NICE100+ Integrated Open-Loop Elevator Controller User Guide

A00
Data code: 19010615

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Preface

Thank you for purchasing the NICE100+ integrated open-loop elevator controller.

NICE100+ is a new-generation integrated elevator controller independently developed and manufactured by Inovance, by optimizing the MD380L open loop elevator AC drive. NICE100+ has the following advantages: a) Using high-performance vector control technology, it supports both open loop vector control and V/F control; b) It drives an AC asynchronous motor without the need of an encoder. NICE100+ serves a maximum of 12 floors full collective with extension board and is widely used in low rise elevators.

This manual provides guidance on correct use of the NICE100+, including information on product features, safety precautions, construction and installation, operation, maintenance, and troubleshooting. Read and understand the manual before using the product, keep it carefully for future operation and maintenance.

The personnel who involve in system installation, commissioning, and maintenance must receive necessary trainings on safety and use of the product, understand this manual thoroughly, and have related experience before performing commissioning and maintenance tasks.

NOTE
■ For illustration purpose, the drawings in the manual are sometimes shown without covers or protective guards. Remember to install the covers or protective guards as specified before using the product and operate in accordance with the instructions. ■ The drawings in the manual are for illustration only. Actual products may vary. ■ The instructions are subject to change, without notice, due to product upgrade, specification modification as well as efforts to increase the accuracy and convenience of the manual. ■ Contact our agents or customer service center if you need a new user manual or have problems during the use.

Check the delivered product:

Upon unpacking, check:

◆ Whether the nameplate model and controller ratings are consistent with your order.
◆ Whether the controller is damaged during transportation. If you find any omission or damage, contact your supplier or Inovance immediately.

For first-time use:

For users who use this product for the first time, read this manual carefully. If you have any problem concerning the functions or performance, contact the technical support personnel of Inovance to ensure correct use.

Introduction

1. Connection to peripheral devices

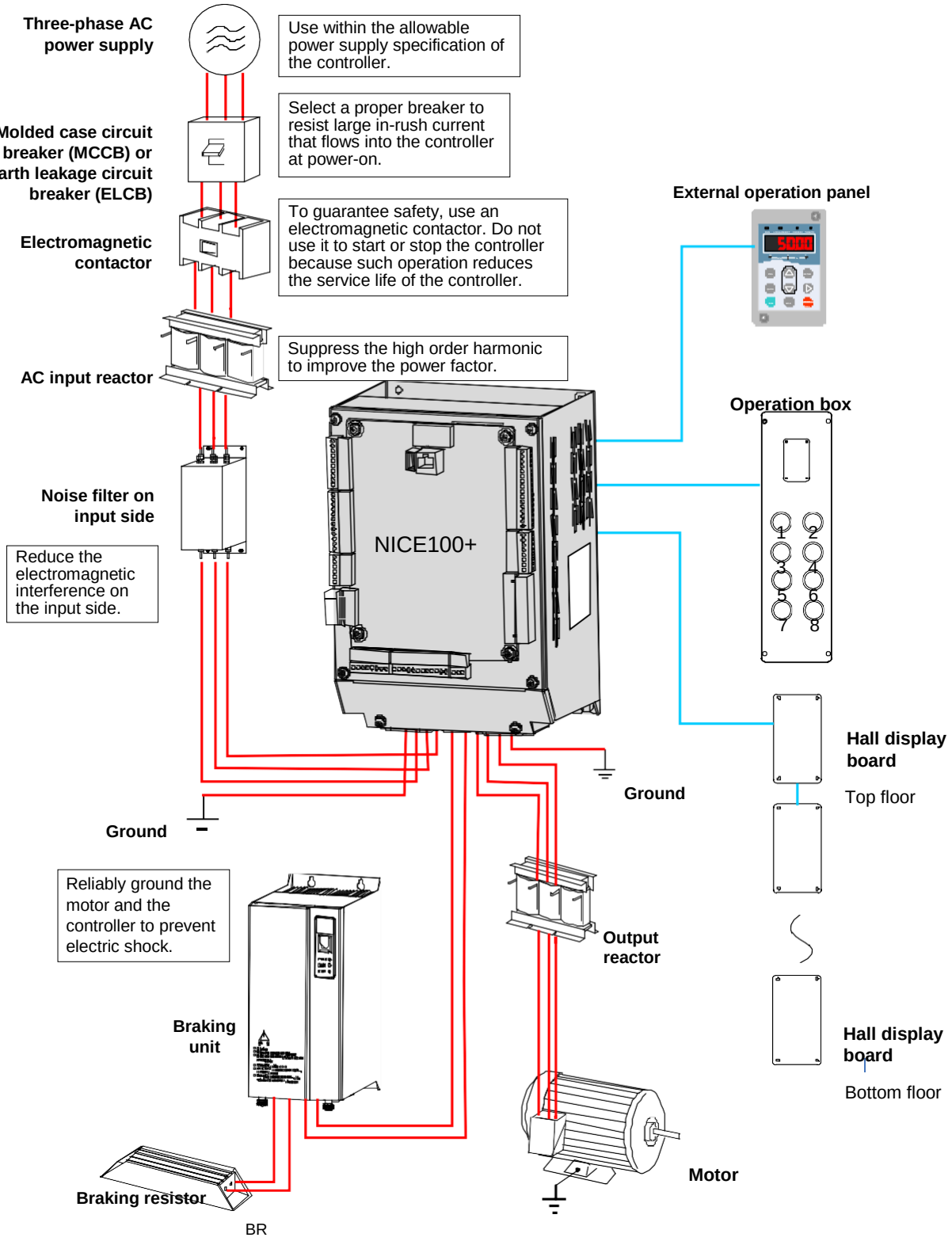

Figure 1. Connection diagram between NICE100+ and peripheral devices

NOTE

- The preceding figure is a schematic diagram showing the interconnection between the controller and its peripheral devices.
- Some of the peripheral devices are obtainable through Inova. Contact our commercial staff if you need.
- The controller must be installed inside a power distribution box. Grounding is required for the power distribution box.

2. NICE100+ Basic Configuration

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Safety Instructions

-11-

Safety Disclaimer

- Read and comply with the safety instructions before you are performing any installation, operation, and maintenance on the equipment.
- To ensure the safety of humans and the device, follow the marks on the device and all the safety instructions in this document.
- The “CAUTION”, “WARNING”, and “DANGER” are only supplements to the safety instructions.
- Use this equipment based on the designated environment requirements. Damages caused by improper usage are not covered by warranty.
- The company shall take no responsibility of any personal injuries or property damages caused by improper usage.

Safety Levels and Definitions

1. The Danger ”Danger” sign indicates that failure to comply with the notice will result in server personal injuries or even death.

2. The Warning ”Warning” sign indicates that failure to comply with the notice may result in server personal injuries or even death.

3. The Caution ”Caution” sign indicates that failure to comply with the notice may result in minor or moderate personal injuries or damage to the equipment.

Safety Instructions

Unpacking
Caution ◆ Check whether the packing is intact and whether there is damage, water seepage, damp, and deformation. ◆ Unpack the package following the package sequence. Do not hit the package with force. ◆ Check whether there are damages, rust, or injuries on the surface of the product or product accessories. ◆ Check whether the number of packing materials is consistent with the packing list.
Warning ◆ Do not install the equipment if you find damages, corrosions, or indications of use on the product or accessories. ◆ Do not install the equipment if you find water seepage, component missing or damage upon unpacking. ◆ Do not install the equipment if you find the packing list does not conform to the equipment you received.
Storage and Transportation
Caution ◆ Store this equipment based on the storage and transportation requirements on humidity and temperature. ◆ Avoid transporting the equipment in environment such as water splashing, rain, direct sunlight, high voltage, strong magnetic field, and strong vibration. ◆ Avoid storing the product for more than 3 months, long-term storage shall require stricter protection and necessary inspections. ◆ Pack the product strictly before you transport. Use a sealed box for long-distance transportation. ◆ Never transport this product with products or materials that harm or have negative impacts on this product.

Warning

- Use professional loading and unloading equipment to carry large-scale or heavy products.
- When carry this equipment with bear hand, hold the product casing firmly with care preventing from parts falling, otherwise, it may result in personal jury or equipment damages.
- Handle the products with care, mind your steps, otherwise, it may result in personal juries or equipment damages.
- Never stand or stay below the equipment when the equipment is lifted by hoisting equipment.

Installation

Warning

- Read and comply with the safety instructions before performing installation.
- Do not modify this product.
- Do not rotate the product components or the fixed bolts and red marked bolts on product components.
- Do not install this product in places where there is strong electric field or strong magnetic field.
- When this product is installed in a cabinet or terminal device, the cabinet or terminal device must be equipped with protective shell. The proof class must comply with relevant IEC standards and local regulations.

Danger

- Do not allow non-professionals to perform product installation, wiring, maintenance, inspection or parts replacement.
- The installation, wiring, maintenance, inspection and parts replacement are intended to be performed by professional personnel only.
- Installation personnel must be familiar with product installation requirements and relevant technical materials.
- If you need to install transformer or other strong electromagnetic interference equipment, install shielding device at the same time to avoid product malfunction.

Wiring

Danger

- Do not allow non-professionals to perform product installation, wiring, maintenance, inspection or parts replacement.
- Never perform wiring at power-on. Failure to comply may result in electric shock.
- Cut off all power supplies before wiring. Wait at least 10 minutes after power-off so that residual voltage can discharge safely. Wait at least 10 minutes after power-off so that residual voltage can discharge safely.
- Make sure that the equipment is reliably grounded. Failure to comply may result in electric shock.
- Following the proper electrostatic discharge (ESD) procedures, and wear an anti-static wrist strap to perform wiring. Failure to comply may result in damage to the equipment or the internal circuit the product.

Warning

- Never connect the power cable with the product output terminals (U, V, W.). Failure to comply may result in equipment damage or even fire.
- When connecting driving equipment with the motor, make sure the phase sequence of the drive and motor are consistent to prevent motor reverse rotation.
- The cable used in wiring must conform to the wire diameter and shielding requirements, the shielding layer of the shielded cable must be reliably grounded at one end.
- After wiring, make sure there are no fallen screws or exposed wire inside the cabinet or product.

Power-on

Danger

- Before power-on, make sure that the equipment or products are intact, all wiring are safely connected, and the motor device allows a restart.
- Before power-on, check if the power supply meets the equipment requirements, avoid equipment damage or fire.
- At power-on, equipment or product may start running abruptly, keep away from mechanical device.
- After power-on, never open the cabinet door or the protective shell to avoid electric shock.
- Never touch any terminals at power-on to avoid electric shock.
- Never dismantle the equipment or remove any parts from the equipment at power-on to avoid electric shock.

Operation

Danger

- Never touch any terminals during operation. Failure to comply may result in electric shock.
- Never dismantle the equipment or remove any parts from the equipment during operation. Failure to comply may result in electric shock.
- Never touch the equipment shell, fan or resistor for temperature detection. Failure to comply may result in burn!
- Do not allow non-professional technicians to detect signals during operation. Failure to comply may result in equipment damage even personal injuries.

Warning

- Prevent metal or other objects from falling into the device during operation, failure to comply may result in equipment damage.
- Never use contactors to start or stop the equipment. Failure to comply may result in damage to the equipment!

Maintenance

Danger

- Do not allow non-professionals to perform product installation, wiring, maintenance, inspection or parts replacement.
- Never perform maintenance at power-on. Failure to comply may result in electric shock.
- Before maintenance, wait at least 10 minutes after power-off so that residual voltage can discharge safely.

Warning

- Following the equipment repair and maintenance requirements to perform routine and periodical inspection and maintenance, and keep a maintenance record.

Repair

Danger

- Do not allow non-professionals to perform product installation, wiring, maintenance, inspection or parts replacement.
- Never perform any inspection or maintenance operations at power-on. Failure to comply may result in electric shock.
- Before inspection or maintenance, wait at least 10 minutes so that residual voltage can discharge safely.

Warning

- Following the terms defined in the warranty agreement to repair the product.
- When the equipment has a fault or is damaged, follow the instructions of the professionals to perform troubleshooting or maintenance, and keep a maintenance record.
- Following the instructions of the quick-wear parts instructions to replace the damaged parts.
- Do not continue to use the damaged equipment. Failure to comply may result in worse damages.
- After replacement, perform a re-check of the wiring and specifications.

Disposal

Warning

- Following the local regulations or standards to dispose the retired equipment or products. Failure to comply may result in property damage or even death.
- Following the industry waste disposal standards to recycle the scrapped equipment to avoid environmental pollution.

Safety signs

To guarantee safety operations and maintenance of the equipment, follow the safety stickers on the equipment and products. Do not stain or remove the safety signs. Instructions of safety signs are as follows:

Safety signs	Instructions
	◆ Read this notice before installation and operation. Failure to comply may result in electric shock. ◆ Do not remove the cover within 10 minutes of power-off. ◆ During maintenance, inspection or wiring, you may start operation at least 10 minutes after power-off at the input/output terminal when the power indicators are completely off.

1 General Precautions

◆ Requirements on residual current device (RCD)

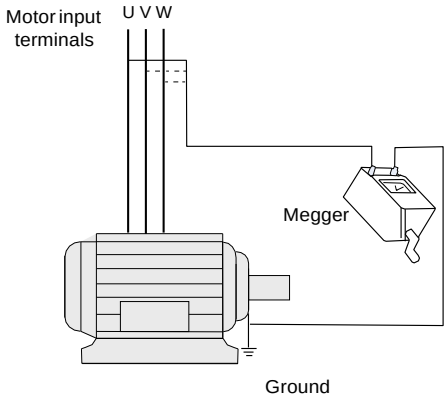
The controller generates high leakage current during running, which flows through the protective earthing conductor. Install a type-B RCD at primary side of the power supply. When selecting the RCD, you should consider the transient and steady-state leakage current to ground that may be generated at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

◆ 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.

◆ Motor insulation test

Perform the insulation test when the motor is used for the first time, or when it is re-used after being stored for a long time, or in a regular check-up, 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.



◆ Thermal protection of motor

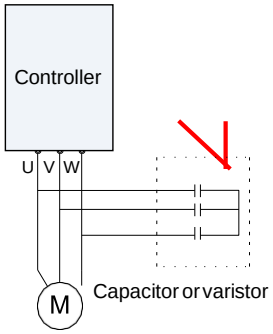
If the rated capacity of the motor selected does not match that of the controller, especially when the rated power of the controller is greater than that of the motor, adjust the motor protection parameters on the operating panel of the controller or install a thermal relay for the motor circuit for protection.

◆ Motor heat and noise

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

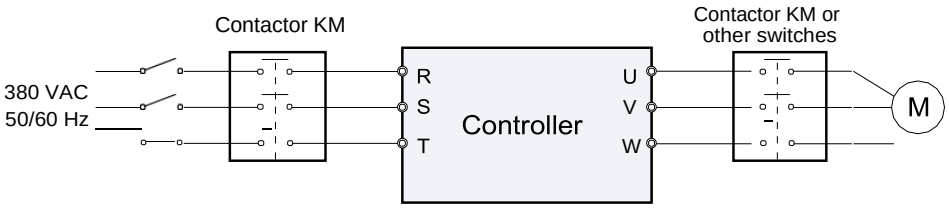
◆ Voltage-sensitive device or capacitor on the output side of the controller

The controller outputs PWM waves. Do not install the capacitor for improving power factor or lightning protection voltage-sensitive resistor on the output side of the controller. These may cause transient overcurrent or even damage to the controller.



◆ Contactor on the input and output sides of the 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.



◆ Use outside the rated voltage

The 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.

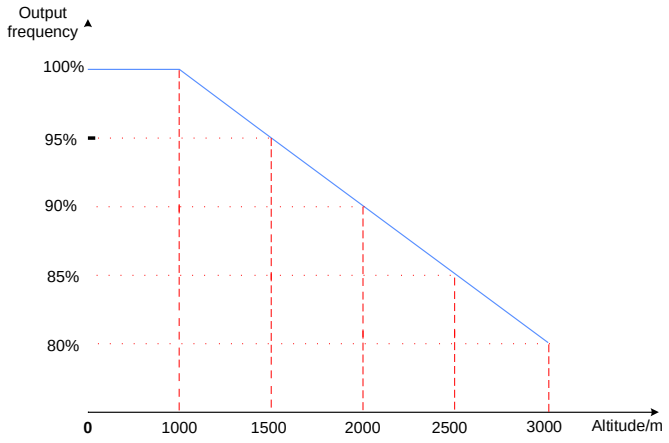
◆ Surge suppressor

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.

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

◆ Altitude and de-rating

In places where the altitude is above 1000 m and the cooling effect reduces due to thin air, it is necessary to de-rate the controller. Contact Inovance for technical support.



◆ Ambient temperature and de-rating

The controller is designed to operate under an ambient temperature between -10°C and +50°C. When the ambient temperature is above 40°C, the controller must be de-rated 1.5% every 1°C. The maximum working temperature is 50°C.

◆ Disposal

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.

◆ Adaptable motor

The controller is adaptable to squirrel-cage asynchronous motor. 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.

◆ 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 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 the mains frequency. Thus, 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 the mains frequency.

Protective Features

Adopting different protective features for various levels of faults, NICE380 provides the elevator running system with full abnormality protection.

The controller provides protective features against the following abnormalities:

◆ Drive control abnormal

The related faults include drive overcurrent, over voltage/under voltage, 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.

◆ Leveling sensor abnormal

The related faults include sensor failure or sensor stuck. The 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.

◆ Floor data abnormal

The system stores the floor information through the setup drive (for shaft type 1 only) or directly sets the floor pulse information (for shaft types 0, 2, and 3). 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 reports an alarm.

1 Product Information

1.1 Model and Nameplate

NICE - L - I - 40 05

Mark	Product series
NICE	Integrated controller

Mark	Controller type
L	Specialized for elevators

Mark	Drive motor type
I	380 Integrated controller

Mark	Power class
05	5.5kW

Mark	Voltage class
40	Three-phase 380V

Figure 1-1 Product type designation

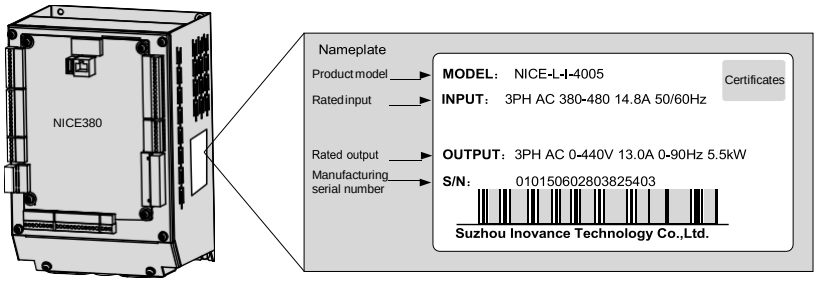


Figure 1-2 Nameplate

1.2 Technical Data

Table 1-1 Technical data

Controller Model	Power Capacity (kVA)	Input Current (A)	Output Current (A)	Adaptable Motor Power (kW)
Three-phase 380 V, range: -15% to 20%				
NICE-L-I-4003	5.9	10.5	9.0	3.7
NICE-L-I-4005	8.9	14.8	13.0	5.5

1.3 Technical Specifications

Table 1-2 Technical specifications

Item		Specification	
Basic specifications	Maximum frequency	99 Hz	
	Carrier frequency	2–12 kHz, adjusted automatically based on the load features	
	Motor control mode	Sensor-less vector control (SVC)/Voltage/Frequency (V/F) control	
	Startup torque	0.5 Hz: 180% (SVC)	
	Speed adjustment range	1:100 (SVC)	1:50 (V/F control)
	Speed stability accuracy	±0.5% (SVC)	
	Overload	60s for 60%–150% of the rated current	
	Motor auto-tuning	Static auto-tuning for asynchronous motor	
	Distance control	Direct travel ride mode in which the leveling position can be adjusted flexibly	
	Acceleration/Deceleration curve	Automatic generation of multiple curves	
	Slow-down	New reliable slow-down feature, automatically identifying the position of the slow-down bracket	
	Setup drive	32-bit data, accurately recording the positions in the shaft	
	Leveling adjustment	Flexible and easy leveling adjustment feature	
	Test function	Easy to implement multiple elevators commissioning functions	
	Fault protection	Solutions to different levels of elevator faults	
	Intelligent management	Remote monitoring, user management	
	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 features	Digital input (DI)	24 x DI Input: 24 V, 5 mA	
		3 higher-voltage detection input terminals of safety circuit and door lock circuit Input: 95−125 V	
	Communication port	1 Modbus communication port	
	Output terminal block	25 relay outputs The terminals can be allocated with different functions.	
Operation and display	Operating panel	5-digit LED display, querying/modifying most parameters and monitoring the system state	
	NEMS software	Connecting the control system and the host computer, convenient for querying/motoring the system state	
Environment	Altitude	Below 1000 m (de-rated 1% for each 100 m higher)	
	Ambient temperature	–10°C to 50°C (de-rated if the ambient temperature is above 40°C)	
	Humidity	Maximum relative humidity 95%, non-condensing	
	Vibration	Maximum vibration: 5.9 m/s^2 (0.6 g)	
	Storage temperature	-20°C to 60°C	
	Pollution degree	PD2	
	IP level	IP20	
	Earthing arrangements	TN/TT	

1.4 Optional Parts

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

Table 1-3 Optional parts

Description	Model	Function	Remarks
External LED operating panel	MDKE	External LED display and operating panel	RJ45 interface
External LED operating panel	MDKE6	External LED display and operating panel	It can be used for copying parameters.
Extension cable	MDCAB	It is a standard 8-core network cable and can be connected to MDKE.	The cable length is 3 m in the standard configuration.

