# MTCC-ALP

## Automatic Leveling Protection Device

### User Manual

V1.2 2019.10

# FOREWORD

Thank you for purchasing MTCC-ALP automatic leveling protection device (here in after referred to as MTCC-ALP).

MTCC-ALP is an automatic leveling protection device for elevators independently developed and produced by Hpmont in combination with market demand, and its operation is simple and easy to use:

- MTCC-ALP-B can perfectly match Hpmont MONT70 integrated controller.
- MTCC-ALP-A is suitable for lift modernization and can be used with old elevator anti-leveling operations.

# Version Modification Records

**Time: 2019/10**

**Version: V1.2**

| Chapter | Content |
|---|---|
| Chapter 1 | • Increase danger and warning<br>• Modify the input and output voltage range, refer to section 1.2<br>• Modify the altitude description, refer to section 1.2<br>• Modify the default function of the X2 terminal, refer to section 1.7<br>• Modify the EPO switch description, refer to section 1.7 |
| Chapter 2 | • Modify the operator panel instructions, refer to section 2.1<br>• Modify the MTCC-ALP debugging steps, refer to section 2.2<br>• Modify the MTCC-ALP workflow, refer to section 2.2 |
| Chapter 3 | • Add Typical Applications, refer to section 3.10<br>• Add a detailed description of the function, refer to Chapter 3 |
| Chapter 5 | • Reserved D00.04/F00.05 - F00.09/F04.02/F04.05<br>• Add D03.05/D01.14/F00.02/F00.12/F00.13/F03.07<br>• Add the base description of D02.00/D02.01/D02.02/D02.03<br>• Modify the function of D00.00/D03.00 - D03.04/F04.02/F04.11 - F04.12/F04.15 - F04.16<br>• Modify the setting range and default of F04.00<br>• Modify the setting range of D01.02/D01.05/D02.03 - D02.04/F01.02/F02.06 - F02.10/F04.01/F04.03/F04.04<br>• Modify the default of F02.02/F02.04/F02.07/F02.08 |

# CONTENTS

# Chapter 1 ALP Indruction

MTCC-ALP is an elevator automatic leveling protection product.

When the main power is normal, MTCC-ALP detects the input voltage status.

In the abnormal state of power failure, phase loss, and voltage over-voltage, the device automatically enters an emergency rescue state, and outputs power for the elevator to lift the car to the nearest floor at a rescue speed to open the car door. In order to enhance the elevator safety performance.

**Danger**

- The MTCC-ALP has a high voltage that can cause severe electrical shock and may even result in death. Please be vigilant at all times when using or near the device that has been connected to the power supply.
- MTCC-ALP as a component is designed to provide safe rescue function design for elevators in the event of a sudden mains failure. If the installation is not correct, the elevator may have potential safety hazards. Therefore, the system installation, commissioning and maintenance personnel must have received the necessary safety and product usage guidance and have appropriate experience.
- When elevator maintenance is performed, external insulation components are used to disconnect the elevator from power supply, and any measures adopted by MTCC-ALP are prohibited to ensure personnel safety.
- The control circuit is basically insulated from the power circuit and cannot be touched after power-on.

**Warning**

- If the control circuit is connected to the external equipment with a touchable port on power, attention should be paid to adding an additional insulation protection isolation device to ensure that the original SELV voltage level of the external equipment is not changed.
- If the communication terminal of the control circuit is connected with the PC, the RS485/RS232 isolation converter that meets the safety requirements should be selected.
- It is strictly prohibited to connect the control terminals other than relay terminals to 220VAC voltage.
- Do not tore off the sticker on the control panel buzzer before putting it into use, so as to prevent dust from entering during construction, which may cause bad buzzer.
- In normal use, tear the buzzer sticker so as not to affect its use.
- When the MTCC-ALP is not in use, make sure the circuit breaker SW is disconnected.

## 1.1 Rated Power

**Table 1-1 MTCC-ALP rated value**

| Size | Model | Adaptive Power | Battery Group | Rated Input Current |
|---|---|---|---|---|
| Frame 1 | MTCC-ALP-A-4T015 | ≤15kW | 12V × 12Ah × 3 | 35A |
| Frame 1 | MTCC-ALP-A-4T022 | 22kW | 12V × 12Ah × 3 | 47A |
| Frame 2 | MTCC-ALP-A-4T037 | 37kW | 12V × 12Ah × 6 | 77A |
| Frame 3 | MTCC-ALP-B-4T2P2 | ≤2.2kW | 12V × 7Ah × 3 | 7.3A |
| Frame 3 | MTCC-ALP-B-4T3P7 | 3.7kW | 12V × 7Ah × 3 | 11.9A |
| Frame 3 | MTCC-ALP-B-4T5P5 | 5.5kW | 12V × 7Ah × 3 | 15A |
| Frame 3 | MTCC-ALP-B-4T7P5 | 7.5kW | 12V × 7Ah × 3 | 19A |
| Frame 3 | MTCC-ALP-B-4T011 | 11kW | 12V × 7Ah × 3 | 28A |

| Size | Model | Adaptive Power | Battery Group | Rated Input Current |
|---|---|---|---|---|
| Frame 3 | MTCC-ALP-B-4T015 | 15kW | 12V × 7Ah × 3 | 35A |
| Frame 3 | MTCC-ALP-B-4T018 | 18kW | 12V × 7Ah × 3 | 39A |
| Frame 3 | MTCC-ALP-B-4T022 | 22kW | 12V × 7Ah × 3 | 47A |
| Frame 3 | MTCC-ALP-B-4T030 | 30kW | 12V × 7Ah × 3 | 62A |
| Frame 3 | MTCC-ALP-B-4T037 | 37kW | 12V × 7Ah × 3 | 77A |
| Rated input voltage: 3PH + N, 380VAC, 50/60Hz. Rated output voltage: 3PH, 380VAC, 50/60Hz.<br>Size is detailed in section 1.3 Dimension, on page 3. | | | | |

