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MONT71 Series
Elevator Integrated Controller

MONT71 Series
Elevator Integrated Controller

User Manual

V1.1 2018.05

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روبروی پالایشگاه نفت پارس، پلاک ۱۲

FOREWORD

Thank you for purchasing MONT71 series elevator integrated controller (MONT71)!

This User Manual describes how to use MONT71 and their installation wiring, parameter setting, troubleshooting and daily maintenance etc.

Before using the product, please read through this User Manual carefully. In addition, please do not use this product until you have fully understood safety precautions.

Note:

- Preserve this Manual for future.
- If you need the User Manual due to damage, loss or other reasons, please contact the regional distributor of our company or directly contact our company Technical Service Center.
- If you still have some problems during use, please contact our company Technical Service Center.
- Due to product upgrade or specification change, and for the purpose of improving convenience and accuracy of this manual, this manual's contents may be modified.

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Version: V1.1

This version should be used with new software of MCB which should be above V2.06.

Charpet	Content
	• V1.1 publissued

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MONT71 Technical Features

MONT71 series products can meet needs of all villa and freight elevators, adapting complete parallel modes for signal transmission, which are the Intelligent Control System with Automatic control technology, Power electronic technology, Motor drive technology and Network communication technology.

More Advanced

- **Direct stop:** Based on the distance control, the direct stop technology realizes smooth speed and high operating efficiency.
- **Parameter auto-tuning free off load:** The synchronous motor and the asynchronous motor can do parameter auto-tuning free off load.
- **Start torque auto-compensation for no weighing device:** No need for the weighing device, you can achieve elevator start without impact, which adapt to a variety of encoders and motors.

Easier to Use

- Pre-torque auto-compensation: It makes debug more convenient and more consistent.
- The onboard small keypad design makes easier to repair and maintain the elevator.
- Synchronous and asynchronous is integration with good commonality.
- The external LCD keypad can support to display in English or Chinese.

Safer

- Multi-security is assured which conforms to GB7588-2003 standard.
- The fault-tolerant design of hardware and software and many types of fault treatments protect the safe operation of the elevator.
- Strong environmental adaptability.
- Immediately locking the base electrode and switching off IGBT output at fault can avoid contactor arcing.

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More Economical

- ➔ Three programmable high voltage 110 - 220VAC input interfaces can save the user's system cost.
- ➔ The system can be equipped with a minimum of three contactors (safety, brake, output).
- ➔ Full range of MONT71 is built-in the braking unit, which can be configured the power regenerative unit to achieve four-quadrant operation and energy saving.
- ➔ The system does not need the up or down limit switch.

More Abundant

- ➔ There are 24 button I/O interfaces, which can meet the needs of 8 floors full selective even without expansion.
- ➔ There are 24 digital inputs and 24 relay outputs.
- ➔ There are 3 high-voltage inputs.
- ➔ You can choose the serial hall call communication.

CONTENTS

Chapter 1

MONT71

Configuration

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1.1 Hardware Configuration

No.	Product	Model	Application	Number	Position	Remark
1	MONT71 elevator integrated controller	MT71-XT-XXX Details refer to section 3.1 Model	Elevator control integrated machine	Each elevator configures one	Elevator control cabinet	Must be equipped Select the model in accordance with motor power
2	Main control board	MT71-MCB-A	Elevator main board	Each elevator configures one	MONT71 or control cabinet	Must be equipped MONT71 has included
3	Keypad	MT70-LCD-A	For elevator adjustment		RJ45 terminal of MCB	Optional MT70-LCD-B can store 10 group parameters
		MT70-LCD-B				
4	Display control board (internal call board)	MT71-HCB-A MT70-HCB-H MT70-HCB-F MT70-HCB-I MT70-HCB-D	For inside car display	Each elevator configures one	Manipulator	Optional The customs can design on their own MT71-HCB-A is parallel, and others are serial
5	Display control board (hall call board)		For hall call landing and floor display	Each floor configures one	Outside calling box	
6	Advanced open block	MT70-AOB-A	For advanced door and OD re-leveling	Each configures one	Elevator control cabinet	Optional
7	Door machine controller	MONT10	For door machine control	Each door motor configures one	Car top	Optional
8	Power regenerative unit	HDRU	Regenerate the energy back to the power grid	Each elevator configures one	Elevator control cabinet	Optional
9	Encoder interface card	MT70-PG1-ABZ	For asynchronous motor	Each elevator configures one	MONT71 series elevator integrated controller	Optional Select according to the encoder type
		MT70-PG2-SINCOS MT70-PG3-UVW	For synchronous motor			
10	IE module	MT70-IE	For internet of elevators	Each elevator configures one	Elevator control cabinet	Optional

1.2 Function Table

Standard Function					
1	Auto run	2	Driver run	3	Inspection run
4	Self-rescue back to leveling run	5	Firefighting back to base station run	6	Fireman run
7	Isolated run	8	Advanced OD run	9	OD re-leveling run
10	Testing run	11	Inspection OD/CD operation	12	Keypad OD/CD operation
13	Auto back to base station run	14	Locked-elevator function	15	Anti-nuisance function
16	Full selective	17	Up selective	18	Down selective
19	Shaft self-learning function	20	Full-load by pass	21	Over-load protection
22	Lighting and fan energy-saving function	23	Reverse cancelling	24	Floor service set for front and back door
25	Door machine multi-modes operation	26	Open-through door control modes	27	Open the door outside this hall
28	OD button open the door	29	Auto open door at power-on	30	Repetition of door closing
31	Forced close door	32	CD button advanced close door	33	Category setting for the time keeping door open
34	Keep open function	35	Miss delete car command	36	Floor display by any setting
37	Various hall data display formats	38	Floor service setting	39	Car arrival chime
40	Double hall call on the same floor	41	Hall call adhesion recognition	42	Weighing signal compensation
43	Car location automatically correct	44	User calibration menu	45	Earthquake control function
46	Current aslant remove	47	Pull door function		
Protection Function					
1	Fault history	2	Over-speed protection	3	Protection of excessive speed deviation
4	Encoder reverse protection	5	Encoder disconnection protection	6	Door light curtain protection
7	Non-open outside door zone	8	Door fault protection	9	Protection of door-lock disconnect when running
10	Door lock jump detected function	11	Next landing	12	Leveling switch fault protection
13	Limit switch protection	14	Anti-slip protection	15	Protection for contactor of contact
16	Motor over-load protection	17	Over-current protection	18	Over-voltage protection
19	CPU overheated protection	20	Shaft self-learning fault protection		

1.3 Standard Function Description

Standard Function		Function Description	Remark
1	Auto run	1. Arrive to station and automatically open the door. 2. Automatically delay closing the door. 3. Manually close the door early. 4. Hall call forward automatic interception. 5. Hall call reverse highest (or lowest) automatic interception.	**Normal/inspection switch turns to normal position;** Inside the car, the auto/driver switch turns to auto position;
2	Driver run	At the driver running mode, the elevator does not have auto close door function controlled by the elevator driver, and the driver can choose the direction and straight running function.	
3	Inspection run	After press the inspection switch, the elevator will access to the inspection state, and the system will cancel auto run and operation of automatic doors. Pressing the up/down buttons will enable the elevator run to up/down at inspection speed. Release the button to stop the elevator immediately or decelerate to zero.	
4	Self-rescue back to leveling run	Running conditions are met, if the elevator stopped at the non-leveling area, elevator will run at 0.200m/s to the nearby leveling area. 1. When detect any one of the up or down leveling signal: The elevator will decelerate from the inspection speed to the re-leveling speed. 2. When detect both of up and down leveling signals: After the delay time passing the leveling park, decelerate from inspection speed to zero speed, stop and then open the door.	
5	Firefighting back to base station run	After fire switch action, the system enters firefighting run mode: 1. The system will clear all of the hall call and internal call. 2. Automatically return to firefighting base station. 3. Normally open door. 4. After return to fire base station, output the fire linkage signal. • If the elevator is reversely running, stop on the near floor without open door, and direct run to fire base station, normally open.	
6	Fireman run	At the fireman run mode, the door does not automatically open or close. Only press the button can make the door action. • The elevator only response to one command in car once. • Only when the elevator open the door stopped at the base station, reset the fire switch and fireman switch, the elevator can run normally.	
7	Isolated run	At isolated running mode, the elevator does not response to hall call and close the door automatically.	Set F26.07 = 1
8	Advanced OD run	At the auto run mode, the speed during stopping process is less than the advanced open speed and the door signals are effective, system opens the door ahead of time through shorted lock- door	Configure MT70-AOB-A Set F26.05 = 1

Standard Function		Function Description	Remark
		signal door-close contactor to reduce the passenger waiting time.	
9	OD re-leveling run	The elevator stopping at the floor station, due to a large number of persons or goods entering and leaving, the leveling fluctuated because of the elastic deformation of elevator wire rope and the rubber, make inconvenience to people and goods entering or leaving. System allows run automatically at the speed of re-leveling to leveling station in the OD state.	Configure MT70-AOB-A Set F26.04 = 1
10	Testing run	Testing run is including the new elevator fatigue test, the shielding of hall call, OD/CD and over-load etc signals, the setting of any running times, and the allowable elevator random run etc.	
11	Inspection OD/CD operation	After elevator entering the inspection state, if door-lock circuit disconnects, via pressing the up/down button the system will send out CD command. If door-lock circuit connects, the elevator will up/down run; If the elevator stopped at the position of the door zone, while pressing the up/down buttons, the system open command is given, and do the opening operation.	
12	Keypad OD/CD operation	Keypad's **RUN** key to perform OD operation; **STOP** key to perform CD operation.	
13	Auto back to base station run	When beyond the setting time and there is no internal call and hall call, elevators automatically return to the base station and wait for passengers.	

14	Locked-elevator function	At the auto run mode, after the elevator locked, the system eliminates all hall calls.
		• If there is internal call registration, after registered, the elevator will automatically return to locked-elevator base station then open the door.
		• If there is not internal call registration, the elevator will directly return to locked-elevator base station. After that:
		  • Stop displaying after 10s, then elevator automatically closes the door, turn off the car lighting, and the internal and hall call displays extinguish.
		  • Pressing the OD button can open the door, 10s later, restart to close the door and turn off the car lighting.	

15	Anti-nuisance function	1. According to the weighing signal: System identifies the number of passengers in car in accordance with the analogue weighing signal,and automatically determines the number of passengers inside and compares with the instructions registered in car. If an excessive number of calls registered, then the system considers it is anti-nuisance state and cancels all calls in car. 2. According to the light curtain signal: If the elevator is landing for consecutive three times and the light curtain is no action, the system will consider to be in anti-nuisance state, and clear all registered internal call command.	

Standard Function		Function Description	Remark
16	Full selective	At auto run mode, elevator automatically response the up and down call button signal outside the hall.	
17	Up selective	At auto run mode, elevator automatically response the up call button signal outside the hall.	
18	Down selective	At auto run mode, elevator automatically response the down call button signal outside the hall.	
19	Shaft self-learning function	At the inspection mode, after start the shaft self-learning, the elevator runs from the lower limit toward the upper limit, to test door zone position of each floor and data of shaft switch position, and save.	
20	Full-load by pass	At auto run mode, when the car is full loaded (generally is 80% rated load), the elevator only responds to internal calls but not the hall calls.	
21	Over-load protection	When the load inside the car is over the rated load; the buzzer inside the car alarms, the over-load indicator is lighting, and the elevator keeps opening the door on the floor.	
22	Lighting and fan energy-saving function	When beyond the setting time and there is no internal call and hall call, the elevator will automatically turn off the light and fan in car.	
23	Reverse cancelling	When elevator runs to the end floor or the direction is changed, system cancels all registered calls of the reverse directions.	
24	Floor service set for front and back door	Based on the need to set the service floors for the front door and the back door.	
25	Door machine multi-mode operation	Parameter setting can be the door machine number, as well as the door machine service floor, door switch holding torque.	
26	Open-through door control mode	Support 4 open-through door control modes.	
27	Open the door outside this hall	If the car stop at one floor, press the call button of this floor, the door will automatically open.	
28	OD button open the door	The elevator stopping at the door zone, you can re-press the OD button in the car to make elevator to re-open the closed or no-closed door.	
29	Auto open door at power-on	Under normal circumstances, each time the elevator system is powered up, if the car is in the door zone, the car door will open automatically.	
30	Repetition of door closing	After the elevator continuing close the door for a certain time, if the door-lock has not been closed, the elevator opens the door automatically, and then repeats to close the door.	Set F22.05 ≠ 0
31	Forced close door	In automatic state, the time of closing door lasts 60 seconds due to some reason, output the forced CD signal, the light curtain is invalid, and the buzzer sounds at the same time.	Set F26.13 = 1
32	CD button advanced close door	At auto run mode, pressing the CD button can cancel the door keep opening function, and after OD arrival, close the door immediately.	

Standard Function		Function Description	Remark
33	Category setting for the time keeping door open	System can identify different time to keep the door open: internal call to open the door, hall call to open the door, base station to open the door, delay to open the door.	
34	Keep open function	By pressing the keeping door open button, the elevator delay closing.	
35	Miss delete car command	In the car passengers can press the command button twice to eliminate the last error registered instruction.	
36	Floor display by any setting	Flexibly set the character displayed on each floor to meet the different display needs.	
37	Various hall data display formats	Outside the hall can set the scroll or fixed display, and the size of arrow.	Only the serial communication of hall call board works
38	Floor service setting	According to the needs can flexibly set the service floor of the elevator: close or activate one or more service floors and park landing.	
39	Car arrival chime	After the elevator arrives to the destination floor, the main control board will send the arrival chime signal.	
40	Double hall call on the same floor	Double hall calls can be set when opposite doors are on the same floor.	
41	Hall call adhesion recognition	System can identify the adhesion situation of the hall call up/down buttons, automatically remove the call of the adhesion to avoid that the elevator can not be closed to run caused by the outside-call button adhesion.	
42	Weighing signal compensation	The system can use weighing signal to compensate the start of the elevator.	
43	Car location automatically correct	1. When the elevator runs to the end station: The system will automatically check and rectify the car location information in accordance with the forced deceleration switch. If the position deviation is too large or the speed is greater than the forced deceleration rate, it will decelerate at forced deceleration to avoid hoisting top and squatting bottom. 2. When the elevator runs to the leveling floor: Automatically correct in accordance with the present position and floor data of shaft parameter self-learning. If the deviation is too large, will decelerate to stop. At the same time, when return to the nearest leveling area, will open the door, the buzzer inside the car will alarm, after closing, elevator returns to the base station correction position at 0.200m/s.	
44	User calibration menu	Users can find the system parameters which are different from the factory parameters by this function.	
45	Earthquake control function	If the earthquake happens, earthquake detection devices act. The device has a contact signal input to the MONT71 system, the system will control the elevator stop at the nearest floor, after open the door, then stop running.	
46	Current aslant remove	When use synchronous motor, after the elevator decelerate and stop, the maintaining current of the motor is removed by the	

Standard Function		Function Description	Remark
		slope way to avoid abnormal noise of the motor during the process.	
47	Pull door function	The system supports the pull door function.	

1.4 Protection Function Description

Protection Function		Function description
1	Fault history	The system can record 11 fault histories, including fault type, fault floor, fault time etc.
2	Over-speed protection	Ensure the car running speed in the security control areas, in order to ensure the safety of passengers and cargo.
3	Protection of excessive speed deviation	When detect that the speed deviation is too large, the system will protect itself automatically.
4	Encoder reverse protection	The system can judge the feedback signal direction of the rotary encoder, if is inconsistent with the given direction, it will carry out protection.
5	Encoder disconnection protection	The system can judge the feedback pulse of the rotary encoder, if encoder feedback signal is lost, it will carry out protection.
6	Door light curtain touching board protection	During the door is closing, the light curtain protection acts or the safe touching board act, the elevator will turn to open the door immediately. • Does not work in the fireman run or forced close door.
7	Non-open outside door zone	Prohibit from opening the door automatically when car is not in door zone.
8	Door fault protection	When detecting the elevator not yet close the door effective after the elevator open and close the door beyond the number set, system stop close and open the door switch and output the fault.
9	Protection of door-lock disconnect when running	When the door-lock disconnects during the elevator running, the system will be automatic protection.
10	Door lock jump detected function	Detect that the door machine OD arrival signal and the door lock signal are valid at the same time, will carry out the door-lock short protection.
11	Next landing	If the elevator continues to open the door more than the time of open the door, the OD arrival signal has not yet been detected, the elevator would be turned into the closing door state, and after the door closed, automatically run the next registered floor. At the same time, elevator alarms the changed floor park fault.
12	Leveling switch fault protection	When the elevator is in the automatic running mode, it will identify the leveling signal loss and adhesion status.
13	Limit switch protection	If the up/down limit switch is action, the elevator bans running up/down, but can run to the opposite direction.
14	Anti-slip protection	At the non-inspection mode during the elevator running process, if the elevator continuous running time beyond the F23.02 set time (maximum 45s) and the leveling switch does not act yet, the system will regard this as detect the rope slip fault and stop all car running.

Protection Function		Function description
15	Protection for contactor of contact	Brake contactor, output contactor, star-delta contactor and locked-door contactor etc feedback contact signals can be connected to the main control board (MCB), the system will automatically judge whether the contactor is normal in accordance with the operating logic. • If find the abnormal contactor, then carry out protection.
16	Motor over-load protection	When detect the motor over-load, the system will be automatic protection.
17	Over-current protection	When detect that the motor's current value is greater than the maximum allowable, the system will be automatic protection.
18	Over-voltage protection	When detect that the voltage is greater than the maximum allowable value, the system will be automatic protection.
19	CPU overheated protection	When detect that the drive module is overheated, the system will be automatic protection.
20	Shaft self-learning fault protection	When the shaft self-learning has not been completed correctly, the system will alarm the shaft self-learning fault. • Without the right shaft data, the elevator will not be able to run.

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Chapter 2

Safety Information and Precautions

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2.1 Safety Definition

Danger: A Danger contains information which is critical for avoiding safety hazard.

Warning: A Warning contains information which is essential for avoiding a risk of damage to products or other equipements.

Note

Note: A Note contains information which helps to ensure correct operation of the product.

2.2 About Motor and Load

Motor's overload protecting threshold

When choose the adaptive motor, the controller can effectively implement the motor thermal protection. Otherwise it must adjust the motor protection parameters or other protection measures to ensure that the motor is at a safe and reliable operation.

Lubrication of mechanical devices

At long time low-speed operation, it should provide periodical lubrication maintenance for the mechanical devices such as gear box and geared motor etc. to make sure the drive results meet the site need.

Repeat in start and stop

It is recommended to use the control terminals to start and stop the controller. It is forbidden to use switching devices such as contactors directly on the input side of the controller to perform repeat start-stop operation. Otherwise, the device may be damaged.

Check the insulation of the motor

For the first time using of the motor or after long time storage, it need check the insulation of the motor to avoid damage the controller because of the worse insulation motor.

Note:

Please use a 500V Mega-Ohm-Meter to test and its insulation resistance must be higher than 5Mohm.

RCD requirements of leakage current protector

In operation the equipment will produce large leakage current which flows through the protective earthing conductor so that you should install type B of leakage protector RCD on the power supply side. When select the leakage current protector RCD, you must consider that the transient and steady-state earth leakage current may occur in equipment up and running, and choose the dedicated RCD with high harmonics measures, or a universal RCD for larger residual current.

Warning of large leakage current to ground

In operation the equipment will produce a large leakage current, before connecting the input power supply, it be reliably grounding. Equipment grounding must comply with relevant IEC standards of local regulations.

2.3 About Safety

No capacitor or varistor on the output side

Since MONT71 output is PWM wave, it is strictly forbidden to connect capacitor for improving the power factor or varistor for lightning protection to the output terminals so as to avoid MONT71 fault tripping or component damage.

Contactors and circuit breakers connected to the output

If contactor or circuit breaker needs to be connected between MONT71 and motor, be sure to operate these contactors or circuit breakers when MONT71 has no output, so as to avoid any damage to MONT71.

Rated voltage

MONT71 is prohibited to be used beyond the specified range of operation voltage. If needed, please use the suitable voltage regulation device to change the voltage.

Capacitor energy storage

When the AC power supply is cut off, the capacitors in the controller will remain in the power state for a period of time, and the voltage is enough to kill person. If the controller has previously been powered, you must cut off the AC power for more than 10 minutes, and confirm that the internal charge indicator has gone out, the voltage between the power terminals (+) and (-) is less than 36V, can be disassembled .

Typically, the internal circuit will discharge the capacitor. However, under certain abnormal conditions, the capacitor may not be discharged. At this time, please consult our company or distributor.

Change three-phase input into single-phase input

For three-phase input controller, the users should not change it to be single-phase input.

If you have to use single-phase power supply, you should set F17.00 (the detect base of lack of input) as 0%. And the bus-voltage and current ripple will increase, which not only influences the life of electrolytic capacitor but also deteriorates the performance of MONT71.

In that case, the controller must be derating and should be within the controller 60% rated value.

Lightning surge protection

MONT71 internal design has lightning surge overcurrent protection circuit, and has certain self-protection capacity against the lightning.

Altitude and derating

In the altitude exceeded 1000 meters area, since the heatsink efficiency will be reduced because of the tenuous air.

For every 100m above sea level, the output current rating is derated by 1%. That is, the altitude rises to 3000m and the controller current rating is derated by 20%.

Chapter 3

Product Information

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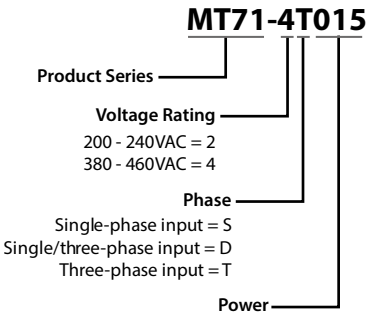
3.1 Model

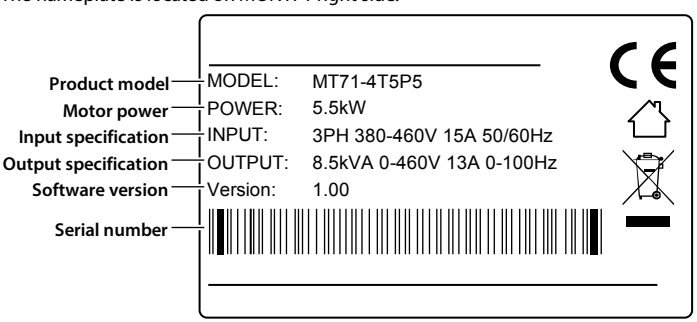


Select the correct encoder interface card.

Motor type	Asynchronous motor	Synchronous motor	
Encoder type	Push-pull, open-circuit, differential	SIN/COS type	UVW type
Encoder interface card	ABZ encoder interface card (MT70-PG1-ABZ)	SINCOS encoder interface card(MT70-PG2-SINCOS)	UVW encoder interface card(MT70-PG3-UVW)

3.2 Nameplate

The nameplate is located on MONT71 right side.



3.3 Ratings

Refer to section 3.5 Dimensions and Weight (on page 20) for size information.

Model	Motor(kW)	Rated capacity (kVA)	Rated input current (A)	Rated output current (A)	Size
Single-phase power supply: 200 - 240V, 50/60Hz					
MT71-2S2P2	2.2	3.8	24.1	10.3	FA
MT71-2S3P7	3.7	5.9	40	17	FA
Single/three-phase power supply: 200 - 240V, 50/60Hz					
MT70-2D5P5	5.5	8.5	60 / 29 (1)	27	FB
MT70-2D7P5	7.5	11	75 / 35 (1)	33	FB
MT70-2D011	11	16	100 / 47 (1)	45	FC
MT70-2D015	15	21	130 / 62 (1)	55	FC
MT70-2D018	18.5	24	160 / 77 (1)	70	FC
(1): Value before / is for single-phase model, value after / is for three-phase model					
Three-phase power supply:200 - 240V, 50/60Hz					
MT71-2T3P7	3.7	5.9	19	17	FA
MT71-2T5P5	5.5	8.5	29	27	FB
MT71-2T7P5	7.5	11	35	33	FB
MT71-2T011	11	16	47	45	FC
MT71-2T015	15	21	62	55	FC
MT71-2T018	18.5	24	77	70	FC
MT71-2T022	22	30	92	80	FD
MT71-2T030	30	39	113	110	FD
Three-phase power supply: 380 - 460V, 50/60Hz					
MT71-4T2P2	2.2	3.4	7.3	5.1	FA
MT71-4T3P7	3.7	5.9	11.9	9	FA
MT71-4T5P5	5.5	8.5	15	13	FA
MT71-4T7P5	7.5	11	20	18	FB
MT71-4T011	11	16	29	27	FB
MT71-4T015	15	21	35	33	FB
MT71-4T018	18.5	24	41	39	FC
MT71-4T022	22	30	50	48	FC
MT71-4T030	30	39	62	60	FC
MT71-4T037	37	49	77	75	FC
MT71-4T045	45	59	93	91	FD
MT71-4T055	55	72	113	112	FD

Note:

Due to elevator on-site use of other power class products are less, some detail parameters are not listed.

If you need this type product, please contact our company.

