Foreword

Thank you for choosing the Smile1000 Series Integrated Elevator Controller.

The Smile1000 Series Integrated Elevator Controller is a new-generation, independently developed and manufactured elevator control system, built upon the extensive application experience of the Smile1000 platform and upgraded to incorporate the latest industry advancements. The controller features high-performance vector control technologies compatible with both synchronous and asynchronous traction machines, supports open-loop low-speed operation, and provides both CANbus and Modbus communication protocols that enable remote monitoring and direct parallel control of two elevators. With a maximum number of service floors up to 8, this controller has shown great applicability in residential villa elevators and freight elevators.

This manual provides a detailed introduction to the product types and features, safety tips, installation and electrical design, basic operation and maintenance, troubleshooting, and other contents of the Smile1000 series controllers. Before using the product, users are kindly requested to read this manual carefully. It is recommended to keep it properly for reference during subsequent maintenance operations.

This manual shall serve as the guidebook for using/operating the Smile1000 Series Integrated Elevator Controller. The installation, commissioning, and maintenance of this product shall be carried out by professional personnel who are sufficiently trained in safety and product operation and possess adequate experience in related subjects.

Please read this manual carefully before using this product.

Strictly follow the safety instructions indicated in this manual to prevent personal injuries and property damages. Any injury or loss resulted from violations of such safety instructions is not the responsibility of our company.

The product/system covered in this document should be used/operated by qualified personnel only. Qualified personnel are those who meet all requirements for their work, have received necessary training on safety and product use, and possess adequate experience. Their operation should fully comply with the instructions provided in the document, in particular the safety warnings.

In case of any questions and requirements arising from the use/operation of this product, please contact our regional office or distributors, or connect directly with our technical service team. Megmeet is dedicated to bringing all-round satisfaction to our clients.

Due to our unwavering commitment to the continuous improvement in product quality and performance, all materials provided are subject to changes without prior notice.

Technical Features

The Smile1000 Series Integrated Elevator Controller features a smart control system that incorporates advanced technologies in computing, automation, network communication, and motor vector control, offering a comprehensive solution for various elevator applications.

Technical Features

- ✧ Direct-to-floor technology: optimal speed curve based on precise distance control, which offers smooth speed change and high running efficiency.
- ✧ Integrated design: seamless combination of elevator logic control and traction machine drive control; dual CPU; integrated communication of CANbus, Modbus, and IoT.
- ✧ No-load-cell startup torque compensation technology: smooth zero-speed elevator start which requires no load cell; applicable to various types of encoders and traction machines.
- ✧ With-load motor auto-tuning: with-load auto-tuning available for both permanent-magnet synchronous motors and asynchronous motors.
- ✧ Parallel control for 2 elevators and group control for 8 elevators: advanced algorithms for elevator parallel/group control, developed in accordance with the latest elevator control theories.

Excellent operability

- ✧ Compact layout based on functional integration of control and drive, convenient for small-machine-room and machine-room-less elevator design.
- ✧ Simplified parameter settings, making on-site commissioning much easier.
- ✧ On-panel keypad, which facilitates elevator inspection, maintenance, and commissioning.
- ✧ Load cell auto-tuning for all load levels.
- ✧ Multiple commissioning methods: PC host software, operating panel, and mobile phone App.
- ✧ In-car leveling precision adjustment.
- ✧ Balance coefficient automatic detection, and slippage detection.

Guaranteed safety

- ✧ Multiple protective measures, in compliance with the requirements of GB-T7588.1-2020 standard.
- ✧ Fault-tolerant design of both hardware and software; countermeasures against multiple categories of faults; countermeasures against the occurrence of accidents (such as top-hitting, and bottom-crashing), ensuring safe elevator operation.
- ✧ Highly proficient manufacturing capabilities ensure robust environmental adaptability, enabling the drive products to effectively withstand harsh working conditions, including power grid fluctuations, dust interference, high temperatures, and lightning strikes.
- ✧ Dual CPU control, brake function, and STO function.

- ✧ UCMP, braking force test, and door lock short-circuit detection.

Optimal comfortability

- ✧ No-load-cell technology or dedicated load cell compensation device, providing smooth startup torque compensation.
- ✧ Optimal vector control maximizes the motor drive performance, delivering superlative comfort in elevator riding.

Ultimate cost-efficiency

- ✧ High level of integration significantly simplifies the system and reduces the peripheral wiring, which enhances the cost efficiency, usability, and elevator safety and stability.
- ✧ Superb combination of CANbus and Modbus communication, which minimizes the number of traveling cables to the greatest extent.
- ✧ Flexible and diverse modular expansions.
- ✧ Parallel control can be easily achieved with only two cables, eliminating the need for additional group control boards.

Contents

Introduction

1. Basic functions

Function	Description	Remarks
General operation		
Compatibility with synchronous. and asynchronous motors	The Smile1000 Series is compatible with both AC asynchronous motors and PM synchronous motors. The switchover between synchronous drive and asynchronous drive is available via modification of parameter F1-25.	-
Full collective selection operation	This function applies to the automatic running state and the attendant state. While responding to the car calls during running, the elevator automatically responds to the hall calls which are registered via button signals. Passengers on any service floor can summon the elevator by registering the up or down calls.	Parameter FE-00 selects the collective operation mode.
Door open holding time setting	The door open holding time setting allows the elevator to automatically distribute different holding time for each door open mode, including open by call, open by command, protective open, and extended open.	Setting via parameter group FB.
Door open manual hold	In the automatic running state, this function enables the passenger to delay the door close action by pressing the door open holding button in the car, which facilitates the handling of goods.	Setting via parameter group FB.
Door operator service floor setting	This function enables the elevator system to designate the specific service floors of the door operator based on actual needs.	Setting via FB-02/04.
Advance door closing via door close button	This function enables the passenger to close the door in advance when the door is in the open holding state during automatic running, which saves the time.	-
Floor number display setting	The system allows a random combination of numbers and letters to be displayed as the indication of each floor for the convenience of use in special occasions.	Setting via parameter group FE.
Light curtain	In case of any obstructions to the closing door, the light curtain	-

Function	Description	Remarks
signal judgement	protection will be initiated to stop the door closing and reopen the door. This function is disabled in the fire emergency state.	
Independent control for the front and rear doors	In case there are two doors in one elevator car, the system provides different automatic control modes for each door as required by the client.	Please refer to Section 5.2.3.
Door re-close	In case the door lock is not applied immediately and the door stays unlocked for a certain amount of time after the door closes, the system will reopen and re-close the door.	Door close protection time setting via FB-08.
Automatic leveling	The system adopts automatic leveling and ensures precision based on both floor pulse counting signal and up/down leveling feedback signal, eliminating the need for leveling commissioning.	-
Response during acceleration	The system allows the elevator to automatically respond to calls from the service floors during acceleration.	-
Idle elevator returning to main floor	During automatic operation, the elevator will automatically return to the designated parking floor after a set time span of no call.	The waiting time before the idle elevator returns to the main floor is set via F9-00.
Landing floor change	In case the door open limit signal remains inactive when the actual time of the door open operation exceeds the door open protection time, the elevator will close the door, and automatically move the car to the next registered floor. An E55 fault will then be reported.	-
Forced door close	When the door fails to close within the set time due to the action of the light curtain or safety edge, the elevator enters the forced door close state, closes the door slowly, and outputs a sound alarm.	-
Service floor setting	The system allows to enable/disable the service for one or more floors as required.	Setting via parameter F6-05
Independent running	The elevator does not respond to any call, and the door needs to be closed manually. When in parallel control mode, the elevator will withdraw from parallel control, and run independently. This mode	-

Function	Description	Remarks
	takes effect only when FE-13 Bit9 is enabled and the independent MCB running input is valid	
Attendant running	When in the attendant state, the elevator running will be controlled by the attendant.	-
Low-speed self-rescue	When stopped in non-leveling area during non-inspection period, the elevator will automatically run to a leveling area at a low speed and opens the door if the state of the system is in compliance with the safety requirements.	-
Door operator function selection	Based upon the door operator types, the system can set whether to continuously output the door open/close command after the door open/close limit.	-
Car arrival gong	After the elevator arrives at the destination floor, the MCB outputs an alarm.	-
Direct travel ride	The system automatically generates the speed curve based on the distance, and directly transports the car to the leveling position without speed discontinuity.	-
Automatic generation of the optimum curve	The system automatically calculates and generates the optimum speed curve which is compliant with the human-machine interaction principle based on distance, without being limited by the number of curves or affected by ultra-short floors.	-
Service suspension signal output	When the system fails to respond to hall calls, the corresponding terminal will output the signal of service suspension.	-
Running times recording	In the automatic running state, the system automatically records the running times of the elevator.	Recorded by F9-05/06.
Running time recording	The system automatically records the accumulative working hours of the elevator.	Recorded by F9-03
Automatic door open/close during door lock malfunction	In case any malfunctions are detected in the door lock circuit during the door open/close, the system will automatically reopen/re-close the door, and report a fault after a set number of failures.	FB-09 sets the door open/close protection times.
Full-load direct	In the automatic operation state, a full-load car does not respond to	-

Function	Description	Remarks
travel ride	hall calls from the passing floors. However, hall calls from these floors can still be registered, and will be executed in the next run (in case of a single elevator) or by other elevators (in case of parallel control).	
Overload protection	The elevator will activate an alarm and stop running when the detected car load exceeds the rated load.	-
Fault data recording	The system allows automatic recording of the details of the fault for the reference during maintenance.	Recorded by group FC.
Inspection and maintenance		
Shaft auto-tuning	Shaft auto-tuning is required before first-time automatic running. During shaft auto-tuning, the elevator runs from the bottom floor to the top floor at the inspection speed and automatically records all position signals in the shaft	Please refer to section 5.1.2 for details.
Checking on user-defined parameters	User can view the parameters that are modified and different from the default setting.	Setting via FP-02.
Inspection running	When in the inspection state, the system disables the automatic running and door operation. Press the up/down button to activate the jog running at the inspection speed.	-
Motor auto-tuning	The system supports with-load and no-load motor auto-tuning for control parameters via simple parameter setting.	For details, please refer to Section 5.1.1.
Smart adjustment of leveling position	Every time the elevator runs to the terminal floor, the system automatically checks and corrects the car position based on slowdown switches, and eliminates top-hitting or bottom-crashing risks with the assistance of the slowdown system.	-
Dual-speed inspection	To reconcile the conflicting aspects of high speed but imprecise running control and low speed yet excessively long running time during inspection, the system implements a dual-speed inspection running curve, which substantially increases the inspection efficiency.	-
Test run	The test run for new elevators includes fatigue run, hall call response prohibition, door open/close prohibition, terminal floor limit switch shielding, overload signal shielding, etc.	Setting via F6-10.

Function	Description	Remarks
Fire emergency and safety		
Fire emergency landing	Upon receiving a fire alarm signal, the elevator stops responding to calls. The car will then return to the fire emergency floor, stop operating, and stand by.	F6-03 sets the fire emergency floor.
Firefighter running	After the elevator enters the firefighter running state, the automatic door open/close function is disabled, and the door can be opened/closed only by jog operation (optional) using the door open/close button. When in this state, the elevator responds to car calls only, and only one call can be registered at a time.	F6-68 selects the fire emergency function.
Elevator lockout	In the automatic running state, when the elevator lockout switch acts, the system will stop registering calls, and transport the car to the lockout floor after completing the existing calls. Then , it will stop automatic operation, and turn off the in-car lighting and fan.	F6-04 sets the elevator lockout floor.
Fault removal based on fault level	Faults are classified into different levels based on the severity. Different levels of faults are rectified using different methods.	For details of fault levels, please refer to Chapter 8.
Runaway prevention	The system monitors the running status of the elevator in real time. If the elevator speed exceeds the limit, the system immediately stops running of the elevator.	-
Automatic identification of state upon stop	The system automatically identifies the state upon power failure, and outputs signals via relay Y0 to select automatic rescue switchover function for emergency rescue.	Relay Y0 as the dedicated output point for rescue function switchover.
Automatic running mode switchover at power failure	For the synchronous motor, when the power supply is interrupted, the system can perform automatic switchover between shorting stator braking mode and controller drive mode, which helps to achieve quick and safe self-rescue.	F6-69 sets the rescue function.
Running direction identification at power failure	When the power supply is interrupted, the system can automatically identify the present car load and determine the running direction.	F6-69 sets the rescue function.

Function	Description	Remarks
Main floor verification	When a position abnormality is detected, the system will run the car to each floor until it reaches the terminal floor, and perform verification, which is targeted to ensure the safety and reliability of the system.	-
Passenger unloading first upon the fault	The system automatically determines the fault level. If the safety running conditions are met, the elevator first runs to the leveling position to unload passengers.	-
Interference degree judgment	The system judges the degree of communication interference.	Viewing via FA-24.
Earthquake protection	When the earthquake detection device is triggered and sends a signal to the system, the elevator will stop the car at the nearest floor and halt operation. After the earthquake signal becomes inactive and the fault is manually reset, the elevator restores normal operation.	-
Current cancellation in ramp mode	For the permanent magnet synchronous motor (PMSM), after the elevator decelerates to stop, the holding current of the motor is canceled in ramp mode, preventing abnormal noise during current cancellation	-
Independent working power supply	The Smile1000 Series integrated control system supports not only three-phase 380 V AC power supply but also single-phase 220 V AC power supply to meet different applications of the power supply system (for example, the 220 V UPS emergency rescue).	-
Automatic voltage identification	The system detects the bus voltage and automatically adjusts the running speed of the elevator to adapt to the situation of insufficient power from the power supply, such as emergency UPS.	-
Parallel/Group control and other functions		
Parallel control	This system supports parallel control of two elevators.	For details, please refer to Section 5.2.2.
Dispersed waiting	In parallel control, elevators can wait at different floors. The system automatically arranges the floors for dispersed waiting.	Setting via FD-05.
Parallel control exit	If the parallel control exit switch of any elevator is valid or the elevator is within the designated time for no parallel control, the elevator will exit parallel control and runs independently. This does	-

Function	Description	Remarks
	not affect normal running of the parallel control system.	
Automatic exit from the parallel control	During parallel running, if any of the elevators can not respond timely to any calls due to any reasons, it will automatically exit the parallel control and runs independently. This does not affect the normal running of the parallel control system.	-
Anti-nuisance function	The system automatically identifies the number of in-car passengers, and compare it with that of car calls. In case the number of calls exceeds the number of passengers, a nuisance state will be determined, and the system will cancel all car calls. Car calls need to be re-registered correctly before running.	F8-13 selects the anti-nuisance function.
Prompt of stop in non-door zone	The system gives a prompt when the elevator stops in a non-door zone area due to faults.	-
Energy saving		
In-car energy saving	If there is no running commands within a set time period, the system will automatically cut off the power supply to the car lighting and fan.	F9-01 sets the time for energy saving.
Idle door operator energy saving	The system stops the output of the door close signal after the in-car lighting is turned off, which reduces the power consumption of the door operator.	FE-14 can modify this function.

2. Optional functions

Function	Description	Remarks
Advance door opening	In the automatic running state, when the elevator speed is smaller than 0.2 m/s during the stop process and the door zone signal is active, the system shorts the door lock signal via the shorting door lock circuit contactor, and outputs an advance door open signal. This measure maximizes the elevator efficiency.	Smile3000-SCB-A (advance door open module) shall be configured.
Micro-leveling	After landing at a floor, the car may move from the leveling position due to load changes, which may result in unaligned sills that cause inconvenience for the entry and exit of passengers and goods. In such cases, the system allows the car to return to the leveling position at	Smile3000-SCB-A (advance door open module) shall

Function	Description	Remarks
	the re-leveling speed while keeping the door open.	be configured.
Emergency evacuation at power failure	For elevators configured with an emergency power supply, the system uses this power supply to implement low-speed self-rescue at power failure.	An emergency power supply shall be provided.
Auxiliary on-site commissioning function	The Smile series system support the control and monitoring of all elevator running and operation using the NEMS commissioning software.	Coordination with the NEMS software is required.

Chapter 1 Important Safety Instructions

1.1 Safety announcements

(1) Before the installation, operation, and maintenance of this product, thoroughly and carefully read this manual, and comply with all the instructions indicated herein.

(2) To ensure safety for the personnel and property, closely follow the guidance on the stickers/signs, and the instructions in this manual during the installation, operation, and maintenance of this product.

(3) The "Caution," "Warning," and "Danger" notices in this manual do not represent all safety precautions that should be followed, but rather serve as supplements to all safety precautions.

(4) This product should be used in environments that meet the design specifications; otherwise, malfunction may occur. Issues such as abnormal function or component damage due to failure to comply with relevant regulations are not covered under product warranty.

(5) We will not be liable for any legal responsibilities arising from personal injuries and property losses caused by improper operation of this product.

1.2 Safety rating definitions and precautions

Mark	Definition
 Danger	It indicates that failure to operate according to instructions/requirements will result in death or serious personal injuries.
 Warning	It indicates that failure to operate according to instructions/requirements may result in death or serious personal injuries.
 Caution	It indicates that failure to operate according to instructions/requirements may result in minor personal injuries or property damage.

1.2.1 Safety precautions before installation


Warning

- ✧ This controller has hazardous high voltage and the controlled motor is a dangerous rotating device. Failure to comply with the notices may result in personal injury or damage to the property.
- ✧ Transportation, installation, operation and maintenance of the controller can be performed only by qualified personnel after they get familiar with the safety information in this manual. This is the prerequisite of safe and stable running of the equipment.
- ✧ Do not open the front cover or touch the power terminals on the main circuit within 10 minutes after the controller is powered off. The capacitor on the DC circuit still has residual high voltage even after power-off. Failure to comply will result in electric shock.

1.2.2 Safety precautions during installation


Danger

- ✧ Do not install the equipment if you find water seepage, component missing or damage upon unpacking.
- ✧ Do not install the equipment if the packing list does not conform to the product received.
- ✧ Install the equipment on incombustible objects such as metal, and keep it away from combustible materials. Failure to comply may result in a fire.


Danger

- ✧ Do not loosen the fixed screws of the components, especially the screws with red mark.
- ✧ Do not install the controller on vibrating parts. Failure to comply may result in damage to the equipment or unexpected accidents.


Warning

- ✧ Handle the equipment with care during transportation to prevent damage to the equipment.
- ✧ Do not drop wire end or screw into the controller. Failure to comply will result in damage to the controller.
- ✧ Do not use the equipment with damaged or missing components. Failure to comply will result in personal injury.
- ✧ Do not touch the components with hands. Failure to comply will result in static electricity damage.
- ✧ Install the controller in places free of vibration and direct sunlight exposure.

1.2.3 Safety precautions at wiring


Danger

- ✧ Wiring must be performed only by qualified personnel under instructions described in this manual. Failure to comply may result in unexpected accidents.
- ✧ A circuit breaker must be used to isolate the power supply and the controller. Failure to comply may result in a fire.
- ✧ Ensure that the power supply is cut off before wiring. Failure to comply may result in electric shock.
- ✧ Tie the controller to ground properly according to the standard. Failure to comply may result in electric shock.


Warning

- ✧ Never connect the power cables to the output terminals (U, V, W) of the controller. Pay attention to the marks of the wiring terminals and ensure correct wiring. Failure to comply will result in damage to the controller.
- ✧ Never connect the braking resistor between the DC bus terminals (+) and (-). Failure to comply may result in a fire.


Caution

- ✧ Ensure that the cabling satisfies the EMC requirements and local codes. Use wire sizes recommended in the manual. Failure to comply may result in accidents.
- ✧ Use the shielded cable for the encoder, and ensure that the shield is reliably grounded at one end.
- ✧ Use a twisted cable with twisted distance of 20 to 30 mm as the communication cable, and ensure that the shield is reliably grounded.

1.2.4 Safety precautions during running


Danger

- ✧ All peripheral devices must be connected properly according to the circuit wiring instructions provided in this manual. Failure to comply will result in accidents.
- ✧ Cover the controller properly before power-on to prevent electric shock.
- ✧ Do not open the controller's cover after power-on. Failure to comply may result in electric shock.
- ✧ Do not touch the controller and peripheral circuits with wet hand. Failure to comply may result in electric shock.
- ✧ Do not touch any I/O terminal of the controller. Failure to comply may result in electric shock.
- ✧ The controller performs safety detection on external strong power circuits automatically at the beginning of power-on. Do not touch the U, V, W terminals of the controller or the motor terminals at the moment. Failure to comply may result in electric shock.
- ✧ Do not touch the fan or the discharging resistor to check the temperature. Failure to comply will result in personal burnt.
- ✧ Signal detection must be performed only by qualified personnel during operation. Failure to comply will result in personal injury or damage to the controller.


Warning

- ✧ Do not touch the rotating part of the motor during the motor auto-tuning or running. Failure to comply will result in accidents.
- ✧ Check that the following requirements are met:
  - The voltage class of the power supply is consistent with the rated voltage class of the controller.
  - The input terminals (R, S, T) and output terminals (U, V, W) are properly connected.
  - No short-circuit exists in the peripheral circuit.
  - The wiring is secured.

  Failure to comply will result in damage to the controller.
- ✧ A circuit breaker must be used to isolate the power supply and the controller. Failure to comply may result in a fire.


Caution

- ✧ For synchronous motor, ensure that motor dynamic auto-tuning is performed successfully. Perform trial running before resuming the steel rope so as to make the motor run properly. Properly connect the controller to the ground; otherwise, there is a risk of electric shock.
- ✧ Avoid objects falling into the controller when it is running. Failure to comply will result in damage to the controller.
- ✧ Do not perform the voltage resistance test on any part of the controller because such test has been done in the factory. Failure to comply may result in accidents.
- ✧ Do not change the default settings of the controller. Failure to comply will result in damage to the controller.
- ✧ Do not start/stop the controller by turning on or off the contactor. Failure to comply will result in damage to the controller.

1.2.5 Safety precautions during maintenance


Danger

- ✧ Do not repair or maintain the controller at power-on. Failure to comply will result in electric shock.
- ✧ Repair or maintain the controller when its voltage is lower than 36 V AC, about 10 minutes after the controller is powered off. Otherwise, the residual voltage in the capacitor may result in personal injury.
- ✧ Do not allow unqualified personnel to repair or maintain the controller. Failure to comply will result in personal injury or damage to the controller.


Warning

- ✧ Repair or maintenance of the controller can be performed only by the warranty center or qualified personnel authorized by Megmeet. Failure to comply will result in personal injury or damage to the controller.
- ✧ Power supply must be cut off before repair or maintenance of the controller.


Caution

- ✧ Set the parameters again after the controller is replaced. All the pluggable components must be plugged or removed only after power-off.
- ✧ Strictly obey the laws and regulations, and repair and maintain the elevator equipment periodically. Only timely troubleshooting can ensure the safety of passengers.

1.2.6 Safety precautions at disposal


Caution

- ✧ The packaging materials, screws and terminal blocks can be re-used and it is suggested that you keep them well for future use.


Warning

- The electrolytic capacitors on the main circuits and the PCB may explode when they are burnt. Poisonous gas is generated when the plastic parts are burnt. Treat them as ordinary industrial waste.

1.2.7 Safety precautions for repair


Danger

- Non-professionals are strictly prohibited from the installation, wiring, maintenance, inspection, and component replacement of the product!
- Repair in the power-on state is strictly prohibited. Otherwise, there is a risk of electric shock!
- After cutting off the power supply of all the devices, please wait at least 10 minutes before proceeding with maintenance and repairs.


Warning

- Please perform the product maintenance and repair in accordance with the requirements specified on the product warranty agreement.
- When product malfunction or damage occurs, the fault removal and repairs must be performed by professionals in accordance with the maintenance and repair instructions, and a complete maintenance record shall be kept.
- Please follow the replacement instructions for wear parts replacement.
- Do not continue using the machine if it is damaged, as it may lead to personal injury or further damage to the product.
- After replacing the equipment, please make sure to conduct a thorough check of the device wiring and parameter settings.

1.2.8 Safety precautions for equipment disposal

Warning

- ✧ Please follow local regulations and standards for the disposal of equipment/product to prevent property loss or personal injury!
- ✧ Make sure to follow the industrial waste treatment standards for the recycling of the discarded equipment/product to prevent environmental pollution.

1.3 General precautions

(1) RCD requirements

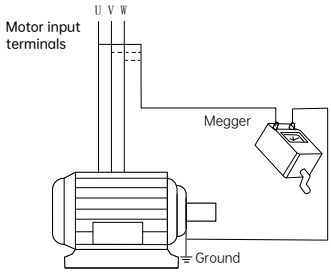
The controller generates high leakage current during running, which flows through the protective earthing conductor. Please install a type-B RCD at primary side of the power supply. When selecting the RCD, user should consider the transient and steady-state leakage current to ground that may be generated at startup and during running of the controller. User can select a dedicated RCD with the function of suppressing high-order harmonics or a general-purpose RCD with relatively large residual current.

(2) High leakage current warning

The controller generates high leakage current during running, which flows through the protective earthing conductor. Earth connection must be done before connection of power supply. Earthing shall comply with local regulations and related IEC standards.

(3) Motor insulation inspection

Perform the insulation test when the motor is used for the first time, when it is reused after being stored for a long time, or in a regular check-up, in order to prevent the poor insulation of motor windings from damaging the controller. The motor must be disconnected from the controller during the insulation test. A 500-V mega-Ohm meter is recommended for the test. Ensure that the insulation resistance is not less than 5 MΩ.



(4) Thermal protection for the motor

If the rated capacity of the motor selected does not match that of the Smile1000 controller, especially when the rated power of the controller is greater than that of the motor, adjust the motor protection

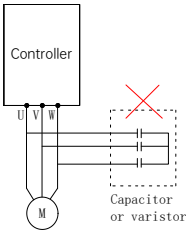
parameters on the operation panel of the Smile1000 controller or install a thermal relay before the motor circuit for protection.

(5) Heating and noise during motor running

The output of the controller is pulse width modulation (PWM) wave with certain harmonic wave. Therefore, the motor temperature rise, noise, and vibration are slightly greater than those at running with the power line frequency.

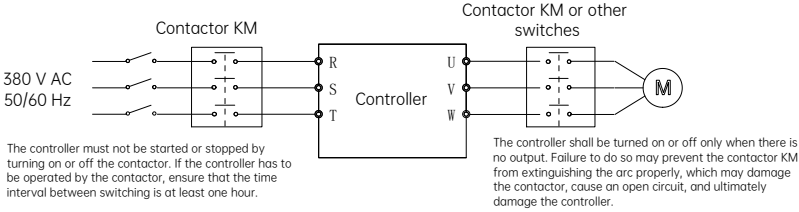
(6) Voltage-sensitive device or capacitor on the output side of the controller

The Smile1000 controller outputs PWM wave. Therefore, do not install the capacitor for improving power factor or lightning protection voltage-sensitive resistor on the output side of the controller. Otherwise, the controller may suffer transient overcurrent or even be damaged.



(7) Contactor on the input and output sides of the Smile1000 controller

When a contactor is installed between the input side of the controller and the power supply, the controller must not be started or stopped by turning on or off the contactor. When a contactor is installed between the output side of the controller and the motor, do not turn off the contactor when the controller is active. Otherwise, modules inside the controller may be damaged.



(8) Use beyond the rated voltages

The Smile1000 controller must not be used outside the allowable voltage range specified in this manual. Otherwise, components inside the controller may be damaged. If required, use a corresponding voltage step-up or step-down device.

(9) Surge suppressor

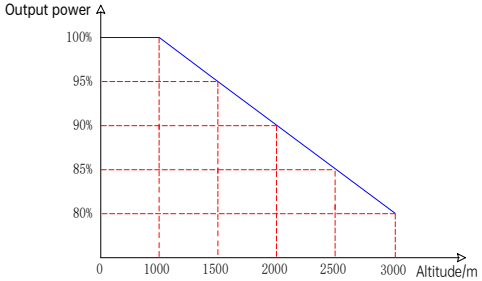
The controller has a built-in voltage dependent resistor (VDR) for suppressing the surge voltage generated when the inductive loads around the controller are switched on or off. If the inductive loads generate very high surge voltage, use a surge suppressor for the inductive load or use a surge suppressor together with a diode.

Note:

Do not connect the surge suppressor on the output side of the controller.

(10) Altitude and derating

In places where the altitude is above 1000 m and the cooling effect weakens due to thin air, it is necessary to implement the derating of the controller as the altitude gets higher. For details, please refer to the following figure.



(11) Temperature and derating

The Smile1000 integrated controller works properly within the temperature range of -10 to +50℃. When the temperature is above 40℃, derated use by 1.5% shall be applied for every 1℃ in temperature rise. The Maximum working temperature is 50℃.

(12) Disposal of controller

The electrolytic capacitors on the main circuits and PCB may explode when they are burnt. Poisonous gas is generated when the plastic parts are burnt. Treat them as ordinary industrial waste.

(13) Matching motors

The controller is adaptable to squirrel-cage asynchronous motor or AC PMSM. Select a proper controller according to motor nameplate. The default parameters configured inside the controller are squirrel-cage asynchronous motor parameters. It is still necessary to perform motor auto-tuning or modify the default values based on actual conditions. Otherwise, the running effect and protection performance will be affected. For PMSM, motor auto-tuning must be performed.

(14) Precautions on selecting residual-current circuit breaker (RCCB)

Tripping may be caused if an improper RCCB is selected when the controller drives the motor. This is because the output wave of the controller has high-order harmonics, and the motor cable and the cable connecting the controller and the motor produce leakage current, which is much larger than the current when the motor runs at power line frequency. Therefore, it is necessary to determine the proper RCCB sensitivity based on the general leakage current of the cables and the motor. The leakage current is dependent on the motor capacity, cable length, insulation class and wiring method. Generally, the leakage current on the output side of the controller is three times of the current when the motor runs at power line frequency.

1.4 Protective Functions

Adopting different protective functions for different levels of faults, the Smile1000 integrated controller system provides the elevator running system with full abnormality protection. For detailed solutions to the faults, see chapter 8.

Faults of the Smile1000 controller are classified as follows.

(1) Speed abnormal

The Smile1000 controller monitors the encoder feedback speed and output torque. Once the feedback speed exceeds the limit or the deviation between the torque limit and the speed feedback is too large, the controller performs protection immediately, reports an alarm and prohibits running.

(2) Drive control abnormal

The related faults include drive overcurrent, overvoltage/undervoltage, power input/output phase loss, overload, and storage abnormality. If such a fault occurs, the controller performs protection immediately, stops output, applies the brake, and prohibits running.

(3) Rotary encoder abnormal

The related faults include encoder phase loss, direction reversing, disconnection, and pulse interference. If such a fault occurs, the Smile1000 controller performs protection immediately to avoid unexpected accidents. If pulse interference is large, the controller reports an alarm immediately. If pulse interference is small, the controller performs position correction every time it receives a leveling signal and clears the accumulative error.

(4) Leveling sensor abnormal

The related faults include sensor failure or sensor stuck. The Smile1000 controller judges whether a fault occurs based on the leveling signal change. If the leveling signal does not change within the set time, the system reports an alarm.

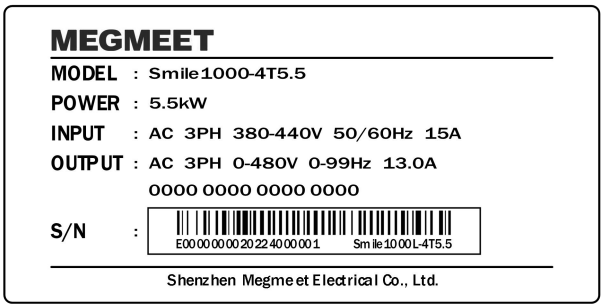
(5) Floor data abnormal

The system stores the floor information through the shaft auto-tuning. If the floor data is abnormal, the system prompts the fault information at the first-time running. During actual running, the controller continuously compares position information input by DIs with the stored floor data. If the deviation is large, the system outputs an alarm.

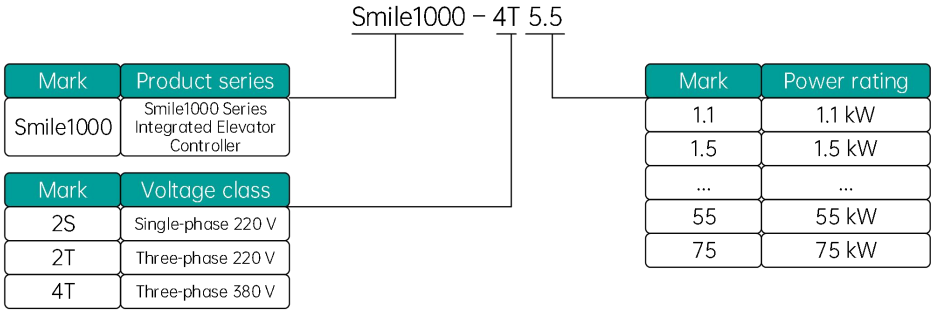
Chapter 2 Product Information

2.1 Nameplate and model

2.1.1 Nameplate



2.1.2 Product naming rule



2.2 Product models and specifications

Model	Power capacity (kVA)	Input current (A)	Output current (A)	Motor power (kW)
Single-phase 220 V. Range: 220 to 240 V. 50/60 Hz				
Smile1000-2S1.1	1.8	8.8	5.5	1.1
Smile1000-2S1.5	2.7	12.5	7.7	1.5

Smile1000-2S2.2	4.0	17.9	9.9	2.2
Smile1000-2S3.7	6.0	25.3	16	3.7
Three-phase 220 V. Range: 220 to 240 V. 50/60 Hz				
Smile1000-2T2.2	4.0	11.0	10.0	2.2
Smile1000-2T3.7	6.0	17.0	15.0	3.7
Smile1000-2T5.5	9.0	29.0	27.0	5.5
Smile1000-2T7.5	12.6	36.0	33.0	7.5
Smile1000-2T11	15.0	41.0	47.0	11.0
Three-phase 380 V. Range: 380 to 440 V. 50/60 Hz				
Smile1000-4T5.5	8.5	15	13	5.5
Smile1000-4T7.5	11	21	18	7.5
Smile1000-4T11	18	28	27	11
Smile1000-4T15	22	33	33	15
Smile1000-4T18.5	24	40	39	18.5
Smile1000-4T22	30	50	48	22
Smile1000-4T30	42	62	60	30
Smile1000-4T37	50	75	75	37
Smile1000-4T45	60	90	90	45
Smile1000-4T55	72	112	110	55
Smile1000-4T75	100	157	152	75

Caution

- ✧ Same models are available for single-phase 220 V AC and three-phase 220 V AC. Pay attentions to the power rating of the matching motor during the use.
- ✧ Select the proper controller output current based on the rated motor current. Ensure that the controller output current is equal to or greater than the rated motor current.
- ✧ If higher voltage or power rating is required, please contact Megmeet.

2.3 Controller structure and components

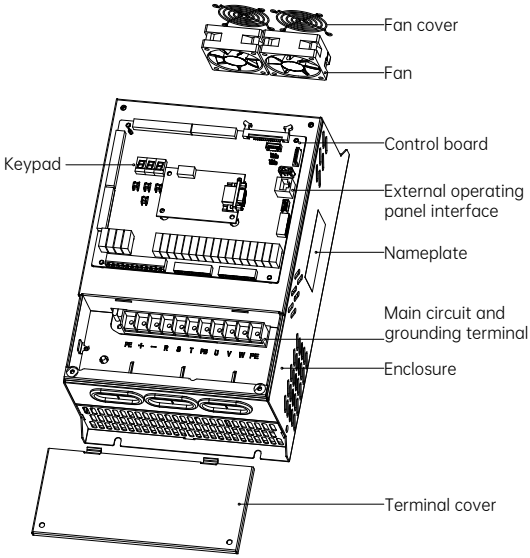


Figure 2-1 Controller component diagram

2.4 Controller appearance and mounting dimensions

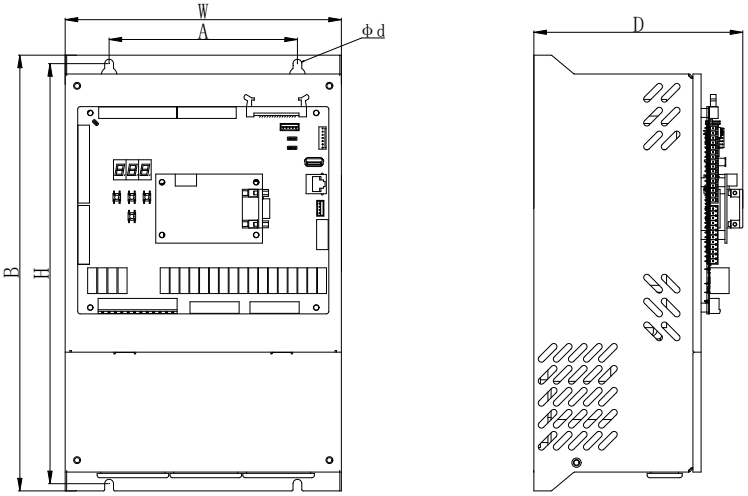


Figure 2-2 Enclosure A

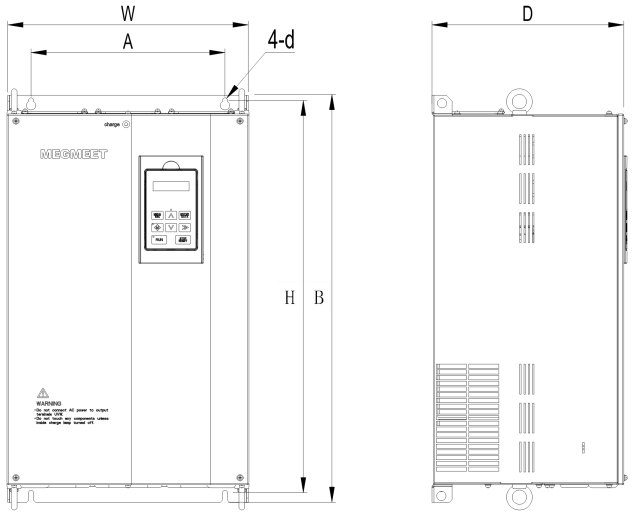


Figure 2-3 Enclosure B

Table 2-1 Mounting dimensions of models with sheet metal

Model	W (mm)	A (mm)	B (mm)	H (mm)	D (mm)	Hole diameter (mm)	Figure
Smile1000-2S1.1	223	150	347	334.5	143	6.5	Figure 2-2
Smile1000-2S1.5							
Smile1000-2S2.2							
Smile1000-2S3.7							
Smile1000-2T2.2	220	150	347	334.5	176.3	6.5	
Smile1000-2T3.7							
Smile1000-2T5.5							
Smile1000-2T7.5	337.5	292.5	520.5	502.5	279.5	7.0	
Smile1000-2T11							
Smile1000-4T5.5	220	150	307	294	160.1	7.0	
Smile1000-4T7.5							
Smile1000-4T11	220	150	347	335	167	7.0	
Smile1000-4T15							
Smile1000-4T18.5	225	195	347	335	186.3	6.5	

Smile1000-4T22							
Smile1000-4T30							
Smile1000-4T37	335	270	570	549	267	7.0	Figure 2-3
Smile1000-4T45							
Smile1000-4T55	335	270	600	579	292	7.0	
Smile1000-4T75							

2.5 Technical specifications

Item	Specifications	
Basic specifications		
Maximum frequency	99 Hz	
Carrier frequency	2 kHz to 16 kHz; adjusted automatically based on the load features.	
Motor control mode	SVC; FVC; V/F control	
Startup torque	0.5 Hz / 180% (SVC); 0 Hz / 200% (FVC)	
Speed adjustment range	1:100 (SVC)	1:1000 (FVC) 1:50 (V/F control)
Speed stability accuracy	±0.5% (SVC)	±0.05% (FVC)
Torque control accuracy	±5% (FVC)	
Overload	60 second for 150% of the rated current, 1 second for 200% of the rated current.	
Motor auto-tuning	Auto-tuning with load; auto-tuning without load.	
Distance control	Direct travel ride mode in which the leveling position can be adjusted flexibly.	
Acceleration/ Deceleration curve	N curves generated automatically.	
Slowdown	New reliable slowdown function, automatically identifying the position of the slowdown shelf	
Shaft auto-tuning	32-bit data, recording the position in the shaft accurately.	

Item	Specifications
Leveling adjustment	Flexible and easy leveling adjustment function.
Startup torque compensation	Load cell startup pre-torque compensation; No-load-cell startup pre-torque self-adaption.
Test function	Easy to implement multiple elevators commissioning functions.
Fault protection	Comprehensive solutions to different levels of elevator faults.
Intelligent management	Remote monitoring, user management, and parallel control adjustment.
Security check of peripheral devices after power-on	Security check of peripheral devices, such as grounding and short circuit, after power-on.
Status monitor	Monitoring the state of feedback signals to ensure that the elevator works properly.
I/O feature	
Digital input (DI)	24 x DI; Input specification: 24 V, 5mA.
	3 higher-voltage detection input terminals of safety circuit and door lock circuit; Input specification: 95 V to 125 V.
Floor input/output terminal	50 channels of floor button inputs and outputs; flexible setting of their corresponding functions.
Analog input (AI)	AI (voltage range: −10 V to +10 V)
Communication port	1 CANbus communication port; 1 Modbus communication port.
Output terminal block	24 relay outputs; The terminals can be allocated with different functions.
Encoder interface	The system supports different encoders by using an optional PG card.
Operation and display	
Keypad	Used for shaft auto-tuning.
Operation panel	5-digit LED display, viewing/modifying most parameters and monitoring the system state.

Item	Specifications
Host controller software	Connecting the control system with the host controller, convenient for viewing/motoring the system status.
Environment	
Altitude	Below 1000 m (derated by 1% for each 100 m higher when above 1000 m).
Ambient temperature	-10℃ to +50℃(derated use if the ambient temperature is above 40°C).
Humidity	Less than 95%RH, non-condensing.
Vibration	Less than 5.9 m/s^2 (0.6 g)
Storage temperature	-20℃ to +60℃
Pollution degree	PD2
IP rating	IP20
Power distribution system	TN/TT

2.6 System configuration

The Smile1000 Series integrated elevator controller combines the functions of elevator controller and vector control AC drive. As a high-performance vector drive and control system for elevators, it meets the requirements of standard applications of the elevator. Users can also configure the optional advance door open module and remote monitoring system to meet requirements for more intelligent applications.

The following figure shows the system components.