2 Installation and Wiring

2.1 Preparation

2.1.1 Environment Requirements

- Ambient temperature: The ambient temperature substantially impacts the service life of the controller. Do not operate the controller outside the allowable ambient temperature (-10°C to 50°C);
- Install the controller on the surface of an incombustible object, and ensure that there is sufficient space around for heat dissipation;
- Install the controller at a place away from vibration. The vibration shall not exceed 0.6g;
- Install the controller at a place free from direct sunlight, high humidity and condensation;
- Install the controller at a place free from corrosive, explosive and combustible gas;
- Install the controller at a place free from oil dirt, dust and metal powder.

2.1.2 Space Requirements

The clearance to be reserved for installing the controller is as follows.

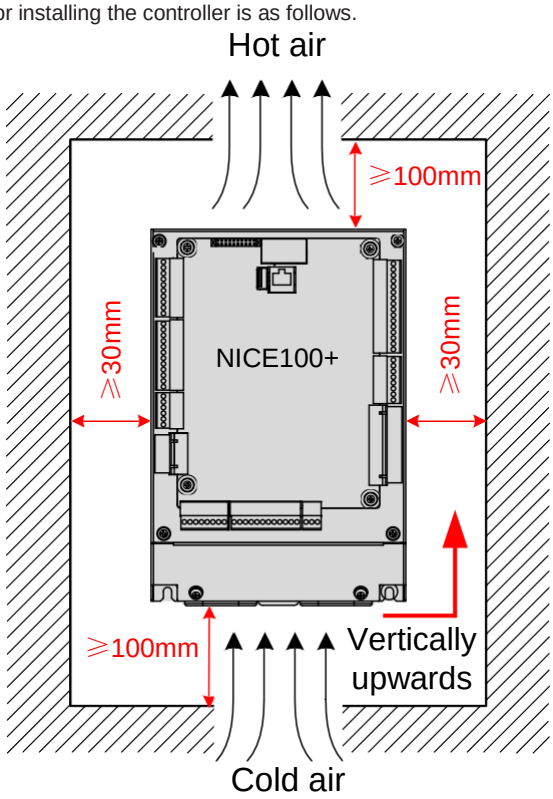
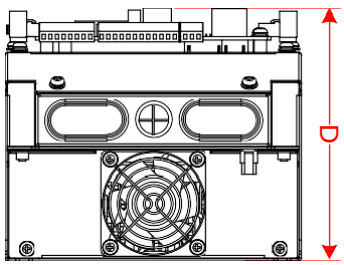


Figure 2-1 Installation clearances

2.2 Product Dimensions

The dimensions of the controller are as follows.



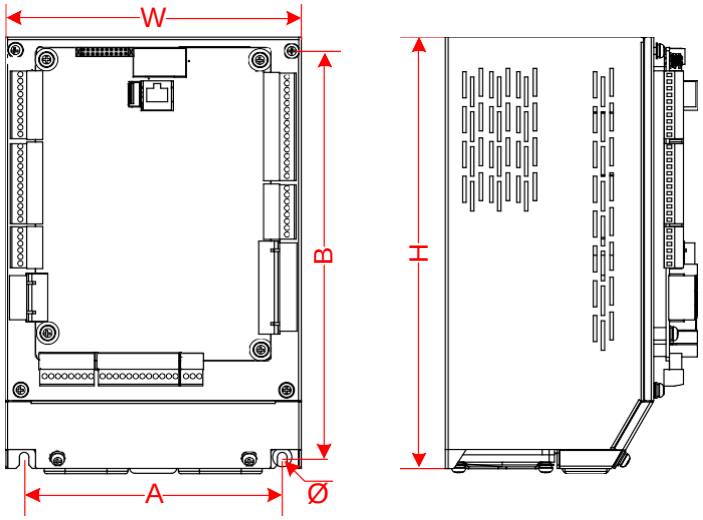


Figure 2-2 Product dimensions

Table 2-1 Product dimensions

Integrated Controller Models	A (mm)	B (mm)	H (mm)	W (mm)	D (mm)	Bore Diameter (mm)
Three-phase 380 V, range: -15% to 20%						
NICE-L-I-4003	148	235	248	170	145	5.5
NICE-L-I-4005						

2.3 Installation Instructions

The NICE100+ is installed vertically upward on the support with screws fixed into the four mounting holes See the illustration below.

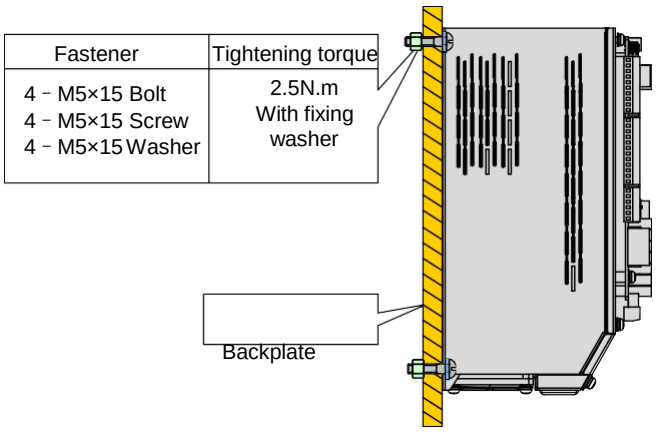


Figure 2-3 Tightening torques for bolts

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

- The temperature inside the cabinet must not rise to 10°C higher than the temperature outside the cabinet.
- A closed control cabinet must be configured with a fan (or other air cooling device such as air conditioner) to ensure air circulation.
- 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.
- 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.
- If the fan does not meet the cooling requirements, install an air conditioner in the cabinet or in the equipment room. Note that the temperature inside the cabinet must not be too low; otherwise, condensation may occur, causing short-circuit of components.
- For special environment where the temperature is high but cannot be reduced effectively, de-rate the controller during use.

2.4 Wiring of main control board (MCB) Terminals

◆ Terminal arrangement

The following figure shows terminal arrangement of the controller.

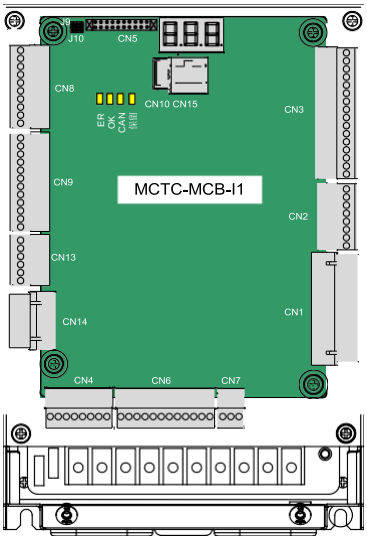


Figure 2-4 Terminal arrangement of NICE100+ controller

◆ Description of Main Circuit Terminals

The following figure shows main circuit terminal arrangement.

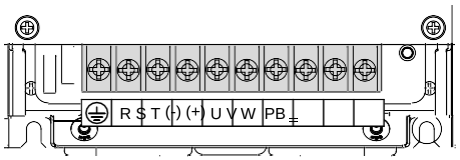


Figure 2-5 Terminal arrangement of main circuit

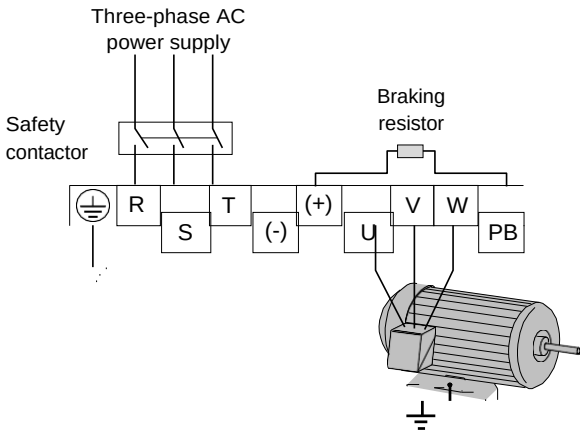


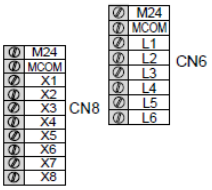
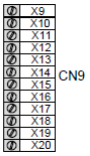
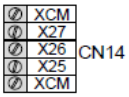
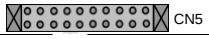
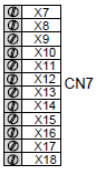
Figure 2-6 Wiring of the main circuit

Table 2-2 Description of Main Circuit Terminals

Mark	Name	Description
R, S, T	Three-phase power supply input terminals	Provide three-phase power supply.
+, -	Positive and negative terminals of DC bus	Connect the external braking unit and energy feedback unit.
PB	Terminals for connecting braking resistor	(+), PB: Connect the braking resistor
U, V, W	Controller output terminals	Connects three-phase motor
⏚	Grounding terminal	Grounding terminal

◆ Description of Control Circuit Terminals

Table 2-3 Description of Control Circuit Terminals

Mark		Terminal Name	Function Description	Terminal Arrangement
CN6/ CN8	M24/ MCOM	External 24 VDC power supply	24 VDC power supply for the entire board	
	X1 to X8	DI	Input voltage range: 10–30 VDC Input impedance: 4.7 kΩ optocoupler isolation Input current limit: 5 mA DI terminal functions are set in F5-01 to F5-24.	
	L1 to L6	Button function selection	Button input and button indicator output, 24 V power for button illumination	
CN9	X9 to X20	DI	Input voltage range: 10–30 VDC Input impedance: 4.7 kΩ optocoupler isolation Input current limit: 5 mA DI terminal functions are set in F5-01 to F5-24.	
CN14	X25 to X27/ XCM	Higher-voltage detection terminal	Input voltage range: 110 VAC±15% 110 VDC±20% for safety circuit and door lock circuit, function set in F5-25 to F5-27	
CN13	X21 to X24	DI	Input voltage range: 10–30 VDC Input impedance: 4.7 kΩ optocoupler isolation Input current limit: 5 mA DI terminal functions are set in F5-01 to F5-24.	
	M24/ MCOM	External 24 VDC power supply	24 VDC power supply for the entire board	
CN5	Interface for extension board MCTC-KZ-D			
CN10	USB interface	Communication port	Used to connect the external WIFI module for commissioning via smart phones Used to burn the MCB program Used for residential monitoring	
CN15	RJ45 interface	Interface for operating panel	Used to connect the operating panel	
CN7	L7-L18	Button function selection	Button input and button indicator output, 24 V power for button illumination	

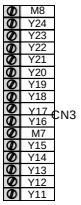
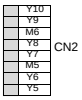
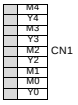
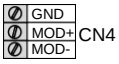
Mark		Terminal Name	Function Description	Terminal Arrangement
CN3	Y11-Y24	DO	Normally-open (NO), maximum current and voltage rating: 5 A, 250 VAC Function set in F7-00 to F7-03	
CN2	Y5-Y10	DO	Normally-open (NO), maximum current and voltage rating: 5 A, 250 VAC Function set in F7-00 to F7-03	
CN1	Y0-Y4	DO	Normally-open (NO), maximum current and voltage rating: 5 A, 250 VAC Function set in F7-00 to F7-03	
CN4	485+/-	485 interface	485 Communication	
J9/J10	Factory reserved. Do not short them randomly. Otherwise, the controller may not work properly.			

Table 2-4 Description of indicators

Mark	Terminal Name	Function 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 communication indicator	This indicator is steady ON (green) when communication for parallel control is enabled, and blinks when the running in parallel mode is normal.
L1 to L18	Button input indicator	This indicator is ON (green) when the button input is active.
X1 to X24	DI signal indicator	This indicator is ON (green) when the external input is active.
Y0 to Y24	DO signal indicator	This indicator is ON (green) when the system output is active.

2.5 Installation of Shaft Position Switches

In elevator control, to implement landing accurately and running safely, the car position needs to be identified based on shaft position switch signals. These shaft position switch signals include the leveling switch signals, up/down slow-down switch signals, up/down limit switch signals, and up/down final limit switch signals. These shaft position signals are directly transmitted by the shaft cables to the MCB of the controller. For the wiring method, see the illustration below.

The following figure shows the arrangement of shaft position switches in the shaft.

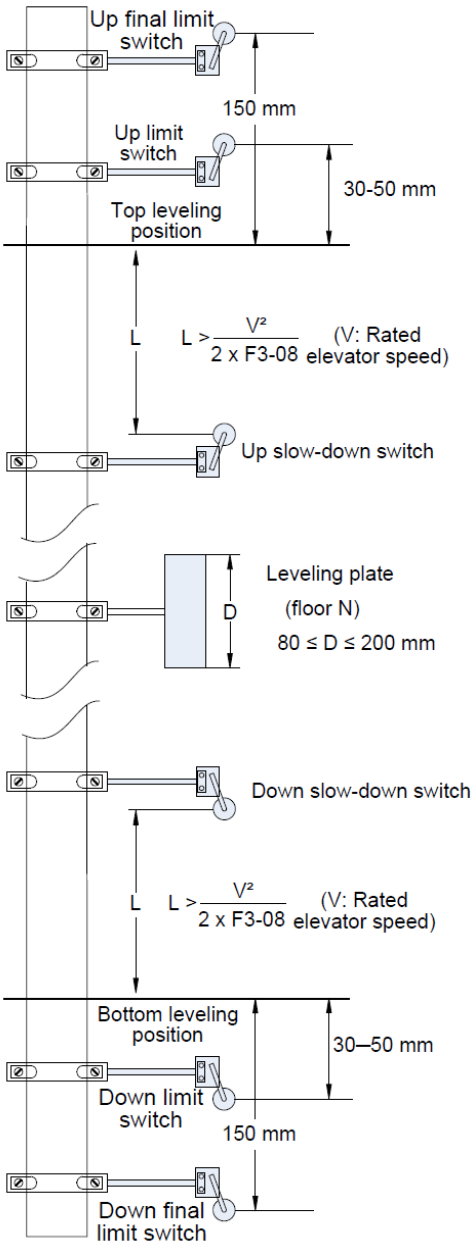


Figure 2-7 Arrangement of shaft position switches in shaft

2.5.1 Installation of Leveling Switches

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. By default, one leveling switch is used. The leveling plate is installed on the guide rail in the shaft. A leveling plate needs to be installed at each floor. Ensure that leveling plates at all floors are mounted with the same depth and verticality.

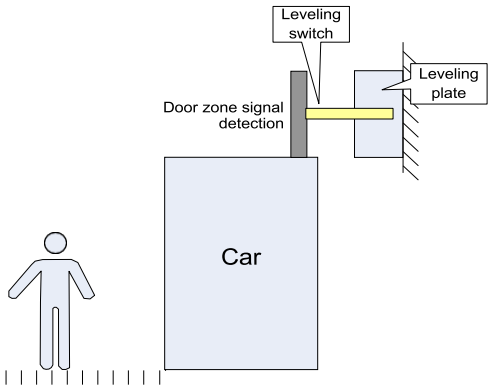
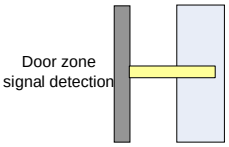
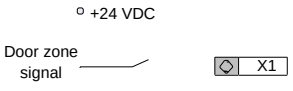
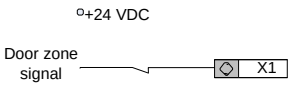


Figure 2-8 Installation position of leveling switches

Number of Leveling Switches	Installation Method	Connecting to Input Terminals of Controller	Parameter Setting
1			F5-01 = 03 (normally open, NO)
			F5-01 = 103 (normally closed, NC)

2.5.2 Installation of Floor Deceleration Switches

Floor Deceleration switches comprise the deceleration sensor and deceleration plate and are directly connected to the input terminal of the controller. It is used to enable the car to land at each floor efficiently and accurately.

The deceleration sensors are generally installed on the top of the car. By default, one deceleration sensor is used, which can be either a mono-stable or a bi-stable switch. Two deceleration sensors are also supported (different sensors for up and down deceleration); The deceleration plate is installed on the guide rail in the shaft. Two deceleration plates (or magnets) need to be installed at each floor. Ensure that deceleration plates at all floors are mounted with the same depth and verticality.

For the open-loop controller (without encoders), deceleration switch signals play an important role in enabling the car to land at each floor efficiently and accurately. Installing deceleration switches at correct places improves the running efficiency of the elevator and prevents it from mistakenly passing the floor without stop. There are two deceleration switches at each floor: the up-deceleration switch and the down deceleration switch. The deceleration distance L1 indicates the distance from the deceleration switch to the deceleration plate at the current floor. The calculating formula is as follows:

$$L_1 > \frac{V_1^2 - V_2^2}{2 \times F3\text{-}05}$$

In the formula, “L1” indicates the deceleration distance, “V1” indicates the F0-04 (Rated elevator speed), “V2” indicates the re-leveling speed, and “F3-05” indicates the deceleration rate.

The default value of F3-05 (Deceleration rate) is 0.5 m/s^2. The default value of F3-10 (Re-leveling speed) is 0.050 m/s^2. The deceleration distances calculated based on different rated elevator speeds are listed in the following table.

Table 2-5 Deceleration distance

Rated Elevator Speed (m/s)	0.25	0.4	0.5	0.63	0.75	1.0
Deceleration Distance (m)	0.3-0.4	0.5-0.6	0.6-0.8	0.8-1.0	1.0-1.2	1.3-1.5

Note the following:

1. If the leveling switch at the door zone and the deceleration switch are not at the same level, consider the relative distance between the leveling switch and the deceleration switch when arranging up and down deceleration plates. See the illustration below taking shaft type 0 as an example.

2. When installing deceleration plates at the top floor and the bottom floor, install the deceleration plates before the terminal slow-down switches where possible so that deceleration switches can act before terminal slow-down switches.

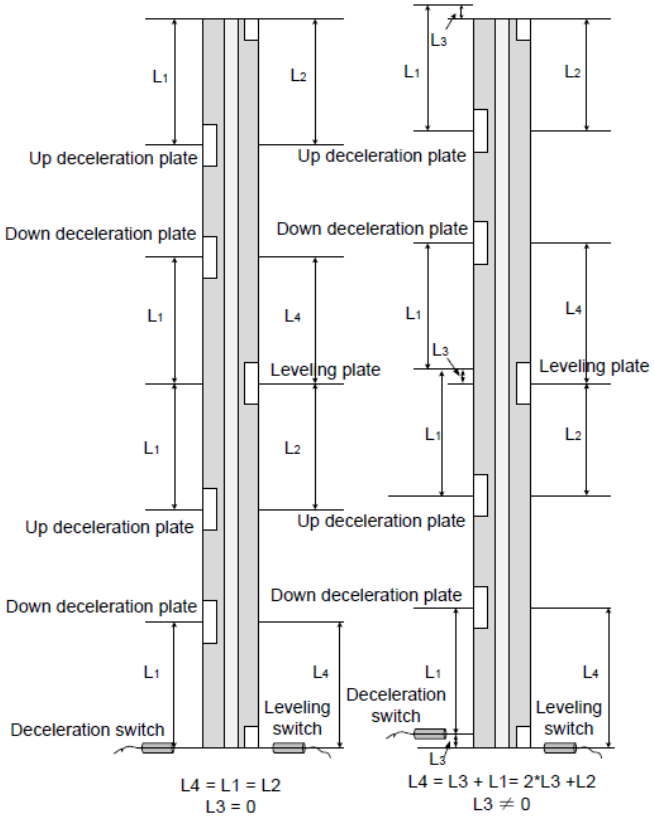


Figure 2-9 Installation position of deceleration switches

2.5.3 Installation of Slow-Down Switches

The slow-down switch is one of the key protective components protecting the elevator from over travel top terminal or over travel bottom terminal at maximum speed when the elevator position becomes abnormal. The controller supports one pair of slow-down switches. The slow-down distance L indicates the distance from the slow-down switch to the leveling plate at the terminal floor. The calculating formula is as follows:

$$L>\frac{V^2}{2\times F3\text{-}08}$$

In the formula, “L” indicates the slow-down distance, “V” indicates the F0-04 (Rated elevator speed), and “F3-08” indicates the special deceleration rate.

The default value of F3-08 (Special deceleration rate) is 0.5 m/s2. The slow-down distances calculated based on different rated elevator speeds are listed in the following table.