## 1.2 Technical Data

**Table 1-2 MTCC-ALP technical data**

| | |
|---|---|
| **Electric** | |
| Input voltage | Three-phase 380 - 460VAC + N, 50/60Hz ± 5%<br>Fluctuation does not exceed ±10%, imbalance rate < 3% |
| Output voltage | Three phases 380VAC, 50/60Hz ± 5% |
| Buttery group | See 1.1 |
| Adaptive elevator controller power | See 1.1 |
| **Protective Function** | |
| Input phase loss, over temperature protection, output short circuit protection, output overload protection, battery low voltage protection, output under voltage protection | |
| **Environmental Characteristics** | |
| Working environment | 0 - 40℃ |
| Storage temperature | -15 - +50℃ |
| Using | Indoor, not subject to direct sunlight, no dust, corrosive gases, flammable gases, oil mist, water vapor, drip or salt and so on |
| Transport environment | Transport road environment (good transport road system):<br>• No more than three level , 25 - 40km per hour speed.<br>Handling conditions (artifact/forklift/crane need to indicate drop height):<br>• Drop height as required by ISTA standards.<br>Packaging (carton/wooden/combination of carton, wooden box):<br>• Carton packaging |
| Altitude | Below 2000 meters, more than 2000 meters need to be derated, over 2000 meters, 1% for each increase of 100 meters |
| Humidity | Less than 95%RH, no condensation of water droplets, humidity 0 - 90% |
| Vibration | Less than 5.9m/s$^2$ (0.6g) |
| Degree of protection | IP20 |
| Pollution level | Level 2 (dry, non-conductive dust pollution) |
| Noise | ≤60dBA (ambient noise is less than 30dBA, with 80% load in front of 1 meter) |

## 1.3 Dimension

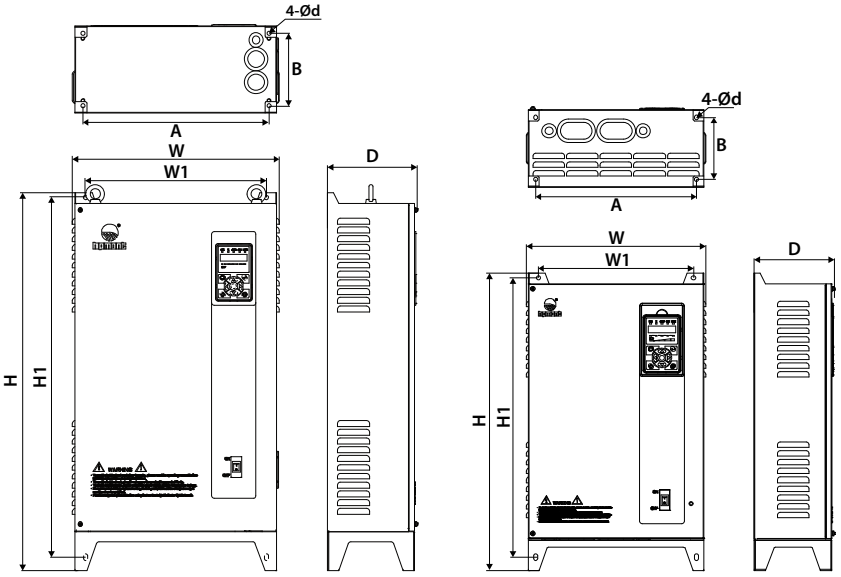



Figure 1-1 MTCC-ALP

Table 1-3 MTCC-ALP size

| Size | Dimension (mm) | | | Mounting Size (mm) | | | | | G.W |
|---|---|---|---|---|---|---|---|---|---|
| | W | H | D | W1 | H1 | A | B | d | kg |
| Frame 1 | 400 | 730 | 171 | 350 | 695 | 360 | 140 | 8 | 40 |
| Frame 2 | 400 | 870 | 171 | 350 | 835 | 360 | 140 | 8 | 56 |
| Frame 3 | 350 | 575 | 153 | 300 | 540 | 312 | 120 | 8 | 21.5 |

## 1.4 Installation Method

The device can be wall-mounted and floor-mounted, as shown below.

a. Wall-mounted

b. Gloor-mounted

**Figure 1-2 MTCC-ALP mounting methods**

## 1.5 Remove the Cover

The device needs to remove the cover to wire main circuit and control circuit. Unscrew the two screws on the cover and open the cover.

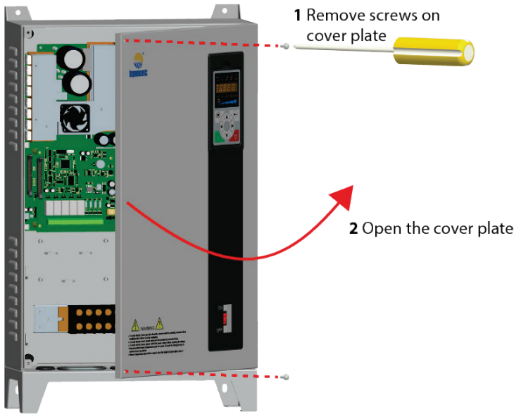



**Figure 1-3 Open cover**

## 1.6 Battery Replacement

**Warning**

- Always switch the ALP off and seperated from the main power.
- Take off metal items such as rings, watches.
- Use a screwdriver with an insulated handle and do not place tools or other metal objects on the battery.
- Do not short-circuit or reverse the battery.

**MTCC-ALP-A Model (Frame1/Frame2)**

Open the cover, see Figure 1-3. Remove the two screws on the battery cover, remove the battery cover, and remove the battery by unplugging the two cables on the battery.

Insert the new battery into the battery compartment, and return it in the reverse order of removal (tighten the screws of the battery cover, close the cover and tighten the two screws of the cover).

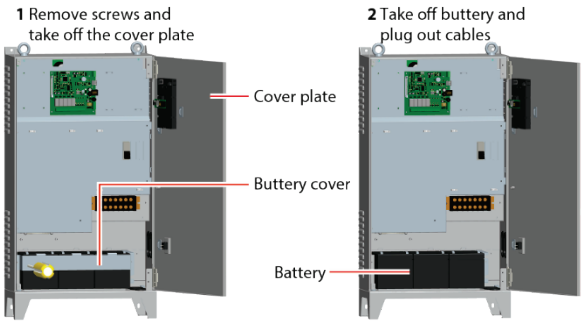



**Figure 1-4 Battery replacement**

**MTCC-ALP-B Model (Frame3)**

Open the cover, see Figure 1-3. Loosen the two captive screws shown in Figure 1-5, and rotate the main board bottom plate to a suitable angle.

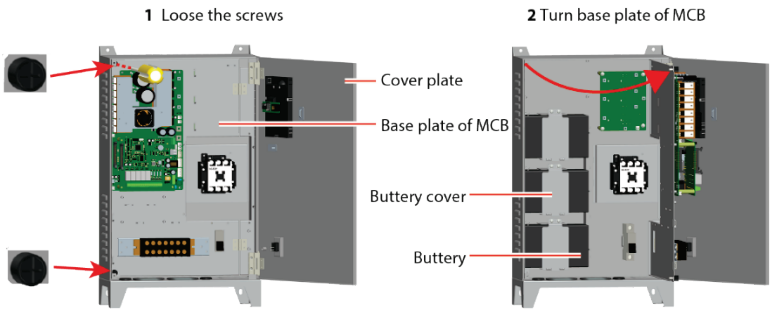



**Figure 1-5 Battery replacement**

Remove the two screws on the battery cover, open the battery cover downwards, and remove the battery by unplugging the two cables on the battery.