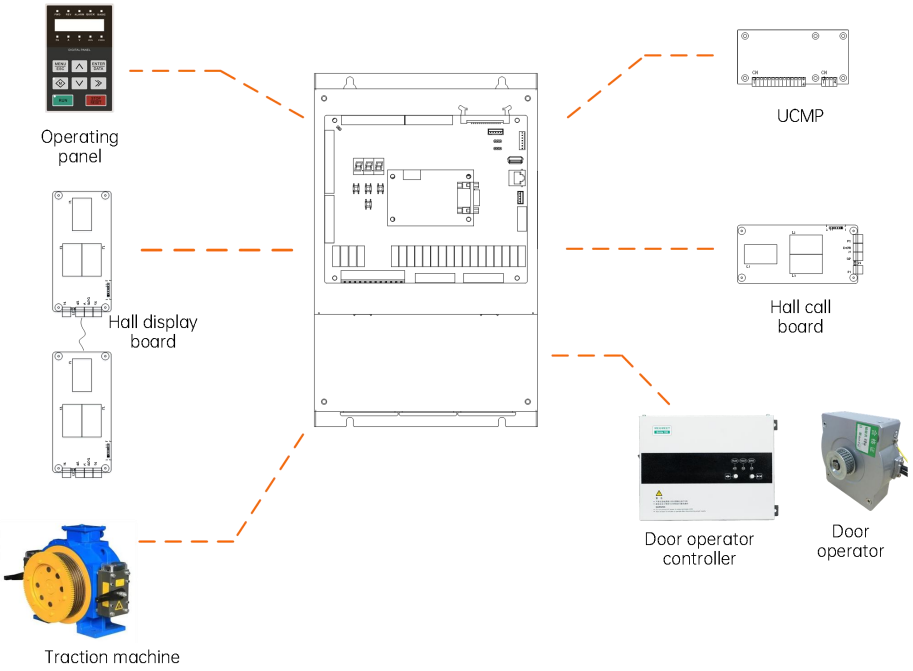


Figure 2-4 System configuration diagram

2.7 Optional parts

If any optional part in the following table is required, specify it in the order.

Model	Name	Function
Smile3000-HCB-R2	Car/Hall call board with display	It is used to register the hall call and display the information (including floor of the car, running direction, etc.). The floor display board can be used as the car display board.
Smile3000-HCB-D5	Car/Hall call board with display	This is a segment display board. It is used to register the hall call and display the information (including floor of the car, running direction, etc.). The floor display board can be used as the car display board.
Smile3000-PG-S	PG card 1	SIN/COS encoder.
Smile3000-PG-P	PG card 2	It is used to adapt to the push-pull and open-collector incremental encoders.

Model	Name	Function
Smile3000-SCB-A	UCMP board	It is used to detect the unintended movement of the car and to implement the advance door open function.
Smile-IOT	IoT module	It is used for elevator monitoring, enabling functions such as running parameter collection, information network transmission, and automatic alarm. Operators can monitor elevator operations in real-time and conduct remote inspections through the Megmeet elevator IoT platform.

2.8 Selection of braking resistors

The Smile1000 models of 75 kW and below have a built-in braking unit, and user only need to connect an external braking resistor between PB and + terminals.

Table 2-2 Braking resistor selection

Integrated controller model	Matching motor power (kW)	Maximum resistance (Ω)	Minimum resistance (Ω)	Power (W)	Braking unit
Single-phase 220 V, Range: 220 to 240 V. 50/60 Hz					
Smile1000-2S1.1	1.1	90	64	650	Built-in
Smile1000-2S1.5	1.5	85	64	1000	
Smile1000-2S2.2	2.2	58	50	1200	
Smile1000-2S3.7	3.7	45	37	1600	
Three-phase 220dV. Range: 220 to 240 V. 50/60 Hz					
Smile1000-2T2.2	2.2	90	64	1200	Built-in
Smile1000-2T3.7	3.7	85	64	1600	
Smile1000-2T5.5	5.5	32	18	2000	
Smile1000-2T7.5	7.5	23	17	2500	
Smile1000-2T11	11	19	15	3000	
Three-phase 380 V. Range: 380 to 440 V					
Smile1000-4T5.5	5.5	108	82	1800	Built-in
Smile1000-4T7.5	7.5	80	60	2500	

Integrated controller model	Matching motor power (kW)	Maximum resistance (Ω)	Minimum resistance (Ω)	Power (W)	Braking unit
Smile1000-4T11	11	56	43	3500	
Smile1000-4T15	15	44	33	4500	
Smile1000-4T18.5	18.5	36	27	5500	
Smile1000-4T22	22	33	25	6400	
Smile1000-4T30	30	21	16	9000	
Smile1000-4T37	37	18	14	11000	
Smile1000-4T45	45	14.5	11.5	15000	
Smile1000-4T55	55	12	10	16500	
Smile1000-4T75	75	8	6.5	24000	

Caution

- The preceding configuration takes the synchronous motor as an example. The asynchronous motor has poor energy transfer efficiency, and user can reduce the power of the braking resistor or increase the resistance of the braking resistor.
- It is recommended that user selects the braking resistor closest to the minimum resistance.

Chapter 3 Mechanical and Electrical Installation

3.1 Installation requirements

3.1.1 Safety installation environment requirements

(1) The ambient temperature has a major influence on the service life of controllers. Please do not operate the controller beyond the specified temperature range (-10℃ to 50℃).

(2) Heat is generated during controller operation. Please install the controller on surface of an incombustible object, and ensure that there is sufficient space around for heat dissipation.

(3) Please install the controller in places with vibration less than 0.6 g.

(4) Please install the controller in places free from direct sunlight exposure, humidity, and condensation.

(5) Please install the controller in places free from corrosive, explosive, and combustible gases.

(6) Please install the controller in places free from oil, dirt, and metal powder.

3.1.2 Installation clearance requirements

The clearance that needs to be reserved varies based upon the power class of the Smile1000 models, as shown in the following figure.

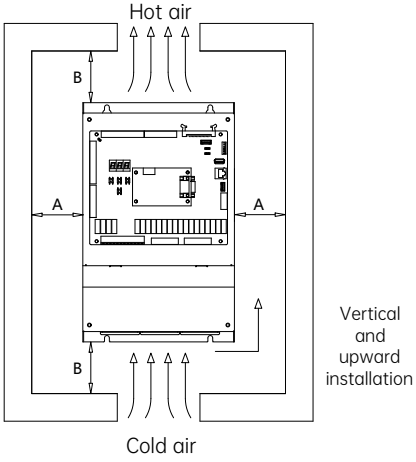


Figure 3-1 Installation clearance

Installation clearance requirements on the Smile1000 models of different power classes

Power class	Dimensions	
15 KW and below	A≥10 mm	B≥100 mm
18.5 KW and above	A≥50 mm	B≥100 mm

3.2 Mechanical installation

The Smile1000 controller is installed vertically upward on the support with screws fixed into the four mounting holes, as shown in the following figure.

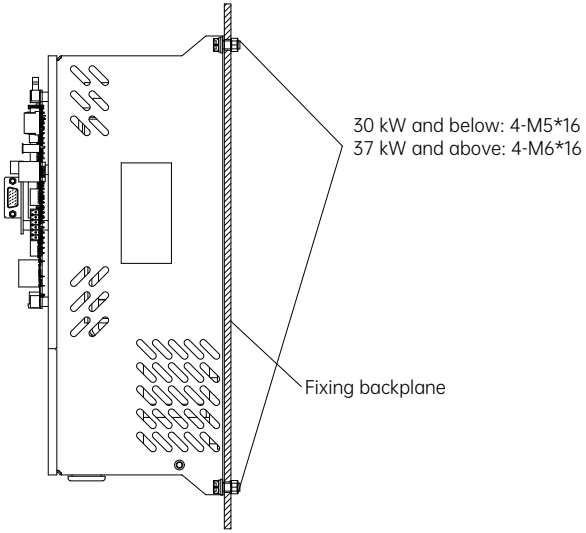


Figure 3-2 Diagram of mounting holes

The controller is generally installed in the control cabinet of the elevator machine room. Pay attention to the following points when designing the control cabinet.

(1) The temperature inside the cabinet must not rise to 10°C higher than the temperature outside the cabinet.

(2) A closed control cabinet must be configured with a fan (or other air cooling device such as air conditioner) to ensure air circulation.

(3) The air from the fan must not blow directly to the drive unit because this easily causes dust adhesion and further a fault on the drive unit.

(4) A vent must be available at bottom of the control cabinet to form bottom-up air flow, which prevents heat island effect on the surface of components or partial thermal conductivity effect.

(5) If the fan does not meet the cooling requirements, install an air conditioner in the cabinet or in the machine room. Note that the temperature inside the cabinet must not be too low; otherwise,

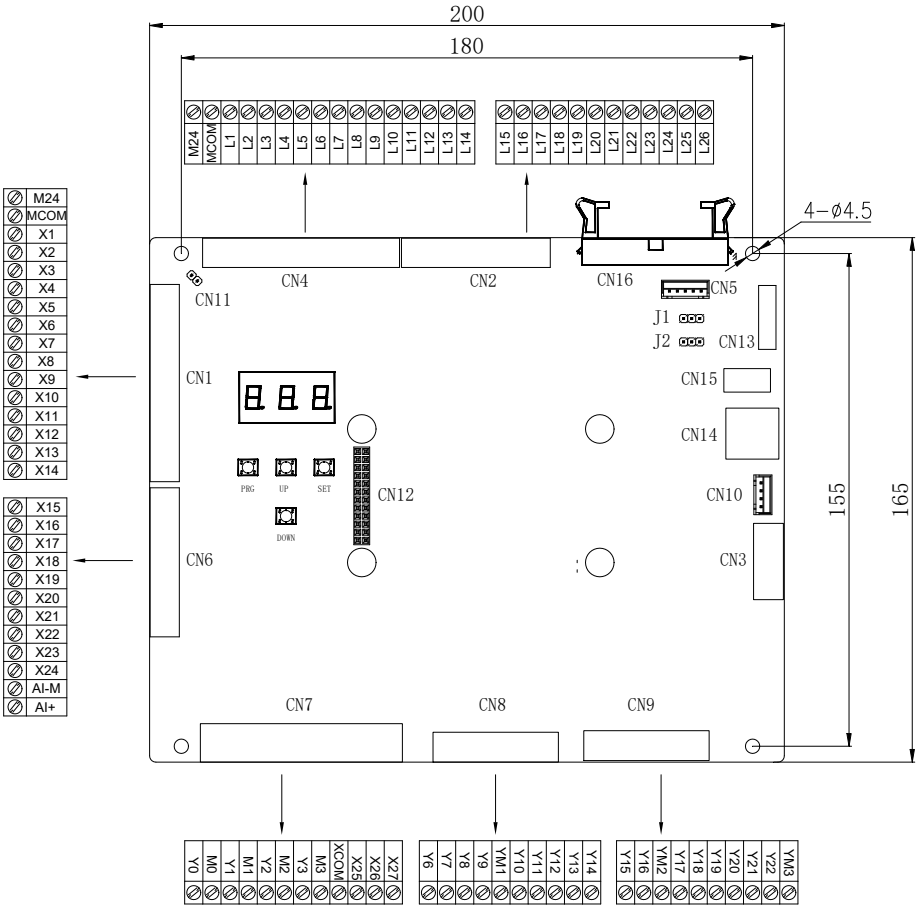
condensation may occur, causing short-circuit of components.

(6) For special environment where the temperature is high but cannot be reduced effectively, derated use of the controller is recommended.

3.3 Electrical installation

3.3.1 Terminal layout and wiring description

(1) Terminal layout



(2) Main circuit terminal description

Main circuit terminal layout is shown in the following figure.

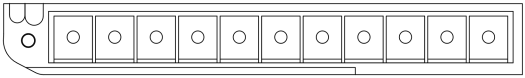


Table 3-1 Main circuit terminal layout

Terminal	Name	Description
R, S, T	Three-phase power input terminals	It provides three-phase AC power supply.
+, -	Positive and negative terminals of DC bus	It connects the external braking unit and energy feedback unit for models of 37 kW and above.
+, PB (P)	Terminals for connecting braking resistor	① Terminals + and PB connect the braking resistor for models below 37 kW; ② Terminals + and P connect the DC reactor for models of 37 kW and above. (At delivery, the (+) and P terminals are shorted with the jumper bar. If DC reactor connection is not required, do not remove the jumper bar.)
U, V, W	Controller output terminals	It connects the three-phase motor.
⏚	Grounding terminal	The system shall be correctly grounded.

(3) Control circuit terminal description

Table 3-2 Control circuit terminals

Terminal	Code	Name	Function
CN2/CN4	24V/COM	External 24 V DC input	24 V DC power supply for the entire board.
	L1 to L26	Button function selection	Button input and button indicator output, 24 V power for button illumination.
CN1/CN6	24V/COM	External 24 V DC input	24 V power supply for the entire board.
	X1 to X24	DI	Input voltage range: 10 V DC to 30 V DC; Input impedance: 4.7 kΩ optocoupler isolation; Input current limit: 5 mA; Functions set via F5-01 to F5-24.
	AI-M/AI	AI	It is used for the analog load cell device.

CN7	X25 to X27/XCM	Higher-voltage detection terminal	Input voltage range: AC 110 V ±15%, DC 110V ± 20%for safety circuit and door lock circuit. Functions set via F5-25 to F5-27.
	Y0/M0 to Y3/M3	Relay output	Relay NO output maximum current and voltage rating: 5 A, 250 V AC. Functions set via F7-00 to F7-03.
CN8/CN9	Y6 to Y22	Relay output	Relay NO output maximum current and voltage rating: 5 A / 250 V AC, or 5A, 30 DC. Functions set via F7-06 to F7-22.
	YM1 to YM3	Common point for relay output	YM1 is the common point for Y6 to Y9; YM2 is the common point for Y10 to Y16; YM3 is the common point for Y17 to Y22.
CN3	MOD+/-	Reserved	Reserved
	CAN+/-	CAN bus differential signal	CAN communication interface for parallel control.
	GND	Ground	It shall be grounded.
CN15	USB interface	Communication	① It is used to connect the external Bluetooth module for commissioning via mobile phone; ② It is used to burn the MCB Program; ③ It is used for residential monitoring.
CN14	RJ45 interface	Interface for operating panel	It is used to connect the digital operating panel.
CN12	PG card interface		
J1/J2	Factory reserved. Do not short them randomly. Otherwise, the controller may not work properly.		

Table 3-3 Description of indicators on the MCB

Indicator mark	Name	Description
ER	Fault indicator	When a fault occurs on the controller, this indicator is ON (red).
OK	Normal running indicator	When the controller is in normal running state, this indicator is ON (green).
CAN	Parallel control	This indicator is steady ON (green) when communication for

	communication indicator	parallel control is enabled, and blinks when the running in parallel mode is normal.
L1 to L26	Button input indicator	This indicator is ON (green) when the button input is active.
X1 to X27	DI signal indicator	This indicator is ON (green) when the external input is active.
Y0 to Y22	Output signal indicator	This indicator is ON (green) when the system output is active.
MOD	MOD IoT communication indicator	This indicator blinks when the communication is normal.

3.3.2 Selection of PG card

Model	Name	Function
Smile3000-PG-S	PG card 1	SIN/COS encoder
Smile3000-PG-P	PG card 2	It is used to adapt to the push-pull and open-collector incremental encoders.

3.3.2.1 Synchronous motor: Smile3000-PG-S

The FVC function of the Smile1000 control system requires a PG card. Please connect the CN2 terminal of the PG card directly to the CN12 terminal on the Smile1000 controller MCB.

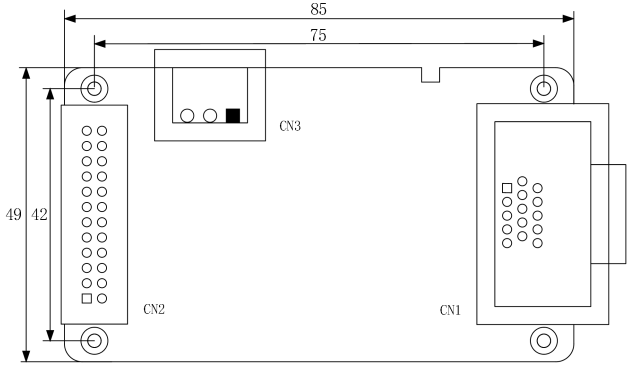


Figure 3-3 Smile3000-PG-S appearance and dimensions (unit: mm)

Table 3-4 PG card CN1 terminal definition

CN1 pin definition														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B-	-	Z+	Z-	A+	A-	COM	B+	VCC	C+	C-	D+	D-	-	-

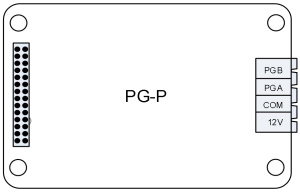
PG card connection precaution:

(1) The cable connecting the PG card and the encoder must be separated from the cables of the control circuit and the power circuit. Parallel cabling in close distance is forbidden;

(2) The cable from the PG card to the encoder must be a shielded cable. The shield must be connected to the PE on the controller side. To minimize interference, single-end grounding is recommended;

(3) The cable from the PG card to the encoder must run through the conduit separately and the metal shell shall be reliably grounded

3.3.2.2 Asynchronous motor: Smile3000-PG-P

PG card appearance	Encoder type	PG card terminal		Encoder terminal	
	Push-pull and open-collector incremental encoders.	1	12 V		V+
		2	COM (0 V)		V-
		3	PGA		A
		4	PGB		B

3.3.3 Matching motor selection

The main operational indicators of the electrical relationship between the controller and the traction machine motor are voltage and current.

(1) In general elevator applications, the input mains voltage is 380 V, and the motor voltage can only be equal to or smaller than 380 V. Therefore, when selecting the Smile1000 drive model, user can take only the current of the motor into consideration.

(2) When the Smile1000 series is designed, large safety allowance is reserved for the main power module. The Smile1000 controller can run properly within the nominal output current range. During stable running, the maximum output torque is 150% of the rated torque and can reach up to 200% of the rated torque for a short time.

Therefore, for the motor with the rated voltage of 380 V, user can select the controller of the same power class. As long as the rated current of the motor is smaller than the output current of the controller, the controller of the same power class can also be used

Generally, select a matching motor based on the output current of the controller and ensure that the rated current of the motor is equal to or smaller than the output current of the controller. For technical specifications of the controller, see Section 2.3.

3.3.4 Selection and use of display board

Megmeet does not provide display board, and customers need to prepare the appropriate board themselves. The Smile1000 series supports four different types of display boards. For details, see the descriptions of FE-12 in chapter 7

3.4 Selection and use of peripheral electrical devices

3.4.1 Description of peripheral electrical devices

Precautions on peripheral device connection of the Smile1000 controller are listed as follows.

(1) Do not install the capacitor or surge suppressor on the output side of the controller. Otherwise, it may cause faults to the controller or damage to the capacitor and surge suppressor.

(2) Inputs/Outputs (main circuit) of the controller contain harmonics, which may interfere with the communication device connected to the controller. Therefore, install an anti-interference filter to minimize the interference.

(3) Select the peripheral devices based on actual applications as well as by referring to section 3.4.2.

Table 3-5 Description of peripheral electrical devices

Device	Mounting location	Function
Air switch	Forefront of controller power input side	It can cut off the power supply of the controller and provide short-circuit protection.
Safety contactor	Between air switch and the controller input side	It can apply/cut off the power supply of the controller. The close/open of the contactor is controlled by the external safety circuit.
AC input reactor	Controller input side	It can improve the power factor of the input side. It can eliminate the higher-order harmonics on the input side to provide effective protection on the rectifier bridge. It can eliminate the input current unbalance due to unbalance between the power phases.
AC output reactor	Between the controller output side and the motor, and close to the	If the distance between the vector drive controller and the motor is greater than 100 m, install an AC output reactor.

Device	Mounting location	Function
	controller	

3.4.2 Selection of peripheral electrical devices

Proper cable specification and cabling greatly improve the anti-interference capability and safety of the system, facilitating installation and commissioning and enhancing system running stability.

Table 3-6 The Smile1000 controller peripheral electrical device selection and specifications

Controller model	MCCB (A)	Contactor (A)	Cable of main circuit (mm^2)	Cable of control circuit (mm^2)	Grounding cable (mm^2)
Three-phase 380 V. Range: -15% to 15%. 50/60 Hz					
Smile1000-4T5.5	25	18	2.5	0.75	2.5
Smile1000-4T7.5	32	25	4	0.75	4
Smile1000-4T11	40	32	6	0.75	6
Smile1000-4T15	50	38	6	0.75	6
Smile1000-4T18.5	63	40	10	0.75	10
Smile1000-4T22	80	50	10	0.75	10
Smile1000-4T30	100	65	10	0.75	10
Smile1000-4T37	100	80	25	1.0	16
Smile1000-4T45	160	95	35	1.0	16
Smile1000-4T55	160	115	50	1.0	25
Smile1000-4T75	225	170	70	1.0	35

3.5 Electrical wiring diagram of the control system

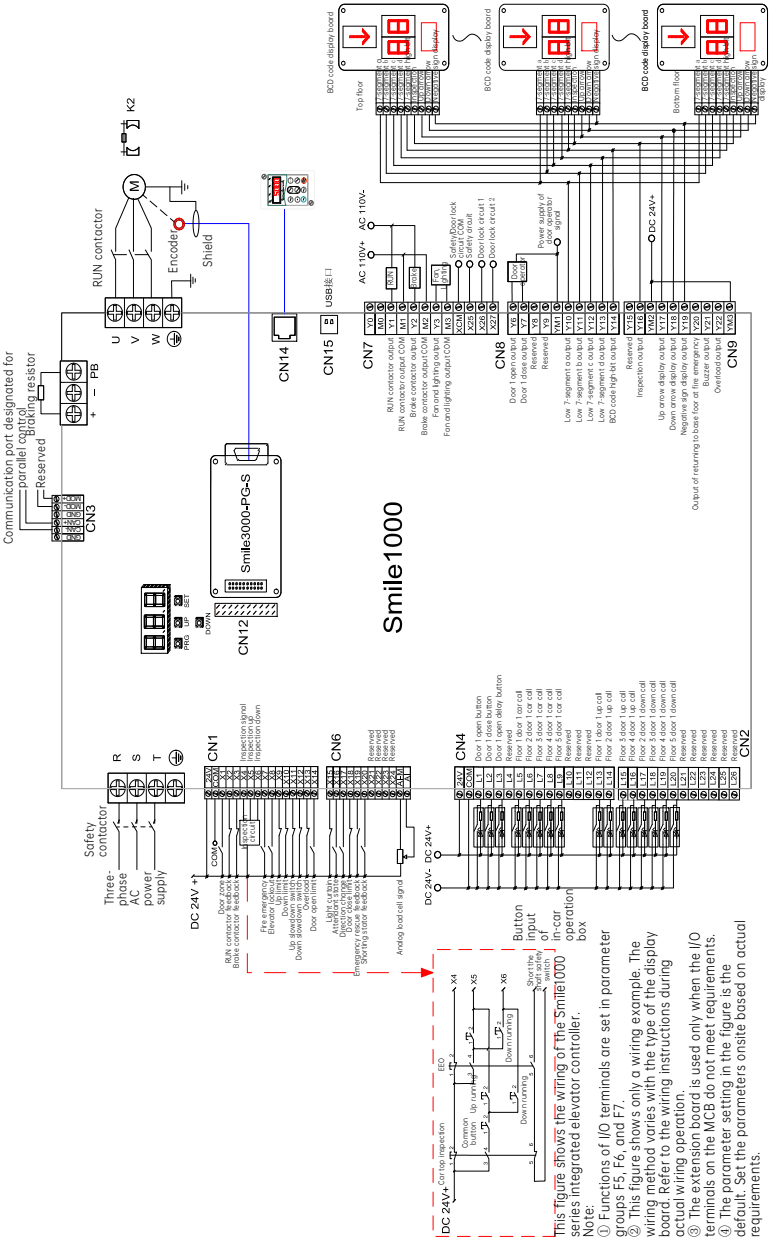


Figure 3-4 Electrical wiring diagram of the Smile1000 control system

3.6 Installation of shaft position signals

In elevator control, to implement landing accurately and running safely, the car position needs to be identified based on shaft position signals. These shaft position signals include the leveling switches, up/down slowdown switches, up/down limit switches, and up/down final limit switches. These shaft position signals are directly transmitted by the shaft cables to the MCB of the controller. For the electrical wiring method, refer to Figure 3-4. The following figure shows the layout of shaft position signals in the shaft.

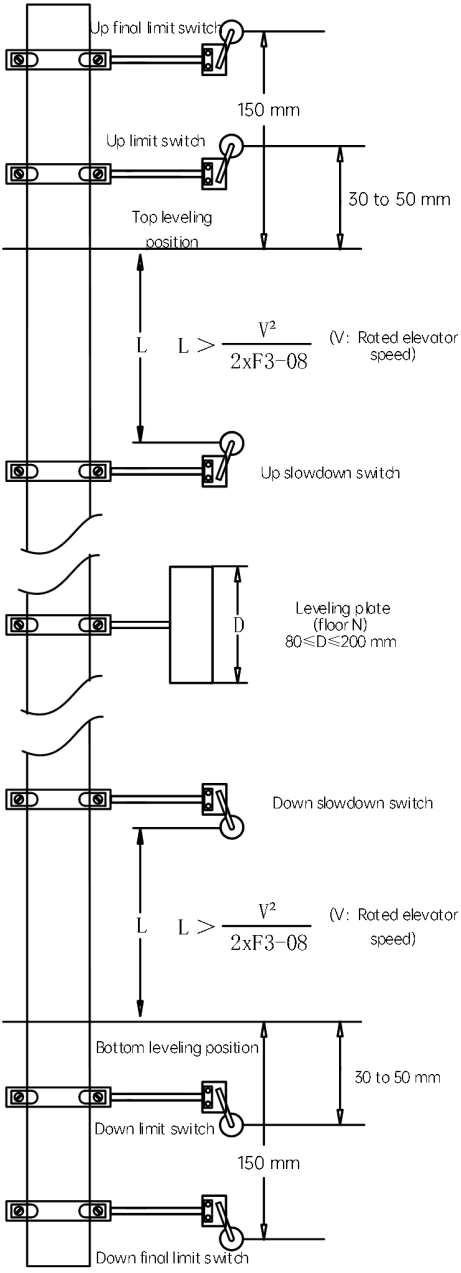


Figure 3-5 Layout of shaft position signals

3.6.1 Installation of leveling signals

Leveling signals comprise the leveling switch and leveling plate, and are directly connected to the input terminal of the controller. It is used to enable the car to land at each floor accurately. The leveling switches are generally installed on the top of the car. The Smile1000 system supports a maximum of three leveling switches; by default, one leveling switch is used. The leveling plate is installed on the guide rail in the shaft. One leveling plate needs to be installed at each floor. Ensure that leveling plates at all floors are mounted with the same depth and verticality.

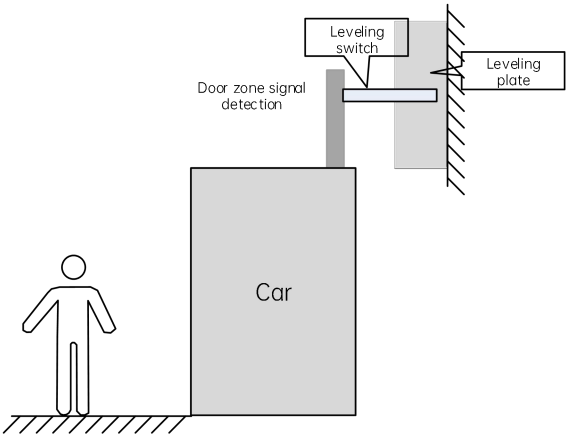
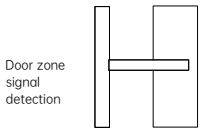
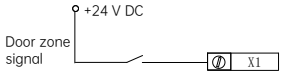
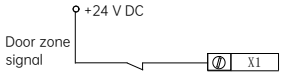
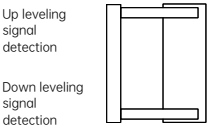
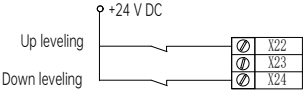
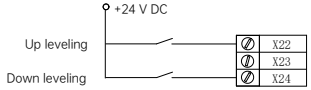
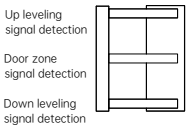
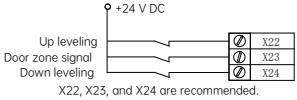
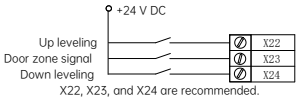


Figure 3-6 Installation positions of leveling signals

Table 3-7 Installation requirements of leveling switches

Number of Leveling Switches	Installation Method	Connection with the controller input terminals	Function code setting
1			F5-01=03 (NO)
			F5-01=103 (NC)
2		 X22 and X24 are recommended.	F5-22=101 (NC) F5-24=102 (NC)
		 X22 and X24 are recommended.	F5-22=01 (NO) F5-24=02 (NO)

Number of Leveling Switches	Installation Method	Connection with the controller input terminals	Function code setting
3		 X22, X23, and X24 are recommended.	F5-22=101 (NC) F5-23=103 (NC) F5-24=102 (NC)
		 X22, X23, and X24 are recommended.	F5-22=01 (NO) F5-23=03 (NO) F5-24=02 (NO)

3.6.2 Installation of slowdown switches

The slowdown switch is one of the key protective components of the Smile1000 series, protecting the elevator from over travel top terminal (top hitting) or over travel bottom terminal (bottom crashing) at maximum speed when the elevator position becomes abnormal. The Smile1000 system supports one pair of slowdown switches. The slowdown distance L indicates the distance from the slowdown switch to the leveling plate at the terminal floor. The calculating formula is as follows:

$$L > \frac{V^2}{2 \times P3.08}$$

L: slowdown distance;

V: Rated elevator speed (F0-04);

F3-08: Special deceleration rate.

The default value of F3-08 (special deceleration rate) is 0.5 m/s^2. The slowdown distances calculated based on different rated elevator speeds are listed in the following table.

Table 3-8 Slowdown distance

Rated elevator speed (m/s)	0.25	0.4	0.5	0.63	0.75	1	1.5	1.6	1.75
Slowdown distance (m)	0.3 to 0.4	0.5 to 0.6	0.6 to 0.8	0.8 to 1.0	0.9 to 1.2	1.2 to 1.5	1.8 to 2.5		

Caution

- ✧ The slowdown switch supports the terminal floor reset function. It must be installed between the leveling plates of the terminal floor and the secondary terminal floor.
- ✧ If the distance between these two floors is small and the installation distance of the slowdown switch is beyond the installation range of these two floors based on Table 3-2, enable the ultra-short floor function by setting Bit14 or Bit15 of F6-07.

3.6.3 Installation of limit switches

The up limit switch and down limit switch protect the elevator from over travel top/bottom (top hitting / bottom crashing) terminal when the elevator does not stop at the leveling position of the terminal floor.

(1) The up limit switch needs to be installed 30 to 50 mm away from the top leveling position. The limit switch acts when the car continues to run upward 30 to 50 mm from the top leveling position

(2) The down limit switch needs to be installed 30 to 50 mm away from the bottom leveling position. The limit switch acts when the car continues to run downward 30 to 50 mm from the bottom leveling position.

3.6.4 Installation of final limit switches

The final limit switch is to protect the elevator from over travel top/bottom terminal (top hitting / bottom crashing) when the elevator does not stop completely upon passing the up/down limit switch.

(1) The up final limit switch is mounted above the up limit switch. It is usually 150 mm away from the top leveling position

(2) The down final limit switch is mounted below the down limit switch. It is usually 150 mm away from the bottom leveling position.

Chapter 4 Commissioning Tools

The Smile1000 series supports three commissioning tools: 4-button keypad, panel for operation control and information display (referred to as operating panel below), and host computer monitoring software.

Tool	Function	Remarks
4-button keypad	For command input during shaft commissioning and floor information viewing	Standard
LED operating panel	For viewing and modification of all parameters related to elevator drive and control.	Optional
host computer monitoring software (NEMS)	For monitoring the present running status of the elevator, viewing and modifying all parameters, and uploading/downloading parameters.	-

This manual provides instructions for keypad and LED operating panel only.

4.1 Keypad

The keypad comprises 3 LED digital tubes for controller information display and 4 keys for simple command input.

The keypad appearance is shown below: three 7-segment display digits and four buttons (defined respectively as PRG, UP, SET, and DOWN).

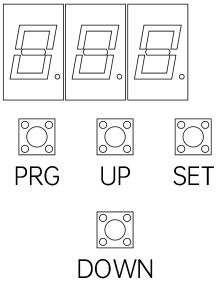


Figure 4-1 4-key keypad appearance

Table 4-1 Button definition

Button/Key	Function
PRG	In any running state, press the button to display the present group number in the function menu; press the button to exit the present operation.

Button/Key	Function
UP	Press the button to increase the value of the group number in the function menu or the value of data. In the group P6 menu, this button is used to input the door open command.
SET	Press this button to enter the editing mode of the function menu, and to confirm and save settings. In the group P6 menu, this button is used to input the door close command.
DOWN	Press the button to decrease the value of the group number in the function menu or the value of data.

The flowchart in Figure 4-2 illustrates the steps of calling the elevator to floor 4 via the keypad.

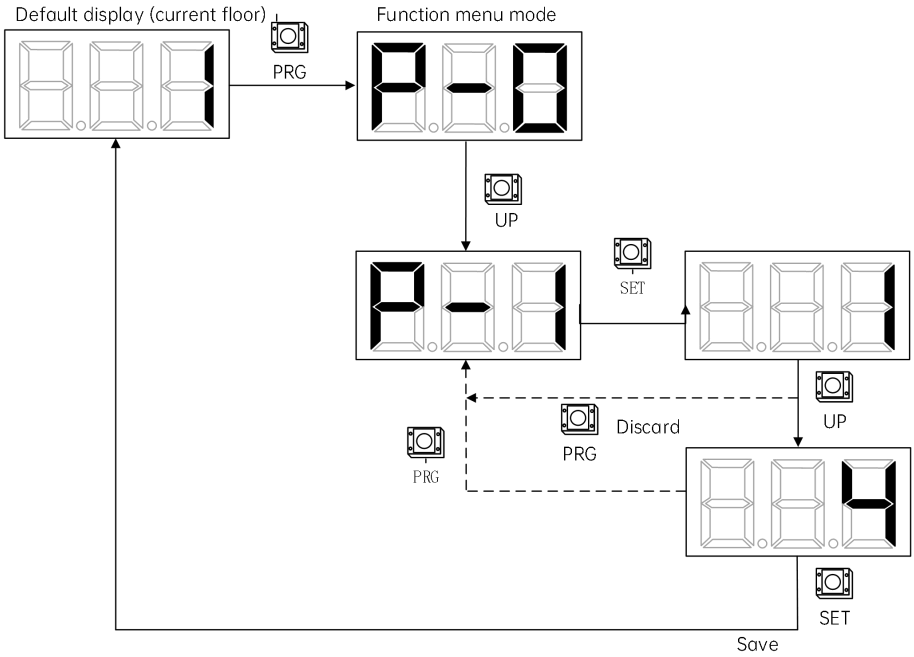


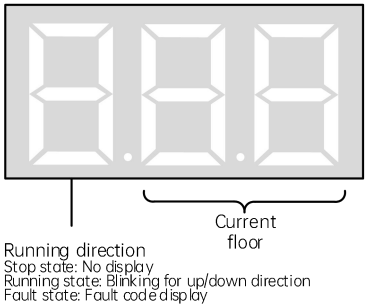
Figure 4-2 Flowchart of floor call via keypad

Parameters related to keypad control are described below.

- F0: Information of floor and running direction

  The default menu display upon power-on is F0. The right two digit tubes represent the floor where the car is currently, and the first digit tube represents the running direction. The first digit tube does not display direction when the elevator is in the stop state, and it displays up/down direction when the car is running upwards/downwards. If a fault arises from normal operation of the system, the

digit tubes automatically display the fault code in a scrolling manner. If the fault is removed, the display enters the F0 menu.



- F1: Command input of running to designated floor

  After entering the F1 menu via operation on the four keys, the LED displays the lowest service floor (set via F6-01). Use UP and DOWN keys to set the destination floor within the range of the lowest floor to the highest floor, and press SET to save the setting. Afterwards, the elevator runs to the set destination floor, and the keypad automatically changes to display the group F menu.

- F6: Door open/close control

  After entering the F6 menu via the PRG, UP, and SET keys, the digit tubes display 1-1. At the same time, the UP and SET keys represent the door open and door close commands respectively. Press the PRG key to exit.

- F7: Input of floor auto-tuning

  After entering the F7 menu via the four keys, the digit tubes display 0. Use the UP and DOWN keys to set the data within the range of 0 to 2. Value 1 and value 2 represent different floor auto-tuning commands. Value 1: Do not clear the P20 leveling adjustment parameters. Value 2: Clear the group PR leveling adjustment parameters. At the time, press the SET key, and the elevator will start shaft auto-tuning if the conditions are met. The LED will change automatically to display the F0 menu. When the auto-tuning is completed, F7 will be automatically reset to 0. If the conditions for auto-tuning are not met, the system reports an Err35 fault.

4.2 Operating panel

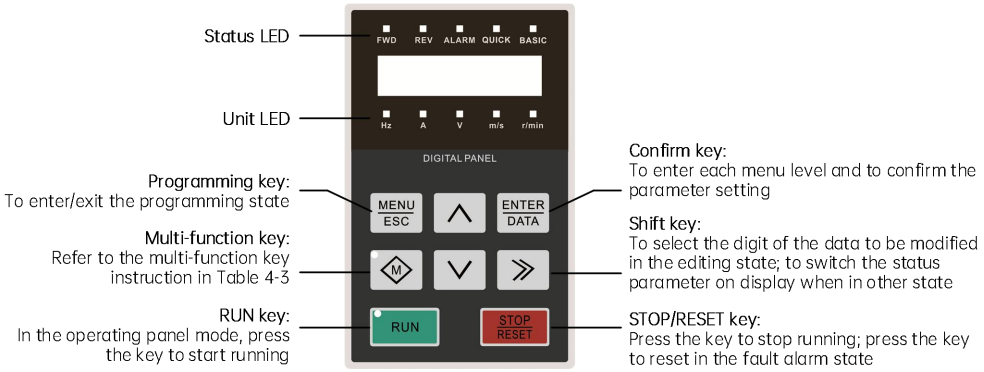


Figure 4-3 Operating panel appearance and functions

4.2.1 LED Indicator and multi-function key instructions

Table 4-2 Indicator instructions

LED indicator	Name	Definition	color
Status LED			
FWD	Forward running indicator	ON: When in the stop state, the drive receives a FWD running command; When in the running state, the drive is running in the forward direction; Blinking: The running direction is switching from FWD to REV.	Green
REV	Reverse running indicator	ON: When in the stop state, the drive receives a REV running command; When in the running state, the drive is running in the reverse direction; Blinking: The running direction is switching from REV to FWD.	Green

<table>
<tr><th>LED indicator</th><th>Name</th><th colspan="3">Definition</th><th>color</th></tr>
<tr><td>ALARM</td><td>Alarm indicator</td><td colspan="3">ON: The drive enters the alarm state.</td><td>Red</td></tr>
<tr><td>QUICK</td><td rowspan="5">Menu mode indicator</td><td>QUCIK LED</td><td>BASIC LED</td><td>Menu mode</td><td>Green</td></tr>
<tr><td rowspan="4">BASIC</td><td>ON</td><td>OFF</td><td>Quick menu</td><td rowspan="4">Green</td></tr>
<tr><td>OFF</td><td>ON</td><td>Basic menu</td></tr>
<tr><td>OFF</td><td>OFF</td><td>Verification menu</td></tr>
<tr><td colspan="6">Unit LED</td></tr>
<tr><td>Hz</td><td>Frequency indicator</td><td colspan="3">ON:
The present parameter on display refers to the running frequency;
Blinking:
The present parameter on display refers to the frequency reference.</td><td>Green</td></tr>
<tr><td>A</td><td>Current indicator</td><td colspan="3">ON:
The present parameter on display refers to the current.</td><td>Green</td></tr>
<tr><td>V</td><td>Voltage indicator</td><td colspan="3">ON:
The present parameter on display refers to the voltage.</td><td>Green</td></tr>
<tr><td>m/s</td><td>Linear speed indicator</td><td colspan="3">ON:
The present parameter on display refers to the linear speed.</td><td>Green</td></tr>
<tr><td>r/min</td><td>Rotating speed indicator</td><td colspan="3">ON:
The present parameter on display refers to the rotating speed.</td><td>Green</td></tr>
</table>

Table 4-3 Multi-function key instructions

Key	Name	Function
0	No function	The multi-function (M) key is disabled.
1	JOG	The M key serves as the JOG key. When the operating panel works as the command channel, press and hold this key to start the drive real-time jog running. To stop, release the key.

Key	Name	Function
2	FWD/REV switchover	The M key serves as the FWD/REV switchover key. When the operating panel works as the command channel, press the key to switch the direction of the output frequency online.
3	Command channel switchover 1	The M key serves as the command channel switching key, which is valid in the stop state only. The command channel switching sequence is as follows: The operating panel as the command channel (the M key LED indicator is ON) → The terminal as the command channel (the M key LED indicator is OFF) → The serial port as the command channel (the M key LED indicator is blinking) → The operating panel as the command channel (the M key LED indicator is ON)
4	Command channel switchover 2	The M key serves as the command channel switching key, which is valid in the stop state and the in the running state. The switching sequence is the same as mentioned above.
5	Keypad lockout	The M key serves to lock the keypad. To lock the keypad, press and hold the M key, and tap the ∧ key three times simultaneously. The lockout mode is determined by the thousands place of this function code. To unlock the keypad, when the thousands place is set to 5, press and hold the M key, and tap the ∨ key three times simultaneously; when the thousands place is set to 0, the keypad lockout function is disabled.
6	Emergency stop	The M key serves as the emergency stop key. Press the key in the open loop mode or the V/F mode, and the elevator will immediately decelerate to stop.
7	Coast to stop	The M key serves as the "coast to stop" key. Press the key in any running mode, and the drive will coasts to stop.

4.2.2 LED display symbols

There are 5 digits on the panel display, which can display the frequency reference, the output frequency, the monitoring data of all categories, the fault code, etc.

Table 4-4 LED symbols and their meanings

Symbol	Meaning	Symbol	Meaning	Symbol	Meaning	Symbol	Meaning	Symbol	Meaning
	0		7		d		J		r
	1		8		E		L		S
	2		9		F		N		T
	3		A		G		n		U
	4		b		H		O		V
	5		C		h		P		Y
	6		c		I		q		-

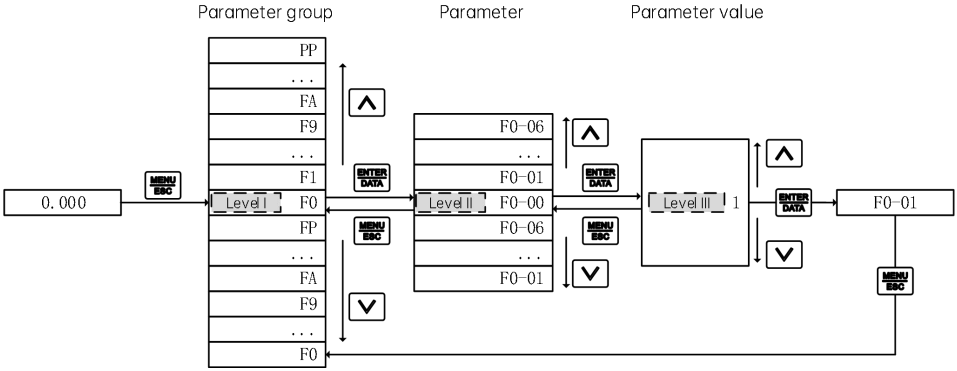
4.2.3 Basic operation

The operating panel menu adopts a three-level structure for the parameter setting, namely:

Level I: Parameter group

Level II: Parameter

Level III: Parameter value



4.2.3.1 Parameter display

Users can set the parameter display list via FA-01 (parameter display in the running state) and FA-02 (parameter display in the stop state). Each binary bit of FA-01 and FA-02 defines a specific parameter (for details, please refer to the parameter instruction). When the binary bit is set to 1, display of its corresponding parameter will be enabled; when it is set to 0, display of its corresponding parameter will be disabled.