3.4 Specifications

Electrical	
Input voltage	Single/three-phase: 200 - 240V Three-phase: 380 - 460V Fluctuation within ± 10%, imbalance rate < 3%
Input frequency	50/60Hz ± 5%
Output voltage	0 - Input voltage
Output frequency	0 - 100.00Hz
Performance	
Maximum current	150% rated output current for 2 minutes; 180% rated output current for 10 seconds
Control mode	Closed-loop vector control (VC)
Operation command control mode	Keypad control; terminal distance control
Speed control accuracy	± 0.05%
Speed control range	1:1000
Torque control response	< 50ms
Start torque	200% rated torque /0Hz
Carrier frequency	1 - 16k, Carrier frequency can be adjusted automatically in accordance with the load characteristic
Characteristic	
Maximum floor	10 floors
Maximum run speed	1.5 m/s
Communication mode	Built-in: parallel communication Optional: serial communication
Functions	
Parameter upload and download function	Can achieve parameter upload or download
Motor auto-tuning	Static auto-tuning free off load
Distance control	Distance control with direct stop
Start weighing compensation	Support many weighing compensations
Acc/Dec curve	Can set Acc/Dec curve parameter and auto select optimal speed in accordance with floor distance
Shaft self-learning	Using 32-bit data can record the shaft position accurately
Re-leveling	Support OD re-leveling and advanced open door
Fault protection	Provide up to 60 kinds of protection such as short circuit protection, I/O lack phase protection, over-current protection, elevator over-speed, excessive speed deviation, door machine fault, encoder disconnection, and encoder reverse etc. A complete elevator fault-dealing system
State display	Can easily monitor I/O signals of main control board via keypad

Input / Output	
Digital input	25 digital input terminals, input specifications are 24V and 5mA
High voltage input	4 high voltage input terminals, specifications are 110 - 220VAC/DC
Analogue input	Analogue voltage input (-10 - 10V)
Communication terminal	Modbus communication
Programmable relay output	24 relay outputs
Encoder interface	The optional encoder interface card can be adapted to different types of encoder
Button I/O terminals	24 button inputs and outputs, and terminal function can be set
Operation & Monitoring	
LCD display	Function parameter setting, state parameter check, fault code check etc.
Small keypad	3-bit LED, can achieve part of the debugging features
Host computer	Parameter settings, upload and download, fault inquiries, call and curve monitoring etc.
Environment	
Operation temperature	-10 - +40℃, Max. allowed temperature is 50℃ and air temperature fluctuation is less than 0.5℃/min The derating value of the output current shall be 2% for each degree centigrade above 40 - 50℃
Storage temperature	-40 - +70℃
Location for use	Indoor, preventing from direct sunlight, no dust, corrosive, flammable gases, oil mist, water vapor, dripping or salt etc.
Altitude	Less than 1000 meters, otherwise should be derating use
Humidity	Less than 95%RH, non-condensing
Vibration Resistance	It is 3.5m/s^2 in 2 - 9Hz, it is 10m/s^2 (IEC60721-3-3) in 9 - 200Hz
Protection Class	IP20
Pollution level	Level 2 (Dry, non canducting dust pollution)
Options	
Encoder interface card	ABZ incremental encoder interface card (MT70-PG1-ABZ) SINCOS encoder interface card (MT70-PG2-SINCOS) UVW encoder interface card (MT70-PG3-UVW)
Hall call board	BCD code display control board (MT71-HCB-A) Vertical dot matrix display control board (MT70-HCB-H) Horizontal dot matrix display control board (MT70-HCB-F) Ultrathin dot matrix display control board (MT70-HCB-I) LCD display control board (MT70-HCB-D)
Expansion card	MT70-IOB-A
About keypad	Keypad (MT70-LCD-A) Mounting base to keypad (HD-KMB) 1m/2m/3m/6m extension cable to keypad [HD-CAB-1M/2M/3M/6M]
Power regenerative unit	Power regenerative unit (HDRU-4T025)

3.5 Dimensions and Weight

MONT71 dimensions and gross weight are shown in Table 3-1.

Refer to Section 3.3 Ratings, page17 for specific model specifications.

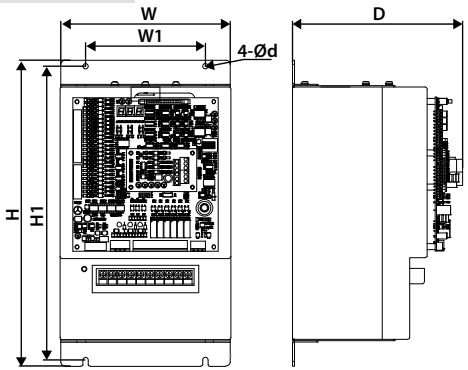


Figure 3-1 MONT71 outlook schematic diagram

Table 3-1 MONT71 dimensions and gross weight

Size	Dimension (mm)		Mounting size (mm)				GW (kg)
	W	H	W1	H1	D	Aperture d	
FA	200	358	140	344	200	6.5	8.7
FB	223	348	150	334.5	203	6.5	9.1
FC	290	555	235	541.5	216	6.5	17.7
FD	380	598	260	576	290	10.0	46.6

Note:

Due to elevator on-site use of other power class products are less, some detail parameters are not listed. If you need this type product, please contact our company.

Chapter 4

Control System Introduction

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روبـروی پالایشگاه نفت پـارس، پلاک ۱۲

4.1 Control System and Precautions

MONT71 system configuration diagram is shown in Figure 4-1.

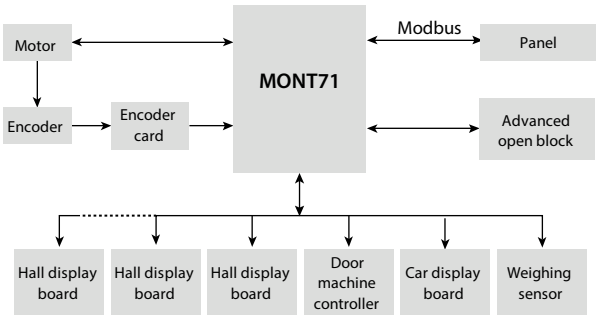

Figure 4-1 MONT71 control system configuration diagram

Danger

- The control circuit is basically insulated with the power circuit. Do not touch the control circuit when the controller is on power.

Warning

- If the control circuit is connected to the external devices with live touchable port, it should increase an additional isolating barrier to ensure that classification of external devices may not be changed.
- If connect the communication terminal of the control circuit to the PC, you should choose the RS485/232 isolating converter which meets the safety requirement.
- MONT71 provides automatic restart. Please check the peripheral device and motor connecting carefully before power the drive, to avoid damage.

4.2 Main Control Board (MT71-MCB-A)

MT71-MCB-A is the core of the control system and using the industry leading 32-bit DSP as the control core, which completes high-performance traction machine vector control, and achieves signal I/O processing and elevator logic control.

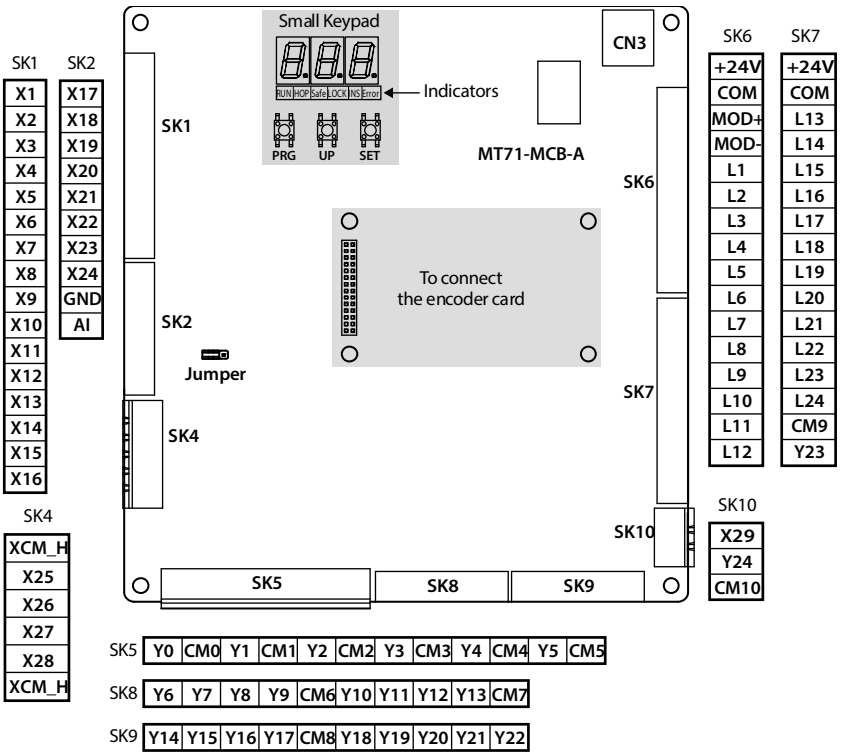

Figure 4-2 MT71-MCB-A

4.2.1 Indicator Description

Table 4-1 Indicator Description

Indicator		Description
RUN	Elevator operation indicator	Flashing at run; lighting at stop
HOP	HCB Modbus communication indicator	Flashing at normal communication; extinguishing at abnormal
Safe	Safety circuit indicator	Lighting at safety circuit closing; extinguishing at disconnection
LOCK	Locked-door circuit indicator	Lighting at locked-door circuit closing; Extinguishing at disconnection
INS	Inspection indicator	Lighting at elevator inspection state; extinguishing at other states
Error	Fault indicator	Lighting at serious fault, flashing at general fault; Extinguishing at no fault

4.2.2 Terminal Description

Table 4-2 MCB Terminal Function Description

Terminal		Description
X1 - X24, X29	Digital input	Programmable bipolar optional input signal Input voltage: 0 - 30VDC; input impedance: 4.7kΩ • X1 - X24 is set by F12.01 - F12.24 • X29 is set by F27.07
X25 - X28, XCM_H	High voltage input	Optocoupler-isolated input signals Input voltage: 110 - 220VAC/DC; input impedance: 22kΩ • X25 - X27 is set by F12.25 - F12.27 • X28 is set by F26.14 Bit4
AI, GND	Analogue input	Input voltage: -10 - 10V; input impedance: 34kΩ

Y0 - Y24, CM0 - CM10	Relay output (normally open)	Programmable output, contact rating: 250VAC/3A or 30VDC/1A
		• Y0 - Y5 is set by F12.28 - F12.33
		  • CM0 - CM5 is the common terminal of Y0-Y5 seperately
		• Y6 - Y23 is set by F12.34 - F12.51
		  • CM6 is common terminal of Y6 - Y9
		  • CM7 is common terminal of Y10 - Y13
		  • CM8 is common terminal of Y14 - Y17
		  • CM9 is common terminal of Y18 - Y23
		• Y24 is set by F27.08
		  • CM10 is common terminal of Y24

L1 - L24	Elevator button interfaces	The button input connects with button indicator output using for button lighting output 24V • The function is set by F13.01 - F13.24
+24V, COM	+24V power supply	External DC 24V power input, as I/O circuits and communication circuit power
MOD+, MOD-	Modbus communication	For Modbus communicating with hall call board (MT70-HCB-*), and need F26.06 to open this function (hall call floors of L terminals is no valid in this case) • Recommended to use shielded twisted pair
CN3	RJ45	Modbus communication terminal • Optional keypad, to check and modify the parameter of main control board

4.2.3 Jumper Description

Table 4-3 Jumper Description

Jumper	Description
Jumper 	Digital input terminal X1 - X24 are high level/ low level selections: • Pin 1 & 2 are short-connected, the low level is valid; • Pin 2 & 3 are short-connected, the high level is valid. (Factory setting)

4.2.4 Modbus Communication Terminal Description

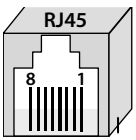

Table 4-4 Communication Terminal Description

Pin	1,3	2	4 - 6	7	8
Difinition	+5V	MOD+	GND	MOD-	Unused
External keypad can view and modify the parameters of the main control board					

4.2.5 Small Keypad Description

Function Description of Key

Three keys are respectively PRG, UP and SET. Their marks are beneath the keys as Figure 4-3.

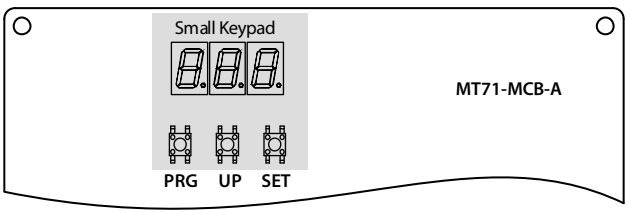

Figure 4-3 Small Keypad Keys

Key	Description
PRG	At any state, pressing **PRG** key can display the present function group number, and can change the function group number via **UP** key.
UP	At function group number menu, via **UP** key to increase group number which can be changed cyclically. At specific functional data menu, you can also input data (or simple command).
SET	At function group number menu, pressing **SET** key can enter data menu of this function group. At specific functional data menu, after input simple command, press **SET** key to save, and then enter into data menu display of F0.
Note: *Pressing three or any two keys of small keypad at the same time is invalid.*	

Display Function

The small keypad displays the information of MCB which respectively are Group F0 – F11. Specific categories are shown as Table 4-5.

Table 4-5 Small Keypad Display Function

Small Keypad Display Function		
F0: Floor and run direction information	F5: Display run times	F9: Unused
F1: Call command input	F6: leveling adjustment	F10: brake force Manual detection
F2: Fault reset	F7: Shaft self-learning command input	F11: UCMP start test
F3, F4: Unused	F8: Test function	

Table 1-1 small keypad display description

F0: Floor and run direction information

Group F0 is default in power-on.

- The last two digits of the 3 digits indicate present floor. The 1st digit indicates the direction. When the elevator stops, the 1st digit is not displayed.
- When the elevator is up or down, the digital tube indicates the up or down direction. Flashes in running and always lights in stop.
- In the event of a system failure (there is no problem at first), the digital tube automatically switches to the fault code and the F0 data is displayed alternately. If the fault disappears automatically, enter the F0 menu display.
- Shaft self-learning display function: If there is an E50 fault when the shaft is self-learning, the keypad will alternately display "E50" and "bxx", where xx represents the fault subcode. Its significance is as follows:

Fault sub-code and its meanings		Fault sub-code and its meanings	
b01	When the upper limit switch is activated, the current floor is not the highest floor	b12	When the forced deceleration switch is active, the current floor is not the highest floor
b02	After the self-learning is completed, the upper limit switch does not operate	b13	The learned board distance exceeds 50cm
b03	When starting self-learning, the current running direction is the downward direction	b14	In the self-learning process, the inspection mode is switched to normal mode
b04	When starting self-learning, the down forced deceleration switch does not move	b15	During self-learning, the pole angle of the synchronous motor is not self-learning
b05	When starting self-learning, the current floor is not the first floor	b16	Self-learning floor less than 50cm
b06	When starting self-learning, the current control method F00.01 is not closed-loop vector control	b17	Upper forced deceleration switch active in self-learning start
b07	When the current floor is the highest floor, the forced deceleration switch does not move	b18	Down forced deceleration switch position is higher than the up forced deceleration switch position
b08	Learning from the well self-learning, the forced deceleration switch distance is 0	b19	Self-learning data overflow
b09	Learning from the well self-learning, the forced deceleration switch distance is 0	b20	When the floor of the self-learning process is on the third floor, the forced deceleration switch remains active.
b10	When the total floor is the 2nd floor, the floor level signal is valid when the self-learning is started.	b21	In the self-learning process, the upper plane effective distance is greater than 50cm
b11	When starting self-learning, the upper limit action	b22	In the self-learning process, the effective distance of the lower leveling signal is greater than 50cm

Note: In F0 display data menu, when the system is in maintenance state and no fault, press UP and SET key for more than 3s to directly perform well self-learning. Like the self-learning mode 1 under the function of keypad F07.

F1: Call command input
After enter Group F1, digital tube displays "1" (physical floor). • which can be set via pressing **UP** key and the range is [1 - maximum floor]. • After set the running destination floor, then press **SET** key to save and it will automatically switch to F0 data menu.
F2: Fault reset
After enter Group F2, digital tube displays "0". • Press **UP** key to set and the range [0,1]. 1: system fault reset command. • After save the setting via pressing **SET** key, then clear the present system fault and automatically switch to Group F3 finally.
F3: Carrier frequency
After entering group F3, the digital tube displays the actual carrier frequency (F18.00). • In the maintenance mode, you can press the UP button to set the range [4 - 8], and automatically switch to the F4 group when finished.
F4: Encoder direction
After entering group F4, the digital tube shows the actual encoder direction (F11.02). • In the maintenance mode, you can press the UP button to set the range [0,1], and automatically switch to the F5 group when finished. • This function needs to set Bit 6 of F27.26 to 1 (allow keypad to change encoder direction).
F5: Display run times
After enter Group F5, digital tube cyclically displays the run times. • Each time cyclically displays one-bit from left to right, after completes, it will begin to re-cycle from the highest bit, which can display up to 999,999 times.
F6: Leveing adjustment
After entering group F6, the digital display shows "30". • Can be fine-tuned based on the leveling of the elevator. When the elevator is over the leveling, decreas this value. When the elevator is underleveling, increase the value. • Hold UP key and the data displayed by the keypad will increase from 30. When it increases to 60, it will jump to 0 to increase. • When the number becomes the target value, stop pressing the UP button, and then press the SET button to save and automatically switch to the F6 group.   • If you want to see if the target value is written correctly. You can press the SET button again to enter the F6 group. The target value should be displayed.
F7: Shaft self-learning command input

After enter group F7, digital tubes display "0".
• Press **UP** key to set and the range is [0 - 2], refer to F26.01.
  • 1: Start shaft self-learning (do not clear F27.01 - F27.25).
  • 2: Start shaft self-learning (clear F27.01 - F27.25).
• Press **SET** key to save, when meet self-learning conditions, the elevator begins self-learning, and display data menu of Group F0, after the self-learning it automatically resets to zero.

F8: Test function

After enter Group F8, digital tubes display "00".

- Press **UP** key to set and the range is [00 - 05]. Press **SET** key to save, digital tubes are flashing to display "E88", which means the present setting of the elevator is at testing state. Press **PRG** key to reset to zero.

00: No function	02: Locked open door	04: Locked limitation switch
01: Locked hall call	03: Locked over-load	05: Allow elevator random run 500 times

- In addition, when the small keypad of the main control board enters into Group F8 and in the testing function mode, **SET** key will be equivalent to close button.

F10: brake power manual detection

When the elevator enters the F10 group in the automatic mode, changing the parameter from "0" to "1" can start the braking force detection.

- When the brake detection is successful, F04.17 will automatically increase by one. If the brake detection fails, the system will report E66 fault (self-test brake failure).
- This fault can only be reset manually in service mode.

F11: UCMP start test

After entering group F11, change the parameter from "0" to "1" to enable the UCMP test function.

4.2.6 Terminal Connection

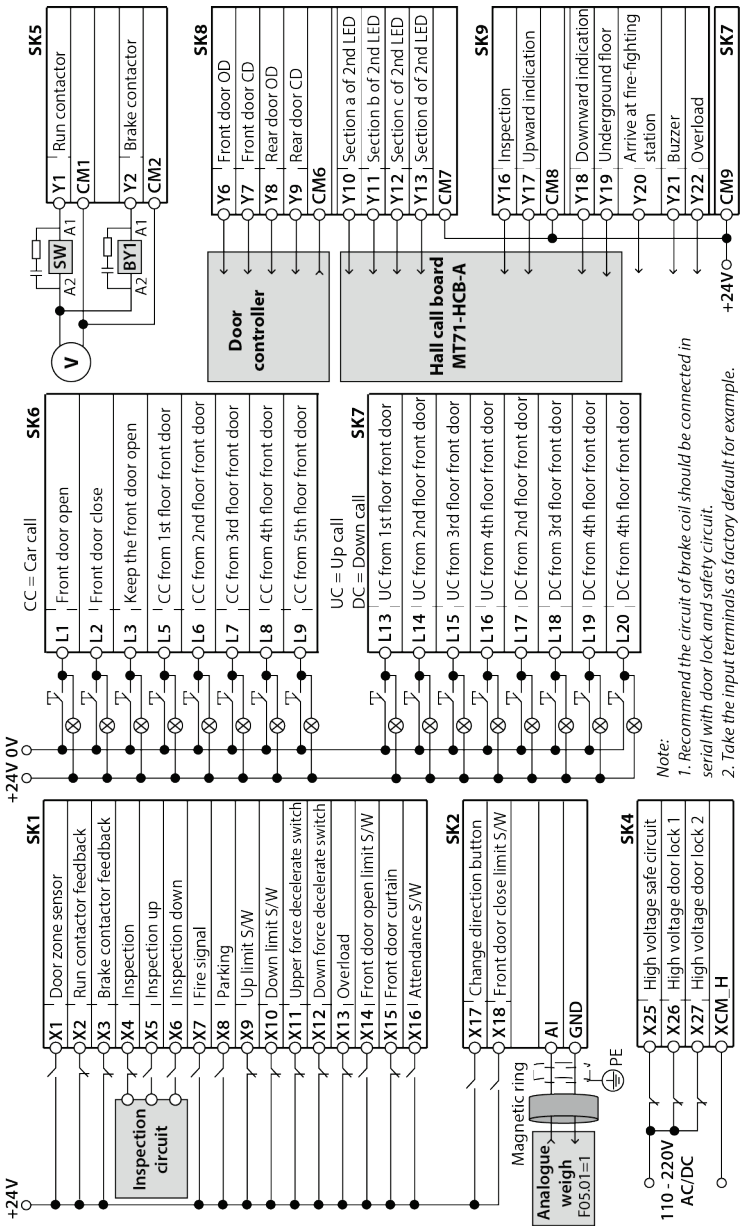

Figure 4-4 Five floors of full selective connection (it defaults the factory setting)

4.3 BCD Code Display Control Board (MT71-HCB-A)

Function

- **Hall call board**: Installing outside the hall, to receive the user calling and display information about where floor elevator and the running direction etc.
- **Internal call board**: Installing inside the car, to display information about elevator of floor and the running direction etc.

Dimensions

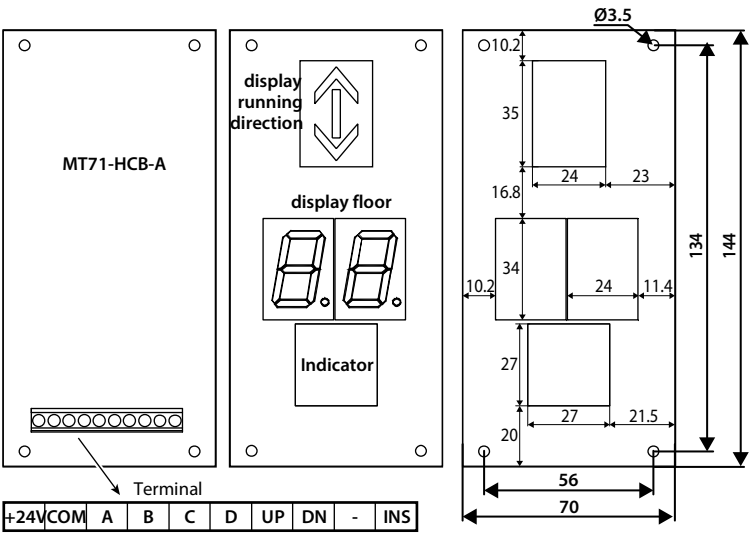

Figure 4-5 MT71-HCB-A

Terminal Description

The input terminals can change the corresponding terminal functions via F12.28 - F12.51 (Y0 - Y23 of MCB-A). Such as: set F12.38 = 22 (Y8 = overload instruction output) so as to reposition INS indicator connected to the Y8 as overload indicator.

Table 4-6 Terminal Description

Terminal		Description
+24V, COM	+24V power supply	External provide DC24V, as MT71-HCB-A working power supply
A / B / C / D	A / B / C / D signal input	The floor displays LED control signal A / B / C / D
UP / DN	UP / Down signal input	The up / down arrow indicates LED control signal
-	Minus signal input	The minus LED control signal
INS	Inspection signal input	The inspection indicates LED control signal

Indicators

Can set indicators of MT71-HCB-A via parameters F12.28 - F12.51.

4.4 Encoder Interface Card

4.4.1 Encoder Interface Card Selection

MONT71 provide three kind encoder interface cards (optional).

Table 4-7 Encoder interface card

Encoder interface card	Encoder interface card function
ABZ incremental encoder interface card (MT70-PG1-ABZ)	• Support differential, OC, push-pull signal input and pulse output; • Apply to asynchronous motor close-loop vector control (VC)
SINCOS encoder interface card (MT70-PG2-SINCOS)	• Support sine and cosine signal input; support pulse output; • Apply to synchronous motor close-loop vector control (VC)
UVW encoder interface card (MT70-PG3-UVW)	• Support 5V-line drive ABZ and UVW signal input; support pulse output; • Apply to synchronous motor close-loop vector control (VC)

Wiring requirement of encoder interface card:

1. Encoder interface card wire should be laid separately and kept distance from power cables and forbidden to parallel with them.