Table 2-6 Terminal slow-down distances

Rated Elevator Speed (m/s)	0.25	0.4	0.5	0.63	0.75	1.0
Terminal Slow-down Distance (m)	0.3-0.4	0.5-0.6	0.6-0.8	0.8-1.0	1.0-1.2	1.3-1.5

Note the following:

The slow-down switch supports the terminal floor reset function. It must be installed between the leveling plates of the terminal floor and the secondary terminal floor.

2.5.4 Installation of Limit Switches

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

- The up limit switch needs to be installed 30−50 mm away from the top leveling position. The limit switch acts when the car continues to run upward 30−50 mm from the top leveling position.
- The down limit switch needs to be installed 30−50 mm away from the bottom leveling position. The limit switch acts when the car continues to run downward 30−50 mm from the bottom leveling position.

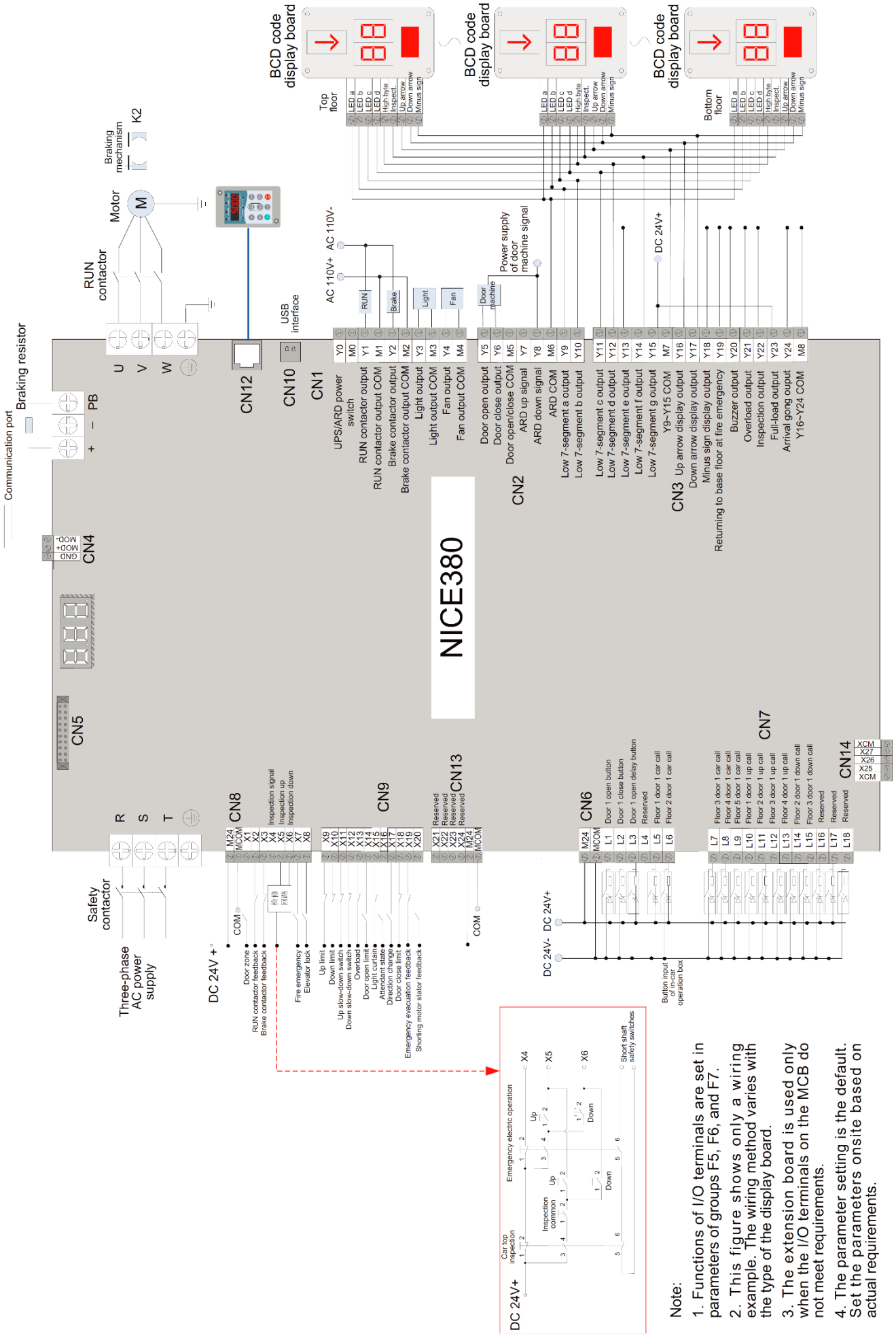
2.5.5 Installation of Final Limit Switches

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

- The up final limit switch is mounted above the up-limit switch. It is usually 150 mm away from the top leveling position.
- The down final limit switch is mounted below the down limit switch. It is usually 150 mm away from the bottom leveling position.

2.6 Wiring Diagram of the Integrated Control System

See the following figure for the details.



Note:

1. Functions of I/O terminals are set in parameters of groups F5, F6, and F7.
2. This figure shows only a wiring example. The wiring method varies with the type of the display board.
3. The extension board is used only when the I/O terminals on the MCB do not meet requirements.
4. The parameter setting is the default. Set the parameters onsite based on actual requirements.

3 Use of the Operating Panel

The controller supports three commissioning tools: the operation control and information display panel (the “operating panel”), the host computer monitoring software, and the commissioning app for smart phones.

Tool	Function Description	Remarks
LED Operating Panel	It is used to view and modify parameters related to elevator drive and control.	Optional
Host computer monitoring software (NEMS)	It is used to monitor the current elevator state, view and modify all parameters, and upload and download parameters on the PC.	Contact the supplier for software

3.1 LED Operating Panel

The LED operation panel is connected to the RJ45 interface of the controller by using an 8-core flat cable. You can modify the parameters, monitor the working status and start or stop the controller by operating the operation panel. See the illustration below.

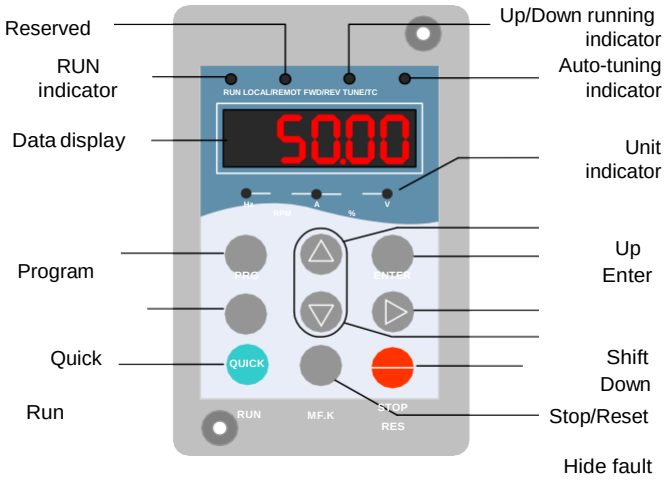


Figure 3-1 Diagram of operation panel

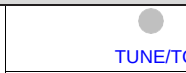
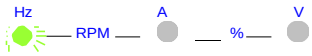
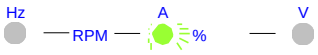
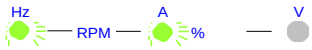
3.2 Operating Panel Elements

3.2.1 Function indicators

: ON; : OFF; : Blinking

Table 3-1 Description of indicators

Indicator State		Indication
RUN Running indicator	RUN	OFF indicates the stoppage state.
	RUN	ON indicates the running state.
LOCAL/REMOT Reserved		Reserved
FWD/REV Elevator running direction indicator	FWD/REV	OFF: Elevator running up
	FWD/REV	ON: Elevator running down

Indicator State		Indication
TUNE/TC Auto-tuning indicator		OFF: not applicable
		ON: Auto-tuning state
		Frequency unit: Hz
		Current unit: A
		Voltage unit: V
		Rotation speed unit: RPM
		Percentage: %

3.2.2 Keys

Table 3-2 Description of keys

Key	Name	Function
PRG	Programming	Enter or exit Level-I menu.
ENTER	Enter	It is used to access a menu item and confirm parameter settings.
△	Up	Increase data or parameter number.
▽	Down	Decrease data or parameter number.
▷	Shift	Select the displayed parameters in turn in the stoppage or running state, and select the digit to be modified when modifying parameters.
RUN	Run	Start the AC drive in the operating panel control mode.
STOP RES	Stop/Reset	Stop the AC drive when it is in the running state and perform the reset operation when it is in the fault state.
QUICK	Quick Menu	Enter or exit Level-I quick menu.
MF.K	Fault Hide fault	Display or hide the fault information in the fault state, which facilitates parameter viewing.

3.3 Parameter Menu Description

The operating panel has three levels of menu for parameter setting.

- Level I: parameter group
- Level II: parameter
- Level III: parameter value

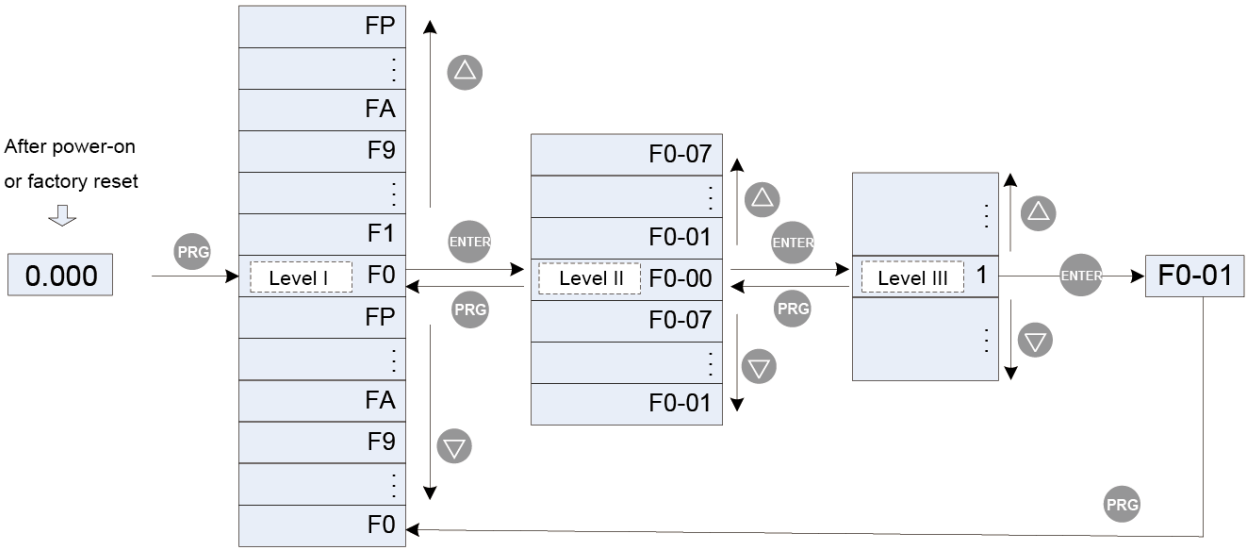


Figure 3-2 Structure of the three-level menu

Note:

You can return to Level II menu from Level III menu by pressing PRG or ENTER. The difference between the two is as follows:

- After you press ENTER, the system saves the parameter setting first, and then goes back to Level II menu and shifts to the next parameter number.
- After you press PRG, the system does not save the parameter setting, but directly returns to Level II menu and remains at the current parameter number.

In Level III menu, if the parameter has no blinking digit, it means that the parameter cannot be modified.

This may be because:

- Such a parameter is only readable. Such as actually detected parameters and running record parameters.
- Such a parameter cannot be modified in the running state and can only be changed at stoppage state

4 System Commissioning

4.1 Safety Checks Before Commissioning

The elevator needs to be commissioned after being installed; the correct commissioning guarantees safe and normal running of the elevator. Before performing electrical 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 mechanical safety.

Check that the shaft is unobstructed, there is no person in the shaft, inside or on top of the car, and the conditions for elevator safe running are met.

2. Check electrical wiring.

□√	No.	Item
□	1	The power supply R, S, T cables are wired correctly and securely.
□	2	The UVW cables between the controller and the motor are wired correctly and securely.
□	3	The controller (cabinet) and motor are grounded correctly.
□	4	The safety circuit is conducted, and the emergency stop buttons and switches in the cabinet and in the equipment room can be enabled.
□	5	The door lock circuit is conducted. The door lock circuit is disconnected when the car door or any hall door opens.

3. Check electrical safety.

□√	No.	Item
□	1	The line voltage of the user power supply is within 380 to 440 VAC, and the phase unbalance degree does not exceed 3%.
□	2	The total lead-in wire gauge and total switch capacity meet the requirements.
□	3	There is no inter-phase or to-ground short circuit in the R, S, T power supply.
□	4	There is no inter-phase or to-ground short circuit in the U, V, W phases of the controller. There is no inter-phase or to-ground short circuit in the U, V, W phases of the motor.
□	5	There is no short circuit to ground on the output side of the transformer.
□	6	There is no inter-phase or to-ground short circuit in the 220 V power supply.
□	7	The 24 V power supply has no short circuit between positive and negative or to-ground short circuit.
□	8	The CANbus/Modbus communication cable has no short circuit with the 24 V power supply or short circuit to ground.

4.2 Motor Commissioning

The controller supports both V/F and SVC control. In SVC control, auto-tuning is required before startup of the motor in order that more precise control parameters can be obtained for the motor.

Table 4-1 Parameters Related to Motor Auto-tuning

Parameter No.	Parameter Name	Description
F1-01 to F1-05	Motor rated power/voltage/current/frequency/speed	Model dependent, to be manually input
F0-01	Command source selection	0: Operating panel control 1: Distance control
F1-11	Motor auto-tuning mode	0: Disabled 2: Asynchronous motor static auto-tuning mode 2

4.2.1 Asynchronous motor static auto-tuning mode 2

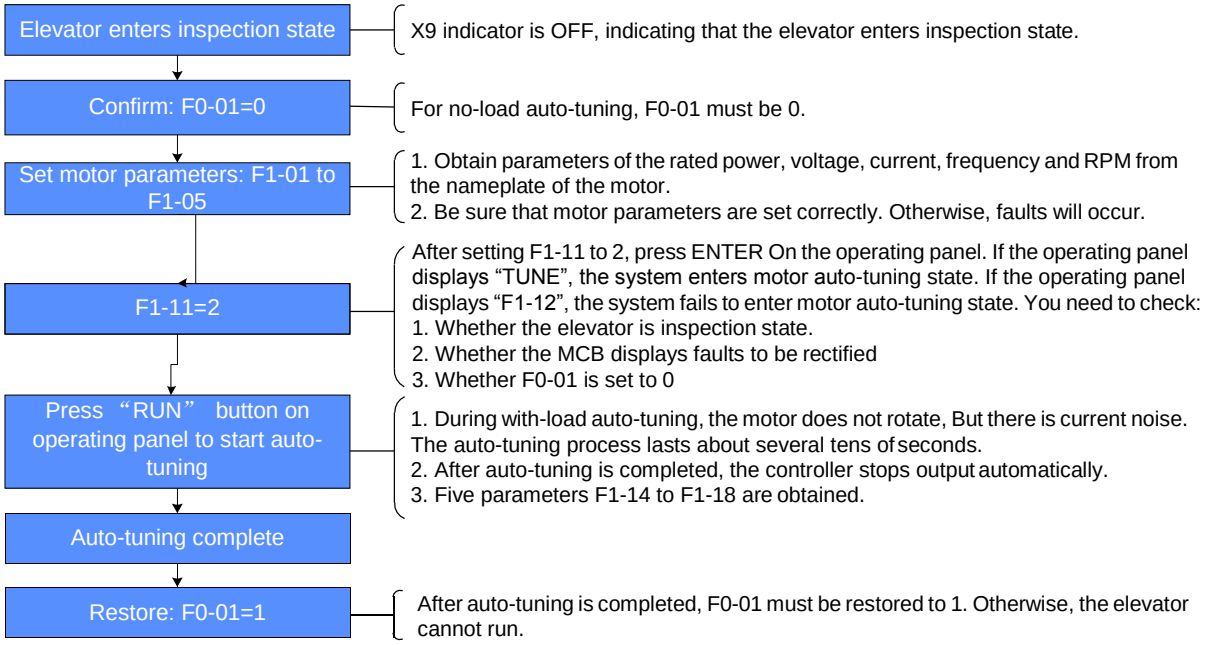


Figure 4-2 Asynchronous motor static auto-tuning mode 2

4.3 Shaft auto-tuning (only for motor wheel pulse type)

1) Make preparations for shaft auto-tuning.

- ◆ Check that the shaft switches are installed correctly. The signals are valid and reliable.
- ◆ Check the pulse signals are stable, the X input electrical level lasts for more than 20 ms (maximum resolution = 50 Hz).
- ◆ Check that the number of floors is set correctly.

2) Parameter No.

Parameter No.	Parameter Name	Description	Default Value	Remarks
F0-04	Rated elevator speed	0.250 to 1.000 m/s	0.5 m/s	-
F6-00	Top serving floor of the elevator	F6-01 to 12	6	Actual number of floors+1 minus bottom serving floor
F6-01	Bottom serving floor of the elevator	1 to F6-00	1	-

NOTE

- If the parameter F0-04 is modified, the elevator must perform another shaft auto-tuning. Otherwise abnormal conditions may occur to the elevator during running.
- After F4-00 Shaft type is modified, the elevator controller must be re-powered on. If F4-00=1, shaft auto-tuning must be performed, otherwise the elevator cannot run normally.

3) Check that the conditions for shaft auto-tuning have been met.

- The elevator is in the inspection state.
- The elevator is at the leveling position of the bottom floor.
- The down slow-down switch 1 signal input to the MCB is active.
- The NICE100+ is not in the fault state. If there is a fault, press STOP/RES to reset the fault.

NOTE

- When there are only two floors, the elevator needs to run to bel ow the bottom leveling position, that is, at least one leveling sensor is below the leveling plate. This is the prerequisite for successful shaft auto-tuning.

4) Perform shaft auto-tuning.

When the preceding conditions are met, start shaft auto-tuning by using any of the following methods:

- Set F1-11 to 3 on the operating panel.

After shaft auto-tuning starts, the elevator runs at the inspection speed set in F3-11 and stops after reaching the leveling plate of the top floor. Then, the keypad on the MCB displays the present floor number (top floor), indicating that shaft auto-tuning is successful.

If fault E35 is reported during the process, it indicates that shaft auto-tuning fails. You need to rectify the fault according to the solution described in Troubleshooting and perform shaft auto-tuning again.

4.4 Riding Comfort Adjustment

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 system control and the elevator's mechanical construction.

4.4.1 Performance Adjustment of System Control

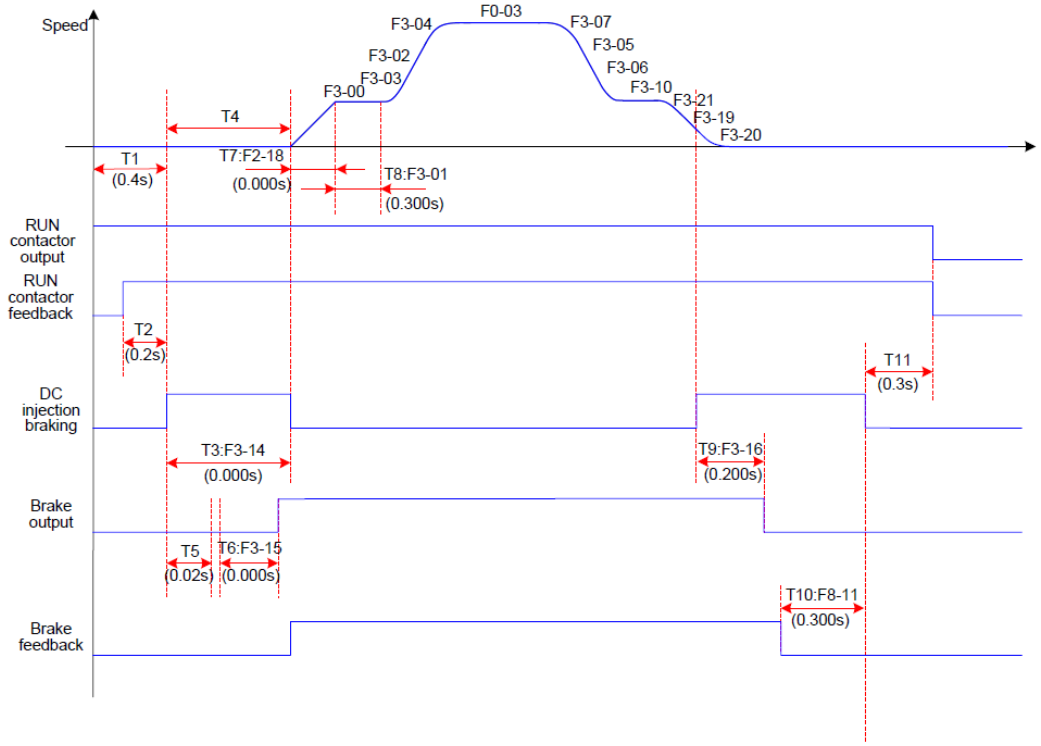


Figure 4-3 Timing diagram of controller operation

◆ Riding comfort adjustment at elevator startup and stop

Parameter	Name	Setting Range	Default
F2-00	Speed loop proportional gain 1	0 to 100	10
F2-01	Speed loop integral time 1	0.01 to 10.00s	1.00s
F2-03	Speed loop proportional gain 2	0 to 100	30
F2-04	Speed loop integral time 2	0.01 to 10.00s	1.00s

a) Adjustment to abnormal motor startup

F2-00, F2-01, F2-03 and F2-04 are used to adjust the speed dynamic response characteristics of the motor.