In the running state or the stop state, press the [≫] key on the panel to switch among each byte of FA-01 and FA-02, so different status parameters can be displayed.

(1) Parameter display in the running state

In the running state, there are 16 running status parameters. Users can set the binary bit of FA-01 to determine whether the corresponding parameter of the bit can be displayed or not.

(2) Parameter display in the stop state

In the stop state, there are 16 stop status parameters. Users can set the binary bit of FA-02 to determine whether the corresponding parameter of the bit can be displayed or not.

Caution

For details, please refer to the explanation of FA-01 and FA-02.

4.2.3.2 Parameter viewing

Press the [MENU ESC] key on the panel, and then tap the [∧] or [∨] to display the parameter groups in the level I menu.

After the entry into each menu level, if any digit blinks, it indicates that the corresponding value of the digit is open to modification via the [∧] key, the [∨] key, and the [≫] key on the panel.

4.2.3.3 Parameter modification

After the entry into each menu level, if any digit blinks, it indicates that the corresponding value of the digit is open to modification via the [∧] key, the [∨] key, and the [≫] key on the panel.

When in the level III menu, users can press the [MENU ESC] key or the [ENTER DATA] key to return to the level II menu. However, there is difference between the two choices:

(1) If the [ENTER DATA] key is selected, the system will save the parameter change before returning to the level II menu, and automatically switches to the next parameter;

(2) If the [MENU ESC] key is selected, the system will discard the parameter change, and directly returns to the level II menu of the current parameter.

When in the level III menu, if the display digits of the parameter value do not blink, it indicates that this parameter value can not be modified, and the possible reasons include the followings:

(1) This parameter does not allow modification because it represents the drive type, the detected value, the running records, or the item alike;

(2) This parameter does not allow modification in the running state, but supports modification in the stop state.

Chapter 5 Commissioning and operation demonstration

5.1 System commissioning

Caution

- ✧ Ensure that there is no person in the shaft or car before performing commissioning on the elevator.
- ✧ Ensure that the peripheral circuit and mechanical installation are ready before performing commissioning.

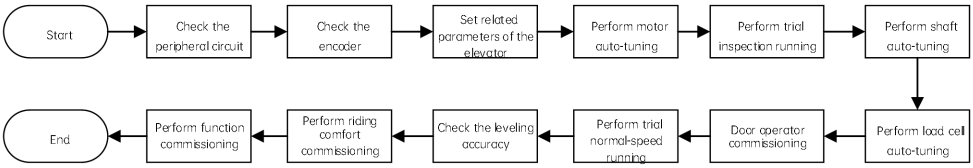


Figure 5-1 Commissioning flowchart of the Smile1000 series

5.1.1 Check before commissioning

The elevator needs to be commissioned after being installed; the correct commissioning guarantees safe and normal running of the elevator. Before performing electric commissioning, check whether the electrical part and mechanical part are ready for commissioning to ensure safety. At least two persons need to be onsite during commissioning so that the power supply can be cut off immediately when an abnormality occurs.

(1) Check the field mechanical and electric wiring

- Before power-on, check the peripheral wiring to ensure component and personal safety.
- Check whether the component models are matched.
- Check whether the safety circuit is conducted and reliable.
- Check whether the door lock circuit is conducted and reliable.
- Check whether the shaft is unobstructed, and the car has no passenger and meets the conditions for safe running.
- Check whether the cabinet and traction motor are well grounded.
- Check whether the peripheral circuit is correctly wired according to the drawings of the manufacturer.

- Check whether all switches act reliably.
- Check whether there is short-circuit to ground by checking the inter-phase resistance of the main circuit.
- Check whether the elevator is set to the inspection state.
- Check whether the mechanical installation is complete (otherwise, it will result in equipment damage and personal injury).

(2) Check the encoder

The pulse signal from the encoder is critical to the accurate control of the system. Before commissioning, check the following items carefully.

- Check whether the encoder is installed reliably with correct wiring.
- Check whether the signal cable and strong-current circuit of the encoder are laid in different ducts to prevent interference.
- The encoder cable is preferably connected directly to the control cabinet. If the cable is not long enough and an extension cable is required, the extension cable must be a shielding cable and preferably welded to the original encoder cable by using the soldering iron.
- Check whether the shielding of the encoder cable is grounded on the end close to the controller (it is recommended that one end is grounded to prevent interference).

(3) Check the power supply before power-on

Before power-on, check the user power supply.

- Make sure the inter-phase voltage of the user power supply is within (380 V ± 15%), and that the unbalance degree of each phase does not exceed 3%.
- Make sure that the power input voltage between terminals 24 V and COM on the MCB is within 24 V DC ± 15%.
- Make sure that the total lead-in wire gauge and total switch capacity meet the requirements.


Caution

If the input voltage exceeds the allowable value, serious damage will be caused. Distinguish the negative and positive of the DC power supply. Do not run the system when there is input power phase loss.

(4) Check the grounding

Check whether the resistance between the following points and the ground PE is close to infinity. Inspection is required if the resistance is excessively small.

- Between R, S, T and PE
- Between U, V, W and PE
- Between MCB 24 V and PE
- Between motor U, V, W and PE
- Between + , - bus terminals and PE

(5) Check the grounding terminals of all elevator electrical components and the power supply of the control cabinet

5.1.2 Setting and auto-tuning of motor parameters

The Smile1000 series supports two major control modes: SVC and FVC. SVC is applicable to inspection speed running for commissioning and fault judgment running during maintenance of the asynchronous motor. FVC is applicable to normal elevator running. In FVC mode, good driving performance and running efficiency can be achieved in the prerequisite of correct motor parameters.

(1) Parameters related to motor tuning

Table 5-1 Parameters related to motor tuning

Parameters	Name	Description
F1-25	Motor type	0: Asynchronous motor 1: Synchronous motor
FF-00	User password	0 to 65535 0: No password
F1-00	Encoder type selection	0: Sin/Cos or absolute encoder 1: UVW encoder 2: AB encoder (asynchronous motor)
F1-12	Encoder resolution	0 to 10000
F1-01 to F1-05	Rated motor power / voltage / current / frequency / speed	Depend on model; input manually.
F0-00	Control mode	0: SVC 1: FVC 2: V/F
F0-01	Command source selection	0: Operating panel control 1: Distance control
F1-11	With-load tuning, no-load tuning, and shaft auto-tuning	0: No action 1: With-load tuning 2: No-load tuning 3: Shaft auto-tuning 1 4: Shaft auto-tuning 2

(2) Precautions for motor auto-tuning

Follow the following precautions.

- Ensure that all wiring and installation meet the safety specifications.
- Reset the present fault and then start auto-tuning, because the system cannot enter the auto-tuning state ("TUNE" is not displayed) when there is a fault.
- After the auto-tuning is completed, perform trial inspection running. Check whether the current is normal, and whether the actual running direction is the same as the set direction. If the running direction is different from the set direction, change the value of F2-10.
- With-load auto-tuning is dangerous (inspection-speed running of many control cabinets is EEO running and the shaft safety circuit is shorted). Ensure that there is no person in the shaft in this auto-tuning mode.

The figure below is the flowchart of the motor parameter auto-tuning.

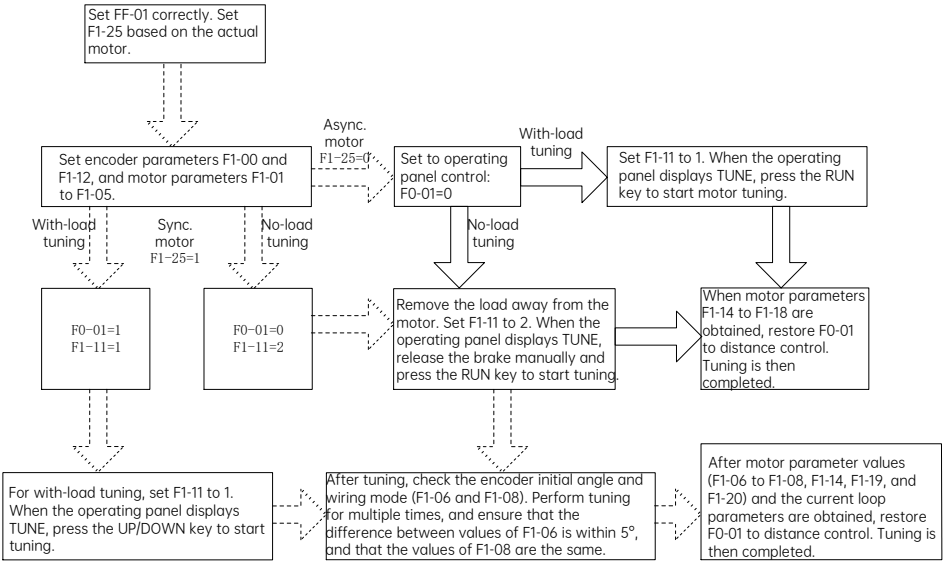


Figure 5-2 Motor auto-tuning flowchart

Below are instructions for motor tuning.

a) When the Smile1000 controller drives the synchronous motor, an encoder is required to provide feedback signals. User must set the encoder parameters correctly before performing motor auto-tuning.

b) For synchronous motor auto-tuning:

- During with-load and no-load tuning with synchronous motors, the motor needs to rotate. Therefore, no-load tuning is preferable. Try with-load tuning if the steel rope is difficult to disengage (or when no-load tuning is impossible).

- Perform three or more times of auto-tuning, and compare the obtained values of F1-06 (Encoder initial angle). The value deviation of F1-06 shall be within ±5°, which indicates that the auto-tuning is successful.
- With-load auto-tuning learns stator resistance, axis D and axis Q inductance, current loop (including zero servo) PI parameters, and encoder initial angle. No-load auto-tuning additionally learns the encoder wiring mode.
- After wiring phase sequence of the motor is changed or the encoder is replaced, perform motor auto-tuning again.

c) For asynchronous motor auto-tuning:

- With-load auto-tuning learns stator resistance, rotor resistance, and leakage inductance, and automatically calculates the mutual inductance and motor magnetizing current.
- No-load auto-tuning learns the mutual inductance, motor magnetizing current, and current loop parameters.

d) The motor wiring must be correct (UVW cables of the motor are connected respectively to UVW terminals of the controller) during with-load tuning. If the motor wiring is incorrect, the motor may jitter or may fail to run and report Err20 (subcode 3) when brake is released. To solve the problem, replace any two phases of the motor UVW cable.

(3) Output state of RUN and brake output

Due to different safety features in different control modes, the system handles the output commands to the RUN contactor or brake contactor differently. In some situations, it is necessary to release the RUN contactor or the brake contactor manually. The following table lists the output state of the RUN and brake contactors.

Table 5-2 Output state of the RUN and brake contactors

Control mode / Output state	No-load tuning	With-load tuning		Operating panel control F0-01=0	Distance control F0-01=1
		Synchronous	Asynchronous		
RUN contactor	Output	Output	Output	No output	Output
Brake contactor	No output	Output	No output	No output	Output

5.1.3 Trial run at normal speed

The state of the elevator shall satisfy all the safety running requirements for the trial run.

To perform shaft auto-tuning, the following conditions must be satisfied.

(1) The signals of the encoder and leveling sensors (NC, NO setting is correct, and the devices act reliably) are correct and the slowdown switches are installed properly and act correctly.

(2) When the elevator is at the bottom floor, the down slowdown switch acts.

(3) The elevator is in the inspection state. The control mode is distance control and FVC (F0-00 = 1, F0-01 = 1).

(4) The top floor number (F6-00) and bottom floor number (F6-01) are set correctly

(5) The Smile1000 system is not in the fault alarm state. If there is a fault at the moment, press STOP RESET to reset the fault.

When the above conditions are met, set F1-11 to 3 on the operating panel or hold down S1 on the keypad of the MCB (release S1 after the motor starts up), and start shaft auto-tuning.

5.1.4 Door operator commissioning

The Smile1000 system can control the elevator door properly in the prerequisite that

- Wiring between the MCB and the door operator controller is correct.
- After being commissioned, the door operator controller can open/close the elevator door properly and feeds back door open/close limit signal correctly in the terminal control mode.
- The door open/close command output relays on the MCB are set correctly. The NO/NC states of the door open/close limit signal input contacts are set correctly.

Descriptions of monitoring the elevator door based on the MCB are as follows.

(1) F5-28 is used to monitor whether the door open/close signals received by the system are correct. Segment G/DP of LED3 and segment A/B of LED4 are respectively used to monitor door 1/2 open limit and door 1/2 close limit.

(2) Below are instructions for door open limit monitoring.

In the following figure, if segment G is ON, it indicates that the system has received the door 1 open limit signal, and door 1 should be in open state. If segment G is OFF when the door is open, and ON when the door is closed, it indicates that the NO/NC state of door 1 open limit signal are set incorrectly. In this case, user needs to correct the setting. If segment G stays ON or OFF regardless of whether the door is open or closed, it indicates that MCB does not receive the door open limit signal feedback. In this case, check the door operator controller and its wiring.

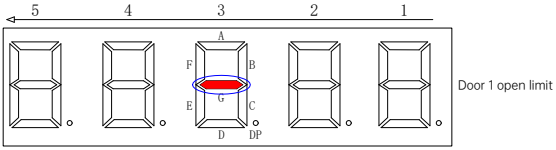


Figure 5-3 F5-28 door 1 open limit monitoring

(3) Below are instructions for door close limit monitoring.

In the following figure, if segment A is ON, it indicates that the system has received the door 1 close limit signal, and door 1 should be in close state. If segment G is OFF when the door is closed, and ON when the door is open, it indicates that the NO/NC state of door 1 close limit signal are set incorrectly. In this case, user needs to correct the setting. If segment A stays ON or OFF regardless of whether

the door is open or closed, it indicates that MCB does not receive the door open limit signal feedback. In this case, check the door operator controller and its wiring.

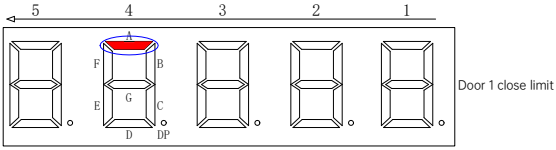


Figure 5-4 F5-28 door 1 close limit monitoring

(4) In the door open/close process, neither of the segments G and A will be ON.

5.1.5 Riding comfort

The riding comfort is an important factor of the elevator's overall performance. Improper installation of mechanical parts and improper parameter settings will cause discomfort. Enhancing the riding comfort mainly involves adjustment of the controller output and the elevator's mechanical construction.

(1) The parameters that may influence the riding comfort are described in this part.

Function code	Name	Range	Default	Description
F1-18	Asynchronous motor no-load current	0.00 to 300.00	0.00 A	The increase in this value can improve the loading capacity of the asynchronous motor.
F2-00	Speed loop proportional gain 1	0 to 100	40	F2-00 and F2-01 are the PI regulation parameters when the running frequency is lower than F2-02 (Switchover frequency 1). F2-03 and F2-04 are the PI regulation parameters when the running frequency is higher than F2- 05 (Switchover frequency 2). The regulation parameters when the running frequency is between F2-02 and F2-05 are the weighted average value of F2-00 & F2-01 and F2-03 & F2-04.
F2-01	Speed loop integral time 1	0.01s to 10.00 s	0.60 s	
F2-02	Switchover frequency 1	0.00 to F2-05	2.00 Hz	
F2-03	Speed loop proportional gain 2	0 to 100	35	
F2-04	Speed loop integral time 2	0.01s to 10.00 s	0.80 s	
F2-05	Switchover frequency 2	F2-02 to F0-06	5.00 Hz	

Function code	Name	Range	Default	Description
◆ General regulation method The speed dynamic responsiveness of vector control can be adjusted via the setting of proportional gain and integral time of the speed regulator. Both increasing proportional gain and decreasing integral time can make the speed loop dynamic response faster. However, an excessively large proportional gain or an excessively small integral time can generate oscillation in the system. ◆ Recommended regulation method If the default setting cannot satisfy the requirements, make slight regulation. Decrease the proportional gain first to ensure that the system does not oscillate. Then decrease the integral time to ensure fast responsiveness and smaller overshoot. If both F2-02 (Switchover frequency 1) and F2-05 (Switchover frequency 2) are set to 0, only F2-03 and F2-04 are valid.				
F2-06	Current loop proportional gain	10 to 500	60	F2-06 and F2-07 are the current loop adjustment parameters in the vector control algorithm.
F2-07	Current loop integral gain	10 to 500	30	
◆ General regulation method The optimum values of these two parameters are obtained during motor auto-tuning, and user does not need to modify them. Appropriate setting of the parameters can restrain jitter during running and have obvious effect on the riding comfort.				
F2-18	Startup acceleration time	0.000 to 1.500	0.000 s	It can reduce the feeling of abruptness at startup caused by the breakout friction of the guide rail.
F3-00	Startup speed	0.000 to 0.030 m/s	0.000 m/s	
F3-01	Startup speed holding time	0.000 to 0.500 s	0.000 s	
F3-14	Zero-speed current output time before curve starts	0.000 to 1.000 s	0.200 s	It specifies the zero speed holding time before brake output.
F3-15	Zero-speed holding time for brake release	0.000s to 2.000 s	0.200 s 0.600 s	It specifies the brake release time.
F3-16	Zero-speed holding time after curve ends	0.000s to 1.000 s	0.300 s	It specifies the zero speed holding time after the brake is applied.

Function code	Name	Range	Default	Description
F8-11	zero-speed torque holding time for brake engagement	0.200s to 1.500 s	0.200 s	It specifies the brake apply time.

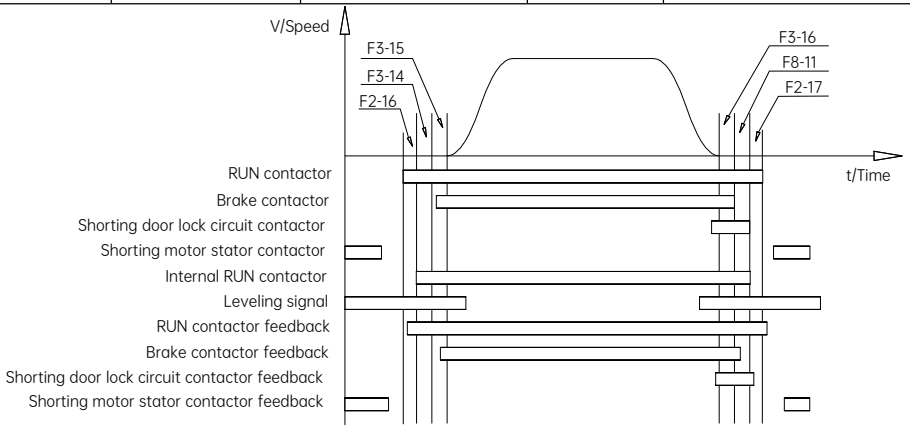


Figure 5-5 Running time sequence

F3-14 (zero-speed current output time before curve starts) specifies the time from output of the RUN contactor to output of the brake contactor, during which the controller performs excitation on the motor and outputs zero-speed current with large startup torque

F3-15 (zero-speed holding time for brake release) specifies the time from the moment when the system sends the brake release command to the moment when the brake is completely released, during which the system retains the zero-speed torque current output to prevent rollback.

F8-11 (zero-speed torque holding time for brake engagement) specifies the time from the moment when the system sends the brake apply command to the moment when the brake is completely applied, during which the system retains the zero-speed torque current output to prevent rollback.

F3-16 (zero-speed holding time after curve ends) specifies the zero-speed output time when the running curve ends.

The release time of the brakes varies according to the types and the response time of the brakes is greatly influenced by the ambient temperature. A high brake coil temperature slows the brake responsiveness. Therefore, when the riding comfort at startup or stop cannot be improved by adjusting zero servo or load cell compensation parameters, appropriately increase the values of F3-15 and F8-11 to check whether the brake release time influences the riding comfort.

F8-01	Pre-torque selection	0: Pre-torque invalid 1: Load cell pre-torque compensation	0	Set this parameter based on actual requirement.

Function code	Name	Range	Default	Description
		2: Automatic pre-torque compensation		
F2-11	Zero-servo current coefficient	0.20% to 50.0%	15.0%	These are zero-servo regulating parameters when F8-01 is set to 2 (automatic pre-torque compensation).
F2-12	Zero-servo speed loop Kp	0.00 to 2.00	0.50	
F2-13	Zero-servo speed loop Ti	0.00 to 2.00	0.60	

When F8-01 is set to 2 (automatic pre-torque compensation), the system automatically adjusts the compensated torque at startup.

a. Gradually increase F2-11 (zero-servo current coefficient) until that the rollback is canceled at brake release and the motor does not vibrate.

b. Decrease the value of F2-11 (zero-servo current coefficient) if the motor jitters when F2-13 (zero-servo speed loop Ti) is less than 1.00.

c. Motor vibration and acoustic noise indicate excessive value of F2-12 (zero-servo speed loop Kp). Decrease the default value of F2-12.

d. If the motor noise is large at no-load-cell startup, decrease the value of F2-12 or F2-13.

F8-02	Pre-torque offset	0.0% to 100.0%	50.0%	These are pre-torque regulation parameters.
F8-03	Drive gain	0.00 to 2.00	0.60	
F8-04	Brake gain	0.00 to 2.00	0.60	

When F8-01 is set to 1 (load cell pre-torque compensation), the system with a load cell pre-outputs the torque which matches the load to ensure the riding comfort of the elevator.

- Motor driving state: full-load up, no-load down
- Motor braking state: full-load down, no-load up

F8-02 (pre-torque offset) is actually the elevator balance coefficient, namely, the percentage of the car load to the rated load when the car and counterweight are balanced.

F8-03 (drive gain) or F8-04 (brake gain) scales the elevator's present pre-torque coefficient when the motor runs at the drive or brake side. If the gain set is higher, then the calculated value of startup pre-torque compensation is higher. The controller identifies the braking or driving state according to the load cell signal and automatically calculates the required torque compensation value.

When an analog device is used to measure the load, these parameters are used to adjust the elevator startup. The method of adjusting the startup is as follows.

- In the driving state, increasing the value of F8-03 could reduce the rollback during the elevator

Function code	Name	Range	Default	Description
startup, but a very high value could cause car lurch at start. • In the braking state, increasing the value of F8-04 could reduce the jerk in command direction during the elevator startup, but a very high value could cause car lurch at start.				

(2) Mechanical Construction that may influence the riding comfort

The mechanical construction affecting the riding comfort involves installation of the guide rail, guide shoe, steel rope, and brake, balance of the car, and the resonance caused by the car, guild rail and motor. For asynchronous motor, abrasion or improper installation of the gearbox may cause poor riding comfort.

- Installation of the guide rail mainly involves the verticality and surface flatness of the guide rail, smoothness of the guide rail connection and parallelism between two guide rails (including guide rails on the counterweight side)。
- Tightness of the guide shoes (including the one on the counterweight side) also influences the riding comfort. The guide shoes must not be too loose or tight
- The drive from the motor to the car totally depends on the steel rope. Large flexibility of the steel rope with irregular resistance during the car running may cause curly oscillation of the car. In addition, unbalanced stress of multiple steel ropes may cause the car to jitter during running.
- The riding comfort during running may be influenced if the brake arm is installed too tightly or released incompletely
- If the car weight is unbalanced, it will cause uneven stress of the guide shoes that connect the car and the guide rail. As a result, the guide shoes will rub with the guide rail during running, affecting the riding comfort.
- For asynchronous motor, abrasion or improper installation of the gearbox may also affect the riding comfort.
- Resonance is an inherent character of a physical system, related to the material and quality of system components. If user is sure that the oscillation is caused by resonance, reduce the resonance by increasing or decreasing the car weight or counterweight and adding resonance absorbers at connections of the components (for example, place rubber blanket under the motor).

5.1.6 Password setting

The Smile1000 series provides the parameter password protection function. The example in the following figure shows the process of changing the password to 12345 (⁛ indicates the blinking digit).

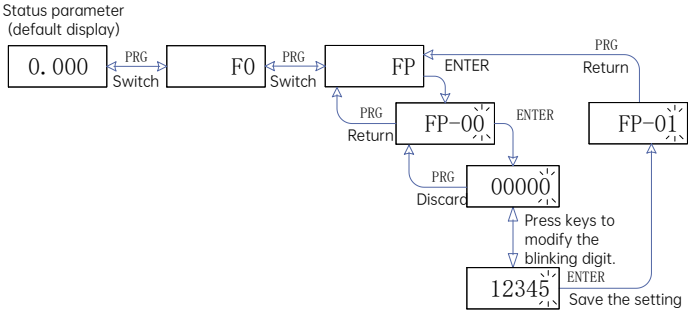


Figure 5-6 Flowchart of password setting

(1) After the user sets the user password (set FP-00 to a non-zero value), the system requires user password authentication (the system displays "- - - - -") when the user presses PRG key. In this case, the user can modify the function code parameters only after entering the password correctly.

(2) For factory parameters (group FF), the user also needs to enter the factory password.

(3) Do not try to modify the factory parameters. If these parameters are set improperly, the system may be unstable or abnormal.

(4) In the password protection unlocked state, user can change the password at any time. The last input number will be the user password.

(5) If user wants to disable the password protection function, enter the correct password and then set FP-00 to 0. If FP-00 is a non-zero value at power-on, the parameters are protected by the password.

5.2 System application

5.2.1 Emergency running solutions at power failure

Passengers may be trapped in the car if power failure suddenly happens during the use of the elevator. The emergency evacuation function at power failure is designed to solve the problem. The emergency evacuation function is implemented in the following modes:

- Uninterrupted power supply (UPS).
- Emergency automatic rescue device (ARD) power supply.
- Shorting motor stator (synchronous motor can apply this mode to save energy and improve safety).

The three modes are described in detailed in the following part.

(1) 220 V UPS emergency power solution

In this mode, the 220 V UPS provides power supply to the main unit and the drive control circuit. During application, a safety contactor shall be used in the cabinet. The following figure shows the emergency 220 V UPS circuit.

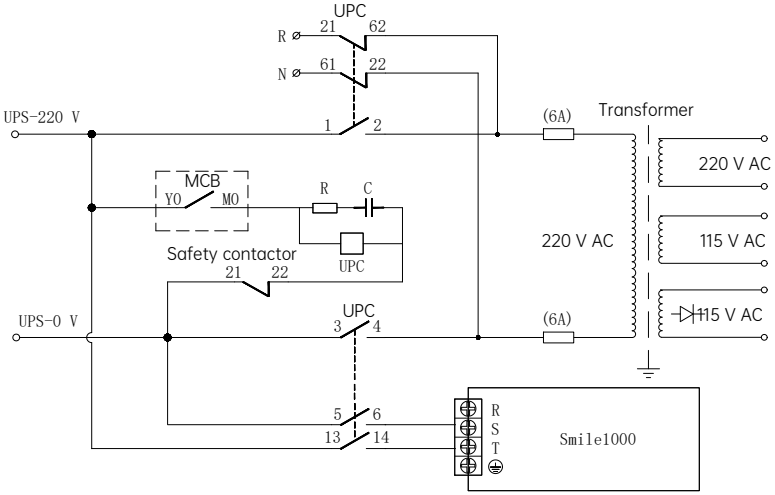
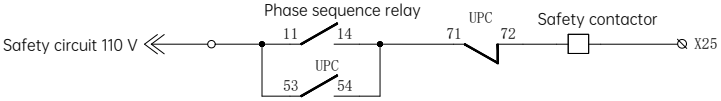


Figure 5-7 220V UPS emergency power circuit diagram



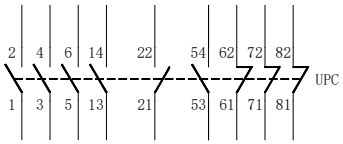


Figure 5-8 Contacts of the contactor

The following tables show the related configuration.

Table 5-3 Recommended UPS power for each power class

UPS power	Controller power
1 kVA (700 W to 800 W)	P ≤ 5.5 kW
2 kVA (1400 W to 1600 W)	5.5 kW < P ≤ 11 kW
3 kVA (2100 W to 2400 W)	15 kW ≤ P ≤ 22 kW

Table 5-4 Parameter setting

Parameter	Value	Description
F6-72	0.010 to 0.630 m/s	Emergency switchover speed

Parameter	Value	Description
F6-73	0 to F6-01	Rescue parking floor
F8-09	0.000 to F3-11	Emergency rescue speed at power failure
F3-18	0.100 to 1.300 m/s^2	Acceleration rate during emergency rescue
F8-10	0: Invalid 1: UPS power supply 2: 48 V battery power supply	Selection of emergency rescue at power failure
F5-19 (X19)	33: UPS input valid	Emergency rescue running signal
F7-00 (Y0)	32: Door 2 selection signal	Automatic switchover of emergency running at power failure

(2) ARD emergency power solution

The ARD is a emergency evacuation device with self recognition and control functions. It is connected between the mains supply and the elevator control cabinet. When the mains supply is normal, it supplies power to the elevator. When the mains supply is interrupted, the ARD supplies power to the main circuit and control circuit. The following figure shows the schematic diagram.

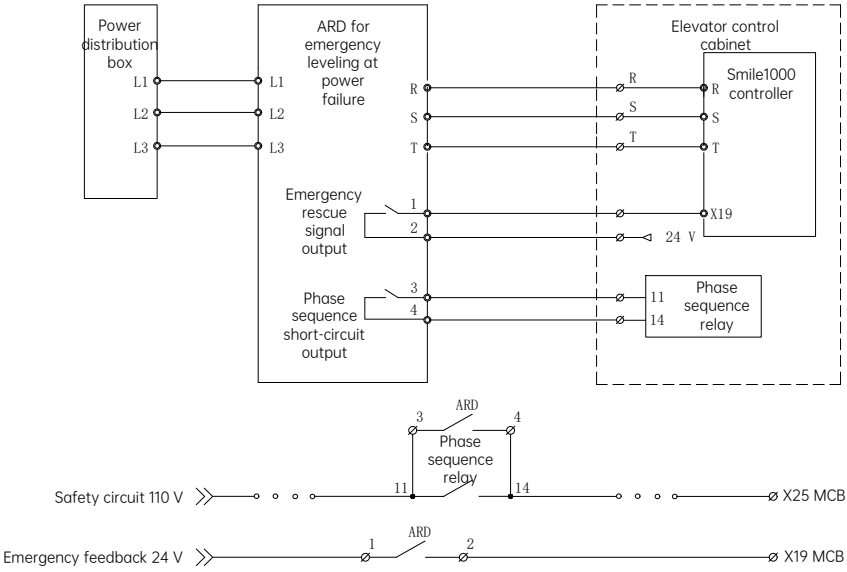


Figure 5-9 Three-phase ARD emergency power solution

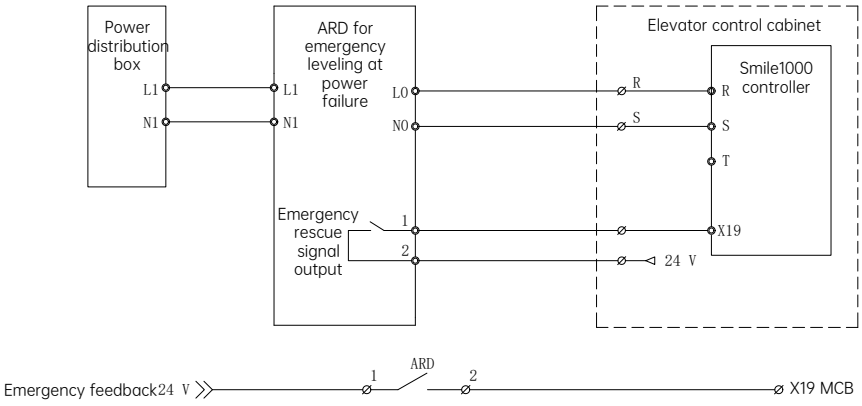


Figure 5-10 Single-phase ARD emergency power solution

The following part shows the related configuration.

Select the ARD with the nominal output power equal to or larger than the rated motor power

The 380V ARD outputs the single-phase emergency voltage between the R and T phases to the control cabinet. Note that for ARDs of other brands, the phases that output the emergency voltage may be different.

Table 5-5 Parameter setting in the ARD mode

Parameter	Value	Description
F6-72	0.010 to 0.630m/s	Emergency switchover speed
F6-73	0 to F6-00	Rescue parking floor
F8-09	0.000 to F3-11	Emergency rescue speed at power failure
F3-18	0.100 to 1.300m/s^2	Acceleration rate during emergency rescue
F8-10	0: Invalid 1: UPS power supply 2: 48 V battery power supply	Selection of emergency rescue at power failure
F5-19 (X19)	33: UPS input valid	Emergency rescue running signal

(3) Shorting motor stator

Shorting PMSM stator means shorting phases UVW of the PMSM, which produces resistance to restrict movement of the elevator car. In field application, an auxiliary NC contact is usually added to the NO contact of the output contactor to short PMSM UVW phases to achieve the effect. It is feasible in theory but may cause overcurrent actually. Due to poor quality of the contactor and wiring of adding the auxiliary contact, the residual current of the controller is still high when the outputs UVW are shorted at abnormal stop. This results in an overcurrent fault and may damage the controller or motor.

Megmeet's shorting motor stator scheme requires installation of an independent contactor for shorting motor stator. The shorting motor stator function is implemented via the NC contact of the relay. On the coil circuit of the RUN contactor, an NO contact of the shorting motor stator contactor is connected in serial, to ensure that output short-circuit does not occur when the parameter setting is incorrect.

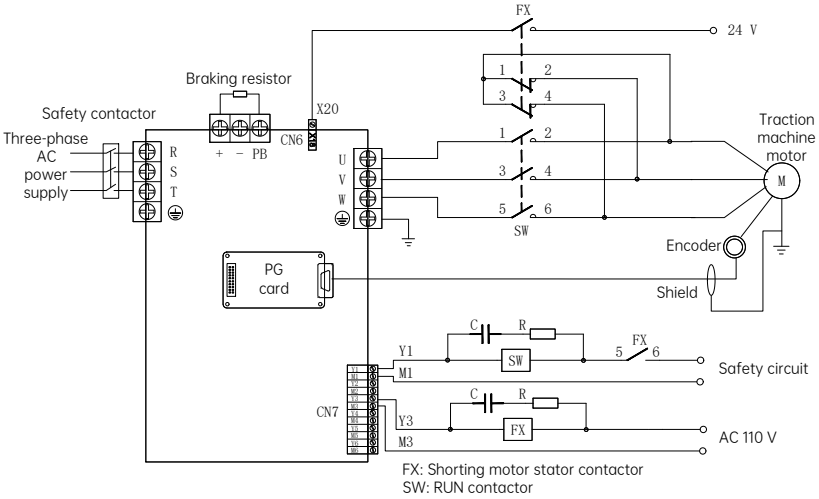


Figure 5-11 Wiring of independent shorting motor stator contactor

The parameter setting in this wiring mode is described in the following table.

Table 5-6 Parameter setting in the shorting motor stator mode

Parameter	Name	Setting value	Description
F5-20	X20 function selection	7	Set X20 to the feedback signal of the shorting motor stator output.
F7-03	Y3 function selection	12	Set Y3 to the output of shorting motor stator contactor by relay control
FE-14	Elevator function selection	-	NC shorting stator contactor: Bit10=0; NO shorting stator contactor: Bit10=1。

Below are the settings for emergency-related functions.

Table 5-7 F6-69 rescue function selection

Bit	Function	Binary setting						Remarks
Bit0	Direction determination method	0	Set by automatic calculation	0	Set by half load	1	Stop at the nearest floor	Automatic calculation requires no-load-cell function (F8-01=2)
Bit1		0		1		0		

Bit	Function	Binary setting		Remarks
Bit2	Car stop at rescue parking floor	1	Stop at the parking floor	-
		0	Stop at the nearest floor	-
Bit4	Startup compensation	1	Torque compensation shall be valid during emergency running.	When direction set by automatic calculation is selected, startup compensation will be enabled automatically.
Bit8	Emergency running time protection	1	When no arrival signal is detected after emergency running for 50 seconds, a fault Err33 will be reported.	When the switchover function from shorting stator braking mode to drive mode is used, this function is invalid.
Bit10	Buzzer alarm	1	The buzzer output is active during UPS emergency evacuation running.	-
Bit12	Switching from shorting stator braking mode to the drive mode	1	Enable the function of switching over the shorting stator braking mode to controller drive mode.	-
Bit13	Type of switching from shorting stator braking mode to the drive mode	1	Speed setting	If the speed is still lower than the value set in F6-72 after the elevator is in shorting stator braking mode for 10 seconds, the controller starts to drive the elevator
		0	Time setting	If the time of the shorting stator braking mode exceeds the time set in F6-75, the controller starts to drive the elevator.
Bit14	Method of exiting from rescue	1	Exit at door close limit	-
		0	Exit at door open limit	-
Bit15	Function selection of	1	enable the function of shorting stator braking.	When this function code is invalid, all related

Bit	Function	Binary setting		Remarks
	shorting stator braking			parameter settings will be invalid.

5.2.2 Parallel control of two elevators

The Smile1000 supports parallel control of two elevators, which is implemented by using the CAN communication port for information exchange and processing between the two elevators, improving elevator use efficiency

(1) Parameter setting for parallel control

Table 5-8 Parameter setting for parallel control

Parameter	Name	Setting value	Setting in parallel control
FD-03	Number of elevators in parallel control	0 to 2	2
FD-04	Elevator number in parallel control	1 to 2	Main elevator: 1 Auxiliary elevator 2

(2) Communication wiring diagram for parallel control

Connect the CN3 terminals of the controllers for the two elevators, as shown in the following figure.

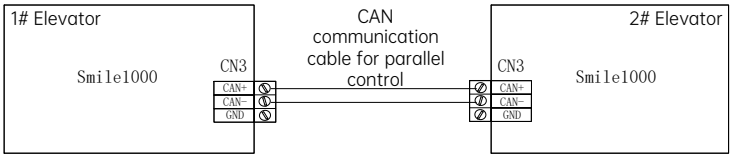


Figure 5-12 Communication wiring for parallel control

Function description on parallel control

a) Physical floor is defined by the installation position of the leveling plate. The floor (such as the ground floor) at which the lowest leveling plate is installed corresponds to physical floor 1. The top physical floor is the accumulative number of the leveling plates. In parallel mode, the physical floor numbers of the same floor for two elevators are consistent.

b) If the floor structures of two elevators are different, the physical floor numbers should start with the floor with the lowest position. The physical floors at the overlapped area of the two elevators shall be the same. Even if one elevator does not stop at a floor in the overlapped area, a leveling plate should be installed there; user can make the elevator not stop at the floor by setting service floors. When two elevators are in parallel mode, the hall call and car call wiring and setting should be performed according to physical floors. Parallel running can be implemented only when the hall call and car call setting for one elevator is the same as that for the other elevator in terms of the same floor.

Caution

- In parallel mode, the top floor (F6-00) and bottom floor (F6-01) of the elevators should be set based on corresponding physical floors.
- When two elevators are in parallel control mode using the Smile1000 system, they do not share the hall call.

Assume that there are two elevators in parallel mode. Elevator 1 stops at floor B1, floor 1, floor 2, and floor 3, while elevator 2 stops at floor 1, floor 3, and floor 4. Now, user needs to set related parameters according to the following table.

Table 5-9 Parameter and address settings of two elevators in parallel control

		Elevator 1		Elevator 2	
Number of elevators in parallel control (FD-03)		2		2	
Elevator number in parallel control (FD-04)		1		2	
Actual floor	Physical floor	Hall call input	Hall call display	Hall call input	Hall call display
B1	1	Terminal L floor 1	FE-01=1101	-	-
1	2	Terminal L floor 2	FE-02=1901	Terminal L floor 2	FE-02=1901
2	3	Terminal L floor 3	FE-03=1902	The car does not stop at this floor; however, the leveling plate is required.	FE-03=1902
3	4	Terminal L floor 4	FE-04=1903	Terminal L floor 4	FE-04=1903
4	5	-	-	Terminal L floor 5	FE-05=1904
Bottom floor (F6-01)		1		2	
To floor (F6-00)		4		5	
Service floor (F6-05)		65535		65531 (the car does not stop at physical floor 3)	

5.2.3 Double-sided door instructions

The Smile1000 supports four double-sided door control modes: mode 1, mode 2, mode 3, and mode 4, as described in the following table.

Instructions on the control mode and parameter setting of double-sided door system are described below.

Mode	Description	Function	Supported floor
Mode 1: FB-01=0	Simultaneous control of front/rear door.	The front door and rear door act simultaneously upon arrival for hall calls and car calls.	≤8 (standard) ≤16 (after extension)
Mode 2: FB-01=1	Independent hall call; Simultaneous car call.	The front door opens upon arrival for front door hall calls; the rear door opens upon arrival for rear door hall calls. The front and rear doors act simultaneously upon arrival for car calls.	≤4 (standard) ≤8 (after extension)
Mode 3: FB-01=2	Independent hall call; Manual control of car call.	Two methods are available to enable mode 3. Method 1: F6-64 Bit4 (Opening one door during manual door control of double-sided elevator) = 1; DI with function 46 "Single/Double door selection" is inactive in this case. A. The front door opens upon arrival for hall calls from the front door, and the rear door opens upon arrival for hall calls from the rear door. B. By default, the front door opens upon arrival for car calls. If the DI with function 31 "Door 2 selection signal" is active, the rear door opens upon arrival for car calls. Method 2: Using DI with function 46 "Single/Double door selection" (F6-64 Bit4 = 0). A. DI inactive (single door control): same as method 1. B. DI active (double door control): same as mode 2.	≤4 (standard) ≤8 (after extension)
Mode 4: FB-01=3	Independent hall call;	The corresponding door opens upon arrival for halls call and car calls from this	≤4 (standard) ≤8 (after

Mode	Description	Function	Supported floor
	Independent car call.	Door.	extension)


Caution

- ✧ In the fire emergency, inspection, or re-leveling state, the two doors will be under simultaneous control; independent control will be disabled at the time.
- ✧ In any mode, if the door operator controller does not work at a certain floor , the door does not open upon arrival of the elevator.
- ✧ In any mode, if the door operator controllers of both the front and rear doors work but "Rear door prohibit" input is active, the rear door does not open.
- ✧ In any mode, when any door close button input in the car is active, both the front door and rear door close.
- ✧ "Single/Double door selection" input is valid only in mode 3, and the elevator is in double door service state in this case. Otherwise, the elevator is in single door service state.

