    | 0: Invalid<br>1: Valid                                                                                                                                                                                                                      | 0       | ○       | 0A0A        |
| FA.11 | AC Input Phase Loss Protection Option        | 0: Invalid<br>1: Valid                                                                                                                                                                                                                      | 1       | ○       | 0A0B        |
| FA.12 | AC Output Phase Loss Protection Option       | 0: Invalid<br>1: Valid                                                                                                                                                                                                                      | 1       | ○       | 0A0C        |
| FA.13 | Phase Loss Software Detection Point          | 0.0 to 999.9%                                                                                                                                                                                                                               | 15.0%   | ○       | 0A0D        |
| FA.14 | PWM parameter                                | Ones Place: PWM mode selection<br>0: PZV<br>1: 7 segments<br>Tens Place: Enable Voltage Prediction Compensation<br>Hundreds Place:<br>0: SSSU<br>1: DSDU<br>Thousands Place: Random Carrier mode<br>0: Random Carrier<br>1: Random 0 Vector | 0110    | ●       | 0A0E        |
| FA.15 | Hardware Current & Voltage Protection Option | Ones Place: Hardware Overcurrent Protection<br>0: Invalid, 1: Valid<br>Tens Place: Hardware Overvoltage Protection<br>0: Invalid, 1: Valid<br>Hundreds Place: Reserved<br>Thousands Place: Reserved                                         | 1110    | ○       | 0A0F        |
| FA.16 | Hardware Overcurrent Protection Point        | 100 to 220% * VFD Rated Current                                                                                                                                                                                                             | 180%    | ○       | 0A10        |
| FA.17 | Hardware Overcurrent Protection Delay        | 1 to 5000ms                                                                                                                                                                                                                                 | 500ms   | ○       | 0A11        |
| FA.18 | Protection Point of Too Low Bus Voltage      | 40.0% to 100.0%                                                                                                                                                                                                                             | 100%    | ○       | 0A12        |
| FA.19 | Protection Point of Overvoltage              | 120.0 - 200.0%                                                                                                                                                                                                                              | 100%    | ○       | 0A13        |
| FA.20 | Auto Error Reset Times                       | 0 to 5                                                                                                                                                                                                                                      | 0       | ○       | 0A14        |
| FA.21 | Auto Error Reset Interval                    | 0.1 to 100.0s                                                                                                                                                                                                                               | 1.0s    | ○       | 0A15        |
| FA.23 | Flux Brake Gain                              | 0 - 500%                                                                                                                                                                                                                                    | 170%    | ○       | 0A16        |