◆ To achieve a faster system response, increase the proportional gain or reduce the integral time. Be aware that either a too big gain or a too short time may lead to system oscillation.
◆ Decreasing the proportional gain or increasing the integral time will slow the dynamic response of the motor. However, too small proportional gain or too large integral time may cause motor speed tracking abnormality, resulting in fault E33 or instable leveling at stop.

The default setting is proper for most large-power motors, and you need not modify these parameters. These parameters need to be adjusted only for small-power motors (P ≤ 5.5 kW) because they may have oscillation. To adjust, perform the following.

◆ Decrease the proportional gain first (between 10 and 40) to ensure that the system does not oscillate.
◆ Reduce the integral time (between 0.1 and 0.8) to ensure that the system has quick response but small overshoot.

b) Adjustment to elevator startup
Related parameters:

Parameter	Name		Setting Range	
F8-15	DC injection braking current at startup		0 to 150	50%
F3-14	DC injection braking time at startup		0.000 to 1.000	0.300
F3-15	Brake release delay		0.000 to 1.000	0.050

4.4.2 Mechanical Factors riding Comfort

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

No.	Mechanical Factor	Description
1	Guide rail	Installation of the guide rail mainly involves: Verticality and surface flatness of the guide rail Smoothness of the guide rail connection Parallelism between two guide rails (including guide rails on the counterweight side)
2	Guide shoe	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.
3	Steel suspension rope	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.
4	Brake	The riding comfort during running may be influenced if the brake arm is installed too tightly or released incompletely.
5	Balance of the car	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.
6	Gearbox	For asynchronous motor, abrasion or improper installation of the gearbox may also affect the riding comfort.
7	Resonance	Resonance is an inherent character of a physical system, related to the material and quality of system components. If you are 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 machine bed).

4.5 Leveling Accuracy Adjustment

Leveling adjustment parameters

Parameter	Name	Setting Range	Default	Unit
Fr-00	Leveling adjustment mode	0 to 1	0	-
Fr-01	Leveling adjustment record 1	0 to 15015	0	s
Fr-02	Leveling adjustment record 2		0	mm
...	...		...	...
Fr-28	Leveling adjustment record 28		0	mm

NOTE

- The parameter value has five digits, the two high bytes of each value are used for leveling delay adjustment for up running, and the two low bytes are used for leveling delay adjustment for down running. Each parameter is used for the adjustment of a single floor. For example, Fr-02 is used for adjusting the leveling of floor 2. The adjustment of this parameter does not affect the leveling results of other floors.

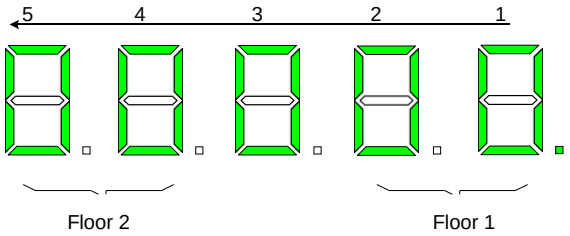
Perform the leveling adjustment as follows:

- Leveling adjustment in the equipment room

Parameters Fr-01 to Fr-12: Fr-01 is for the bottom floor, Fr-02 is for the physical floor 2, and so on. Inside each parameter, Bit1 and Bit2 are for the leveling stop delay during down running, Bit4 and Bit5 are for the leveling stop delay during up running. Bit4 and Bit5 are invalid for Fr-01, and Bit1 and Bit2 are invalid for Fr-12.

NOTE

- The leveling stop delay is calculated starting from the time when the elevator receives the leveling signal. When two leveling signals are used, the calculation starts from the time when both leveling signals are received.
- The leveling adjustment must be performed after the riding comfort adjustment is completed.



- Leveling adjustment inside the car

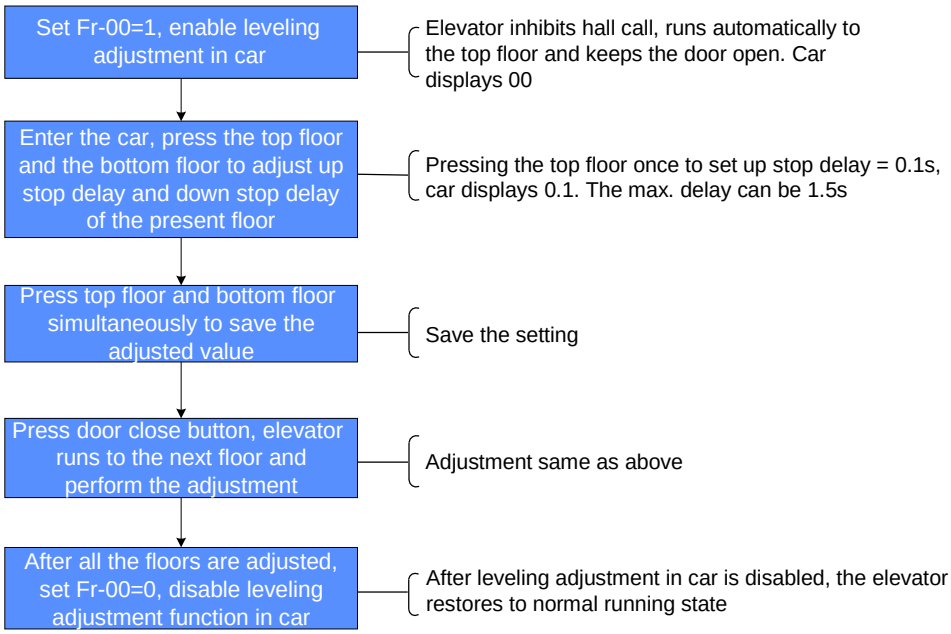


Figure 4-4 Flow diagram of leveling adjustment inside car

NOTE

- Ensure that shaft auto-tuning is completed successfully, and the elevator runs properly at normal speed.
- After you set Fr-00 to 1, the elevator shields hall calls, automatically runs to the top floor, and keeps the door open after arrival.
- During adjustment, the car display board displays “00” or the value after adjustment. Positive value: up arrow + value, negative value: down arrow + value, adjustment range: 0 to 1.5s.
- After you save the adjustment result, the car display board displays the present floor.
- Note that if a certain floor need not adjustment, you also need to save the data once. Otherwise, you cannot register the car call.

5 Parameter Description

5.1 Parameter Description

The parameters adopt the three-level menu.

- Level I: parameter group
- Level II: parameter
- Level III parameter value

The definitions of each column in the parameter table are as follows.

Parameter No.	Parameter Name	Setting Range	Default	Unit	Operation
The number of the parameter	The full name of the parameter	The valid setting range of the parameter	The original factory setting of the parameter	The minimum measurement unit of the parameter	Whether the parameter can be modified (including the modification conditions)

"☆": The parameter value can be changed when the system is stopped or operational.

"★": The parameter cannot be modified when the AC drive is in the running state;

"●": The parameter is the actually measured value and cannot be modified.

The system automatically restricts the properties of all parameters to prevent mal-function.

5.2 Parameter Groups

On the operation panel, press PRG and then △/▽, and you can view the parameter groups. The parameter groups are classified as follows:

F0	Basic parameters	F9	Time parameters
F1	Motor parameters	FA	Keypad setting parameters
F2	Vector control parameters	Fb	Door parameters
F3	Running control parameters	FC	Protection parameters
F4	Floor parameters	Fd	Communication parameters
F5	Terminal input parameters	FE	Elevator function parameters
F6	Basic elevator parameters	FF	Factory parameters (reserved)
F7	Terminal output parameters	FP	User parameters
F8	Advanced function parameters	Fr	Leveling adjustment parameters

Group F0: Basic parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit	Operation
F0: Basic parameters					
F0-00	Control mode	0: Sensorless vector control (SVC) 2: V/F control	0	-	★
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 elevator speed	0.200 to 1.000	0.500	m/s	★
F0-05	Maximum frequency	F1-04 to 99.00	50.00	Hz	★
F0-06	Carrier frequency	0.5 to 12.0	10.0	kHz	★

Group F1: Motor parameters

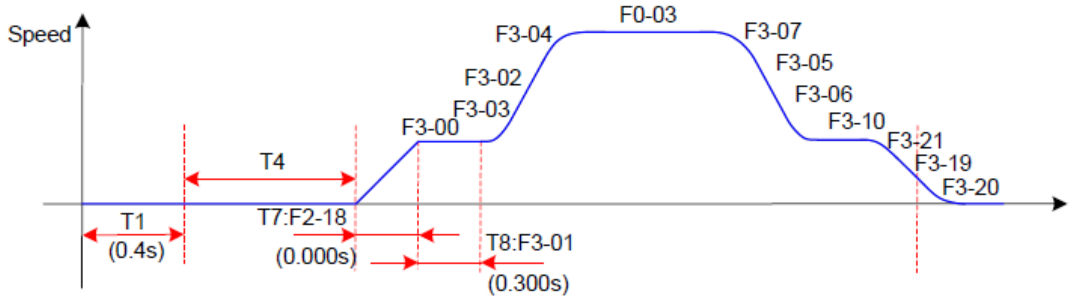
Parameter No.	Parameter Name	Setting Range	Default	Unit	Operation
F1: Motor parameters					
F1-01	Rated power	0.7 to 75.0	Model dependent	kW	★
F1-02	Rated voltage	0 to 550	Model dependent	V	★
F1-03	Rated current	0.00 to 655.00	Model dependent	A	★
F1-04	Rated frequency	0.00 to 99.00	Model dependent	Hz	★
F1-05	Rated rotation speed	0 to 3000	Model dependent	RPM	★
F1-09	Current detection compensation	0 to 100	5	-	★
F1-10	DSP fault block	0 to 65535	0	-	★
F1-11	Auto-tuning mode	0: Disabled 2: Asynchronous motor static auto-tuning 2 3: Shaft auto-tuning 1 4: Shaft auto-tuning (clear leveling adjustment data)	0	-	★

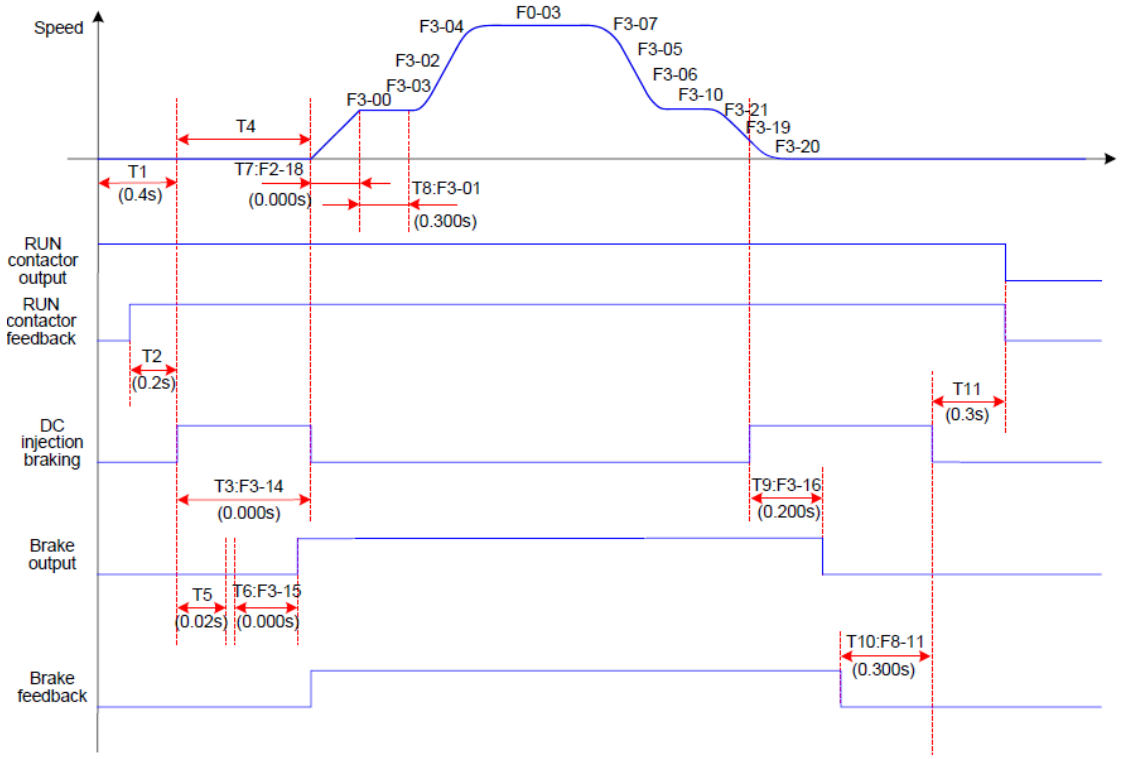
Parameter Value	Motor auto- tuning mode	Function
0	Disabled	None
2	Asynchronous motor static auto-tuning 2	Applicable for scenarios where the load cannot be removed, and a complete auto-tuning is impossible. Stator resistance, rotor resistance, leakage inductance, mutual inductance and no-load current will be auto-tuned
3	Shaft auto-tuning 1	Leveling adjustment records in group Fr are preserved
4	Shaft auto-tuning 2	Leveling adjustment records in group Fr are cleared

F1-12	Pulses per revolution of motor	0 to 10000	10	PPR	★
The valid signal pulses on the flywheel x10 per each revolution of the motor (only valid for motor flywheel signal used as shaft signal)					
F1-14	Asynchronous motor stator resistance	0.000 to 30.000	Model dependent	Ω	★
F1-15	Asynchronous motor rotor resistance	0.000 to 30.000	Model dependent	Ω	★
F1-16	Asynchronous motor leakage inductance	0.00 to 300.00	Model dependent	mH	★
F1-17	Asynchronous motor mutual inductance	0.1 to 3000.0	Model dependent	mH	★
F1-18	Asynchronous motor Magnetizing current	0.01 to 300.00	Model dependent	A	★
F1-25	Motor type	0: Asynchronous motor	0	-	●
F2: Vector control parameters					
F2-00	Speed loop proportional gain 1	0 to 100	10	-	★
F2-01	Speed loop integral time 1	0.01 to 10.00	1.00	s	★
F2-02	Switchover frequency 1	0.00 to F2-05	3.00	Hz	★
F2-03	Speed loop prop.I gain 2	0 to 100	30	-	★
F2-04	Speed loop integral time 2	0.01 to 10.00	1.00	s	★
F2-05	Switchover frequency 2	F2-02 to F0-05	7.00	Hz	★
F2-06	Vector control slip gain	50 to 200	100	%	★
F2-08	Torque upper limit	0.0 to 200.0	150.0	%	★
F2-09	Over-excitation gain	0 to 200	64	-	★
F2-10	Running direction	0: Direction unchanged 1: Direction reversed	0	-	★
F2-11	Retard Co-efficient	0~100	0	-	★
F2-12	Retard Co-efficient	0 – Disable 1 - Enable	0	-	★
F2-13	Excitation regulation proportional gain	0 to 60000	2000	-	★
F2-14	Excitation regulation integral gain	0 to 60000	1300	-	★
F2-15	Torque regulation proportional gain	0 to 60000	2000	-	★
F2-16	Torque regulation integral gain	0 to 60000	1300	-	★
F2-17	Random PWM depth	0 to 10	0	-	★

Parameter No.	Parameter Name	Setting Range	Default	Unit	Operation
F2: Vector control parameters					
F2-18	Startup acceleration time	0.000 to 1.500	0.000	s	★
F2-19	Asynchronous motor SCV2, M-axis current loop proportional coefficient	5 to 300	20	-	☆
F2-20	Asynchronous motor SCV2, M-axis current loop integral coefficient	0 to 65535	0	-	☆
F2-21	Asynchronous motor SCV flux observation compensation coefficient	0 to 200	100	%	☆
F2-22	Asynchronous motor SCV flux observation low-pass filter cutoff frequency	100 to 2000	500	-	☆
F2-23	Asynchronous motor SCV added M-axis current loop proportional closed-loop gain	0 to 500	200	-	☆
F2-24	Asynchronous motor SCV added T-axis current loop proportional closed-loop gain	0 to 500	0	-	☆
F2-25	SVC excitation current boost	0.0 to 50.0	10.0	%	☆
F2-26	SVC excitation current boost cutoff frequency	0 to F1-04	20.00	Hz	★
F2-27	SVC speed loop filter	0.000 to 0.100	0.000	-	☆
F2-28	SVC torque limit mode selection	0 to 1000	0	-	☆
F2-29	SVC2 speed filter coefficient	0.000 to 1.000	0.050	-	☆
F2-30	Exciting current coefficient	1 to 1000	100	-	☆
F2-31	Torque limit filter coefficient	0 to 63	63	-	☆
F2-32	Turn off pulse-by-pulse current limit interruption	0 to 65535 0: Turn on 1: Turn off	0	-	☆
F2-33	Special treatment of synchronous frequency at SVC output phase loss detection	0 to 65535 0: Turn on 1: Turn off	0	-	☆
F2-34	Input phase loss detection time	0 to 65535 1: Input phase loss detection time=2s 0: Input phase loss detection time=1s	0	-	☆
F2-43	VF Torque boost gain	0.0 to 30.0	0.0	%	☆
F2-44	VF torque boost cutoff frequency	0.00 to F0-05	4.00	Hz	★
F2-45	VF slip compensation gain	0.0 to 200.0	100.0	%	☆
F2-46	VF over-excitation gain	0 to 200	0	-	☆
F2-47	VF oscillation suppression gain	0 to 100	30	-	☆
F2-48	VF oscillation suppression mode	0 to 4	3	-	☆
F2-49	VF overcurrent stall gain	50 to 200	170	-	☆
F2-50	VF overcurrent stall gain enabling bit	0 to 1	1	-	☆
F2-51	VF overcurrent stall frequency modulation Kp	0 to 100	20	-	☆
F2-52	VF multiplying speed overcurrent stall action current compensation coefficient	50 to 200	50	-	☆
F2-53	VF overvoltage stall gain	650.0 to 800.0	770.0	V	☆
F2-54	VF overvoltage stall gain enabling bit	0 to 1	0	-	☆
F2-55	VF overvoltage stall gain frequency modulation Kp	0 to 100	30	-	☆
F2-56	VF overvoltage stall gain voltage regulation Kp	0 to 100	30	-	☆
F2-57	Maximum frequency of VF overvoltage stall gain increase	0 to 50	5	-	☆
F2-58	VF under voltage stall enabling bit	0 to 2	0	-	☆
F2-59	VF under voltage stall frequency modulation Kp	0 to 100	40	-	☆
F2-60	VF under voltage stall frequency modulation Ki	0 to 100	30	-	☆
F2-61	VF under voltage stall recovery judgment voltage	85 to 120	85	-	☆
F2-62	VF under voltage stall recovery judgment voltage time	0.1 to 10.0	0.5	-	☆
F2-63	VF under voltage stall gain	60 to 85	80	-	☆
F2-65	VF slip compensation response time	0.1 to 10.0	0.5	s	☆
F2-66	V/F slip compensation suspension	0 to 1	0	-	☆

Group F3: Running control parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit	Operation
F3: Running control parameters					
F3-00	Startup speed	0.000 to 0.030	0.008	m/s	★
F3-01	Startup holding time	0.000 to 0.500	0.300	s	★
These two parameters are used to set the startup speed and startup speed holding time. For details, see the S-curve. The parameters may reduce the terrace feeling at startup due to static friction between the guide rail and the guide shoes.					
F3-02	Acceleration rate	0.200 to 0.800	0.300	m/s2	★
F3-03	Acceleration jerk time 1	0.300 to 4.000	1.500	s	★
F3-04	Acceleration jerk time 2	0.300 to 4.000	1.500	s	★
F3-05	Deceleration rate	0.200 to 0.800	0.500	m/s2	★
F3-06	Deceleration jerk time 1	0.300 to 4.000	1.500	s	★
F3-07	Deceleration jerk time 2	0.300 to 4.000	1.500	s	★
These parameters are used to set the running curve during deceleration of the elevator. F3-02 (F3-05) is the acceleration rate (deceleration rate) in the straight-line acceleration process (deceleration process) of the S curve. F3-03 (F3-07) is the time for the rate to increase from 0 to the value set in F3-02 (F3-05) in the end jerk segment of the S curve. The larger the value is, the smoother the jerk is. F3-04 (F3-06) is the time for the rate to decrease from the value set in F3-02 (F3-05) to 0 in the start jerk segment of the S curve. The larger the value is, the smoother the jerk is. Setting the running curve:  					
F3-08	Special deceleration rate	0.200 to 2.000	0.500	m/s2	★
F3-09	Pre-deceleration distance	100 to 900.0	200.0	mm	★
F3-10	Floor leveling speed	0.050 to 0.200	0.050	m/s	★
F3-11	Inspection speed	0.100 to 0.500	0.250	m/s	★
F3-12	Position of up slow-down	0.000 to 300.00	0.00	m	★
F3-13	Position of down slow-down	0.000 to 300.00	0.00	m	★
F3-14	DC injection braking time at startup	0.000 to 1.000	0.300	s	★
F3-15	Brake release delay	0.000 to 1.000	0.050	s	★
F3-16	Running end delay time	0.000 to 1.000	0.200	s	★