Chapter 6 Parameter Table

6.1 Parameter instructions

The parameters of the Smile1000 system are structured into three levels as described below.

① Parameter group corresponding to level-1 menu.

② Parameter corresponding to level-2 menu.

③ Parameter setting value corresponding to level-3 menu.

The meaning of each column in the parameter table is explained below.

Item	Meaning
Function code	It indicates the serial number of the parameter.
Name	It indicates the complete name of the parameter
Range	It indicates the range for the setting of the parameter.
Default	It indicates the default setting of the parameter at factory.
Unit	It indicates the measurement unit of the parameter.
Property	○: It indicates that the parameter can be modified during running.
	×: It indicates that the parameter can be modified only in the stop state.
	*: It indicates that the parameter is read only and can not be modified.

(The system automatically restricts the modification property of all parameters to prevent malfunction.)

6.2 Groups of parameters

On the operating panel, press PRG key firstly, and then press UP/DOWN key to show level-1 menu where groups of parameters will be displayed and classified as below.

F0	Basic parameters	F9	Time parameters
F1	Motor Parameters	FA	Parameters of keypad setting
F2	Vector control parameters	FB	Door function parameters
F3	Running control parameters	FC	Protection function parameters
F4	Floor parameters	FD	Communication parameters
F5	Terminal function parameters	FE	Elevator function setting

			parameters
F6	Basic elevator parameters	FF	Manufacturer parameters
F7	Terminal output function parameters	Fr	Leveling adjustment parameters
F8	Enhanced function parameters	FP	User parameters

6.3 Parameter table

Function code	Name	Range	Default	Unit	Property
F0: Basic parameters					
F0-00	Control mode	0: SVC 1: FVC 2: V/F	1	-	×
F0-01	Command source selection	0: Operating panel control 1: Distance control	1	-	×
F0-02	Running speed under operating panel control	0.050 to F0-04	0.050	m/s	○
F0-03	Maximum running speed	0.200 to F0-04	0.480	m/s	×
F0-04	Rated speed	0.200 to 1.750	0.500	m/s	×
F0-05	Maximum frequency	F1-04 to 99.00	50.00	Hz	×
F0-06	Carrier frequency	0.5 to 16.0	6.0	kHz	×
F1: Motor Parameters					
F1-00	Encoder type selection	0: Sin/Cos or absolute encoder 1: UVW encoder 2: AB encoder (asynchronous motor)	0	-	×
F1-01	Rated power	0.7 to 75.0	Depend on model	kW	×

Function code	Name	Range	Default	Unit	Property
F1-02	Rated voltage	0 to 600	Depend on model	V	×
F1-03	Rated current	0.00 to 655.00	Depend on model	A	×
F1-04	Rated frequency	0.00 to 99.000	Depend on model	Hz	×
F1-05	Rated speed	0 to 3000	Depend on model	rpm	×
F1-06	Synchronous motor initial angle	0.0 to 359.9	0	Degree	×
F1-07	Synchronous motor angle at power-off	0.0 to 359.9	0	Degree	×
F1-08	Synchronous motor wiring method	0 to 1	0	-	×
F1-09	ADC sampling delay	0.0 to 359.9	73.0	-	×
F1-10	Encoder verification selection	0 to 65535	0	-	×
F1-11	With-load tuning, no-load tuning, and shaft auto-tuning	0: No action 1: With-load tuning 2: No-load tuning 3: Shaft auto-tuning 1 4: Shaft auto-tuning 2	0	-	×
F1-12	Encoder resolution	0 to 10000	2048	PPR	×
F1-13	Encoder fault detection time	0 to 10.0 When set to a value less than 0.5 second, the detection function is ineffective.	1.0	s	×
F1-14	Asynchronous motor stator resistance	0.000 to 30.000	Depend on model	Ω	×

Function code	Name	Range	Default	Unit	Property
F1-15	Asynchronous motor rotor resistance	0.000 to 30.000	Depend on model	Ω	×
F1-16	Asynchronous motor leakage inductive reactance	0.00 to 300.00	Depend on model	mH	×
F1-17	Asynchronous motor mutual inductive reactance	0.1 to 3000.0	Depend on model	mH	×
F1-18	Asynchronous motor no-load current	0.00 to 300.00	Depend on model	A	×
F1-19	Q-axis inductance (torque)	0.00 to 650.00	3.00	mH	×
F1-20	D-axis inductance (excitation)	0.00 to 650.00	3.00	mH	×
F1-21	Back EMF coefficient	0 to 65535	0	-	×
F1-25	Motor type	0: Asynchronous motor 1: Synchronous motor	1	-	×
F2: Vector control parameters					
F2-00	Speed loop proportional gain 1	0 to 100	40	-	×
F2-01	Speed loop integral time 1	0.01 to 10.00	0.60	s	×
F2-02	Switchover frequency 1	0.00 to F2-05	2.00	Hz	×
F2-03	Speed loop proportional gain 2	0 to 100	35	-	×
F2-04	Speed loop integral time 2	0.01 to 10.00	0.80	s	×

Function code	Name	Range	Default	Unit	Property
F2-05	Switchover frequency 2	F2-02 to F0-05	5.00	Hz	×
F2-06	Current loop proportional gain	10 to 500%	60	%	×
F2-07	Current loop integral gain	10 to 500%	30	%	×
F2-08	Torque upper limit	0.0 to 200.0	150.0	%	×
F2-10	Elevator running direction	0: Direction unchanged 1: Direction reversed	0	-	×
F2-11	Zero-servo current coefficient	2.0 to 50.0	15	-	×
F2-12	Zero-servo speed loop Kp	0.00 to 2.00	0.5	-	×
F2-13	Zero-servo speed loop Ti	0.00 to 2.00	0.6	-	×
F2-16	Torque acceleration time	1 to 500	1	ms	×
F2-17	Torque deceleration time	1 to 500	350	ms	×
F2-18	Startup acceleration time	0.000 to 1.500	0.000	s	×
F2-19	Speed filter coefficient	0.0 to 20.00	0.1	ms	×
F2-20	Function setting	When the following bits are set to 1, their corresponding functions are enabled. bit0: Encoder CD signal disconnection detection shield bit1: Encoder Z signal disconnection detection shield bit2: Encoder AB signal disconnection detection shield	0	-	×

Function code	Name	Range	Default	Unit	Property
		bit3: Speed deviation detection shield bit4: Z electric angle correction shield bit5: Electric angle mode selection at power-on 0: Based on CD signal 1: Based on excitation Bit6: Random PWM function Bit7: Shorting stator at electric brake Bit8: STO Bit9: MT speed detection optimization Bit10: Zero-servo time limit set to 400 ms Bit11: Zero-servo mode 2 (asynchronous motor) Bit12: Speed loop mode 2 (asynchronous motor)			
F2-21	Obtained pulse width	1 to 100	8	-	*
F2-22	Amplitude ratio A/B	80.0 to 120.0	100.0	%	*
F2-23	Amplitude ratio C/D	80.0 to 120.0	100.0	%	*
F2-24	Sin/Cos A phase zero drift	5000 to 15000	9000	-	*
F2-25	Sin/Cos B phase zero drift	5000 to 15000	9000	-	*
F2-26	Sin/Cos C phase zero drift	5000 to 15000	9000	-	*
F2-27	Sin/Cos D phase zero drift	5000 to 15000	9000	-	*
F2-28	Number of pole	1 to 100	8	-	×

Function code	Name	Range	Default	Unit	Property
	pairs				
F2-29	Drive rated voltage	0 to 999	1	V	*
F2-30	Drive rated current	0.1 to 999.9		A	*
F2-31	Reserved	-	-	-	-
F2-32	Upper limit of current threshold	0 to 200	100	%	×
F2-33	Lower limit of current threshold	0 to 200	60	%	×
F2-34	IF current amplitude	0 to 200	30	%	×
F2-35	Encoder AB direction	0 to 1	0	-	×
F2-36	Encoder CD direction	0 to 1	0	-	×
F2-37	IF function selection	0 to 1	0	-	×
F2-38	IF DC positioning angle	0.0 to 360.0	0.0	Degree	×
F2-39	Braking force torque time	1 to 10	5	s	×
F2-40	Braking force torque amplitude	1 to 150	110	%	×
F3: Running control parameters					
F3-00	Startup speed	0.000 to 0.030	0.000	m/s	×
F3-01	Startup speed holding time	0.000 to 0.500	0.000	s	×
F3-02	Acceleration	0.200 to 0.800	0.300	m/s^2	×
F3-03	Acceleration jerk time 1	0.300 to 4.000	2.500	s	×
F3-04	Acceleration jerk	0.300 to 4.000	2.500	s	×

Function code	Name	Range	Default	Unit	Property
	time 2				
F3-05	Deceleration	0.200 to 0.800	0.300	m/s²	×
F3-06	Deceleration jerk time 1	0.300 to 4.000	2.500	s	×
F3-07	Deceleration jerk time 2	0.300 to 4.000	2.500	s	×
F3-08	Special deceleration rate	0.200 to 2.000	0.500	m/s²	×
F3-09	Pre-deceleration distance	0 to 90.00	0.0	mm	×
F3-10	Re-leveling speed	0.020 to 0.080	0.040	m/s	×
F3-11	Inspection speed	0.100 to 0.500	0.250	m/s	×
F3-12	Up slowdown position	0.000 to 300.00	0.00	m	×
F3-13	Down slowdown position	0.000 to 300.00	0.00	m	×
F3-14	Zero-speed current output time before curve starts	0.000 to 1.000	0.200	s	×
F3-15	Zero-speed holding time for brake release	0.000 to 2.000	0.600	s	×
F3-16	Zero-speed holding time after curve ends	0.000 to 1.000	0.300	s	×
F3-17	Low-speed re-leveling speed	0.100 to F3-11	0.100	m/s	×
F3-18	Acceleration rate during emergency rescue	0.100 to 1.300	0.300	m/s²	×

Function code	Name	Range	Default	Unit	Property
F4: Floor parameters					
F4-00	Leveling adjustment	0 to 60	30	mm	×
F4-01	Current floor	F6-01 to F6-00	1	-	×
F4-02	High byte of current car position	0 to 65535	1	Pulses	*
F4-03	Low byte of current car position	0 to 65535	34464	Pulses	*
F4-04	Leveling plate length 1	0 to 65535	0	Pulses	×
F4-05	Leveling plate length 2	0 to 65535	0	Pulses	×
F4-06	High byte of floor height 1	0 to 65535	0	Pulses	×
F4-07	Low byte of floor height 1	0 to 65535	0	Pulses	×
F4-08	High byte of floor height 2	0 to 65535	0	Pulses	×
F4-09	Low byte of floor height 2	0 to 65535	0	Pulses	×
F4-10	High byte of floor height 3	0 to 65535	0	Pulses	×
F4-11	Low byte of floor height 3	0 to 65535	0	Pulses	×
F4-12	High byte of floor height 4	0 to 65535	0	Pulses	×
F4-13	Low byte of floor height 4	0 to 65535	0	Pulses	×
F4-14	High byte of floor height 5	0 to 65535	0	Pulses	×
F4-15	Low byte of floor	0 to 65535	0	Pulses	×

Function code	Name	Range	Default	Unit	Property
	height 5				
F4-16	High byte of floor height 6	0 to 65535	0	Pulses	×
F4-17	Low byte of floor height 6	0 to 65535	0	Pulses	×
F4-18	High byte of floor height 7	0 to 65535	0	Pulses	×
F4-19	Low byte of floor height 7	0 to 65535	0	Pulses	×
F4-20	High byte of floor height 8	0 to 65535	0	Pulses	×
F4-21	Low byte of floor height 8	0 to 65535	0	Pulses	×
F4-22	High byte of floor height 9	0 to 65535	0	Pulses	×
F4-23	Low byte of floor height 9	0 to 65535	0	Pulses	×
F4-24	High byte of floor height 10	0 to 65535	0	Pulses	×
F4-25	Low byte of floor height 10	0 to 65535	0	Pulses	×
F4-26	High byte of floor height 11	0 to 65535	0	Pulses	×
F4-27	Low byte of floor height 11	0 to 65535	0	Pulses	×
F4-28	High byte of floor height 12	0 to 65535	0	Pulses	×
F4-29	Low byte of floor height 12	0 to 65535	0	Pulses	×
F4-30	High byte of floor height 13	0 to 65535	0	Pulses	×

Function code	Name	Range	Default	Unit	Property
F4-31	Low byte of floor height 13	0 to 65535	0	Pulses	×
F4-32	High byte of floor height 14	0 to 65535	0	Pulses	×
F4-33	Low byte of floor height 14	0 to 65535	0	Pulses	×
F4-34	High byte of floor height 15	0 to 65535	0	Pulses	×
F4-35	Low byte of floor height 15	0 to 65535	0	Pulses	×
F5: Terminal input function parameters					
F5-00	Attendant/Automatic switchover time	3 to 200	3	-	×
F5-01	X1 function selection	1 to 99 (NO), 101 to 199 (NC) 00: Inactive 01: Signal of leveling 1 02: Signal of leveling 2 03: Door zone signal 04: RUN output feedback signal 05: Brake output feedback signal 06: Brake travel switch feedback signal 1 07: Shorting motor stator feedback signal 08: Shorting door lock circuit output feedback signal 09: Inspection signal 10: Inspection up running signal 11: Inspection down running signal 12: First fire emergency signal 13: Reserved	03	-	×
F5-02	X2 function selection		104	-	×
F5-03	X3 function selection		105	-	×
F5-04	X4 function selection		109	-	×
F5-05	X5 function selection		10	-	×
F5-06	X6 function selection		11	-	×
F5-07	X7 function selection		12	-	×
F5-08	X8 function selection		14	-	×
F5-09	X9 function selection		115	-	×

Function code	Name	Range	Default	Unit	Property
F5-10	X10 function selection	14: Elevator lockout signal 15: Upper limit signal 16: Lower limit signal 17: Up slowdown signal 18: Down slowdown signal 19: Overload signal 20: Full-load signal 21: Emergency stop (safety circuit feedback) signal 22: Door 1 open limit signal 23: Door 2 open limit signal 24: Door 1 close limit signal 25: Door 2 close limit signal 26: Door 1 light curtain signal 27: Door 2 light curtain signal 28: Attendant signal 29: Direct travel ride signal 30: Direction switchover signal 31: Independent running signal 32: Door 2 selection signal 33: UPS input valid 34: Door open button 35: Door close button 36: Safety circuit 37: Door lock circuit 1 38: Door lock circuit 2 39: Half-load signal 40: Motor overheat 41: Door 1 safety edge 42: Door 2 safety edge 43: Earthquake signal 44: Rear door prohibit	116	-	×
F5-11	X11 function selection		117	-	×
F5-12	X12 function selection		118	-	×
F5-13	X13 function selection		119	-	×
F5-14	X14 function selection		22	-	×
F5-15	X15 function selection		126	-	×
F5-16	X16 function selection		28	-	×
F5-17	X17 function selection		30	-	×
F5-18	X18 function selection		124	-	×
F5-19	X19 function selection		00	-	×
F5-20	X20 function selection		00	-	×
F5-21	X21 function selection		00	-	×
F5-22	X22 function selection		00	-	×
F5-23	X23 function selection		00	-	×
F5-24	X24 function selection		00	-	×

Function code	Name	Range	Default	Unit	Property
		45: Light load 46: Single/Double door selection 47: Fire emergency floor switchover 48: Dummy floor input 49: Fire fighter input 50: Brake travel switch feedback signal 2 51 to 99: Reserved			
F5-25	X25 function selection	1 to 16 00: Not in use 01: Safety circuit signal 02: Door lock circuit 1 signal 03: Door lock circuit 2 signal 04 to 16: Reserved	01	-	×
F5-26	X26 function selection		02	-	×
F5-27	X27 function selection		03	-	×
F5-28	I/O terminal status display 1	-	-	-	*
F5-29	I/O terminal status display 2	-	-	-	*
F5-30	Floor I/O terminal status display 1	-	-	-	*
F5-31	Floor I/O terminal status display 2	-	-	-	*
F6: Basic elevator parameters					
F6-00	Top floor	F6-01 to 16	5	-	×
F6-01	Bottom floor	1 to F6-00	1	-	×
F6-02	Parking floor for idle elevator	F6-01 to F6-00	1	-	×
F6-03	Fire emergency floor 1	F6-01 to F6-00	1	-	×
F6-04	Parking floor for elevator lockout	F6-01 to F6-00	1	-	×

Function code	Name	Range	Default	Unit	Property
F6-05	Service floor	1: Responded 0: Not responded	65535	-	×
F6-06	Program control selection 1	Bit1: Returning to parking floor due to excessive car position deviation Bit3: Buzzer silence during re-leveling Bit5: Disabling the door lock fault auto-reset function Bit6: Advance cancellation of floor number display and advance display of direction switchover Bit8: Hall call non-directional input Bit9: Disabling the function of analog disconnection detection Bit10: Additional door lock disengagement when switching from inspection to normal state	0	-	×
F6-07	Program control selection 2	Bit2: Blinking arrow during running Bit3: Elevator lockout available in the attendant state Bit6: No fault display on keypad Bit9: Torque holding at abnormal brake feedback Bit10: Disabling Err30 detection during re-leveling Bit12: Automatic fault reset Bit13: Non-standard ultra-short floor Bit14: No reset of floor display via up slowdown signal when ultra-short floor is enabled Bit15: No reset of floor display via down slowdown signal when ultra-short floor is enabled	0	-	×
F6-08	Arrow blinking	0 to 5.0	1.0	-	×

Function code	Name	Range	Default	Unit	Property
	cycle				
F6-09	Number of random tests	0 to 60000	0	-	×
F6-10	Test selection of enable state	Bit0: Hall call prohibited Bit1: Door open prohibited Bit2: Overload allowed Bit3: Limit switch invalid	0	-	×
F6-11	L1 function selection	00: Not in use Codes from 200 to 299 are door 1 control parameters. 201 to 203 (door 1 open/close) 211 to 226 (door 1 car call) 231 to 245 (door 1 up hall call) 252 to 266 (door 1 down hall call) 201: Door 1 open button 202: Door 1 close button 203: Door 1 open delay button 204: Door 2 selection button input 205 to 210: Reserved 211: Floor 1 door 1 car call 212: Floor 2 door 1 car call 213: Floor 3 door 1 car call 214: Floor 4 door 1 car call 215: Floor 5 door 1 car call 216: Floor 6 door 1 car call 217: Floor 7 door 1 car call 218: Floor 8 door 1 car call 219: Floor 9 door 1 car call 220: Floor 10 door 1 car call 221: Floor 11 door 1 car call 222: Floor 12 door 1 car call	201	-	×
F6-12	L2 function selection		202	-	×
F6-13	L3 function selection		203	-	×
F6-14	L4 function selection		00	-	×
F6-15	L5 function selection		211	-	×
F6-16	L6 function selection		212	-	×
F6-17	L7 function selection		213	-	×
F6-18	L8 function selection		214	-	×
F6-19	L9 function selection		215	-	×
F6-20	L10 function selection		00	-	×
F6-21	L11 function selection		00	-	×
F6-22	L12 function selection		00	-	×

Function code	Name	Range	Default	Unit	Property
F6-23	L13 function selection	223: Floor 13 door 1 car call 224: Floor 14 door 1 car call	231	-	×
F6-24	L14 function selection	225: Floor 15 door 1 car call 226: Floor 16 door 1 car call	232	-	×
F6-25	L15 function selection	227 to 230: Reserved 231: Floor 1 door 1 up call	233	-	×
F6-26	L16 function selection	232: Floor 2 door 1 up call 233: Floor 3 door 1 up call	234	-	×
F6-27	L17 function selection	234: Floor 4 door 1 up call 235: Floor 5 door 1 up call	252	-	×
F6-28	L18 function selection	236: Floor 6 door 1 up call 237: Floor 7 door 1 up call	253	-	×
F6-29	L19 function selection	238: Floor 8 door 1 up call 239: Floor 9 door 1 up call	254	-	×
F6-30	L20 function selection	240: Floor 10 door 1 up call 241: Floor 11 door 1 up call	255	-	×
F6-31	L21 function selection	242: Floor 12 door 1 up call 243: Floor 13 door 1 up call	00	-	×
F6-32	L22 function selection	244: Floor 14 door 1 up call 245: Floor 15 door 1 up call	00	-	×
F6-33	L23 function selection	246 to 251: Reserved 252: Floor 2 door 1 down call	00	-	×
F6-34	L24 function selection	253: Floor 3 door 1 down call 254: Floor 4 door 1 down call	00	-	×
F6-35	L25 function selection	255: Floor 5 door 1 down call 256: Floor 6 door 1 down call	00	-	×
F6-36	L26 function selection	257: Floor 7 door 1 down call 258: Floor 8 door 1 down call	00	-	×
F6-37	L27 function selection	259: Floor 9 door 1 down call 260: Floor 10 door 1 down call	00	-	×
F6-38	L28 function selection	261: Floor 11 door 1 down call 262: Floor 12 door 1 down call	00	-	×

Function code	Name	Range	Default	Unit	Property
F6-39	L29 function selection	263: Floor 13 door 1 down call 264: Floor 14 door 1 down call 265: Floor 15 door 1 down call 266: Floor 16 door 1 down call 267 to 299: Reserved 301 to 399: (door 2 control parameter) 301 to 303: (door 2 open/close) 304: Door 2 selection button indicator output 305 to 310: Reserved 311 to 326: (door 2 car call) 327 to 330: Reserved 331 to 345: (door 2 up hall call) 346 to 351: Reserved 352 to 369: (door 2 down hall call) 370 to 399: Reserved The setting rules are the same with that of door 1, and that is : 301: Door 2 open button 302: Door 2 close button……(The following codes follow the same pattern.)	00	-	×
F6-40	L30 function selection		00	-	×
F6-41	L31 function selection		00	-	×
F6-42	L32 function selection		00	-	×
F6-43	L33 function selection		00	-	×
F6-44	L34 function selection		00	-	×
F6-45	L35 function selection		00	-	×
F6-46	L36 function selection		00	-	×
F6-47	L37 function selection		00	-	×
F6-48	L38 function selection		00	-	×
F6-49	L39 function selection		00	-	×
F6-50	L40 function selection		00	-	×
F6-51	L41 function selection		00	-	×
F6-52	L42 function selection		00	-	×
F6-53	L43 function selection		00	-	×
F6-54	L44 function selection		00	-	×

Function code	Name	Range	Default	Unit	Property
F6-55	L45 function selection		00	-	×
F6-56	L46 function selection		00	-	×
F6-57	L47 function selection		00	-	×
F6-58	L48 function selection		00	-	×
F6-59	L49 function selection		00	-	×
F6-60	L50 function selection		00	-	×
F6-61	Leveling sensor delay	10 to 50	14	ms	×
F6-62	Random running interval	0 to 1000	3	-	○
F6-63	Reserved	-	-	-	-
F6-64	Program function selection 1	Bit1: Software limit function Bit4: Opening one door during manual door control of double-sided elevator Bit5: Immediate call cancellation upon elevator lockout Bit9: Disabling the function of car call cancellation upon direction switchover Bit11: Car call priority response	0	-	×
F6-65	Program function selection 2	Bit2: Car stop by slowdown inspection Bit4: Buzzer alarm after door open delay Bit8: Door open during elevator lockout	0	-	×

Function code	Name	Range	Default	Unit	Property
		Bit9: Hall call display during lockout Bit11: Flashing alarm upon arrival			
F6-66	Program function selection 3	Bit1: Cancellation delay of door open/close command upon door open/close limit Bit2: No door lock state judgement before door close limit confirmation Bit3: Door close output during running Bit4: Terminal floor verification after first power-on	0	-	×
F6-67	Attendant function selection	Bit0: Call cancellation upon first-time entry into the attendant state Bit1: No automatic response to hall calls Bit2: Attendant/Automatic state switchover Bit3: Door close at jogging Bit4: Automatic door close Bit5: Intermittent buzzer alarm in the attendant state Bit6: Continuous buzzer alarm in the attendant state Bit7: Function selection of car call button flashing alarm	128	-	×
F6-68	Fire emergency function selection	Bit3: Arrival gong output in the inspection or fire emergency state Bit4: Multi-car-call input in the fire fighter state Bit5: Operation status retentive at power outage in the fire emergency state	16456	-	×

Function code	Name	Range	Default	Unit	Property
		Bit6: Door close by holding door close button Bit9: HOP floor display in the fire emergency state Bit11: Fire emergency state exit upon fire emergency floor arrival Bit12: No cancellation of car call during reverse door open Bit14: Door open by holding door open button Bit15: Automatic door open upon fire emergency floor arrival			
F6-69	Rescue function selection	Bit0\Bit1: Direction determination method Bit2: Car stop at rescue parking floor Bit4: Startup compensation Bit8: Emergency running time protection Bit10: Buzzer alarm Bit12: Switching from shorting stator braking mode to the drive mode Bit13: Type of switching from shorting stator braking mode to the drive mode Bit14: Method of exiting from rescue Bit15: Function selection of shorting stator braking	0	-	×
F6-71	Reserved	-	-	-	-
F6-72	Emergency switchover speed	0.010 to 0.630	0.010	m/s	×
F6-73	Rescue parking floor	0 to F6-00	0	-	×

Function code	Name	Range	Default	Unit	Property
F6-74	Advance time for flashing alarm	0.0 to 15.0	1	-	×
F6-75	Waiting time for switching from shorting stator braking mode to the drive mode	0 to 45.0	20	-	×
F7: Terminal output function parameters					
F7-00	Y0 function selection	(Y0 is the dedicated output point for emergency running at power failure.) Range: (00 to 05) or 32 00: Not in use 01: RUN contactor output 02: Brake contactor output 03: Higher-voltage startup of brake 04: Fan/Lighting output 05: Shorting synchronous motor stator output	00	-	×
F7-01	Y1 function selection		01	-	×
F7-02	Y2 function selection		02	-	×
F7-03	Y3 function selection		04	-	×
F7-04	Y4 function selection	Range: 06 to 99 00: Not in use 06: Door 1 open output 07: Door 1 close output 08: Door 2 open output 09: Door 2 close output 10: Low 7-segment a display output 11: Low 7-segment b display output 12: Low 7-segment c display output 13: Low 7-segment d display output 14: Low 7-segment e display output 15: Low 7-segment f display output 16: Low 7-segment g display output 17: Up arrow display output	00	-	×
F7-05	Y5 function selection		00	-	×
F7-06	Y6 function selection		06	-	×
F7-07	Y7 function selection		07	-	×
F7-08	Y8 function selection		08	-	×
F7-09	Y9 function selection		09	-	×
F7-10	Y10 function selection		10	-	×

Function code	Name	Range	Default	Unit	Property
F7-11	Y11 function selection	18: Down arrow display output 19: Negative sign display output 20: Returning to base floor at fire emergency 21: Buzzer control output 22: Overload output 23: Arrival gong output 24: Full-load output 25: Inspection output 26: Fan/Lighting output2 27: Shorting door lock circuit contactor output 28: BCD, Gray code, or 7-segment high-bit output 29: Controller normal running output 30: Electric lock output 31: Reserved 32: Emergency rescue at power failure 33: Force door close 1 34: Force door close 2 35: Fault state 36: Elevator up running signal 37: Medical sterilization output 38: Non-door-zone stop output 39: Non-service state output 40: Reserved 41: High 7-segment a display output 42: High 7-segment b display output 43: High 7-segment c display output 44: High 7-segment d display	11	-	×
F7-12	Y12 function selection		12	-	×
F7-13	Y13 function selection		13	-	×
F7-14	Y14 function selection		00	-	×
F7-15	Y15 function selection		00	-	×
F7-16	Y16 function selection		25	-	×
F7-17	Y17 function selection		17	-	×
F7-18	Y18 function selection		18	-	×
F7-19	Y19 function selection		19	-	×
F7-20	Y20 function selection		20	-	×
F7-21	Y21 function selection		21	-	×
F7-22	Y22 function selection		22	-	×
F7-23	Y23 function selection		00	-	×
F7-24	Y24 function selection		00	-	×
F7-25	Y25 function selection		00	-	×
F7-26	Y26 function selection		00	-	×

Function code	Name	Range	Default	Unit	Property
F7-27	Y27 function selection	output 45: High 7-segment e display output 46: High 7-segment f display output 47: High 7-segment g display output 48 to 99: Reserved	00	-	×
F8: Enhanced function parameters					
F8-00	Car load ratio during load cell auto-tuning	0 to 100%	0	%	×
F8-01	Pre-torque selection	0: Pre-torque compensation is invalid. 1: Pre-torque compensation is valid. 2: Automatic pre-torque calculation	0	-	×
F8-02	Pre-torque offset	0.0% to 100.0%	50.0	%	×
F8-03	Drive gain	0.00 to 2.000	0.60	-	×
F8-04	Brake gain	0.00 to 2.00	0.60	-	×
F8-05	Current car load	0 to 255	0	-	*
F8-06	Condition of car no-load	0 to 255	0	-	×
F8-07	Condition of car full-load	0 to 255	100	-	×
F8-08	Load cell input selection	0: MCB digital sampling 1: MCB analog sampling	0	-	×
F8-09	Emergency rescue speed at power failure	0.000 to F3-11	0.05	m/s	×
F8-10	Selection of emergency rescue at power failure	0: Invalid 1: UPS power supply 2: 48 V battery power supply	0	-	×

Function code	Name	Range	Default	Unit	Property
F8-11	zero-speed torque holding time for brake engagement	0.200 to 1.500	0.200	s	×
F8-12	Fire emergency floor 2	0 to F6-00	0	-	×
F8-13	Anti-nuisance function selection	Bit0: Reserved Bit1: Light curtain judgement Bit2: Light-load judgement	0	-	×
F9: Time parameters					
F9-00	Maximum idle time before returning to parking floor	1 to 240 0: Function invalid	10	min	○
F9-01	Fan/Lighting turn-off time	1 to 240 0: This function is invalid, and the fan keeps working.	2	min	○
F9-02	Motor running time limit	0 to 45 When set to a value less than 3 seconds, this function is disabled.	45	s	×
F9-03	Accumulative running time	0 to 65535 hours	0	h	*
F9-04	Reserved	-	-	-	-
F9-05	High byte of running times	0 to 9999 **Note:** Value 1 indicates 10000 times in actual running.	0	-	*
F9-06	Low byte of running times	0 to 9999	0	-	*
FA: Parameters of keypad setting					
FA-00	Reserved	-	-	-	-
FA-01	Parameter display in the running state	1 to 65535	65535	-	○

Function code	Name	Range	Default	Unit	Property
FA-02	Parameter display in the stop state	1 to 65535	65535	-	○
FA-03	Current encoder angle	0.0 to 360.0	0.0	Degree	*
FA-04	Reserved	-	-	-	-
FA-05	Software version (ARM)	0 to 65535	0	-	*
FA-06	Software version (DSP)	0 to 65535	0	-	*
FA-07	Heatsink temperature	0 to 100℃	0	℃	*
FA-08	Integrated controller model	0 to 65535	1000	-	-
FA-09	Reserved	0 to 65535	0	-	-
FA-10	Reserved	0 to 65535	0	-	-
FA-11	Pre-torque current	0.0 to 200.0	0	%	-
FA-12	Logic information	0 to 65535	0	-	-
FA-13	Curve information	0 to 65535	0	-	-
FA-14	Speed reference	0.000 to 4.000	0	m/s	*
FA-15	Feedback speed	0.000 to 4.000	0	m/s	*
FA-16	Bus voltage	0 to 999.9	0	V	*
FA-17	Present position	0.0 to 300.00	0	m	*
FA-18	Output current	0.0 to 999.9	0	A	*
FA-19	Output frequency	0.00 to 99.99	0	Hz	*
FA-20	Torque current	0.0 to 999.9	0	A	*
FA-21	Output voltage	0 to 999.9	0	V	*
FA-22	Output torque	0 to 200.0	0	%	*
FA-23	Output power	0.00 to 99.99	0	kW	*

Function code	Name	Range	Default	Unit	Property
FA-24	Communication interference	0 to 65535	0	-	*
FA-25	Encoder interference	0 to 65535	0	-	*
FA-26	Input status 1	0 to 65535	0	-	*
FA-27	Input status 2	0 to 65535	0	-	*
FA-28	Input status 3	0 to 65535	0	-	*
FA-29	Input status 4	0 to 65535	0	-	*
FA-30	Input status 5	0 to 65535	0	-	*
FA-31	Output status 1	0 to 65535	0	-	*
FA-32	Output status 2	0 to 65535	0	-	*
FA-33	Output status 3	0 to 65535	0	-	*
FA-34	Floor I/O status 1	0 to 65535	0	-	*
FA-35	Floor I/O status 2	0 to 65535	0	-	*
FA-36	Floor I/O status 3	0 to 65535	0	-	*
FA-37	Floor I/O status 4	0 to 65535	0	-	*
FA-38	Floor I/O status 5	0 to 65535	0	-	*
FA-39	Floor I/O status 6	0 to 65535	0	-	*
FA-40	Floor I/O status 7	0 to 65535	0	-	*
FA-41	System state	0 to 65535	0	-	*
FB: Door function parameters					
FB-00	Number of door operators	1 to 2	1	-	×
FB-01	Double-sided door selection	0 to 3	0	-	×
FB-02	Service floor of door operator 1	0 to 65535 1: Normal door open 0: Door open disabled	65535	-	○

Function code	Name	Range	Default	Unit	Property
FB-03	Holding time of manual door open	1 to 60	10	s	○
FB-04	Service floor of door operator 2	0 to 65535 1: Normal door open 0: Door open disabled Valid only when there are two door operators.	65535	-	○
FB-05	Stop delay at re-leveling	0.00 to 2.00	0	s	×
FB-06	Door open protection time	5 to 99	10	s	○
FB-07	Program control selection	0 to 65535 Bit0 to Bit4: Reserved Bit5: Synchronous motor current detection Bit6 to Bit12: Reserved Bit13: Higher/Lower voltage 1.5-second detection	0	-	○
FB-08	Door close protection time	5 to 99	15	s	○
FB-09	Door open/close protection times	0 to 20 0: Invalid	0	-	○
FB-10	Door status of standby elevator	0: Normal door close at base floor 1: Waiting with door open at base floor 2: Waiting with door open at each floor	0	-	○
FB-11	Door open holding time for hall call	1 to 1000	5	s	○
FB-12	Door open holding time for car call	1 to 1000	3	s	○
FB-13	Door open holding	10 to 1000	30	s	○

Function code	Name	Range	Default	Unit	Property
	time upon valid open delay				
FB-14	Door open holding time at base floor	1 to 1000	10	s	○
FB-15	Arrival gong output delay	0 to 1000	0	ms	○
FB-16	Door lock waiting time upon manual door	0 to 50	0	s	○
FB-17	Holding time for forced door close	5 to 180	120	s	○
FC: Protection function parameters					
FC-00	Short-circuit to ground detection at power-on	0 to 65535; Bit0: Short-circuit to ground detection at power-on Bit1: Cancellation of current detection at inspection startup Bit2: Decelerating to stop at valid light curtain Bit3: Password ineffective after 30 minutes of no operation Bit4 to Bit9: Reserved	0	-	×
FC-01	Overload protection selection	0 to 65535; Bit0: Overload protection 0: Disabled. 1: Enabled Bit1: Cancellation of output phase loss protection Bit2: Over-modulation 0: Over-modulation enabled 1: Over-modulation disabled Bit3: Reserved Bit4: Light curtain judgment at door	1	-	×

Function code	Name	Range	Default	Unit	Property
		close limit 0: No door re-open 1: Door re-open Bit5: Cancellation of SPI communication judgement Bit7: Reserved; Bit8: Reserved Bit9: Cancellation of Err55 alarm (landing floor change) Bit10 to Bit13: Reserved Bit14: Cancellation of input phase loss protection			
FC-02	Overload protection coefficient	0.50 to 10.00	1.00	-	×
FC-03	Overload pre-alarm coefficient	50 to 100%	80%	%	×
FC-04	The 1st fault information	0 to 9999 The high two digits indicate the number of the floor, and the low two digits indicate the fault code. For example, if Err30 occurs at floor 1, it will display 0130. 0: No fault 1: Reserved 2: Over-current during acceleration 3: Over-current during deceleration 4: Over-current at constant speed 5: Over-voltage during acceleration 6: Over-voltage during deceleration 7: Over-voltage at constant speed 8: Reserved 9: Undervoltage 10: Controller overload	0	-	*

Function code	Name	Range	Default	Unit	Property
		11: Motor overload 12: Power supply phase loss 13: Power output phase loss 14: Module overheat 15: Output abnormal 16: Current control fault 17: Encoder interference during motor auto-tuning 18: Current detection fault 19: Motor auto-tuning fault 20: Speed feedback incorrect 21: Reserved 22: Leveling signal abnormal 23: Reserved 24: Reserved 25: Storage data abnormal 26: Earthquake signal 27 to 28: Reserved 29: Shorting synchronous motor stator feedback abnormal 30: Elevator position abnormal 33: Elevator speed abnormal 34: Logic fault 35: Shaft auto-tuning data abnormal 36: RUN contactor feedback abnormal 37: Brake contactor feedback abnormal 38: Encoder signal abnormal 39: Motor overheat 40: Elevator running reached 41: Safety circuit disconnected			

Function code	Name	Range	Default	Unit	Property
		42: Door lock disconnected during running 43: Up limit signal abnormal 44: Down limit signal abnormal 45: Slowdown switch position abnormal 46: Re-leveling abnormal 47: Shorting door lock circuit contactor abnormal 48: Door open fault 49: Door close fault 50: Consecutive loss of leveling signal 53: Door lock fault 54: Overcurrent at inspection startup 55: Stop at another landing floor 57: SPI communication abnormal 58: Shaft position switches abnormal 62: Analog input cable broken			
FC-05	Designated fault code	0 to 9999	0	-	*
FC-06	Designated fault subcode	0 to 65535	0	-	*
FC-07	Logic information of designated fault	0 to 65535	0	-	*
FC-08	Curve information of designated fault	0 to 65535	0	-	*
FC-09	Speed reference at designated fault	0.000 to 1.750	0	m/s	*
FC-10	Speed feedback at designated fault	0.000 to 1.750	0	m/s	*

Function code	Name	Range	Default	Unit	Property
FC-11	Bus voltage at designated fault	0 to 999.9	0	V	*
FC-12	Present position at designated fault	0.0 to 300.0	0	m	*
FC-13	Output current at designated fault	0.0 to 999.9	0	A	*
FC-14	Output frequency at designated fault	0.00 to 99.99	0	Hz	*
FC-15	Torque current at designated fault	0.0 to 999.9	0	A	*
FC-16	1st fault code	0 to 9999	0	-	*
FC-17	1st fault subcode	0 to 65535	0	-	*
FC-18	2nd fault code	0 to 9999	0	-	*
FC-19	2nd fault subcode	0 to 65535	0	-	*
FC-20	3rd fault code	0 to 9999	0	-	*
FC-21	3rd fault subcode	0 to 65535	0	-	*
FC-22	4th fault code	0 to 9999	0	-	*
FC-23	4th fault subcode	0 to 65535	0	-	*
FC-24	5th fault code	0 to 9999	0	-	*
FC-25	5th fault subcode	0 to 65535	0	-	*
FC-26	6th fault code	0 to 9999	0	-	*
FC-27	6th fault subcode	0 to 65535	0	-	*
FC-28	7th fault code	0 to 9999	0	-	*
FC-29	7th fault subcode	0 to 65535	0	-	*
FC-30	8th fault code	0 to 9999	0	-	*
FC-31	8th fault subcode	0 to 65535	0	-	*
FC-32	9th fault code	0 to 9999	0	-	*
FC-33	9th fault subcode	0 to 65535	0	-	*

Function code	Name	Range	Default	Unit	Property
FC-34	10th fault code	0 to 9999	0	-	*
FC-35	10th fault subcode	0 to 65535	0	-	*
FC-36	Latest fault code	0 to 9999	0	-	*
FC-37	Latest fault subcode	0 to 65535	0	-	*
FC-38	Logic information of the latest fault	0 to 65535	0	-	*
FC-39	Curve information of the latest fault	0 to 65535	0	-	*
FC-40	Speed reference at the latest fault	0.000 to 1.750	0	m/s	*
FC-41	Speed feedback at the latest fault	0.000 to 1.750	0	m/s	*
FC-42	Bus voltage at the latest fault	0 to 999.9	0	V	*
FC-43	Present position at the latest fault	0.0 to 300.0	0	m	*
FC-44	Output current at the latest fault	0.0 to 999.9	0	A	*
FC-45	Output frequency at the latest fault	0.00 to 99.99	0	Hz	*
FC-46	Torque current at the latest fault	0.0 to 999.9	0	A	*
FD: Communication parameters					
FD-00	Local address	0 to 127	1	-	×
FD-01	Communication response delay	0 to 20	10	ms	×
FD-02	Communication timeout	0 to 60.0	0	s	×
FD-03	Number of elevators in parallel	0 to 2	1	-	×

Function code	Name	Range	Default	Unit	Property
	control				
FD-04	Elevator number in parallel control	1 to 2	1	-	×
FD-05	Parallel control function selection	Bit0: Dispersed waiting	0	-	×
FD-06	Fan operation mode	0: Start working upon power on 1: Start working after it is enabled; stop working when the system stops operation 2: Intelligent running	1	-	×
FD-07	Monitoring channel 1	0 to 65535	0	-	○
FD-08	Monitoring channel 2	0 to 65535	0	-	○
FD-09	Monitoring channel 3	0 to 65535	0	-	○
FD-10	Monitoring channel 4	0 to 65535	0	-	○
FD-11	Dead-zone compensation	0 to 200	100	%	×
FD-12	UV gain difference	85.0 to 115.0	100	%	×
FD-13	TD2 temperature	0 to 999	Actual value	℃	*
FD-14	Reserved	-	-	-	-
FD-15	Reserved	-	-	-	-
FE: Elevator function setting parameters					
FE-00	Collective selective mode	0: Full collective selective 1: Down collective selective 2: Up collective selective	0	-	×
FE-01	Floor 1 display	0000 to 1999	1901	-	○

Function code	Name	Range	Default	Unit	Property
FE-02	Floor 2 display	The high two digits indicate the code on the tens place of the floor number, and the low two digits indicate the code on the ones place of the floor number. These two codes are listed below. 00: Display "0" 01: Display "1" 02: Display "2" 03: Display "3" 04: Display "4" 05: Display "5" 06: Display "6" 07: Display "7" 08: Display "8" 09: Display "9" 10: Display "A" 11: Reserved 12: Reserved 13: Display "H" 14: Display "L" 15: Reserved 16: Display "P" 17: Reserved 18: Display "-" 19: No display 23: Display "C" 24: Display "d" 25: Display "E" 26: Display "F" 28: Display "J" 31: Display "o" 35: Display "U"	1902	-	○
FE-03	Floor 3 display		1903	-	○
FE-04	Floor 4 display		1904	-	○
FE-05	Floor 5 display		1905	-	○
FE-06	Floor 6 display		1906	-	○
FE-07	Floor 7 display		1907	-	○
FE-08	Floor 8 display		1908	-	○
FE-09	Floor 9 display		1909	-	○
FE-10	Floor 10 display		0100	-	○
FE-11	Floor 11 display		0101	-	○