2. Encoder interface card wire should be shield wire, and shield layer should connect to PE near controller. (In order to avoid being disturbed, only one terminal connects to ground).

3. Encoder interface card wire should be pulled on pipe separately, and metal crust should be connected to ground reliably.

4.4.2 MT70-PG1-ABZ

ABZ incremental encoder interface card is shown as Figure 4-6.

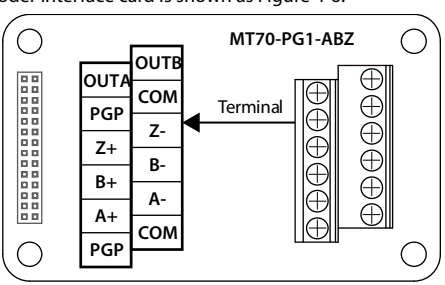

Figure 4-6 MT70-PG1-ABZ

Terminal Description

Table 4-8 Terminal description

Terminal	Description	Terminal	Description
PGP	+12V power supply output	Z+ / Z-	Z+ / Z- signals of encoder
COM	Power ground, isolated from GND	OUTA	Output A signal, the output type is OC output
A+ / A-	A+ / A- signals of encoder	OUTB	Output B signal, the output type is OC output
B+ / B-	B+ / B- signals of encoder	COM	Output ground, isolated from GND

Encoder Interface Card Connection

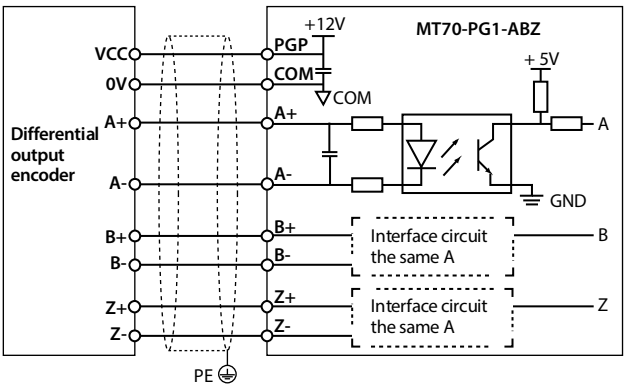

Figure 4-7 Connection of differential output encoder

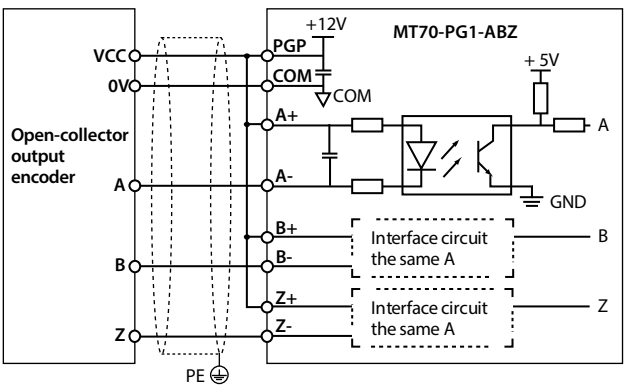

Figure 4-8 Connection of open collector output encoder

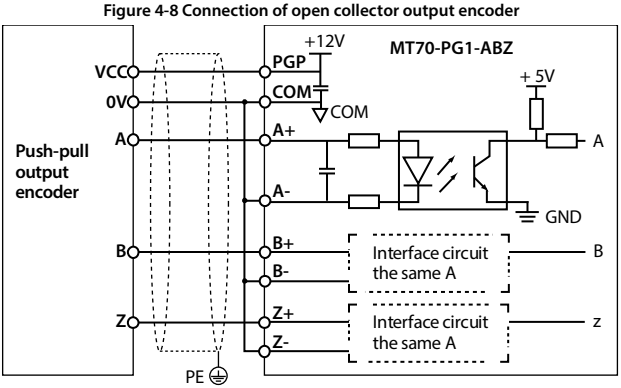

Figure 4-9 Connection of push-pull output encoder

4.4.3 MT70-PG2-SINCOS

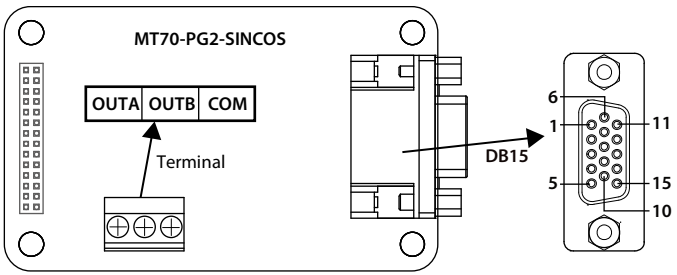

Figure 4-10 MT70-PG2-SINCOS

Terminal Description

Table 4-9 DB15 and terminal description

Terminal		Description	Terminal		Description
1 / 8	B- / B+	Differential signal B- / B+	12 / 13	D+ / D-	Differential signal D+ / D-
3 / 4	R+ / R-	Differential signal R+ / R-	2 / 14 / 15		Invalid
5 / 6	A+ / A-	Differential signal A+ / A-	OUTA		Output signal A /B, output type is OC output
7	PGGND	Power supply ground	OUTB		
9	PGVCC	+5V power supply	COM		Output signal site, isolated from GND
10 / 11	C+ / C-	Differential signal C+ / C-			

Encoder Interface Card Connection

We recommend HEIDENHAIN ERN1387 encoder for use. The 1387 double-socket and DB15 connection terminal are shown as Table 4-10.

Table 4-10 1387 double-socket and DB15 terminal relation

1387 double-socket		DB15 terminal	
1b 2b 3b 4b 5b 6b 7b 1a 2a 3a 4a 5a 6a 7a		5 1 10 6 15 11	
5a	B-	1	B-
4b	R+(Z+)	3	R+
4a	R-(Z-)	4	R-
6b	A+	5	A+
2a	A-	6	A-
3a+5b	0V	7	PGGND
3b	B+	8	B+
7a+1b	5V	9	PGVCC
7b	C+(SIN-)	10	C+
1a	C-(SIN+)	11	C-
2b	D+(COS+)	12	D+

1387 double-socket		DB15 terminal	
6a	D-(COS-)	13	D-

Note:

The phase sequence of C+/C- and D+/D- signals will automatically learn the wiring mode at the parameter auto-tuning timing. There is no special requirement for wiring.

That is, C+/C- can be replaced by C-/C+, and D+/D- can be replaced by D-/D+.

4.4.4 MT70-PG3-UVW

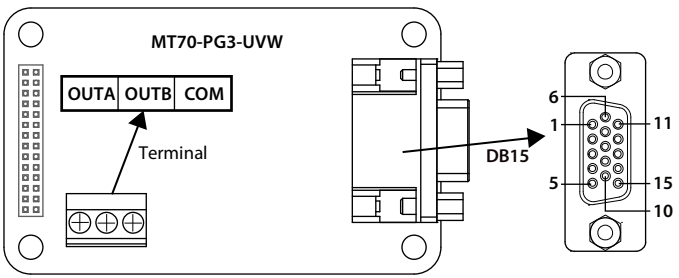

Figure 4-11 MT70-PG3-UVW

Terminal Description

Table 4-11 DB15 and terminal description

Terminal		Description	Terminal		Description
1 / 2	A+ / A-	Differential signal A+ / A-	13	PGVCC	Power supply ground
3 / 4	B+ / B-	Differential signal B+ / B-	14	PGGND	+5V power supply
5 / 6	Z+ / Z-	Differential signal Z+ / Z-	15		Invalid
7 / 8	U+ / U-	Differential signal U+ / U-	OUTA		Output signal A /B, output type is OC output
9 / 10	V+ / V-	Differential signal V+ / V-	OUTB		
11 / 12	W+ / W-	Differential signal W+ / W-	COM		Output signal site, isolated from GND

4.5 MT70-IOB-A

MT70-IOB-A is an interface card for the MONT71 product expansion function application. Its functions mainly include:

- Support MONT71 full Collective to the largest floor to 16th floor.
- As the car communication floor command and floor information display, only 4 lines are used to communicate with the main control board. Reduce the number of accompanying cables.

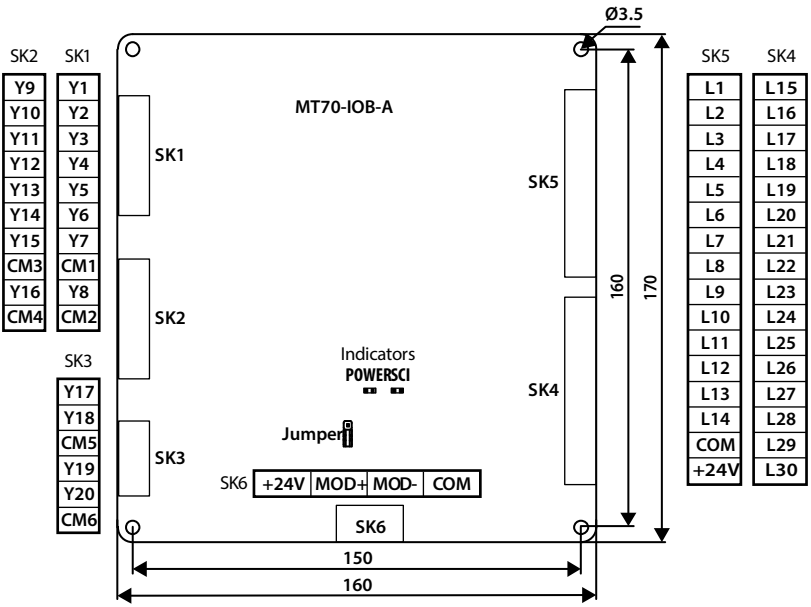

Figure 4-12 MT71-IOB-A

4.5.1 Indicator Description

Table 4-12 Indicator description

Indicator		Description
POWER	Power indicator	Blinks when normal, and goes out when abnormal
SCI	Communication indicators with the main control board	Uniformly blinks when communication is normal, and goes out when abnormal

4.5.2 Jumper Description

Table 4-13 Jumper description

Jumper	Description
Jumper 	MODBUS communication matching resistor selection: 1, 2pin shorted, matching resistor is effective; 2. When the 3pin is shorted, the matching resistor is invalid (factory setting).

4.5.3 Terminal Description

Table 4-14 Terminal description

Terminal		Description
Y1 - Y20, CM1 - CM6	Relay output (normally open)	Programmable output, contact rating: 250VAC/3A or 30VDC/1A • The function is set by F28.01 - F28.20 • CM1 is common terminal of Y1 - Y7 • CM2 is common terminal of Y8 • CM3 is common terminal of Y9 - Y15 • CM4 is common terminal of Y16 • CM5 is common terminal of Y17 - Y18 • CM6 is common terminal of Y19 - Y20
L1 - L30	Button interfaces	Button input on and button light output, output 24V for button light • The function is set by F29.01 - F29.30 setting
+24V, COM	+24V power supply	External DC 24V power input, as input and output and communication power
MOD+, MOD-	Modbus communication	Used for Modbus communication with MONT71 cruise board

4.5.4 Function Description

MT70-IOB-A needs to be used with the main control board MONT71 (not labeled MONT71-IOB-A).

The new function parameters are shown in the table below.

F13: Main Control Board L Terminal Function Parameters

F13.01	MCB terminals L1 functions	000 – 366 [201]
F13.02	MCB terminals L2 functions	000 - 366 [202]
F13.03	MCB terminals L3 functions	000 - 366 [203]
F13.04	MCB terminals L4 functions	000 - 366 [0]
F13.05	MCB terminals L5 functions	000 - 366 [211]
F13.06	MCB terminals L6 functions	000 - 366 [212]
F13.07	MCB terminals L7 functions	000 - 366 [213]
F13.08	MCB terminals L8 functions	000 - 366 [214]
F13.09	MCB terminals L9 functions	000 – 366 [215]
F13.10	MCB terminals L10 functions	000 - 366 [0]
F13.11	MCB terminals L11 functions	000 - 366 [0]
F13.12	MCB terminals L12 functions	000 - 366 [0]
F13.13	MCB terminals L13 functions	000 - 366 [221]
F13.14	MCB terminals L14 functions	000 - 366 [222]
F13.15	MCB terminals L15 functions	000 - 366 [223]
F13.16	MCB terminals L16 functions	000 - 366 [224]
F13.17	MCB terminals L17 functions	000 - 366 [232]
F13.18	MCB terminals L18 functions	000 - 366 [233]
F13.19	MCB terminals L19 functions	000 - 366 [234]

F13.20	MCB terminals L20 functions	000 - 366 [235]
F13.21	MCB terminals L21 functions	000 - 366 [0]
F13.22	MCB terminals L22 functions	000 - 366 [0]
F13.23	MCB terminals L23 functions	000 - 366 [0]
F13.24	MCB terminals L24 functions	000 - 366 [0]
F13.25 - F13.26	Manufacturer debugging parameters, prohibit changes	

It is used to set up 16 floors of internal call/up call/down call.

- For the setting of floors 1 - 10, refer to section 8.2.14 F13.01 - F13.24. For the setting of floors 11 - 16, see below.
- No up call on the 16th floor, No down call on the 1st floor.

240: Reserve	340: Reserve
241: 11 floor front door internal call	341: 11 floor back door internal call
242: 12 floor front door internal call	342: 12 floor back door internal call
243: 13 floor front door internal call	343: 13 floor back door internal call
244: 14 floor front door internal call	344: 14 floor back door internal call
245: 15 floor front door internal call	345: 15 floor back door internal call
246: 16 floor front door internal call	346: 16 floor back door internal call

250: 10 floor front door up call	350: 10 floor back door up call
251: 11 floor front door up call	351: 11 floor back door up call
252: 12 floor front door up call	352: 12 floor back door up call
253: 13 floor front door up call	353: 13 floor back door up call
254: 14 floor front door up call	354: 14 floor back door up call
255: 15 floor front door up call	355: 15 floor back door up call
256: Reserve	356: Reserve

261: 11 floor front door down call	361: 11 floor back door down call
262: 12 floor front door down call	362: 12 floor back door down call
263: 13 floor front door down call	363: 13 floor back door down call
264: 14 floor front door down call	364: 14 floor back door down call
265: 15 floor front door down call	365: 15 floor back door down call
266: 16 floor front door down call	366: 16 floor back door down call

F20: Floor Height Data Parameters

F20.18	floor height 10 high bit	0 - 50000 [0]
F20.19	floor height 10 low bit	0 - 50000 [0]
F20.20	floor height 11 high bit	0 - 50000 [0]
F20.21	floor height 11 low bit	0 - 50000 [0]
F20.22	floor height 12 high bit	0 - 50000 [0]
F20.23	floor height 12 low bit	0 - 50000 [0]

F20.24	floor height 13 high bit	0 - 50000 [0]
F20.25	floor height 13 low bit	0 - 50000 [0]
F20.26	floor height 14 high bit	0 - 50000 [0]
F20.27	floor height 14 low bit	0 - 50000 [0]
F20.28	floor height 15 high bit	0 - 50000 [0]
F20.29	floor height 15 low bit	0 - 50000 [0]

Defines the height of the current floor from N to N + 1 layers. Unit: pulses.

For example, the height from the 10th to the 11th: 50000 × F20.18 + F20.19.

F24: Floor Information Display Parameters

F24.11	Floor 11 display	0000 - 9999 [0101]
F24.12	Floor 12 display	0000 - 9999 [0102]
F24.13	Floor 13 display	0000 - 9999 [0103]
F24.14	Floor 14 display	0000 - 9999 [0104]
F24.15	Floor 15 display	0000 - 9999 [0105]
F24.16	Floor 16 display	00000 - 9999 [0106]

Defines the display content of hall and car display.

- The set value consists of 4 digits. The high 2 digits represent the ten bit of the floor, and the low 2 digits represent the unit. The meaning is as follows:

Such as: 11th floor shows 11, F24.11 = 0101; 16th floor shows -1 floor, F24.16=1801.

Value	Display	Value	Display	Value	Display
00	0	09	9	35	U
01	1	10	A	39	Y
02	2	13	H	50	b
03	3	16	P	51	d
04	4	18	-	52	t
05	5	19	No display	53	G
06	6	23	C	54	L
07	7	25	E	55	J
08	8	26	F		

F24.17	Hall call output selection	0 - 3 [0]

0: 7 segment.

1: BCD code.

2: Reserve.

3: Binary.

F28: IOB Output Parameter

F28.00	IOB enhance parameter	0 - 65535 [0]

Bit3 - Bit15: Reserve	Bit2: IOB expansion Functions 0: Forbiden 1: Enable	Bit1: Reserve	Bit0: Reserve

F28.01	IOB relay Y1 functions	6 - 46 [0]
F28.02	IOB relay Y2 functions	6 - 46 [0]
F28.03	IOB relay Y3 functions	6 - 46 [0]
F28.04	IOB relay Y4 functions	6 - 46 [0]
F28.05	IOB relay Y5 functions	6 - 46 [0]
F28.06	IOB relay Y6 functions	6 - 46 [0]
F28.07	IOB relay Y7 functions	6 - 46 [0]
F28.08	IOB relay Y8 functions	6 - 46 [0]
F28.09	IOB relay Y9 functions	6 - 46 [0]
F28.10	IOB relay Y10 functions	6 - 46 [0]
F28.11	IOB relay Y11 functions	6 - 46 [0]
F28.12	IOB relay Y12 functions	6 - 46 [0]
F28.13	IOB relay Y13 functions	6 - 46 [0]
F28.14	IOB relay Y14 functions	6 - 46 [0]
F28.15	IOB relay Y15 functions	6 - 46 [0]
F28.16	IOB relay Y16 functions	6 - 46 [0]
F28.17	IOB relay Y17 functions	6 - 46 [0]
F28.18	IOB relay Y18 functions	6 - 46 [0]
F28.19	IOB relay Y19 functions	6 - 46 [0]
F28.20	IOB relay Y20 functions	6 - 46 [0]

Same as the MCB relay Y6 - Y23 output setting.

- See the F12.34 - F12.51 parameters in section 7.2.13 for details.

F28.21	IOB Y1 - Y16 states	0 - 65535 [0]

The status of the MT70-IOB-A relay (Y1 - Y16) is displayed by a 16-bit binary display, see the following table:

Bit15: Y16 relay	Bit14: Y15 relay	Bit13: Y14 relay	Bit12: Y13 relay
Bit11: Y12 relay	Bit10: Y11 relay	Bit9: Y10 relay	Bit8: Y9 relay
Bit7: Y8 relay	Bit6: Y7 relay	Bit5: Y6 relay	Bit4: Y5 relay
Bit3: Y4 relay	Bit2: Y3 relay	Bit1: Y2 relay	Bit0: Y1 relay
• 0: Relay no output		• 1: Relay has output	

F28.22	IOB Y17 - Y22 status	0 - 65535 [0]

The status of the MT70-IOB-A relay (Y17 - Y22) is displayed by a 16-bit binary display, see the following table:

Bit15 - Bit7: reserve	Bit6: reserve	Bit5: Y22 relay	Bit4: Y21 relay
Bit3: Y20 relay	Bit2: Y19 relay	Bit1: Y18 relay	Bit0: Y17 relay
• 0: Relay no output		• 1: Relay has output	

F29: IOB Input Parameter

F29.00	Input filter settings	2 - 40 [10mm]

- Defines the input filter time for the L terminal (L1 - L30) of the IOB board. It is used to set the sensitivity of the input terminal.
- If the input terminal is susceptible to malfunction due to interference, this parameter setting can be increased but the sensitivity of the terminal can be reduced.

F29.01	IOB terminals L1 functions	000 - 366 [0]
F29.02	IOB terminals L2 functions	000 - 366 [0]
F29.03	IOB terminals L3 functions	000 - 366 [0]
F29.04	IOB terminals L4 functions	000 - 366 [0]
F29.05	IOB terminals L5 functions	000 - 366 [0]
F29.06	IOB terminals L6 functions	000 - 366 [0]
F29.07	IOB terminals L7 functions	000 - 366 [0]
F29.08	IOB terminals L8 functions	000 - 366 [0]
F29.09	IOB terminals L9 functions	000 - 366 [0]
F29.10	IOB terminals L10 functions	000 - 366 [0]
F29.11	IOB terminals L11 functions	000 - 366 [0]
F29.12	IOB terminals L12 functions	000 - 366 [0]
F29.13	IOB terminals L13 functions	000 - 366 [0]
F29.14	IOB terminals L14 functions	000 - 366 [0]
F29.15	IOB terminals L15 functions	000 - 366 [0]
F29.16	IOB terminals L16 functions	000 - 366 [0]
F29.17	IOB terminals L17 functions	000 - 366 [0]
F29.18	IOB terminals L18 functions	000 - 366 [0]
F29.19	IOB terminals L19 functions	000 - 366 [0]
F29.20	IOB terminals L20 functions	000 - 366 [0]
F29.21	IOB terminals L21 functions	000 - 366 [0]
F29.22	IOB terminals L22 functions	000 - 366 [0]
F29.23	IOB terminals L23 functions	000 - 366 [0]
F29.24	IOB terminals L24 functions	000 - 366 [0]
F29.25	IOB terminals L25 functions	000 - 366 [0]
F29.26	IOB terminals L26 functions	000 - 366 [0]
F29.27	IOB terminals L27 functions	000 - 366 [0]

F29.28	IOB terminals L28 functions	000 - 366 [0]
F29.29	IOB terminals L29 functions	000 - 366 [0]
F29.30	IOB terminals L30 functions	000 - 366 [0]
F29.31 - F29.32	Manufacturer debugging parameters, prohibit changes	

Used to set up 16 floors of internal call/up call/down call

- Same settings as the main control board L1 - L24 terminals. For details, refer to F13.01 - F13.24 in section 4.5.4.
- No up call on the 16th floor, No down call on the 1st floor.

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Chapter 5

Installation and Wiring

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5.1 Installation Precautions

Danger

- Do not install if MONT71 is imcomplete or impaired.
- Make sure that MONT71 is far from the explosive and combustible things.
- Do not operate MONT71 until the power is cut-off 10 minutes later.

Warning

- Do not play metal into MONT71 when installing.

5.2 Requirement for the Installation Site

Ensure the installation site meeting the following requirements:

- Do not install at the direct sunlight, moisture, water droplet location;
- Do not install at the combustible, explosive, corrosive gas and liquid location;
- Do not install at the oily dust, fiber and metal powder location;
- Be vertical installation on fire-retardant material with a strong support;
- Make sure adequate cooling space for MONT71 so as to keep the ambient temperature between - 10 - + 40℃;
- Install at where the vibration is 3.5m/s^2 in 2 - 9Hz, 10m/s^2 in 9 - 200Hz (IEC60721-3-3);
- Install at where the humidity is less than 95%RH and non-condensing location;
- Protection level of HD30 is IP20 and pollution level is 2 (Dry, non-conducting dust pollution).

Note:

1. It needs derating use if operation temperature exceeds 40℃. The derating value shall be 2% for each degree centigrade. Max. allowed temperature is 50℃

2. Keep ambient temperature between -10 - +40℃. It can improve operation performance if install at the location with good ventilation or cooling devices.

5.3 Wiring Precautions

Danger

- Only qualified electrical engineer can perform wiring job.
- To facilitate input-side over-current protection and outage maintenance, the MONT71 should be connected to the power supply via an air switch MCCB or fuse.
- After MONT71 is turned off for 10 minutes, and the internal charge indicator has been turned off, the voltage between the power terminals (+) and (-) is lower than 36V before the wiring can be performed or the MONT71 internal device can be removed.
- After the external power supply emergency stop terminal is turned on, be sure to check whether the operation is effective and reliable.
- MONT71 has more than 3mA leakage current to ground. The specific value depends on the conditions of use. To ensure safety, MONT71 and the motor must use two independent grounding wires to ensure reliable grounding. It is recommended that users install the Type B leakage protection device (ELCB / RCD).
- Do not touch the MONT71 terminal block while the MONT71 is powered. Do not connect the power terminals of the MONT71 to the product case. Do not short-circuit the power terminals.
- Bare metal parts of connections of high voltage input terminals (X25 - X28) and relay output terminals (Y0 - Y24) of main control board must be wrapped with insulating tape.

Warning

- MONT71 passed the pressure test before leaving the factory, Do not do dielectric strength test on MONT71.
- MONT71, which has been stored for more than 2 years, should be slowly boosted by a voltage regulator when it is powered on.
- Do wiring connection of the braking resistor according to the wiring figure.
- Make sure the terminals are fixed tightly.
- Do not connect the AC supply cable to the output terminals U/V/W.
- Do not connect the phase-shifting capacitors to the output circuit.
- MONT71 DC bus terminals must not be short-circuited.

5.4 Peripheral Accessories Selection

5.4.1 Wiring specifications of input and output

The AC supply to MONT71 must be installed with suitable protection against overload and short-circuits, i.e. MCCB (molded case circuit breaker) or equivalent device.

The recommended specification of MCCB, contactor & cables are shown as Table 5-2.

The size of ground wire should accord with the requirement in 4.3.5.4 of IEC61800-5-1, as shown in Table 5-1.