Insert the new battery into the battery compartment and reverse the direction according to the removal order (tighten the screws of the battery cover and battery cover, close the main control board bottom, tighten the captive screws, replace the cover, and tighten the two covers screw).

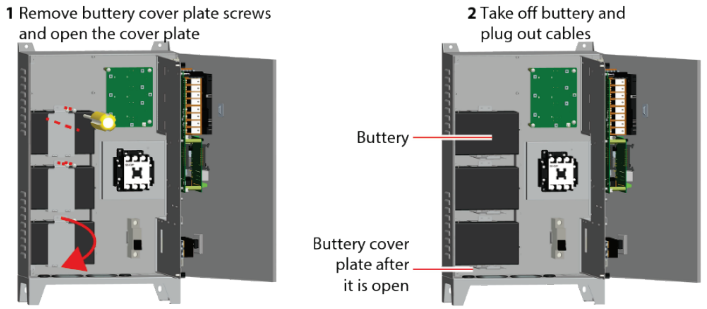



**Figure 1-6 Battery replacement**

## 1.7 Terminals Description

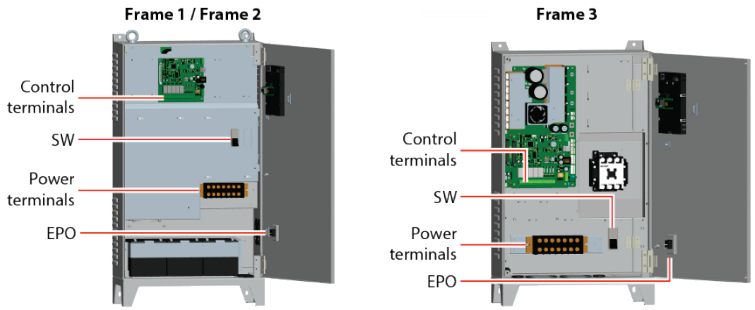



**Figure 1-7 Terminals description**

**Table 1-4 Power supply terminals description**

| Terminals | | Description |
|---|---|---|
| L1, L2, L3, N | MTCC-ALP AC input | Connect main power to L1/L2/L3/N of MTCC-ALP |
| R, S, T | MTCC-ALP AC output | R/S/T is connected to elevator control panel |
| SW | Circuit breaker | Cut off battery current output |

***Note:***

*Do not connect the L line of the input power supply to the N-line terminal of the MTCC-ALP, otherwise the MTCC-ALP will be damaged.*

**Table 1-5 Control terminals description**

| Terminals | | Description |
|---|---|---|
| X1 | Stop signal of rescure | Rescue is completed when ALP received this signal, and stop the output, wait for main power recovering.<br>• If this signal is not received, ALP automatically stops output after running for 3min.<br>• NO input in factory default |
| X2 | Forbiden signal of rescure | ALP received this signal that the rescue output is disabled.<br>When there is no breaker in the control panel of machine room elevator (there is a power breaker in the room corresponding to the room elevator) and the auxiliary contact of breaker is forbidden by ALP, that is, ALP can not work automatically after the power supply in the equipment room is powered off.<br>• Factory default unable. Settings please refer to F02.02 |
| X3 | Enable signal of rescure | After receiving this signal, the ALP considers that the rescue is enabled. After detecting that the elevator is out of power or lack of phase, the ALP automatically enters the emergency rescue status and outputs the power for the elevator.<br>• Factory default disable. Settings please refer to F02.03 |
| X4 | Signal of second rescure | There is waiting time after the completion of the MTCC-ALP rescue. During this time, if this signal is received, the MTCC-ALP will rescue again.<br>• Factory default frequently open input, closed effective |
| Y1, CM1 | ALP emergency output signal | ALP emergency output, it is connected and disconnected at the end |
| Y2, CM2 | Output phases sequence short signal | ALP emergency output, it is connected and disconnected at the end |
| Y3, CM3 | ALP fault output signal | In ALP fault, it is connected |
| EPO | Emergency power off switch | When this switch is in the OFF state, MTCC-ALP is powered down and does not rescue |

# Chapter 2 Adjustment

## 2.1 Keypad

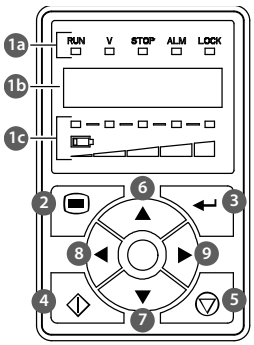



**Figure 2-1 Keypad**

**Table 1-1 Keypad**

| No. | Description | |
|---|---|---|
| 1 | 1a | **Status indicator**: Shows the current status.<br>• RUN: ALP runtime display.<br>• V (voltage): Voltage display.<br>• STOP (stop/reset): Displayed when ALP is stopped or reset.<br>• ALM (warning): Displayed if there is a problem.<br>• LOCK: When displayed, the parameters cannot be modified. |
| | 1b | **Display area**: Under normal circumstances, the parameters are displayed, fault code is displayed.<br>• When a bit value is flashing, it means the bit can be modified. |
| | 1c | **Power indicator**: Display the current power.<br>• Each light represents 20% of the charge.<br>• Charging high LED flashes.<br>• When discharging, the LED will turn on and off from right to left since the current high lightblue rising sign description. |
| 2 | ⊟ | **Programming/exiting buttons**: Entering or exiting the button. |
| 3 | ↵ | **Enter/confirm button**: To enter the lower menu; Set parameters, the displayed value is saved. |
| 4 | ◇ | **Run button**: When you control the operation panel, this is the rescue output button. |
| 5 | ▽ | **Stop/reset button**: Control panel to stop emergency output; Fault detection reset fault. |
| 6 | ▲ | **Increment button**: Select function parameters, increase the value of function parameters; Set parameters to increase set value. |
| 7 | ▼ | **Decrement button**: Select the function parameters, reduce the value of the function parameters; Set the parameters to reduce the set value. |
| 8 | ◀ | **Shift button**: When selecting function parameters or setting parameters, select 1 bit to the left. |
| 9 | ▶ | **Shift button**: When selecting function parameters or setting parameters, select a 1-digit value to the right. |