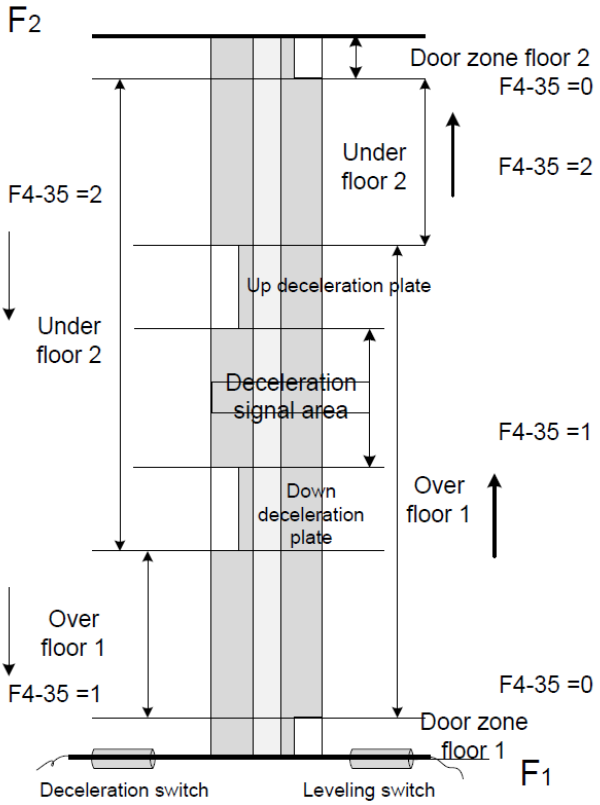
Parameter No.	Parameter Name	Setting Range	Default	Unit	Operation
F3: Running control parameters					
These parameters are used to set the time related to the zero-speed holding current output and braking action delay. F3-14 (DC injection braking time at startup) specifies the valid time for outputting DC injection braking at startup, during which the controller performs excitation on the motor and outputs zero-speed current with large startup torque. F3-15 (Brake release delay) 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. F8-11 (Stop torque output delay) specifies the time from the moment when the system brake is completely applied to the moment when the stop DC injection braking is canceled, during which the system retains the zero-speed torque current output. F3-16 (Running end delay time) specifies the time during which the system keeps output when the running curve ends (output frequency less than 0.5 Hz or the speed is lower than the value set in F3-25).  					
F3-17	Low-speed re-leveling speed	0.080 to F3-11	0.100	m/s	★
It is used to set the elevator speed of returning to the leveling position at normal non-leveling stop.					
F3-18	Acceleration rate at emergency evacuation	0.050 to 0.500	0.100	m/s2	★
F3-19	Re-leveling deceleration rate	0.200 to 0.800	0.300	m/s2	★
F3-20	Re-leveling deceleration end	0.300 to 4.000	0.500	s	★
F3-21	Re-leveling deceleration start	0.300 to 4.000	0.500	s	★
F3-23	Brake apply Speed	0.000 to 0.100	0.008	m/s	★
F3-24	Brake apply Current	0 to 100	5	%	★
F3-25	Stop speed	0.000 to F3-10	0.005	m/s	★

Group F4: Floor parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit	Operation
F4: Floor parameters					
F4-00	Shaft signal type	0 to 3 0: One deceleration signal, mono-stable 1: Motor flywheel signal 2: One deceleration signal, bi-stable 3: Two deceleration signals, mono-stable	0	-	★

Parameter No.	Parameter Name	Setting Range	Default	Unit	Operation
F4: Floor parameters					
F4-01	Current floor	F6-01 to F6-00	1	-	★
F4-02	High byte of current floor position	0 to 65535	1	Pulses	●
F4-03	Low byte of current floor position	0 to 65535	10000	Pulses	●
F4-04	Length 1 of leveling plate	0 to 65535	0	Pulses	★
F4-05	Length 2 of leveling plate	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	20	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	20	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	20	Pulses	★
F4-35	Current position area	0 to 65535 0: At leveling position 1: Over the current floor 2: Under the current floor	0	-	●

This parameter is used to display the position within the current floor where the elevator car is located. If the current position pulses are the same as the pulses calculated for the current floor, the direction for re-levelling can be determined. If the elevator is running up and is under the current floor, the system determines that the elevator gets closer to the levelling if it runs up. When the elevator is running down and is over the current floor, the system determines that the elevator gets closer to the levelling if it runs down. See the illustration below.



Re-leveling in non-door zone: if the car is within the deceleration signal area, it will run up to re-leveling. Whichever is closer: the car re-levels to the closest floor based on the pulses of the current door zone.

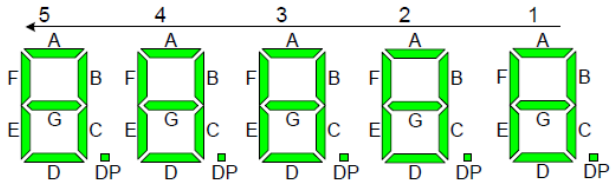
Group F5: Terminal input parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit	Operation
Group F5: Terminal input parameters					
F5-00	Attendant/Automatic switchover time	3 to 200	3	-	★
If there is a hall call at current floor in attendant state, the system automatically switches over to the automatic (normal) state after the time set in this parameter. After this running is completed, the system automatically restores to the attendant state (Bit2 of F6-67 must be set to 1). When the value of this parameter is smaller than 5, this function is disabled, and the system is in the normal attendant state.					
F5-01	X1 function selection	1 to 99 (normally open), 101 to 199 (normally closed) 00: Unused	03	-	★
F5-02	X2 function selection	01: Reserved 02: Reserved	55	-	★
F5-03	X3 function selection	03: Door zone signal 04: Running output feedback signal	0	-	★
F5-04	X4 function selection	05: Brake output feedback signal 06: Brake travel switch feedback signal 1	109	-	★
F5-05	X5 function selection	07: Reserved 08: Reserved	10	-	★
F5-06	X6 function selection	09: Inspection signal 10: Inspection up signal	11	-	★
F5-07	X7 function selection	10: Inspection down signal 12: First fire emergency signal	12	-	★
F5-08	X8 function selection	13: Reserved 14: Elevator lock signal	20	-	★
F5-09	X9 function selection	15: Up limit signal 16: Down limit signal	115	-	★
F5-10	X10 function selection	17: Up slow-down signal 18: Down slow-down signal	116	-	★
F5-11	X11 function selection ▼	19: Overload signal 20: Full-load signal	117	-	★
F5-12	X12 function selection	21: Emergency stop (safety feedback) signal 22: Door 1 open limit signal	118	-	★
F5-13	X13 function selection	23: Reserved 24: Door 1 close limit signal	119	-	★
F5-14	X14 function selection	25: Reserved 26: Door 1 light curtain signal	22	-	★
F5-15	X15 function selection	27: Reserved 28: Attendant signal	126	-	★
F5-16	X16 function selection	29: Direct travel ride signal 30: Direction change signal	28	-	★
F5-17	X17 function selection	31: Reserved 32: Reserved	30	-	★
F5-18	X18 function selection	33: UPS valid signal 34: Door open button	124	-	★
F5-19	X19 function selection	35: Door close button 36: Safety circuit	00	-	★
F5-20	X20 function selection	37: Door lock circuit 1 38: Door lock circuit 2	00	-	★
F5-21	X21 function selection	39: Half-load signal 40: Motor overheat signal	00	-	★
F5-22	X22 function selection	41: Door machine 1 safety edge signal 42: Door machine 2 safety edge signal	00	-	★
F5-23	X23 function selection	43: Earthquake signal 44: Reserved	00	-	★
F5-24	X24 function selection	45: Light-load signal 46: Reserved 47: Fire emergency floor switchover signal 48: Reserved 49: Firefighter input 50: Brake travel feedback 2 51: Car lighting switch input 52: Car fan switch input 53: Up deceleration signal input 54: Down deceleration signal input 55: Single deceleration signal input or motor flywheel signal 56 to 79: Reserved 80: RCR feedback input 81: Inside-car STOP signal input	00	-	★

Parameter No.	Parameter Name	Setting Range	Default	Unit	Operation
Group F5: Terminal input parameters					
F5-25	X25 higher-voltage input function selection	1 to 16 00: Unused 01: Safety circuit signal 02: Door lock circuit 1 signal 03: Door lock circuit 2 signal 04 to 16: Reserved	01	-	★
F5-26	X26 higher-voltage input function selection		02	-	★
F5-27	X27 higher-voltage input function selection		03	-	★
F5-28	I/O terminals state display 1	-	-	-	●
F5-29	I/O terminals state display 2	-	-	-	●

Parameter No.	Parameter Name	Setting Range	Default	Unit	Operation
Group F5: Terminal input parameters					

After you enter the F5-28 menu, the operation panel displays the state of all I/O terminals of the system. The LEDs are numbered 1 to 5 from right to left. The segments are defined as follows:



Digit Sequence	Segment	Function		
1	A	Reserved	-	●
	B	Up Levelling signal active	-	●
	C	Down Leveling signal active	-	●
	D	Door zone signal active	-	●
	E	RUN contactor output feedback	-	●
	F	Brake output feedback 1 signal actve	-	●
	G	Brake output feedback 2 signal active	-	●
	DP	U.V.W shorting (FX) contactor feedback signal active	-	●
2	A	Door lock jump out contactor feedback signal active	-	●
	B	Inspection signal active	-	●
	C	Inspection up signal active	-	●
	D	Inspection down signal active	-	●
	E	Fire emergency Landing signal active	-	●
	F	Reserved	-	●
	G	Lift lock signal active	-	●
	DP	Up limit signal active	-	●
3	A	Down limit signal active	-	●
	B	Up terminal slowdown signal active	-	●
	C	Down terminal slowdown signal active	-	●
	D	Over load signal active	-	●
	E	Full load signal active	-	●
	F	Emergency stop (safety feedback) signal active	-	●
	G	Door 1 open limit signal active	-	●
	DP	Door 2 open limit signal active	-	●

LED No.	Segment	Meaning of Segment	Meaning of Segment ON
4	A	Door 1 close limit signal	Door 1 close limit signal active
	B	Reserved	Reserved
	C	Door machine 1 light curtain signal	Door machine 1 light curtain signal active
	D	Reserved	Reserved
	E	Attendant signal	Attendant signal active
	F	Direct travel ride signal	Direct travel ride signal active
	G	Direction change signal	Direction change signal active
	DP	Independent running signal	Independent running signal active
5	A	Reserved	Reserved
	B	UPS input signal active	UPS input signal active
	C	Door open button	Door open button active
	D	Door close button	Door close button active
	E	Door lock circuit 1 (low-voltage input)	Door lock circuit 1 signal active
	F	Door lock circuit 2 (low-voltage input)	Door lock circuit 2 signal active
	G	Half-load signal	Half-load signal active
	DP	Unused	Not applicable

Parameter No.	Parameter Name	Setting Range	Default	Unit	Operation
Group F5: Terminal input parameters					

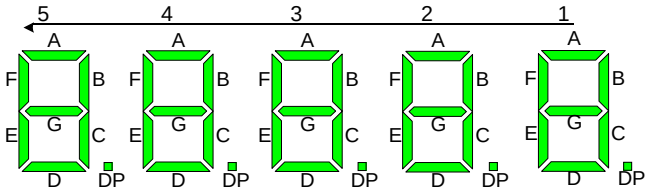
The following table describes the meaning of the LED segments indicating the I/O terminal state in F5-29.

LED No.	Segment	Meaning of Segment	Meaning of Segment ON
1	A	Unused	Not applicable
	B	Safety circuit signal	Safety circuit signal active
	C	Door lock circuit 1 signal (high-voltage input)	Door lock circuit 1 signal active
	D	Door lock circuit 2 signal (high-voltage input)	Door lock circuit 2 signal active
	E	Unused	Not applicable
	F	Unused	Not applicable
	G	Unused	Not applicable
	DP	Unused	Not applicable
2	A	Y0 output	Y0 output active
	B	Running contactor output	Running contactor output active
	C	Brake contactor output	Brake contactor output active
	D	Higher-voltage startup of brake	Higher-voltage startup of brake active
	E	Fan/light output	Fan/light output active
	F	Reserved	Reserved
	G	Door 1 open output	Door 1 open output active
	DP	Door 1 close output	Door 1 close output active
LED No.	Segment	Meaning of Segment	Meaning of Segment ON
3	A	Reserved	Reserved
	B	Reserved	Reserved
	C	Low 7-segment a display output	Low 7-segment a display output active
	D	Low 7-segment b display output	Low 7-segment b display output active
	E	Low 7-segment c display output	Low 7-segment c display output active
	F	Low 7-segment d display output	Low 7-segment d display output active
	G	Low 7-segment e display output	Low 7-segment e display output active
	DP	Low 7-segment f display output	Low 7-segment f display output active
4	A	Low 7-segment g display output	Low 7-segment g display output active
	B	Up arrow display output	Up arrow display output active
	C	Down arrow output	Down arrow output active
	D	Minus sign display output	Minus sign display output active
	E	Returning to base floor at fire emergency output	Returning to base floor at fire emergency output active
	F	Buzzer output	Buzzer output active
	G	Overload output	Overload output active
	DP	Arrival gong output	Arrival gong output active

Parameter No.	Parameter Name	Setting Range	Default	Unit	Operation
Group F5: Terminal input parameters					
5	A	Full-load output	Full-load output active		
	B	Inspection output	Inspection output active		
	C	Fan/light output 2	Fan/light output 2 active		
	D	Door lock circuit shorting contactor output	Door lock circuit shorting contactor output active		
	E	BCD/Gray code/7-segment high-bit output	BCD/Gray code/7-segment high-bit output active		
	F	Controller normal running output	Controller normal running output active		
	G	Unused	Not applicable		
	DP	Unused	Not applicable		
F5-30	Floor I/O terminal state display 1	-	-	-	●

Parameter No.	Parameter Name	Setting Range	Default	Unit	Operation
Group F5: Terminal input parameters					

After you enter the F5-30 menu, the operation panel displays the state of all floor I/O terminals of the system. The LEDs are numbered 1 to 5 from right to left. The segments are defined as follows:



The following table describes the meaning of the LED segments indicating the floor I/O terminal state in F5-30.

1	A	Door 1 open button I/O	Door 1 open button I/O active
	B	Door 1 close button I/O	Door 1 close button I/O active
	C	Door 1 open delay button I/O	Door 1 open delay button I/O active
	D	Floor 1 door 1 car call I/O	Floor 1 door 1 car call I/O active
	E	Floor 2 door 1 car call I/O	Floor 2 door 1 car call I/O active
	F	Floor 3 door 1 car call I/O	Floor 3 door 1 car call I/O active
	G	Floor 4 door 1 car call I/O	Floor 4 door 1 car call I/O active
	DP	Floor 5 door 1 car call I/O	Floor 5 door 1 car call I/O active
2	A	Floor 6 door 1 car call I/O	Floor 6 door 1 car call I/O active
	B	Floor 7 door 1 car call I/O	Floor 7 door 1 car call I/O active
	C	Floor 8 door 1 car call I/O	Floor 8 door 1 car call I/O active
	D	Floor 9 door 1 car call I/O	Floor 9 door 1 car call I/O active
	E	Floor 10 door 1 car call I/O	Floor 10 door 1 car call I/O active
	F	Reserved	Reserved
	G	Unused	Not applicable
	DP	Unused	Not applicable
3	A	Floor 1 door 1 up call I/O	Floor 1 door 1 up call I/O active
	B	Reserved	Reserved
	C	Floor 2 door 1 up call I/O	Floor 2 door 1 up call I/O active
	D	Floor 2 door 1 down call I/O	Floor 2 door 1 down call I/O active
	E	Floor 3 door 1 up call I/O	Floor 3 door 1 up call I/O active
	F	Floor 3 door 1 down call I/O	Floor 3 door 1 down call I/O active
	G	Floor 4 door 1 up call I/O	Floor 4 door 1 up call I/O active
	DP	Floor 4 door 1 down call I/O	Floor 4 door 1 down call I/O active

LED No.	Segment	Meaning of Segment	Meaning of Segment ON
4	A	Floor 5 door 1 up call I/O	Floor 5 door 1 up call I/O active
	B	Floor 5 door 1 down call I/O	Floor 5 door 1 down call I/O active
	C	Floor 6 door 1 up call I/O	Floor 6 door 1 up call I/O active
	D	Floor 6 door 1 down call I/O	Floor 6 door 1 down call I/O active
	E	Floor 7 door 1 up call I/O	Floor 7 door 1 up call I/O active
	F	Floor 7 door 1 down call I/O	Floor 7 door 1 down call I/O active
	G	Floor 8 door 1 up call I/O	Floor 8 door 1 up call I/O active
	DP	Floor 8 door 1 down call I/O	Floor 8 door 1 down call I/O active
5	A	Floor 9 door 1 up call I/O	Floor 9 door 1 up call I/O active
	B	Floor 9 door 1 down call I/O	Floor 9 door 1 down call I/O active
	C	Reserved	Reserved
	D	Floor 10 door 1 down call I/O	Floor 10 door 1 down call I/O active
	E	Reserved	Reserved
	F	Reserved	Reserved
	G	Unused	Not applicable
	DP	Unused	Not applicable

Group F6: Elevator basic parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit	Operation
F6: Elevator basic parameters					
F6-00	Top serving floor of the elevator	F6-01 to 12	6	-	★
F6-01	Bottom serving floor of the elevator	1 to F6-00	1	-	★
F6-02	Parking floor	F6-01 to F6-00	1	-	★
F6-03	Fire emergency floor 1	F6-01 to F6-00	1	-	★
F6-04	Elevator lock floor	F6-01 to F6-00	1	-	★
F6-05	Service floors	1: Respond to calls 2: Not respond to calls	65535	-	★

Bit	Corresponding floor	Service or not	Binary setting	Bit	Corresponding floor	Service or not	Binary setting
Bit0	Floor 1	In service	1	Bit8	Floor 9	Not in service	0
Bit1	Floor 2	Not in service	0	Bit9	Floor 10	In service	1
Bit2	Floor 3	In service	1	Bit10	Floor 11	In service	1
Bit3	Floor 4	In service	1	Bit11	Floor 12	Not in service	0
Bit4	Floor 5	In service	1	Bit12	Reserved	None	
Bit5	Floor 6	In service	1	Bit13	Reserved	None	
Bit6	Floor 7	In service	1	Bit14	Reserved	None	
Bit7	Floor 8	Not in service	0	Bit15	Reserved	None	

Convert the binary value to decimal: 1111 0110 0111 1101 = 63101
Then, enter “63101” for F6-05 on the operation panel.