| Code  | Name                                     | Range                                                                                                                                                                                                                       | Default | Feature | RAM Address |
|-------|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|-------------|
| FA.26 | Output power Correction Factor           | 0 - 1000%                                                                                                                                                                                                                   | 100%    | ○       | 0A1A        |
| FA.27 | Output Power Display Unit                | 0 – Percentage (%)<br>1 - kW                                                                                                                                                                                                | 0       | ○       | 0A1B        |
| FA.28 | Speed Tracking Current Gain              | 0 to 100.00%                                                                                                                                                                                                                | 10%     | ○       | 0A1C        |
| FA.29 | Speed tracking gain                      | 0 to 100.00%                                                                                                                                                                                                                | 5%      | ○       | 0A1D        |
| FA.30 | Speed tracking current                   | 10 - 200%                                                                                                                                                                                                                   | 60%     | ○       | 0A1E        |
| FA.31 | Software Current Protection Option       | 0: Invalid, 1: Valid                                                                                                                                                                                                        | 1       | ○       | 0A1F        |
| FA.32 | Software Current Protection Point        | 200%-300% * VFD Rated Current                                                                                                                                                                                               | 270%    | ○       | 0A20        |
| FC.00 | RS485(Modbus)Communication Address       | 1 to 247                                                                                                                                                                                                                    | 1       | ○       | 0C00        |
| FC.01 | Communication Baud Rate                  | 0: 1200 bps<br>1: 2400 bps<br>2: 4800 bps<br>3: 9600 bps<br>4: 19200 bps<br>5: 38400 bps                                                                                                                                    | 3       | ○       | 0C01        |
| FC.02 | Modbus Data Format                       | 0: (N,8,1)<br>No parity, data bits: 8; stop bits: 1<br>1: (E,8,1)<br>Even parity, data bits: 8; stop bits: 1<br>2: (O,8,1)<br>Odd parity, data bits: 8; stop bits: 1<br>3: (N,8,2)<br>No parity, data bits: 8; stop bits: 2 | 0       | ○       | 0C02        |
| FC.03 | Modbus Communication Reply Delay         | 0 to 500ms                                                                                                                                                                                                                  | 1ms     | ○       | 0C03        |
| FC.04 | Modbus Communication Timeout Alarm Delay | 0.1 to 100.0s                                                                                                                                                                                                               | 1.0s    | ○       | 0C04        |
| FD.00 | INNER PLC(AND MULTI-STAGE SPEED)0        | 0.0 to 100.0% * F0.10                                                                                                                                                                                                       | 0       | ○       | 0D00        |
| FD.01 | INNER PLC(AND MULTI-STAGE SPEED)1        | 0.0 to 100.0% * F0.10                                                                                                                                                                                                       | 0       | ○       | 0D01        |
| FD.02 | INNER PLC(AND MULTI-STAGE SPEED)2        | 0.0 to 100.0% * F0.10                                                                                                                                                                                                       | 0       | ○       | 0D02        |
| FD.03 | INNER PLC(AND MULTI-STAGE SPEED)3        | 0.0 to 100.0% * F0.10                                                                                                                                                                                                       | 0       | ○       | 0D03        |

| Code  | Name                               | Range                                                                                              | Default | Feature | RAM Address |
|-------|------------------------------------|----------------------------------------------------------------------------------------------------|---------|---------|-------------|
| FD.04 | INNER PLC(AND MULTI-STAGE SPEED)4  | 0.0 to 100.0% * F0.10                                                                              | 0       | ○       | 0D04        |
| FD.05 | INNER PLC(AND MULTI-STAGE SPEED)5  | 0.0 to 100.0% * F0.10                                                                              | 0       | ○       | 0D05        |
| FD.06 | INNER PLC(AND MULTI-STAGE SPEED)6  | 0.0 to 100.0% * F0.10                                                                              | 0       | ○       | 0D06        |
| FD.07 | INNER PLC(AND MULTI-STAGE SPEED)7  | 0.0 to 100.0% * F0.10                                                                              | 0       | ○       | 0D07        |
| FD.08 | INNER PLC(AND MULTI-STAGE SPEED)8  | 0.0 to 100.0% * F0.10                                                                              | 0       | ○       | 0D08        |
| FD.09 | INNER PLC(AND MULTI-STAGE SPEED)9  | 0.0 to 100.0% * F0.10                                                                              | 0       | ○       | 0D09        |
| FD.10 | INNER PLC(AND MULTI-STAGE SPEED)10 | 0.0 to 100.0% * F0.10                                                                              | 0       | ○       | 0D0A        |
| FD.11 | INNER PLC(AND MULTI-STAGE SPEED)11 | 0.0 to 100.0% * F0.10                                                                              | 0       | ○       | 0D0B        |
| FD.12 | INNER PLC(AND MULTI-STAGE SPEED)12 | 0.0 to 100.0% * F0.10                                                                              | 0       | ○       | 0D0C        |
| FD.13 | INNER PLC(AND MULTI-STAGE SPEED)13 | 0.0 to 100.0% * F0.10                                                                              | 0       | ○       | 0D0D        |
| FD.14 | INNER PLC(AND MULTI-STAGE SPEED)14 | 0.0 to 100.0% * F0.10                                                                              | 0       | ○       | 0D0E        |
| FD.15 | INNER PLC(AND MULTI-STAGE SPEED)15 | 0.0 to 100.0% * F0.10                                                                              | 0       | ○       | 0D0F        |
| FD.16 | Inner PLC Running Mode             | 0: Stop after a single cycle<br>1: Continuous loop<br>2: Hold the final value after a single cycle | 0       | ○       | 0D10        |
| FD.17 | Inner PLC Power-off Memory Option  | 0: Invalid, 1: Valid                                                                               | 0       | ○       | 0D11        |
| FD.18 | Inner PLC Stage 0 Running Period   | 0.0 to 6500.0(s/m/h)                                                                               | 10.0    | ○       | 0D12        |