Table 5-1 Sectional area of ground protective conductor

Sectional area S of phase conductor (power supply cable) while installing (mm^2)	$S \leq 2.5$	$2.5 < S \leq 16$	$16 < S \leq 35$	$S > 35$
Min. sectional area Sp of relative protective conductor (ground cable) (mm^2)	2.5	S	16	S/2

Table 5-2 MONT71 I/O wiring specification

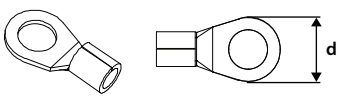
Model	MCCB (A)	Contactor (A)	Supply Cable (mm^2)	Motor Cable (mm^2)	Ground Cable (mm^2)	Size
Single-phase: 200 - 240V, 50/60Hz						
MT71-2S2P2	32	20	6	2.5	2.5	FA
MT71-2S3P7	63	32	16	4	16	FA
Single/three-phase: 200 - 240V, 50/60Hz						
MT71-2D5P5	125 / 63(1)	100 / 40(1)	35 / 10(1)	6	16 / 10(1)	FB
MT71-2D7P5	160 / 63(1)	100 / 40(1)	35 / 16(1)	10	16	FB
MT71-2D011	200 / 100(1)	125 / 63(1)	50 / 25(1)	16	25 / 16(1)	FC
MT71-2D015	200 / 125(1)	160 / 100(1)	70 / 35(1)	25	35 / 16(1)	FC
MT71-2D018	250 / 160(1)	160 / 100(1)	95 / 35(1)	35	50 / 16(1)	FC
(1): Value before / is for single-phase model, value after / is for three-phase model.						
Three-phase: 200 - 240V, 50/60Hz						
MT71-2T3P7	40	32	6	4	2.5	FA
MT71-2T5P5	63	40	10	10	2.5	FB
MT71-2T7P5	63	40	16	10	2.5	FB
MT71-2T011	100	63	25	16	16	FC
MT71-2T015	125	100	35	25	16	FC
MT71-2T018	160	100	35	35	16	FC
MT71-2T022	200	125	35	35	16	FD
MT71-2T030	200	125	50	50	25	FD
Three-phase: 380 - 460V, 50/60Hz						
MT71-4T2P2	16	10	1.5	0.75	2.5	FA
MT71-4T3P7	25	16	2.5	2.5	2.5	FA
MT71-4T5P5	32	25	4	4	2.5	FA
MT71-4T7P5	40	32	6	6	2.5	FB
MT71-4T011	63	40	10	10	2.5	FB
MT71-4T015	63	40	16	16	16	FB
MT71-4T018	100	63	16	16	16	FC
MT71-4T022	100	63	25	25	16	FC
MT71-4T030	125	100	35	35	16	FC
MT71-4T037	160	100	35	35	16	FC
MT71-4T045	200	125	35	35	16	FD
MT71-4T055	200	125	50	50	25	FD

5.4.2 Power Terminal Lug

Select the lug of power terminal according to the size of terminal, screw size and max. outer diameter of lug. Refer to Table 5-3.

Take the round terminal as an example.

Table 5-3 Selection of power terminal lug



Size	FA	FB	FC	FD
Screw size	M4	M5	M6	M8
Tightening torque (N. M)	1.2 - 1.5	2.5 - 3.0	4.0 - 5.0	9.0 - 10.0
Max. outer diameter of lug d (mm)	9.9	12	15.5	24

5.5 Power Terminal and Wiring

Danger

- The bare portions of the power cables must be bound with insulation tapes.

Warning

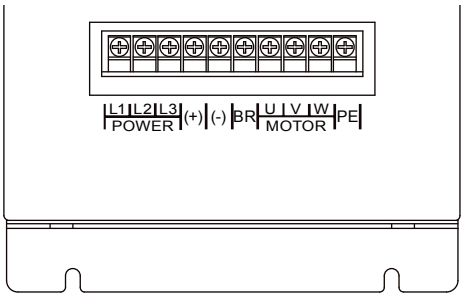
- Ensure that AC supply voltage is the same as MONT71 rated input voltage.

5.5.1 Power Terminal Description

Table 5-4 Power Terminal Description

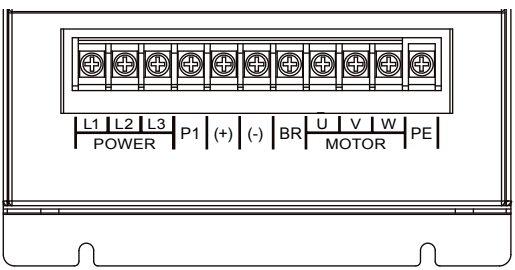
FA

- L1, L2, L3: Three-phase AC power input terminals
- U, V, W: Output terminals, connect to three-phase AC motor
- (+), (-): DC supply input terminals; DC input terminals of power regenerative unit
- (+), BR: Braking resistor connection terminals
- PE: Earth terminal, connect to the ground



FB - FD

- L1, L2, L3: Three-phase AC power input terminals
- U, V, W: Output terminals, connect to three-phase AC motor
- P1, (+): DC reactor connection terminals
- (+), (-): DC supply input terminals; DC input terminals of power regenerative unit
- (+), BR: Braking resistor connection terminals
- PE: Earth terminal, connect to the ground



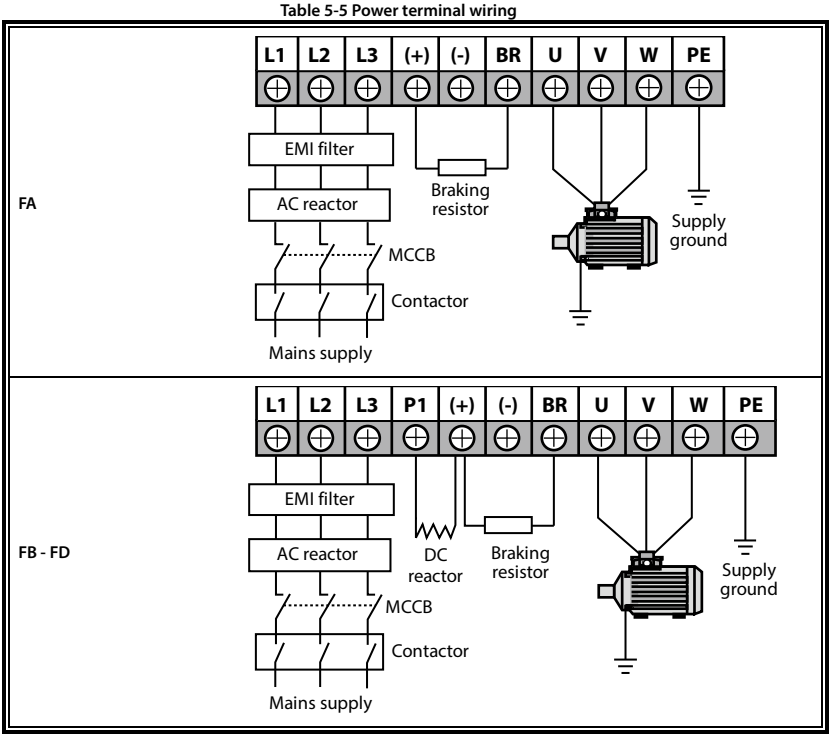
5.5.2 Power Terminal Wiring

ontactors, MCCBs, power cords, motor cables, grounding lines, see 5.4 Peripheral Accessories Selection, on page 45.

Braking resistor selection, see 5.7 Braking Resistor Selection, on page 49.

Reactor selection, see 5.6 Reactor Selection, on page 49.

Table 5-5 Power terminal wiring



5.6 Reactor Selection

Table 5-6 Reactor selection

Model	AC input reactor		AC output reactor		DC reactor	
	Model	Parameter (mH-A)	Model	Parameter (mH-A)	Model	Parameter (mH-A)
MT71-4T037	HD-AIL-4T037	0.19-75	HD-AOL-4T037	0.08-80	HD-DCL-4T037	0.35-100
MT71-4T045	HD-AIL-4T045	0.16-90	HD-AOL-4T045	0.06-100	HD-DCL-4T045	0.29-120
MT71-4T055	HD-AIL-4T055	0.13-115	HD-AOL-4T055	0.04-125	HD-DCL-4T055	0.23-150

5.7 Braking Resistor Selection

All series is built-in dynamic braking unit.

See Table 5-7 for selection of braking resistors and section 5.5.2 Power Terminal Wiring on page 49 for wiring.

Table 5-7 Braking Resistor Selection

Model	Motor (kW)	Recommended value(Ω)			Recommended power (kW)	
		Min	Max	Recommended	Synchronous	Asynchronous
Single-phase: 200 - 240V, 50/60Hz						
MT71-2S2P2	2.2	26	130	50	1	1
MT71-2S3P7	3.7	26	90	30	1.6	1.2
Single/three-phase: 200 - 240V, 50/60Hz						
MT71-2D5P5	5.5	17	27	20	2	1.6
MT71-2D7P5	7.5	11	20	15	3.2	2
MT71-2D011	11	11	20	15	4	3.2
MT71-2D015	15	10	16	12	5	4
MT71-2D018	18.5	10	16	12	6.4	5
Three-phase: 200 - 240V, 50/60Hz						
MT71-2T3P7	3.7	26	50	30	1.6	1.2
MT71-2T5P5	5.5	17	27	20	2	1.6
MT71-2T7P5	7.5	11	20	15	3.2	2
MT71-2T011	11	11	20	15	4	3.2
MT71-2T015	15	10	16	12	5	4
MT71-2T018	18.5	10	16	12	6.4	5
MT71-2T022	22	7	10	9	8	6.4
MT71-2T030	30	7	10	9	10	8
Three-phase: 380 - 460V, 50/60Hz						
MT71-4T2P2	2.2	56	210	100	1	1
MT71-4T3P7	3.7	56	144	80	1.6	1.2
MT71-4T5P5	5.5	56	100	70	2	1.6
MT71-4T7P5	7.5	56	72	64	3.2	2
MT71-4T011	11	34	48	40	4	3.2
MT71-4T015	15	34	41	36	5	4
MT71-4T018	18.5	17	31	24	6.4	5
MT71-4T022	22	17	27	20	8	6.4
MT71-4T030	30	11	20	15	10	8
MT71-4T037	37	10	16	12	12	10
MT71-4T045	45	7	10	9	18	15
MT71-4T055	55	5	8	8	22	18

Note:

1. Please select braking resistor based on the Table 5-7.
Bigger resistor can protect the braking system in fault condition, but oversized resistor may bring a capacity decrease, lead to over voltage protection.

2. The braking resistor should be mounted in a ventilated metal housing to prevent inadevertent contact during it works, for the temperature is high.

5.8 Shaft Mounting Position Signals

Without UCMP protection, the system can use one door sensor or two upper and lower level sensors. When it is necessary to open the door in advance or open the door to relevel the floor, a leveling sensor and a lower leveling sensor are required.

- For systems with UCMP protection, the recommended leveling board and flat layer signals are shown inFigure 5-1.

Note:

1. Two releveling sensors must be used.

2. The leveling sensor must be installed in order, otherwise the direction will be reversed when the leveling operation is performed or when the door is opened earlier.

3. The length of the magnetic separation plate is determined by the actual opening area (door length) of the elevator.

4. The length of the magnetic separation board and the installation of the leveling sensor will affect the effective distance of UCMP output.

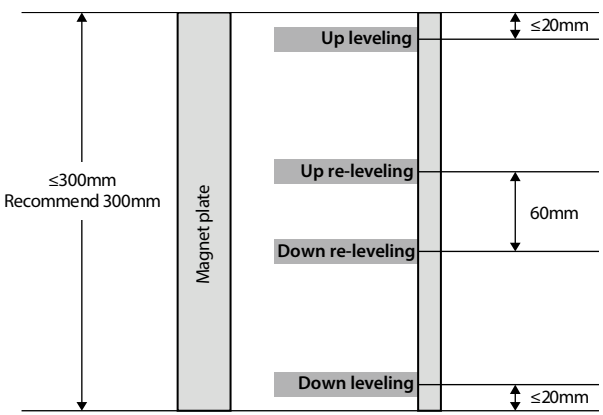


Figure 5-1 UCMP sensor installation recommended program

5.9 Meet EMC Requirement of Installation

5.9.1 Correct EMC Installation

According national standards GB/T12668.3, MONT71 should meet the two requirements of electromagnetic interference (EMI) and anti-electromagnetic interference. The international standards IEC/61800-3 (VVVF drive system part 3: EMC specifications and test methods) are identical to the national standards GB/T12668.3.

MONT71 are designed and produced according to the requirements of IEC/61800-3. Please install as per the description below so as to achieve good electromagnetic compatibility (EMC).

- In a drive system, MONT71, control equipment and sensors are installed in the same cabinet, the electromagnetic noise should be suppressed at the main connecting points with the EMI filter and input reactor installed in cabinet to satisfy the EMC requirements.
- The most effective but expensive measure to reduce the interference is to isolate the noise source and the noise receiver, which should be considered in mechanical system design phase. In driving system, the noise source can be MONT71, braking unit and contactor. Noise receiver can be automation equipment, encoder and sensor etc.

The mechanical/system is divided into different EMC areas according to its electrical characteristics. The recommended installation positions are shown in Figure 5-2.

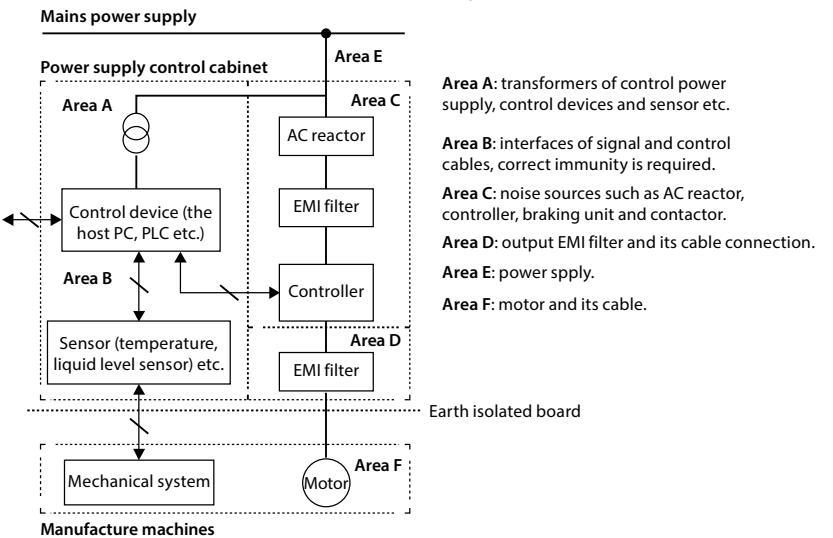


Figure 5-2 System wiring sketch

- All areas should be isolated in space to achieve electromagnetic decoupling effect.
- The minimum distance between areas should be 20cm, and use earthing bars for decoupling among areas, the cables from different area should be placed in different tubes.
- EMI filters should be installed at the interfaces between different areas if necessary.
- Bus cable (such as RS485) and signal cable must be shielded.

5.9.2 Wiring Requirement

In order to avoid interference intercoupling, it is recommended to separate the motor cables and the control cables from power supply cables, and keep enough distance among the cables. Especially when the cables are laid in parallel and the cable length is long, the signal cables should cross the power supply cables perpendicularly as shown in Figure 5-3.

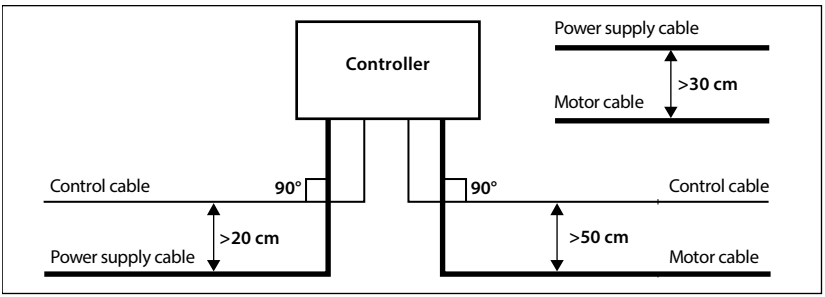


Figure 5-3 System wiring requirement

Shielded/armoured cable: High frequency low impedance shielded cable should be used. For example: copper net, aluminum net or iron net.

Normally, the control cables must use the shielded cables and the shielding metal net must be connected to MONT71 metal enclosure of the drive by cable clamps as shown in Figure 5-4.

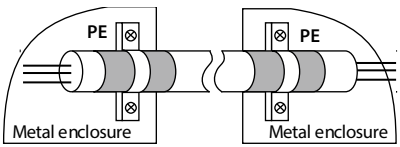


Figure 5-4 Correct connection of the shielded cable

5.9.3 Wiring Motor

Longer the cable between MONT71 and motor is, higher the high-frequency leakage current is, causing MONT71 output current to increase as well. This may affect peripheral devices.

When the cable between motor and MONT71 is longer than 100 meters, it is recommended to install output reactor and adjust the carrier frequency as per the instruction in Table 5-8.

Table 5-8 Carrier frequency and wiring distance between MONT71 and motor

MONT71 and Motor	< 30m	30 - 50m	50 - 100m	≥ 100m
Carrier Frequency	15kHz below	10kHz below	5kHz below	2kHz below

MONT71 should be derated if the motor cables are too long or their cross sectional area (CSA) is too large. MONT71 cables should be the cables with specified CSA (see Table 5-2) because the capacitance of the cable to ground is in proportional to the cable's CSA. If the cable with big CSA is used, its current should be reduced. The current should be decreased by 5% when per level of CSA is increased.

5.9.4 Ground Connection

The grounding terminals PE must be connected to ground properly. The grounding cable should be as short as possible (the grounding point should be as close to the controller as possible) and the grounding area should be as large as possible. The grounding resistance should be less than 10Ω.

Do not share the grounding wire with other devices (A). HD30 can share grounding pole with other devices (C). It achieves the best effect if HD30 and other devices use dedicated grounding poles (B), as shown in Figure 5-5.

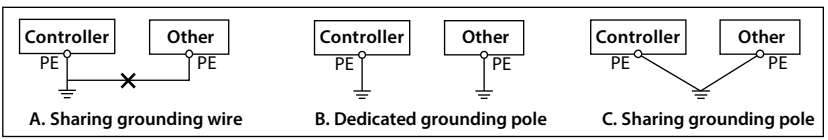


Figure 5-5 Recommended ground method

When using more than two MONT71, be careful not to loop the ground wire as shown in Figure 5-6.

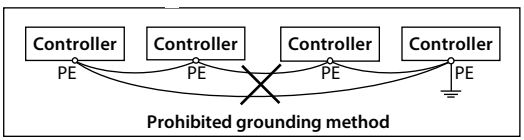


Figure 5-6 Prohibited ground method

5.9.5 EMI Filter

The EMI filter should be used in the equipment that may generate strong EMI or the equipment that is sensitive to the external EMI. The EMI filter should be a dual-way low pass filter through which lower frequency current can flow while higher frequency current can hardly flow.

Function of EMI filter

1. The EMI filter ensures that the equipment not only can satisfy the conducting emission and conducting sensitivity in EMC standard but also can suppress the radiation of the equipment.

2. It can prevent the EMI generated by equipment from entering the power cable and the EMI generated by power cable from entering equipment.

Common mistakes in using EMI filter

1. Too long the power cable is between the EMI filter and MONT71

The filter inside the cabinet should be located near to the input power source. The length of filter power cables should be as short as possible.

2. Too close the input and output cables of the EMI filter

The distance between input and output cables of the filter should be as far apart as possible. Otherwise the high-frequency noise may be coupled between the cables and bypass the filter. Thus, the filter will become ineffective.

3. EMI filter bad earthing

The EMI filter's enclosure must be earthed properly to the metal case. In order to achieve better earthing effect, make use of a special earthing terminal on the filter's enclosure. If you use one cable to connect the filter to the case, the earthing is useless for high frequency interference. When the frequency is high, so is the impedance of cable, hence there is little bypass effect.

The correct installation: The EMI filter should be mounted on the enclosure of equipment. Ensure to clear away the insulation paint between the filter case and the enclosure for good earthing contact.

5.9.6 Conduction, Radiation and Radio Frequency Interference Countermeasures

MONT71 radiation emission

MONT71 operating theory means that some radiation and emission is unavoidable. MONT71 is usually installed in a metal cabinet which normally little affects the instruments outside the metal cabinet. The cables are the main radiation emission source. If connect the cables according to this manual, the radiation and emission can be suppressed effectively.

If MONT71 and other control equipment are installed in one cabinet, the area rule must be observed. Pay attention to the isolation between different areas, cable layout and shielding.

Reducing conducted interference

Please add a noise filter to suppress conducted interference on the output side. Additionally, conducted interference can be efficiently reduced by threading all the output cables through a grounded metal tube. And conducted interference can be dramatically decreased when the distance between the output cables and the signal cables is above 0.3m.

RF interference clearing

The I/O cables and MONT71 itself will produce radio frequency interference. A noise filter can be installed both on the input side and output side, and shield them with iron utensil to reduce RF interference. The wiring distance between MONT71 and motor should be as short as possible shown in Figure 5-7.

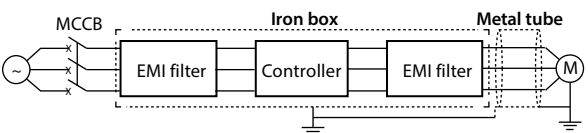


Figure 5-7 RF interference clearing

5.9.7 Input and Output Reactor

AC input reactor

The purpose of installing an AC input reactor is: to increase the input power factor; to dramatically reduce the harmonics on the input side at the high voltage point of common coupling and prevent input current unbalance which can be caused by the phase-to-phase unbalance of the power supply. An AC line reactor which will help to protect the input rectifiers also reduces external line voltage spikes (for example the lightning!).

DC reactor

The installation of a DC reactor can increase the input power factor, improve MONT71 overall efficiency and thermal stability, substantially eliminate the upper harmonics influence on MONT71 performance, and considerably decrease the conducted and radiated electromagnetic emissions from MONT71.

AC output reactor

Generally speaking, when the length of the cable between MONT71 and motor is more than 100m, it will cause leakage current and MONT71 tripping. It suggests that the user should consider installing an AC output reactor.

Chapter 6

Keypad Introduction

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MONT71 series have optional LCD keypad (MT70-LCD-A), see Table 6-1.

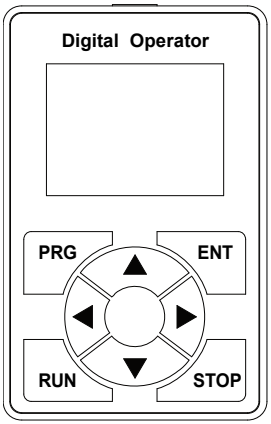

Table 6-1 Keypad's key description

Key	Function
PRG	Entry or exit programming key
ENT	Enter lower menu or confirm to save the data
RUN	At keypad control (F00.07 = 0), to start MONT71; At distance control (F00.07 = 1), equivalent to the open door (OD) button
STOP	At keypad control (F00.07 = 0), to stop MONT71; At distance control (F00.07 = 1), equivalent to the close door (CD) button; At detecting fault and fault floor, to be as fault reset key
▲	Increment of data or function parameter number
▼	Decrement of data or function parameter number
◀	Select the data modification bit or switch the display status parameters
▶	Select the data modification bit

6.1 Keypad Display Interface

Power-up Display Interface

At power–up, the keypad display interface is shown as Figure 6-1, and the second display interface is MONT71 actual configuration parameters.

After the keypad displays "power-up display interface", if MONT71 does not have the user password, it will display "state display interface"; if have user password, display "input password display interface".

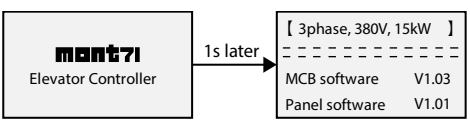

Figure 6-1 Keypad power-up display interface

Input Password Display Interface

If MONT71 has been set parameter password to protect, only inputting the correct password you can operate the keypad.

When MONT71 is power-up or there is no press on the keypad for 5 minutes, the keypad will display "input password display interface", shown as Figure 6-2.

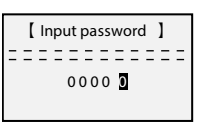

Figure 6-2 Input password display interface

If you want to clear, modify or set the user password, you can refer to section 6.3.2.

Note:

If MONT71 does not have password protection, it will not display "input password interface" at power-up.

Fault Display Interface

When MONT71 fault occurs, the keypad will automatically alternate display "fault display interface", shown as Figure 6-3.

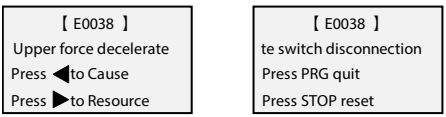

Figure 6-3 Display interface at fault

State Display Interface

The state display interface is shown as Figure 6-4, refer to Table 6-2 for details.