Function code	Name	Range	Default	Unit	Property
		Larger than 35: No display			
FE-12	Hall call output selection	0: 7-segment code 1: BCD code 2: Gray code 3: Binary code 4: One-to-one output	1	-	○
FE-13	Elevator function setting selection	0 to 65535 When set to 1, the corresponding function is enabled. Bit0: Reserved;Bit1: Reserved Bit2: Re-leveling function Bit3: Advance door open function Bit4: Reserved Bit5: Forced door close Bit6: Door open in non-door zone in the inspection state Bit7: Door open/close for one time after the switchover from inspection to normal Bit8: Reserved Bit9: Independent running Bit10: Reserved Bit11: Door re-open after car call of the present floor Bit12 to Bit15: Reserved	0	-	○
FE-14	Elevator function setting selection 2	0 to 65535 When set to 1, the corresponding function is enabled. Bit0: Reserved Bit1: Door open holding at open limit Bit2: No door close command output upon door close limit Bit3: Manual door function selection	0	-	○

<table>
<tr><th>Function code</th><th>Name</th><th>Range</th><th>Default</th><th>Unit</th><th>Property</th></tr>
<tr><td></td><td></td><td>Bit4: Auto reset for RUN and brake contactor stuck
Bit5: Slowdown switch stuck detection
Bit6 to Bit9: Reserved
Bit10: NC output of shorting motor stator contactor
Bit11: Reserved
Bit12: NC output of fan/lighting
Bit13 to Bit15: Reserved</td><td></td><td></td><td></td></tr>
<tr><td>FE-15</td><td>Floor 12 display</td><td rowspan="5">The floor display setting method is the same with that of FE-01 to FE-11.</td><td>0102</td><td>-</td><td>○</td></tr>
<tr><td>FE-16</td><td>Floor 13 display</td><td>0103</td><td>-</td><td>○</td></tr>
<tr><td>FE-17</td><td>Floor 14 display</td><td>0104</td><td>-</td><td>○</td></tr>
<tr><td>FE-18</td><td>Floor 15 display</td><td>0105</td><td>-</td><td>○</td></tr>
<tr><td>FE-19</td><td>Floor 16 display</td><td>0106</td><td>-</td><td>○</td></tr>
<tr><td colspan="6">FF: Manufacturer parameters</td></tr>
<tr><td>FF-00</td><td>User password</td><td>0 to 65535
0: No password</td><td>0</td><td>-</td><td>○</td></tr>
<tr><td>FF-01</td><td>Type of the AC drive</td><td>Each of the following value represents a combination of rated current and matching power of the single-phase 220 V drive.
<table>
<tr><th>Value</th><th>Rated current</th><th>Matching power</th></tr>
<tr><td>0</td><td>5.5 A</td><td>1.1 kW</td></tr>
<tr><td>1</td><td>7.7 A</td><td>1.5 kW</td></tr>
<tr><td>2</td><td>10 A</td><td>2.2 kW</td></tr>
<tr><td>3</td><td>18 A</td><td>3.7 kW</td></tr>
<tr><td>4</td><td>23 A</td><td>5.5 kW</td></tr>
</table></td><td>0</td><td>-</td><td>×</td></tr>
</table>

<table>
<tr><th>Function code</th><th>Name</th><th>Range</th><th>Default</th><th>Unit</th><th>Property</th></tr>
<tr><td></td><td></td><td>Each of the following value represents a combination of rated current and matching power of the three-phase 380 V drive.
<table>
<tr><th>Value</th><th>Rated current</th><th>Matching power</th></tr>
<tr><td>10</td><td>5.1 A</td><td>2.2 kW</td></tr>
<tr><td>11</td><td>9.0 A</td><td>3.7 kW</td></tr>
<tr><td>12</td><td>13.0 A</td><td>5.5 kW</td></tr>
<tr><td>13</td><td>18.0 A</td><td>7.5 kW</td></tr>
<tr><td>14</td><td>27.0 A</td><td>11.0 kW</td></tr>
<tr><td>15</td><td>33.0 A</td><td>15.0 kW</td></tr>
<tr><td>16</td><td>39.0 A</td><td>18.5 kW</td></tr>
<tr><td>17</td><td>48.0 A</td><td>22.0 kW</td></tr>
<tr><td>18</td><td>60.0 A</td><td>30.0 kW</td></tr>
<tr><td>19</td><td>75.0 A</td><td>37.0 kW</td></tr>
<tr><td>20</td><td>91.0 A</td><td>45.0 kW</td></tr>
<tr><td>21</td><td>112.0 A</td><td>55.0 kW</td></tr>
</table></td><td></td><td></td><td></td></tr>
<tr><td>FF-02 to FF-05</td><td>Reserved</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>FF-06</td><td>Software under-voltage point</td><td>60.0 to 140.0</td><td>100.0</td><td>1</td><td>%</td></tr>
<tr><td>FF-07</td><td>Reserved</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>FF-08</td><td>Voltage correction coefficient</td><td>50.0 to 150.0</td><td>100.0</td><td>0.1</td><td>%</td></tr>
<tr><td>FF-09</td><td>Current correction coefficient</td><td>50.0 to 150.0</td><td>100.0</td><td>0.1</td><td>-</td></tr>
<tr><td>FF-10</td><td>Module type</td><td>0 to 5</td><td>0</td><td>-</td><td>-</td></tr>
</table>

Function code	Name	Range	Default	Unit	Property
FF-11	Reserved	-	-	-	-
Fr: Leveling adjustment parameters					
Fr-00	Leveling adjustment mode	0 to 1	0	-	×
Fr-01	Leveling adjustment record 1	0 to 60060	30030	-	×
Fr-02	Leveling adjustment record 2	0 to 60060	30030	-	×
Fr-03	Leveling adjustment record 3	0 to 60060	30030	-	×
Fr-04	Leveling adjustment record 4	0 to 60060	30030	-	×
Fr-05	Leveling adjustment record 5	0 to 60060	30030	-	×
Fr-06	Leveling adjustment record 6	0 to 60060	30030	-	×
Fr-07	Leveling adjustment record 7	0 to 60060	30030	-	×
Fr-08	Leveling adjustment record 8	0 to 60060	30030	-	×
FP: User parameters					
FP-00	User password	0 to 65535 0: No password	0	-	○
FP-01	Parameter update	0: No action	0	-	×

Function code	Name	Range	Default	Unit	Property
		1: Restore default settings 2: Clear records			
FP-02	Check of user-defined settings	0: Invalid 1: Valid	0	-	×

Chapter 7 Parameter Explanation

7.1 F0: Basic parameters

Function code	Name	Range	Default	Unit	Property
F0-00	Control mode	0: SVC 1: FVC 2: V/F	1	-	×

F0-00 sets the system control mode. It can be set to the following values.

0: SVC;

SVC for asynchronous motor low-speed running during no-load commissioning or fault judgement running during maintenance, and for synchronous motor running under special operating conditions.

1: FVC;

FVC for normal running under distance control.

2: V/F;

Open-loop V/F control, applied for situations with partial detection devices. (The voltage/frequency ratio is generally at a fixed value; the control is simple; the low-frequency torque output characteristics are not satisfactory).

Function code	Name	Range	Default	Unit	Property
F0-01	Command source selection	0: Operating panel control 1: Distance control	1	-	×

F0-01 sets the method for the system to generate the running command and the running speed command. It can be set to the following values.

0: Operating panel control;

Control via the RUN and STOP buttons on the panel; set the running speed via the parameter F0-02 (running speed controlled by panel); this method applies for trial running and motor no-load commissioning only.

1: Distance control;

This method is adopted by the system of the Smile series integrated controller. During inspection running, the elevator operates at the speed set by the parameter F3-11. In normal operation, the system automatically calculates the speed and the running curve according to the distance between the current floor and the target floor, and directly stops the car on the target floor. The speed will be limited within the rated speed range.

Function code	Name	Range	Default	Unit	Property
F0-02	Running speed under operating panel control	0.050 to F0-04	0.050	m/s	○

F0-02 sets the running speed in the operating panel control mode.

Function code	Name	Range	Default	Unit	Property
F0-03	Maximum running speed	0.200 to F0-04	0.480	m/s	×

F0-03 sets the maximum speed in actual running (the set value shall not exceed the rated elevator speed).

Function code	Name	Range	Default	Unit	Property
F0-04	Rated speed	0.200 to 1.750	0.500	m/s	×

F0-04 sets the rated speed for the elevator operation. The value of this parameter is determined by the mechanical property and the tractor machine of the elevator.

Function code	Name	Range	Default	Unit	Property
F0-05	Maximum frequency	F1-04 to 99.00	50.00	Hz	×

F0-05 sets the maximum frequency output enabled by the system, which shall exceed the rated motor frequency.

Function code	Name	Range	Default	Unit	Property
F0-06	Carrier frequency	0.5 to 16.0	6.0	kHz	×

F0-06 sets the carrier frequency of the controller.

The value of the carrier frequency is closely related to the noise level during motor running. When the value is set above 6 kHz, the motor is capable of quiet operation. Please select a low carrier frequency in the range allowed by the appropriate noise level as it minimizes the controller losses and reduces the intensity of RF interference.

When the carrier frequency is low, the higher-order harmonic components of the output current increase, motor losses increase, and the motor temperature rise increases.

When the carrier frequency is high, motor losses decrease, and the motor temperature rise decreases; however, the system losses increase, the system temperature rise increases, and interference increases.

The relation between carrier frequency and system performance is as follows:

Carrier frequency	Low to high
Motor noise volume	High to low

Wave form of output current	Poor to good
Motor temperature rise	High to low
Controller temperature rise	Low to high
Leakage current	Small to large
Radiation to the surroundings	Low to high

7.2 F1: Motor Parameters

Function code	Name	Range	Default	Unit	Property
F1-00	Encoder type selection	0: Sin/Cos or absolute encoder 1: UVW encoder 2: AB encoder (asynchronous motor)	0	-	×

Set F1-00 to an appropriate value based on the type of the encoder paired with the motor.

When a synchronous motor is selected (F1-25=1), this parameter is automatically set to 0. If a UVW encoder is used, please set this parameter to 1 manually before tuning; otherwise, normal operation will be denied.

When an asynchronous motor is selected (F1-25=0), this parameter is automatically set to 2 (AB encoder). No manual modification is needed.

Function code	Name	Range	Default	Unit	Property
F1-01	Rated power	0.7 to 75.0	Depend on model	kW	×
F1-02	Rated voltage	0 to 600	Depend on model	V	×
F1-03	Rated current	0.00 to 655.00	Depend on model	A	×
F1-04	Rated frequency	0.00 to 99.000	Depend on model	Hz	×
F1-05	Rated speed	0 to 3000	Depend on model	rpm	×

Please set the parameters (F1-01 to F1-05) in accordance with the specifications provided on the motor nameplate.

Function code	Name	Range	Default	Unit	Property
F1-06	Synchronous motor initial angle	0.0 to 359.9	0	Degree	×
F1-07	Synchronous motor angle at power-off	0.0 to 359.9	0	Degree	×
F1-08	Synchronous motor wiring method	0 to 1	0	-	×

Parameter values (F1-06 to F1-08) are obtained via motor tuning.

F1-06 sets the angle of the encoder zero-point position. Conduct motor tuning for several times and compare the angle results. The error range should not exceed 5°.

F1-07 represents the angle when the motor magnetic poles are de-energized. The value will be recorded at power-off and used for comparison and judgment after power-on next time.

F1-08 represents the wiring method of the motor. It indicates whether the phase sequence of the drive board output is consistent with the UVW phase sequence. Under normal circumstances, after the motor tuning is successfully completed, if this value is an even number, it indicates that the phase sequence is correct; if it is an odd number, it indicates that the phase sequence is incorrect. In this case, swap any two output lines.

Function code	Name	Range	Default	Unit	Property
F1-09	ADC sampling delay	0.0 to 359.9	73.0	-	×

F1-09 is set to default values based on different power ratings before delivery. Modification is denied.

Function code	Name	Range	Default	Unit	Property
F1-10	Encoder verification selection	0 to 65535	0	-	×

F1-10 configures the encoder signal verification setting. It is for the manufacturer's use only. Please do not change this value casually.

Function code	Name	Range	Default	Unit	Property
F1-11	With-load tuning, no-load tuning, and shaft auto-tuning	0: No action 1: With-load tuning 2: No-load tuning 3: Shaft auto-tuning 1 4: Shaft auto-tuning 2	0	-	×

F1-11 selects the tuning mode. It can be set to the following values.

0: No action

1: With-load tuning

For asynchronous motors, static tuning is used (the motor does not rotate), while for synchronous motors, rotational tuning is applied (the motor will release the brake and rotate).

2: No-load tuning

The motor will rotate during the tuning process. Having a load on the motor can affect the tuning results. Therefore, before tuning, it is required to manually release the brake. Make sure that the motor is completely disconnected from the load.

3: Shaft auto-tuning 1

The auto-tuning method is the same as that of "Shaft auto-tuning 2", but the leveling adjustment records in Group Fr will be retained.

4: Shaft auto-tuning 2

The auto-tuning method is the same as that of "Shaft auto-tuning 1", but the recorded leveling adjustment parameters of Group Fr will be cleared.

Function code	Name	Range	Default	Unit	Property
F1-12	Encoder resolution	0 to 10000	2048	PPR	×

F1-12 sets the number of pulses per encoder revolution (set the value in accordance with the encoder nameplate).

Function code	Name	Range	Default	Unit	Property
F1-13	Encoder fault detection time	0 to 10.0 When set to a value less than 0.5 second, the detection function is ineffective.	1.0	s	×

F1-13 sets the detection time for encoder disconnection.

After the elevator starts running at a non-zero speed, if there is no encoder signal input within the time set by F1-13, an encoder fault will be prompted and the elevator will stop running. If this parameter is set to a value less than 0.5 seconds, the detection function will be ineffective.

Function code	Name	Range	Default	Unit	Property
F1-14	Asynchronous motor stator resistance	0.000 to 30.000	Depend on model	Ω	×
F1-15	Asynchronous motor rotor resistance	0.000 to 30.000	Depend on model	Ω	×
F1-16	Asynchronous motor leakage inductive reactance	0.00 to 300.00	Depend on model	mH	×

Function code	Name	Range	Default	Unit	Property
F1-17	Asynchronous motor mutual inductive reactance	0.1 to 3000.0	Depend on model	mH	×
F1-18	Asynchronous motor no-load current	0.00 to 300.00	Depend on model	A	×

Values of the above parameters (F1-14 to F1-18) are obtained after the asynchronous motor tuning, and will be automatically upgraded after the motor auto-tuning is successfully completed. If motor tuning is not available on site, please refer to the known parameters of the motors with the same nameplate and the same parameters, and enter them manually.

For the asynchronous motor, after each modification of motor rated power F1-01, these parameters will be reset to default values.

Function code	Name	Range	Default	Unit	Property
F1-19	Q-axis inductance (torque)	0.00 to 650.00	3.00	mH	×
F1-20	D-axis inductance (excitation)	0.00 to 650.00	3.00	mH	×
F1-21	Back EMF coefficient	0 to 655350	0	-	×

Parameters (F1-19 to F1-21) indicate the axis D/Q inductance and the back EMF coefficient (obtained through motor tuning) of the synchronous motor.

Function code	Name	Range	Default	Unit	Property
F1-25	Motor type	0: Asynchronous motor 1: Synchronous motor	1	-	×

F1-25 selects the motor type. It can be set to the following values.

0: Asynchronous motor

1: Synchronous motor

7.3 F2: Vector control parameters

Function code	Name	Range	Default	Unit	Property
F2-00	Speed loop proportional gain 1	0 to 100	40	-	×

Function code	Name	Range	Default	Unit	Property
F2-01	Speed loop integral time 1	0.01 to 10.00	0.60	s	×
F2-02	Switchover frequency 1	0.00 to F2-05	2.00	Hz	×

Speed loop proportional gain Kp1 and speed loop integral time Ti1 are the PI adjustment parameters when the running frequency is less than the value of switchover frequency 1.

Function code	Name	Range	Default	Unit	Property
F2-03	Speed loop proportional gain 2	0 to 100	35	-	×
F2-04	Speed loop integral time 2	0.01 to 10.00	0.80	s	×
F2-05	Switchover frequency 2	F2-02 to F0-05	5.00	Hz	×

Speed loop proportional gain Kp2 and speed loop integral time Ti2 are the PI adjustment parameters when the running frequency is larger than the value of switchover frequency 2.

PI adjustment parameters between switchover frequency 1 and switchover frequency 2 are the weighted average of F2-00, F2-0, F2-03, and F2-04, as shown in Figure 7-1.

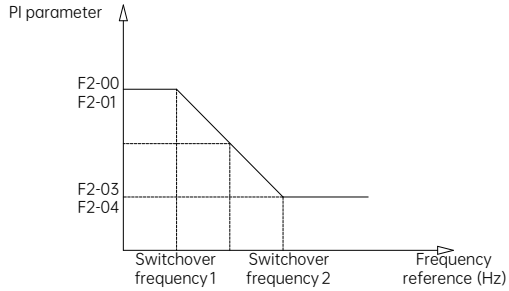


Figure 7-1 PI parameters

By setting the proportional coefficient and integral time of the speed adjuster, it allows for the adjustment of the dynamic response characteristics of the vector-control speed loop. Increasing the proportional gain and reducing the integral time can both accelerate the dynamic response of the speed loop. However, excessive proportional gain or too small integral time may cause oscillations in the system.

Recommended adjustment method is shown below.

If the factory default parameters do not meet requirements, fine-tune them based on the factory default values: first reduce the proportional gain to prevent system oscillation, then decrease the integral time to achieve faster response with minimal overshoot.

When both switchover frequency 1 and switchover frequency 2 are set to 0, only F2-03 and F2-04 are effective.

Function code	Name	Range	Default	Unit	Property
F2-06	Current loop proportional gain	10 to 500%	60	%	×
F2-07	Current loop integral gain	10 to 500%	30	%	×

Current loop proportional gain Kp1 and current loop integral gain Ki1 serve as the adjustment parameters of the torque axis current loop.

Function code	Name	Range	Default	Unit	Property
F2-08	Torque upper limit	0.0 to 200.0	150.0	%	×

F2-08 sets the motor torque upper limit. When it is set to 100%, it indicates the rated output torque of the motor which is paired with the system.

Function code	Name	Range	Default	Unit	Property
F2-10	Elevator running direction	0: Direction unchanged 1: Direction reversed	0	-	×

F2-10 adjusts the running direction of the elevator. It can be set to the following values.

0: Direction unchanged

1: Direction reversed

This parameter allows for the reversing of the motor running direction (on condition that the motor wiring is not changed). During the first inspection running after a successful motor tuning, please confirm that the actual motor running direction is consistent with the inspection command direction. If not consistent, please adjust the actual running direction via F2-10 to align with the inspection command direction.

When restoring the factory default settings, pay special attention to the setting of this parameter.

Function code	Name	Range	Default	Unit	Property
F2-11	Zero-servo current coefficient	2.0 to 50.0	15	-	×
F2-12	Zero-servo speed loop Kp	0.00 to 2.00	0.5	-	×
F2-13	Zero-servo speed loop Ti	0.00 to 2.00	0.6	-	×

Parameters (F2-11 to F2-13) serve to adjust the intensity of the automatic pre-torque compensation for no-load-cell startup. Enable the no-load-cell startup function by setting F8-01=2.

In case of a violent startup, decrease the values of these parameters; in case of a rollback at startup, increase their values (for details, please refer to section 5.1.5 “Improvement of riding comfort”).

Function code	Name	Range	Default	Unit	Property
F2-16	Torque acceleration time	1 to 500	1	ms	×
F2-17	Torque deceleration time	1 to 500	350	ms	×

Parameters (F2-16 and F2-17) set the time for the acceleration/deceleration of the torque current.

Due to different characteristics of the motors, when the car stops, the motor may produce an abrupt clunk when the current is withdrawn. Increase appropriately the torque deceleration time to eliminate the sound.

Function code	Name	Range	Default	Unit	Property
F2-18	Startup acceleration time	0.000 to 1.500	0.000	s	×

F2-18 sets the acceleration time for the startup speed, and is used with F3-00. For details, please refer to Figure 7-2 "Speed curve."

Function code	Name	Range	Default	Unit	Property
F2-19	Speed filter coefficient	0.0 to 20.00	0.1	ms	×
F2-20	Function setting	0 to 65535	0	-	×
F2-21	Obtained pulse width	1 to 100	8	-	*
F2-22	Amplitude ratio A/B	80.0 to 120.0	100.0	%	*
F2-23	Amplitude ratio C/D	80.0 to 120.0	100.0	%	*
F2-24	Sin/Cos A phase zero drift	5000 to 15000	9000	-	*
F2-25	Sin/Cos B phase zero drift	5000 to 15000	9000	-	*
F2-26	Sin/Cos C phase zero drift	5000 to 15000	9000	-	*
F2-27	Sin/Cos D phase zero drift	5000 to 15000	9000	-	*
F2-28	Number of pole pairs	1 to 100	8	-	×
F2-29	Drive rated voltage	0 to 999	1	V	*
F2-30	Drive rated current	0.1 to 999.9	Depend	A	*

Function code	Name	Range	Default	Unit	Property
			on model		
F2-31	Reserved	-	-	-	-
F2-32	Upper limit of current threshold	0 to 200	100	%	×
F2-33	Lower limit of current threshold	0 to 200	60	%	×
F2-34	IF current amplitude	0 to 200	30	%	×
F2-35	Encoder AB direction	0 to 1	0	-	×
F2-36	Encoder CD direction	0 to 1	0	-	×
F2-37	IF function selection	0 to 1	0	-	×
F2-38	IF DC positioning angle	0.0 to 360.0	0.0	Degree	×
F2-39	Braking force torque time	1 to 10	5	s	×
F2-40	Braking force torque amplitude	1 to 150	110	%	×

7.4 F3: Running control parameters

Function code	Name	Range	Default	Unit	Property
F3-00	Startup speed	0.000 to 0.030	0.000	m/s	×
F3-01	Startup speed holding time	0.000 to 0.500	0.000	s	×

Parameters (F3-00 and F3-01) set the system startup speed and its holding time. For details, please refer to Figure 7-2 "Speed curve."

Proper settings of these parameters may reduce the abruptness similar to climbing steps, which may occur at startup due to the static friction between the guide rail and shoes.

Function code	Name	Range	Default	Unit	Property
F3-02	Acceleration	0.200 to 0.800	0.300	m/s^2	×
F3-03	Acceleration jerk time 1	0.300 to 4.000	2.500	s	×

Function code	Name	Range	Default	Unit	Property
F3-04	Acceleration jerk time 2	0.300 to 4.000	2.500	s	×

Parameters (F3-02 to F3-04) set the running curve during the elevator acceleration.

Function code	Name	Range	Default	Unit	Property
F3-05	Deceleration	0.200 to 0.800	0.300	m/s²	×
F3-06	Deceleration jerk time 1	0.300 to 4.000	2.500	s	×
F3-07	Deceleration jerk time 2	0.300 to 4.000	2.500	s	×

Parameters (F3-05 to F3-07) set the running curve during the elevator deceleration.

F3-02 and F3-05 indicate the acceleration/deceleration value during the linear acceleration/deceleration of the S curve.

F3-03 (F3-07) sets the time for the acceleration (deceleration) value changing from 0 to the set value of F3-02 (F3-05) at the inflection point in the S curve acceleration (deceleration) start section. A larger value of this parameter results in gentler curve at the inflection point.

F3-04 (F3-06) sets the time for the acceleration (deceleration) value changing from the set value of F3-02 (F3-05) to 0 at the inflection point in the S curve acceleration (deceleration) start section. A larger value of this parameter results in gentler curve at the inflection point.

Settings for the complete running curve are illustrated in Figure 7-2.

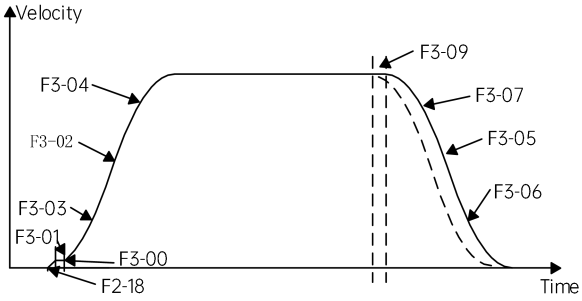


Figure 7-2 Speed curve

Function code	Name	Range	Default	Unit	Property
F3-08	Special deceleration rate	0.200 to 2.000	0.500	m/s²	×

F3-08 sets the deceleration rate in elevator slowdown, inspection, and shaft auto-tuning.

In normal operation, this deceleration mode will not be activated. It will be activated only when the elevator position or the slowdown signal is abnormal, with the purpose of minimizing the risk of top-hitting and bottom-crashing accidents.

Function code	Name	Range	Default	Unit	Property
F3-09	Pre-deceleration distance	0 to 90.00	0.0	mm	×

F3-09 sets the pre-deceleration distance in distance control, as shown in Figure 7-2, to reduce the impact caused by encoder signal loss or leveling signal delay.

Function code	Name	Range	Default	Unit	Property
F3-10	Re-leveling speed	0.020 to 0.080	0.040	m/s	×

F3-10 sets the speed of elevator re-leveling.

This parameter is valid when the re-leveling function (set by FE-13) is enabled by the addition of the advance door opening module (MCTC-SCB-A).

Function code	Name	Range	Default	Unit	Property
F3-11	Inspection speed	0.100 to 0.500	0.250	m/s	×

F3-11 sets the running speed in elevator inspection and shaft auto-tuning.

Function code	Name	Range	Default	Unit	Property
F3-12	Up slowdown position	0.000 to 300.00	0.00	m	×
F3-13	Down slowdown position	0.000 to 300.00	0.00	m	×

Parameters (F3-12 and F3-13) indicate the position of each slowdown switch relative to the lowest floor leveling position. Their values will be recorded automatically during shaft auto-tuning (for information of the slowdown switch installation distance, please refer to Table 3-8).

The Smile1000 integrated elevator controller supports a maximum of one pair of slowdown switches, which shall be installed near the terminal floor. This system automatically monitors the instantaneous running speed of the elevator when it reaches the slowdown switches. If an abnormal speed or position is detected, the system will force the elevator to decelerate at the special deceleration rate set by F3-08 to prevent the elevator from overrunning at the top or bottom (top-hitting or bottom-crashing).

Function code	Name	Range	Default	Unit	Property
F3-14	Zero-speed current output time before curve starts	0.000 to 1.000	0.200	s	×
F3-15	Zero-speed holding time for brake release	0.000 to 2.000	0.600	s	×
F3-16	Zero-speed holding time	0.000 to 1.000	0.300	s	×

Function code	Name	Range	Default	Unit	Property
	after curve ends				

Parameters (F3-14 to F3-16) set the values relative to the zero-speed current output holding time and the brake action delay time.

F3-14 (zero-speed current output time before curve starts) refers to the time period from the RUN contactor output to the brake contactor output. During this period, the drive excites the motor, and simultaneously outputs a zero-speed current with a relatively large starting torque.

F3-15 (zero-speed holding time for brake release) refers to the time period required from when the system issues the brake release command to when the brake arm is fully opened. During this period, the system maintains the output of the zero-speed torque current.

F8-11 (zero-speed torque holding time for brake engagement) refers to the time required from when the system issues the brake engagement command to when the brake arm is fully closed. During this period, the system maintains the output of the zero-speed torque current.

F3-16 (zero-speed holding time after curve ends) refers to the time period during which the system maintains zero-speed output when the running curve ends. The time sequence is illustrated in Figure 7-3.

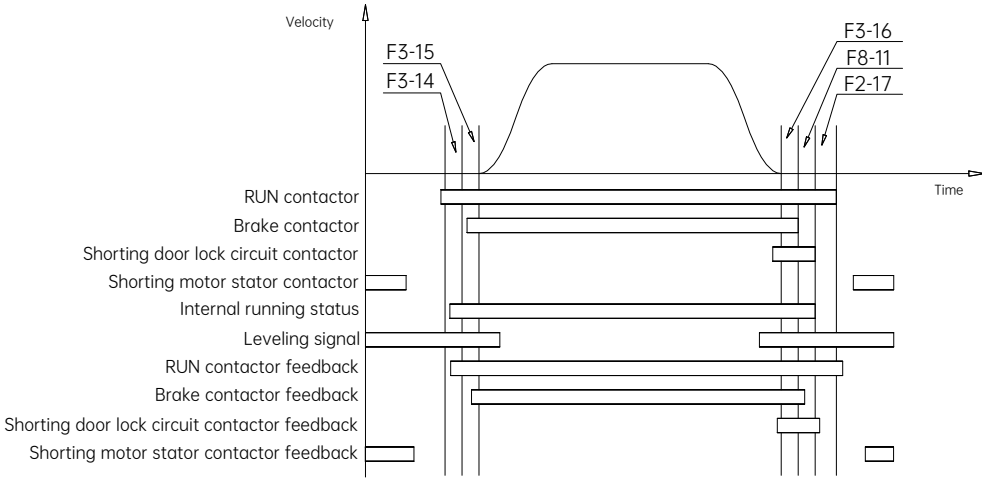


Figure 7-3 Running time sequence

Function code	Name	Range	Default	Unit	Property
F3-17	Low-speed re-leveling speed	0.100 to F3-11	0.100	m/s	×

F3-17 sets the return speed towards the leveling position when the car stops at a non-leveling position in normal operation.

Function code	Name	Range	Default	Unit	Property
F3-18	Acceleration rate during emergency rescue	0.100 to 1.300	0.300	m/s^2	×

F3-18 sets the acceleration rate during emergency rescue running.

7.5 F4: Floor parameters

Function code	Name	Range	Default	Unit	Property
F4-00	Leveling adjustment	0 to 60	30	mm	×

F4-00 adjusts the leveling accuracy when the car stops.

When the car stops, if over-leveling exists on all service floors, reduce properly the value of this parameter; if under-leveling exists on all service floors, increase properly the value of this parameter. Change of this parameter is applied to all service floors. For the leveling adjustment of a single floor, it is recommended to adjust the position of the leveling plate.

The Smile1000 elevator integrated controller employs avant-garde distance-control algorithms and multiple measures to ensure the accuracy and stability in direct leveling. Users are not required to perform adjustment in general situations.

Function code	Name	Range	Default	Unit	Property
F4-01	Current floor	F6-01 to F6-00	1	-	×

F4-01 is used to display the present floor number of the car.

The value of this parameter is automatically modified during car running, and automatically corrected upon door open limit at leveling position after the up/down slowdown switch actions. This parameter allows manual modification when leveling on non-top and non-bottom floors; however, the value shall be consistent with the actual number of the present leveling floor.

Function code	Name	Range	Default	Unit	Property
F4-02	High byte of current car position	0 to 65535	1	Pulse number	*
F4-03	Low byte of current car position	0 to 65535	34464	Pulse number	*

Parameters (F4-02 and F4-03) refer to the absolute pulse number of the current car position relative to the leveling position of the bottom floor.

The Smile1000 elevator integrated controller records the shaft position data in the form of pulse number. Each position is represented by a 32-bit binary number, of which the high 16 bits indicate the pulse high

bits of the corresponding floor height and the low 16 bits indicate the pulse low bits of the corresponding floor height.

Function code	Name	Range	Default	Unit	Property
F4-04	Leveling plate length 1	0 to 65535	0	Pulse number	×
F4-05	Leveling plate length 2	0 to 65535	0	Pulse number	×

Parameters (F4-04 and F4-05) respectively refer to the pulse number corresponding to the length of the leveling plate, and the pulse number corresponding to the distance between the two leveling sensors (automatically obtained via shaft auto-tuning).

Function code	Name	Range	Default	Unit	Property
F4-06	High byte of floor height 1	0 to 65535	0	Pulse number	×
F4-07	Low byte of floor height 1	0 to 65535	0	Pulse number	×
High/Low bits of floor height 2 to 14					
F4-34	High byte of floor height 15	0 to 65535	0	Pulse number	×
F4-35	Low byte of floor height 15	0 to 65535	0	Pulse number	×

Parameters (F4-06 to F4-35) display the pulse number corresponding to the floor height i, i.e., the pulse number corresponding to the distance between the leveling plate of the floor i and the leveling plate of the floor (i+1). Each floor height corresponds to a 32-bit binary number, of which the high 16 bits indicate the high bits of the corresponding floor height and the low 16 bits indicate the low bits of the corresponding floor height. In normal situations, the pulse number corresponding to the floor height i of each floor is approximately the same.

7.6 F5: Terminal input function parameters

Function code	Name	Range	Default	Unit	Property
F5-00	Attendant/Automatic switchover time	3 to 200	3	-	×

In the attendant state, if there is a hall call from other floors, the system will switch to the normal (automatic) operation state after the F5-00 time period finishes; when the running for the above hall call

finishes, the system switches back to the attendant state (this function will be enabled only when the Bit2 of F6-67 is valid); when the value of F5-00 is set below 5, the above functions will be disabled, and the system operates in the same way of the attendant state.

Function code	Name	Range	Default	Unit	Property
F5-01	X1 function selection	0 to 127	3	-	×
F5-02	X2 function selection		104	-	×
F5-03	X3 function selection		105	-	×
...			...		
F5-23	X23 function selection		0	-	×
F5-24	X24 function selection		0	-	×

Terminals (X1 to X24) are digital input terminals, which can be set to a function code within 00 to 199. The codes with the same function cannot be reused. When using the terminal function, if the input signal at terminal X1 is 24 V, the X1 signal indicator on the main control board will light up. This rule applies to other terminals.

Each function is represented by a code.

00: Inactive

Even if there is a signal input to the terminal, the system will not respond. Set the unassigned terminals to 00 to prevent malfunctions.

01: Signal of leveling 1

02: Signal of leveling 2

03: Door zone signal

The system controls the elevator leveling process using the leveling sensor signal, and supports three leveling modes: leveling with door zone leveling sensor only, leveling with up leveling sensor + down leveling sensor, and leveling with up leveling sensor + down leveling sensor + door zone leveling sensor. If the leveling sensor signal is abnormal (stuck or disconnected), the system will report an Err22 fault.

04: RUN output feedback signal

05: Brake output feedback signal

06: Brake travel switch feedback signal 1

50: Brake travel switch feedback signal 2

The system starts to detect the RUN contactor feedback signal and the brake feedback signal 2 seconds after the contactor disconnection signal is output, which is to determine whether the corresponding contactor is engaged properly.

07: Shorting motor stator feedback signal

This function code controls the shorting motor stator contactor of the permanent-magnet synchronous motor. When the elevator is in the emergency running state upon a power failure, if the traction machine is a permanent-magnet synchronous motor and it is in the automatic emergency running state, the brake will open, and the corresponding terminals will output signals, enabling the elevator to automatically coast to the nearest floor for leveling and door opening. Additionally, this function can also be applied after the elevator has stopped normally, which enhance the elevator's safety.

08: Shorting door lock circuit output feedback signal

The system outputs the engagement command to the shorting door lock circuit contactor, which enables the shorting/releasing control of the door lock during the advance door opening and the leveling after door opening.

09: Inspection signal

10: Inspection up running signal

11: Inspection down running signal

Once the automatic/inspection switch is turned to the inspection side, the elevator will enter the inspection state immediately. Under such conditions, all automatic operations of the system, including the automatic door, will be disabled. When there is an input of the inspection up/down running signal, the elevator will run at the inspection speed.

12: First fire emergency signal

Once the fire emergency switch is turned on, the elevator will enter the fire emergency state, and all registered hall calls and car calls will be canceled immediately. The car will directly run to the fire emergency floor (when the car is currently running in the direction of the fire emergency floor), or stop on the nearest floor and then run directly to the fire emergency floor (when the car is currently running in the opposite direction of the fire emergency floor). The elevator will automatically open the door upon the car arrival on the fire emergency floor.

13: Reserved

14: Elevator lockout signal

This function code enables the input of the elevator lock-up signal. When the signal is valid, the system enters the lock-up state.

15: Upper limit signal

16: Lower limit signal

The upper/lower limit signal serves as the stop switch at the terminal floor, which functions when the car does not stop in case of overrunning the leveling position of the terminal floor. Such measures are targeted to prevent elevator top-hitting and bottom-crashing.

17: Up slowdown signal

18: Down slowdown signal

These two function codes serve to set the corresponding terminals to the input NO state for the respective slowdown signal. The Smile1000 controller records the positions of these switches in F3

parameters during shaft auto-tuning.

19: Overload signal

During normal use, the elevator enters the overload state when the elevator load exceeds 110% of the rated volume. In this case, the overload buzzer sounds, the overload indicator in the car lights up, and the elevator doors keep open. The overload signal becomes inactive after the door lock is closed. If running with 110% of the rated load is required during inspection, set Bit2 of F6-10 to 1 to allow overload running.

20: Full-load signal

The system determines that the elevator is in the full-load state when the actual load is from 80% to 110% of the rated volume. In this case, the system displays the full-load state in the main floor hall, and the elevator does not respond to hall calls during running.

21: Emergency stop (safety circuit feedback) signal

The safety circuit is an important guarantee for the safe and reliable operation of the elevator.

22: Door 1 open limit signal

This function code enables the corresponding terminal to receive the door 1 open limit signal.

23: Door 2 open limit signal

This function code enables the corresponding terminal to receive the door 2 open limit signal.

24: Door 1 close limit signal

This function code enables the corresponding terminal to receive the door 1 close limit signal.

25: Door 2 close limit signal

This function code enables the corresponding terminal to receive the door 2 close limit signal.

26: Door 1 light curtain signal

This function code enables the corresponding terminal to receive the light curtain signal 1.

27: Door 2 light curtain signal

This function code enables the corresponding terminal to receive the light curtain signal 2.

28: Attendant signal

The system enters the attendant operation state when this signal is valid.

29: Direct travel ride signal

In the attendant state, if this direct arrival signal is valid, the elevator will not respond to hall calls.

30: Direction switchover signal

In the attendant state, if this signal is valid, the elevator switches the running direction.

31: Independent running signal

If this signal is valid, the elevator will be disengaged from parallel control.

32: Door 2 selection signal

This function is used in the door control of double-sided (through-type) elevators. If the door

open/close is controlled by the switch/button in the car, this signal will be sent to the corresponding terminal. When this signal is valid, the system opens/closes door 2; when invalid, the system opens/closes door 1.

33: UPS input valid

The corresponding input terminal will receive emergency running signal during power failure.

34: Door open button

This function is used to input the door open command signal.

35: Door close button

This function is used to input the door close command signal.

36: Safety circuit

The safety circuit functions as a crucial role in ensuring safe operation of elevators.

37: Door lock circuit 1

The door lock circuit ensures that the car/landing door is fully closed before the elevator starts running.

38: Door lock circuit 2

The functions of door lock circuit 2 and door lock circuit 1 are the same. This design provides the user with the capability to independently process the landing door signal and the car door signal. The system would confirm door close only when both car door lock and landing door lock feedback signals are received.

39: Half-load signal

This signal is effective when the car load exceeds half the rated volume. This signal is important in judging the running direction during emergency running.

40: Motor overheat

This function serves as the input point of the motor overheat protection switch signal. When this signal is valid and lasts for over 2 seconds, the controller will stop outputting and report a fault Err39 to protect the motor.

41: Door 1 safety edge

42: Door 2 safety edge

This function code serves to detect the safety edge signal state of door 1 and door 2 (if existing).

43: Earthquake signal

When this signal is valid and lasts for over 2 seconds, the elevator will enter the earthquake stop state, the car will land at the nearest floor, open the door to evacuate passengers, and stop operation till the earthquake signal becomes invalid.

44: Rear door prohibit

In a double-sided situation, the signal enables the system to suspend the door 2 service.

45: Light load

This signal facilitates the nuisance judgement in anti-nuisance operations. When F8-13 Bit2=1, the light load signal is selected as the nuisance judgement method. Light load is determined when the load level is below 30% of the rated volume.

46: Single/Double door selection

This function is effective in double-sided elevator mode 3 only. When the single/double door selection signal input via the MCB is valid, the elevator will enter the double door service mode; when the signal input is not valid, the elevator will remain in the single door service mode.

47: Fire emergency floor switchover

The Smile1000 series can set two fire emergency floors, of which the fire emergency floor 1 is set as the parking floor by default. If the fire emergency floor switchover signal is valid, the elevator will park the car at fire emergency floor 2.

48: Dummy floor input

This signal is required if the distance between two adjacent floors of the elevator is excessively large. In this case, the running time of the elevator between these two floors may exceed a certain amount, which may initiate the running time protection mechanism, triggering a fault Err30. Under the circumstances, it is required to set a dummy floor input at an appropriate position between the two floors which clears the timing of the protection function when the elevator reaches the position. Fault Err30 will thus be prevented.

49: Fire fighter input

This is the fire-fighter switch input used in the fire fighter running state. After the Smile system transports the car to the fire emergency floor in the fire emergency state, if this signal is valid, the system will then enter the fire fighter running state.

51 to 99: Reserved

101 to 199:

These 99 function codes correspond respectively to the functions 01 to 99. Function codes 01 to 99 set the corresponding input points to NO input, and function codes 101 to 199 set the corresponding input points to NC input.

Function code	Name	Range	Default	Unit	Property
F5-25	X25 function selection	1 to 16	01	-	×
F5-26	X26 function selection		02	-	×
F5-27	X27 function selection		03	-	×

00: Not in use

The system does not respond to any input via this function code. User can set any terminal not in use to this function code 00 to prevent false operation.

01: Safety circuit signal

The terminal which is set to this function can be used to detect the safety circuit high-power

electrical signal feedback.

02: Door lock circuit 1 signal

The terminal which is set to this function can be used to detect the high-power electrical signal feedback of the door lock circuit. It can be used for the landing door lock circuit or the car door lock circuit.

03: Door lock circuit 2 signal

The terminal which is set to this function can be used to detect the high-power electrical signal feedback of the door lock circuit. It can be used for the landing door lock circuit or the car door lock circuit.

04 to 16: Reserved

Function code	Name	Range	Default	Unit	Property
F5-28	I/O terminal status display 1	-	-	-	×
F5-29	I/O terminal status display 2	-	-	-	×

After entering the F5-28 menu, the keypad LED will display the I/O terminal status through the ON/OFF status of the segments. To simplify the description, the digital tubes are marked from right to left as 1, 2, 3, 4, and 5. Each segment is defined as follows.

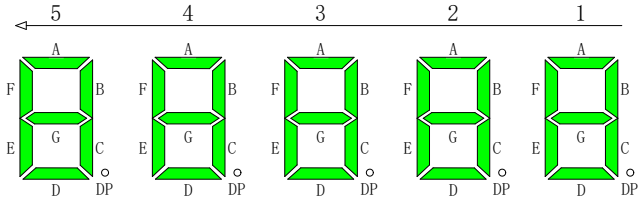


Figure 7-4 F5-28 I/O terminal status display

Parameter F5-28 refers to the I/O terminal status 1. Segment definitions are shown in the table below.