## 2.2 System Description

**System Wiring**

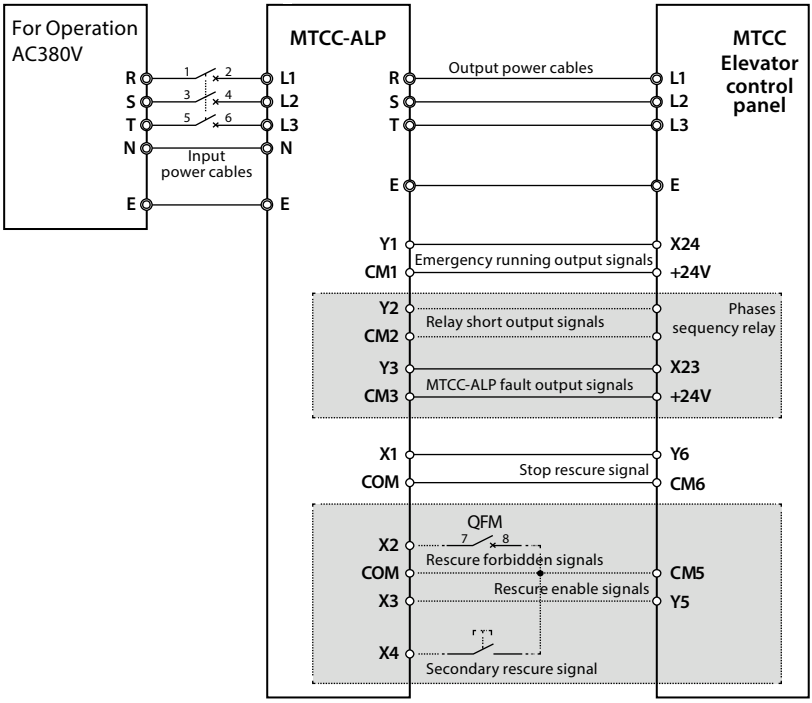



**Figure 2-2 MTCC-ALP system wiring**

## Adjustment Procedure

**Table 1-2 MTCC-ALP procedure**

| Procedure | Description |
|---|---|
| 1 | Confirm that the control panel is equipped with light load operation related functions (including terminal input and emergency light load operation function), confirm that Y1 and COM1 terminals are correctly connected to the corresponding terminals of the control panel, and confirm that the X1 COM terminal can receive the emergency completion signal. No emergency light load operation function, so you can skip this step after confirming that ALP is selected as heavy load type. |
| 2 | Confirm that the power lines L1/L2/L3 + N and R/S/T are connected as required. When using the energy feedback unit at the same time, please send the energy feedback three-phase output to the three-phase input of ALP (L1/L2/L3). Please make sure that the circuit breaker (SW) and EPO switch are "OFF". After completing the wiring according to the electrical diagram, close the circuit breaker (SW), close the upper cover, and close the EPO switch. |
| 3 | On the power frequency AC, ALP frequently bypasses the mains to ensure that the elevator control panel can operate normally and the elevator enters the automatic operation state. |
| 4 | Confirm that ALP has no fault at this time, and enter the charging state. |
| 5 | In the empty car state, the elevator runs automatically, and the power is cut off in the non-leveling area. After 3 - 5s, the ALP buzzer sounds, and the elevator control panel is powered on and enters the emergency operation mode. The elevator goes up to the leveling area to open the door.<br>• After closing the door, in the case of X1 complete signal, stop after receiving completion signal. If there is no completion signal, ALP is stopped after running for 3mins. |
| 6 | Restore the mains: It can be recovered during the emergency process, recovered after the emergency is completed or restored after the ALP panel is extinguished. |

**MTCC-ALP Job Description**

1. During the normal period of the external power grid, MTCC-ALP charges the battery.

2. In the event of an external power grid failure, the workflow is shown in Figure 2-3.

3. When the external power grid returns to normal, MTCC-ALP will connect the external power grid to the elevator control panel and the elevator will resume normal operation.

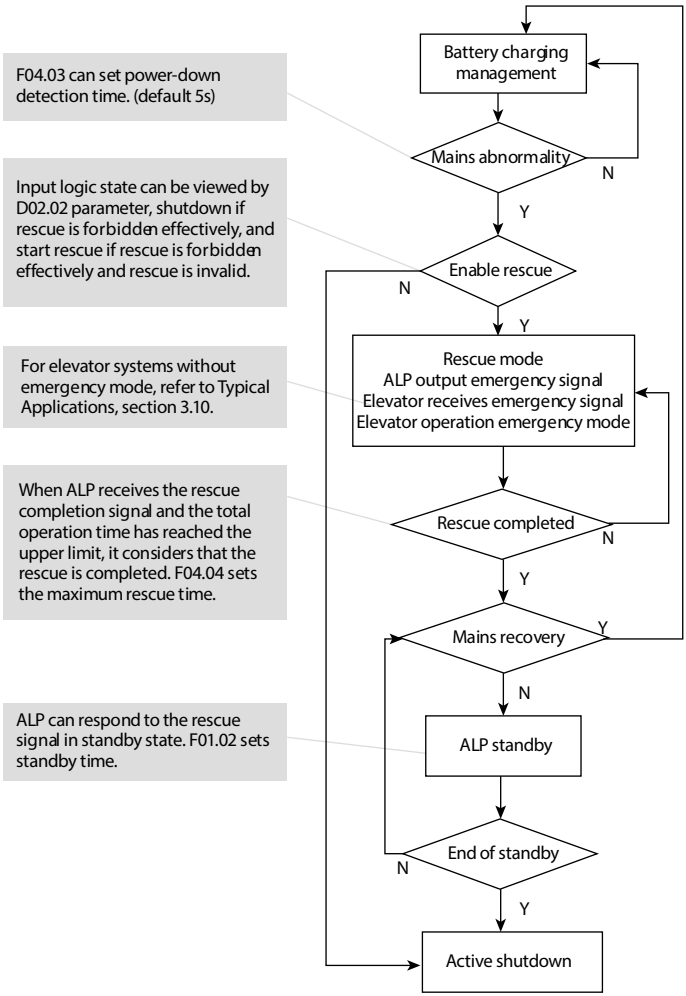



**Figure 2-3 MTCC-ALP flow chart**

# Chapter 3 Detailed Description and Application

## 3.1 D00: System Parameters

| Ref. Code | Function Description | Setting Range [Default] |
|---|---|---|
| D00.00 | Power failure emergency signature | [Actual value] |
| | 0x5075 | |
| D00.01 | Rated power | [Actual value] |
| D00.02 | Rated current | [Actual value] |
| D00.03 | Software version | [Actual value] |
| D00.05 | Main control board hardware version | [Actual value] |
| D00.06 | Internal test version | [Actual value] |