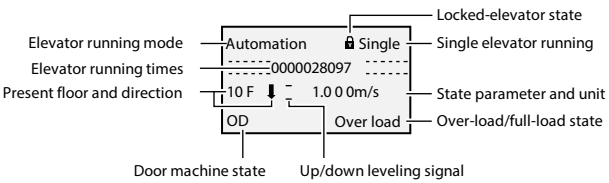

Figure 6-4 State display interface

Table 6-2 Specific content of state display interface

Display content	Specific display
Elevator running mode	Display "auto, inspection, fire back to base station, fireman, driver, auto back to leveling floor, battry-driven, isolated" running mode etc. • If there is fault, alternately display "fault code" and "elevator running mode"
Locked-elevator state	At the locked-elevator state, display the 🔒 mark, otherwise no display
Elevator running times	Display the present elevator running times
Present floor and direction	Display the present elevator floor and running direction. Scrolling the directional arrow shows that the elevator is running, and stilling show that the elevator did not start to run
Up/down leveling signal	When the up leveling signal is valid, it displays ; when the down leveling signal is valid, it displays _ ; When up and down signals are valid, it displays _
State parameter and unit	Include running state parameter (F15.03 - F15.08) and stopping state parameter (F15.09 - F15.14). • Pressing ◀ key or ▶ key can cyclically display different state parameters
Door machine state	Display "opening door, OD arrival, door lock disconnection, closing door, CD arrival, door machine fault, door lock connection and door machine stop" etc. When there are front door and back door, the display will include "front door" or "back door", such as "front door is opening". There is no difference between the door lock connection of front door and back door
Over-load/full-load state	If elevator is over-load, display "over load"; if full-load, display "full load"

6.2 Four-level Menu Description

The four level menus are: **mode setting (first-level)→function group setting (second-level)→ function parameter setting (third-level)→setting parameter(fourth-level).**

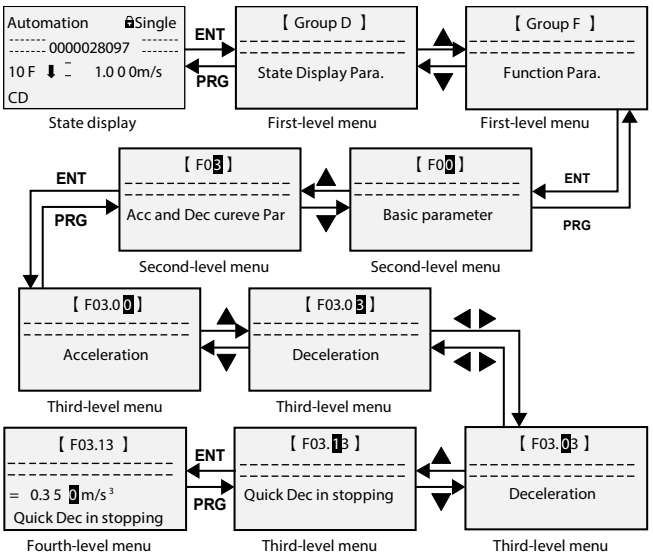

Figure 6-5 Four-level menu operation flowchart

Table 6-3 Key description on each level menu

Key	First-level menu	Second-level menu	Third-level menu	Fourth-level menu
PRG	Return to state display	Return to mode setting level	Return to function group setting level	No save present value and return to function parameter setting level
ENT	Enter to function group setting level	Enter to function para. setting level	Enter to setting parameter level	Save present value and return to function para. setting level
▲	Select function group. Cycle according to D-F-Y	Modify function group. Increase 1 when press the key once	Modify function parameter. Increase 1 based on present modifiable bit	Modify parameter value. Increase 1 based on present modifiable bit
▼	Select function group. Cycle according to Y-F-D	Modify function group. Decrease by 1 when press the key once	Modify function para. Decrease 1 based on present modifiable bit	Modify parameter value. Decrease 1 based on present modified bit
◀	Invalid	Invalid	Switch units and tens	Cyclically switch parameter modifiable bit, long press can quickly switch
▶	Invalid	Invalid	Switch tens and units	Cyclically switch parameter modifiable bit, long press can quickly switch

6.3 Examples of Keypad Use

6.3.1 Set Function Parameter

Modify the setting value of function parameter F00.09 from 1.500m/s to 1.000m/s for example, shown as Figure 6-6.

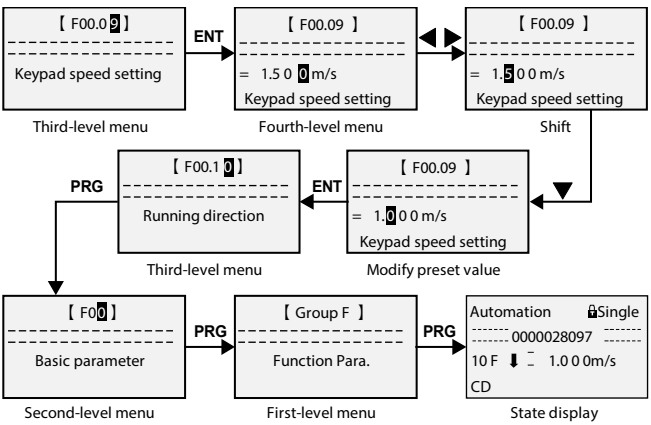

Figure 6-6 Function parameter setting flowchart

In the setting level, if the parameter is not in anti-color displaying, it indicates that this parameter can't be modified. The possible reasons are as follows:

- The function parameter can't be modified, such as the actual detected parameters or recorded parameters etc.
- It can not modify the function parameter in the running state. Only when MONT71 stops can it modify the function parameter.
- **Group F00, Group F01, Group F07, Group F10 and Group F11 (except F11.03) only can be modified at the keypad control mode (F00.07= 0) or the inspection mode.**

Quick operation of multi-bit setting parameter

Take F21.03 (service floor) for example, shown as Figure 6-7.

- On the setting parameter floor, directly pressing ◀ key and ▶ key can achieve quick shift of the 16-bit digital.
- After select the preset bit, change the bit via ▲ key and ▼ key.

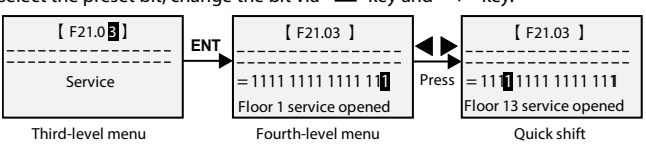

Figure 6-7 Quick operation of 16-bit setting parameter

6.3.2 User Password Operation

Take the user successful set password "00003" (F01.00 = 00003) and no fault for example.

The user password's clear and modify should enter the setting parameter F01.00, and the operating process is shown as Figure 6-8.

- If there is neither user password nor fault, the keypad will directly display "state display interface".
- If there is no user password but fault, the keypad will directly display "fault display interface".
- If there is user password but no fault, after input the correct password, the keypad will directly display "state display interface".
- If there are user password and fault, after input the correct password, the keypad will directly display "fault display interface".
- The "state display interface" refers to section 0; the "fault display interface" refers to section 0.

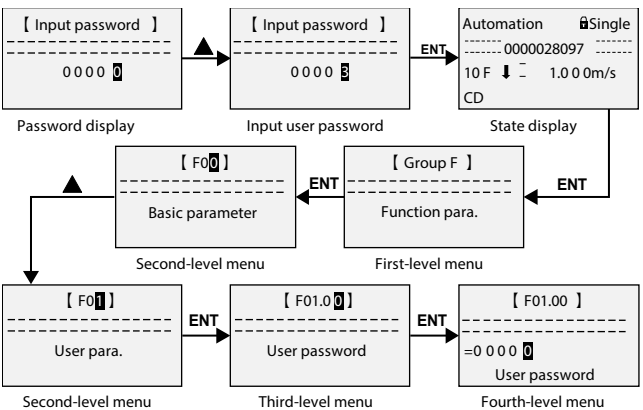

Figure 6-8 Enter to set parameters

User password's clear

After enter the setting parameter F01.00 (always set F01.00 as "00000"), directly press ENT key to clear the password.

User password's modify and set

After entering the setting parameter F01.00 (always set F01.00 as "00000"), directly set password, and then press ENT key to save.

If detected no press on the keypad's key within 5 minutes, the user password is valid; otherwise, restart 5 minute timer.

6.3.3 Parameter Upload and Download

Upload: When the function parameter F01.03 = 1, it uploads the parameters from MCB to the keypad. When the upload is finished, the keypad will jump to display F01.00.

Download: When the function parameter F01.02 = 2, it downloads the parameter from the keypad to MCB. When the download is finished, the keypad will jump to display F01.03.

The upload, download, upload success and down success are shown as Figure 6-9.

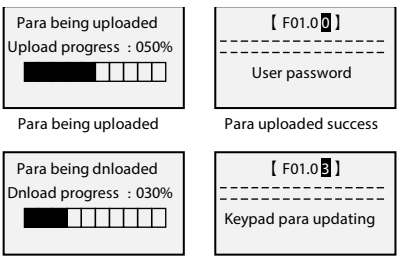

Figure 6-9 Display the parameter upload/download and their success

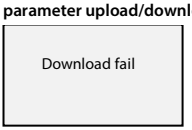

Figure 6-10 Display the parameter download failure

Note:

1. Only at the inspection mode or keypad control can upload and download parameters.

2. At downloading the parameters, display the "parameter download failure", shown as Figure 6-10, representing that keypad storage parameters and the parameters of the present MCB are inconsistent, or software versions are inconsistent.

***Take measure:** You need upload the setting value of the correct function parameter to the keypad and ensure that the software versions are consistent, and then you can download.*

3. When upload or download parameters, the keypad displays "E0022", indicating that keypad's EEPROM read/write abnormality. It will jump to next function parameter 10 seconds later.

***Take measure:** The troubleshooting is in section 9.1 (page 163).*

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Chapter 7

Function Introduction

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This chapter will provide detail function introduction.

7.1 D: State Display Parameters

Group D is state display parameters. The users can directly check the state parameters by checking the function code of Group D.

7.1.1 D00: Configurations of Integrated Hardware and Software

D00.00	Controller series	[Actual value]

Display the MONT71 elevator integrated controller.

D00.01	Controller rated power	[Actual value]

Display the MONT71 rated power.

D00.02	Controller rated current	[Actual value]

Display the MONT71 rated current.

Note:

1. *After the user replaces the main control board (MCB), the factory Y00.01 (model parameter) is needed to be reset, and D00.01 and D00.02 automatically refresh.*
2. *D00.01 and D00.02 must be the same as MONT71 actual power and current, otherwise the MONT71 will run abnormal.*

D00.03	Hardware version of MCB	[Actual value]

Display the hardware version of MCB (MT71-MCB-A).

D00.04	Software version of MCB	[Actual value]

Display the software version of MCB (MT71-MCB-A).

D00.05	Software version of keypad	[Actual value]

Display the software version of keypad (MT70-LCD-A).

D00.06	Special software version of MCB	[Actual value]

Display the special software version of MCB (MT71-MCB-A).

7.1.2 D01: Display Parameters in Drive State

D01.00	S-curve preset speed	[Actual value]

Display the S-curve preset speed.

Display the maximum speed of the elevator at shutdown; display real-time preset speed at runtime.

D01.01	Elevator actual speed	[Actual value]

Display the elevator actual speed.

D01.02	Running RPM	[Actual value]

Display the running RPM.

D01.03	Output voltage	[Actual value]

Display the output voltage.

D01.04	Output current	[Actual value]

Display the output current.

D01.05	Output frequency	[Actual value]

Display the output frequency.

D01.06	DC bus voltage	[Actual value]

Display the DC bus voltage.

7.1.3 D02: Display Parameters of Main Control Board

D02.00	MCB analogue input voltage	[Actual value]

Display the MCB (MT71-MCB-A) analogue input (AI) voltage.

D02.01	MCB X-terminal input state 1	[Actual value]

Display the MCB digital input terminals (X1 - X16) of state by a 16-bit binary, as following table:

Bit15: X16 terminal	Bit14: X15 terminal	Bit13: X14 terminal	Bit12: X13 terminal
Bit11: X12 terminal	Bit10: X11 terminal	Bit9: X10 terminal	Bit8: X9 terminal
Bit7: X8 terminal	Bit6: X7 terminal	Bit5: X6 terminal	Bit4: X5 terminal
Bit3: X4 terminal	Bit2: X3 terminal	Bit1: X2 terminal	Bit0: X1 terminal
• 0: Invalid		• 1: Valid	

D02.02	MCB X-terminal input state 2	[Actual value]

Display the MCB digital input terminals (X17 - X27) of state by a 16-bit binary, as following table:

Bit15 - Bit11: Reserved	Bit10: X27 terminal	Bit9: X26 terminal	Bit8: X25 terminal
Bit7: X24 terminal	Bit6: X23 terminal	Bit5: X22 terminal	Bit4: X21 terminal
Bit3: X20 terminal	Bit2: X19 terminal	Bit1: X18 terminal	Bit0: X17 terminal
• 0: Invalid		• 1: Valid	

D02.03	MCB L-terminal input state 1	[Actual value]

Display the MCB floor input terminals (L1 - L6) of state by a 16-bit binary, as following table:

Bit15: L16 terminal	Bit14: L15 terminal	Bit13: L14 terminal	Bit12: L13 terminal
Bit11: L12 terminal	Bit10: L11 terminal	Bit9: L10 terminal	Bit8: L9 terminal
Bit7: L8 terminal	Bit6: L7 terminal	Bit5: L6 terminal	Bit4: L5 terminal
Bit3: L4 terminal	Bit2: L3 terminal	Bit1: L2 termina	Bit0: L1 terminal
• 0: Invalid		• 1: Valid	

D02.04	MCB L-terminal input state 2	[Actual value]

Display the MCB floor input terminals (L17 - L24) of state by a 16-bit binary, as following table:

Bit15 - Bit12: Reserved	Bit11 - Bit10: Reserved	Bit9: Reserved	Bit8: Reserved
Bit7: L24 terminal	Bit6: L23 terminal	Bit5: L22 terminal	Bit4: L21 terminal
Bit3: L20 terminal	Bit2: L19 terminal	Bit1: L18 terminal	Bit0: L17 terminal
• 0: Invalid		• 1: Valid	

D02.05	MCB X-terminal input logic state 1	[Actual value]

Display the MCB digital input terminals (X1 - X24) of logic state by a 16-bit binary, as following table:

Bit15: Down limit	Bit14: Up limit	Bit13: Locked-elevator	Bit12: Reserved
Bit11: Firefighting signal	Bit10: Down inspection	Bit9: Up inspection	Bit8: Inspection input
Bit7: Locked-door output feedback	Bit6: Synchronous motor self-locked feedback	Bit5: Brake limit switch feedback	Bit4: Brake output feedback
Bit3: Run output feedback	Bit2: Door zone signal	Bit1: Down leveling signal	Bit0: Up leveling signal
• 0: Invalid		• 1: Valid	

D02.06	MCB X-terminal input logic state 2	[Actual value]

Display the MCB digital input terminals (X1 - X24) of logic state by a 16-bit binary, as following table:

Bit15: Front/back door switch	Bit14: Isolated signal	Bit13: Commutation signal	Bit12: Direct arrival signal
Bit11: Driver signal	Bit10: Back door light curtain	Bit9: Front door light curtain	Bit8: Back door CD arrival
Bit7: Front door CD arrival	Bit6: Back door OD arrival	Bit5: Front door OD arrival	Bit4: Safe circuit 1
Bit3: Full load signal	Bit2: Over-loaded signal	Bit1: Down forced Dec.	Bit0: Up forced Dec.
• 0: No signal		• 1: Have the signal	

D02.07	MCB X-terminal input logic state 3	[Actual value]

Display the MCB digital input terminals (X1 - X24) of logic state by a 16-bit binary, as following table:

Bit15: Reserved	Bit14: Alarm input signal	Bit13: Back door prohibits the input signal	Bit12: Brake forcely feedback input
Bit11: Edge input signal of back door	Bit10: Edge input signal of front door	Bit9: Earthquake monitoring input signal	Bit8: Motor over-heated input signal
Bit7: Fireman signal	Bit6: Half-load signal	Bit5: Locked-door circuit 2	Bit4: Locked-door circuit 1
Bit3: Safe circuit 2	Bit2: Close door button input	Bit1: Open door button input	Bit0: Battery-driven running signal
• 0: No signal		• 1: Have the signal	

D02.08	MCB X-terminal input logic state 4	[Actual value]

Display the MCB high voltage input terminals (X25 - X27) of logic state by a 16-bit binary, as following table:

Bit15 - Bit3: Reserved	Bit2: High-voltage locked-door signal 2 0: Disconnected 1: Connected	Bit1: High-voltage locked-door signal 1 0: Disconnected 1: Connected	Bit0: High-voltage safe signal 0: Disconnected 1: Connected

D02.09	L-terminal for front/back door OD/CD signal	[Actual value]

Display the elevator open/close door (OD/CD) signal state by a 16-bit binary, as following table:

Bit15 - Bit8: Reserved			
Bit7: Back door prohibition 0: No prohibited signal 1: Have the signal	Bit6: Front/back door switch signal 0: No signal 1: Have the signal	Bit5: Back door OD delay button 0: No delay button 1: Have the button	Bit4: Back door CD button 0: Invalid 1: Valid
Bit3: Back door OD button 0: Invalid 1: Valid	Bit2: Front door OD delay button 0: No delay button 1: Have the button	Bit1: Front door CD button 0: Invalid 1: Valid	Bit0: Front door OD button 0: Invalid 1: Valid

D02.10	L-terminal for front door internal call state	[Actual value]

Display the 1st - 10th floors of front door internal call state by a 16-bit binary, as following table:

Bit15 - Bit12: Reserved	Bit11 - Bit10: Reserved	Bit9: 10th floor of front door internal call	Bit8: 9th floor of front door internal call
Bit7: 8th floor of front door internal call	Bit6: 7th floor of front door internal call	Bit5: 6th floor of front door internal call	Bit4: 5th floor of front door internal call
Bit3: 4th floor of front door internal call	Bit2: 3rd floor of front door internal call	Bit1: 2nd floor of front door internal call	Bit0: 1st floor of front door internal call
• 0: No		• 1: Yes	

D02.11	L-terminal for front door up call state	[Actual value]

Display the 1st - 10th floors of front door up call state by a 16-bit binary, as following table:

Bit15 - Bit12: Reserved	Bit11 - Bit10: Reserved	Bit9: Reserved	Bit8: 9th floor of front door up call
Bit7: 8th floor of front door up call	Bit6: 7th floor of front door up call	Bit5: 6th floor of front door up call	Bit4: 5th floor of front door up call
Bit3: 4th floor of front door up call	Bit2: 3rd floor of front door up call	Bit1: 2nd floor of front door up call	Bit0: 1st floor of front door up call
• 0: No		• 1: Yes	

D02.12	L-terminal for front door down call state	[Actual value]

Display the 1st - 10th floors of front door down call state by a 16-bit binary, as following table:

Bit15 - Bit12: Reserved	Bit11 - Bit10: Reserved	Bit9: 10th floor of front door down call	Bit8: 9th floor of front door down call
Bit7: 8th floor of front door down call	Bit6: 7th floor of front door down call	Bit5: 6th floor of front door down call	Bit4: 5th floor of front door down call
Bit3: 4th floor of front door down call	Bit2: 3rd floor of front door down call	Bit1: 2nd floor of front door down call	Bit0: Reserved
• 0: No		• 1: Yes	

D02.13	L-terminal for back door internal call state	[Actual value]
D02.14	L-terminal for back door up call state	[Actual value]
D02.15	L-terminal for back door down call state	[Actual value]

D02.13 displays the 1st - 10th floors of back door internal call state, D02.14 displays the 1st - 10th floors of back door up call state, and D02.15 displays the 1st - 10th floors of back door down call state, which are the same with front door setting referring to D02.10 - D02.12.

D02.16	MCB Y-terminal output logic state 1	[Actual value]

Display the MCB of relay output logic state by a 16-bit binary, as following table:

Bit15: Low 7-segment display output g	Bit14: Low 7-segment display output f	Bit13: Low 7-segment display output e	Bit12: Low 7-segment display output d
Bit11: Low 7-segment display output c	Bit10: Low 7-segment display output b	Bit9: Low 7-segment display output a	Bit8: Back door CD output
Bit7: Back door OD output	Bit6: Front door CD output	Bit5: Front door OD output	Bit4: Fan and light output
Bit3: Brake frocely output	Bit2: Synchronous star - delta contactor output	Bit1: Brake contactor output	Bit0: Run contactor output
• 0: No		• 1: Yes	

D02.17	MCB Y-terminal output logic state 2	[Actual value]

Display the MCB of relay output logic state by a 16-bit binary, as following table:

Bit15: Battery-driven output at power off	Bit14: Reserved	Bit13: Reserved	Bit12: Integrated run correctly output
Bit11: High bit output of BCD, Gray code, and seven-segment	Bit10: Locked-door contactor output	Bit9: Fan and light output 2	Bit8: Inspection signal output
Bit7: Full load output	Bit6: Arrival chime output	Bit5: Over-loaded output	Bit4: Buzzer output
Bit3: Firefighting back to station output	Bit2: Minus display output	Bit1: Down arrow display output	Bit0: Up arrow display output
• 0: No		• 1: Yes	

7.1.4 D03: Display Parameters of Floors for Service and Registration

D03.00	Present floor	[Actual value]

Display the present floor which is relative to the bottom floor of the elevator.

D03.01	Present height	[Actual value]

Display the present height which is relative to the bottom leveling floor of the elevator.

D03.02	Distance of lowest floor	[Actual value]
D03.03	Distance of highest floor	[Actual value]

D03.02 and D03.03 respectively display the lowest and the highest of all floors.

D03.04	Registration state of front door 10 – 1 internal call floor	[Actual value]
D03.05	Registration state of back door 10 – 1 internal call floor	[Actual value]
D03.06	Registration state of front door 9 - 1 hall call up run	[Actual value]
D03.07	Registration state of back door 9 - 1 hall call up run	[Actual value]
D03.08	Registration state of front door 10 - 2 hall call down run	[Actual value]
D03.09	Registration state of back door 10 - 2 hall call down run	[Actual value]

D03.04 - D03.09 are displayed by a 16-bit binary, and each bit binary represents one floor and the low bit represents low floor.

D03.04, D03.05 display whether there is the internal call registration of front/back door of 10 - 1 floors.

D03.06 - D03.07 display whether there is the hall call up run registration of front/back door 9 - 1.

D03.08 - D03.09 display whether there is the hall call down registration of front/back door 10 - 2.

- 1: This address of the floor has registration.
- 0: This address of the floor does not have registration.

7.1.5 D04: Display Parameters of Elevator Running State

D04.00	Elevator system state	[Actual value]

Display the elevator system state by a 16-bit binary, as following table:

Bit15: System back door edge 0: System back door edge is invalid 1: System back door edge is valid	Bit14: System front door edge 0: System front door edge is invalid 1: System front door edge is valid	Bit13: System over load 0: System over load signal is invalid 1: System over load signal is valid	Bit12: System full load 0: System full load signal is invalid 1: System full load signal is valid
Bit11 - Bit8: Reserved	Bit7 - Bit4: Elevator state 0000: Automation 0001: Inspection 0010: Battery-driven run 0011: Shaft self-learning	0100: Firefighting back to base station 0101: Fireman mode 0110: Driver mode	0111: Isolated run 1000: Auto back to leveling
Bit3: Hall call firefighting 0: Hall call firefighting is invalid 1: Hall call firefighting is valid	Bit2: Hall call locked-elevator 0: Hall call locked-elevator is invalid 1: Hall call locked-elevator is valid	Bit1: System back door light curtain 0: System back door light curtain is invalid 1: System back door light curtain is valid	Bit0: System front door light curtain 0: System front door light curtain is invalid 1: System front door light curtain is valid

D04.01	Door machine state	[Actual value]

Display the door machine state by a 16-bit binary, as following table:

Bit15 - Bit6: Reserved			
Bit5 - Bit3: Back door machine state		Bit2 - Bit0: Front door machine state	
000: Opening	011: Close door arrival	000: Opening	011: Close door arrival
001: Open door arrival	100: Door machine fault	001: Open door arrival	100: Door machine fault
010: Closing	101: Door machine stop	010: Closing	101: Door machine stop

D04.02	High bit of elevator run times	[Actual value]
D04.03	Low bit of elevator run times	[Actual value]

Display the high bit and the low bit of elevator run times.

Run times = D04.02 × 65536 + D04.03.

D04.04	Total running time (hour)	[Actual value]

Display the elevator total running time and its unit is hour.

D04.05	Heatsink temperature	[Actual value]

Display the heatsink temperature and its unit is ℃.

D04.06	Present fault code	[Actual value]

Display the present fault code.

7.1.6 D05: Display Parameters of Elevator Hardware

D05.00	C phase AD sample value of Sincos encoder	[Actual value]

Display the C phase AD sample value of Sincos encoder.

D05.01	D phase AD sample value of Sincos encoder	[Actual value]

Display the D phase AD sample value of Sincos encoder.

D05.02	A phase AD sample value of Sincos encoder	[Actual value]

Display the A phase AD sample value of Sincos encoder.

D05.03	B phase AD sample value of Sincos encoder	[Actual value]

Display the B phase AD sample value of Sincos encoder.

D05.04	UVW state of UVW encoder	[Actual value]

Display the UVW state of UVW encoder.

D05.05	Electrical angle	[Actual value]

Display the electrical angle.