Digital tube	Segment mark	Segment description	When segment is ON
1	A	Not in use	No meaning
	B	Leveling 1 signal	Leveling 1 signal is valid.
	C	Leveling 2 signal	Leveling 2 signal is valid.
	D	Door zone signal	Door zone signal is valid.
	E	RUN output feedback signal	RUN output feedback signal is valid.

Digital tube	Segment mark	Segment description	When segment is ON
	F	Braking output feedback 1 signal	Braking output feedback 1 signal is valid.
	G	Braking output feedback 2 signal	Braking output feedback 2 signal is valid.
	DP	Shorting motor stator feedback signal	Shorting synchronous motor stator feedback signal is valid.
2	A	Shorting door lock circuit output feedback signal	Shorting door lock circuit output feedback signal is valid.
	B	Inspection signal	Inspection signal is valid.
	C	Inspection up running	Inspection up running is valid.
	D	Inspection down running	Inspection down running is valid.
	E	Primary fire emergency signal	Primary fire emergency signal is valid.
	F	Reserved	Reserved
	G	Elevator lockout signal	Elevator lockout signal is valid.
	DP	Up limit signal	Up limit signal is valid.
3	A	Down limit signal	Down limit signal is valid.
	B	Up slowdown signal	Up slowdown signal is valid.
	C	Down slowdown signal	Down slowdown signal is valid.
	D	Overload signal	Overload signal is valid.
	E	Full-load signal	Full-load signal is valid.
	F	Emergency stop (safety feedback) signal	Emergency stop (safety feedback) signal is valid.
	G	Door 1 open limit signal	Door 1 open limit signal is valid.
	DP	Door 2 open limit signal	Door 2 open limit signal is valid.
4	A	Door 2 close limit signal	Door 2 close limit signal is valid.
	B	Door 2 close limit signal	Door 2 close limit signal is valid.
	C	Door 1 light curtain signal	Door 1 light curtain signal is

Digital tube	Segment mark	Segment description	When segment is ON
			valid.
	D	Door 2 light curtain signal	Door 2 light curtain signal is valid.
	E	Attendant signal	Attendant signal is valid.
	F	Direct ride signal	Direct ride signal is valid.
	G	Direction switchover signal	Direction switchover signal is valid.
	DP	Independent running signal	Independent running signal is valid.
5	A	Door 2 selection signal	Door 2 selection signal is valid.
	B	UPS input valid	UPS input is valid.
	C	Door open button signal	Door open button signal is valid.
	D	Door close button signal	Door close button signal is valid.
	E	Door lock circuit 1 (low-power input)	Door lock circuit 1 (low-power input) is valid.
	F	Door lock circuit 2 (low-power input)	Door lock circuit 2 (low-power input) is valid.
	G	Half-load signal	Half-load signal is valid.
	DP	Not in use	No meaning

Parameter F5-29 refers to the I/O terminal status 2. Segment definitions are shown in the table below.

Digital tube	Segment mark	Segment description	When segment is ON
1	A	Not in use	No meaning
	B	Safety circuit signal	Safety circuit signal is valid.
	C	Door lock circuit 1 signal (high-power input)	Door lock circuit 1 signal (high-power input) is valid.
	D	Door lock circuit 2 signal (high-power input)	Door lock circuit 2 signal (high-power input) is valid.

Digital tube	Segment mark	Segment description	When segment is ON
	E	Not in use	No meaning
	F	Not in use	No meaning
	G	Not in use	No meaning
	DP	Not in use	No meaning
2	A	Y0 output	Y0 output is valid.
	B	RUN contactor output	RUN contactor output is valid.
	C	Brake contactor output	Brake contactor output is valid.
	D	Brake high-voltage output	Brake high-voltage output is valid.
	E	Fan and lighting output	Fan and lighting output is valid.
	F	Shorting synchronous motor stator output	Shorting synchronous motor stator output is valid.
	G	Door 1 open output	Door 1 open output is valid.
	DP	Door 1 close output	Door 1 close output is valid.
3	A	Door 2 open output	Door 2 open output is valid.
	B	Door 2 close output	Door 2 close output is valid.
	C	Low 7-segment a display output	Low 7-segment a display output is valid.
	D	Low 7-segment b display output	Low 7-segment b display output is valid.
	E	Low 7-segment c display output	Low 7-segment c display output is valid.
	F	Low 7-segment d display output	Low 7-segment d display output is valid.
	G	Low 7-segment e display output	Low 7-segment e display output is valid.
	DP	Low 7-segment f display output	Low 7-segmentt f display output is valid.
4	A	Low 7-segment g display	Low 7-segment g display

Digital tube	Segment mark	Segment description	When segment is ON
		output	output is valid.
	B	Up arrow display output	Up arrow display output is valid.
	C	Down arrow display output	Down arrow display output is valid.
	D	Negative sign display output (_x0007_)	Negative sign display output is valid.
	E	Fire emergency floor arrival signal output	Fire emergency floor arrival signal output is valid.
	F	Buzzer control output	Buzzer control output is valid.
	G	Overload output	Overload output is valid.
	DP	Arrival gong output	Arrival gong output is valid.
5	A	Full-load output	Full-load output is valid.
	B	Inspection output	Inspection output is valid.
	C	Fan and lighting output 2	Fan and lighting output 2 is valid.
	D	Shorting door lock circuit output	Shorting door lock circuit output is valid.
	E	Binary-coded decimal (BCD), Binary gray code, and 7-segment high-bit outputs	Binary-coded decimal (BCD), Binary gray code, and 7-segment high-bit outputs are valid.
	F	Integrated running normal output	Integrated running output is normal.
	G	Not in use	No meaning
	DP	Not in use	No meaning

Function code	Name	Range	Default	Unit	Property
F5-30	Floor I/O terminal status display 1	-	-	-	×

Function code	Name	Range	Default	Unit	Property
F5-31	Floor I/O terminal status display 2	-	-	-	×

After entering the F5-30 menu, the keypad LED will display the floor I/O terminal status through the ON/OFF status of the segments. To simplify the description, the digital tubes are marked from right to left as 1, 2, 3, 4, and 5. Each segment is defined as follows.

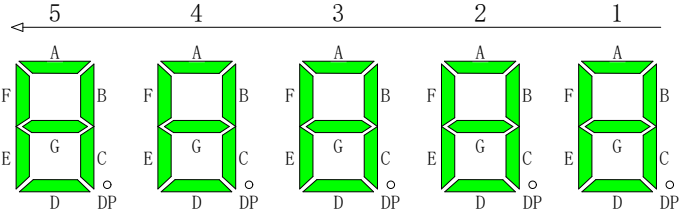


Figure 7-5 F5-30 floor I/O terminal status display

Digital tube	Segment mark	Segment description	When segment is ON
1	A	Door 1 open button input/output	Door 1 open button input/output is valid.
	B	Door 1 close button input/output	Door 1 close button input/output is valid.
	C	Door 1 open delay button input/output	Door 1 open delay button input/output is valid.
	D	Floor 1 door 1 car call input/output	Floor 1 door 1 car call input/output is valid.
	E	Floor 2 door 1 car call input/output	Floor 2 door 1 car call input/output is valid.
	F	Floor 3 door 1 car call input/output	Floor 3 door 1 car call input/output is valid.
	G	Floor 4 door 1 car call input/output	Floor 4 door 1 car call input/output is valid.
	DP	Floor 5 door 1 car call input/output	Floor 5 door 1 car call input/output is valid.
2	A	Floor 6 door 1 car call input/output	Floor 6 door 1 car call input/output is valid.
	B	Floor 7 door 1 car call	Floor 7 door 1 car call

Digital tube	Segment mark	Segment description	When segment is ON
		input/output	input/output is valid.
	C	Floor 8 door 1 car call input/output	Floor 8 door 1 car call input/output is valid.
	D	Floor 9 door 1 car call input/output	Floor 9 door 1 car call input/output is valid.
	E	Floor 10 door 1 car call input/output	Floor 10 door 1 car call input/output is valid.
	F	Reserved	Reserved
	G	Not in use	No meaning
	DP	Not in use	No meaning
3	A	Floor 1 door 1 up call input/output	Floor 1 door 1 up call input/output is valid.
	B	Reserved	Reserved
	C	Floor 2 door 1 up call input/output	Floor 2 door 1 up call input/output is valid.
	D	Floor 2 door 1 down call input/output	Floor 2 door 1 down call input/output is valid.
	E	Floor 3 door 1 up call input/output	Floor 3 door 1 up call input/output is valid.
	F	Floor 3 door 1 down call input/output	Floor 3 door 1 down call input/output is valid.
	G	Floor 4 door 1 up call input/output	Floor 4 door 1 up call input/output is valid.
	DP	Floor 4 door 1 down call input/output	Floor 4 door 1 down call input/output is valid.
4	A	Floor 5 door 1 up call input/output	Floor 5 door 1 up call input/output is valid.
	B	Floor 5 door 1 down call input/output	Floor 5 door 1 down call input/output is valid.
	C	Floor 6 door 1 up call input/output	Floor 6 door 1 up call input/output is valid.

Digital tube	Segment mark	Segment description	When segment is ON
	D	Floor 6 door 1 down call input/output	Floor 6 door 1 down call input/output is valid.
	E	Floor 7 door 1 up call input/output	Floor 7 door 1 up call input/output is valid.
	F	Floor 7 door 1 down call input/output	Floor 7 door 1 down call input/output is valid.
	G	Floor 8 door 1 up call input/output	Floor 8 door 1 up call input/output is valid.
	DP	Floor 8 door 1 down call input/output	Floor 8 door 1 down call input/output is valid.
5	A	Floor 9 door 1 up call input/output	Floor 9 door 1 up call input/output is valid.
	B	Floor 9 door 1 down call input/output	Floor 9 door 1 down call input/output is valid.
	C	Reserved	Reserved
	D	Floor 10 door 1 down call input/output	Floor 10 door 1 down call input/output is valid.
	E	Reserved	Reserved
	F	Reserved	Reserved
	G	Not in use	No meaning
	DP	Not in use	No meaning

Parameter F5-31 refers to the floor I/O terminal status 2. Segment definitions are shown in the table below.

Digital tube	Segment mark	Segment description	When segment is ON
1	A	Door 2 open button input/output	Door 2 open button input/output is valid.
	B	Door 2 close button input/output	Door 2 close button input/output is valid.
	C	Door 2 open delay button input/output	Door 2 open delay button input/output is valid.

Digital tube	Segment mark	Segment description	When segment is ON
	D	Floor 1 door 2 car call input/output	Floor 1 door 2 car call input/output is valid.
	E	Floor 2 door 2 car call input/output	Floor 2 door 2 car call input/output is valid.
	F	Floor 3 door 2 car call input/output	Floor 3 door 2 car call input/output is valid.
	G	Floor 4 door 2 car call input/output	Floor 4 door 2 car call input/output is valid.
	DP	Floor 5 door 2 car call input/output	Floor 5 door 2 car call input/output is valid.
2	A	Floor 6 door 2 car call input/output	Floor 6 door 2 car call input/output is valid.
	B	Floor 7 door 2 car call input/output	Floor 7 door 2 car call input/output is valid.
	C	Floor 8 door 2 car call input/output	Floor 8 door 2 car call input/output is valid.
	D	Floor 9 door 2 car call input/output	Floor 9 door 2 car call input/output is valid.
	E	Floor 10 door 2 car call input/output	Floor 10 door 2 car call input/output is valid.
	F	Reserved	Reserved
	G	Not in use	No meaning
	DP	Not in use	No meaning
3	A	Floor 1 door 2 up call input/output	Floor 1 door 2 up call input/output is valid.
	B	Reserved	Reserved
	C	Floor 2 door 2 up call input/output	Floor 2 door 2 up call input/output is valid.
	D	Floor 2 door 2 down call input/output	Floor 2 door 2 down call input/output is valid.
	E	Floor 3 door 2 up call	Floor 3 door 2 up call

Digital tube	Segment mark	Segment description	When segment is ON
		input/output	input/output is valid.
	F	Floor 3 door 2 down call input/output	Floor 3 door 2 down call input/output is valid.
	G	Floor 4 door 2 up call input/output	Floor 4 door 2 up call input/output is valid.
	DP	Floor 4 door 2 down call input/output	Floor 4 door 2 down call input/output is valid.
4	A	Floor 5 door 2 up call input/output	Floor 5 door 2 up call input/output is valid.
	B	Floor 5 door 2 down call input/output	Floor 5 door 2 down call input/output is valid.
	C	Floor 6 door 2 up call input/output	Floor 6 door 2 up call input/output is valid.
	D	Floor 6 door 2 down call input/output	Floor 6 door 2 down call input/output is valid.
	E	Floor 7 door 2 up call input/output	Floor 7 door 2 up call input/output is valid.
	F	Floor 7 door 2 down call input/output	Floor 7 door 2 down call input/output is valid.
	G	Floor 8 door 2 up call input/output	Floor 8 door 2 up call input/output is valid.
	DP	Floor 8 door 2 down call input/output	Floor 8 door 2 down call input/output is valid.
5	A	Floor 9 door 2 up call input/output	Floor 9 door 2 up call input/output is valid.
	B	Floor 9 door 2 down call input/output	Floor 9 door 2 down call input/output is valid.
	C	Reserved	Reserved
	D	Floor 10 door 2 down call input/output	Floor 10 door 2 down call input/output is valid.
	E	Reserved	Reserved

Digital tube	Segment mark	Segment description	When segment is ON
	F	Reserved	Reserved
	G	Not in use	No meaning
	DP	Not in use	No meaning

7.7 F6: Basic elevator parameters

Function code	Name	Range	Default	Unit	Property
F6-00	Top floor	F6-01 to 16	5	-	×
F6-01	Bottom floor	1 to F6-00	1	-	×

The above parameters set the top and the bottom floor of the elevator based upon the number of leveling plates actually installed.

Function code	Name	Range	Default	Unit	Property
F6-02	Parking floor for idle elevator	F6-01 to F6-00	1	-	×

When the idle time of the elevator exceeds the value set in F9-00, the elevator returns to the parking floor automatically.

Function code	Name	Range	Default	Unit	Property
F6-03	Fire emergency floor 1	F6-01 to F6-00	1	-	×

When the elevator enters the state of returning to fire emergency floor, the elevator will return to the set floor.

Function code	Name	Range	Default	Unit	Property
F6-04	Parking floor for elevator lockout	F6-01 to F6-00	1	-	×

When the elevator enters the lockout state, it will return to the parking floor for elevator lockout.

Function code	Name	Range	Default	Unit	Property
F6-05	Service floor	0 to 65535 (floor 1 to 16)	65535	-	×

This parameter sets the service floor for the elevator. The setting method is described below.

Floor serviceability is determined by a 16-bit binary number (in case of a 16-floor elevator). Each bit (low to high) represents a floor (low to high). If one of the bits is set to 1, its corresponding floor call will be

responded by the system; if set to 0, its corresponding floor call won't be responded. For example, the serviceability of a 16-floor elevator is configured as the following table.

Bit	Floor	Service	Setting	Bit	Floor	Service	Setting
Bit0	1	Enabled	1	Bit8	9	Disabled	0
Bit1	2	Disabled	0	Bit9	10	Enabled	1
Bit2	3	Enabled	1	Bit10	11	Enabled	1
Bit3	4	Enabled	1	Bit11	12	Disabled	0
Bit4	5	Enabled	1	Bit12	13	Enabled	1
Bit5	6	Enabled	1	Bit13	14	Enabled	1
Bit6	7	Enabled	1	Bit14	15	Enabled	1
Bit7	8	Disabled	0	Bit15	16	Enabled	1

In the above table , the 16-bit binary number is 1111 0110 0111 1101 based on the setting of each floor. The corresponding decimal number is 63101, thus the parameter F6-05 shall be set to 63101.

Function code	Name	Range	Default	Unit	Property
F6-06	Program control selection 1	0 to 65535	0	-	×

This parameter configures the functions required by the elevator user. The disabled/enabled status of the function is determined by a single-bit binary number, where 1 indicates it is enabled and 0 indicates it is disabled.

The definition of each function code is explained in the table below.

F6-06 Program control selection 1			
Bit	Function	Description	Default
Bit1	Returning to parking floor due to excessive car position deviation	In case of excessive car position deviation, the car will stop at the nearest floor and return to the terminal floor for verification.	0
Bit2	Reserved	Reserved	-
Bit3	Buzzer silence during re-leveling	When this function is enabled, the buzzer output control relay does not work during re-leveling.	0
Bit5	Disabling the door lock fault auto-reset function	When a door lock fault occurs, the system does not reset the fault automatically.	0
Bit6	Advance cancellation of	The system cancels the display of the destination	0

F6-06 Program control selection 1			
Bit	Function	Description	Default
	floor number display and advance display of direction switchover	floor before arrival; in case a direction switchover is pending, the system displays the switched direction in advance.	
Bit8	Hall call non-directional input	This function applies to the situation where only one hall call button is provided and present. The input signal of such hall call button can be connected to both the up running button input point and the down running button input point of the corresponding floor on the MCB.	0
Bit9	Disabling the function of analog disconnection detection	During normal running, analog disconnection detection is disabled.	0
Bit10	Additional door lock disengagement when switching from inspection to normal state	When switching from inspection to normal operation, the door lock must be disengaged once to transition into the normal state.	0

The method to view and configure this parameter is explained below.

1) Two methods for viewing

- Decimal mode: A decimal number will be displayed after entering the F6-06 menu. The value is the sum of the decimal numbers which correspond to the binary numbers representing the enabled state of all enabled F6-06 bits. For example, when only Bit0, Bit3, and Bit8 are enabled, the decimal number on display will be 00265. This decimal mode is for parameter viewing only. No modification is allowed in this mode.
- Bit mode: In the decimal number display mode, press the up/down arrow on the operating panel, and the display will enter the bit viewing/configuration mode.

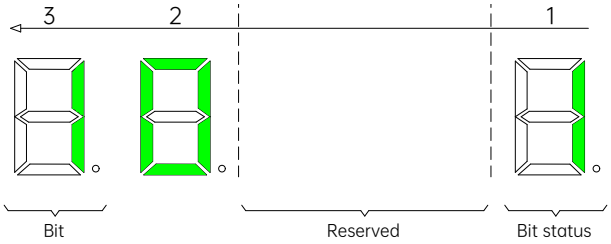


Figure 7-6 Viewing/Configuration in bit mode

The three digital tubes in the above figure are respectively marked as 1, 2, and 3 from right to left. The digital tube 2 and 3 combined display the number of the bit, and the digital tube 1 displays its

status, with 1 for "enabled" and 0 for "disabled". The example shown in the figure indicates Bit10 of F6-06 is valid (i.e., the "Additional door lock disengagement when switching from inspection to normal state" function is enabled).

2) Method for configuration

This parameter provides the status viewing and configuration of 16 bits from Bit0 to Bit15. For cyclic viewing of the bits on digital tube 2 and 3, please use the up/down arrow on the operating panel, and use the right arrow for configuration (set the value for digital tube 1).

Cyclic viewing illustration:

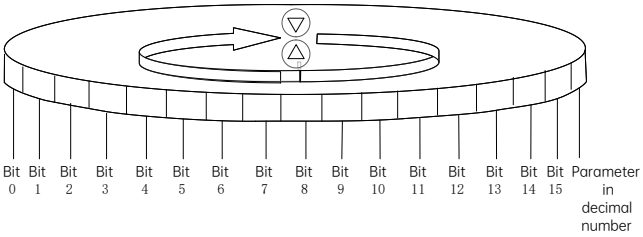


Figure 7-7 F6-06 cyclic viewing

Caution

This viewing/configuration method applies to all multi-bit parameters in this manual, including F6-06/07/64/65/66/67/68/69, FB-07, FC-00/01, and FE-13/14.

Function code	Name	Range	Default	Unit	Property
F6-07	Program control selection 2	0 to 65535	0	-	×

This parameter configures the functions required by the elevator user. The disabled/enabled status of the function is determined by a single-bit binary number, where 1 indicates it is enabled and 0 indicates it is disabled.

The definition of each function code is explained in the table below.

F6-07 program control selection 2			
Bit	Function	Description	Default
Bit2	Blinking arrow during running	The display arrow is blinking during car running. Set the blinking cycle via F6-08.	0
Bit3	Elevator lockout available in the attendant state	It enables elevator lockout in the attendant state.	0

F6-07 program control selection 2			
Bit	Function	Description	Default
Bit6	No fault display on keypad	It disable the display of fault code on the keypad display.	0
Bit9	Torque holding at abnormal brake feedback	When an abnormal brake feedback occurs, the drive continues to output a holding torque.	0
Bit10	Disabling Err30 detection during re-leveling	It disable the detection function of Err30 during the process of re-leveling.	0
Bit12	Automatic fault reset	The system automatically resets the fault once every hour.	0
Bit13	Non-standard ultra-short floor	When the height between two adjacent floors is lower than 500 mm, the system is unable to perform shaft auto-tuning. To enable the shaft auto-tuning in this case, enable this function.	0
Bit14	No reset of floor display via up slowdown signal when ultra-short floor is enabled	When this function is enabled, up slowdown signal does not reset floor display; however, down slowdown signal still resets floor display (only when the ultra-short floor function is enabled).	0
Bit15	No reset of floor display via down slowdown signal when ultra-short floor is enabled	When this function is enabled, down slowdown signal does not reset floor display; however, up slowdown signal still resets floor display (only when the ultra-short floor function is enabled).	0

Function code	Name	Range	Default	Unit	Property
F6-08	Arrow blinking cycle	0 to 5.0	1.0	-	×

This parameter sets the blinking cycle when the "Blinking arrow during running" function is enabled.

Function code	Name	Range	Default	Unit	Property
F6-09	Number of random tests	0 to 60000	0	-	×

This parameter is used in running test. When enabled, the system chooses an arbitrary floor as destination and automatically performs running test till the number of tests are reached.

Function code	Name	Range	Default	Unit	Property
F6-10	Test selection of enable state	Bit0: Hall call prohibited Bit1: Door open prohibited Bit2: Overload allowed Bit3: Limit switch invalid	0	-	×

Bit0: Hall call prohibited; if this bit is set to 1, hall call will not be responded. This bit will be automatically reset to 0 upon a power failure.

Bit1: Door open prohibited; if this bit is set to 1, door will not be automatically opened. This bit will be automatically reset to 0 upon a power failure.

Bit2: Overload allowed; if this bit is set to 1, overload running does not function. This bit will be automatically reset to 0 upon a power failure. This bit is used for 110% load running.

Bit3: Limit switch invalid; if this bit is set to 1, the limit protection does not function. This bit will be automatically reset to 0 upon a power failure. To facilitate the testing of final limit switch during inspection, this bit can be used only once after its setting.

Bit4 to Bit15: Reserved

This F6-10 parameter function is restricted to qualified professionals only. Please exercise extreme caution. It is hereby declared that all consequences arising from its use shall be borne solely by the operator. Please ensure that F6-10 is set to 0 during normal elevator operation.

Function code	Name	Range	Default	Unit	Property
F6-11	L1 function selection	201 to 399	201	-	×
F6-12	L2 function selection	201 to 399	202	-	×
...					
F6-59	L49 function selection	201 to 399	00	-	×
F6-60	L50 function selection	201 to 399	00	-	×

This parameter group sets the functions of the floor button inputs.

Function code	Name	Range	Default	Unit	Property
F6-61	Leveling sensor delay	10 to 50	14	ms	×

This parameter sets the delay between the leveling sensor action and the leveling signal validation. No need for modification by user.

Function code	Name	Range	Default	Unit	Property
F6-62	Random running interval	0 to 1000	3	-	○

This parameter sets the time interval between the random running tests.

Function code	Name	Range	Default	Unit	Property
F6-64	Program function selection 1	0 to 65535	0	-	×
F6-65	Program function selection 2	0 to 65535	0	-	×
F6-66	Program function selection 3	0 to 65535	0	-	×

This parameter group is used for the program control selection. Value 1 indicates that the corresponding function is enabled, and value 0 indicates that the corresponding function is disabled. Definitions of each function code are explained in the table below.

F6-64 program control selection 1			
Bit	Function	Description	Default
Bit1	Software limit function	When up slowdown signal and down leveling signal are valid, and up leveling signal is invalid, an up limit state will be determined; when down slowdown signal and up leveling signal are valid, and down leveling signal is invalid, an down limit state will be determined.	0
Bit4	Opening one door during manual door control of double-sided elevator	This function code is valid only when double-sided elevator mode 3 is effective. In this case, the system opens only one door at a time, which takes the close limit of the other door as a prerequisite.	0
Bit5	Immediate call cancellation upon elevator lockout	When the elevator lockout signal is valid, the system immediately cancels all registered calls, stops at the nearest floor, and then returns to the parking floor for elevator lockout.	0
Bit9	Disabling the function of car call cancellation upon direction switchover	All registered car calls will be canceled by default each time the car changes its running direction. If this function code is valid, the function of car call cancellation upon direction switchover is	0

F6-64 program control selection 1			
Bit	Function	Description	Default
		disabled.	
Bit11	Car call priority response	Only after the completion of all car calls will the hall calls be responded.	0
F6-65 program control selection 2			
Bit	Function	Description	Default
Bit2	Car stop by slowdown inspection	During inspection running, level 1 slowdown at the terminal floor acts, and the car decelerates and stops.	0
Bit4	Buzzer alarm after door open delay	When the FB-13 door open delay time is reached, the buzzer will output alarm.	0
Bit8	Door open during elevator lockout	In the elevator lockout state, the car will stop at the lockout floor with door open.	0
Bit9	Hall call display during lockout	The hall call display is normal during elevator lockout.	0
Bit11	Flashing alarm upon arrival	The system outputs flashing alarm in the car upon car arrival. The advance time for flashing alarm is set via F6-74.	0
F6-66 program control selection 3			
Bit	Function	Description	Default
Bit1	Cancellation delay of door open/close command upon door open/close limit	When this function code is valid, door open/close command will be canceled after 1 second of delay following the door open/close limit.	0
Bit2	No door lock state judgement before door close limit confirmation	When the function of no door close output after door close limit is selected, it is required to firstly confirm the door close limit in normal situations. The door lock circuit shall be conducting before the confirmation. If this function code is valid, the system does not need to check the door lock state before door close limit confirmation	0
Bit3	Door close output during running	The system continues to output door close command during elevator running.	0

F6-64 program control selection 1			
Bit	Function	Description	Default
Bit4	Terminal floor verification after first power-on	When this function code is valid, the car will run to the bottom floor after first power-on.	0

Function code	Name	Range	Default	Unit	Property
F6-67	Attendant function selection	0 to 65535	128	-	×

This parameter selects the elevator function. Value 1 indicates that the function is enabled, and value 0 indicates that the function is disabled. Function code definitions are explained in the table below.

F6-67 program control selection 1			
Bit	Function	Description	Default
Bit0	Call cancellation upon first-time entry into the attendant state	When entering the attendant state for the first time, all car/hall calls will be cleared.	0
Bit1	No automatic response to hall calls	The system does not automatically respond to hall calls of the floors where there are flashing alarm in the car over hall call registration.	0
Bit2	Attendant/Automatic state switchover	When this function code is valid, the F5-00 (attendant/automatic switchover time) takes effect.	0
Bit3	Door close at jogging	Press the door close button once, and the elevator closes the door.	0
Bit4	Automatic door close	The system automatically closes the door when the door open holding time is reached, the same as the normal state.	0
Bit5	Intermittent buzzer alarm in the attendant state	The buzzer will sound intermittently for 2.5 seconds when the hall call floor does not match the car call floor.	0
Bit6	Continuous buzzer alarm in the attendant state	The buzzer will sound continuously when the hall call floor does not match the car call floor.	0
Bit7	Function selection of car call button flashing alarm	When the hall call input signal is valid, the corresponding floor button in the car will flash.	0

Function code	Name	Range	Default	Unit	Property
F6-68	Fire emergency function selection	0 to 65535	16456	-	×

This parameter selects the elevator function. Value 1 indicates that the function is enabled, and value 0 indicates that the function is disabled. Function code definitions are explained in the table below.

F6-68 Fire emergency function selection			
Bit	Function	Description	Default
Bit3	Arrival gong output in the inspection or fire emergency state	The system outputs arrival gong in the inspection or fire emergency state.	0
Bit4	Multi-car-call input in the fire fighter state	The system allows for registration of multiple car calls in the fire-fighter running state; otherwise, only one car call is allowed.	0
Bit5	Operation status retentive at power outage in the fire emergency state	In the fire emergency state, the elevator records the current state of the system and the car at power failure, and recovers to the recorded state upon power-on again.	0
Bit6	Door close by holding door close button	In the fire emergency state, the door close process will be completed only when the user presses and holds the door close button till the door close limit; otherwise, the system automatically switches to door open.	0
F6-68 Fire emergency function selection			
Bit9	HOP floor display in the fire emergency state	Floor is displayed on the HOP in the fire emergency state.	0
Bit11	Fire emergency state exit upon fire emergency floor arrival	In the fire emergency state, the system will exits the fire emergency state only upon car arrival at the fire emergency floor.	0
Bit12	No cancellation of car call during reverse door open	In the fire emergency state, the registered car call will not be cleared during reverse door open.	0
Bit14	Door open by holding door open button	In the fire emergency state, the door open process will be completed only when the user	0

		presses and holds the door open button till the door open limit; otherwise, the system automatically switches to door close.	
Bit15	Automatic door open upon fire emergency floor arrival	The system automatically opens the door upon arrival at the fire emergency floor.	0

Function code	Name	Range	Default	Unit	Property
F6-69	Rescue function selection	0 to 65535	0	-	×

This parameter selects the elevator function. Value 1 indicates that the function is enabled, and value 0 indicates that the function is disabled. Function code definitions are explained in the table below.

F6-69 rescue function selection								
Bit	Function	Description						Default
Bit0	Direction determination method	0	Automatic calculation (run towards the direction of heavy load, used when there is no load cell)	0	Determined by load (run towards the direction of heavy load, used when there is load cell)	1	Direction of the nearest landing floor	0
Bit1		0		1		0		0
Bit2	Car stop at rescue parking floor	In rescue mode, the elevator runs to and park the car at the floor set by F6-73 (rescue parking floor; it shall be set to a non-0 value, and the set floor shall be an elevator service floor); otherwise, the elevator will stop at the nearest floor.						0
Bit4	Startup compensation	During emergency rescue operations, no-load-cell startup still functions.						0
Bit8	Emergency running time protection	A fault Err33 will be triggered if the rescue duration exceeds 50 seconds. At the time, the system disables the function of switching from time-limited shorting stator braking mode to the drive mode.						0
Bit10	Buzzer alarm	Intermittent buzzer alarm during emergency running.						0
Bit12	Switching from shorting stator	The system enables the function of switching from shorting stator braking mode to the drive mode.						0

	braking mode to the drive mode			
Bit13	Type of switching from shorting stator braking mode to the drive mode	0	Time limited: Set the time interval of switching from shorting stator braking mode to the drive mode via F6-75.	0
		1	Speed limited: After 10 seconds in shorting stator braking mode, if the speed is lower than the value of F6-72, the system switches to the drive mode.	
Bit14	Method of exiting from rescue	0	The system exits from the rescue mode upon door open limit after arrival at the destination floor.	0
		1	The system exits from the rescue mode upon door close limit after arrival at the destination floor.	
Bit15	Function selection of shorting stator braking	This function code enables the related functions of shorting stator braking. These related functions will take effect only when this function code is valid.		0

Function code	Name	Range	Default	Unit	Property
F6-72	Emergency switchover speed	0.010 to 0.630	0.010	m/s	×

This parameter sets the speed threshold for switching from speed-limited shorting stator braking mode to the drive mode.

Function code	Name	Range	Default	Unit	Property
F6-73	Rescue parking floor	0 to F6-00	0	-	×

When Bit2 (car stop at rescue parking floor) of F6-69 is enabled, the rescue parking floor set by F6-73 will be the floor for parking.

Function code	Name	Range	Default	Unit	Property
F6-74	Advance time for flashing alarm	0.0 to 15.0	1	-	×

This parameter sets the advance time for the flashing alarm upon car call arrival.

Function code	Name	Range	Default	Unit	Property
F6-75	Waiting time for switching from shorting stator braking mode to	0 to 45.0	20	-	×

Function code	Name	Range	Default	Unit	Property
	the drive mode				

This parameter sets the time interval for switching from shorting stator braking mode to the drive mode. If leveling is not reached within the interval, the system will switch to the drive mode for rescue operations.

7.8 F7: Terminal output function parameters

Function code	Name	Range	Default	Unit	Property
F7-00	Y0 function selection	(00 to 05)或 32	00	-	×

As an independent relay output, Y0 can be set to any relay output function available. When power outage emergency running function is required, only Y0 can be used as the control relay of the emergency rescue output. At the time, this parameter shall be set to 32, which enables the automatic switchover to the power outage emergency running state when a power failure occurs.

Function code	Name	Range	Default	Unit	Property
F7-01	Y1 function selection	00 to 05	01	-	×
F7-02	Y2 function selection	00 to 05	02	-	×
F7-03	Y3 function selection	00 to 05	04	-	×

Parameters F7-01 to F7-03 can be set to the following function codes only.

00: Not in use

No function for the output terminal.

01: RUN contactor output

This function controls the release/engage of the RUN contactor.

02: Brake contactor output

This function controls the release/engage of the brake contactor.

03: Higher-voltage startup of brake

The system continues to output this function for 4 seconds each time the brake is released. Such measure is aimed to control the startup voltage of the brake.

04: Fan/Lighting output

This function controls the output of the fan and lighting.

05: Shorting synchronous motor stator output

This function controls the shorting stator contactor of the permanent magnet synchronous motor. When the synchronous motor elevator is in the power outage emergency rollback state (shorting

stator braking mode), the system releases the brake and outputs the shorting stator signal, and the car runs in rollback mode to the nearest floor and opens door after leveling. Additionally, this function also improves the safety during normal elevator stop.

Function code	Name	Range	Default	Unit	Property
F7-04	Y4 function selection	06 to 99	00	-	×
F7-05	Y5 function selection	06 to 99	00	-	×
F7-06	Y6 function selection	06 to 99	06	-	×
...					
F7-27	Y27 function selection		00	-	×

The above parameters set the output port functions.

7.9 F8: Enhanced function parameters

Function code	Name	Range	Default	Unit	Property
F8-00	Car load ratio during load cell auto-tuning	0 to 100%	0	%	×

This parameter is used in load cell auto-tuning. Load cell auto-tuning is processed in three steps.

Step 1: Confirm that F8-01 is set o 0 and that F8-08 is set to 1, which enables the load cell auto-tuning;

Step 2: Land the car at an arbitrary service floor, make sure the car is in the no-load state, set F8-00 to 0, and press the ENTER button;

Step 3: Place N% load into the car, set F8-00=N, and press ENTER to confirm setting. For example, if 500 kg load is placed into a car whose rated load is 1000 kg, set F8-00 to 50.

After the auto-tuning, the no-load and full-load data will be recorded in parameters F8-06 and F8-07, or entered manually by the user based on actual working conditions.

Function code	Name	Range	Default	Unit	Property
F8-01	Pre-torque selection	0 to 2	0	-	×

This parameter sets the pre-torque compensation mode at elevator startup. The setting values include the following.

0: Load cell auto-tuning is allowed, and pre-torque compensation is invalid;

1: Load cell pre-torque is enabled; this function is used to coordinate with the load cell using pre-torque compensation;

2: Automatic pre-torque compensation is enabled; load cell is not needed, and the system automatically adjust the torque compensation during startup.

When using the pre-torque compensation to coordinate with the load cell, the system firstly outputs a torque which matches the car load. Such measure can improve the riding comfort at elevator startup. However, the torque output is limited by the torque upper limit (F2-08). when the load torque exceeds the upper limit, the system's output torque will equal the value of the upper limit.

Function code	Name	Range	Default	Unit	Property
F8-02	Pre-torque offset	0.0% to 100.0%	50.0	%	×

This parameter sets the value of the pre-torque offset.

This parameter also serves as the balance coefficient of the elevator, which is the ratio of car load to the rated load when the counterweight achieves a balance with the car weight.

Function code	Name	Range	Default	Unit	Property
F8-03	Drive gain	0.00 to 2.000	0.60	-	×
F8-04	Brake gain	0.00 to 2.00	0.60	-	×

The above parameters set the pre-torque drive gain and brake gain during running. For details, please refer to the section 5.1.5 "Improvement of riding comfort".

Function code	Name	Range	Default	Unit	Property
F8-05	Current car load	0 to 255	0	-	

This parameter indicates the current car load, and is read only. The Smile1000 series adopts the analog load cell sampling method in both the over-load and full-load judgement and the calculation of torque current during load cell pre-torque compensation.

Function code	Name	Range	Default	Unit	Property
F8-06	Condition of car no-load	0 to 255	0	-	×
F8-07	Condition of car full-load	0 to 255	100	-	×

The above parameters indicate the judgement values of car no-load and full-load. Their values are the analog AD sampling values

Function code	Name	Range	Default	Unit	Property
F8-08	Load cell input selection	0: MCB digital sampling 1: MCB analog sampling	0	-	×

This parameter sets the load cell signal channel. Before using the load cell, please set this parameter and ensure it is correct.

Function code	Name	Range	Default	Unit	Property
F8-09	Emergency rescue speed at power failure	0.000 to F3-11	0.05	m/s	×

This parameter sets the elevator speed for emergency rescue operation at power failure.

Function code	Name	Range	Default	Unit	Property
F8-10	Selection of emergency rescue at power failure	0 to 2	0	-	×

This parameter sets the power supply mode during emergency running. For details, please refer to section 5.2.1 "Emergency running solutions at power failure". the available setting values include the following.

0: Invalid

1: UPS power supply

2: 48 V battery power supply

Function code	Name	Range	Default	Unit	Property
F8-11	zero-speed torque holding time for brake engagement	0.200 to 1.500	0.200	s	×

This parameter sets the torque holding time at zero speed during car stop. Please refer to Figure 7-3 for details.

Function code	Name	Range	Default	Unit	Property
F8-12	Fire emergency floor 2	0 to F6-00	0	-	×

This parameter is used to set fire emergency floor 2. After the fire emergency floor switchover signal set on the MCB is active, the elevator enters the fire emergency running state and returns to this fire emergency floor.

Function code	Name	Range	Default	Unit	Property
F8-13	Anti-nuisance function selection	Bit0: Reserved Bit1: Light curtain judgement Bit2: Light-load judgement	0	-	×

It is used to set the conditions to judge nuisance. The possible values to be set:

Bit0: Function invalid

Bit1: Light curtain judgement; The system determines that nuisance exists when the light curtain does not act after the elevator stops at destination floor for three consecutive times;

Bit2: Light-load judgement; If the light-load signal is active, the system determines that nuisance exists when the number of car calls is greater than a certain value.

When the system determines that the elevator is in the nuisance state, it cancels all car calls. In this case, car calls need to be registered again.

7.10 F9: Time parameters

Function code	Name	Range	Default	Unit	Property
F9-00	Maximum idle time before returning to parking floor	1 to 240	10	min	○

It is used to set the time of idle elevator parking.

When the idle time of the elevator exceeds the setting of this parameter, the elevator returns to the parking floor.

Function code	Name	Range	Default	Unit	Property
F9-01	Fan/Lighting turn-off time	1 to 240	2	min	○

It is used to set the time that fan and lighting stays ON before being turned off automatically.

If there is no running command in the automatic running state, the system turns off the fan and lighting automatically after reaching the value set in this parameter.

Function code	Name	Range	Default	Unit	Property
F9-02	Motor running time limit	0 to 45	45	s	×

It is used to set the running time limit of the motor. When it is set to a value less than 3 seconds, this function is disabled.

In the normal running state, if the continuous motor running time in the same direction between two adjacent floors exceeds the setting of this parameter but no leveling signal is received, the system will perform protection. This parameter is mainly used for timeout protection in the case of steel rope slipping on the traction sheave.

Function code	Name	Range	Default	Unit	Property
F9-03	Accumulative running time	0 to 65535 hours	0	h	*

Function code	Name	Range	Default	Unit	Property
F9-05	High byte of running times	0 to 9999 **Note:** Value 1 indicates 10000 times in actual running.	0	-	*
F9-06	Low byte of running times	0 to 9999	0	-	*

This parameter group is used to view the running time and times in actual running.

Elevator running times = High bit of running times × 10000 + Low bit of running times

7.11 FA: Parameters of keypad setting

Function code	Name	Range	Default	Unit	Property
FA-01	Parameter display in the running state	1 to 65535	65535	-	○

It is used to set the running parameters displayed on the operating panel when the elevator is running.

FA-01 includes 16 binary bits, corresponding to 16 parameters that can be displayed during running. User can press the Shift key to view different parameters. Every parameter is controlled by a binary bit. If a bit is set to 1, the parameter indicated by this bit is displayed; if this bit is set to 0, the parameter is not displayed. User can modify this parameter for user's own convenience.

The correlation between the parameters and binary bits is as follows.

Binary bit	Parameter	Default	Binary bit	Parameter	Default
Bit0	Running speed	1	Bit8	Car load	1
Bit1	Rated speed	1	Bit9	System state	1
Bit2	Bus voltage	1	Bit10	Pre-torque current	1
Bit3	Output voltage	1	Bit11	Input terminal 1 status	1
Bit4	Output current	1	Bit12	Input terminal 2 status	1
Bit5	Output frequency	1	Bit13	Input terminal 3 status	1
Bit6	Current floor	1	Bit14	Output terminal 1 status	1
Bit7	Current position	1	Bit15	Output terminal 2 status	1

Function code	Name	Range	Default	Unit	Property
FA-02	Parameter display in the stop state	1 to 65535	65535	-	○

It is used to set the status parameters displayed on the operating panel when the elevator is at stop. FA-02 includes 16 binary bits, corresponding to 16 parameters that can be displayed at stop. The usage is the same as that of FA-01

The correlation between the parameters and binary bits is as follows.

Binary bit	Parameter	Default	Binary bit	Parameter	Default
Bit0	Rated speed	1	Bit8	Input terminal 2 status	1
Bit1	Bus voltage	1	Bit9	Input terminal 3 status	1
Bit2	Current floor	1	Bit10	Output terminal 1 status	1
Bit3	Current position	1	Bit11	Output terminal 2 status	1
Bit4	Car load	1	Bit12	Reserved	0
Bit5	Slowdown distance at rated speed	1	Bit13	Reserved	0
Bit6	System state	1	Bit14	Reserved	0
Bit7	Input terminal 1 status	1	Bit15	Reserved	0

FA-01 and FA-02 are two important parameters for technician's reference during on-site commissioning of the Smile1000 series. Definitions of each variable are explained below.