| Code  | Name                                                                    | Range                                                                                                                                                                                                                                                                                                                                                                        | Default | Feature | RAM Address |
|-------|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|-------------|
| FD.19 | Inner PLC Stage 0<br>Direction &<br>Acceleration &<br>Deceleration Time | LED Ones Place: Direction<br>of the Stage<br>0: FWD, 1: REV<br>LED Tens Place:<br>Acceleration &<br>Deceleration Time<br>0: Acceleration &<br>Deceleration Time 1<br>1: Acceleration &<br>Deceleration Time 2<br>2: Acceleration &<br>Deceleration Time 3<br>3: Acceleration &<br>Deceleration Time 4<br>LED Hundreds Place:<br>Reserved<br>LED Thousands Place:<br>Reserved | 0       | ○       | 0D13        |
| FD.20 | Inner PLC Stage 1<br>Running Period                                     | 0.0 to 6500.0(s/m/h)                                                                                                                                                                                                                                                                                                                                                         | 10.0    | ○       | 0D14        |
| FD.21 | Inner PLC Stage 1<br>Direction &<br>Acceleration &<br>Deceleration Time | Same as FD.19                                                                                                                                                                                                                                                                                                                                                                | 0       | ○       | 0D15        |
| FD.22 | Inner PLC Stage 2<br>Running Period                                     | 0.0 to 6500.0(s/m/h)                                                                                                                                                                                                                                                                                                                                                         | 10.0    | ○       | 0D16        |
| FD.23 | Inner PLC Stage 2<br>Direction &<br>Acceleration &<br>Deceleration Time | Same as FD.19                                                                                                                                                                                                                                                                                                                                                                | 0       | ○       | 0D17        |
| FD.24 | Inner PLC Stage 3<br>Running Period                                     | 0.0 to 6500.0(s/m/h)                                                                                                                                                                                                                                                                                                                                                         | 10.0    | ○       | 0D18        |
| FD.25 | Inner PLC Stage 3<br>Direction &<br>Acceleration &<br>Deceleration Time | Same as FD.19                                                                                                                                                                                                                                                                                                                                                                | 0       | ○       | 0D19        |
| FD.26 | Inner PLC Stage 4<br>Running Period                                     | 0.0 to 6500.0(s/m/h)                                                                                                                                                                                                                                                                                                                                                         | 10.0    | ○       | 0D1A        |
| FD.27 | Inner PLC Stage 4<br>Direction &<br>Acceleration &<br>Deceleration Time | Same as FD.19                                                                                                                                                                                                                                                                                                                                                                | 0       | ○       | 0D1B        |
| FD.28 | Inner PLC Stage 5<br>Running Period                                     | 0.0 to 6500.0(s/m/h)                                                                                                                                                                                                                                                                                                                                                         | 10.0    | ○       | 0D1C        |