D05.06	Leveling switch number	[Actual value]

Display the leveling switch number.

D05.07	Length between leveling switches	[Actual value]

Display the length between leveling switches. And the unit is mm.

D05.08	Leveling plate length	[Actual value]

Display the leveling plate length. And the unit is mm.

D05.09	Encoder pulse count	[Actual value]

Display the encoder pulse count.

When the motor is rotating, the encoder pulse input can be judged by the change of this parameter.

D05.10	Manufacturer debugging parameter, prohibit to change	

D05.11	Buzzer source	[Actual value]

Display the buzzer action source.

0: No action.

1: To remind at excessive position deviation returning to base station.

2: To remind there is hall call information at driver mode.

3: To remind at elevator over-loaded.

4: To remind at battery-driven.

5: To remind at forced close door.

6: To remind at firefighting back to base station.

7: To earthquake signal input.

8: To remind there is alarm input.

D05.12 - D05.49	Manufacturer debugging parameter, prohibit to change	

7.1.7 D06: Hall Call State Parameters of Modbus Extension

D06.00	Software version of hall call board (HCB)	[Actual value]

Display the software version of hall call board.

D06.01	HCB communication interference evaluation	[Actual value]

Indicate the hall call board (HCB) communication quality. The larger the value is, the greater the communication interference is.

D06.02	Hall call node communication state 1	[Actual value]

Display the communication state of hall call node 10 - 1.

D06.03	Hall call node communication state 2	[Actual value]

Display the communication state of hall call node 34 - 25.

Through-open back door address = Front door address + 24.

7.2 F: Function Parameters

7.2.1 F00: Basic Parameters

F00.00	Motor type	0,1 [0]

0: Asynchronous motor.

1: Synchronous motor.

Note:

1. If the motor type is selected as asynchronous motor, the motor parameters are corresponding to Group F07.

2. If the motor type is selected as synchronous motor, the motor parameters are corresponding to Group F10.

F00.01	Control mode	0 - 2 [2]

0: Constant voltage/frequency (VF) control. The constant control voltage/frequency ratio is only applicable for the asynchronous motor.

1: Open-loop vector (SVC) control. The vector control without speed sensor is only applicable for the asynchronous motor.

2: Encoder closed-loop (VC) control. The vector control with speed sensor is applicable for normal distance control.

Note:

1. V/f control and SVC control are applicable for the asynchronous motor without installing encoder which is a kind of temporary run mode when the elevator is in inspection run.

2. The synchronous motor can only use the VC control, and must do the parameter auto-tuning before inspection running! Otherwise it may be out of control!

F00.02	Elevator max running speed	0.150 - F00.03 [0.500m/s]

Define the elevator max running speed.

- The upper limit of the setting range is F00.03 (elevator rated speed).
- Speed-related parameters of group F04 and group F19 should be smaller than F00.02.

F00.03	Elevator rated speed	0.150 - 1.500 [0.500m/s]

Define the elevator nominal rated speed.

- This speed is decided by the elevator mechanical structure and traction machine rated speed.

F00.04	Elevator rated load	100 - 50000 [1000kg]

Define the elevator nominal rated load.

- The anti-nuisance function will use the function of F00.04.

F00.05	Controller max output frequency	5.00 - 100.00 [50.00Hz]

Define the controller allowable output max frequency.

Note: F00.05 must not be less than the motor rated frequency and is normally set as rated frequency of the motor.

F00.06	Traction machine mechanical parameter	10.0 - 6000.0 [20.0]

The formula for calculating motor mechanical parameters is as below:

$$F00.06 = \frac{\pi \times D}{i \times \text{Winding mode}}$$

- D: Diameter of motor (mm); i: Dec. rate; Winding mode: To set in accordance with the actual elevator setting.

Note:

F00.06 is calculated based-on the traction machine parameters. It decides the control precision and must be correctly set; otherwise it can not run normally at the distance control.

The specific performances are as follows:

1. The keypad displaying speed and the elevator actual speed are inconsistent.

2. The data from shaft self-learning and the actual floor data are different.

F00.07	Operation mode	0,1 [1]

0: Keypad control.

- Via RUN and STOP keys of the keypad to control; the running speed is set by F00.09.
- Only use for testing or motor parameter auto-tuning.

1: Distance control.

- At inspection running, the elevator runs in accordance with F04.00 (inspection run speed).
- At normally running, automatically calculating the speed and run curve in accordance with the elevator present floor and the distance of destination floor achieves direct stop.

Note: At elevator normally running, F00.07 must be set as 1.

F00.08	Manufacturer debugging parameter, prohibit to change	
F00.09	Speed setting via keypad	0.000 - F00.02 [0.500m/s]

When F00.07 = 0, set the target speed at running.

F00.10	Elevator run direction	0,1 [0]

0: The elevator run direction is the same as run command.

1: The elevator run direction is opposite to run command.

Note:

1. When debugging the elevator, if the preset direction and the elevator actual run direction are inconsistent, you can set the inverse F00.10.

2. When normally run, F00.10 can not be changed. If the original system has floor data, when modify F00.10, the shaft self-learning is needed to restart.

7.2.2 F01: User Parameters

F01.00	User password	00000 - 65535 [00000]

XXXXX: Set the user password (any non-zero digital).

- Once the password is set, after press ENT key, and then detect that there is no press on the keypad within five minutes, the user password will be valid; If detect a press on the keypad key within five minutes, a 5-minute timer will be restarted.
- If the password is valid, it is necessary to input correct password if you want to check and change the parameters.

00000: MONT71 factory setting.

- If the user wants to clear the password, please refer to section 6.3.2 User Password Operation.

Note: After the user password is set, you should keep the password in mind.

F01.01	Menu mode selection	0 - 2 [0]

0: Standard menu mode.

- All of the function parameter can be displayed.

1: Checking menu mode.

- Only different from factory setting parameters can be displayed.

2: Reserved.

F01.02	MCB parameter update	0 - 12 [0]

0: No operation.

1: Restore to factory settings.

- Except Group F01, F07.00 - F07.14, F10.00 - F10.09, Group F11, F15.00, F17.08 - F17.21 and Group Y.
- **Operation steps:** Set F01.02 = 1, press ENT key to confirm and restore the factory settings, the keypad will display the "loading default parameter". Then the keypad will jump to "status display interface" after finish restoring to factory setting.

2: Download keypad parameter group 1 to MCB.

- Except Group F01, F17.08 - F17.21 and Group Y.
- At downloading parameters, such as motor parameters, encoder parameters and magnetic pole angle etc. will be downloaded. The original motor parameters, encoder parameters and magnetic pole angle etc. need to be recorded, or restart parameter auto-tuning.

3: Clear fault information.

- The faulty history information of 17.08 - F17.21 will be cleared.
- **Operating steps:** Set F01.02 = 3, press ENT key to confirm and clear fault information, the keypad will display "clearing fault information". Then the keypad will display next parameter F01.03 after finish clearing the fault information.

4: Download the keypad parameter group 2 to MCB.

5: Download the keypad parameter group 3 to MCB.

6: Download the keypad parameter group 4 to MCB.

7: Download the keypad parameter group 5 to MCB.

8: Download the keypad parameter group 6 to MCB.

9: Download the keypad parameter group 7 to MCB.

10: Download the keypad parameter group 8 to MCB.

11: Download the keypad parameter group 9 to MCB.

12: Download the keypad parameter group 10 to MCB.

Note: The F01.02 setting of No. 4 - 12 functions is the same with No. 2 function.

F01.03	Keypad parameter update	0 - 10 [0]

0: No operation. MONT71 is in the normal parameters of read and write state.

1: Upload MCB parameters to keypad parameter group 1. Except Group F01, F17.08 - F17.21 and Group Y.

2: Upload MCB parameters to keypad parameter group 2.

3: Upload MCB parameters to keypad parameter group 3.

4: Upload MCB parameters to keypad parameter group 4.

5: Upload MCB parameters to keypad parameter group 5.

6: Upload MCB parameters to keypad parameter group 6.

7: Upload MCB parameters to keypad parameter group 7.

8: Upload MCB parameters to keypad parameter group 8.

9: Upload MCB parameters to keypad parameter group 9.

10: Upload MCB parameters to keypad parameter group 10.

Parameter upload (F01.03 = 1) and download (F01.02 = 2)

You can simplify the parameter setting via parameter upload and download to improve debugging efficiency. Parameter upload and download are generally applied on the following occasions:

1. After on-site debugging one elevator, this elevator parameter is needed to copy to another elevator.

2. If the on-site debugging MCB need to be replaced by a new one, the new MCB parameters need to re-set.

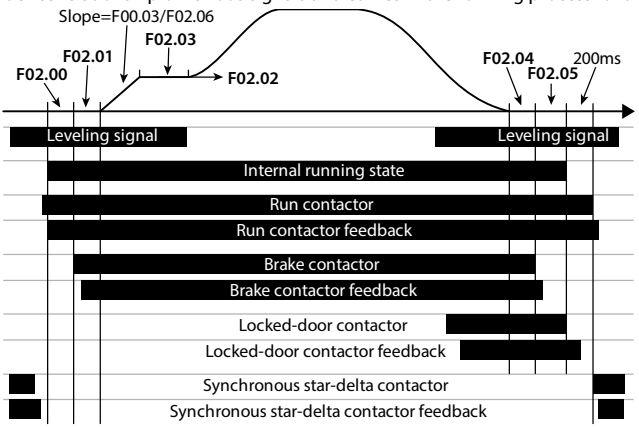
Both of these cases can set F01.03 as 1 (upload parameter to keypad), then in the other MCB set F01.02 as 2 (download parameter to MCB).

Notes of upload and download:

1. *For the replaced MCB, after parameters upload and download, if equipped with Sincos encoder interface card, the parameter auto-tuning should be restarted due to the MCB hardware parameter differences.*
2. *For different elevator parameters download, you need to restart shaft self-learning; otherwise the floor data may be inconsistent with the actual, which can affect the normal operation of the elevator.*
3. *Replace the MCB for different motor, you need to re-start parameter auto-tuning, or it may be out of control.*
4. *Parameter upload and download can be done only at the inspection mode or keypad control mode.*

7.2.3 F02: Start and Stop Parameters

The correspondence relationship of various signals and curves in the running process follows FIG.



F02.00	**Retention time of start zero-speed**	**0.000 - 2.000 [0.200s]**

Define the time of zero-speed output before brake-open. During this time, a magnetic field can be created, which may improve the starting comfort.

F02.01	**Delay time of curve run**	**0.000 - 2.000 [0.500s]**

Define the delay time of curve from zero-speed to preset speed.

Note: When F05.00 = 3 (pre-torque auto-compensation), F02.01 is set to at least 0.5s.

F02.02	**Start speed**	**0.000 - 0.030 [0.000m/s]**
F02.03	**Retention time of start speed**	**0.000 - 2.000 [0.000s]**

F02.02 defines the MONT71 initial speed at start.

- Setting a suitable start speed can overcome the static friction at elevator starting, but if the setting is too large, it will cause the starting instant impact.

F02.03 defines the retention time of running start speed (F02.02) during MONT71 starting process.

F02.04	**Brake close delay time at stop**	**0.000 - 2.000 [0.200s]**

Define the time of MONT71 from zero-speed to brake close command output.

F02.05	**Zero-speed retention time at stop**	**0.000 - 2.000 [0.300s]**

Define the time of keeping motor zero-speed with output torque at stopping, which may improve the comfort.

Note: If the syn. motor needs to remove the current ramp, F02.05 should be greater than or equal to F16.00.

F02.06	**Start ramp time**	**0.000 - 2.000 [0.000s]**

Define the time that elevator takes to accelerate from zero to the (F00.03) with the use of F02.02.

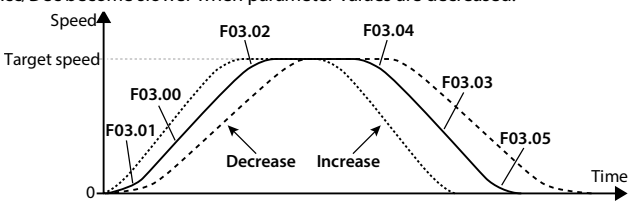
- F02.06 = 0, the ramp is invalid.

7.2.4 F03: Acceleration and Deceleration Curve Parameters

F03.00	Acceleration speed	0.020 - 2.000 [0.250m/s^2]
F03.01	Start Acc jerk	0.020 - 2.000 [0.250m/s^3]
F03.02	End Acc jerk	0.020 - 2.000 [0.250m/s^3]
F03.03	Deceleration speed	0.020 - 2.000 [0.250m/s^2]
F03.04	Start Dec jerk	0.020 - 2.000 [0.250m/s^3]
F03.05	End Dec jerk	0.020 - 2.000 [0.250m/s^3]

The following figure shows the effect of F03.00 - F03.05 at elevator running S-curve.

- Acc/Dec jerk: The change ratio of acceleration/ deceleration.
- The S-curve becomes steeper and Acc/Dec become faster when parameter values are raised; the S-curve and Acc/Dec become slower when parameter values are decreased.



F03.06	Inspection Acc speed	0.020 - 2.000 [0.250m/s^2]
F03.07	Inspection Dec speed	1.000 - 2.000 [1.000m/s^2]

Define the elevator Acc and Dec speed at inspection run mode.

F03.08	Battery driven Acc speed	0.020 - 2.000 [0.250m/s^2]
F03.09	Battery driven Dec speed	0.020 - 2.000 [1.000m/s^2]

Define the elevator Acc and Dec speed at battery driven run mode.

F03.10	Asynchronous motor parameter auto-tuning Acc speed	0.020 - 2.000 [0.100m/s^2]
F03.11	Asynchronous motor parameter auto-tuning Dec speed	0.020 - 2.000 [0.100m/s^2]

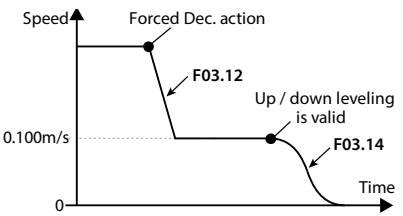
Define the asynchronous motor Acc and Dec speed at rotating auto-tuning.

F03.12	Forced Dec speed	0.500 - 2.000 [0.500m/s²]

Define the deceleration speed when the forced deceleration is effective.

- When the up and down forced deceleration switch is action and the present detected speed is larger than F04.06 - F04.08, the forced deceleration will be valid.
- When the up and down forced deceleration switch is action and the deviation of the present position and the shaft self-learning position are too large, the forced deceleration will be valid.

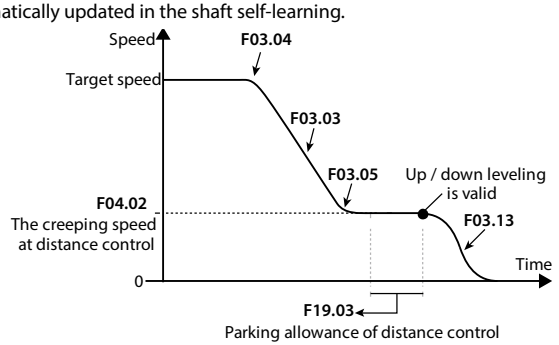
When the forced deceleration switch is action, the elevator decelerates to 0.100m/s in accordance with F03.12 and creeps to the leveling area, slow down at speed of F03.14 and stop, which is shown as following figure.



F03.13	Stop Dec jerk	0.002 - 2.000 [0.230m/s³]

Define the Dec jerk from creeping speed to zero-speed at direct parking mode 1 (F19.06 = 1) to adjust the leveling effect with the creeping speed (F04.02) together, as following figure.

- When modify F04.02, MONT71 will automatically update F03.13.
- Just fine-tuning F03.13 can adjust the leveling accuracy.
- F03.13 is automatically updated in the shaft self-learning.



F03.14	Forced stop Dec jerk	0.002 - 2.000 [0.080m/s³]

This parameter is used to ensure the leveling accuracy at forced deceleration action.

This parameter is automatically updated in the shaft self-learning, and generally not need to change by the user.

7.2.5 F04: Speed Parameters

F04.00	Inspection run speed	0.000 - 0.630 [0.200m/s]

Define the run speed of the elevator at the inspection mode. Elevator GB provides the speed can not be greater than 0.63m/s.

- The elevator inspection runs to up and down effectively forced signal and the running speed is 0.100m/s.
- After the inspection up and down run direction is revoked, the stop mode can be set as immediate stop or Dec stop (set by the Bit2 of F26.12).
- When the inspection run encounters the upper and lower limit, in order to prevent crossing the limit, the stop mode will become immediate stop.

F04.01	Battery driven run speed	0.020 - 0.100 [0.050m/s]

Define the elevator run speed at battery driven mode. (Non-automatic running car)

F04.02	The creeping speed at distance control	0.050 - 0.150 [0.100m/s]

Define the creeping speed of the direct parking mode 1 (set F19.06 as 1).

F04.03	Shaft self-learning speed	0.100 - 0.300 [0.2000m/s]

Define the elevator speed at the shaft self-learning.

F04.04	Re-leveling speed	0.020 - 0.080 [0.040m/s]

Define the elevator running speed in a non-inspection mode, automatically return to the leveling process to reach the leveling area (where a leveling switch has been activated, and the other leveling switch unactuated), and the running speed in open door of the re-leveling.

- In the non-leveling area, the speed is 0.200m/s at automatically returns to leveling.

F04.05	Advanced open speed	0.020 - 0.100 [0.050m/s]

Define that open the door in advance when the elevator running speed is less than F04.05.

Note:

1. When set F26.05 as 1 (with advanced open function), this parameter is valid.

2. The advanced open block (MT70-AOB-A) should be equipped.

F04.06	Forced Dec speed setting	0.0 - 105.0(F00.03) [103.0%]
F04.07, F04.08	Manufacturer debugging parameter, prohibit to change	

The preset value of F04.06 is relative to the percentage of the elevator rated speed.

- F04.06 is corresponding to the speed reference point of up/down forced deceleration switch.
- At up/down forced deceleration switch action, if the car speed is greater than the forced Dec. speed setting (F04.06), it will decelerate to 0.100m/s in accordance with forced deceleration (F03.12).
- There is one forced deceleration switch installing in the shaft, and its position is refered to the figure of parameters F19.12 - F19.13.

F04.09	Over-speed setting	80.0 - 120.0(F00.03) [115.0%]
F04.10	Over-speed detection time	0.1 - 2.0 [0.3s]

When elevator actual speed exceeds the F04.09 setting and lasts longer than the F04.10 setting, it will alarm E0032 fault (motor over speed).

- The setting value of F04.09 is relative to the percentage of elevator rated speed.

F04.11	Detected value of speed deviation	5.0 - 30.0(F00.03) [20.0%]
F04.12	Detected time of speed deviation	0.1 - 2.0 [1.0s]

When the deviation of preset speed and motor actual running speed exceeds the F04.11 setting, and lasts longer than the F04.12 setting, it will alarm E0018 fault (excessive speed deviation).

- The setting value of F04.11 is relative to the percentage of elevator rated speed.

7.2.6 F05: Weighing Compensation Parameters

F05.00	Pre-torque selection	0 - 3 [0]

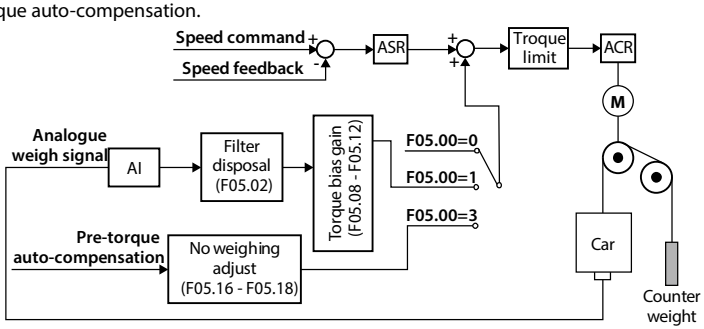
Starting pre-torque function can pre-output torque which is corresponds to the torque of load weight, to avoid the car slipping at starting and reduce start impact.

0: No pre-torque.

1: Analogue weighing. The corresponding compensation torque will be output in accordance with the input analog weighing signal.

2: Reserved.

3: Pre-torque auto-compensation.



F05.01	Analogue weighing selection	0,1 [0]

To set the analogue weighing in accordance with the elevator equipped with weighing device type.

0: No analogue weighing.

1: Analogue weighing.

F05.02	Weighing analogue filter time	0.00 - 2.00 [0.50s]

Define the analogue filter time.

- The greater F05.02 is, the stronger filtering effect is, and the greater the signal lag is.

F05.03	Analogue weighing self-learning	0 - 2 [0]
F05.04	Car no-load	0.00 - 10.00 [0.00V]
F05.05	Car full-load	0.00 - 10.00 [8.00V]
F05.06	Self-learning car load	0 - 100 [0%]

F05.03 defines the analogue weighing self-learning modes.

0: No self-learning.

1: No-load self-learning.

2: Other load self-learning.

- Refer to the torque compensation of section 8.1.9 Comfort Adjustment (page 144) about F05.03 - F05.06.

F05.07	Anti-nuisance function	0 - 3 [0]

0: No anti-nuisance function.

1: In accordance with weighing. This function must work with analogue weighing sensor or digital light-load signal.

- If the car command registered number is over the person number in car plus three, the system will clear up all commands (and each person according to 70 kg).

2: In accordance with light curtain. This function must work with light curtain signal.

- When the elevator runs and arrives to the station for three consecutive times and the OD light curtains are not action, which will be considered as nuisance and all of the car commands will be automatically cleared up.

3: Both weighing and light curtain. Both weighing and light curtain will work.

Note: The anti-nuisance function will not work at the test mode (set F25.03 as non-zero value).

F05.08	Pre-torque bias	0.0 - 100.0 [50.0%]
F05.09	Up electrical pre-torque gain	0.000 - 9.000 [1.000]
F05.10	Up brake pre-torque gain	0.000 - 9.000 [1.000]
F05.11	Down electrical pre-torque gain	0.000 - 9.000 [1.000]
F05.12	Down brake pre-torque gain	0.000 - 9.000 [1.000]

F05.08 is actually the balance coefficient of the elevator and it is also the percentage of the rated weight in the car when the car is in balance with the counterweight.

F05.09 - F05.12 are the elevator pre-torque coefficients when the motor is in electrical or brake state.

- If the car is in full loading, the elevator runs up, the motor is in electrical running state; the elevator runs down, the motor is in brake running state.
- If the car is in non-loading, the elevator runs up, the motor is in brake running state; the elevator runs down, the motor is in electrical running state.
- The greater the gain is, the greater the elevator start compensation value is.
- The controller can identify the electrical and brake state according to the weighing sensor signals, and then work out desirable torque compensation values.

When set F05.00 as 1 (analogue weighing) or 2 (digital weighing), details of adjusting ways are as follows:

- In up electrical state, if the elevator rolls back when starts, increase F05.09; if the elevator rushes to start, reduce F05.09.
- In up brake state, if the elevator rolls back when starts, increase F05.10; if the elevator rushes to start, reduce F05.10.
- In down electrical state, if the elevator rolls back when starts, increase F05.11; if the elevator rushes to start, reduce F05.11.
- In down brake state, if the elevator rolls back when starts, increase F05.12; if the elevator rushes to start, reduce F05.12.

F05.13 - F05.15	**Manufacturer debugging parameter, prohibit to change**	

F05.16	**No weighing current coefficient**	**0 - 9999 [3000]**
F05.17	**No weighing speed-loop KP**	**1 - 9999 [1000]**
F05.18	**No weighing speed-loop KI**	**1 - 9999 [1000]**

F05.16 - F05.18 are used to adjust the effect of pre-torque auto-compensation (F05.00 = 3).

- To increase F05.16 - F05.18 can increase the response speed of the system, but too large will cause the system overshoot and oscillation.
- At debugging, adjusting F05.16 can achieve the elevator smooth start generally.
  - At the starting moment the elevator slips car, increase F05.16; at the starting moment elevator vibrates, reduce F05.16.

7.2.7 F06: Manufacturer Debugging Parameters

F06.00	**Manufacturer debugging parameter, prohibit to change**	
F06.01	**Manufacturer debugging parameter, prohibit to change**	
F06.02	**Manufacturer debugging parameter, prohibit to change**	
F06.03	**Manufacturer debugging parameter, prohibit to change**	
F06.04	**Manufacturer debugging parameter, prohibit to change**	
F06.05	**Manufacturer debugging parameter, prohibit to change**	

7.2.8 F07: Asynchronous Motor Parameters

F07.00	Asynchronous motor rated power	0.2 - 500.0kW [Depend on model]
F07.01	Asynchronous motor rated voltage	0 - 999V [Depend on model]
F07.02	Asynchronous motor rated current	0.0 - 999.9A [Depend on model]
F07.03	Asynchronous motor rated frequency	1.00 - F00.05 [50.00Hz]
F07.04	Asynchronous motor rated RPM	1 - 24000 [1440rpm]
F07.05	Asynchronous motor power factor	0.001 - 1.000 [0.850]

Please set F07.00 - F07.05 in accordance with parameters of motor nameplate.

F07.06	Asynchronous motor parameter auto-tuning	0 - 2 [0]

0: No action.