- Running speed: it refers to the actual speed during elevator running, the maximum of which is set by F0-03 (unit:m/s);
- Speed reference: it refers to the running speed of the Smile1000 series based on theoretical calculation (unit:m/s);
- Bus voltage: it refers to the value of DC bus voltage of the Smile1000 series (unit: V);
- Current floor: it refers to the physical floor where the elevator car is running at the moment, which is the same with F4-01;
- Current position: it refers to the absolute distance between the present car position and the floor 1 leveling plate (unit: m);
- Car load: it refers to the percentage (detected by the Smile1000 series based up sensor data) of car load against the rated load (unit: %);
- Output voltage: it refers to the effective value of the PWM waveform equivalent voltage output by the Smile1000 series (unit: V);
- Output current: it refers to the effective value of the actual current during motor running which is

driven by the Smile1000 series (unit: A);

- Output frequency: it refers to the actual frequency during motor running, which corresponds to the running speed in a fixed manner (unit: Hz);
- Pre-torque current: it refers to the percentage of the compensated pre-torque current during elevator startup of this time against the rated current (unit: %);

For details of each I/O terminal status, please refer to the descriptions below.

Input terminal 1 status: each bit is designated for a specified signal input. When set to 1, it indicates that the corresponding signal is valid. The definitions of the 16 bits are listed below.

Binary bit	Definition	Binary bit	Definition
Bit0	Reserved	Bit8	Shorting door lock circuit output feedback
Bit1	Up leveling signal	Bit9	Inspection signal
Bit2	Down leveling signal	Bit10	Inspection up signal
Bit3	Door zone signal	Bit11	Inspection down signal
Bit4	RUN output feedback	Bit12	Fire emergency signal
Bit5	Brake output feedback	Bit13	Reserved
Bit6	Brake travel switch feedback	Bit14	Elevator lockout
Bit7	Self-locking feedback	Bit15	Up limit signal

Input terminal 2 status: each bit is designated for a specified signal input. When set to 1, it indicates that the corresponding signal is valid. The definitions of the 16 bits are listed below.

Binary bit	Definition	Binary bit	Definition
Bit0	Down limit signal	Bit8	Door 1 close limit
Bit1	Up slowdown signal	Bit9	Door 2 close limit
Bit2	Down slowdown signal	Bit10	Door 1 light curtain
Bit3	Overload signal	Bit11	Door 2 light curtain
Bit4	Full-load signal	Bit12	Attendant signal
Bit5	Emergency stop (safety feedback) signal	Bit13	Direct travel ride signal
Bit6	Door 1 open limit	Bit14	Direction switchover signal
Bit7	Door 2 open limit	Bit15	Independent running

Input terminal 3 status: each bit is designated for a specified signal input. When set to 1, it indicates that the corresponding signal is valid. The definitions of the 16 bits are listed below.

Binary bit	Definition	Binary bit	Definition
Bit0	Door 2 selection	Bit8	Motor overheat
Bit1	UPS input valid	Bit9	Door 1 safety edge
Bit2	Door open button	Bit10	Door 2 safety edge
Bit3	Door close button	Bit11	Earthquake signal
Bit4	Safety circuit	Bit12	Rear door prohibition
Bit5	Door lock circuit 1	Bit13	Light load
Bit6	Door lock circuit 2	Bit14	Single/Double door selection
Bit7	Half load signal	Bit15	Fire Emergency floor switchover

Output terminal 1 status: each bit is designated for a specified signal output. When set to 1, it indicates that the corresponding signal is valid. The definitions of the 16 bits are listed below.

Binary bit	Definition	Binary bit	Definition
Bit0	Reserved	Bit8	Door 2 open
Bit1	RUN contactor	Bit9	Door 2 close
Bit2	Brake contactor	Bit10	Low 7-segment a output
Bit3	Higher-voltage brake startup output	Bit11	Low 7-segment b output
Bit4	Fan/Lighting output	Bit12	Low 7-segment c output
Bit5	Shorting sync. motor stator output	Bit13	Low 7-segment d output
Bit6	Door 1 open	Bit14	Low 7-segment e output
Bit7	Door 1 close	Bit15	Low 7-segment f output

Output terminal 2 status: each bit is designated for a specified signal output. When set to 1, it indicates that the corresponding signal is valid. The definitions of the 16 bits are listed below.

Binary bit	Definition	Binary bit	Definition
Bit0	Low 7-segment g output	Bit8	Full-load output
Bit1	Up arrow output	Bit9	Inspection output
Bit2	Down arrow output	Bit10	Fan/Lighting output 2

Bit3	Negative sign display output	Bit11	Shorting door lock circuit contactor output
Bit4	Fire emergency floor arrival	Bit12	Binary-coded decimal (BCD), Binary gray code, 7-segment code, and binary high-bit output
Bit5	Buzzer output	Bit13	Integrated normal running output
Bit6	Overload output	Bit14	Electric lock output
Bit7	Arrival gong output	Bit15	Reserved

System status: each bit is designated for a specified signal. When set to 1, it indicates that the corresponding signal is valid. The definitions of the 16 bits are listed below.

Binary bit	Definition	Binary bit	Definition
Bit0	System light curtain status 1	Bit8	Car status: 1: Door open 2: Door open holding 3: Door close 4: Door close limit 5: Running
Bit1	System light curtain status 2	Bit9	
Bit2	Elevator lockout	Bit10	
Bit3	Fire emergency	Bit11	
Bit4	Elevator status: 0: Inspection 1: Shaft auto-tuning 3: Fire emergency return 4: Fire fighter 6: Attendant 7: Automatic (normal)	Bit12	System full-load
Bit5		Bit13	System overload
Bit6		Bit14	Reserved
Bit7		Bit15	Reserved

Function code	Name	Range	Default	Unit	Property
FA-03	Current encoder angle	0.0 to 360.0	0.0	Degree	*

This parameter is used to display the real-time angle of the encoder. Modification of this parameter is not available to user.

Function code	Name	Range	Default	Unit	Property
FA-05	Software version (ARM)	0 to 65535	0	-	*
FA-06	Software version (DSP)	0 to 65535	0	-	*

These two parameters indicate the program version of the logic control board and the drive control board respectively.

Function code	Name	Range	Default	Unit	Property
FA-07	Heatsink temperature	0 to 100℃	0	℃	*

This parameter indicates the present temperature of the heatsink.

In normal conditions, the heatsink temperature stays under 40℃. If it is excessively high, the system will lower the carrier frequency to reduce heat generation. If it exceeds a certain level, the system will report a module overheat fault and stop running.

Function code	Name	Range	Default	Unit	Property
FA-08	Integrated controller model	0 to 65535	1000	-	-

This parameter is used to display the controller model in the Smile series model list.

Function code	Name	Range	Default	Unit	Property
FA-11	Pre-torque current	0.0 to 200.0	0	%	-

This parameter is used to display the percentage of the pre-torque current against the rated current (with positive/negative indication for motoring or regenerating status).

Function code	Name	Range	Default	Unit	Property
FA-12	Logic information	0 to 65535	0	-	-

This parameter is used to display the elevator status.

As shown in Figure 7-8, five LEDs are marked as 1, 2, 3, 4, and 5 from right to left. Digital tube 1 indicates the door 1 state. Digital tube 2 and 3 are reserved. The combination of digital tube 4 and 5 indicates the elevator state. The following figure indicates that the elevator is in the "inspection, and door close" state.

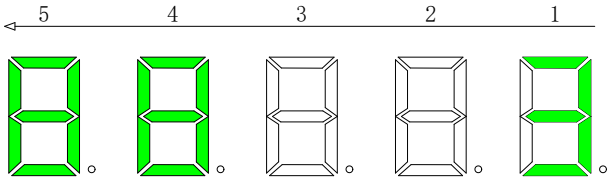


Figure 7-8 Indication of digital tube display

The following table lists the types of elevator status and their corresponding numbers.

5		4		3	2	1	
Elevator status				No display	No display	Door 1 status	
00	Inspection	08	Elevator lockout	-	-	0	Waiting
01	Shaft auto-tuning	09	Parking in idle time			1	Opening
02	Micro-leveling	10	Re-leveling at low speed			2	Open limit
03	Returning to fire emergency floor	11	Rescue operation			3	Closing
04	Fire fighter running	12	Motor auto-tuning			4	Close limit
05	In fault	13	In keypad control			-	-
06	Attendant state	14	Main floor verification			-	-
07	Automatic running	-	-			-	-

Function code	Name	Range	Default	Unit	Property
FA-13	Curve information	0 to 65535	0	-	-

This parameter is used to display the curve information during elevator running, and the method is the same with that of FA-12. Digital tube 2 and 1 combined indicate the running curve information. The details are provided in the table below.

5	4	3	2	1
No display	No display	No display	Curve information	

5	4	3	2		1	
-	-	-	00	Standby	09	Deceleration start section
			01	Zero speed start section	10	Linear deceleration section
			02	Zero speed holding section	11	Deceleration end section
			03	Reserved	12	Stop at zero speed
			04	Startup speed section	13	Current stop
			05	Acceleration start section	14	Reserved
			06	Linear acceleration section	15	Data processing stop
			07	Acceleration end section	16 to 20	Auto-tuning section
			08	Constant speed running section	21	Emergency running

Function code	Name	Range	Default	Unit	Property
FA-14	Speed reference	0.000 to 4.000	0	m/s	*
FA-15	Feedback speed	0.000 to 4.000	0	m/s	*
FA-16	Bus voltage	0 to 999.9	0	V	*
FA-17	Present position	0.0 to 300.00	0	m	*
FA-18	Output current	0.0 to 999.9	0	A	*
FA-19	Output frequency	0.00 to 99.99	0	Hz	*
FA-20	Torque current	0.0 to 999.9	0	A	*
FA-21	Output voltage	0 to 999.9	0	V	*
FA-22	Output torque	0 to 200.0	0	%	*
FA-23	Output power	0.00 to 99.99	0	kW	*

These parameters display the current performance state of the system (the output torque and output power support positive/negative display).

Function code	Name	Range	Default	Unit	Property
FA-24	Communication interference	0 to 65535	0	-	*

The present communication quality of the system is displayed via five digital tubes as shown in the table below.

5		4	3		2	1
SPI communication quality		No display	CAN communication quality		No display	No display
0	Good	-	0	Good	-	-
↓	↑		↓	↑		
9	Interrupted		9	Interrupted		

Numbers of 0 to 9 indicate the communication quality. The greater the number is, the larger interference the communication suffers and the poorer the communication quality is.

Function code	Name	Range	Default	Unit	Property
FA-26	Input status 1	0 to 65535	0	-	*
FA-27	Input status 2	0 to 65535	0	-	*
FA-28	Input status 3	0 to 65535	0	-	*
FA-29	Input status 4	0 to 65535	0	-	*
FA-30	Input status 5	0 to 65535	0	-	*
FA-31	Output status 1	0 to 65535	0	-	*
FA-32	Output status 2	0 to 65535	0	-	*
FA-33	Output status 3	0 to 65535	0	-	*
FA-34	Floor I/O status 1	0 to 65535	0	-	*
FA-35	Floor I/O status 2	0 to 65535	0	-	*
FA-36	Floor I/O status 3	0 to 65535	0	-	*
FA-37	Floor I/O status 4	0 to 65535	0	-	*
FA-38	Floor I/O status 5	0 to 65535	0	-	*
FA-39	Floor I/O status 6	0 to 65535	0	-	*
FA-40	Floor I/O status 7	0 to 65535	0	-	*

These parameters are used to show the system I/O status as described in Figure 7-9.

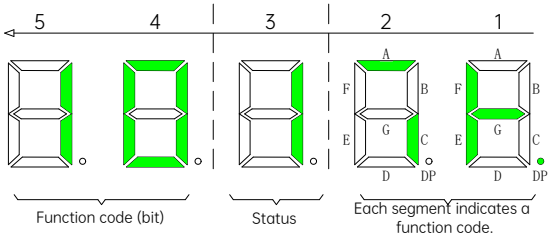


Figure 7-9 Input status display example

As shown in the preceding figure, the LEDs from right to left are numbered 1, 2, 3, 4, and 5. For FA-26 to FA-37, LEDs 5 and 4 combined show the function number; LED 3 shows whether the function is valid (1) or invalid (0); the 16 segments of LEDs 1 and 2 show the statuses of the 16 function codes in this parameter.

The preceding figure shows the display of FA-16: LEDs 5, 4, and 3 show that function 10 (inspection down running) is 1 (valid); LEDs 1 and 2 show that besides function 10, functions 4 (RUN contactor feedback), 5 (brake contactor feedback), 6 (brake travel switch feedback), 7 (Shorting stator output feedback), and 8 (Shorting door lock circuit output feedback) are valid

FA-26 input status 1				FA-27 input status 2			
Code	Function	Code	Function	Code	Function	Code	Function
0	Reserved	8	Shorting door lock circuit output feedback	0	Down limit signal	8	Door 1 close limit
1	Up leveling signal	9	Inspection signal	1	Up slowdown signal	9	Door 2 close limit
2	Down leveling signal	10	Inspection up running	2	Down slowdown signal	10	Door 1 light curtain
3	Door zone signal	11	Inspection down running	3	Overload signal	11	Door 2 light curtain
4	RUN output feedback	12	Fire emergency signal	4	Full-load signal	12	Attendant signal
5	Brake output feedback	13	Reserved	5	Emergency stop signal	13	Direct travel signal
6	Brake travel switch	14	Elevator lockout	6	Door 1 open limit	14	Direction switchover

	feedback						signal
7	Shorting stator output feedback	15	Up limit signal	7	Door 2 open limit	15	Independent running
FA-28 input status 3				FA-29 input status 4			
Code	Function	Code	Function	Code	Function	Code	Function
0	Door 2 selection	8	Motor overheat	0	Dummy floor	8	Reserved
1	UPS input valid	9	Door 1 safety edge	1	Fire-fighter signal	9	Reserved
2	Door open button	10	Door 2 safety edge	2	Brake travel switch feedback 2	10	Reserved
3	Door close button	11	Earthquake signal	3	Reserved	11	Reserved
4	Safety circuit	12	Rear door prohibit	4	Reserved	12	Reserved
5	Door lock circuit 1	13	Light-load signal	5	Reserved	13	Reserved
6	Door lock circuit 2	14	Single/Double door selection	6	Reserved	14	Reserved
7	Half-load signal	15	Fire emergency floor switchover	7	Reserved	15	Reserved
FA-30 input status 5				FA-31 input status e 1			
Code	Function	Code	Function	Code	Function	Code	Function
0	Reserved	8	Reserved	0	Reserved	8	Door 2 open
1	Higher-voltage safety circuit	9	Reserved	1	RUN contactor output	9	Door 2 close
2	Higher-voltage door lock circuit 1	10	Reserved	2	Brake contactor output	10	Low 7-segment a output
3	Higher-voltage	11	Reserved	3	Higher-voltage	11	Low 7-segment

	door lock circuit 2				startup of brake		b output
4	Reserved	12	Reserved	4	Fan/Lighting output	12	Low 7-segment c output
5	Reserved	13	Reserved	5	Shorting motor stator output	13	Low 7-segment d output
6	Reserved	14	Reserved	6	Door 1 open	14	Low 7-segment e output
7	Reserved	15	Reserved	7	Door 1 close	15	Low 7-segment f output
FA-32 input status 2				FA-33 input status 3			
Code	Function	Code	Function	Code	Function	Code	Function
0	Low 7-segment g output	8	Full-load output	0	Emergency running valid at power failure	8	Reserved
1	Up arrow output	9	Inspection output	1	Forced door close 1	9	High 7-segment a output
2	Down arrow output	10	Fan/Lighting output 2	2	Forced door close 2	10	High 7-segment b output
3	Negative sign display	11	Shorting door lock circuit contactor output	3	Fault state	11	High 7-segment c output
4	Fire emergency floor arrival	12	Binary-coded decimal (BCD), Binary gray code, 7-segment code, and binary high-bit output	4	Up running signal	12	High 7-segment d output
5	Buzzer output	13	Integrated normal running output	5	Medical sterilization output	13	High 7-segment e output
6	Over-load output	14	Electric lock output	6	Non-door-zone stop output	14	High 7-segment f output

7	Arrival gong output	15	Reserved	7	Non-service-state output	15	High 7-segment g output

Parameters (FA-34 to 40) are used to view the signal input/output status of each floor, and the method is the same with parameters (FA-26 to 33). For details, please refer to the following tables.

FA-34 floor I/O status 1				FA-35 floor I/O status 2 (door 1 car call)			
Code	Function	Code	Function	Code	Function	Code	Function
0	Door 1 open	8	Door 2 open	0	Floor 1 car call	8	Floor 9 car call
1	Door 1 close	9	Door 2 close	1	Floor 2 car call	9	Floor 10 car call
2	Door 1 open delay	10	Door 2 open delay	2	Floor 3 car call	10	Floor 11 car call
3	Door 2 selection	11	Reserved	3	Floor 4 car call	11	Floor 12 car call
4	Reserved	12	Reserved	4	Floor 5 car call	12	Floor 13 car call
5	Reserved	13	Reserved	5	Floor 6 car call	13	Floor 14 car call
6	Reserved	14	Reserved	6	Floor 7 car call	14	Floor 15 car call
7	Reserved	15	Reserved	7	Floor 8 car call	15	Floor 16 car call
FA-36 floor I/O status 3 (door 1 up call)				FA-37 floor I/O status 4 (door 1 down call)			
Code	Function	Code	Function	Code	Function	Code	Function
0	Floor 1 up call	8	Floor 9 up call	0	Reserved	8	Floor 9 down call
1	Floor 2 up call	9	Floor 10 up call	1	Floor 2 down call	9	Floor 10 down call
2	Floor 3 up call	10	Floor 11 up call	2	Floor 3 down call	10	Floor 11 down call
3	Floor 4 up call	11	Floor 12 up call	3	Floor 4 down call	11	Floor 12 down call
4	Floor 5 up call	12	Floor 13 up call	4	Floor 5 down call	12	Floor 13 down call
5	Floor 6 up call	13	Floor 14 up call	5	Floor 6 down call	13	Floor 14 down call
6	Floor 7 up call	14	Floor 15 up call	6	Floor 7 down call	14	Floor 15 down call

7	Floor 8 up call	15	Reserved	7	Floor 8 down call	15	Floor 16 down call
FA-38 floor I/O status 5 (door 2 car call)				FA-39 floor I/O status 6 (door 2 up call)			
Code	Function	Code	Function	Code	Function	Code	Function
0	Floor 1 car call	8	Floor 9 car call	0	Floor 1 up call	8	Floor 9 up call
1	Floor 2 car call	9	Floor 10 car call	1	Floor 2 up call	9	Floor 10 up call
2	Floor 3 car call	10	Floor 11 car call	2	Floor 3 up call	10	Floor 11 up call
3	Floor 4 car call	11	Floor 12 car call	3	Floor 4 up call	11	Floor 12 up call
4	Floor 5 car call	12	Floor 13 car call	4	Floor 5 up call	12	Floor 13 up call
5	Floor 6 car call	13	Floor 14 car call	5	Floor 6 up call	13	Floor 14 up call
6	Floor 7 car call	14	Floor 15 car call	6	Floor 7 up call	14	Floor 15 up call
7	Floor 8 car call	15	Floor 16 car call	7	Floor 8 up call	15	Reserved
FA-39 floor I/O status 7 (door 2 down call)				FA-41 system status			
Code	Function	Code	Function	Code	Function	Code	Function
0	Reserved	8	Floor 9 up call	0	Up direction display	8	-
1	Floor 2 down call	9	Floor 10 up call	1	Down direction display	9	-
2	Floor 3 down call	10	Floor 11 up call	2	System in running	10	-
3	Floor 4 down call	11	Floor 12 up call	3	System full-load	11	-
4	Floor 5 down call	12	Floor 13 up call	4	System overload	12	-
5	Floor 6 down call	13	Floor 14 up call	5	System half-load	13	-
6	Floor 7 down call	14	Floor 15 up call	6	System light-load	14	-
7	Floor 8 down call	15	Floor 16 up call	7	-	15	-

Function code	Name	Range	Default	Unit	Property
FA-41	System state	0 to 65535	0	-	*

7.12 FB: Door function parameters

Function code	Name	Range	Default	Unit	Property
FB-00	Number of door operators	1 to 2	1	-	×

This parameter sets the number of the door operators. User can set this parameter value based on the actual number of door operators.

Function code	Name	Range	Default	Unit	Property
FB-01	Double-sided door selection	0 to 3	0	-	×

This parameter sets the relative functions of double-sides door control to the following available values.

0: Simultaneous control

1: Independent hall call control and simultaneous car call control

2: Independent hall call control and manual car call control

3: Independent car/hall call control

Function code	Name	Range	Default	Unit	Property
FB-02	Service floor of door operator 1	0 to 65535	65535	-	○
FB-04	Service floor of door operator 2	0 to 65535	65535	-	○

These two parameters are used to set respectively the service floor of door operator 1 (or door operator 2). The setting method is the same with that of F6-05.

Function code	Name	Range	Default	Unit	Property
FB-03	Holding time of manual door open	1 to 60	10	s	○

This parameter is used to set the delay time after door open limit under manual control. This parameter is valid only when manual door function is enabled.

Function code	Name	Range	Default	Unit	Property
FB-05	Stop delay at re-leveling	0.00 to 2.00	0	s	○
FB-06	Door open protection time	5 to 99	10	s	○

This parameter is used to set the door open protection time.

After outputting the door open command, if the system does not receive the door open limit signal after the time set in this parameter, the system closes and opens the door again. When the door open/close times reach the value set in FB-09, the system reports fault Err48.

Function code	Name	Range	Default	Unit	Property
FB-07	Program control selection	0 to 65535	0	-	○

This parameter selects the required program control functions. If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled. Meaning of each bit is explained in the table below.

FB-07 Elevator function selection			
Bit	Function	Meaning	Default
Bit5	Synchronous motor current detection	The system detects the output current at startup of the synchronous motor, and blocks the output and forbids running if the current is abnormal.	0
Bit13	Higher/Lower voltage 1.5-second detection	When the higher/lower voltage safety and door lock signals are both enabled, the higher voltage and lower voltage signals must become consistent within 1.5s. Otherwise, the system will consider that the signals are invalid and require to power on the system again to restore the detection.	0

Function code	Name	Range	Default	Unit	Property
FB-08	Door close protection time	5 to 99	15	s	○

This parameter is used to set the door close protection time.

After outputting the door close command, if the system does not receive the door close limit signal after the time set in this parameter, the system closes and opens the door again. When the door open/close times reach the value set in FB-09, the system reports fault Err49.

Function code	Name	Range	Default	Unit	Property
FB-09	Door open/close protection times	0 to 20. 0: Invalid.	0	-	○

This parameter sets the maximum number of times allowed for door re-open and re-close when door open/close is abnormal.

Function code	Name	Range	Default	Unit	Property
FB-10	Door status of standby elevator	0 to 2	0	-	○

This parameter sets the door state when the elevator is the stop/standby state. It can be set to the following values.

0: Normal door close at base floor

1: Waiting with door open at base floor

2: Waiting with door open at each floor

Function code	Name	Range	Default	Unit	Property
FB-11	Door open holding time for hall call	1 to 1000	5	s	○

This parameter sets the door open holding time after the door opens upon car arrival for a hall call. However, if there is a door close command received, the elevator closes the door immediately.

Function code	Name	Range	Default	Unit	Property
FB-12	Door open holding time for car call	1 to 1000	3	s	○

This parameter sets the door open holding time when there is a car call. However, if there is a door close command received, the elevator closes the door immediately.

Function code	Name	Range	Default	Unit	Property
FB-13	Door open holding time upon valid open delay	10 to 1000	30	s	○

This parameter sets the door open holding time when there is door open delay input. However, if there is a door close command received, the elevator closes the door immediately.

Function code	Name	Range	Default	Unit	Property
FB-14	Door open holding time at base floor	1 to 1000	10	s	○

This parameter sets the door open holding time after the elevator arrives at the base floor. However, if there is a door close command received, the elevator closes the door immediately.

Function code	Name	Range	Default	Unit	Property
FB-15	Arrival gong output delay	0 to 1000	0	ms	○

This parameter sets the delay time of arrival gong output.

Function code	Name	Range	Default	Unit	Property
FB-16	Door lock waiting time upon manual door	0 to 50	0	s	○

When the manual door function is enabled, the elevator responds to other calls only after the time set in this parameter if the door lock is not disconnected upon arrival.

Function code	Name	Range	Default	Unit	Property
FB-17	Holding time for forced door close	5 to 180	120	s	○

This parameter sets the holding time before forced door close is implemented.

If the forced door close function is enabled, the system enters the forced door close state and sends a forced door close signal when there is no door close signal after the time set in this parameter is reached

7.13 FC: Protection function parameters

Function code	Name	Range	Default	Unit	Property
FC-00	Short-circuit to ground detection at power-on	0 to 65535	0	-	×

This parameter sets the program control related to protection functions.

If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled. Meaning of each bit is explained in the table below.

FC-00 Program control for protection function			
Bit	Function	Meaning	Default
Bit0	Short-circuit to ground detection at power-on	The system detects upon power-on whether the motor is short-circuited to ground. If the motor is short-circuited to ground, the controller blocks the	0

FC-00 Program control for protection function			
Bit	Function	Meaning	Default
		output immediately, and reports a fault.	
Bit1	Cancellation of current detection at inspection startup	The system cancels the upper limit of current at inspection startup.	0
Bit2	Decelerating to stop at valid light curtain	During normal-speed running, the elevator decelerates to stop immediately after the light curtain acts. after the light curtain restores, it runs to the registered destination floor. This function is mainly used in the case of manual door.	0
Bit3	Password ineffective after 30 minutes of no operation	If no operation is performed within 30 minutes after entering the password, the operating panel exits the function code interface automatically. The user needs to enter the password again for further operation.	0

Function code	Name	Range	Default	Unit	Property
FC-01	Overload protection selection	0 to 65535	1	-	×

This parameter selects the program function for overload protection.

If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled. Meaning of each bit is explained in the table below.

FC-00 Program control for overload protection			
Bit	Function	Meaning	Default
Bit0	Overload protection	This function enable/disable the overload protection.	1
Bit1	Cancellation of output phase loss protection	This function code enables/disables the protection for output phase loss.	0
Bit2	Over-modulation	0: Over-modulation enabled; 1: Over-modulation disabled.	0
Bit4	Light curtain judgment at door close limit	When this function is enabled, the elevator re-opens the door upon valid light curtain signal	0

FC-00 Program control for overload protection			
Bit	Function	Meaning	Default
		even if there is door close limit.	
Bit5	Cancellation of SPI communication judgement	This function code enables/disables the disconnection detection of the SPI communication between the control board and the drive board.	0
Bit9	Cancellation of Err55 alarm	After car arrival, when the door open limit signal becomes inactive, the elevator runs to the next floor for landing. At the time, Err55 will not be reported.	0
Bit14	Cancellation of input phase loss protection	This function code enables/disables the protection for input phase loss.	0

Function code	Name	Range	Default	Unit	Property
FC-02	Overload protection coefficient	0.50 to 10.00	1.00	-	×

The implementation of this parameter is based on the motor overload current. When an output current is detected to exceed the value of rated motor current multiplied by FC-02, and such current lasts the time specified in the inverse time lag curve, the system will report Err11 which indicates a motor overload fault.

Function code	Name	Range	Default	Unit	Property
FC-03	Overload pre-alarm coefficient	50 to 100%	80%	%	×

The implementation of this parameter is based on the motor overload current. When an output current is detected to exceed the value of rated motor current multiplied by FC-03, and such current lasts the time specified in the inverse time lag curve, the system will output a pre-alarm signal.

Function code	Name	Range	Default	Unit	Property
FC-04	The 1st fault information	0 to 9999	0	-	*

This parameter designates the fault code to be monitored. The designated fault code will be saved in parameters of FC-05 to FC-15, and will not be overwritten.

Function code	Name	Range	Default	Unit	Property
FC-05	Designated fault code	0 to 9999	0	-	*
FC-06	Designated fault subcode	0 to 65535	0	-	*
FC-07	Logic information of designated fault	0 to 65535	0	-	*
FC-08	Curve information of designated fault	0 to 65535	0	-	*
FC-09	Speed reference at designated fault	0.000 to 1.750	0	m/s	*
FC-10	Speed feedback at designated fault	0.000 to 1.750	0	m/s	*
FC-11	Bus voltage at designated fault	0 to 999.9	0	V	*
FC-12	Present position at designated fault	0.0 to 300.0	0	m	*
FC-13	Output current at designated fault	0.0 to 999.9	0	A	*
FC-14	Output frequency at designated fault	0.00 to 99.99	0	Hz	*
FC-15	Torque current at designated fault	0.0 to 999.9	0	A	*

Function code	Name	Range	Default	Unit	Property
FC-16	1st fault code	0 to 9999	0	-	*
FC-17	1st fault subcode	0 to 65535	0	-	*
FC-18	2nd fault code	0 to 9999	0	-	*
FC-19	2nd fault subcode	0 to 65535	0	-	*
...					
FC-34	10th fault code	0 to 9999	0	-	*

Function code	Name	Range	Default	Unit	Property
FC-35	10th fault subcode	0 to 65535	0	-	*

Parameters FC-16 to FC-35 record the latest 10 faults of the elevator.

The fault code is a 4-digit number. The two high digits indicate the floor where the car is located when the fault occurs, and the two low digits indicate the fault code.

For example, the 1st fault code is 0835, indicating that when the 1st fault (Err35) occurs, the car is near floor 8.

The fault subcode is used to locate the causes of the fault.

Function code	Name	Range	Default	Unit	Property
FC-36	Latest fault code	0 to 9999	0	-	*
FC-37	Latest fault subcode	0 to 65535	0	-	*
FC-38	Logic information of the latest fault	0 to 65535	0	-	*
FC-39	Curve information of the latest fault	0 to 65535	0	-	*
FC-40	Speed reference at the latest fault	0.000 to 1.750	0	m/s	*
FC-41	Speed feedback at the latest fault	0.000 to 1.750	0	m/s	*
FC-42	Bus voltage at the latest fault	0 to 999.9	0	V	*
FC-43	Present position at the latest fault	0.0 to 300.0	0	m	*
FC-44	Output current at the latest fault	0.0 to 999.9	0	A	*
FC-45	Output frequency at the latest fault	0.00 to 99.99	0	Hz	*
FC-46	Torque current at the latest fault	0.0 to 999.9	0	A	*

7.14 FD: Communication parameters

Function code	Name	Range	Default	Unit	Property
FD-00	Local address	0 to 127	1	-	×
FD-01	Communication response delay	0 to 20	10	ms	×
FD-02	Communication timeout	0 to 60.0	0	s	×

These parameters set the RS232 serial port communication parameters of the Smile1000 series integrated elevator controller. These RS232 serial port communication parameters are used for communication with the monitor software in the host controller.

- Fd-00 specifies the present address of the controller. The setting of these parameters must be consistent with the setting of the serial port parameters on the host controller.
- Fd-01 specifies the delay for the controller to send data via the serial port.
- Fd-02 specifies the communication timeout time of the serial port. Transmission of each frame must be completed within the time set in this parameter; otherwise, a communication fault occurs.

Function code	Name	Range	Default	Unit	Property
FD-03	Number of elevators in parallel control	0 to 2	1	-	×
FD-04	Elevator number in parallel control	1 to 2	1	-	×

These two parameters are used to set the quantity and serial number of the elevators in parallel control mode.

Function code	Name	Range	Default	Unit	Property
FD-05	Parallel control function selection	Bit0: Dispersed waiting	0	-	×

When Bit0 = 1, the elevator does not return to the base floor in idle time. Based on automatic system arrangement, one elevator waits at the base floor and the other waits at a non-base floor when there are two elevators in parallel control.

Function code	Name	Range	Default	Unit	Property
FD-06	Fan operation mode	0: Start working upon power on 1: Start working after it is enabled; stop working when	1	-	×

Function code	Name	Range	Default	Unit	Property
		the system stops operation 2: Intelligent running			
FD-07	Monitoring channel 1	0 to 65535	0	-	○
FD-08	Monitoring channel 2	0 to 65535	0	-	○
FD-09	Monitoring channel 3	0 to 65535	0	-	○
FD-10	Monitoring channel 4	0 to 65535	0	-	○
FD-11	Dead-zone compensation	0 to 200	100	%	×
FD-12	UV gain difference	85.0 to 115.0	100	%	×
FD-13	TD2 temperature	0 to 999	Actual value	℃	*
FD-14	Reserved	-	-	-	-
FD-15	Reserved	-	-	-	-

7.15 FE: Elevator function setting parameters

Function code	Name	Range	Default	Unit	Property
FE-00	Collective selective mode	0 to 2	0	-	×

It is used to set the collective selective mode of the system.

The values are as follows:

- 0: Full collective selective

  The elevator responds to both up and down hall calls.

- 1: Down collective selective

  The elevator responds to down hall calls but does not respond to up hall calls.

- 2: Up collective selective

  The elevator responds to up hall calls but does not respond to down hall calls

Function code	Name	Range	Default	Unit	Property
FE-01	Floor 1 display	0000 to 1999	1901	-	○
FE-02	Floor 2 display		1902	-	○
...			...		
FE-10	Floor 10 display		0100	-	○
FE-11	Floor 11 display		0101	-	○

Function code	Name	Range	Default	Unit	Property
FE-12	Hall call output selection	0 to 4	1	-	○

- 0: 7-segment code
- 1: BCD code
- 2: Gray code
- 3: Binary code
- 4: One-to-one output

Please set this parameter based on the coding method of the hall call display board. The default setting is BCD code.

For the setting of the 7-segment output point, please refer to the setting instructions of group F7.

BCD/Gray code: The display of a bit is controlled by a Y output point. In the Smile1000 Series, the setting of the output control parameter for each bit is based upon the parameter setting of the 7-segment code. For details, please refer to the table below.

Bit	Y output point setting parameter	Bit	Y output point setting parameter
Low Bit0	10: Low 7-segment a display output	Low Bit3	13: Low 7-segment d display output
Low Bit1	11: Low 7-segment b display output	High bits	28: High bit output of BCD/Gray/7-segment code
Low Bit2	12: Low 7-segment c display output	-	-

Binary code: The display of a bit is controlled by a Y output point. In the Smile1000 Series, the setting of the output control parameter for each bit is based upon the parameter setting of the 7-segment code. For details, please refer to the table below.

Bit	Y output point setting parameter	Bit	Y output point setting parameter
Bit0	10: Low 7-segment a display output	Bit3	13: Low 7-segment d display output

Bit	Y output point setting parameter	Bit	Y output point setting parameter
Bit1	11: Low 7-segment b display output	Bit4	14: Low 7-segment e display output
Bit2	12: Low 7-segment c display output	-	-

One-to-one output: The display of each floor is controlled by a fixed Y output point. In the Smile1000 Series, the setting of the output control parameter for each floor is based upon the parameter setting of the 7-segment code. For details, please refer to the table below.

Floor	Y output point setting parameter	Floor	Y output point setting parameter
1	10: Low 7-segment a display output	9	42: High 7-segment b display output
2	11: Low 7-segment b display output	10	43: High 7-segment c display output
3	12: Low 7-segment c display output	11	44: High 7-segment d display output
4	13: Low 7-segment d display output	12	45: High 7-segment e display output
5	14: Low 7-segment e display output	13	46: High 7-segment f display output
6	15: Low 7-segment f display output	14	47: High 7-segment g display output
7	16: Low 7-segment g display output	15	19: Negative sign display output
8	41: High 7-segment a display output	16	28: High bit output of BCD/Gray/7-segment code

Function code	Name	Range	Default	Unit	Property
FE-13	Elevator function setting selection	0 to 65535	0	-	○

This parameter selects the elevator functions. If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled. Meaning of each bit is explained in the table below.

FE-13 Fire emergency function selection			
Bit	Function	Meaning	Default
Bit2	Re-leveling function	The elevator performs re-leveling at a low speed with door open. An external shorting door lock circuit contactor needs to be used together.	0
Bit3	Advance door open function	During normal stop, when the elevator speed is smaller than a certain value and the door zone signal is active, the system shorts the door lock	0

FE-13 Fire emergency function selection			
Bit	Function	Meaning	Default
		via the shorting door lock circuit contactor, and outputs the door open signal, which is defined as advance door open (or pre-open). This improves the elevator use efficiency	
Bit5	Forced door close	If the door still does not close within the time set in Fb-17 in automatic state, the system outputs the forced door close signal; at the time, the light curtain becomes invalid and the buzzer outputs alarm.	0
Bit6	Door open in non-door zone in the inspection state	In the inspection state, the user can open/close the door by pressing the door open/close button in the non-door zone.	0
Bit7	Door open/close for one time after the switchover from inspection to normal	The elevator door opens and closes once after the system turns from inspection to normal running.	0
Bit9	Independent running	The independent running function is enabled.	0
Bit11	Door re-open after car call of the present floor	The door re-opens if the car call of the present floor is valid during door close.	1

Function code	Name	Range	Default	Unit	Property
FE-14	Elevator function setting selection 2	0 to 65535	0	-	○

This parameter selects the elevator functions. If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled. Meaning of each bit is explained in the table below.

FE-14 Elevator function selection2			
Bit	Function	Meaning	Default
Bit1	Door open holding at open limit	The system still outputs the door open command upon door open limit.	0
Bit2	No door close command output upon door close	The system stops outputting the door close command upon door close limit.	0

FE-14 Elevator function selection2			
Bit	Function	Meaning	Default
	limit		
Bit3	Manual door function selection	When this function is enabled, the system does not output the door open/close command (electric lock output still active), and does not detect door open/ close limit.	0
Bit4	Auto reset for RUN and brake contactor stuck	If the feedback of the RUN and brake contactors is abnormal, faults Err36 and Err37 are reported, and user needs to manually reset the system. With this function, the system resets automatically after the fault symptom disappears. A maximum of three auto reset times are supported.	0
Bit5	Slowdown switch stuck detection	The system monitors the state of slowdown switches. Once a stuck slowdown switch is detected, the system instructs the elevator to slow down immediately and reports a corresponding fault.	0
Bit10	NC output of shorting motor stator contactor	When an NO contactor is used in shorting motor stator, this function code shall be set to 1.	0
Bit12	NC output of fan/lighting	When fan/lighting control relay NO output is needed, this function code shall be set to 1.	0

Function code	Name	Range	Default	Unit	Property
FE-15	Floor 12 display	0000 to 1999	0102	-	○
FE-16	Floor 13 display	0000 to 1999	0103	-	○
FE-17	Floor 14 display	0000 to 1999	0104	-	○
FE-18	Floor 15 display	0000 to 1999	0105	-	○
FE-19	Floor 16 display	0000 to 1999	0106	-	○

The floor display setting method is the same with that of FE-01 to FE-11.

7.16 FF: Manufacturer parameters

<table>
<tr><th>Function code</th><th>Name</th><th>Range</th><th>Default</th><th>Unit</th><th>Property</th></tr>
<tr><td>FF-00</td><td>User password</td><td>0 to 65535</td><td>0</td><td>-</td><td>○</td></tr>
<tr><td>FF-01</td><td>Type of the AC drive</td><td>Each of the following value represents a combination of rated current and matching power of the single-phase 220 V drive.<table><tr><th>Value</th><th>Rated current</th><th>Matching power</th></tr><tr><td>0</td><td>5.5 A</td><td>1.1 kW</td></tr><tr><td>1</td><td>7.7 A</td><td>1.5 kW</td></tr><tr><td>2</td><td>10 A</td><td>2.2 kW</td></tr><tr><td>3</td><td>18 A</td><td>3.7 kW</td></tr><tr><td>4</td><td>23 A</td><td>5.5 kW</td></tr></table>Each of the following value represents a combination of rated current and matching power of the three-phase 380 V drive.<table><tr><th>Value</th><th>Rated current</th><th>Matching power</th></tr><tr><td>10</td><td>5.1 A</td><td>2.2 kW</td></tr><tr><td>11</td><td>9.0 A</td><td>3.7 kW</td></tr><tr><td>12</td><td>13.0 A</td><td>5.5 kW</td></tr><tr><td>13</td><td>18.0 A</td><td>7.5 kW</td></tr><tr><td>14</td><td>27.0 A</td><td>11.0 kW</td></tr><tr><td>15</td><td>33.0 A</td><td>15.0 kW</td></tr><tr><td>16</td><td>39.0 A</td><td>18.5 kW</td></tr><tr><td>17</td><td>48.0 A</td><td>22.0 kW</td></tr></table></td><td>0</td><td>-</td><td>×</td></tr>
</table>

Function code	Name	Range	Default	Unit	Property
		18 60.0 A 30.0 kW 19 75.0 A 37.0 kW 20 91.0 A 45.0 kW 21 112.0 A 55.0 kW			
FF-06	Software under-voltage point	60.0 to 140.0	100.0	1	%
FF-08	Voltage correction coefficient	50.0 to 150.0	100.0	0.1	%
FF-09	Current correction coefficient	50.0 to 150.0	100.0	0.1	
FF-10	Module type	-	-	-	-

7.17 Fr: Leveling adjustment parameters

Function code	Name	Range	Default	Unit	Property
Fr-00	Leveling adjustment mode	0 to 1	0	-	×

This parameter enables the leveling adjustment function.

Function code	Name	Range	Default	Unit	Property
Fr-01	Leveling adjustment record 1	0 to 60060	30030	-	×
Fr-02	Leveling adjustment record 2	0 to 60060	30030	-	×
...					
Fr-08	Leveling adjustment record 8	0 to 60060	30030	-	×

These parameters are used to record the leveling adjustment values. Each parameter records the adjustment information of two floors, and therefore, 40 floor adjustment records are supported totally.

The method of viewing the record is shown in the following figure.

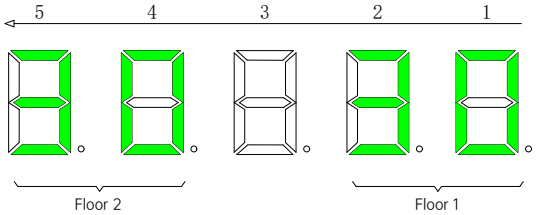


Figure 7-10 Leveling record viewing

As shown in the preceding Figure 7-10, the left two LEDs and the right two LEDs respectively show the adjustment bases of floor 1 and floor 2. If the value is larger than 30, it is upward leveling adjustment; if the value is smaller than 30, it is downward leveling adjustment. The default value "30" indicates that there is no leveling adjustment. The maximum adjustment range is ±30 mm.

The leveling adjustment method is as follows:

1. Ensure that shaft auto-tuning is completed successfully, and the elevator runs properly at normal speed.
2. Set Fr-00 to 1 to enable the car leveling adjustment function. Then, the elevator shields hall calls, automatically runs to the top floor, and keeps the door open after arrival. If the elevator is at the top floor, it directly keeps the door open.
3. Enter the car, press the top floor button, and the leveling position is changed 1 mm upward; press the bottom floor button, and the leveling position is changed 1 mm downward. The value is displayed in the car. Positive value: up arrow + value. Negative value: down arrow + value. Adjustment range: ±30 mm.
4. After completing adjustment for the present floor, press the top floor button and bottom floor button in the car at the same time to save the adjustment result. The car display restores to the normal state. If the leveling position of the present floor does not need to be adjusted, press the top floor button and bottom floor button in the car at the same time to exit the leveling adjustment state. Then, car calls can be registered.
5. Press the door close button, and press the button for the next floor. The elevator runs to the next floor and keeps the door open after arrival. Then, user can perform leveling adjustment.
6. After completing adjustment for all floors, set Fr-00 to 0 to disable the leveling adjustment function. Otherwise, the elevator cannot be used.