## 3.2 D01: MTCC-ALP Drive Status Parameters

| Ref. Code | Function Description | Setting Range [Default] |
|---|---|---|
| D01.00 | Running temperature | [Actual value] |
| D01.01 | Battery voltage | [Actual value] |
| D01.02 | Battery discharging current | [Actual value] |
| D01.03 | Bus voltage | [Actual value] |
| D01.04 | Battery charging voltage | [Actual value] |
| D01.05 | Battery charging current | [Actual value] |
| D01.06 | Battery power | [Actual value] |
| D01.07 | Input voltage L1 phase effective value | [Actual value] |
| D01.08 | Input voltage L2 phase effective value | [Actual value] |
| D01.09 | Input voltage L3 phase effective value | [Actual value] |
| D01.10 | Input L1/L2 line voltage effective value | [Actual value] |
| D01.11 | Input L2/L3 line voltage effective value | [Actual value] |
| D01.12 | Input L1/L3 line voltage effective value | [Actual value] |
| D01.13 | Output voltage RS phase effective value | [Actual value] |
| D01.14 | Output voltage ST phase effective value | [Actual value] |

## 3.3 D02: Input and Output Display Parameters

<table>
<tr><th>Ref. Code</th><th>Function Description</th><th>Setting Range [Default]</th></tr>
<tr><td>D02.00</td><td>Input IO status (binary representation)</td><td>[Actual value]</td></tr>
<tr><td></td><td>Input status of the X1 - X4 terminals on the control board.
<table>
<tr><td>Bit3: X4 input</td><td>Bit2: X3 input</td><td>Bit1: X2 input</td><td>Bit0: X1 input</td></tr>
<tr><td colspan="2">• 0: Input invalid</td><td colspan="2">• 1: Input valid</td></tr>
</table></td><td></td></tr>
<tr><td>D02.01</td><td>Output IO status (binary representation)</td><td>[Actual value]</td></tr>
<tr><td></td><td>Output status of Y1 - Y5 on the control board.
<table>
<tr><td>Bit4: Y5 output</td><td>Bit3: Y4 output</td><td>Bit2: Y3 output</td><td>Bit1: Y2 output</td><td>Bit0: Y1 output</td></tr>
<tr><td colspan="2">• 0: Output invalid</td><td colspan="3">• 1: Output valid</td></tr>
</table></td><td></td></tr>
<tr><td>D02.02</td><td>Input logic status (binary representation)</td><td>[Actual value]</td></tr>
<tr><td></td><td>Input logic status is determined by input IO status and input terminal function parameters.
<table>
<tr><td>Bit3: Rescue again</td><td>Bit2: Enable rescue</td><td>Bit1: No rescue</td><td>Bit0: Complete rescue</td></tr>
<tr><td colspan="2">• 0: Invalid</td><td colspan="2">• 1: Valid</td></tr>
</table>
• During the rescue process, stop the rescue output if you receive the rescue completion signal, and the F00.11 rescue delay can be set to delay the output after receiving the rescue signal.<br>
• When the rescue is prohibited, the mains is lost, and the MTCC-ALP does not start the rescue.<br>
• When enable rescue is effective and no rescue is invalid, MTCC-ALP starts the rescue, otherwise the MTCC-ALP does not start the rescue.<br>
• After a rescue is completed, the mains is not restored, and the rescue signal is input again. MTCC-ALP can start the second rescue.</td><td></td></tr>
<tr><td>D02.03</td><td>Output logic status (hexadecimal representation)</td><td>[Actual value]</td></tr>
<tr><td></td><td>The output logic state is determined by the MTCC-ALP operating state.
<table>
<tr><td></td><td></td><td>Bit5: OD output</td><td>Bit4: Up output</td></tr>
<tr><td>Bit3: Reserved</td><td>Bit2: Fault output</td><td>Bit1: Short phase sequence</td><td>Bit0: Emergency rescue</td></tr>
<tr><td colspan="2">• 0: Invalid</td><td colspan="2">• 1: Valid</td></tr>
</table></td><td></td></tr>
<tr><td>D02.04</td><td>Main contactor status</td><td>[Actual value]</td></tr>
<tr><td></td><td>Bit0: Contactor frequently open contact<br>
Bit1: Contactor frequently closed contact<br>
• 00: Contactor fault.<br>
• 01: Contactor disconnect.<br>
• 10: Contactor suction.<br>
• 11: Contactor fault.</td><td></td></tr>
</table>

## 3.4 D03: Operation Statistics

| Ref. Code | Function Description | Setting Range [Default] |
|---|---|---|
| D03.00 | Power-on running time (minutes.seconds) | [Actual value] |
| D03.01 | Power-on running time (hours) | [Actual value] |
| D03.02 | Cumulative running time (minutes.seconds) | [Actual value] |
| D03.03 | Cumulative running time (hours) | [Actual value] |
| D03.04 | Rescue cumulative running time (minutes.seconds) | [Actual value] |
| D03.05 | Rescue cumulative running time (hours) | [Actual value] |

## 3.5 F00: Basic Parameters

| Ref. Code | Function Description | Setting Range [Default] |
|---|---|---|
| F00.00 | UPS mode enable | 0,1 [0] |
| | 0: Unable.<br>1: Enable. | |
| F00.01 | The mains normal confirm time | 10 - 120 [30s] |
| | Under the UPS operation mode (F00.00 = 1), after the mains power is lost and the MTCC-ALP emergency start, if the mains is detected to return to normal, the mains supply should be cut, and the elevator is no longer powered by the battery.<br>The normal duration of the mains can be detected by the F00.01 setting. If the duration reaches this value, the mains recovery is considered, so that the mains can be safely cut. | |
| F00.02 | Output frequency | 50/60Hz [Model confirm] |
| | This parameters can be used to modify the MTCC-ALP power supply frequency. | |
| F00.04 | Buzzer enable during rescue | 0,1 [0] |
| | 0: Unable.<br>1: Enable. | |
| F00.10 | MTCC-ALP fault power failure | 0,1 [0] |
| | 0: Unable.<br>• When MTCC-ALP fails, the elevator will be powered by the bypass grid.<br>1: Enable.<br>• When MTCC-ALP fails, the bypass contactor will be disconnected and the elevator will be powered off. | |
| F00.11 | Rescue delay | 0 - 120 [0s] |
| | Rescue signal is received and emergency output is delayed. Refer to Typical Applications, section 3.10, page 19. | |
| F00.12 | Emergency delay output up time | 0 - 30 [1s] |
| | Delayed output up time after emergency start. Refer to Typical Application, section 3.10, page 19. | |
| F00.13 | R, S, T output phase sequence setting | 0,1 [0] |
| | 0: Positive.<br>1: Negative.<br>Set F00.13 at the time of phase sequence detection to make the phase sequence of MTCC-ALP output consistent with the mains. | |