1: Motor static auto-tuning.

2: Motor rotation auto-tuning.

- See the section 8.1.3 Motor Parameter Auto-tuning (page 135) for the detail parameter auto-tuning.

F07.07	Asynchronous motor stator resistance	0.000 - 65.535Ω [Depend on model]
F07.08	Asynchronous motor rotor resistance	0.000 - 65.535Ω [Depend on model]
F07.09	Asynchronous motor leakage inductance	0.0 - 6553.5mH [Depend on model]
F07.10	Asynchronous motor mutual inductance	0.0 - 6553.5mH [Depend on model]
F07.11	Asynchronous motor no-load current	0.0 - 999.9A [Depend on model]
F07.12	Asynchronous motor of core saturation coefficient 1	0.00 - 0.50 [0.50]
F07.13	Asynchronous motor of core saturation coefficient 2	0.00 - 0.75 [0.75]
F07.14	Asynchronous motor of core saturation coefficient 3	0.00 - 1.20 [1.20]

It will automatically update parameters F07.07 - F07.14 after motor parameters auto-tuning.

F07.15	Asynchronous motor torque boost	0.1 - 30.0 [0.1%]
F07.16	Asynchronous motor torque boost end-point	0.0 - 50.0(F07.03) [10.0%]
F07.17	Asynchronous motor of slip compensation gain	0.0 - 300.0[100.0%]
F07.18	Asynchronous motor of slip compensation filter time	0.1 - 10.0 [0.1s]
F07.19	Asynchronous motor of slip compensation limitation	0.0 - 250.0 [200.0%]

Note: F07.15 - F07.19 can only work at V/f control and asynchronous motor parameter rotation auto-tuning.

F07.20	Asynchronous motor performance optimization	0 - 65535 [0]

Bit0: Exciting current optimization

0: Normal processing.

1: Optimization processing.

Bit1: Methods of exciting current optimization

0: Voltage method.

1: Current method.

Bit2: New algorithm for asynchronous pre-torque compensation

0: The new asynchronous pre-torque compensation algorithm is invalid.

1: The new asynchronous pre-torque compensation algorithm is valid.

Bit3 - Bit15: Reserved

F07.21	Asynchronous motor of oscillation-suppression mode	0,1 [1]

0: Oscillation suppression is dependent on the motor's exciting component.

1: Oscillation suppression is dependent on the motor's torque component.

F07.22	Asynchronous motor of oscillation-suppression coefficient	0 - 200 [100]

For suppressing the inherent oscillations generated by MONT71 with motor.

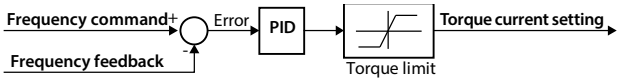
- If the constant load runs, when the output current changes repeatedly, can set F07.22 on the basis of the factory setting parameters to eliminate the oscillation, so that the motor can run smoothly.

Note: F07.21 and F07.22 can only work at V/f control and asynchronous motor parameter rotation auto-tuning.

7.2.9 F08: Vector Control Speed-loop Parameters

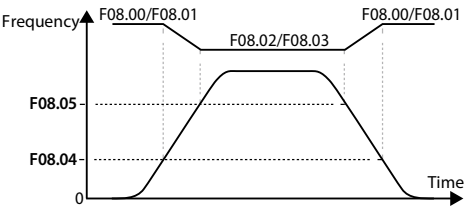
F08.00	**Low speed ASR KP**	**1 - 9999 [500]**
F08.01	**Low speed ASR KI**	**1 - 9999 [500]**
F08.02	**High speed ASR KP**	**1 - 9999 [500]**
F08.03	**High speed ASR KI**	**1 - 9999 [500]**
F08.04	**ASR PI switching frequency 1**	**0.00 - 50.00 [10.00Hz]**
F08.05	**ASR PI switching frequency 2**	**0.00 - 50.00 [15.00Hz]**

F08.00 - F08.07 comfirm the PID parameters of ASR. The structure of ASR is shown in following figure:



As the following figure:

- When operates in a range of 0 - F08.04, the PI parameters of vector control are F08.00 and F08.01;
- When operates above F08.05, the PI parameters of vector control are F08.02 and F08.03;



- When operates with frequency in a range of F08.04 - F08.05, vector control P parameter is the linear interpolation between F08.00 and F08.02, while vector control I parameter is the linear interpolation between F08.01 and F08.03.
- The system's response can be expedited through increasing the ASR KP (F08.00, F08.02), but oscillation may occur if the value of KP is too high.
- The system's response can be expedited through increasing the ASR KI (F08.01, F08.03), but oscillation and high overshoot happen easily if the value of KI is too high.
  - If F08.01/F08.03 = 0, and the integral function is disabled, the speed-loop works only as a proportional regulator.
- Generally, the KP should be adjusted firstly to the maximum on condition that the system does not vibrate, and then the KI should be adjusted to shorten the response time without overshoot.

F08.06	**ASR integral limitation**	**0.0 - 200.0 (motor rated current) [180.0%]**

Define the maximum integral value of the vector control ASR integral. Its setting is relative to the percentage of the motor rated current.

F08.07	**ASR differential time**	**0.000 - 1.000 [0.000s]**

Define the vector control ASR differential time. No need to set normally. When it is necessary to accelerate the dynamic response, it may be set appropriately.

- There isn't speed-loop differential when F08.07 = 0.

F08.08	ASR output filter time	0.000 - 1.000 [0.008s]

Filter the output of ASR (speed-loop) regulator.

- When F08.08 = 0, the speed-loop filter is disabled.

F08.09	Torque limitation	0.0 - 200.0 (motor rated current) [180.0%]

F08.09 is used to set the torque upper limitation. Its setting is relative to the percentage of the motor rated current.

- If the torque is too small, the run speed may deviate from the setting value.

Note: Users generally do not need to modify F08.06 - F08.09.

7.2.10 F09: Vector Control Current-loop Parameters

F09.00	Current-loop KP	1 - 4000 [500]
F09.01	Current-loop KI	1 - 4000 [500]

Define the PI regulator parameter of current-loop (ACR).

- F09.00 and F09.01 directly impact the system dynamic response speed and control accuracy, and the appropriate adjustment may be required on different occasions.
- The synchronous motor may have obvious effect to the comfort by adjusting F09.00 and F09.01, and the jitter in elevator operation can be suppressed by adjusting appropriately.

F09.02	Current-loop output filter time	0.000 - 1.000 [0.000s]

F09.02 = 0, the current-loop output has no filter. And users generally do not need to change.

F09.03	Manufacturer debugging parameter, prohibit to change	

F09.04	Current loop execution cycle	1 - 10 [6k]
F09.05 - F09.07	Manufacturer debugging parameter, prohibit to change	

7.2.11 F10: Synchronous Motor Parameters

F10.00	Synchronous motor type	0,1 [0]

0: IPM.

1: SMPM.

F10.01	Synchronous motor rated power	0.4 - 400.0kW [Depend on model]
F10.02	Synchronous motor rated voltage	0 - 999V [Depend on model]
F10.03	Synchronous motor rated current	0.0 - 999.9A [Depend on model]
F10.04	Synchronous motor rated frequency	1.00 - F00.05 [19.20Hz]
F10.05	Synchronous motor rated RPM	1 - 24000 [96rpm]
F10.06	Synchronous motor stator resistance	0.000 - 9.999 [0.000Ω]
F10.07	Synchronous motor cross axis inductance	0.0 - 999.9 [0.0mH]
F10.08	Synchronous motor direct axis inductance	0.0 - 999.9 [0.0mH]
F10.09	Synchronous motor Back EMF	0 - 999 [0V]

Please set F10.01 - F10.09 in accordance with parameters of motor nameplate.

F10.10	Synchronous motor of angle auto-tuning	0 - 2 [0]

0: No action.

1: Static angle auto-tuning.

2: Rotation angle auto-tuning.

- See the section 8.1.3 Motor Parameter Auto-tuning (page 135) for the auto-tuning.

F10.11	Synchronous motor static auto-tuning voltage setting	0.0 - 100.0 (F10.02) [100.0%]

If the overcurrent fault is alarmed at synchronous motor static auto-tuning, it may reduce the setting value appropriately.

F10.12	Synchronous motor initial angle	0.0 - 359.9 [0.0°]
F10.13	Synchronous motor of Z pulse initial angle	0.0 - 359.9 [0.0°]
F10.14	Sincos encoder C amplitude	0 - 9999 [2048]
F10.15	Sincos encoder C zero-bias	0 - 9999 [2048]
F10.16	Sincos encoder D amplitude	0 - 9999 [2048]
F10.17	Sincos encoder D zero-bias	0 - 9999 [2048]

F10.12 is a learning angle after synchronous motor auto-tuning and an important parameter for the synchronous motor normal starting, which should not be arbitrarily changed.

F10.13 this parameter should be reserved.

F10.14 - F10.17 are the parameter auto-tuning results with sincos encoder, and can not be changed casually.

F10.18	Sincos encoder CD phase	0,1 [0]

0: Normal.

1: CD phase is opposite.

F10.19	Synchronous motor current filter coefficients	0 - 40 [0]

F10.20	Performance optimization parameters	0 - 65535 [0]

Bit0: Inspection run parameter auto-tuning

0: Do not automatically parameter tuning.

1: Automatically parameter tuning.

Bit1: Current loop parameters are automatically optimized

0: Manually optimize.

1: Automatically optimize.

Bit2: SINCOS encoder performace optimized

0: Normal processing.

1: Optimization processing.

Bit3: Elevator speed and grid voltage optimization

0: Normal processing.

1: Optimization processing.

Bit4-Bit5: Reserved

Bit6: Start comfort

0: Mode 0.

1: Mode 1.

Bit7-Bit8: Reserved

Bit10&Bit9: Performance Optimization

00: Mode 0.

01: Mode 1.

10: Mode 2.

11: Mode 3.

Bit11-Bit13: Reserved

Bit14: Current sampling method

0: Mean sampling.

1: single sampling.

Bit15: Vibration Optimization

0: The old method of vibration optimization.

1: A new method of vibration optimization.

7.2.12 F11: Encoder Parameters

In the elevator application, the rotary encoder of the motor is indispensable configuration.

Refer to section 4.4 (page 31) for the details of encoder interface card.

F11.00	Encoder interface card selection	1 - 3 [1]

1: ABZ incremental encoder interface card (MT70-PG1-ABZ).

- Only apply to asynchronous motor.

2: UVW encoder interface card (MT70-PG3-UVW).

- Only apply to synchronous motor. When select UVW encoder interface card, you must ensure that the pole number of the encoder is the same as the motor.

3: SINCOS encoder interface card (MT70-PG2-SINCOS).

- Only apply to synchronous motor. It is used to adapt the SINCOS encoder, such as the HEIDENHAIN ERN1387-type SINCOS encoder.

F11.01	Encoder P/R	1 - 9999 [1024]
F11.02	Encoder direction setting	0,1 [0]

The effect of changing F11.02 is equivalent to changing the AB two-phase sequence of encoder.

0: The same direction.

1: The reverse direction.

F11.03	Encoder signal filter coefficient	00 - 99 [11]

F11.03 generally does not need to change, if there is obvious current noise during motor running process, it can be appropriately modified.

- Units: Low speed of filter coefficient.
- Tens: High speed of filter coefficient.

F11.04	Manufacturer debugging parameter, prohibit to change	
F11.05	Detecting time of encoder wire disconnection	0.00 - 2.00 [1.00s]

Define the continuous detection time of encoder wire disconnection fault.

MONT71 detects the encoder wire disconnection and lasts more than the time set by F11.05, it will alarm E0031 fault (encoder disconnection).

- F11.05 = 0, the encoder wire disconnection can be detected.

7.2.13 F12: Main Control Board Terminal Parameters

F12.01 - F12.24 set the functions of input terminal X1 - X24 on MCB (MT71-MCB-A);

F12.25 - F12.27 set the functions of high voltage input terminal X25 - X27 on MCB (MT71-MCB-A);

F12.28 - F12.51 set the output functions of relay Y0 - Y23 on MCB (MT71-MCB-A).

F12.00	MCB input terminal filter time	2 - 40 [10ms]

Define the MCB input terminal (X1 - X24) filter time, used to set the sensitivity of the input terminal.

- As input terminals are vulnerable to interference and cause the malfunction, to increase the value of this parameter setting, but will reduce the sensitivity of the terminals.

F12.01	MCB input terminal X1 functions	000 - 153 [3]
F12.02	MCB input terminal X2 functions	000 - 153 [104]
F12.03	MCB input terminal X3 functions	000 - 153 [105]
F12.04	MCB input terminal X4 functions	000 - 153 [109]
F12.05	MCB input terminal X5 functions	000 - 153 [10]
F12.06	MCB input terminal X6 functions	000 - 153 [11]
F12.07	MCB input terminal X7 functions	000 - 153 [12]
F12.08	MCB input terminal X8 functions	000 - 153 [14]
F12.09	MCB input terminal X9 functions	000 - 153 [115]
F12.10	MCB input terminal X10 functions	000 - 153 [116]
F12.11	MCB input terminal X11 functions	000 - 153 [117]
F12.12	MCB input terminal X12 functions	000 - 153 [118]
F12.13	MCB input terminal X13 functions	000 - 153 [119]
F12.14	MCB input terminal X14 functions	000 - 153 [22]
F12.15	MCB input terminal X15 functions	000 - 153 [126]
F12.16	MCB input terminal X16 functions	000 - 153 [28]

F12.17	MCB input terminal X17 functions	000 - 153 [30]
F12.18	MCB input terminal X18 functions	000 - 153 [24]
F12.19	MCB input terminal X19 functions	000 - 153 [0]
F12.20	MCB input terminal X20 functions	000 - 153 [0]
F12.21	MCB input terminal X21 functions	000 - 153 [0]
F12.22	MCB input terminal X22 functions	000 - 153 [0]
F12.23	MCB input terminal X23 functions	000 - 153 [0]
F12.24	MCB input terminal X24 functions	000 - 153 [0]

Note:

1. X1 - X24 are digital input terminals and can select the corresponding function code 000 - 140, but the same function code can not be reused.

2. Hundreds is set as 0, it indicates the normally open input; if set as 1, it indicates the normally closed input.

0: No function.

- To set the terminal in a non-functional state, even if there is a signal input, it will not make any action.
- You can set the unused terminal as 0 so as to prevent misconnection or malfunction.

1: Up leveling normally open input (DZU).

2: Down leveling normally open input (DZD).

3: Door zone normally open input (SX1).

- Via the leveling sensor signal to control the elevator leveling parking, and there are two way controls in accordance with different sensors.
- 1: The elevator equipped with up and down leveling sensors, you need these two sensor signals to the corresponding terminal, and the terminal's function is set as up leveling signal input (1 or 101), and down leveling signal input (2 or 102).
- The up operation should successively receive the up leveling signal and then the down leveling signal; and the down operation should successively receive the down leveling signal and then the up leveling signal.
- 2: If the elevator is equipped with one leveling sensor, there are the following two methods:
- ① Connect the leveling sensor signal to the corresponding terminal, the terminal is set to door zone signal (3 or 103), while the up leveling signal function (1/101 set to 0) and the down leveling signal function (2/102 set to 0) have been set to cancel.
  ② Connect the leveling sensor signal to two corresponding terminals, which are set to up leveling signal input (1/101) and down leveling signal input (2/102).

4: Run output feedback normally open input (SW).

5: Brake output feedback normally open input (BZK).

- The system automatically detect that the outputs of run contactor and brake contactor whether are consistent with the feedback signal.
- If inconsistent, it will alarm E0056 fault (run contactor feedback abnormal) and E0057 fault (brake contactor feedback abnormal).

6: Brake limit switch feedback normally open input (BZK1).

- Use for detecting the actual action of brake. If the actual action is inconsistent with the brake output, it will alarm E0057 fault (brake contactor feedback abnormal).

7: Synchronous motor self-locking feedback normally open input (FX).

- The system automatically detects whether the synchronous star-delta contactor output is consistent with the feedback signal. If not, it will alarm E0054 fault (synchronous motor star-delta contactor feedback abnormal).

8: Locked door output feedback normally open input (FMFB).

- When the elevator opens the door in advance or re-leveling jumps out door lock after opening the door, it will detect locked-door feedback signal for insuring the elevator safely running.
- The system automatically detects whether the locked-door output is consistent with the feedback signal. If not, it will alarm E0047 fault (locked-door feedback abnormal).

9: Inspection normally open input (INS).

10: Inspection up normally open input (UP).

11: Inspection down normally open input (DN).

- Turn the auto/inspection switch to inspection, the elevator enters to inspection mode and the INS lamp of main control board will become lighting.
- At the inspection mode, the system will not operate automatically (including the automatic door). When there is inspection up signal or inspection down signal, the elevator will run at inspection speed (F04.00).

12: Fire signal normally open input (FIRS1).

- When the "fire" switch is open, the elevator comes into fire state.
- At this mode, the system will cancel all entered hall call and car call; the elevator will park at the next station without opening the door. Elevator directly runs to the fire station and won't open door for setting passengers free until arriving at the fire station.

13: Reserved.

14: Locked-elevator normally open input (LOCK).

- It is the locked-elevator signal input point, and if this signal is valid, the system enters into locked-elevator state.

15: Up limit normally open input (LSU).

16: Down limit normally open input (LSD).

- No. 15 and No. 16 functions are terminal stopping switches for preventing car and counterweight rest when the elevator passed the leveling station of landing without stopping.

17: Up forced Dec normally open input (ULS1).

18: Down forced Dec normally open input (DLS1).

- During the shaft self-learning process, MONT71 will record these switch positions to F19.12 and F19.13.

19: Over load normally open input (LWD).

- If the elevator loading is over 110% of rated load, the system comes into over loading state.
- The over loading buzzer tweets, the car light of over loading will light and the elevator will not close the door.
- In the elevator checking course, if the system need run with 110% over loading, it can set Bit2 of F25.04 as 1 (enabled over-load run).

20: Full load normally open input (LWX).

- The elevator loading among 80 - 110% of elevator rated load (F00.04) is full loading state.
- In the full loading state, the hall shows full loading, the elevator doesn't response the hall call.

21: Safety circuit 1 normally open input (JT1).

22: Front door OD arrival normally open input (OLT1).

23: Back door OD arrival normally open input (OLT2).

24: Front door CD arrival normally open input (CLT1).

25: Back door CD arrival normally open input (CLT2).

26: Front door light curtain normally open input (EDP1).

27: Back door light curtain normally open input (EDP2).

Pay attention to No. 22 - 27 functions: when there is only one door, it defaults that it is front door.

28: Driver signal normally open input (ATS).

29: Direct arrival signal normally open input (NSB).

30: Commutation signal normally open input (ACB).

31: Isolated run signal normally open input (ISS).

32: Front/back door switch normally open input (GABS).

- When the internal call arrives, this terminal is disabled, and it opens the front door; but if enabled, it will open the back door.
- Set F26.21 as 1 (open-through door control opens), set F22.17 as 2 (open-through door control mode 2), the No. 32 function will be enabled. Refer to section 8.2.2 Open-through Door Description (page 156).

33: Battery-driven normally open input (UPC).

- The normally open input using for the power failure emergency run whether is valid, you can refer to the section 8.2.1 (page 152) about details.

34: OD button normally open input (DOB1).

35: CD button normally open input (DCB1).

36: Safety circuit 2 normally open input (JT2).

37: Door locked circuit 1 normally open input (DLC1).

38: Door locked circuit 2 normally open input (DLC2).

- The safety circuit and the door locked circuit are enabled, which is an essential condition for elevator operation.
- **Safety circuit (No. 21 and No. 36 functions):** It is an important guarantee of the elevator safe and reliable operation. If select two safety circuit input points but any of them is broken off, it will alarm E0041 fault (safety circuit disconnection).
- **Door locked circuit (No. 37 and No. 38 functions):** It ensures that the hall door and the car door have closed at the elevator starting running. The function of door lock 2 is the same with that of door lock 1, that may handle hall door and car door signals separately. Two door locked signals are simultaneously connected to system before believe that the locks closed, otherwise alarm E0042 fault (door locked disconnection during running).

Note:

1. *No. 21 function and No. 36 function can use with the high voltage safety circuit signal. If using with the high voltage safety circuit, and detect that all safety circuits are valid, it will believe that the safety circuits pass, otherwise will alarm E0041 fault (safety circuit disconnection).*
2. *No. 37 function and No. 38 function can use with the high voltage door locked signal. If that, and detect the preset door lock signal circuits all turned on, it will believe the door lock closing. After door lock has closed, the LOCK lamp of MCB will become lighting.*

39: Half-load signal normally open input (HALFLOAD).

40: Fireman normally open input (FIRS2).

- The fireman switch input is used for fireman to run the elevator (twice fire control). At the fire back to base station, MONT71 will get into the fireman running state if there's fireman signal.

41: Motor over-heated normally open input (MT).

42: Earthquake monitoring switch normally open input (EQ).

43: Edges feedback for front door normally open input (EDK1).

44: Edges feedback for back door normally open input (EDK2).

45: Brake forced feedback normally open input (KMZ).

46: Back door prohibition normally open input.

47: Alarm bell normally open input.

48: Door lock stuck normally open input.

49: Brake travel switch feedback 2 normally open input.

50: The second fire station is normally open.

51: bypass signal normally open input.

52: Up deceleration signal normally open input.

- Only MT71-SVC is non-standard.

53: Normally open input of down deceleration signal.

- Only MT71-SVC is non-standard.

F12.25	**MCB high voltage input terminal X25 function**	**0 - 99 [1]**
F12.26	**MCB high voltage input terminal X26 function**	**0 - 99 [2]**
F12.27	**MCB high voltage input terminal X27 function**	**0 - 99 [3]**

0: No function.

1: High voltage safe circuit signal (JT).

2: High voltage locked door 1 signal (DS1).

3: High voltage locked door 2 signal (DS2).

4: High voltage door lock short signal.

- The high-voltage terminal X28 of the new version of the control board can only be used as a high voltage door lock short-circuit signal, enabled by F26.14 Bit4.
- The X28 is generally required only when it has front and rear doors.

5 - 99: Reserved.

F12.28	MCB relay Y0 function	0 - 46 [0]

F12.29	MCB relay Y1 function	0 - 5 [1]
F12.30	MCB relay Y2 function	0 - 5 [2]
F12.31	MCB relay Y3 function	0 - 5 [4]
F12.32	MCB relay Y4 function	0 - 5 [0]
F12.33	MCB relay Y5function	0 - 5 [0]

F12.34	MCB relay Y6 function	6 - 46 [6]
F12.35	MCB relay Y7 function	6 - 46 [7]
F12.36	MCB relay Y8 function	6 - 46 [8]
F12.37	MCB relay Y9 function	6 - 46 [9]
F12.38	MCB relay Y10 function	6 - 46 [10]
F12.39	MCB relay Y11 function	6 - 46 [11]
F12.40	MCB relay Y12 function	6 - 46 [12]
F12.41	MCB relay Y13 function	6 - 46 [13]
F12.42	MCB relay Y14 function	6 - 46 [0]
F12.43	MCB relay Y15 function	6 - 46 [0]
F12.44	MCB relay Y16 function	6 - 46 [25]
F12.45	MCB relay Y17 function	6 - 46 [17]
F12.46	MCB relay Y18 function	6 - 46 [13]
F12.47	MCB relay Y19 function	6 - 46 [19]
F12.48	MCB relay Y20 function	6 - 46 [20]
F12.49	MCB relay Y21 function	6 - 46 [21]
F12.50	MCB relay Y22 function	6 - 46 [22]
F12.51	MCB relay Y23 function	6 - 46 [0]

Note:

1. The setting range of F12.28 (Y0) is 0 - 32.

2. The setting range of F12.29 - F12.33 (Y1 - Y5) is 0 - 5.

3. The setting range of F12.34 - F12.51 (Y6 - Y23) is 6 - 31.

0: No function.

- To set the terminal in a non-functional state and can not make any action.

1: Run contactor output (SW).

- The system outputs the run contactor's pick-up and release commands; controls the run contactor's pick-up and release.

2: Brake contactor output (BZK).

- The system outputs the brake contactor's pick-up and release commands so as to achieve the pick-up and release control of brake.

3: Synchronous star-delta contactor output (FX).

- The system outputs the pick-up and release command of run contactor; control the pick-up and release of synchronous star-delta contactor.
- It can be set by F26.19.
- The synchronous star-delta contactor can guarantee that the elevator does not occur high-speed car rolling even in the case of the brake failure.

4: Brake forced output (KMZ).

- Each time, opening the brake and lasting 4s can be used to control the starting voltage of the brake.

5: Lighting and fan output (FAN). There will be lighting output if meet any one of the following conditions; but there will be no output at other conditions.

- 1. Inspection running.
- 2. There is running direction.
- 3. There is fault.
- 4. The door machine is opening or keeping opening state.
- 5. There is floor registration in car.

6: Front door open output (OD1).

7: Front door close output (CD1).

8: Back door open output (OD2).

9: Back door close output (CD2).

- When there is only one door, it defaults that it is front door.

10: Low 7-segment code display output a.

11: Low 7-segment code display output b.