| Code  | Name                                                                     | Range                | Default | Feature | RAM Address |
|-------|--------------------------------------------------------------------------|----------------------|---------|---------|-------------|
| FD.29 | Inner PLC Stage 5<br>Direction &<br>Acceleration &<br>Deceleration Time  | Same as FD.19        | 0       | ○       | 0D1D        |
| FD.30 | Inner PLC Stage 6<br>Running Period                                      | 0.0 to 6500.0(s/m/h) | 10.0    | ○       | 0D1E        |
| FD.31 | Inner PLC Stage 6<br>Direction &<br>Acceleration &<br>Deceleration Time  | Same as FD.19        | 0       | ○       | 0D1F        |
| FD.32 | Inner PLC Stage 7<br>Running Period                                      | 0.0 to 6500.0(s/m/h) | 10.0    | ○       | 0D20        |
| FD.33 | Inner PLC Stage 7<br>Direction &<br>Acceleration &<br>Deceleration Time  | Same as FD.19        | 0       | ○       | 0D21        |
| FD.34 | Inner PLC Stage 8<br>Running Period                                      | 0.0 to 6500.0(s/m/h) | 10.0    | ○       | 0D22        |
| FD.35 | Inner PLC Stage 8<br>Direction &<br>Acceleration &<br>Deceleration Time  | Same as FD.19        | 0       | ○       | 0D23        |
| FD.36 | Inner PLC Stage 9<br>Running Period                                      | 0.0 to 6500.0(s/m/h) | 10.0    | ○       | 0D24        |
| FD.37 | Inner PLC Stage 9<br>Direction &<br>Acceleration &<br>Deceleration Time  | Same as FD.19        | 0       | ○       | 0D25        |
| FD.38 | Inner PLC Stage 10<br>Running Period                                     | 0.0 to 6500.0(s/m/h) | 10.0    | ○       | 0D26        |
| FD.39 | Inner PLC Stage 10<br>Direction &<br>Acceleration &<br>Deceleration Time | Same as FD.19        | 0       | ○       | 0D27        |
| FD.40 | Inner PLC Stage 11<br>Running Period                                     | 0.0 to 6500.0(s/m/h) | 10.0    | ○       | 0D28        |
| FD.41 | Inner PLC Stage 11<br>Direction &<br>Acceleration &<br>Deceleration Time | Same as FD.19        | 0       | ○       | 0D29        |
| FD.42 | Inner PLC Stage 12<br>Running Period                                     | 0.0 to 6500.0(s/m/h) | 10.0    | ○       | 0D2A        |
| FD.43 | Inner PLC Stage 12<br>Direction &<br>Acceleration &<br>Deceleration Time | Same as FD.19        | 0       | ○       | 0D2B        |

| Code  | Name                                                            | Range                                                                                                                                                                                                                                | Default | Feature | RAM Address |
|-------|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|-------------|
| FD.44 | Inner PLC Stage 13 Running Period                               | 0.0 to 6500.0(s/m/h)                                                                                                                                                                                                                 | 10.0    | ○       | 0D2C        |
| FD.45 | Inner PLC Stage 13 Direction & Acceleration & Deceleration Time | Same as FD.19                                                                                                                                                                                                                        | 0       | ○       | 0D2D        |
| FD.46 | Inner PLC Stage 14 Running Period                               | 0.0 to 6500.0(s/m/h)                                                                                                                                                                                                                 | 10.0    | ○       | 0D2E        |
| FD.47 | Inner PLC Stage 14 Direction & Acceleration & Deceleration Time | Same as FD.19                                                                                                                                                                                                                        | 0       | ○       | 0D2F        |
| FD.48 | Inner PLC Stage 15 Running Period                               | 0.0 to 6500.0(s/m/h)                                                                                                                                                                                                                 | 10.0    | ○       | 0D30        |
| FD.49 | Inner PLC Stage 15 Direction & Acceleration & Deceleration Time | Same as FD.19                                                                                                                                                                                                                        | 0       | ○       | 0D31        |
| FD.50 | Inner PLC Running Option                                        | LED Tens Place : Time Unit<br>0: Sec<br>1: Min<br>2: H<br>LED Thousands Place:<br>Starting Option<br>0: Start from stage 1<br>1: Start from the stage when being stopped<br>2: Start with the rest period at the stage being stopped | 0       | ○       | 0D32        |
| FD.51 | Multi-Stage Speed 0 Source                                      | 0: FD.00<br>1: AI1<br>2: Reserved<br>3: Keypad Potentiometer<br>4: Reserved<br>5: PID<br>6: Reserved                                                                                                                                 | 0       | ○       | 0D33        |
| FD.52 | Multi-Stage Speed Priority                                      | 0: Invalid<br>1: Valid                                                                                                                                                                                                               | 1       | ○       | 0D34        |
| FE.00 | Lock Option of Parameters and Buttons                           | 0: Unlocked<br>1: Parameters Locked<br>2: Parameters & Keypad Buttons Locked (Except RUN/STOP/JOG)<br>3: Parameters & All Keypad Buttons Locked                                                                                      | 0       | ○       | 0E00        |
| FE.01 | User Password                                                   | 0 to 9999                                                                                                                                                                                                                            | 0       | ○       | 0E01        |