## 3.6 F01: Supporting Parameters

| Ref. Code | Function Description | Setting Range [Default] |
|---|---|---|
| F01.00 | **User's password input** | **0 - 65535 [0]** |
| | When the password needs to be removed, enter the password in this parameters. | |
| F01.01 | **Parameters renew** | **0 - 3 [0]** |
| | 0: No operation.<br>1: Restore factory parameters.<br>2: Clear up the fault.<br>3: Clear up the fault and operation records. | |
| F01.02 | **Rescue completion standby time** | **0 - 120 [120s]** |
| | After the first rescue, standby when the mains is not restored.<br>In response to the rescue again signal during the standby time, the MTCC-ALP actively shuts down beyond the standby time. | |
| F01.03 | **Password modify** | **0 - 65535 [0]** |
| | This parameters can be used to set the user password. This parameters is not visible when encrypting, and can be modified after decryption.<br>0: No user password. | |

## 3.7 F02: Terminal Function Parameters

| Ref. Code | Function Description | Setting Range [Default] |
|---|---|---|
| F02.00 | **Input terminal filter time** | **2 - 40 [10ms]** |
| | Define the filter time of the control board input terminals X1 - X4, used to set the sensitivity of the input terminal. | |
| F02.01 | **X1 function** | **0 - 104 [1]** |
| F02.02 | **X2 function** | **0 - 104 [0]** |
| F02.03 | **X3 function** | **0 - 104 [0]** |
| F02.04 | **X4 function** | **0 - 104 [0]** |

*Note:*

*1. Hundred is set to 0, indicating frequently open input. Set to 1, indicating frequently close input.*

*2. Multiple terminals cannot be set to the same function.*

| Function | Description |
|---|---|
| 0: No function | |
| 1: Rescue complete frequently open input<br>101: Rescue complete frequently close input | When the emergency operation receives the rescue completion signal to stop the rescue, the rescue delay can be set to stop after receiving the completion signal |
| 2: No rescue frequently open input<br>102: No rescue frequently close input | No rescue is effective and no rescue will be initiated.<br>Receive no rescue after startup, and stop the rescue |
| 3: Enable rescue frequently open input<br>103: Enable rescue frequently close input | When enable rescue signal is received and enable rescue terminal is not set, the enable rescue is valid by default.<br>When enable rescue terminal is set up, and enable.<br>Rescue signal is input from outside, the MTCC-ALP enable logic is valid |
| 4: Rescue again frequently open input<br>104: Rescue again frequently close input | After the rescue is completed, the second rescue signal is received and the second rescue is started |

| Ref. Code | Function Description | Setting Range [Default] |
|---|---|---|
| F02.05 | Reserved | |
| F02.06 | Y1 function | 0 - 108 [1] |
| F02.07 | Y2 function | 0 - 108 [0] |
| F02.08 | Y3 function | 0 - 108 [0] |
| F02.09 | Y4 function | 0 - 108 [0] |
| F02.10 | Y5 function | 0 - 108 [0] |

*Note:*

*1. Hundred is set to 0, indicating frequently open input. Set to 1, indicating norm frequently ally closed input.*

*2. Multiple terminals cannot be set to the same function.*

| Function | Description |
|---|---|
| 0: No function | |
| 1: Emergency rescue frequently open output<br>101: Emergency rescue frequently close output | Output during emergency rescue |
| 2: Phase sequence short-circuit frequently open output<br>102: Phase sequence short-circuit frequently close output | |
| 3: Fault frequently open output<br>103: Fault frequently close output | Output when MTCC-ALP is failed |
| 4: Emergency up frequently open output<br>104: Emergency up frequently close output | Output during emergency rescue<br>• Refer to Typical Applications, section 3.10, page 19 |
| 5: No function<br>105: No function | |
| 6: Emergency aided frequently open output<br>106: Emergency aided frequently close output | |
| 7: OD command frequently open output<br>107: OD command frequently close output | |
| 8: OD electric reset frequently open output<br>108: OD electric reset frequently close output | |

## 3.8 F03: Default Record

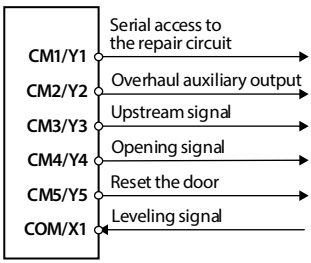
| Ref. Code | Function Description | Setting Range [Default] |
|---|---|---|
| F03.00 | Input L1 phase voltage | [Actual value] |
| F03.01 | Input L2 phase voltage | [Actual value] |
| F03.02 | Input L3 phase voltage | [Actual value] |
| F03.03 | Input L1/L2 line voltage effective value | [Actual value] |
| F03.04 | Input L2/L3 line voltage effective value | [Actual value] |
| F03.05 | Input L1/L3 line voltage effective value | [Actual value] |
| F03.06 | Output R/S voltage | [Actual value] |
| F03.07 | Output S/T voltage | [Actual value] |

## 3.9 F04: Mains Detection Parameters

| Ref. Code | Function Description | Setting Range [Default] |
|---|---|---|
| F04.00 | Input phase lack detection reference | 40 - 90% (controller rated voltage) [60%] |
| | MTCC-ALP can start rescue when the grid is under voltage. This parameters sets the undervoltage point. | |
| F04.01 | Rescue completion signal detection delay | 0 - 20 [20s] |
| | After the MTCC-ALP starts, the rescue completion signal is ignored during this time.<br>• Some elevator controllers will immediately output the rescue completion signal after power failure. MTCC-ALP will receive the second rescue completion signal to confirm the rescue is completed. | |
| F04.02 | Reserved | |
| F04.03 | Power failure confirmation time setting | 3 - 15 [5s] |
| | MTCC-ALP detects the power failure time. If the power failure time exceeds F04.03, MTCC-ALP will start, otherwise it will not start. | |
| F04.04 | Maximum rescue time | 180 - 400 [180s] |
| | MTCC-ALP power failure rescue single maximum running time. When F04.04 is exceeded, MTCC-ALP will stop supplying power. | |
| F04.05 | Reserved | |
| F04.06 | Fault code 1 | [Actual value] |
| F04.07 | Fault code 2 | [Actual value] |
| F04.08 | Fault code 3 | [Actual value] |
| F04.09 | Fault code 4 | [Actual value] |
| F04.10 | Fault code 5 | [Actual value] |
| F04.11 | Fault record operating temperature | 0.0 - 140.0℃ [Actual value] |
| F04.12 | Fault record battery voltage | 0.0 - 46.0V [Actual value] |
| F04.13 | Fault record discharging current | 0 - 300A [Actual value] |
| F04.14 | Fault record bus voltage | 0 - 900V [Actual value] |
| F04.15 | Fault record charging voltage | 0.0 - 46.0V [Actual value] |
| F04.16 | Fault record charging current | 0.000 - 4.000A [Actual value] |

## 3.10 Typical Application

For the reconstruction site without emergency mode, MTCC-ALP will control the elevator to enter the maintenance operation state through terminal control. By setting parameters, MTCC-ALP can actively complete the emergency function of power failure.