F6-06	Elevator function control 1	Bit1: Returning to base floor if position deviation too large Bit3: Buzzer not tweet upon re-leveling Bit5: Cancelling auto reset of door lock fault Bit6: Clear floor number and display direction in advance Bit8: Hall call not directional Bit10: Door lock disconnected once when inspection turned to normal	0	-	★
F6-07	Elevator function control 2	Bit2: Arrow blinking during running Bit3: Elevator lock in the attendant state Bit6: Fault code not displayed on keypad Bit9: Stop holding at brake feedback abnormal Bit10: Cancelling Err30 detection at re-leveling Bit12: Fault auto reset	0	-	★
F6-08	Arrow blinking interval	0 to 5.0	1.0	-	★
F6-09	Random test times	0 to 60000	0	-	★
F6-10	Test function selection	Bit0: Hall call Disable Bit1: Door open Disable Bit2: Overload allowed Bit3: Terminal Limit cancel	0	-	★

Parameter No.	Parameter Name	Setting Range	Default	Unit	Operation
F6: Elevator basic parameters					
F6-11	L1 function selection	00: Unused 201 to 203 (Door 1 open/close), 205 to 209 (Reserved), 210 to 229 (Door 1 car call), 230 to 249 (Door 1 up hall call), 250 to 269 (Door 1 down hall call), 270 to 399 (Reserved) 201: Door 1 open button 202: Door 1 close button 203: Door 1 open delay button 204: Reserved 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 223: Reserved 224: Reserved 225: Reserved 226: Reserved 227 to 230: Reserved 231: Floor 1 door 1 up call 232: Floor 2 door 1 up call 233: Floor 3 door 1 up call 234: Floor 4 door 1 up call 235: Floor 5 door 1 up call 236: Floor 6 door 1 up call 237: Floor 7 door 1 up call 238: Floor 8 door 1 up call 239: Floor 9 door 1 up call 240: Floor 10 door 1 up call 241: Floor 11 door 1 up call 242: Reserved 243: Reserved 244: Reserved 245: Reserved 246 to 251: Reserved 252: Floor 2 door 1 down call 253: Floor 3 door 1 down call 254: Floor 4 door 1 down call 255: Floor 5 door 1 down call 256: Floor 6 door 1 down call 257: Floor 7 door 1 down call 258: Floor 8 door 1 down call 259: Floor 9 door 1 down call 260: Floor 10 door 1 down call	231	-	★
F6-12	L2 function selection		252	-	★
F6-13	L3 function selection		232	-	★
F6-14	L4 function selection		253	-	★
F6-15	L5 function selection		233	-	★
F6-16	L6 function selection		254	-	★
F6-17	L7 function selection		234	-	★
F6-18	L8 function selection		255	-	★
F6-19	L9 function selection		235	-	★
F6-20	L10 function selection		256	-	★
F6-21	L11 function selection		00	-	★
F6-22	L12 function selection		00	-	★
F6-23	L13 function selection		211	-	★
F6-24	L14 function selection		212	-	★
F6-25	L15 function selection		213	-	★
F6-26	L16 function selection		214	-	★
F6-27	L17 function selection		215	-	★
F6-28	L18 function selection		216	-	★
F6-29	L19 function selection		236	-	★
F6-30	L20 function selection		257	-	★
F6-31	L21 function selection		237	-	★
F6-32	L22 function selection		258	-	★
F6-33	L23 function selection		238	-	★
F6-34	L24 function selection		259	-	★
F6-35	L25 function selection		239	-	★
F6-36	L26 function selection		260	-	★
F6-37	L27 function selection		240	-	★
F6-38	L28 function selection		261	-	★
F6-39	L29 function selection		241	-	★
F6-40	L30 function selection		262	-	★
F6-41	L31 function selection		217	-	★
F6-42	L32 function selection		218	-	★
F6-43	L34 function selection		219	-	★
F6-44	L34 function selection		220	-	★
F6-45	L35 function selection		221	-	★
F6-46	L36 function selection	261: Floor 11 door 1 down call	222	-	★
F6-47	L37 function selection	262: Floor 12 door 1 down call	00	-	★
F6-48	L38 function selection	263: Reserved	00	-	★
F6-49	L39 function selection	264: Reserved	00	-	★
F6-50	L40 function selection	265: Reserved	00	-	★
F6-51	L41 function selection	266: Reserved	00	-	★
F6-52	L42 function selection	267 to 299: Reserved	00	-	★
F6-61	Leveling sensor delay	10 to 50	14	ms	★

Parameter No.	Parameter Name	Setting Range	Default	Unit	Operation
F6: Elevator basic parameters					
F6-62	Time interval of random running	0 to 1000	3	-	☆
F6-64	Program control selection 1	Bit1: Reserved Bit4: Reserved Bit5: Clearing calls immediately at elevator lock Bit9: Disabling reverse floor number clear Bit11: Responding to car calls first	0	-	★
F6-65	Program control selection 2	Bit2: Inspection to stop due to slow-down Bit4: Buzzer tweet during door open delay Bit8: Door open at elevator lock Bit9: Display available at elevator lock Bit11: Blinking at arrival	0	-	★
F6-66	Program control selection 3	Bit1: Cancelling door open/close command at delay after door open/close limit Bit2: Not judging door lock state at door close output Bit3: Door close command output during running Bit4: Returning to base floor for verification at first-time power-on	0	-	★
F6-67	Attendant function selection	Bit0: Calls cancelled after entering attendant state Bit1: Not responding to hall calls Bit2: Attendant/Automatic state switchover Bit3: Door close at jogging Bit4: Automatic door close Bit5: Buzzer tweeting at intervals in attendant state Bit6: Continuous buzzer tweeting in attendant state Bit7: Car call button blinking to prompt	128	-	★
F6-68	Fire emergency function selection	Bit0: Automatic entering of fire emergency state once fire emergency switch is active Bit3: Arrival gong output in inspection or fire emergency state Bit4: Multiple car calls registered in fire emergency state Bit5: Retentive at power failure in fire emergency state Bit6: Closing door by holding down the door close button Bit9: Displaying hall calls in fire emergency state Bit11: Exiting fire emergency state for firefighter Bit12: Not clearing car calls at reverse door open in firefighter running state Bit14: Opening door by holding down the door open button Bit15: Automatic door open in fire emergency floor	16457	-	★

Parameter No.	Parameter Name	Setting Range	Default	Unit	Operation
F6-69	Emergency evacuation function selection	Bit0\Bit1: Direction determine mode Bit2: Stopping at evacuation parking floor Bit4: Reserved Bit8: Emergency running time protection Bit10: Emergency buzzer output Bit12: Reserved Bit13: Reserved Bit14: Emergency evacuation exit mode Bit15: India ARD evacuation mode	0	-	★
F6-73	Evacuation parking floor	0 to F6-00	0	-	★
F6-74	Blinking advance time	0.0 to 15.0	1	s	★

Group F7: Terminal output parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit	Operation
F7: Terminal output parameters					
F7-00	Y0 function selection	(Y0 is the special output used for emergency drive at power failure) Setting range: (00 to 05) or 32 00: Unused 01: Running contactor output 02: Brake contactor output 03: Reserved 04: Lighting, fan output 05: Reserved	32	-	★
F7-01	Y1 function selection		01	-	★
F7-02	Y2 function selection		02	-	★
F7-03	Y3 function selection		04	-	★

Parameter No.	Parameter Name	Setting Range	Default	Unit	Operation
F7: Terminal output parameters					
F7-04	Y4 function selection	Setting range: 06 to 99 00: Unused 06: Door 1 open output 07: Door 1 close output 08: Reserved 09: Reserved 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 18: Down arrow display output 19: Minus sign display output 20: Returning to base floor at fire emergency 21: Buzzer output 22: Overload output 23: Arrival gong output 24: Full-load output 25: Inspection output 26: Fan output 27: Door lock circuit shorting contactor output 28: BCD/Gray code/7-segment high-bit output 29: Controller normal running output 30: Electric lock output 31: Reserved 32: Emergency evacuation at power failure 33: Forced door close 1 34: Forced door close 2 35: Faulty state 36: Up 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 output 45: High 7-segment e display output 46: High 7-segment f display output 47: High 7-segment g display output 48: UPS/ARD up running output 49: UPS/ARD down running output 50: Up running hall indicator output 51: Down running hall indicator output 52: Up/down running hall indicator output 53: Fire emergency state prompt output 54: Elevator normal mode output 55: Manual door lock cutoff prompt 56: Attendant state prompt output 57 to 99: Reserved	26	-	★
F7-05	Y5 function selection		06	-	★
F7-06	Y6 function selection		07	-	★
F7-07	Y7 function selection		48	-	★
F7-08	Y8 function selection		49	-	★
F7-09	Y9 function selection		25	-	★
F7-10	Y10 function selection		10	-	★
F7-11	Y11 function selection		11	-	★
F7-12	Y12 function selection		12	-	★
F7-13	Y13 function selection		13	-	★
F7-14	Y14 function selection		14	-	★
F7-15	Y15 function selection		15	-	★
F7-16	Y16 function selection		16	-	★
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		23	-	★
F7-24	Y24 function selection		24	-	★

Group F8: Advanced function parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit	Operation
F8: Advanced function parameters					
F8-05	Current car load	0 to 255	0	%	•
F8-06	Mechanical friction torque	0.0 to 100.0	10	%	★

F8-09	Emergency evacuation operation speed at power failure	0.000 to F3-11	0.05	m/s	★
F8-10	Emergency evacuation operation mode at power failure	0: Motor not running 1: UPS running 2: 48 V battery power supply	0	-	★
F8-11	Stop torque output delay	0.200 to 1.500	0.300	s	★
F8-12	Fire emergency floor 2	0 to F6-00	0	-	★
F8-13	Anti-nuisance function	Bit0: Reserved Bit1: Judged by light curtain Bit 2: Judged by light-load signal	0	-	★
F8-14	Startup mode	0: DC injection braking startup 1: Pre-excitation startup (AC asynchronous motor)	0	-	★
F8-15	DC injection braking current at startup	0 to 150	50	%	★
F8-16	DC injection braking current at stop	0 to 150	30	%	★
F8-20	Delay of arrival at door zone in emergency evacuation	0.000 to 2.000	0	s	★
F8-21	Manual Door Open Buzzer Delay	0.000 to 2.000	0	s	★
F8-22	Auto Call Cancellation delay upon door safety disconnection on normal running	0 ~ 120s	120	s	★

Group F9: Time parameters

Parameter	Name	Setting Range	Default	Unit	Operation
F9: Time parameters					
F9-00	Idle time before returning to base floor	1 to 240 0: Disabled	10	min	☆
F9-01	Fan/light turnoff time	0 to 6000 0: Disabled. The fan will always run.	60	s	☆
F9-02	Motor running time limit	0 to 45 Invalid for the time less than 3s.	45	s	★
F9-03	Accumulative running hours	0 to 65535 hours	0	h	●
F9-05	High byte for number of running cycles	0 to 9999 Note: 1 indicates an actual number of 10,000 running cycles	0	-	●
F9-06	Low byte for number of running cycles	0 to 9999	0	-	●
F9-08	Set running time	0 to 9999	0	h	●

Group FA: Keypad setting parameters

Parameter	Name	Setting Range	Default	Unit	Operation
FA: Keypad setting parameters					
FA-00	Baud rate	0:9600 1:38400	1	-	-
FA-01	Display in running state	1 to 65535	65535	-	☆
FA-02	Display in stop state	1 to 65535	65535	-	☆

Parameter	Name	Setting Range	Default	Unit	Operation
FA: Keypad setting parameters					

It is used to set the parameters displayed on the keypad when the elevator is in the stop state. A total of 16 parameters can be displayed at stop. The use is the same as that of FA-01.

The 16 binary bits correspond to the stop state parameters listed in the following table.

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

The running and stop parameters of the controller are the important references for engineers to perform commissioning on site. The parameters are described as follows:

Running speed: indicates the actual running speed of the elevator. Its maximum value is F0-03 (Maximum running speed), in unit of m/s.

Set speed: indicates the set speed of the controller during elevator running. It is the running speed calculated by the system theoretically at which the elevator should run, in unit of m/s.

Bus voltage: indicates the DC bus voltage of the controller, in unit of m/s.

Current floor: indicates the information of the physical floor where the elevator is located. It is the same as the value of F4-01.

Current position: indicates the absolute distance from the current elevator car to the leveling plate of the first floor, in unit of m.

Car load: indicates the percentage of the car load to the rated load judged by the controller based on data from the sensor, in unit of %.

Output voltage: indicates the effective value of the equivalent voltage of the PWM wave output by the controller, in unit of V.

Output current: indicates the effective value of the actual current when the controller drives the motor to turn, in unit of A.

Output frequency: indicates the actual frequency of the motor during running. It has a fixed corresponding relationship with the running speed. The unit is Hz.

Pre-torque current: indicates the percentage of the pre-torque current compensated during startup to the rated current, in unit of %.

The following describes the details for I/O terminal state display.

Input terminal 1 state: indicate the meaning of input terminals by bit. “1” indicates that the signal is active. A total of 16 bits are defined as below:

Bit	Description	Bit	Description
Bit0	Reserved	Bit8	Door lock circuit shorting 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	Running contactor feedback	Bit12	Fire emergency signal
Bit5	Brake contactor feedback	Bit13	Reserved
Bit6	Brake travel switch feedback	Bit14	Elevator lock signal
Bit7	Self-lock feedback	Bit15	Up limit signal

Parameter	Name	Setting Range	Default	Unit	Operation
FA: Keypad setting parameters					

Input terminal 2 state: indicate the meaning of input terminals by bit. “1” indicates that the signal is active. A total of 16 bits are defined as below:

Bit	Description	Bit	Description
Bit0	Down limit signal	Bit8	Door 1 close limit
Bit1	Up slow-down signal	Bit9	Reserved
Bit2	Down slow-down signal	Bit10	Door machine 1 light curtain
Bit3	Overload signal	Bit11	Reserved
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 change signal
Bit7	Reserved	Bit15	Independent running

Input terminal 3 state: indicate the meaning of input terminals by bit. “1” indicates that the signal is active. A total of 16 bits are defined as below:

Bit	Description	Bit	Description
Bit0	Reserved	Bit8	The motor is overheated.
Bit1	UPS input	Bit9	Door 1 safety edge
Bit2	Door open button	Bit10	Reserved
Bit3	Door close button	Bit11	Earthquake signal
Bit4	Safety circuit	Bit12	Reserved
Bit5	Door lock circuit 1	Bit13	Light-load
Bit6	Door lock circuit 2	Bit14	Reserved
Bit7	Half-load signal	Bit15	Fire emergency floor switchover

Output terminal 1 state: indicates the meaning of output terminals by bit. “1” indicates that the signal is active. A total of 16 bits are defined as below:

Bit	Description	Bit	Description
Bit0	Reserved	Bit8	Reserved
Bit1	Running contactor	Bit9	Reserved
Bit2	Brake contactor	Bit10	Low 7-segment a display output
Bit3	Higher-voltage startup of brake	Bit11	Low 7-segment b display output
Bit4	Fan/light output	Bit12	Low 7-segment c display output
Bit5	Reserved	Bit13	Low 7-segment d display output
Bit6	Door 1 open	Bit14	Low 7-segment e display output
Bit7	Door 1 close	Bit15	Low 7-segment f display output

Parameter	Name	Setting Range	Default	Unit	Operation
FA: Keypad setting parameters					

Output terminal 2 state: indicates the meaning of CTB outputs by bit. “1” indicates that the signal is active. A total of 16 bits are defined as below:

Bit	Description	Bit	Description
Bit0	Low 7-segment g display output	Bit8	Full-load output
Bit1	Up arrow display output	Bit9	Inspection output
Bit2	Down arrow display output	Bit10	Fan/light output 2
Bit3	Minus sign display output	Bit11	Door lock circuit shorting contactor output
Bit4	Returning to base floor at fire emergency output	Bit12	BCD/Gray code/7-segment code high-byte output
Bit5	Buzzer output	Bit13	Controller normal running output
Bit6	Overload output	Bit14	Electric lock output
Bit7	Arrival gong output	Bit15	Reserved

System state: indicates the system state by bit. “1” indicates that the signal is active. A total of 16 bits are defined as below:

Bit	Description	Bit	Description
Bit0	Light curtain state 1	Bit8	Car state: 1: Door open 2: Door open holding 3: Door close 4: Door close limit 5: Running
Bit1	Light curtain state 2	Bit9	
Bit2	Elevator lock signal	Bit10	
Bit3	Fire emergency	Bit11	
Bit4	Elevator state: 0: Inspection 1: Shaft auto-tuning 3: Return to base floor at fire emergency 4: Firefighter operation 6: Attendant operation 7: Automatic (normal)	Bit12	Full-load
Bit5		Bit13	Overload
Bit6		Bit14	Reserved
Bit7		Bit15	Reserved

FA-03	Current encoder angle	0.0 to 360.0	0.0	degree	●
FA-05	Software version (ZK)	0 to 65535	0	-	●
FA-06	Software version (DSP)	0 to 65535	0	-	●
FA-07	Heatsink temperature	0 to 100	0	°C	●
FA-08	Controller model	0 to 65535	380	-	-
FA-12	Logic information	0 to 65535	0	-	-

It displays the elevator status parameters.

The LEDs are arranged as 5, 4, 3, 2, 1 from left to right. LED 1 shows the state of door 1. LEDs 2 and 3 have no display. LEDs 4 and 5 together show the elevator state. The following figure shows the elevator in inspection and door close state.

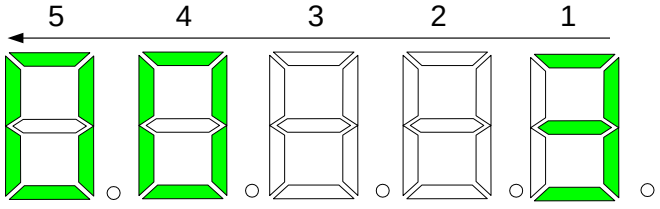


Figure 2-5 Elevator state display

Parameter	Name	Setting Range	Default	Unit	Operation
FA: Keypad setting parameters					

The LEDs are defined in the following table.

5		4		3	2	1	
Elevator State				No data displayed	No data displayed	Door 1 State	
00	Inspection state	8	Elevator lock	-	-	0	Waiting state
01	Shaft auto-tuning	09	Idle elevator parking			1	Door open state
02	Micro-leveling	10	Re-leveling at low speed			2	Door open limit
03	Returning to base floor at fire emergency	11	Emergency evacuation operation			3	Door close state
04	Firefighter running	12	Motor auto-tuning			4	Door close limit
05	Fault state	13	Keypad control			-	-
06	Attendant	14	Base floor verification			-	-
07	Automatic	-	-			-	-

FA-13	Curve information	0 to 65535	0	-	-

It displays the system running curve information. Similar to the display of FA-12, LEDs 5, 4 and 3 have no display, while LEDs 2 and 1 show the running curve information. See the table below:

5	4	3	2		1	
No data displayed	No data displayed	No data displayed	Curve information			
-	-	-	00	Standby state	09	Deceleration start segment
			01	Zero-speed start segment	10	Linear deceleration segment
			02	Zero-speed holding segment	11	Deceleration end segment
			03	Reserved	12	Zero speed at stop
			04	Startup speed stage	13	Current stop phase
			05	Acceleration start segment	14	Reserved
			06	Linear acceleration segment	15	Stop data processing
			07	Acceleration end segment	16 to 20	Auto-tuning stage
			08	Stable-speed running segment	21	Emergency running

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	Current position	0.0 to 300.0	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	●
FA-24	Communication interference	0 to 65535	0	-	●

Parameter	Name	Setting Range	Default	Unit	Operation
FA: Keypad setting parameters					

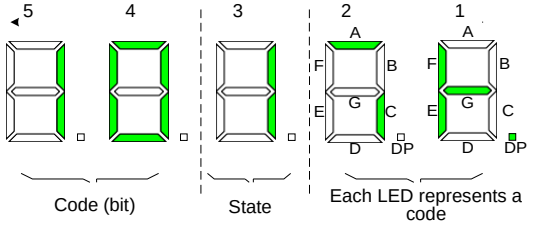
It displays the current communication quality of the system, as described in the following table.

5		4	3		2	1
SPI Communication Quality		No data displayed	CAN Communication Quality		No data displayed	No data displayed
0	High	-	0	High	-	-
↓	↑		↓	↑		
9	Interrupted		9	Interrupted		

0–9 indicates the communication quality. The greater the number is, the larger interference the communication suffers and the poorer the communication quality is.

FA-26	Input state 1	0 to 65535	0	-	●
FA-27	Input state 2	0 to 65535	0	-	●
FA-28	Input state 3	0 to 65535	0	-	●
FA-29	Input state 4	0 to 65535	0	-	●
FA-30	Input state 5	0 to 65535	0	-	●
FA-31	Output state 1	0 to 65535	0	-	●
FA-32	Output state 2	0 to 65535	0	-	●
FA-33	Output state 3	0 to 65535	0	-	●
FA-34	Floor I/O state 1	0 to 65535	0	-	●
FA-35	Floor I/O state 2	0 to 65535	0	-	●
FA-36	Floor I/O state 3	0 to 65535	0	-	●
FA-37	Floor I/O state 4	0 to 65535	0	-	●

They show the system input and output status. For details, see the figure below.



Example of input state display

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 show the function No.; LED 3 shows whether the function is valid (1) or invalid (0); the 16 segments of LEDs 1 and 2 show the states of the16 functions in this parameter.

The preceding figure shows display of FA-16: LEDs 5, 4, and 3 show that function 10 (Inspection down) is 1 (Valid); LEDs 1 and 2 show that besides function 10, functions 4 (Running contactor feedback), 5 (Brake contactor feedback), 6 (Brake travel switch feedback) are valid.