Table 5-1 Functional parameter

## 5.2 Monitoring Parameters

| Parameter | Name                          | Minimum Unit | Priority | Address |
|-----------|-------------------------------|--------------|----------|---------|
| D0.00     | Running Frequency(Hz)         | 0.01Hz       | ◎        | D000    |
| D0.01     | Set Frequency(Hz)             | 0.01Hz       | ◎        | D001    |
| D0.02     | Bus Voltage(V)                | 0.1V         | ◎        | D002    |
| D0.03     | Output Voltage(V)             | 1V           | ◎        | D003    |
| D0.04     | Output Current(A)             | 0.01A        | ◎        | D004    |
| D0.05     | Output power (kW)             | 0.1kW        | ◎        | D005    |
| D0.06     | Output torque (%)             | 0.1%         | ◎        | D006    |
| D0.07     | DI Input Status               | 1            | ◎        | D007    |
| D0.08     | DO Output Status              | 1            | ◎        | D008    |
| D0.09     | AI Voltage(V)                 | 0.01V        | ◎        | D009    |
| D0.10     | Reserved                      | -            | ◎        | D00A    |
| D0.11     | PLC Stage                     | -            | ◎        | D00B    |
| D0.12     | IGBT Module Temperature(°C)   | 0.1°C        | ◎        | D00C    |
| D0.13     | Count value                   | 1            | ◎        | D00D    |
| D0.14     | Load speed display            | 1            | ◎        | D00E    |
| D0.15     | PID Set                       | 1            | ◎        | D00F    |
| D0.16     | PID FeedBback                 | 1            | ◎        | D010    |
| D0.17     | PLC Stage                     | 1            | ◎        | D011    |
| D0.18     | Reserved                      | -            | ◎        | D012    |
| D0.19     | Feedback Speed(Unit0.1Hz)     | 0.1Hz        | ◎        | D013    |
| D0.20     | Reserved                      | -            | ◎        | D014    |
| D0.21     | Feedback Speed(Unit0.1Hz)     | 0.1Hz        | ◎        | D015    |
| D0.22     | Reserved                      | -            | ◎        | D016    |
| D0.32     | Reserved                      | -            | ◎        | D017    |
| D0.24     | Reserved                      | -            | ◎        | D018    |
| D0.25     | Current power-on time         | 1Min         | ◎        | D019    |
| D0.26     | Current running time          | 0.1Min       | ◎        | D01A    |
| D0.27     | Reserved                      | -            | ◎        | D01B    |
| D0.28     | Communication setting         | 0.01%        | ◎        | D01C    |
| D0.29     | Reserved                      | -            | ◎        | D01D    |
| D0.30     | Main frequency X display      | 0.01Hz       | ◎        | D01E    |
| D0.31     | Auxiliary frequency Y display | 0.01Hz       | ◎        | D01F    |