| MTCC-ALP Wiring | Parameters Setting |
|---|---|
|  | F02.06 = 101, Y1 is set as emergency frequently close output.<br>• Enter the maintenance circuit in series, disconnect the maintenance circuit in emergency state, and make the elevator enter the maintenance state<br>F02.01 = 1, X1 is set to rescue complete frequently open input.<br>• Output after receiving the leveling signal<br>F02.08 = 4, Y3 is set to the up frequently open output.<br>• When no leveling signal is detected, the up signal is output, and the leveling signal is detected and the up output is turned off<br>F02.09 = 7, Y4 is set to open signal frequently open output.<br>• After the leveling signal is detected, the open door signal is output<br>F00.11 = 120, delay downtime.<br>• Continue emergency output after detection of leveling signal and wait for the completion of door opening<br>F02.07 = 6, Y2 is set to service auxiliary frequently open output.<br>• Delay one second output after the emergency signal is output, and the two cooperate to make the elevator enter the inspection state<br>F02.10 = 8, Y5 is set to OD point reset frequently open output.<br>• Jog output between receiving the leveling signal and the output opening signal, which can be used as the output signal of the door open reset button |

# Chapter 4 Troubleshooting

When there is a fault, the ALM indicator on the operation panel lights up.

| Fault | | Fault Reasons | Counter-measures |
|---|---|---|---|
| E0001 | No battery or battery damage | • The battery switch SW or EPO switch is not closed<br>• Disconnected battery wires<br>• The battery is damaged | • Please check if the switch status is normal<br>• Make sure the battery cable is in good condition<br>• Please check if the battery is normal |
| E0002 | Battery undervoltage | • Low battery or battery damage<br>• Unsuitable emergency machine parameters settings | • Please charge the battery or replace the battery<br>• Adjust emergency rescue parameters<br>• You can change brake<br>• Failure when the car starts, reducing the starting acceleration<br>• Failure when the car stops, reducing car deceleration |
| E0003 | EEPROM error | • EEPROM memory circuit failure | • Contact factory maintenance |
| E0004 | FO | • Output short circuit<br>• Inadequate setting of the emergency rescue parameters leads to over-current of the busbar<br>• Power module is damaged | • Please check the output wiring to ensure that the back-end equipment is normal<br>• See E0002 troubleshooting<br>• Seek technical support |
| E0005 | Bus undervoltage | • Low battery or battery damage<br>• Power module is damaged | • Please charge the battery or replace the battery<br>• Seek technical support |
| E0006 | Abnormal main power | • Main power is not normal | • Please check if the input mains is three-phase four-wire 380VAC |
| E0007 | Overcurrent in charging | • Battery mistaked wiring<br>• Charging circuit failure | • Please check the battery cable connection<br>• Seek technical support |
| E0008 | Overcurrent in discharging | • Unreasonable model selection, exceeding the power used | • Seek technical support |
| E0009 | Overvoltage in charging | • Battery wiring error<br>• Damaged charging circuit | • Please check the battery cable connection<br>• Seek technical support |
| E0010 | Overheat of module | • The ambient temperature is too high<br>• Temperature check circuit is damaged | • Improve working environment conditions<br>• Seek technical support |
| E0011 | Bypass contactor failure | • Contactor status signal is abnormal<br>• Bypass contactor is abnormal | • Please confirm the normal connection of the control board CN31<br>• Check if the bypass contactor is abnormal |
| E0012 | System overload | • Unreasonable configuration, exceeding power usage | • Seek technical support |
| E0013 | Discharge abnormality of battery discharge | • Abnormal signal detection circuit | • Seek technical support |

| Fault | | Fault Reasons | Counter-measures |
|---|---|---|---|
| E0014 | OC | • Damaged module | • Seek technical support |
| E0015 | Input voltage abnormal | • Low battery or battery damage<br>• Inverter module is damaged | • Please charge the battery or replace the battery<br>• Seek technical support |
| E0016 | Input voltage over | • Input voltage exceeds specification | • N phase wiring error<br>• The input is not three-phase four-wire 380VAC ± 10% |

# Chapter 5 Function

Modify the property:

*: Actual parameters cannot be modified

×: Cannot be modified during operation

○: Can be modified during operation

| Ref. Code | Function | Setting Range | Default | Attribute |
|---|---|---|---|---|
| D00: System Parameters | | | | |
| D00.00 | ALP series | 0x5075 | Actual value | * |
| D00.01 | ALP rated power | 0.1 - 999.9kW | Actual value | * |
| D00.02 | ALP rated current | 0.1 - 999.9A | Actual value | * |
| D00.03 | ALP software version | 0 - 9.99 | Actual value | * |
| D00.04 | ALP software version of keypad | 0 - 9.99 | Actual value | * |
| D00.05 | ALP hardware version of main control board | 1.00 - 9.99 | Actual value | * |
| D00.06 | ALP internal test version | 1 - 999 | Actual value | * |
| D01: MTCC-ALP Drive Status Parameters | | | | |
| D01.00 | ALP running temperature | 0 - 140℃ | Actual value | * |
| D01.01 | ALP buttery voltage | 0 - 46.0V | Actual value | * |
| D01.02 | ALP releasing current | 0 - 600A | Actual value | * |
| D01.03 | ALP bus voltage | 0.1 - 900A | Actual value | * |
| D01.04 | ALP charging voltage | 0 - 46.0V | Actual value | * |
| D01.05 | ALP charging current | 0 - 4.000A | Actual value | * |
| D01.06 | ALP buttery volume | 0 - 100% | Actual value | * |
| D01.07 | ALP input voltage L1 phase vallid value | 0 - 999V | Actual value | * |
| D01.08 | ALP input voltage L2 phase vallid value | 0 - 999V | Actual value | * |
| D01.09 | ALP input voltage L3 phase vallid value | 0 - 999V | Actual value | * |
| D01.10 | ALP input L1/L2 phases voltage valid value | 0 - 999V | Actual value | * |
| D01.11 | ALP input L2/L3 phases voltage valid value | 0 - 999V | Actual value | * |
| D01.12 | Input line L1/L3 voltage effective value | 0 - 999V | Actual value | * |
| D01.13 | Output voltage RS phase effective value | 0 - 999V | Actual value | * |
| D01.14 | Output voltage ST phase effective value | 0 - 999V | Actual value | * |
| D02: Input and Output Display Parameters | | | | |