Parameter	Name	Setting Range	Default	Unit	Operation

FA: Keypad setting parameters

FA-26 Input state 1

No.	Function	No.	Function
0	Reserved	8	Door lock circuit shorting feedback
1	Up leveling signal	9	Inspection signal
2	Down leveling signal	10	Inspection up
3	Door zone signal	11	Inspection down
4	Running contactor feedback	12	Fire emergency
5	Brake contactor feedback	13	Reserved
6	Brake travel switch feedback	14	Elevator lock
7	Reserved	15	Up limit signal

FA-27 Input state 2

No.	Function	No.	Function
0	Down limit signal	8	Door 1 close limit
1	Up emergency terminal slow-down signal	9	Reserved
2	Down emergency terminal slow-down signal	10	Door machine 1 light curtain
3	Overload signal	11	Reserved
4	Full-load signal	12	Attendant signal
5	Emergency stop	13	Direct travel ride signal
6	Door 1 open limit	14	Direction change signal
7	Reserved	15	Independent running

FA-28 Input state 3

No.	Function	No.	Function
0	Reserved	8	The motor is overheated.
1	UPS input	9	Door 1 safety edge
2	Door open button	10	Reserved
3	Door close button	11	Earthquake signal
4	Safety circuit	12	Back door forbidden
5	Door lock circuit 1	13	Light-load
6	Door lock circuit 2	14	Single/Double door selection
7	Half-load signal	15	Fire emergency floor switchover

FA-29 Input state 4

No.	Function	No.	Function
0	Virtual floor	8	Reserved
1	Firefighter switch	9	Reserved
2	Brake travel switch feedback 2	10	Reserved
3	Reserved	11	Reserved
4	Reserved	12	Reserved
5	Reserved	13	Reserved
6	Reserved	14	Reserved
7	Reserved	15	Reserved

FA-30 Input state 5

No.	Function	No.	Function
0	Reserved	8	Reserved
1	Higher-voltage safety circuit	9	Reserved
2	Higher-voltage door lock circuit 1	10	Reserved
3	Higher-voltage door lock circuit 2	11	Reserved
4	Reserved	12	Reserved
5	Reserved	13	Reserved
6	Reserved	14	Reserved
7	Reserved	15	Reserved

FA-31 Output state 1

No.	Function	No.	Function
0	Reserved	8	Reserved
1	Running contactor output	9	Reserved
2	Brake contactor output	10	Low 7-segment a display output
3	Higher-voltage startup of brake	11	Low 7-segment b display output
4	Fan/light output	12	Low 7-segment c display output
5	Reserved	13	Low 7-segment d display output
6	Door 1 open	14	Low 7-segment e display output
7	Door 1 close	15	Low 7-segment f display output

Parameter	Name	Setting Range	Default	Unit	Operation
FA: Keypad setting parameters					

FA-32 Output state 2				FA-33 Output state 3			
No.	Function	No.	Function	No.	Function	No.	Function
0	Low 7-segment g display output	8	Full-load output	0	Emergency evacuation at power failure (valid).	8	Reserved
1	Up arrow display output	9	Inspection output	1	Forced door close 1	9	High 7-segment a display output
2	Down arrow display output	10	Fan/light output 2	2	Reserved	10	High 7-segment b display output
3	Minus sign display output	11	Door lock circuit shorting contactor output	3	Fault state	11	High 7-segment c display output
4	Returning to base floor at fire emergency output	12	BCD/Gray code/7-segment code high-byte output	4	Up signal	12	High 7-segment d display output
5	Buzzer output	13	Controller normal running output	5	Medical sterilization output	13	High 7-segment e display output
6	Overload output	14	Electric lock output	6	Non-door zone stop output	14	High 7-segment f display output
7	Arrival gong output	15	Reserved	7	Non-service state output	15	High 7-segment g display output

The input/output signals of all floors are viewed in FA-34 to FA-40, as described in the following table.

FA-34 Floor I/O state 1				FA-35 Floor I/O state 2 (door 1 car call)			
No.	Function	No.	Function	No.	Function	No.	Function
0	Door 1 open	8	Reserved	0	Floor 1 car call	8	Floor 9 car call
1	Door 1 close	9	Reserved	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	Reserved	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 state 3 (door 1 up call)				FA-37 Floor I/O state 4 (door 1 down call)			
No.	Function	No.	Function	No.	Function	No.	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

Parameter	Name	Setting Range	Default	Unit	Operation
FA: Keypad setting parameters					
FA-41	System state	0 to 65535 0: Display up direction# 1: Display down direction# 2: 1=Running; 0=Stop# 3: 1=System full-load# 4: 1=System overload# 5: 1=System half-load# 6: 1=System light-load#	0	-	●
FA-42	Input state 6	0 to 65535	0	-	●
FA-43	Input state 7	0 to 65535	0	-	●
FA-44	Non-standard version number	0 to 65535	0	-	●
FA-45	Manufacturer version number	0 to 65535	0	-	●
FA-46	Output state 4	0 to 65535	0	-	●
FA-47	Output state 5	0 to 65535	0	-	●

Group FB: Door parameters

Parameter	Name	Setting Range	Default	Unit	Operation
FB: Door parameters					
FB-00	Number of door machine(s)	1 to 2	1	-	★
FB-02	Service floors of door machine 1	0 to 65535 1: Normal opening; 0: Opening forbidden	65535	-	☆
FB-03	Holding time of manual door open	1 to 60	5s	s	☆
FB-05	Stop delay for returning to leveling floor	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 Bit 6 to bit 12: Reserved Bit13: Higher voltage/Lower voltage 1.5s detection	0	-	☆
FB-08	Door close protection time	5 to 99	15	s	☆
FB-09	Door open/close protection times	0 to 20; 0: Disabled	0	-	☆
FB-10	Door state of standby elevator	0: Closing the door as normal 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 time upon open delay valid	10 to 1000	30	s	☆

Parameter	Name	Setting Range	Default	Unit	Operation
FB: Door parameters					
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 at manual door	0 to 50	5s	s	☆
FB-17	Holding time for forced door close	5 to 180	120	s	☆
FB-18	Door function selection	Bit0: India manual door Bit1: India semi-automatic door mode 1 Bit2: India semi-automatic door mode 2 Bit3: No open/close limit for doors Bit5: Arrival gong hall call prompt Bit6: 1: Intermittent output of door lock verification prompts; 0: Continuous output of door lock verification prompts Bit7: 1: Output continued if door lock is still inactive after three times of verifications; 0: Disabled	0	s	☆
FB-19	Holding time for electromagnetic lock close	1 to 60	3	s	☆
FB-20	Holding time for electromagnetic lock release	1 to 60	3	s	☆
FB-21	Holding time for electromagnetic lock feedback	0 to 65535	500	ms	★
FB-22	Time limit for returning to leveling floor in emergency evacuation	0 to 60000	180	s	☆
FB-23	Holding time for door open after emergency evacuation complete	0 to 1000	5	s	☆

Group FC: Protection function parameters

Parameter	Name	Setting Range	Default	Unit	Operation
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 enabled Bit1: Canceling current detection at inspection startup Bit2: Decelerating to stop at valid light curtain Bit3: Password ineffective if no operation within 30 minutes Bit4: Floor number not cleared if door lock is open during running, elevator continues to run after door lock is closed again Bit 4 to bit 9: Reserved	18	-	★
FC-01	Overload protection selection	0 to 65535 Bit0: Enable overload protection 0: Disabled; 1: Enabled Bit1: Disable output phase loss protection Bit2: Output phase loss protection mode 0: Only detection during running 1: Detection before and during running Bit3: Reserved Bit4: Light curtain judgment at door close limit 0: No re-open 1: Re-open Bit5: Disable SPI communication judgment Bit7: Reserved Bit8: Reserved Bit9: Canceling Err55 alarm, stop at another floor Bit 10 to bit 13: Reserved Bit14: Canceling protection at input phase loss	69	-	★

Parameter	Name	Setting Range	Default	Unit	Operation
FC: Protection function parameters					
FC-02	Overload protection coefficient	0.20 to 10.00	1.00	-	★
FC-03	Overload pre-warning coefficient	50 to 100%	80%	%	★
FC-04	Underload detection level	0.0 to 100.0	10.0	%	●
FC-05	Underload detection time	0.0 to 60.0	1.0	-	●
If underload protection function is effective, when the output current of the AC drive is less than the value set in FC-04 (Underload detection level), and the underload lasts for longer than the time set in FC-05 (Underload detection time), the output frequency of the AC drive will decrease to 7% of the rated frequency automatically. During underload protection period, if the load is recovered, the AC drive will recover to its rated frequency automatically.					
Parameters FC-17 to FC-46 record the latest 10 to 20 faults of the elevator. If the 10 detailed fault records are full, the earliest detailed fault record will be moved to the latest brief fault record. For example, if a new fault occurs, the fault code, subcode and time information of the fault recorded in group E9 (fault information) will be moved to FC-17 to FC-19. The brief fault record 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 record is 0835, indicating that when the latest brief fault record (fault Err35) occurs, the car is near floor 8. The fault subcode is used to locate the causes of the fault.					

Parameter	Name	Setting Range	Default	Unit	Operation
FC: Protection function parameters					
FC-17	11th fault record	0 to 9999 The two high digits indicate the floor number, and the two low digits indicate the fault code. For example, if Err30 (Elevator position abnormal) occurs at floor 1, the fault record will be 1030. 0: No fault 1: Reserved 2: Overcurrent during acceleration 3: Overcurrent during deceleration 4: Overcurrent during constant speed 5: Overvoltage during acceleration 6: Overvoltage during deceleration 7: Overvoltage during constant speed 8: Reserved 9: Undervoltage 10: AC drive overload 11: Motor overload 12: Power supply phase loss 13: Power output phase loss 14: Heatsink overheat 15: Power output abnormal 16: Encoder fault 17: Base signal fault 18: Current detection fault 19: Motor auto-tuning fault 20: Rotary encoder fault 21: Reserved 22: Leveling signal abnormal 23: Reserved 24: Reserved 25: Data storage abnormal 26: Earthquake signal 27 to 28 Reserved 29: PMSM stator shorting contactor feedback abnormal 30: Elevator position abnormal 33: Elevator speed abnormal 34: Logic abnormal 35: Shaft auto-tuning data abnormal 36: Running contactor feedback abnormal 37: Brake contactor feedback abnormal 38: Control rotary encoder signal abnormal 40: Elevator running time-out 41: Safety circuit interrupted 42: Door lock open during running 43: Up limit signal inactive during running 44: Down limit signal inactive during running 45: Up/Down slow-down switch inactive 46: Re-leveling abnormal 47: Door lock circuit shorting contactor stuck 48: Door open fault 49: Door close fault 50: Leveling signal continuously missing 53: Door lock short-circuit fault 54: Overcurrent at inspection startup 55: Stop at another floor 57: SPI communication fault 58: Shaft position switch abnormal 62: Analog input cable broken	0	-	●
FC-18	11th fault subcode		0	-	●
FC-19	11th fault time		0	-	●
FC-20	12th fault record		0	-	●
FC-21	12th fault subcode		0	-	●
FC-22	12th fault time		0	-	●
FC-23	13th fault record		0	-	●
FC-24	13th fault subcode		0	-	●
FC-25	13th fault time		0	-	●
FC-26	14th fault record		0	-	●
FC-27	14th fault subcode		0	-	●
FC-28	14th fault time		0	-	●
FC-29	15th fault record		0	-	●
FC-30	15th fault subcode		0	-	●
FC-31	15th fault time		0	-	●
FC-32	16th fault record		0	-	●
FC-33	16th fault subcode		0	-	●
FC-34	16th fault time		0	-	●
FC-35	17th fault record		0	-	●
FC-36	17th fault subcode		0	-	●
FC-37	17th fault time		0	-	●
FC-38	18th fault record		0	-	●
FC-39	18th fault subcode		0	-	●
FC-40	18th fault time		0	-	●
FC-41	19th fault record		0	-	●
FC-42	19th fault subcode		0	-	●
FC-43	19th fault time		0	-	●
FC-44	20th fault record		0	-	●
FC-45	20th fault subcode		0	-	●
FC-46	20th fault time		0	-	●

Group FD: Communication parameters

Parameter	Name	Setting Range	Default	Unit	Operation
FD: Communication parameters					
FD-00	Local machine address	0 to 127	1	-	★
FD-01	Response delay	0 to 20	10	ms	★
FD-02	Communication time-out	0 to 60.0	0	s	★

These RS232 serial port communication parameters are used for communication with the monitor software in the host computer. FD-00 specifies the current address of the controller. The setting of these two parameters must be consistent with the setting of the serial port parameters on the host computer. FD-01 specifies the delay for the controller to send data by means of 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.

Group FE: Elevator function parameters

Parameter	Name	Setting Range	Default	Unit	Operation
FE: Elevator function 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 The two high digits indicate the display code of the ten's digit, and the two low digits indicate the display code of the unit's digit. - Redundant info - 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: Display "B" 12: Display "G"	1901	-	☆
FE-02	Floor 2 display		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	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" Greater than 35: No display	0101	-	☆
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	-	☆

Parameter	Name	Setting Range	Default	Unit	Operation
FE: Elevator function parameters					
FE-13	Elevator factory function setting selection	0 to 65535 If a bit is set to 1, the function indicated by this bit is enabled: Bit0: Reserved; Bit1: Reserved Bit2: Reserved Bit3: Reserved Bit4: Reserved Bit5: Forced door close Bit6: Door open valid at non-door zone in the inspection state Bit7: Door open and close once after inspection turned to normal Bit8: Reserved Bit9: Independent running Bit10: Reserved Bit11: Door re-open after car call of the present floor Bit 12 to bit 15: Reserved	0	-	☆
FE-14	Elevator factory function setting selection	0 to 65535 If a bit is set to 1, the function indicated by this bit is enabled: Bit0: Reserved Bit1: Door open holding at open limit Bit2: Door close command not output upon door close limit Bit3: Manual door function selection Bit4: Auto reset for running and brake contactor stuck Bit5: Slow-down switch stuck detection Bit 6 to bit 9: Reserved Bit10: Reserved Bit11: Reserved Bit12: NC output selection of light/fan Bit 13 to bit 15: Reserved	0	-	☆
FE-15	Floor 12 display	Floor display settings are the same as parameters FE-01 to FE-11	0102	-	☆

Group Fr: Leveling adjustment parameters

Parameter	Name	Setting Range	Default	Unit	Operation
Fr: Leveling adjustment parameters					
Fr -00	Leveling adjustment mode	0 to 1	0	-	★
Fr -01	Leveling adjustment record 1	0 to 15015	0	-	★
Fr -02	Leveling adjustment record 2	0 to 15015	0	-	★
Fr -03	Leveling adjustment record 3	0 to 15015	0	-	★
Fr -04	Leveling adjustment record 4	0 to 15015	0	-	★
Fr -05	Leveling adjustment record 5	0 to 15015	0	-	★
Fr -06	Leveling adjustment record 6	0 to 15015	0	-	★
Fr -07	Leveling adjustment record 7	0 to 15015	0	-	★
Fr -08	Leveling adjustment record 8	0 to 15015	0	-	★
Fr -09	Leveling adjustment record 9	0 to 15015	0	-	★
Fr -10	Leveling adjustment record 10	0 to 15015	0	-	★
Fr -11	Leveling adjustment record 11	0 to 15015	0	-	★
Fr -12	Leveling adjustment record 12	0 to 15015	0	-	★

Group FP: User parameters

Parameter	Name	Setting Range	Default	Unit	Operation
FP: User parameters					
FP-00	User password	0 to 65535 0: No password	0	-	☆
FP-01	Updating parameters	0: No update 1: Restore factory setting 2: Clear recorded information	0	-	★
FP-02	User-defined parameter display	0: Disabled 1: Enabled	0	-	★

Group E0: The first set of detailed fault information

Parameter	Name	Setting Range	Default	Unit	Operation
Group E0: The first set of detailed fault information					
E0-00	1st fault record	0 to 9999	0	-	●
E0-01	1st fault sub-code	0 to 65535	0	-	●
E0-02	1st fault time	0 to 65535	0	-	●
E0-03	Logic information of 1st fault record	0 to 65535	0	-	●
E0-04	Curve information of 1st fault record	0 to 65535	0	-	●
E0-05	Speed reference of 1st fault record	0.000 to 65.535	0	m/s	●
E0-06	Feedback speed of 1st fault record	0.000 to 65.535	0	m/s	●
E0-07	Bus voltage of 1st fault record	0 to 999.9	0	V	●

Parameter	Name	Setting Range	Default	Unit	Operation
E0-08	Present position of 1st fault record	0.0 to 300.0	0	m	●
E0-09	Output current of 1st fault record	0.0 to 999.9	0	A	●
E0-10	Output frequency of 1st fault record	0.00 to 99.99	0	Hz	●
E0-11	Torque current of 1st fault record	0.0 to 999.9	0	A	●
E0-12	Input state 1 of 1st fault record	0 to 65535	0	-	●
E0-13	Input state 2 of 1st fault record	0 to 65535	0	-	●
E0-14	Input state 3 of 1st fault record	0 to 65535	0	-	●
E0-15	Input state 4 of 1st fault record	0 to 65535	0	-	●
E0-16	Input state 5 of 1st fault record	0 to 65535	0	-	●
E0-17	Input state 6 of 1st fault record	0 to 65535	0	-	●
E0-18	Input state 7 of 1st fault record	0 to 65535	0	-	●
E0-19	Output state 1 of 1st fault record	0 to 65535	0	-	●
E0-20	Output state 2 of 1st fault record	0 to 65535	0	-	●
E0-21	Output state 3 of 1st fault record	0 to 65535	0	-	●
E0-22	Output state 4 of 1st fault record	0 to 65535	0	-	●
E0-23	Output state 5 of 1st fault record	0 to 65535	0	-	●
E9-00	10th fault record	0 to 9999	0	-	●
E9-01	10th fault subcode	0 to 65535	0	-	●
E9-02	10th fault time	0 to 65535	0	-	●
E9-03	Logic information of 10th fault record	0 to 65535	0	-	●
E9-04	Curve information of 10th fault record	0 to 65535	0	-	●
E9-05	Speed reference of 10th fault record	0.000 to 65.535	0	m/s	●
E9-06	Feedback speed of 10th fault record	0.000 to 65.535	0	m/s	●
E9-07	Bus voltage of 10th fault record	0 to 999.9	0	V	●
E9-08	Present position of 10th fault record	0.0 to 300.0	0	m	●
E9-09	Output current of 10th fault record	0.0 to 999.9	0	A	●
E9-10	Output frequency of 10th fault record	0.00 to 99.99	0	Hz	●
E9-11	Torque current of 10th fault record	0.0 to 999.9	0	A	●
E9-12	Input state 1 of 10th fault record	0 to 65535	0	-	●
E9-13	Input state 2 of 10th fault record	0 to 65535	0	-	●
E9-14	Input state 3 of 10th fault record	0 to 65535	0	-	●
E9-15	Input state 4 of 10th fault record	0 to 65535	0	-	●
E9-16	Input state 5 of 10th fault record	0 to 65535	0	-	●
E9-17	Input state 6 of 10th fault record	0 to 65535	0	-	●
E9-18	Input state 7 of 10th fault record	0 to 65535	0	-	●
E9-19	Output state 1 of 10th fault record	0 to 65535	0	-	●
E9-20	Output state 2 of 10th fault record	0 to 65535	0	-	●
E9-21	Output state 3 of 10th fault record	0 to 65535	0	-	●
E9-22	Output state 4 of 10th fault record	0 to 65535	0	-	●
E9-23	Output state 5 of 10th fault record	0 to 65535	0	-	●

6 Troubleshooting

6.1 Description of Fault Levels

The controller has almost 70 pieces of alarm information and protective functions. It monitors various input signals, running conditions and feedback signals. 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.

Fault Level	Action	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 l function is disabled.
		2B. The door pre-open/re-leveling function is disabled.
Level 3	■ Display the fault code. ■ Output the fault relay action command. ■ Stop output and apply the brake immediately after stop.	3A. In low-speed running, the elevator stops at special deceleration rate, and cannot restart.
		3B. 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 3s.
Level 4	■ Display the fault code. ■ Output the fault relay action command. ■ In distance control, the elevator decelerates to stop and cannot run again.	4A. In low-speed running, the elevator stops at special deceleration rate, and cannot 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 3s.
		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 3s.
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 cannot 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 3s.

6.2 Fault Information and Troubleshooting

If an alarm is reported, the system performs corresponding processing based on the fault level. You can handle the fault according to the possible causes described in the following table.