Table 5-2 Monitoring Parameters

## 5.3 Fault recording parameters

| Function Code                     | Parameter Name        | Setting Range                                                                                              | Property | Property |
|-----------------------------------|-----------------------|------------------------------------------------------------------------------------------------------------|----------|----------|
| E0 GROUP THE LATEST FAULT RECORDS |                       |                                                                                                            |          |          |
| E0.00                             | The latest fault type | No faultOvercurrent during acceleration<br>(Err02)Overcurrent during deceleration<br>(Err03)Overcurrent at | ◎        | E000     |

| Function Code | Parameter Name                                       | Setting Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Property | Property |
|---------------|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|
|               |                                                      | constant speed<br>(Err04)Overvoltage during acceleration<br>(Err05)Overvoltage during deceleration<br>(Err06)Overvoltage at constant speed<br>(Err07)Undervoltage<br>(Err09)AC Drive overload (Err10)Motor overload<br>(Err11)Output missing phase (Err13)Module overheating<br>(Err14)External equipment fault<br>(Err15)Current detection fault<br>(Err18)Data overflow<br>(Err21)On-power EEPROM check fault<br>(Err22)Running time arrival (Err26)PID feedback loss during running(Err31) |          |          |
| E0.01         | Frequency by the latest failure                      | 0.0Hz~F0.10<br>(Maximum frequency)                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ◎        | E001     |
| E0.02         | Current by the latest failure                        | 0.00~655.35                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ◎        | E002     |
| E0.03         | Bus voltage by the latest failure                    | 0.0~810.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ◎        | E003     |
| E0.04         | Input terminal status by the latest failure          | 0-15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ◎        | E004     |
| E0.05         | The temperature of AC Drive by the latest failure    | 0~65535                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ◎        | E005     |
| E0.06         | The temperature of IGBT Module by the latest failure | 0~100℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ◎        | E006     |
| E0.07         | Inverter Fault Status                                | LED Ones Place:<br>Running Direction 0:<br>FWD1: REVLED Tens Place: Running status0: Shutdown1: S tabilized speed2:                                                                                                                                                                                                                                                                                                                                                                           | ◎        | E007     |

| Function Code                           | Parameter Name                                                 | Setting Range                                                                                | Property | Property |
|-----------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------|----------|
|                                         |                                                                | Acceleration3:<br>DecelerationLED<br>Hundreds Place:<br>ReservedThousands<br>Place: Reserved |          |          |
| E0.08                                   | Time of latest failure (timing from this on-power time)        | 0~65535H                                                                                     | ◎        | E008     |
| E0.09                                   | Time of the latest failure (timing from the running beginning) | 0~65535H                                                                                     | ◎        | E009     |
| E0.10                                   | Fault Output Voltage                                           | 0~1500V                                                                                      | ◎        | E00A     |
| E0.12                                   | Reserved                                                       | -                                                                                            | ◎        | E00B     |
| E1 ~ EE GROUP THE LAST 14 FAULT RECORDS |                                                                |                                                                                              |          |          |

Table 5-4 Fault recording parameters

## 5.4 Main Error Codes and Solutions

| Code  | Description                     | Possible Causes                                                             | Solutions                                                                               |
|-------|---------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| ERR02 | Overcurrent during acceleration | There is grounding or short circuit in the output circuit of the controller | Eliminate peripheral faults and check whether there is a short circuit at the motor end |
|       |                                 | Acceleration time is set too short                                          | Increase acceleration time                                                              |
|       |                                 | The controller model is selected improperly(with too small power)           | Select the controller that matches the motor power and load conditions                  |
| ERR03 | Overcurrent during deceleration | There is grounding or short circuit in the output circuit of the controller | Eliminate peripheral faults and check whether there is a short circuit at the motor end |
|       |                                 | Deceleration time is set too short                                          | Increase deceleration time                                                              |
| ERR04 | Overcurrent at constant speed   | There is grounding or short circuit in the output circuit of the controller | Eliminate peripheral faults and check whether there is a short circuit at the motor end |
|       |                                 | Controller model is too small                                               | Select the controller that matches the motor power and load conditions                  |
| ERR05 | Overvoltage during acceleration | Input voltage is too high                                                   | Adjust input voltage to a proper range                                                  |
|       |                                 | Acceleration time is set too short                                          | Increase acceleration time                                                              |
|       |                                 | No braking unit and braking resistor installed                              | Install braking unit and braking resistor                                               |
| ERR06 | Overvoltage during deceleration | Input voltage is too high                                                   | Adjust input voltage to a proper range                                                  |
|       |                                 | Deceleration time is set too short                                          | Increase deceleration time                                                              |