| Ref. Code | Function | Setting Range | Default | Attribute |
|---|---|---|---|---|
| D02.00 | ALP input IO status (binary representation) | 5-bit binary number, from the lowest bit to the highest bit represent:<br>Bit0: X1 terminal<br>Bit1: X2 terminal<br>Bit2: X3 terminal<br>Bit3: X4 terminal<br>• 0: Input invalid<br>• 1: Input valid | Actual value | * |
| D02.01 | ALP output IO status (binary representation) | 5-bit binary number, from the lowest bit to the highest bit represent:<br>Bit0: Y1 terminal<br>Bit1: Y2 terminal<br>Bit2: Y3 terminal<br>Bit3: Y4 terminal<br>Bit4: Y5 terminal<br>• 0: Input invalid<br>• 1: Input valid | Actual value | * |
| D02.02 | ALP input logic status (binary representation) | Bit0: Rescue completed<br>Bit1: Output disabled<br>Bit2: Enable rescue<br>Bit3: Rescue again<br>• 0: Input invalid<br>• 1: Input valid | | * |
| D02.03 | ALP output logic status (hexadecimal representation) | The function code consists of a 2-bit hexadecimal number, which is represented by the lowest bit and the highest bit respectively<br>Bit0: Emergency rescue<br>Bit1: Phase sequence short joint<br>Bit2: Fault output<br>Bit3: Uplink output<br>Bit4: (no function)<br>Bit5: Emergency auxiliary output<br>Bit6: Open-door command output<br>Bit7: Open-door point moving reset | Actual value | * |
| D02.04 | Main contactor status | Bit1: Contactor frequently open contact<br>Bit2: Contactor frequently closed contact<br>• 0: Disconnect<br>• 1: Suck on | Actual value | * |

| Ref. Code | Function | Setting Range | Default | Attribute |
|---|---|---|---|---|
| D03: Operation Statistics | | | | |
| D03.00 | Low bit of running time with power | 00.00 - 60.60 | Actual value | * |
| D03.01 | High power-on time (hours) | 00.00 - 65500 | Actual value | * |
| D03.02 | Low bit of cumulative run time | 00.00 - 60.60 | Actual value | * |
| D03.03 | High cumulative running time (hours) | 00.00 - 65500 | Actual value | * |
| D03.04 | Rescuing times | 0 - 65535 | Actual value | * |
| D03.05 | Accumulated high rescue time (hours) | 0000 - 65500 | Actual value | * |
| F00: Basic Parameters | | | | |
| F00.00 | UPS mode enable | 0: Disable<br>1: Enable | 0 | × |
| F00.01 | Confirming time of normal main power | 10 - 120s | 30s | × |
| F00.02 | Output frequency | 50/60Hz | Depend on model | × |
| F00.03 | Reserved | | | |
| F00.04 | Buzzer enable in rescuing | 0: Disable<br>1: Enable | 1 | × |
| F00.10 | ALP cut off the grid in fault | 0: Not cut off<br>1: Cut off | 0 | × |
| F00.11 | Delayed closing output | 0 - 120s | 0s | × |
| F00.13 | R, S, T output phase sequence setting | 0: Positive<br>1: Negative | 0 | × |
| F01: Supporting Parameters | | | | |
| F01.00 | User password | 0 - 65535 | 1 | ○ |
| F01.01 | ALP parameters updating | 0: No operation<br>1: Restore factory parameters<br>2: Clear the fault information<br>3: Clear the fault records | 0 | × |
| F01.02 | Waiting time of rescue completion | | 120s | |
| F01.03 | Password modification (visible after decryption) | 0 - 65535<br>0: No password function<br>X: Current password | 0 | × |
| F02: Terminal Function Parameters | | | | |
| F02.00 | ALP input terminal filter time | 2 - 40ms | 2ms | × |
| F02.01 | X1 function | 0000: No function<br>001: Rescue completion NO input<br>1: No rescuing NO input<br>2: Rescuing enable NO input<br>3: Rescue again NO input | 1 | × |
| F02.02 | X2 function | | 0 | × |
| F02.03 | X3 function | | 0 | × |

| Ref. Code | Function | Setting Range | Default | Attribute |
|---|---|---|---|---|
| F02.04 | X4 function | 102: No rescuing NC input<br>103: Rescuing enable NC input<br>104: Rescue again NC input | 0 | * |
| F02.05 | Reserved | | | |
| F02.06 | Y1 function | 0: No function<br>1: Emergency rescue output (NO)<br>2: Phases sequency short output (NO)<br>3: ALP fault output (NO)<br>4: Emergency up output (NO)<br>5: Emergency down output (NO)<br>6: Emergency auxiliary output (NO)<br>*Hundreds indicate frequently open and frequently closed switches, such as: 101: Emergency rescue output (frequently closed)* | 1 | × |
| F02.07 | Y2 function | | 0 | × |
| F02.08 | Y3 function | | 0 | × |
| F02.09 | Y4 function | | 0 | × |
| F02.10 | Y5 function | | 0 | × |
| F03: Default Record | | | | |
| F03.00 | A phase voltage | 0 - 999V | 0V | * |
| F03.01 | B phase voltage | 0 - 999V | 0V | * |
| F03.02 | C phase voltage | 0 - 999V | 0V | * |
| F03.03 | Input line L1/L2 voltage effective value | 0 - 999V | 0V | * |
| F03.04 | Input line L2/L3 voltage effective value | 0 - 999V | 0V | * |
| F03.05 | Input line L1/L3 voltage effective value | 0 - 999V | 0V | * |
| F03.06 | Output R/S voltage | 0 - 999V | 0V | * |
| F03.07 | Output S/T voltage | 0 - 999V | 0V | * |
| F04: Mains Detection Parameters | | | | |
| F04.00 | Input phase loss detection reference | 0 - 100% rated voltage | 50% | × |
| F04.01 | Signal detection delay of rescue completion | 1 - 20s | 20s | × |
| F04.02 | Reserved | | 0 | × |
| F04.03 | Confirmation time setting of power failure | 3 - 15s | 5s | × |
| F04.04 | Emergency run time setting | 180 - 400s | 300s | × |
| F04.05 | Soft start time setting | 50 - 500ms | 50ms | × |
| F04.06 | Fault code 1 | 0 - 16 | 0 | * |
| F04.07 | Fault code 2 | 0 - 16 | 0 | * |
| F04.08 | Fault code 3 | 0 - 16 | 0 | * |

| Ref. Code | Function | Setting Range | Default | Attribute |
|---|---|---|---|---|
| F04.09 | Fault code 4 | 0 - 16 | 0 | * |
| F04.10 | Fault code 5 | 0 - 16 | 0 | * |
| F04.11 | ALP input voltage | 0.0 - 46.0V | 0.0V | * |
| F04.12 | ALP buttery voltage | 0.0 - 46.0V | 0.0V | * |
| F04.13 | ALP releasing current | 0 - 300A | 0A | * |
| F04.14 | ALP bus voltage | 0 - 900V | 0V | * |
| F04.15 | ALP charging voltage | 0.0 - 46.0V | 0.0V | * |
| F04.16 | ALP charging current | 0.000 - 4.000A | 0.000A | * |