Fault Code	Fault Description	Probable Causes	Solution	Level
Err02	Overcurrent during acceleration	■ The main circuit output is grounded or short circuited. ■ Motor auto-tuning is performed improperly. ■ The load is too heavy. ■ The encoder signal is incorrect. ■ The UPS feedback signal is abnormal.	■ Check whether the running contactor at the controller output side is normal. ■ Check whether the power cable jacket is damaged or possibly short circuited to ground. Check whether the power cable is connected reliably. ■ Check the insulation of motor power terminals, and check whether the motor winding is short-circuited or grounded. ■ Check whether PMSM stator shorting contactor causes controller output short circuit. ■ Check whether motor parameters comply with the nameplate. ■ Perform motor auto-tuning again. ■ Check whether the brake keeps released before the fault occurs and whether the brake is stuck mechanically. ■ Check whether the balance coefficient is correct. ■ Check whether the encoder wirings are correct. For asynchronous motor, perform SVC and compare the current to judge whether the encoder works properly. ■ Check whether encoder pulses per revolution (PPR) is set correctly, encoder signal is interfered, the encoder cable runs through the duct independently, the cable is too long, or the shield is grounded at one end. ■ Check whether the encoder is installed reliably, the rotating shaft is connected to the motor shaft reliably, or the encoder is stable during normal-speed running. ■ Check whether UPS feedback is valid in the non-UPS running state (Err02). ■ Check whether the acceleration/deceleration rate is too high. (Err02, Err03)	5A
Err03	Overcurrent during deceleration	■ The main circuit output is grounded or short circuited. ■ Motor auto-tuning is performed improperly. ■ The load is too heavy. ■ The deceleration rate is too short. ■ The encoder signal is incorrect.		5A
Err04	Overcurrent during constant speed	■ The main circuit output is grounded or short circuited. ■ Motor auto-tuning is performed improperly. ■ The load is too heavy. ■ The encoder is seriously interfered.		5A
Err05	Overvoltage during acceleration	■ The input voltage is too high. ■ The regeneration power of the motor is too high. ■ The braking resistance is too large, or the braking unit fails. ■ The acceleration rate is too short.	■ Adjust the input voltage. Observe whether the bus voltage is normal and whether it rises too quickly during running. ■ Check whether the balance coefficient is correct. ■ Select a proper braking resistor and check whether the resistance is too large based on the recommended braking resistance table. ■ Check whether the cable connecting the braking resistor is damaged, the cooper wire touches the ground, or the connection is reliable.	5A
Err06	Overvoltage during deceleration	■ The input voltage is too high. ■ The braking resistance is too large, or the braking unit fails. ■ The deceleration rate is too short.		5A
Err07	Overvoltage during constant speed	■ The input voltage is too high. ■ The braking resistance is too large, or the braking unit fails.		5A
Err09	Under voltage	■ Instantaneous power failure occurs on the input power supply. ■ The input voltage is too low. ■ The drive control board fails.	■ Eliminate external power supply faults and check whether the power fails during running. ■ Check whether the wiring of all power input cables is secure. ■ Contact the agent or Inovance.	5A

Fault Code	Fault Description	Probable Causes	Solution	Level
Err10	Drive overload	■ The brake circuit is abnormal. ■ The load is too heavy. ■ The encoder feedback signal is abnormal. ■ The motor parameters are incorrect. ■ Check the motor power cable.	■ Check the brake circuit and power input. ■ Reduce the load. ■ Check whether the encoder feedback signal and setting are correct, and whether the initial angle of the encoder for the PMSM is correct. ■ Check the motor parameter setting and perform motor auto-tuning. ■ Check the motor power cable. (See the solution of Err02)	4A
Err11	Motor overload	■ FC-02 is set improperly. ■ The brake circuit is abnormal. ■ The load is too heavy.	■ Adjust the parameter (FC-02 can be set to the default value). ■ See the solution of Err10.	3A
Err12	Power supply phase loss	■ The power input phases are not symmetric. ■ The drive control board fails.	■ Check whether the three phases of power supply are balanced and whether the power voltage is normal. If not, adjust the power input. ■ Contact the agent or Inovance.	4A
Err13	Power output phase loss	■ The output wiring of the main circuit is loose. ■ The motor is damaged.	■ Check the wiring. ■ Check whether the contactor on the output side is normal. ■ Eliminate the motor fault.	4A
Err14	Module overheat	■ The ambient temperature is too high. ■ The fan is damaged. ■ The air filter is blocked.	■ Lower the ambient temperature. ■ Clear the air filter. ■ Replace the damaged fan. ■ Check whether the installation clearance of the controller satisfies the requirement.	5A
Err15	Power output abnormal	■ Braking short-circuit occurs on the output side. ■ The U, V, W output is abnormal.	■ Check wiring of the braking resistor and braking unit is correct, without short-circuit. ■ Check whether the main contactor works properly. ■ Contact the agent or Inovance.	5A
Err16	Current control fault	■ The excitation current deviation is too large. ■ The torque current deviation is too large. ■ The time of exceeding torque upper limit is too long.	■ Check the circuit of the encoder. ■ The output MCCB becomes OFF. ■ The values of the current loop parameters are too small. ■ Perform motor auto-tuning again if the zero-point position is incorrect. ■ Reduce the load if it too heavy.	5A
Err18	Current detection fault	■ The drive control board fails.	■ Contact the agent or Inovance.	5A
Err19	Motor auto-tuning fault	■ The motor cannot rotate properly. ■ The motor auto-tuning times out. ■ The encoder of the PMSM is abnormal.	■ Enter the motor parameters correctly. ■ Check the motor wiring and whether phase loss occurs on the contactor at the output side. ■ Check the encoder wiring and ensure that the encoder PPR is set properly. ■ Check whether the brake keeps released during no-load auto-tuning. ■ Check whether the inspection button is released before the PMSM with-load auto-tuning is finished.	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.	■ 101, 102: Check whether the leveling and door zone sensors work properly. Check the installation verticality and depth of the leveling plates. ■ Check the leveling signal input points of the MCB. ■ 103: Check whether the steel rope slips.	1A
Err25	Data storage abnormal	■ 101, 102: The storage data of the MCB is abnormal.	■ 101, 102: Contact the agent or Inovance.	4A

Fault Code	Fault Description	Probable Causes	Solution	Level
Err26	Earthquake signal	■ 101: The earthquake signal is active and the duration exceeds 2s.	■ 101: Check that the earthquake signal is consistent with the parameter setting (NC, NO) of the MCB.	3B
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.	■ 101, 102: Check whether the leveling signal cables are connected reliably and whether the signal copper wires may 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.	4A
Err34	Logic fault	■ Logic of the MCB is abnormal.	■ Contact the agent or Inovance.	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 slow-down is invalid. ■ 102: The system is not in the inspection state 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 within 45s continuous running. ■ 111, 115: The stored floor height is smaller than 50 cm. ■ 112: The floor when auto-tuning is completed is not the top floor. ■ 113: The pulse check is abnormal.	■ 101: Check that the down slowdown switch is valid, and that F4-01 (Current floor) is set to 1. ■ 102: Check that the inspection switch is in inspection state. ■ 103, 104: Perform shaft auto-tuning. ■ 106, 107, 109, 114: Check that NO/NC setting of the leveling sensor is set correctly. Check whether the leveling plates are inserted properly and whether there is strong power interference if the leveling sensor signal blinks. ■ Check whether the leveling plate is too long for the asynchronous motor. ■ 108, 110: Check whether the running times out: No leveling signal is received when the running time exceeds F9-02. ■ 111, 115: Enable the super short floor function if the floor distance is less than 50 cm. If the floor distance is normal, check installation of the leveling plate for this floor and check the sensor. ■ 112: Check whether the setting of F6-00 (Top floor of the elevator) is smaller than the actual condition. ■ 113: Check whether the signal of the leveling sensor is normal. Perform shaft auto-tuning again.	4C
Err36	Running contactor feedback abnormal	■ 101: The feedback of the running contactor is active, but the contactor has no output. ■ 102: The controller outputs the running signal but receives no running feedback. ■ 103: The startup current of the asynchronous motor is too small. ■ 104: When both feedback signals of the running 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 cables UVW of the controller are connected properly. Check whether the control circuit of the running 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. ■ 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.	■ 101 to 104: 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.	5A
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 cooling conditions of the motor.	3A

Fault Code	Fault Description	Probable Causes	Solution	Level
Err40	Elevator running time-out	■ Elevator running time-out	■ Check the related parameter, or contact the agent or Inovance.	4B
Err41	Safety circuit interrupted	■ 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 open 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.	■ 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.	4C
Err44	Down limit signal abnormal	■ 101: The down limit switch acts when the elevator is running in the down direction.	■ 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.	4C
Err45	Slow-down switch abnormal	■ 101: The down slow-down distance is insufficient during shaft auto-tuning. ■ 102: The up slow-down distance is insufficient during shaft auto-tuning. ■ 103: The slow-down position is abnormal during normal running. ■ 104, 105: The elevator speed exceeds the maximum speed when slow-down is enabled.	■ 101 to 103: Check whether the up slowdown and the down slow-down are in good contact. ■ Check the signal feature (NO, NC) of the up slow-down and the down slow-down. ■ 104, 105: Ensure that the obtained slowdown distance satisfies the slowdown requirement at the elevator speed.	4B
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 machine 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 machine system works properly. Check whether the CTB is normal. Check whether the door lock acts properly.	5A
Err50	Leveling signal continuously missing	■ Leveling signal stuck or loss occurs for three consecutive times ■ (Err22 is reported for three consecutive times)	■ Check whether the leveling and door zone sensors work properly. ■ Check the installation verticality and depth of the leveling plates. ■ 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 3s during door open. ■ 102: The multiple door lock feedback signal states are inconsistent for more than 2s.	■ 101: Check whether the door lock circuit is normal. Check whether the feedback contact of the door lock contactor acts properly. Check whether the system receives the door open limit signal when the door lock signal is valid. 102: Check whether when the hall door lock signal and the car door lock signal are detected separately, the detected states of the hall door locks and car door lock are inconsistent.	5A
Err54	Overcurrent at inspection startup Current	■ The current at startup for inspection exceeds 110% of the rated current.	■ Reduce the load. ■ Change Bit1 of FC-00 to 1 to cancel the startup current detection function.	5A
Err55	Stop at another floor	■ 101: During automatic running of the elevator, the door open limit is not achieved at the present floor.	■ 101: Check the door open limit signal at the present floor.	1A

Fault Code	Fault Description	Probable Causes	Solution	Level
Err57	SPI communication fault	■ 101, 102: The SPI communication is abnormal. No correct data is received with 2s of DSP communication. ■ 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 Inovance.	5A
Err58	Shaft position switch abnormal	■ 101: The up slowdown and down slowdown are disconnected simultaneously. ■ 102: The up limit feedback and down limit feedback are disconnected simultaneously.	■ 101, 102: Check whether the states (NO, NC) of the slow-down switches and limit switches are consistent with the parameter setting of the MCB. Check whether malfunction of the slow-down switches and limit switches occurs.	4B
Err62	Analog input cable broken	■ The analog input cable of the CTB or the MCB is broken.	■ Check whether F8-08 is set correctly. ■ Check whether the analog input cable of the CTB or MCB is connected incorrectly or broken.	1A
Err63	Shaft type signal input abnormal	■ The selection of the shaft type is inconsistent with the deceleration signal input.	■ Check the parameter setting of the deceleration signal input.	4A

- ◆ The number (such as 1, 3...101, 102, 103...) in the table indicates the fault subcode.
- ◆ Fault Err41 is not recorded in the elevator stop state.
- ◆ Fault Err42 is reset automatically when the door lock circuit is shorted or 1s after the fault occurs in the door zone.
- ◆ If faults Err51 and Err52 persist, they are recorded once every one hour.

Appendix A Electromagnetic Compatibility

A.1 Definition of Terms

- 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.
- 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.
- 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.
- Category C1 controller: Power Drive System (PDS) of rated voltage less than 1,000 V, intended for use in the first environment.
- Category C2 controller: PDS of rated voltage less than 1 000 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 person.
- Category C3 controller: PDS of rated voltage less than 1 000 V, intended for use in the second environment and not intended for use in the first environment.
- Category C4 controller: PDS of rated voltage equal to or above 1 000 V, or rated current equal to or above 400 A, or intended for use in complex systems in the second environment.

A.2 Introduction to EMC Standard

A.2.1 EMC Requirements for Installation Environment

The integrator of the system installed with the controller is responsible for compliance of the system with the European EMC directive and standard EN 61800-3: 2004 +A1: 2012 Category C2, C3 or C4 according to the system application environment.

Machines and devices used in combination with the controller must also be CE certified and marked. The integrator who integrates the drive with the CE mark in into other devices has the responsibility of ensuring compliance with European directives and verifying that conditions meet requirements of EN 61800-3: 2004 Category C2.

- When applied in the first environment, the controller may generate radio interference. Besides the CE compliance described in this chapter, take measures to avoid the radio interference if required.

A.2.2 Requirements on Satisfying the EMC Directive

- The model selection table lists the recommended manufacturers and models of EMC filters which is required for the controller to fulfill EMC requirements. Keep the length of the connection cable between the controller and filter as short as possible. Recommended length is less than 30 cm. Install the filter and the controller on the same sheet metal. The PE terminals of the controller and the grounding point of the filter must be well connected with the sheet metal.
- Select the motor and control cable types according to the description in Shielded Cable.
- Perform the wiring of the controller according to instructions in Installation and Wiring.
- An AC input reactor is installed to eliminate the harmonics of the input current.

A.3 Selection of Peripheral EMC Devices

A.3.1 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 controller satisfies the requirements of category C2 only with an EMC filter installed on the power input side. The installation precautions are as follows:

- 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.
- 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.
- 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 controller. Select a proper one based on actual requirements.

Table A-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: -15% to 15%				
NICE-L-I-4003	8.9	14.8	DL-16EBK5	FN 3258-16-33
NICE-L-I-4005				

A.3.2 Installation of AC Input Reactor on Power Input Side

An AC input reactor is installed to eliminate the harmonics of the input current. As an optional device, the reactor can be installed externally to meet strict requirements of an application environment for harmonics. The following table lists the recommended manufacturers and models of input reactors.

Table A-2 Recommended manufacturers and models of AC input reactors

Controller Model	Power Capacity (kVA)	Rated Input Current (A)	AC Input Reactor Model (Inovance)
Three-phase 380 V, range: -15% to 15%			
NICE-L-I-4005	8.9	14.8	MD-ACL-15-0.93-4T-2%

A.4 Shielded Cable

A.4.1 Requirements for Shielded Cable

The shielded cable must be used to satisfy the EMC requirements of CE marking. 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 cable. See the illustration below.

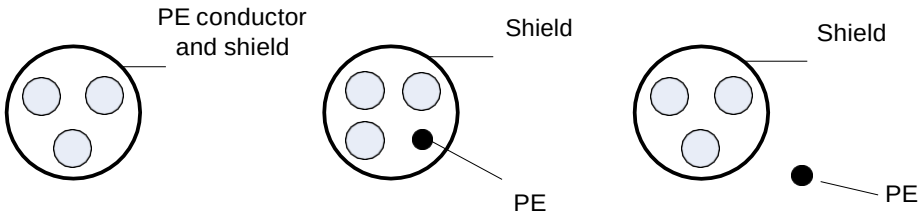


Figure A-1 Cross-secion of shielded cable

The motor cable and PE shielded conducting wire (twisted 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 cooper braid. The braided density of the cooper braid should be greater than 90% to enhance the shielding efficiency and conductivity. See the illustration below.

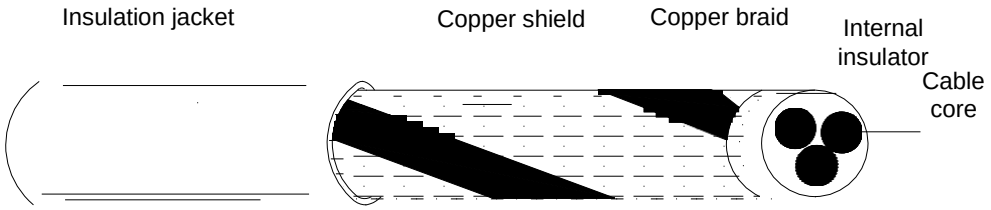


Figure A-2 Braided density of cooper braid

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 sheet metal using the metal cable clamp so as to achieve good contact.

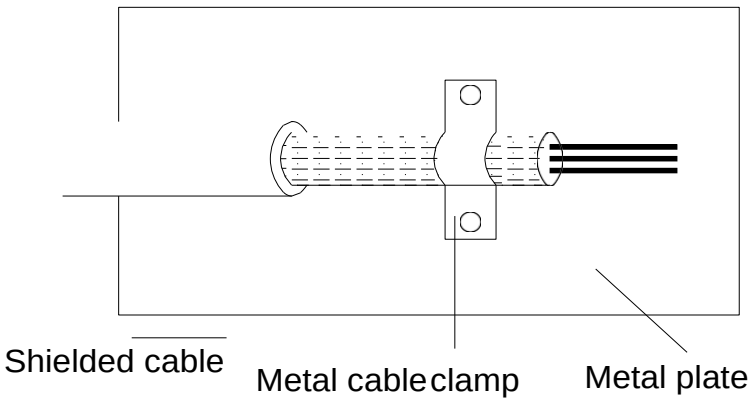


Figure A-3 Metal cable clamp fixing the shield

The following figure shows the grounding method of the shielded cable.

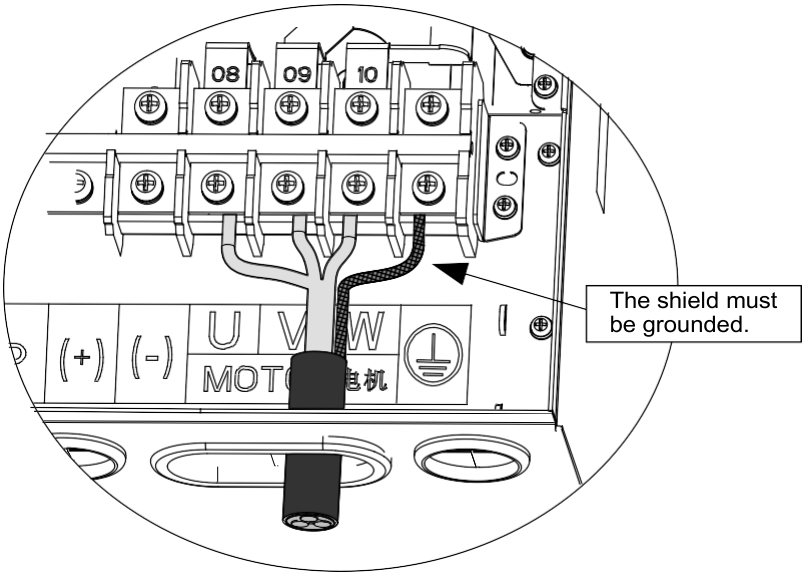


Figure A-4 Grounding of shieled cable

A.4.2 Installation Requirements

- All the shielded cables should use shielded pair cables. Four-conductor cables may also be used for input cables.
- The motor cable and PE shielded conducting wire (twisted 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.
- It is recommended that all control cables be shielded.
- The output power cable of the AC drive should use shielded cable, and the shield must be reliably grounded. For lead cables in exposure to interference, twisted pair shielded control cable should be used and the shield must be reliably grounded.

A.4.3 Cabling Requirements

- The motor cables must be far away from other cables. Recommended distance is bigger than 0.5 m. The several controllers can be laid in parallel.
- 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. It is recommended that the motor cables, power input cables and control cables be laid in different trunking. The cable trunking must be in good connection and well grounded.
- 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 drive.
- The power input and output cables of the controllers and weak-current signal cables (such as control cable) should be laid vertically (if possible) rather than in parallel.
- The cable trunking must be in good connection and well grounded. Aluminum trunking can be used to improve electric potential.
- The filter, controllers and motor should be connected to the system (machinery or appliance) properly, with spraying protection at the installation part and conductive metal in full contact.
- 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.

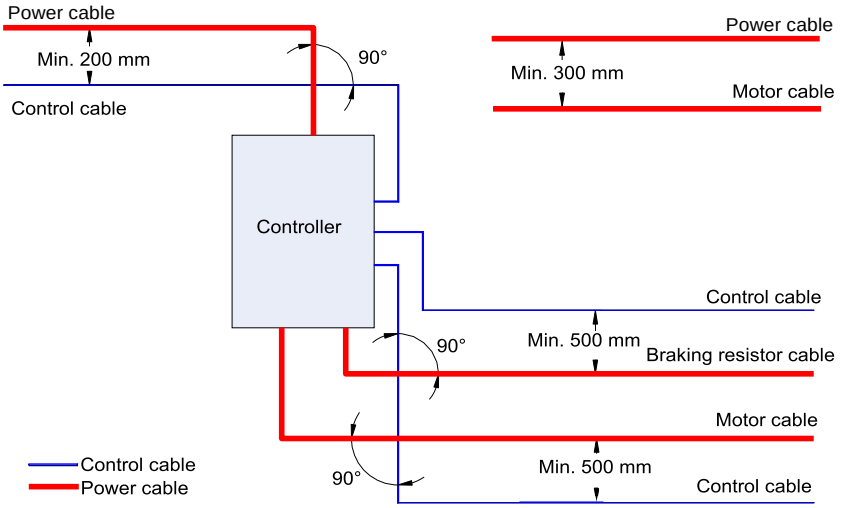


Figure A-5 Cabling requirements

A.5 Solutions to EMC Interference

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
ELCB 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 0.1 uF capacitance is suggested. ■ Enlarge the capacitance at the AI. A maximum of 0.22 uF is suggested.

Revision History

Date	Revision	Change description
April 2018	A00	First issue.

automation
by INOVANCE technology
Forward, Always Progressing !
Inova Automation Pvt., Limited
Chennai Head Office, Tamil Nadu
Add : III Floor, “NIBHI CORPORATE CENTRE”,
No.7, CBI Colony, 1st Main Link Road,
Perungudi, Chennai – 600 096.
www.inova-automation.com
www.inovance.cn (Industrial Automation)
www.szmctc (Monarch Elevator&Escalator Solutions)