| Code  | Description                   | Possible Causes                                                                                                  | Solutions                                                                       |
|-------|-------------------------------|------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
|       |                               | No braking unit and braking resistor installed                                                                   | Install braking unit and braking resistor                                       |
| ERR07 | Overvoltage at constant speed | Input voltage is too high                                                                                        | Adjust input voltage to a proper range                                          |
| ERR08 | Snubber resistor overload     | The input voltage is not within the specified range                                                              | Adjust input voltage to a proper range                                          |
| ERR09 | Low input voltage             | The input voltage is not within the specified range                                                              | Adjust input voltage to a proper range                                          |
|       |                               | Abnormal bus voltage detection; abnormality of rectifier bridge, snubber resistor, drive board and control board | Seek for technical support                                                      |
| ERR10 | VFD overload                  | Load is too large or motor is stuck                                                                              | Reduce load and check motor and mechanical condition                            |
|       |                               | Controller model is too small                                                                                    | Select the controller that matches the motor power and load conditions          |
| ERR11 | Motor overload                | The motor overload protection parameters (FA.01-FA.02) are not properly set                                      | Correctly set them                                                              |
|       |                               | Load is too large or motor is stuck                                                                              | Reduce load and check motor and mechanical condition                            |
| ERR12 | Input phase loss              | Abnormal three-phase input power                                                                                 | Check and troubleshoot existing problems in peripheral circuits                 |
|       |                               | Failure of drive board or control board                                                                          | Seek for technical support                                                      |
| ERR13 | Output phase loss             | Motor failure                                                                                                    | Check if the motor winding is open                                              |
|       |                               | The wirings between controller and motor is abnormal                                                             | Troubleshoot peripherals                                                        |
|       |                               | When the motor is running, the three-phase output of the controller is unbalanced                                | Check whether the three-phase windings of the motor are normal and troubleshoot |
|       |                               | Failure of IGBT or drive board                                                                                   | Seek for technical support                                                      |
| ERR14 | IGBT overheat                 | Ambient temperature is too high                                                                                  | Lower ambient temperature                                                       |
|       |                               | Air duct blocked                                                                                                 | Clear air duct                                                                  |
|       |                               | Fan failure                                                                                                      | Replace the fan                                                                 |
|       |                               | Failure of thermistor or IGBT                                                                                    | Seek for technical support                                                      |
| ERR15 | External alarm input          | Input external fault signal through DI terminal                                                                  | Clear external fault signal                                                     |
| ERR18 | Current detection failure     | Abnormal current detection circuit                                                                               | Seek for technical support                                                      |
|       |                               | Control board failure                                                                                            | Seek for technical support                                                      |
| ERR21 | Parameter R/W                 | Control board failure                                                                                            | Seek for technical support                                                      |

| Code  | Description    | Possible Causes     | Solutions                  |
|-------|----------------|---------------------|----------------------------|
|       | failure        |                     |                            |
| ERR22 | EEPROM failure | EEPROM chip failure | Seek for technical support |

Table 5-4 Main Error Codes and Solutions

## 6 Communication Protocol

VM Series AC Drive provides RS485 communication interface and supports Modbus communication protocol. Users can achieve centralized control by computer or PLC, set AC Drive operation commands, modify or read function code parameters, read the working state and fault info of the AC Drive.

### 5.1 Communication Address Description

The communication address listed in the function code table is in the way of writing to RAM, and the data will not be saved after the VFD is powered off. During communication, for the write command "06H", if the parameters need to be stored in power-down, the way of writing to EEPROM should be used, and the original The "0" of the highest bit of the RAM address is changed to "F", and converted into the corresponding EEPROM address, such as: "0XXX" to "FXXX", address conversion example:

The upper limit frequency is F012, the communication address for writing RAM is: 000C, and the address corresponding to EEPROM is: F00C.

Acceleration time F018, the communication address for writing RAM is: 0012, and the address corresponding to EEPROM is: F012.