7.18 FP: User parameters

Function code	Name	Range	Default	Unit	Property
FP-00	User password	0 to 65535	0	-	○

This parameter sets the user password. When set to 0, it indicates that there is no user password.

If it is set to any non-zero number, the password protection function is enabled. After a password has been set and taken effect, user must enter the correct password in order to enter the menu. If the entered password is incorrect, user cannot view or modify parameters. If FP-00 is set to 00000, the previously set user password is cleared, and the password protection function is disabled. Remember the set password. If the password is set incorrectly or forgotten, contact manufacturer to replace the control board.

Function code	Name	Range	Default	Unit	Property
FP-01	Parameter update	00 to 2	0	-	×

This parameter resets part of the internal parameters of the system. It can be set to the following values.

0: No action

1: Restore default settings

This function resets all parameters (excluding group F1) to default settings. Please use with caution.

2: Clear records

This function clears fault records.

Function code	Name	Range	Default	Unit	Property
FP-02	Check of user-defined settings	0: Invalid 1: Valid	0	-	×

This parameter is used to display the modified parameters. When set to 1, user can view the parameters whose value is different from its default setting.

When it is set to 1, only those parameters whose values are different from their default settings will be displayed in the menu. To view the complete parameters, please set FP-02 to 0 after checking.

Chapter 8 Maintenance and Troubleshooting

8.1 Maintenance

8.1.1 Routine inspection

The influence of the ambient temperature, humidity, dust and vibration will cause the aging of the components inside the controller, thereby leading to potential faults or reduced service life of the controller. Therefore, it is necessary to carry out routine and periodic maintenance.

(1) Routine maintenance involves checking the followings.

- Whether abnormal noise exists during motor running;
- Whether the motor vibrates excessively;
- Whether the installation environment of the controller changes;
- Whether the cooling fan works properly;
- Whether the controller overheats.

(2) Routine cleaning involves the followings.

- Keep the controller clean all the time;
- Remove the dust, especially metal powder on the surface of the controller, to prevent the dust from entering the controller;
- Clear the oil stain on the cooling fan of the controller.

8.1.2 Periodic inspection

Perform periodic inspection on the items that are difficult to check during running.

Periodic inspection involves the followings.

(1) Check and clean the air duct periodically;

(2) Check whether the screws become loose;

(3) Check whether the controller is corroded;

(4) Check whether the wiring terminals have arc signs;

(5) Carry out the main circuit insulation test.

Caution

Before measuring the insulating resistance with megameter (500 V DC megameter is recommended), disconnect the main circuit from the controller. Do not use the insulating resistance meter to test the insulation of the control circuit. It is not required to perform the high voltage test again because it has been completed before delivery.

8.1.3 Replacement of quick-wear parts

Quick-wear parts of the controller include the cooling fan and filter electrolytic capacitor. Their service life is related to the operating environment and maintenance. The service life of the two components is listed in the following table.

Quick-wear parts	Service life
Fan	2 to 3 years
Electrolytic capacitor	4 to 5 years

- Ambient temperature: average 30°C per year
- Load rate: below 80%
- Running time: less than 20 hours per day

(1) Cooling fan

Possible causes of damage: Bearing wear, blade aging.

Inspection criteria: Check for cracks on fan blades, and listen for abnormal vibration noises during operation startup.

(2) Filter electrolytic capacitor

Possible causes of damage: Poor input power quality, high ambient temperature, frequent load fluctuations, electrolyte aging

Inspection criteria: Check for liquid leakage, bulging safety valves, measure electrostatic capacitance, and test insulation resistance.

8.1.4 Controller storage

For storage of the controller, pay attention to the following two aspects.

(1) Pack the controller with the original packing box provided by Megmeet.

(2) Long-term storage degrades the electrolytic capacitor. Thus, the controller must be energized once every 2 years, each time lasting at least 5 hours. The input voltage must be increased slowly to the rated value with the regulator.

8.2 Controller warranty

(1) The free warranty applies only to the controller itself

(2) Under normal use, our company provides an 18-month warranty (starting from the date of manufacture, as indicated by the bar-code on the product; existing contractual agreements shall prevail). After 18 months, reasonable repair fees will be charged.

(3) Within the 18-month warranty period, repair fees will be applied in the following cases:

- Damage caused by improper use not in accordance with the user manual.
- Damage resulting from fires, floods, voltage irregularities, or other external factors.
- Damage caused by using the controller for non-intended purposes.

(4) Service fees shall be calculated according to the manufacturer's standard pricing. Contractual agreements shall take precedence over these terms.

8.3 Fault levels

The Smile1000 series has almost 60 pieces of alarm information and protective functions. It monitors various input signals, running conditions, and feedback signals in real-time. If a fault occurs, the system implements the relevant protective function and displays the fault code.

The controller is a complicated electronic control system, and the displayed fault information is graded into five levels according to the severity. The faults of different levels are handled according to the following table.

Table 8-1 Fault levels

Fault levels	Controller action upon fault	Remarks
Level 1	◆ Display the fault code; ◆ Output the fault relay action command.	1A—The elevator running is not affected on any condition.
Level 2	◆ Display the fault code; ◆ Output the fault relay action command; ◆ Continue normal running of the elevator.	2A—The parallel/group control function is disabled.
		2B—The advance door open and re-leveling functions are disabled.
Level 3	◆ Display the fault code; ◆ Output the fault relay action command; ◆ Stop output and apply	3A—In low-speed running, the elevator stops at special deceleration rate, and can not restart.
		3B—In low-speed running, the elevator does not stop. In normal-speed running, the elevator stops, and then

Fault levels	Controller action upon fault	Remarks
	the brake immediately after stop.	can start running at low speed after a delay of 3 seconds.
Level 4	◆ Display the fault code; ◆ Output the fault relay action command; ◆ In distance control, the elevator decelerates to stop and can not run again.	4A—In low-speed running, the elevator stops at special deceleration rate, and can not restart.
		4B—In low-speed running, the elevator does not stop. In normal-speed running, the elevator stops, and then can start running at low speed after a delay of 3 seconds.
		4C—In low-speed running, the elevator does not stop. In normal-speed running, the elevator stops, and then can start running at low speed after a delay of 3 seconds.
Level 5	◆ Display the fault code; ◆ Output the fault relay action command; ◆ The elevator stops immediately.	5A—In low-speed running, the elevator stops immediately and can not restart.
		5B—In low-speed running, the elevator does not stop. In normal-speed running, the elevator stops, and then can start running at low speed after a delay of 3 seconds.

8.4 Fault information and troubleshooting

If an alarm is reported, the system performs corresponding processing based on the fault level. User can handle the fault according to the possible causes described in the following table.

Code	Name	Possible causes	Solutions	Level
E01	Hardware overcurrent	The main circuit output is grounded or short circuited.	① Check whether the motor wiring and grounding are correct; ② Check whether a short circuit occurs on the controller output side due to abnormalities of shorting motor stator contactor or RUN contactor; ③ Check whether the motor power cable jacket is damaged.	5A
		Motor auto-tuning is not performed, or performed	Set the motor parameters according to its nameplate, and re-perform the motor	

Code	Name	Possible causes	Solutions	Level
		incorrectly.	auto-tuning.	
		Abnormal encoder signal.	① Check whether the value of encoder pulses per revolution is set correctly; ② Check whether the encoder signal is interfered with, whether the encoder cables have independent ducting, whether the cables are too long, and whether the shield is grounded at one end; ③ Check whether the encoder is reliably installed, and whether the connection between the rotating shaft and the motor shaft is fixed and secured without any twisting or instability during high-speed operation; ④ Check whether the encoder is correctly and reliably wired; ⑤ Check whether the system is reliably grounded.	
		The phase sequence in motor connection is incorrect.	Interchange the motor UVW phases, and re-perform the motor auto-tuning.	
		The acceleration/deceleration is too fast.	Reduce the acceleration/deceleration rate.	
		Overcurrent due to dynamic braking.	Check whether there is abnormal braking circuit or braking resistor.	
E02	Overvoltage	Excessive input voltage.	Check whether the input voltage is too high; Monitor and check whether the bus voltage is too high (the bus voltage shall be with the range of 540 V to 580 V when the input voltage stays at 380 V).	5A
		The braking resistance is set too high, or the braking unit is abnormal.	① Check the balance coefficient; ② Check whether the bus voltage increase during operation is too fast; an excessively fast increase in bus voltage	

Code	Name	Possible causes	Solutions	Level
			indicates an idle braking resistor or improper braking resistor model; ③ Check whether the braking resistor wiring cables are damaged, whether the copper wires touch the ground, and whether the connection are reliable; ④ Re-check and confirm that the actual resistance is within the proper range; ⑤ In case an over-voltage occurs every time the elevator reaches the target speed while the braking resistance is set in the proper range, decrease the F2-01/F2-04 value to reduce the curve following error and prevent over-voltage due to system overshoot.	
		Excessive acceleration/deceleration rate in the acceleration/deceleration section.	Reduce the acceleration/deceleration rate.	
E03	Undervoltage	Instantaneous power failure upon power supply input.	① Check whether any power failure occurs during running; ② Check whether the connection is reliable for all the power supply input cables.	5A
		The input voltage is too low.	Check whether the external power voltage is too low.	
		The drive control board is abnormal.	Contact the agent or manufacturer.	
E04	Drive overcurrent	The main circuit output is grounded or short circuited.	① Check whether the motor wiring and grounding are correct; ② Check whether a short circuit occurs on the controller output side due to abnormalities of shorting motor stator contactor of RUN contactor; ③ Check whether the motor power cable	5A

Code	Name	Possible causes	Solutions	Level
			jacket is damaged.	
		Motor auto-tuning is not performed, or performed incorrectly.	Set the motor parameters according to its nameplate, and re-perform the motor auto-tuning.	
		Encoder signal abnormal.	① Check whether the value of encoder pulses per revolution is set correctly; ② Check whether the encoder signal is interfered with, whether the encoder cables have independent ducting, whether the cables are too long, and whether the shield is grounded at one end; ③ Check whether the encoder is reliably installed, and whether the connection between the rotating shaft and the motor shaft is fixed and secured without any twisting or instability during high-speed operation; ④ Check whether the encoder is correctly and reliably wired; ⑤ Check whether the system is reliably grounded.	
		The phase sequence in motor connection is incorrect.	Interchange the motor UVW phases, and re-perform the motor auto-tuning.	
		The acceleration/deceleration is too fast.	Reduce the acceleration/deceleration rate.	
E05	Resistance identification error	Motor abnormal.	Check whether the motor wiring is correct, whether the connection is normal, and whether the motor winding is normal.	5A
		External voltage abnormal.	Check whether the bus voltage is too low or unstable.	
E06	Excessive speed	The speed PI parameters are improper.	Change function code values in parameter group F2.	5A

Code	Name	Possible causes	Solutions	Level
	deviation	Incorrect settings of motor parameters.	Confirm that parameters are correctly configured based on the motor nameplate.	
		The detection threshold for speed deviation is set too small.	Change the detection threshold for speed deviation.	
		The load fluctuation is too strong.	Eliminate the load fluctuation.	
		Abnormal braking action.	Check whether the brake circuit and the corresponding power supply are in normal state.	
		Drive output phase loss during running	Check whether the motor wiring is correct.	
E07	AC drive overheat	The ambient temperature is too high.	Lower the ambient temperature.	5A
		The fan is damaged.	Replace the fan.	
		The air duct is blocked.	① Clean the air duct; ② Check whether the installation clearance of the controller meets the requirements.	
		Abnormal setting of drive model	Check whether the drive model and power are set correctly.	
E08	AC drive phase loss at the output side	The output wiring of the main circuit is loose.	① Check the motor wiring; ② Check whether the RUN contactor at the output side is normal.	5A
		The motor is damaged.	Check whether the internal coil of motor is normal.	
E09	AC drive overload	The external mechanical resistance is too large.	① Check whether the brake is released, and whether the brake power supply is normal; ② Check whether the guide shoes are too tight.	5A
		The balance coefficient is improper.	Check whether the balance coefficient is proper.	

Code	Name	Possible causes	Solutions	Level
		The encoder feedback signal is abnormal.	Check whether the encoder feedback signal and parameter setting are correct, and whether the initial angle of the encoder for the synchronous motor is correct.	
		Motor auto-tuning is not performed properly.	① Check the motor parameter setting and encoder installation angle, and perform motor auto-tuning again; ② If this fault is reported when the slip test is carried on, perform the slip test by using the slip function.	
		The motor phase sequence is incorrect.	Change the UVW phase sequence of motor.	
		The power rating of AC drive model in use is too small.	Replace the model with a larger power rating. (The AC drive model is below requirements, if the actual current reaches above the rated AC drive current when the elevator car without load is in constant speed running.)	
E10	Motor overload	The external mechanical resistance is too large.	① Check whether the brake is released, and whether the brake power supply is normal; ② Check whether the guide shoes are too tight.	5A
		The balance coefficient is improper.	Check whether the balance coefficient is proper.	
		Motor auto-tuning is not performed properly.	① Check the motor parameter setting and encoder installation angle, and perform motor auto-tuning again; ② If this fault is reported when the slip test is carried on, perform the slip test by using the slip function.	
		The motor phase sequence is incorrect.	Change the UVW phase sequence of motor.	

Code	Name	Possible causes	Solutions	Level
		The power rating of motor model in use is too small.	Replace the model with a larger power rating. (The motor model is below requirements, if the actual current reaches above the rated motor current when the elevator car without load is in constant speed running.)	
E11	AC drive input phase loss	The power input phases are not symmetric.	① Check whether any phase of the three-phase power supply is lost; ② Check whether the three phases of power supply are balanced; ③ Check whether the power voltage is normal, and adjust the power voltage.	5A
		The drive control board is abnormal.	Contact the agent or Megmeet.	
E12	Motor software overcurrent	The main circuit output is grounded or short circuited.	① Check whether the motor wiring is correct, and whether the grounding is correct; ② Check whether the shorting motor stator contactor causes controller output short circuit; ③ Check whether the power cable jacket is damaged.	5A
		Motor auto-tuning is not performed.	Perform motor auto-tuning properly according to the motor nameplate.	
		The encoder signal is abnormal.	① Check whether encoder pulses per revolution (PPR) is set correctly; ② Check whether the encoder signal is interfered, whether the encoder cable runs through the duct independently, whether the cable is too long, and whether the shield is grounded at one end; ③ Check whether the encoder is installed reliably, whether the rotating shaft is connected to the motor shaft reliably, and whether the encoder is stable	

Code	Name	Possible causes	Solutions	Level
			during high-speed running; ④ Check whether the encoder wiring is correct and secure; ⑤ Check whether the system is reliably shorted to ground.	
		The motor phase sequence is incorrect.	Change the UVW phase sequence of motor, and perform auto-tuning again.	
		The acceleration/ deceleration time is too short.	Lower the acceleration/deceleration rate.	
E13	Dynamic auto-tuning fault	Subcode 6: The AB directions may be reversed.	① Reverse the AB directions of the encoder in P04-29, and perform auto-tuning again; ② Check whether the brake is released and whether there is any other fault; ③ Confirm that parameters are correctly configured based on the motor nameplate, and conduct the dynamic auto-tuning again afterwards;	5A
		Subcode 7: Timeout.	The speed during auto-tuning is too high. Properly lower the inspection speed.	
		Subcode 8: Sin/Cos encoder A signal abnormality.	① Check whether the encoder works normally; ② Check whether the encoder signal is interfered, whether the encoder wiring cables are routed in independent conduits, whether the routing distance is excessively long, and whether the shield layer is grounded in single-end manner; ③ Check whether the encoder is reliably installed, whether the rotating shaft is firmly connected to the motor shaft, and whether the shaft is stable during high-speed running; ④ Check whether the encoder wiring is	
		Subcode 9: Sin/Cos encoder B signal abnormality.		
		Subcode 10: Sin/Cos encoder AB signal abnormality.		

Code	Name	Possible causes	Solutions	Level
			correct and reliable; ⑤ Check whether the PG card is abnormal; ⑥ Check whether the system is reliably shorted to ground.	
E14	Reserved	-	-	-
E15	Strong encoder interference	The interference to AB signals or Z signal is too strong.	① Check whether encoder pulses per revolution (PPR) is set correctly; ② Check whether the encoder signal is interfered, whether the encoder cable runs through the duct independently, whether the cable is too long, and whether the shield is grounded at one end; ③ Check whether the encoder is installed reliably, whether the rotating shaft is connected to the motor shaft reliably, and whether the encoder is stable during high-speed running; ④ Check whether the encoder wiring is correct and secure; ⑤ Check whether the system is reliably shorted to ground; ⑥ Try re-commissioning.	5A
E16	Reserved	-	-	-
E17	Sin/Cos encoder signal abnormal	Subcode 1: AB disconnection Subcode 2: CD disconnection Subcode 3: Z disconnection Subcode 4: A disconnection Subcode 5:B disconnection.	① Check whether the encoder is abnormal; ② Check the encoder wiring; ③ Check whether the PG card is abnormal; ④ Check whether the system is reliably shorted to ground.	5A
E18	Hardware	Current zero drift	Contact the agent or manufacturer.	5A

Code	Name	Possible causes	Solutions	Level
	abnormal	detection fault.		
E19	STO function abnormal	Subcode 1: The STO hardware feedback is abnormal; Subcode 2: The STO hardware output is abnormal.	Check whether the STO hardware is normal.	5A
E20	Motor short-circuit to ground	AC drive output is short-circuited to ground.	① Check the motor insulation; ② Check whether the motor power cable is shorted to ground; ③ Check whether the contactor is shorted to ground.	5A
Err22	Leveling signal abnormal	101: The leveling signal is active during floor switchover; 102: The falling edge of the leveling signal is not detected during elevator startup and floor switchover; 103: The leveling position deviation is too large in elevator auto-running state; 104: Reserved; 105: Leveling signal is not detected in communication mode	101, 102: Check whether the leveling and door zone switches work properly; check the installation verticality and depth of the leveling plates; check the leveling signal input of the MCB; 103: Check the steel rope for slip; 104: Contact the agent or manufacturer; 105: Check the connection between the leveling switch and the CTB.	1A
Err25	Storage data abnormal	101、102、103: The storage data of the MCB is abnormal.	101、102、103: Contact the agent or manufacturer.	4A
Err26	Earthquake signal	101: The earthquake signal is active and the duration exceeds 2 seconds.	101: Check whether the earthquake signal is consistent with the parameter setting (NC/NO) of the MCB.	3B

Code	Name	Possible causes	Solutions	Level
Err29	Shorting synchronous motor stator feedback abnormal	101: The shorting synchronous motor stator contactor feedback is abnormal.	101: Check whether the state (NO/NC) of the feedback contact on the contactor is correct. Check whether the contactor and corresponding feedback contact act correctly. Check the coil circuit of the shorting synchronous motor stator contactor.	5A
Err30	Elevator position abnormal	101, 102: In the normal-speed running or re-leveling running mode, the running time is larger than the value of F9-02, but the leveling signal has no change; 103: Door zone signal has no change within a certain period of running.	101, 102: Check whether the leveling signal cables are connected reliably and whether the signal copper wires touch the ground or be short-circuited with other signal cables. Check whether the distance between two floors is too large, causing too long re-leveling running time. Check whether signal loss exists in the encoder circuits; 103: Check whether the door zone signal cables are connected reliably, touch the ground, or be shorted with other signal cables. Check whether the floor-to-floor height is too large, or whether the re-leveling time set in F3-21 is too short, causing overlong re-leveling time.	4A
Err33	Elevator speed abnormal	101: The detected running speed during normal-speed running exceeds the limit.; 102: The speed exceeds the limit during inspection or shaft auto-tuning; 103: The speed exceeds the limit in shorting stator braking mode; 104: The speed exceeds the limit during emergency running; 105: The emergency	101: Check whether the encoder is used properly. Check the setting of motor nameplate parameters. Perform motor auto-tuning again; 102: Attempt to decrease the inspection speed or perform motor auto-tuning again; 103: Check whether the shorting motor stator function is enabled; 104, 105: Check whether the emergency power capacity meets the requirements. Check whether the emergency running speed is set properly; 106: Check the wiring of the rotary	5A

Code	Name	Possible causes	Solutions	Level
		running time protection function is enabled (set in Bit8 of F6-69), and the running time exceeds 50 seconds, causing the timeout fault; 106: The MCB speed measuring deviation is too large.	encoder. Check whether the SPI communication between the MCB and the drive board is in good quality.	
Err34	Logic fault	The MCB logic of redundancy judgement is abnormal.	Contact the agent or manufacturer for MCB replacement.	5A
Err35	Shaft auto-tuning data abnormal	101: When shaft auto-tuning is started, the elevator is not at the bottom floor or the down slowdown is invalid; 102: The inspection switch is OFF when shaft auto-tuning is performed; 103: It is judged upon power-on that shaft auto-tuning is not performed; 104: In distance control mode, it is judged at running startup that shaft auto-tuning is not performed; 106, 107, 109, 114: The plate pulse length sensed at up/down leveling is abnormal; 108, 110: No leveling signal is received	101: Check whether the down slowdown switch is valid, and whether F4-01 (current floor) is set to the bottom floor; 102: Check whether the inspection switch is in inspection state; 103, 104: Perform shaft auto-tuning; 106, 107, 109, 114: Check whether the NO/NC setting of the leveling switch is set correctly. Check whether the leveling plates are inserted properly and whether there is strong power interference in case the leveling switch signal blinks. Check whether the leveling plate is too long for the asynchronous motor; 108, 110: Check whether any leveling signal is received when the running time exceeds the value of F9-02; 111, 115: Enable the ultra-short floor function if the floor-to-floor distance of any floor is less than 50 cm. If the floor distance is normal, check the installation of the leveling plate for this floor and check the sensor; 112: Check whether the setting of F6-00	4C

Code	Name	Possible causes	Solutions	Level
		within 45 seconds of continuous running; 111, 115: The stored floor height is smaller than 50 cm; 112: The floor is not the top floor when auto-tuning is completed; 113: The pulse check is abnormal.	(Top floor of the elevator) is smaller than the actual condition; 113: Check whether the signal of the leveling switch is normal. Perform shaft auto-tuning again.	
Err36	RUN contactor feedback abnormal	101: The feedback of the RUN contactor is active, but the contactor has no output; 102: The controller outputs the RUN signal but receives no RUN feedback; 103: The startup current of the asynchronous motor is too small; 104: When both feedback signals of the RUN contactor are enabled, their states are inconsistent.	101, 102, 104: Check whether the feedback contact of the contactor acts properly. Check the signal feature (NO/NC) of the feedback contact; 103: Check whether the output UVW cables of the controller are connected properly. Check whether the control circuit of the RUN contactor coil is normal.	5A
Err37	Brake contactor feedback abnormal	101: The output of the brake contactor is inconsistent with the feedback; 102: When both feedback signals of the brake contactor are enabled, their states are inconsistent;	101 to 107: Check whether the brake coil and feedback contact are correct. Check the signal feature (NO/NC) of the feedback contact. Check whether the control circuit of the brake contactor coil is normal; 105: Check whether the feedback contact of the brake contactor malfunctions.	5A

Code	Name	Possible causes	Solutions	Level
		103: The output of the brake contactor is inconsistent with the feedback 2; 104: When both feedback 2 signals of the brake contactor are enabled, their states are inconsistent; 105: The brake contactor feedback is active before the brake releases; 106: The brake contactor output is inconsistent with the brake travel switch 2 feedback; 107: When a feedback contact of brake travel switch 2 is enabled for multiple functions, their states are inconsistent.		
Err38	Encoder signal abnormal	101: Pulse signal in F4-03 does not change within the time threshold in of F1-13; 102: The running direction and pulse direction are inconsistent; 103: F4-03 decreases in motor up running; 104: The SVC is used in distance control mode; 105: During up running, the down level-1 slowdown switch	101: Check whether the rotary encoder wiring is correct (Perform manual rotation to check whether F4-03 changes). Check whether the brake works normally; 102, 103: Check whether the parameter setting and wiring of the rotary encoder are correct. Check whether the system grounding and signal grounding are reliable. Check whether the UVW phase sequence of the motor is correct; 104: Set F0-00 (Control mode) to 1 (FVC) in distance control mode; 105, 106: Check whether the elevator rolls back at startup on the terminal floor.	5A

Code	Name	Possible causes	Solutions	Level
		becomes active and the down limit switch operates; 106: During down running, the up slowdown switch 1 becomes active and the up limit switch operates.	Check whether the wiring of the down limit switch is normal.	
Err39	Motor overheat	101: The motor overheat relay input remains valid for a certain time.	101: Check whether the thermal protection relay is normal. Check whether the motor is used properly and whether it is damaged. Improve the cooling conditions of the motor.	3A
Err40	Reserved	Reserved	Contact the agent or manufacturer.	4B
Err41	Safety circuit disconnected	101: The safety circuit signal becomes OFF.	101: Check the safety circuit switches and their states. Check whether the external power supply is normal. Check whether the safety circuit contactor acts properly. Confirm the signal feature (NO/NC) of the feedback contact of the safety circuit contactor.	5A
Err42	Door lock disconnected during running	101: The door lock circuit feedback is invalid during the elevator running.	101: Check whether the hall door lock and the car door lock are in good contact. Check whether the door lock contactor acts properly. Check the signal feature (NO/NC) of the feedback contact on the door lock contactor. Check whether the external power supply is normal.	5A
Err43	Up limit signal abnormal	101: The up limit switch acts when the elevator is running in the up direction; 102: In the inspection state, the up button and up limit switch are active at the same	101: Check the signal feature (NO/NC) of the up limit switch. Check whether the up limit switch is in good contact. Check whether the limit switch is installed at a relatively low position and acts even when the elevator arrives at the terminal floor normally; 102: Check whether the release of the up	4C

Code	Name	Possible causes	Solutions	Level
		time.	button discontinues the elevator up process. Check the signal feature (NO/NC) of the up limit switch. Check whether the up limit switch is in good contact.	
Err44	Down limit signal abnormal	101: The down limit switch acts when the elevator is running in the down direction; 102: In the inspection state, the down button and down limit switch are active at the same time.	101: Check the signal feature (NO/NC) of the down limit switch. Check whether the down limit switch is in good contact. Check whether the limit switch is installed at a relatively high position and thus acts even when the elevator arrives at the terminal floor normally; 102. Check whether the release of the down button discontinues the elevator down process. Check the signal feature (NO/NC) of the down limit switch. Check whether the down limit switch is in good contact.	4C
Err45	Slowdown switch position abnormal	101: The down slowdown distance is insufficient during shaft auto-tuning; 102: The up slowdown distance is insufficient during shaft auto-tuning; 103: The slowdown position is abnormal during normal running; 104, 105: The elevator speed exceeds the maximum value when slowdown is enabled.	101 to 103: Check whether the up slowdown and the down slowdown switches are in good contact. Check the signal feature (NO/NC) of the up slowdown and the down slowdown. 104, 105: Ensure that the obtained slowdown distance satisfies the slowdown requirement at the elevator speed.	4B
Err46	Re-leveling abnormal	101: The leveling signal is inactive during re-leveling; 102: The re-leveling	101: Check whether the leveling signal is normal; 102: Check whether the encoder is used	2B

Code	Name	Possible causes	Solutions	Level
		speed exceeds 0.1 m/s; 103: At startup of normal-speed running, the re-leveling state is valid and there is shorting door lock circuit feedback; 104: During re-leveling, no shorting door lock circuit feedback or door lock signal is received 2 second after shorting door lock circuit output	properly; 103, 104: Check whether the signal of the leveling switch is normal. Check the signal feature (NO/NC) of the feedback contact on the shorting door lock circuit contactor, and check the relay and wiring of the SCB-A board.	
Err47	Shorting door lock circuit contactor abnormal	101: In re-leveling or advance door open mode, the shorting door lock circuit contactor outputs continuously for 2 seconds, but the feedback is invalid and the door lock is disconnected; 102: In re-leveling or advance door open mode, the shorting door lock circuit contactor has no output, but the feedback is valid for 2 seconds; 103: In re-leveling or advance door open mode, the output time of the shorting door lock circuit contactor	101, 102, 106: Check the signal feature (NO/NC) of the feedback contact on the shorting door lock circuit contactor. Check whether the shorting door lock circuit contactor acts properly; 103: Check whether the leveling and re-leveling signals are normal. Check whether the re-leveling speed is set too low.	2B

Code	Name	Possible causes	Solutions	Level
		is larger than 15 seconds; 106: The shorting door lock circuit relay feedback is active through detection before re-leveling.		
Err48	Door open fault	101: The consecutive times that the door does not open to the limit reaches the setting in Fb-13.	101: Check whether the door operator system works properly. Check whether the CTB is normal. Check whether the door open limit signal is normal.	5A
Err49	Door close fault	101: The consecutive times that the door does not close to the limit reaches the setting in Fb-13.	101: Check whether the door operator system works properly. Check whether the CTB is normal. Check whether the door lock acts properly.	5A
Err50	Consecutive loss of leveling signal	① Leveling signal stuck or loss occurs for three consecutive times (Err22 is reported for three consecutive times).	① Check whether the leveling and door zone sensors work properly; ② Check the installation verticality and depth of the leveling plates; ③ Check the leveling signal input points of the MCB. Check whether the steel rope slips.	5A
Err53	Door lock fault	101: The door lock feedback signal remains active for more than 3 seconds during door open; 102: The states of multiple door lock feedback signals are inconsistent for more than 2 seconds; 105: The door lock 1 shorting signal remains active 3	101: Check whether the door lock circuit is normal. Check whether the feedback contact of the door lock contactor acts properly; 102, 105: Check whether the door opens smoothly without lock hook being blocked. Check whether the door opens at a too low speed. Check whether the door lock circuit is shorted; 107: Check whether the shorting door lock circuit feedback cable is disconnected.	5A

Code	Name	Possible causes	Solutions	Level
		seconds after door open output, with shorting door lock circuit enabled; 107: The door lock shorting signal is selected, but the feedback signal is continuously disconnected.		
Err54	Overcurrent at inspection startup	The current at startup for inspection exceeds 120% of the rated current.	① Do not have unbalanced load, or reduce the load during installation in inspection mode; ② Check whether the motor parameters obtained through auto-tuning are correct and perform auto-tuning again if possible; ③ Check whether the mechanical resistance is too large; ④ Set the Bit1 of FC-00 to ON to disable the startup overcurrent detection.	5A
Err55	Stop at another landing floor	101: During automatic running of the elevator, the door open limit is not reached at the present floor.	101: Check the door open limit signal at the present floor.	1A
Err57	SPI communication abnormal	101, 102: The SPI communication is abnormal. No correct data is received for 2 seconds in communication with DSP; 103: The MCB does not match the AC drive	101, 102: Check the wiring between the control board and the drive board. 103: Contact the agent or manufacturer.	5A
Err58	Shaft position	101: The up slowdown	101, 102: Check whether the states (NO/NC)	4B

Code	Name	Possible causes	Solutions	Level
	switches abnormal	and down slowdown are disconnected simultaneously; 102: The up limit feedback and down limit feedback are disconnected simultaneously.	of the slowdown switches and limit switches are consistent with the parameter setting of the MCB. Check whether malfunction of the slowdown switches and limit switches occurs.	
Err62	Analog input cable broken	The analog input cable of the CTB or the MCB is broken.	① Check whether F8-08 is set correctly; ② Check whether the analog input cable of the CTB or MCB is connected incorrectly or broken.	3B
Err65	UCMP test abnormal	101: This fault is reported when the car moves unexpectedly.	① Check whether the brake is fully closed and ensure that the car does not move unexpectedly; ② Check the gap between the door vane and door roller and ensure there is no contact between them during operation.	5A
Err66	Braking force abnormal	101: The braking force is detected to be insufficient, and this fault will be reported.	Check the braking force.	5A

Caution

- ✧ The number (such as 1, 3...101, 102, 103...) in the above table indicates the fault subcode;
- ✧ Fault E41 is not recorded in the elevator stop state;
- ✧ E42 is reset automatically when the door lock circuit is connected or 1 second after the fault occurs in the door zone;
- ✧ If the fault E57 persists, it is recorded once every one hour.

Chapter 9 EMC

9.1 Definition of Terms

(1). EMC

Electromagnetic compatibility (EMC) describes the ability of electronic and electrical devices or systems to work properly in the electromagnetic environment and not to generate electromagnetic interference that influences other local devices or systems. In other words, EMC includes two aspects: the electromagnetic interference generated by a device or system must be restricted within a certain limit; the device or system must have sufficient immunity to the electromagnetic interference in the environment.

(2). First environment

Environment that includes domestic premises. It also includes establishments directly connected without intermediate transformers to a low-voltage power supply network which supplies buildings used for domestic purposes.

(3). Second environment

Environment that includes all establishments other than those directly connected to a low-voltage power supply network which supplies buildings used for domestic purposes.

(4). Category C1 controller

Power Drive System (PDS) of rated voltage less than 1000 V, intended for use in the first environment.

(5). Category C2 controller

PDS of rated voltage less than 1000 V, which is neither a plug in device nor a movable device and, when used in the first environment, is intended to be installed and commissioned only by a professional.

(6). Category C3 controller

PDS of rated voltage less than 1000 V, intended for use in the second environment and not intended for use in the first environment.

(7). Category C4 controller

PDS of rated voltage equal to or above 1000 V or of rated current equal to or above 400 A, or intended for use in complex systems in the second environment.

9.2 Introduction to EMC standard

9.2.1 Installation environment

The system manufacturer using the controller is responsible for compliance of the system with the European EMC directive. Based on the application of the system, the integrator must ensure that the system complies with standard EN 61800-3: 2004 Category C2, C3 or C4. The system (machinery or appliance) installed with the controller must also have the CE mark. The system integrator is responsible for compliance of the system with the EMC directive and standard EN 61800-3: 2004 Category C2.


Caution

If applied in the first environment, the controller may generate radio interference. Besides the CE compliance described in this chapter, users must take measures to avoid such interference, if necessary.

9.2.2 Requirements on satisfying the EMC directive

(1) The controller requires an external EMC filter. The recommended filter models are listed in Table 9-1. The cable connecting the filter and the controller should be as short as possible and be no longer than 30 cm. Furthermore, install the filter and the controller on the same metal plate, and ensure that the grounding terminal of the controller and the grounding point of the filter are in good contact with the metal plate.

(2) Select the motor and the control cable according to the description of the cable in the corresponding section.

(3) Install the controller and arrange the cables according to the cabling and grounding requirements in the corresponding section.

(4) Install an AC reactor to restrict the current harmonics.

9.3 Selection of peripheral EMC devices

Installation of EMC input filter on power input side

An EMC filter installed between the controller and the power supply can not only restrict the interference of electromagnetic noise in the surrounding environment on the controller, but also prevents the interference from the controller on the surrounding equipment. The Smile1000 series controller satisfies the requirements of category C2 only with an EMC filter installed on the power input side. The installation precautions are as follows.

(1) Strictly comply with the ratings when using the EMC filter. The EMC filter is category I electric apparatus, and therefore, the metal housing ground of the filter should be in good contact with the

metal ground of the installation cabinet on a large area, and requires good conductive continuity. Otherwise, it will result in electric shock or poor EMC effect.

(2) The grounds of the EMC filter and the PE conductor of the controller must be tied to the same common ground. Otherwise, the EMC effect will be affected seriously

(3) The EMC filter should be installed as closely as possible to the power input side of the controller

The following table lists the recommended manufacturers and models of EMC filters for the Smile1000 controller. Select a proper one based on actual requirements.

Table 9-1 Recommended manufacturers and models of EMC filter

Controller Model	Power capacity (kVA)	Rated input current (A)	AC input filter model (Changzhou Jianli)	AC input filter model (Schaffner)
Three-phase 380 V. Range: 380 to 440 V				
Smile1000-4T5.5	8.5	14.8	DL-16BK5	FN 3258-16-44
Smile1000-4T7.5	11.0	20.5	DL-25BK5	FN 3258-30-33
Smile1000-4T11	17.0	29.0	DL-35BK5	FN 3258-30-33
Smile1000-4T15	21.0	36.0	DL-50BK5	FN 3258-42-33
Smile1000-4T18.5	24.0	41.0	DL-50BK5	FN 3258-42-33
Smile1000-4T22	30.0	49.5	DL-50BK5	FN 3258-55-34
Smile1000-4T30	40.0	62.0	DL-65BK5	FN 3258-75-34
Smile1000-4T37	57.0	77.0	DL-80BK5	FN 3258-100-35
Smile1000-4T45	69.0	93.0	DL-100BK5	FN 3258-100-35
Smile1000-4T55	85.0	113.0	DL-130BK5	FN 3258-130-35
Smile1000-4T75	114.0	157.5	DL-160BK5	FN 3258-180-35

9.4 Requirements on shielded cable and wiring

9.4.1 Requirements on shielded cable

The shielded cable must be used to satisfy the EMC requirements. Shielded cables are classified into three-conductor cable and four-conductor cable. If conductivity of the cable shield is not sufficient, add an independent PE cable, or use a four-conductor cable, of which one phase conductor is PE, as shown below.

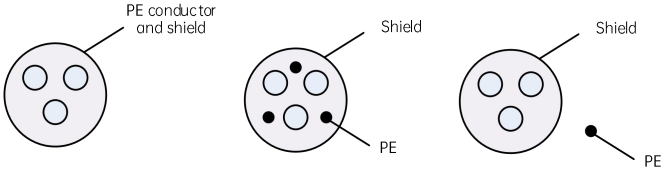


Figure 9-1 Cross-sectional diagram of shielded cables

The motor cable and PE shielded conducting wire (twisted and shielded) should be as short as possible to reduce electromagnetic radiation and external stray current and capacitive current of the cable.

To suppress emission and conduction of the radio frequency interference effectively, the shield of the shielded cable is copper braid. The braided density of the copper braid should be greater than 90% to enhance the shielding efficiency and conductivity, as shown in the following figure.

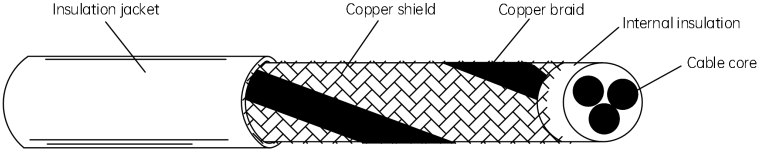


Figure 9-2 Braided density

It is recommended that all control cables be shielded. The grounding area of the shielded cable should be as large as possible. A suggested method is to fix the shield on the metal plate using the metal cable clamp so as to achieve good contact, as shown in the following figure.

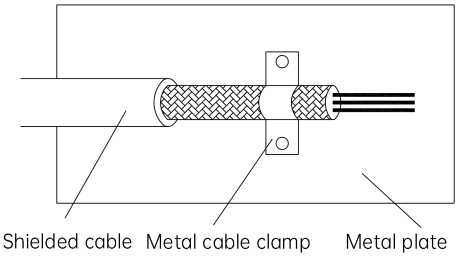


Figure 9-3 Fixing the shield with a metal cable clamp

9.4.2 Installation precautions of the shielded cable

(1) Symmetrical shielded cable is recommended. The four-conductor shielded cable can also be used as an input cable.

(2) The motor cable and PE shielded conducting wire (twisted and shielded) should be as short as possible to reduce electromagnetic radiation and external stray current and capacitive current of the cable. If the motor cable is over 100 meters long, an output filter or reactor is required.

(3) It is recommended that all control cables be shielded.

(4) It is recommended that a shielded cable be used as the output power cable of the controller; the cable shield must be reliably grounded. For devices suffering from interference, shielded twisted pair cable is recommended as the lead wire and the cable shield must be well grounded.

9.4.3 Wiring requirement

(1) The motor cables must be laid far away from other cables, with recommended distance larger than 0.5 m. The motor cables of several controllers can be laid side by side;

(2) It is recommended that the motor cables, power input cables and control cables be laid in different ducts. To avoid electromagnetic interference caused by rapid change of the output voltage of the controller, the motor cables and other cables must not be laid side by side for a long distance;

(3) If the control cable must run across the power cable, make sure they are arranged at an angle of close to 90°. Other cables must not run across the controller;

(4) The power input and output cables of the controller and weak-current signal cables (such as control cable) should be laid vertically (if possible) rather than in parallel;

(5) The cable ducts must be in good connection and well grounded. Aluminium ducts can be used to improve electric potential;

(6) The filter and controller should be connected to the cabinet properly, with spraying protection at the installation part and conductive metal in full contact;

(7) The motor should be connected to the system (machinery or appliance) properly, with spraying protection at the installation part and conductive metal in full contact.

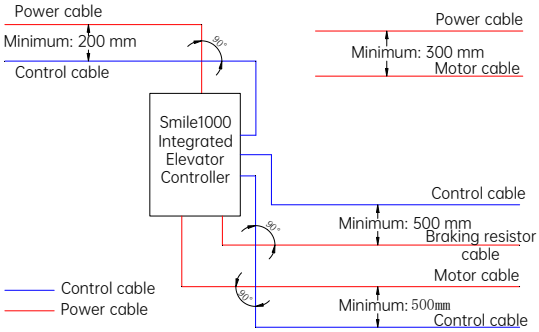


Figure 9-4 Wiring diagram

9.5 Solutions to common EMC interference problems

The controller generates very strong interference. Although EMC measures are taken, the interference may still exist due to improper cabling or grounding during use. When the controller interferes with other devices, adopt the following solutions.

Interference type	Solution
Leakage protection switch tripping	◆ Connect the motor housing to the PE of the controller. ◆ Connect the PE of the controller to the PE of the mains power supply. ◆ Add a safety capacitor to the power input cable. ◆ Add magnetic rings to the input drive cable
Controller interference during running	◆ Connect the motor housing to the PE of the controller. ◆ Connect the PE of the controller to the PE of the mains power supply. ◆ Add a safety capacitor to the power input cable and wind the cable with magnetic rings. ◆ Add a safety capacitor to the interfered signal port or wind the signal cable with magnetic rings. ◆ Connect the equipment to the common ground.
Communication interference	◆ Connect the motor housing to the PE of the controller. ◆ Connect the PE of the controller to the PE of the mains power supply. ◆ Add a safety capacitor to the power input cable and wind the cable with magnetic rings. ◆ Add a matching resistor between the communication cable source and the load side. ◆ Add a common grounding cable besides the communication cable. ◆ Use a shielded cable as the communication cable and connect the cable shield to the common grounding point.
I/O interference	◆ Enlarge the capacitance at the low-speed DI. A maximum of 0.11 μF capacitance is recommended. ◆ Enlarge the capacitance at the AI. A maximum of 0.22 μF is recommended.