It should be noted that the erasing life of EEPROM is about 1 million times. After the erasing times are exceeded, the reliability of data storage will be affected. If it is not necessary, it is recommended to use the method of writing RAM to control communication.

## 6.1 RS485 Communication Registers

| Name            | Address | Description                    | Data Remarks                 | Feature      |
|-----------------|---------|--------------------------------|------------------------------|--------------|
| Set Frequency   | 1000H   | -10000 to 10000                | $\pm 100.00\% * F0.10$       | R/W          |
| Control Command | 2000H   | 0001: FWD Running              | -                            | written only |
|                 |         | 0002: REV Running              | -                            | written only |
|                 |         | 0003: FWD JOG                  | -                            | written only |
|                 |         | 0004: REV JOG                  | -                            | written only |
|                 |         | 0005: Free Stop(Coast to Stop) | -                            | written only |
|                 |         | 0006: Deceleration Stop        | -                            | written only |
|                 |         | 0007: Error Reset              | -                            | written only |
| Running Status  | 3000H   | 0001: FWD Running              | -                            | read only    |
|                 |         | 0002: REV Running              | -                            | read only    |
|                 |         | 0003: Stopped                  | -                            | read only    |
| Monitoring Data | 1001H   | Running Frequency(Hz)          | 2 decimal places             | read only    |
|                 | 1002H   | Set Frequency(Hz)              | 2 decimal places             | read only    |
|                 | 1003H   | Bus Voltage(V)                 | 1 decimal places             | read only    |
|                 | 1004H   | Output Voltage(V)              | 1 decimal places             | read only    |
|                 | 1005H   | Output Current(A)              | 2 decimal places             | read only    |
|                 | 100DH   | IGBT Temperature               | 1 decimal places             | read only    |
|                 | 1008H   | DI Input Status                | DI1-DI4 Add up by binary bit | read only    |

| Name                         | Address | Description                            | Data Remarks     | Feature   |
|------------------------------|---------|----------------------------------------|------------------|-----------|
|                              | 100CH   | Keypad Potentiometer Voltage(V)        | 1 decimal places | read only |
|                              | 100AH   | AI Input Voltage(V)                    | 1 decimal places | read only |
|                              | 1000FH  | Motor RPM                              | 1 decimal places | read only |
|                              | 1012H   | PLC Stage                              | 0-15             | read only |
| Error Record                 | 8000H   | 0000: No Error                         | -                | read only |
|                              |         | 0002: Overcurrent during acceleration  | -                | read only |
|                              |         | 0003: Overcurrent during deceleration  | -                | read only |
|                              |         | 0004: Overcurrent at constant speed    | -                | read only |
|                              |         | 0005: Overvoltage during acceleration  | -                | read only |
|                              |         | 0006: Overvoltage during deceleration  | -                | read only |
|                              |         | 0007: Overvoltage at constant speed    | -                | read only |
|                              |         | 0009: Low input voltage                | -                | read only |
|                              |         | 000A: VFD overload                     | -                | read only |
|                              |         | 000B: Motor overload                   | -                | read only |
|                              |         | 000D: Output phase loss                | -                | read only |
|                              |         | 000E: IGBT overheat                    | -                | read only |
|                              |         | 000F: External alarm input             | -                | read only |
|                              |         | 0012: Current detection failure        | -                | read only |
|                              |         | 0015: Parameter R/W failure            | -                | read only |
| Communication Failure Record | 8001H   | 0000: No Error                         | -                | read only |
|                              |         | 0001: Command code error               | -                | read only |
|                              |         | 0002: Communication transmission error | -                | read only |
|                              |         | 0003: CRC Check error                  | -                | read only |
|                              |         | 0004: Invalid Address                  | -                | read only |
|                              |         | 0005: Invalid Data                     | -                | read only |
|                              |         | 0006: Invalid parameter setting        | -                | read only |
|                              |         | 0007: System Locked                    | -                | read only |
|                              |         | 0008: Parameter setting                | -                | read only |

Table 6-1 Control Command Addresses