12: Low 7-segment code display output c.

13: Low 7-segment code display output d.

14: Low 7-segment code display output e.

15: Low 7-segment code display output f.

16: Low 7-segment code display output g.

17: Up arrow display output.

18: Down arrow display output.

19: Minus display output.

20: Firefighting back to base station output.

21: Buzzer output (BUZ). The conditions of buzzer output are as follows.

- 1. To remind for the excessive position deviation back to base station.
- 2. To remind for there is hall call information at driver mode.
- 3. To remind for elevator over-loaded.
- 4. To remind for battery-driven running.
- 5. To remind for forced close door.
- 6. To remind for firefighting back to base station.

22: Over load output (LWD).

23: Arrival chimes output.

24: Full load output (LWX).

25: Inspection output.

26: Fan and light output 2 (FAN2).

- Refer to No. 5 function.

27: Locked door contactor output (FM).

- The system outputs the pick-up and release command of locked door contactor so as to achieve the locked-door jump out and release control at advanced open and OD re-leveling.

28: High bit output of BCD code, Gray code, and seven-segment code.

29: Integrated run correctly output.

30: Elevator up run output.

31: Elevator down run output.

32: Power failure emergency run is enabled (UPC).

33: R-cam valve 1 output. The output conditions are:

- When the elevator stops at the leveling floor or when a call signal is called outside this level, the signal starts to output and stops output after 10 seconds.

34: Locked ladder normally open output.

35: Locked ladder normally closed output.

36: High 7 segment a Display output.

37: High 7 segment code b display output.

38: High 7 segment code c display output.

39: High 7 segment code d display output.

40: High 7 segment code e display output.

41: high 7 segment code f display output.

42: high 7 segment code g display output.

43: R-cam 2 normally open output.

44: R-cam 2 normally closed output.

45: Maintenance time to remind the output.

46: Bypass operation signal output.

7.2.14 F13: Main Control Board L-Terminal Parameters

F13.01 - F13.24 set functions of main control board (MT71-MCB-A) input terminal L1 - L24;

F13.00	Input filter settings	2 - 40 [10ms]

It defines the input filter time of MCB L-terminals (L1 - L24) used to set the sensitivity of the input terminals.

- As input terminals are vulnerable to interference and cause the malfunction, to increase the value of this parameter setting, but will reduce the sensitivity of the terminals.

F13.01	MCB terminal L1 function	000 - 339 [201]
F13.02	MCB terminal L2 function	000 - 339 [202]
F13.03	MCB terminal L3 function	000 - 339 [203]
F13.04	MCB terminal L4 function	000 - 339 [0]

F13.05	MCB terminal L5 function	000 - 339 [211]
F13.06	MCB terminal L6 function	000 - 339 [212]
F13.07	MCB terminal L7 function	000 - 339 [213]
F13.08	MCB terminal L8 function	000 - 339 [214]
F13.09	MCB terminal L9 function	000 - 339 [215]
F13.10	MCB terminal L10 function	000 - 339 [0]
F13.11	MCB terminal L11 function	000 - 339 [0]
F13.12	MCB terminal L12 function	000 - 339 [0]

F13.13	MCB terminal L13 function	000 - 339 [221]
F13.14	MCB terminal L14 function	000 - 339 [222]
F13.15	MCB terminal L15 function	000 - 339 [223]
F13.16	MCB terminal L16 function	000 - 339 [224]

F13.17	MCB terminal L17 function	000 - 339 [232]
F13.18	MCB terminal L18 function	000 - 339 [233]
F13.19	MCB terminal L19 function	000 - 339 [234]
F13.20	MCB terminal L20 function	000 - 339 [235]

F13.21	MCB terminal L21 function	000 - 339 [0]
F13.22	MCB terminal L22 function	000 - 339 [0]
F13.23	MCB terminal L23 function	000 - 339 [0]
F13.24	MCB terminal L24 function	000 - 339 [0]
F13.25 - F13.26	Manufacturer debugging parameter, prohibit to change	

0: No function.

- To set the terminal in a non-functional state, it will not make any action even if there is a signal input.
- You can set the unused terminal as zero so as to prevent misconnection or malfunction.

Note: The 10th floor does not have up call, and the 1st floor does not have down call.

201: Front door OD button	301: Back door OD button
202: Front door CD button	302: Back door CD button
203: Front door OD delay button	303: Back door OD delay button
204: Two doors select button input	
205: Back door prohibited switch normally open input	

210: 10th floor of front door internal call	310: 10th floor of back door internal call
211: 1st floor of front door internal call	311: 1st floor of back door internal call
212: 2nd floor of front door internal call	312: 2nd floor of back door internal call
213: 3rd floor of front door internal call	313: 3rd floor of back door internal call
214: 4th floor of front door internal call	314: 4th floor of back door internal call
215: 5th floor of front door internal call	315: 5th floor of back door internal call
216: 6th floor of front door internal call	316: 6th floor of back door internal call
217: 7th floor of front door internal call	317: 7th floor of back door internal call
218: 8th floor of front door internal call	318: 8th floor of back door internal call
219: 9th floor of front door internal call	319: 9th floor of back door internal call

221: 1st floor of front door up call	321: 1st floor of back door up call
222: 2nd floor of front door up call	322: 2nd floor of back door up call
223: 3rd floor of front door up call	323: 3rd floor of back door up call
224: 4th floor of front door up call	324: 4th floor of back door up call
225: 5th floor of front door up call	325: 5th floor of back door up call
226: 6th floor of front door up call	326: 6th floor of back door up call
227: 7th floor of front door up call	327: 7th floor of back door up call
228: 8th floor of front door up call	328: 8th floor of back door up call
229: 9th floor of front door up call	329: 9th floor of back door up call

230: 10th floor of front door down call	330: 10th floor of back door down call
232: 2nd floor of front door down call	332: 2nd floor of back door down call
233: 3rd floor of front door down call	333: 3rd floor of back door down call
234: 4th floor of front door down call	334: 4th floor of back door down call
235: 5th floor of front door down call	335: 5th floor of back door down call
236: 6th floor of front door down call	336: 6th floor of back door down call
237: 7th floor of front door down call	337: 7th floor of back door down call
238: 8th floor of front door down call	338: 8th floor of back door down call
239: 9th floor of front door down call	339: 9th floor of back door down call

F13.27	Output logic setting 1	0 - 65535 [0]
F13.28	Output logic setting 2	0 - 255 [0]

The value of F13.27 is 16-bit binary data. Bit0 is corresponding to MCB terminal L0, and Bit15 is corresponding to terminal L16.

The value of F13.28 is 10-bit binary data. Bit0 is corresponding to MCB terminal L17, and Bit7 is corresponding to terminal L24.

- Any bit is set as 1: output logic is negated.
- Any bit is set as 0: output logic is normal.

7.2.15 F14: Communication Parameters

F14.00	Data format	0 - 5 [0]

0: 1-8-2 format, no parity, RTU.

1: 1-8-1 format, even parity, RTU.

2: 1-8-1 format, odd parity, RTU.

3: 1-7-2 format, no parity, ASCII.

4: 1-7-1 format, even parity, ASCII.

5: 1-7-1 format, odd parity, ASCII.

F14.01	Baud rate selection	0 - 5 [3]

0: 1200bps.

1: 2400bps.

2: 4800bps.

3: 9600bps.

4: 19200bps.

5: 38400bps.

F14.02	Local address	0 - 247 [2]

F14.02 = 0, it represents the broadcast address.

F14.03	Host PC response time	0 - 1000 [0ms]

7.2.16 F15: Keypad Display Parameters

F15.00	LCD keypad language	0,1 [0]

0: Chinese.

1: English.

F15.01	LCD keypad display contrast	1 - 8 [6]

Select the LCD display contrast.

F15.02	Small keypad display direction	0 - 3 [0]

There are three LED digital tubes on the main control board (MT71-MCB-A) of MONT71.

Changing the direction of the digital tube display in accordance with F15.02 is convenient to check and can facilitate the control cabinet design regardless of the MCB installation from positive and negative.

- Positive display: The setting at positive installation of the MCB.
- Reverse display: The setting at negative installation of the MCB.
- Physical floor: The Group F0 data of small keypad display is physical floor.
- Hall call data: The Group F0 data of small keypad display is hall call data.

0: Positive display, physical floor.

1: Reverse display, physical floor.

2: Positive display, hall call data.

3: Reverse display, hall call data.

Note: Setting F15.02 as the physical floors or the hall call data can make the same effect to keypad display floor.

F15.03	Run display parameter 1 setting	0 - 9 [2]
F15.04	Run display parameter 2 setting	0 - 9 [3]
F15.05	Run display parameter 3 setting	0 - 9 [6]
F15.06	Run display parameter 4 setting	0 - 9 [0]
F15.07	Run display parameter 5 setting	0 - 9 [0]
F15.08	Run display parameter 6 setting	0 - 9 [0]

F15.09	Stop display parameter 1 setting	0 - 9 [2]
F15.10	Stop display parameter 2 setting	0 - 9 [0]
F15.11	Stop display parameter 3 setting	0 - 9 [7]
F15.12	Stop display parameter 4 setting	0 - 9 [0]
F15.13	Stop display parameter 5 setting	0 - 9 [0]
F15.14	Stop display parameter 6 setting	0 - 9 [0]

Define that the keypad displays the state parameter at running or stopping.

- Cyclically display via the ◀ key or ▶ key of keypad.
- **Such as:** F15.09 = 2, the stop display parameter is feedback speed at initial power.

0: Reserved.

1: Preset speed.

2: Feedback speed.

3: Output frequency.

4: Running RPM.

5: Output voltage.

6: Output current.

7: DC bus voltage.

8: AI input voltage.

- When F05.01=1 (analogue weighing), display the analogue input voltage of MCB.

9: Present height.

7.2.17 F16: Enhance Function Parameters

F16.00	Current keep time after stop command	0 - 1500 [300ms]

To eliminate the synchronous motor current noise at stop, when the brake is over, the cut-off run signal will reduce the current to zero after some time.

- F16.00 setting time is the time reduced from motor rated current to zero.
- It needs to use with F02.05 (zero-speed retention time at stop).

F16.01	Fan control mode	0 - 2 [0]

Define the fan control mode of MONT71.

- If alarm E0009 fault (heatsink overheated), the fan will run all the time.

0: Auto stop.

- The fan runs all the time in the running state. The fan will auto stop after the time set by F16.02.

1: Immediately stop.

- The fan runs all the time in running state, when stops running, the fan will immediately stop.

2: Always run when power on.

Note:

1. At the inspection mode, if the controller has fault, the fan will immediately stop; if no fault, the fan will run all the time.

2. At inspection mode the fan operation can judge whether there is the fault on-site.

F16.02	Fan control keep time	0.0 - 600.0 [300.0s]
F16.03	Braking unit action voltage	360 - 750V [Depend on model]

For 380V voltage class, the braking voltage range is 630 - 750V and the factory setting is [720V].

For 220V voltage class, the braking voltage range is 360 - 400V and the factory setting is [380V].

Note: Only in the controller running state, the braking action is enabled.

F16.04	Contactor fault detect time	0.3 - 2.0 [1.0s]

Define the fault detected time of output contactor, brake contactor, synchronous star-delta contactor and brake forced contactor.

F16.05	Fault shield	0 - 65535 [0]

Bit0: E0038 and E0039 fault shield

0: No shield fault.

1: Shield fault.

Bit1: E0024 fault shield

Bit2: E0058 fault shield

Bit3: E0059 fault shield

Bit4: E0045 fault shield

Bit5: Sine and cosine CD break fault disable

Bit6: Sine and cosine CD signal deviation disable

Bit7: UCMP 65 fault disable

Bit8: CIC-B communication fault disable

Bit9: Fault disable for synchronous motor static self-tuning encoder

Bit10: E0065, E0066 fault power-off reset

0: Power failure cannot be reset.

1: Power off reset.

Bit11: E0013 fault mask

0: Not shielded.

1: Shielded.

Bit12 - Bit15: Reserved

F16.06	Manufacturer debugging parameter, prohibit to change	
F16.07	Elevator manufacturers choose	0 - 999 [0]
F16.08	Kinds of elevator parameter selection	0 - 99 [0]
F16.09 - F16.10	Manufacturer debugging parameter, prohibit to change	
F16.11	fault detection time for star seal contactor	0.3 - 5.0 [4.0s]

F16.11 sets the fault detection time of the star seal contactor, and can be appropriately reduced if there is no externally-delayed delay circuit configuration.

F16.12 - F16.19	Manufacturer debugging parameters, prohibit changes	
F16.20	CIC-B parameter setting	0 - 65535 [18]

Bit0: CIC-B function is enabled

0: No opening.

1: open.

Bit2-Bit1: Maximum number of reminders for elevator fault messages

00: remind 1 time.

01: Remind 2 times.

10: Remind 3 times.

11: Remind 4 times.

Bit3: Elevator fault SMS alert interval

0: Remind 1 hour interval.

1: Remind two hours apart.

Bit4: Elevator maintenance time to SMS reminder function

0: No maintenance reminder.

1: Open the maintenance reminder.

Bit5: CIC-A cell monitoring opened

0: No opening.

1: open.

F16.21	Maintenance days	1 - 9999 [0015]

Low two bits: Maintenance cycle.

High two bits: reminder for Remaining days.

Can be set to 0 - 99.

F16.22 - F16.24	Manufacturer debugging parameter, prohibit to change	

7.2.18 F17: Fault Protect Parameters

F17.00	The detect base of lack of input	0 - 100 [30%]
F17.01	The detect time of lack of input	0.0 - 5.0[1.0s]

F17.00 setting value is a percentage of MONT71 rated voltage.

When detect certain input voltage without hitting the preset detect base (F17.00) and exceed the preset detect time (F17.01), it will alarm E0015 fault (lack of input).

- When F17.00 or F17.01 is set as 0 or in the battery driven run mode, it does not detect the input phase loss fault.

F17.02	The detect base of lack of output	0 - 100 [20%]
F17.03	The detect time of lack of output	0.0 - 20.0 [3.0s]

F17.02 setting value is a percentage of MONT71 rated current.

When detect certain output current without hitting the preset detect base (F17.02) and exceed the preset detect time (F17.03), it will alarm E0016 fault (lack of output).

- When F17.02 or F17.03 is set as 0, it does not detect the output phase loss fault.

F17.04	Motor overload protect factor	20.0 - 110.0 [100.0%]

The motor overload protection factor can be set as 100% when MONT71 drives a motor with the same power class.

To protect the motor when the motor power is smaller than the standard matched power, you need to set a proper motor overload protect factor (F17.04). The factor can derive from the following formula.

For asynchronous motor:

$$\text{Motor overload protect factor (F17.04)} = \frac{\text{Asynchronous motor rated current(F07.02)}}{\text{MONT71 rated current(D00.02)}} \times 100\%$$

For synchronous motor:

$$\text{Motor overload protect factor (F17.04)} = \frac{\text{Synchronous motor rated current(F10.03)}}{\text{MONT71 rated current(D00.02)}} \times 100\%$$

F17.05	**Fault auto reset times**	**0 - 100 [0]**
F17.06	**Fault auto reset interval**	**2.0 - 20.0 [5.0s/times]**

The auto reset function of faults is as following:

E0001: Controller output Acc overcurrent	E0003: Controller output constant speed overcurrent	E0005: DC bus voltage Dec overvoltage
E0002: Controller output Dec overcurrent	E0004: DC bus voltage Acc overvoltage	E0006: DC bus voltage constant speed overvoltage

When F17.05 = 0, it means "auto reset" is disabled.

- If no other fault is detected within 5 minutes, the auto reset count will be automatically cleared.
- On condition of external fault reset, auto reset count will be cleared.

F17.07	**Fault relay action select**	**0,65535 [0]**

Bit0: During auto reset

0: Fault relay doesn't act.

1: Fault relay acts.

Bit1: During under voltage

0: Fault relay doesn't act.

1: Fault relay acts.

Note: It need preset the MCB relay (F12.34 - F12.51) as No. 29 function (integrated run correctly output).

Bit2: Automatically reset the holding switch when the elevator starts

0: Automatic reset 3 times.

1: Do not reset automatically.

Bit3: E66 fault can be repaired manually reset

0: Cannot be reset manually.

1: Can be manually reset.

Bit4: Three-phase input phase loss detection imbalance

0: Detection.

1: Not detected.

Bit5 – Bit15: Reserved

F17.08	**No. 1 fault type (the farthest time)**	**[Actual value]**
F17.09	**No. 2 fault type**	
F17.10	**No. 3 fault type**	
F17.11	**No. 4 fault type**	
F17.12	**No. 5 fault type**	
F17.13	**No. 6 fault type**	
F17.14	**No. 7 fault type**	
F17.15	**No. 8 fault type**	
F17.16	**No. 9 fault type**	
F17.17	**No. 10 fault type**	

F17.18	The most recent fault type	[Actual value]
F17.19	The most recent running speed at faulty	
F17.20	The most recent DC bus voltage at faulty	
F17.21	The most recent output current at faulty	

These parameters record the elevator's recent 11 fault codes, elevator floor where the fault occurs, and fault time.

- Fault type, meaning and countermeasure refer to 9.1 Troubleshooting (page 164).

The fault information is composed of four bits, the high two bits represent the elevator floor where the fault occurred, and the low two bits represent the fault type.

For example: F17.08 recording the value of 0501 indicates that the farthest time fault is Acc overcurrent fault, and the fault floor is Floor 5th.

7.2.19 F18: PWM Control Parameters

F18.00	Carrier frequency	1 - 16kHz [Depend on model]

Define the carrier frequency of MONT71 output PWM wave.

The F18.00 value is is closely related to the motor running noise. Generally set above 6 kHz, you can achieve quiet operation.

MONT71 power class	Setting range	Factory setting
0.2 - 22kW	1 - 16kHz	8kHz
30 - 45kW	1 - 12kHz	6kHz

- The greater F18.00 is, the lower the loss and temperature in the motor is, but the larger the system loss and interference is, and the higher the temperature is.
- The smaller F18.00 is, the higher the loss and temperature in the motor is, and the greater the higher harmonic component of the output current is.
- When the value of F18.00 is higher than the factory setting, MONT71 should be derated by 5% when per 1kHz is increased compared to the factory setting.

F18.01	Carrier frequency auto adjust enable	0,1 [0]

0: Disable the carrier frequency auto adjustment.

1: Enable the carrier frequency auto adjustment.

F18.02	PWM over-modulation enable	0,1 [1]

0: The over-modulation is disabled.

1: The over-modulation is enabled.

F18.03	PWM modulation mode	0,1 [1]

0: Two phase modulation and three phase modulation switch.

1: Three phase modulation.

7.2.20 F19: Distance Control Parameters

F19.00	Total floor	2 – 10 [5]

Define the total number of floors.

F19.01	Present floor	1 - F19.00 [1]

Define the present physical floor of car.

- The system can automatically change F19.01 when elevator is running. And the system can automatically revise F19.01 after the up or down forced deceleration switch is touching off.
- When elevator is in non-bottom or non-top floor (up/down leveling signal is valid), users can manually change F19.01. But this parameter must accord with the present floor.

F19.02	Present height	0.00 - 299.99 [0.00m]

Define the number of pulse that the present floor relative to the lowest leveling floor.

F19.03	Leveling distance adjustment / Parking allowance of distance control	0 - 60 [30mm]

MONT71 have built-in advanced distance control algorithm, and use a variety of ways to ensure direct parking stability, generally need not be adjusted.

- F19.06 = 0 (direct parking mode 0), F19.03 is the leveling distance adjustment; changing F19.03 can adjust the elevator leveling accuracy.
  - If elevator is over leveling when stops, reduce the value of F19.03. If elevator is under leveling when stops, increase it.
- F19.06 = 1 (direct parking mode 1), F19.03 is the parking allowance of distance control.
  - Increase F19.03, the creeping distance will increase; reduce F19.03, the creeping distance will reduce.
  - If elevator is over leveling when stops, increase the F03.13 (stop Dec jerk); if elevator is under leveling, reduce it.

F19.04	Leveling position correction coefficient	0 - 500 [0mm]

This parameter is related with the length of leveling plate, but not the actual length of leveling plate.

- It is noted when shaft self-learning, the user need not change.
- The data such as the length of leveling plate can be checked via D05.06 - D05.08.

F19.05	Dec point through output adjustment	0.050 - 2.000 [0.250s]

This is the distance control internal deceleration signal, which need not be changed by users.

F19.06	Direct parking selection	0,1 [0]

Define the direct parking mode of elevator.

0: Direct parking mode 0 (without creep).

- To the principle of distance, automatically generate a smooth curve from start to park, no creep, directly stops in leveling position.

1: Direct parking mode 1 (with creep).

- To the principle of distance, automatically generate a smooth curve from start to park, with creep distance of 30mm (F19.03), decelerates at F03.13 (stop Dec jerk) and stops in the leveling position when encounters the leveling signal.
- Refer to the figure of F03.13 for the detail.

F19.07	Highest speed of curve 1	0.000 - F00.02 [0.000m/s]
F19.08	Highest speed of curve 2	0.000 - F00.02 [0.000m/s]
F19.09	Highest speed of curve 3	0.000 - F00.02 [0.000m/s]
F19.10	Highest speed of curve 4	0.000 - F00.02 [0.000m/s]
F19.11	Highest speed of curve 5	0.000 - F00.02 [0.000m/s]

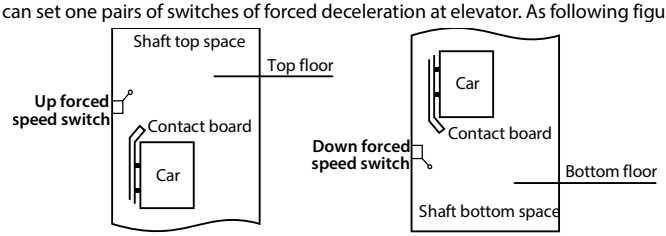
The user cannot modify F19.07 - F19.11 but can only view it.

After the shaft self-learning, the system will generate a running speed curve of F19.07 - F19.11 in accordance with the floor data and the elevator max running speed (F00.02) etc.

F19.12	Up forced Dec position	0.00 - 300.00 [0.00m]
F19.13	Down forced Dec position	0.00 - 300.00 [0.00m]

F19.12 - F19.13 define that forced deceleration switches are relative to the position of the bottom leveling floor, which can be automatically recorded during shaft self-learning process.

- MONT71 can set one pairs of switches of forced deceleration at elevator. As following figure.



- The formula for calculating the installation distance S between the forced deceleration switch and the leveling of the end station is shown below. See the table below for details.

$$S > \frac{V^2}{2 \times F03.12}$$

Elevator rated speed	Distance between the forced Dec switch and station
V ≤ 1.5m/s	1.5m

- The system can automatically monitor the instant running speed when elevator runs to the forced deceleration switch. If detect the abnormal speed or position, the system will forcedly decelerate at F03.12 (forced Dec speed) to avoid climbing or plunging elevator.

- If the distance of forced deceleration is too short, the elevator will alarm E0060 fault (forced Dec and distance is too short) after completes shaft self-learning, which can be solved through adjusting the installing position of forced deceleration switch or increasing the parameter F03.12 (forced Dec speed).

F19.14 - F19.17	**Manufacturer debugging parameter, prohibit to change**	

7.2.21 F20: Storey Height Parameters

F20.00	**High bit of storey 1**	**0 - 50000 [0]**
F20.01	**Low bit of storey 1**	**0 - 50000 [0]**

Define the height from the first floor to the second floor. Unit: Pulse number.

- **The storey height is :**
  - 50000 × F20.00 + F20.01.

F20.02	**High bit of storey 2**	**0 - 50000 [0]**
F20.03	**Low bit of storey 2**	**0 - 50000 [0]**
……	**……**	**0 - 50000 [0]**
F20.14	**High bit of storey 8**	**0 - 50000 [0]**
F20.15	**Low bit of storey 8**	**0 - 50000 [0]**

Define the height from the present floor N to floor N + 1.

- **The relationships of high/low bit of storey N and the parameter number are:**
  - Parameter number of storey high bit = 2N - 2;
  - Parameter number of storey low bit = 2N - 1.
- **The storey height is:**
  - 50000 × High bit of storey + Low bit of storey.

F20.16	**High bit of storey 9**	**0 - 50000 [0]**
F20.17	**Low bit of storey 9**	**0 - 50000 [0]**

Define the height from the 9th floor to the 10th floor. Unit: Pulse number.

- **The storey height is:**
  - 50000 × F20.16 + F20.17.

7.2.22 F21: Elevator Parameters

F21.00	Parking base station	1 - F19.00 [1]

Define the elevator will automatically return to the physical floor when the elevator idle time is excess F23.00 (free return base station time).

F21.01	Fire base station	1 - F19.00 [1]

Define the elevator will return to the physical floor when the elevator enters the fire back base station of running mode.

F21.02	Locked-elevator base station	1 - F19.00 [1]

Entering the locked-elevator mode, the elevator will return to the physical floor after responds the manipulator command.

F21.03	Service floor	0 - 1023 [1023]

Define the floor that the elevator can serve.

Bit0 is corresponding to the physical first floor, and Bit10 is corresponding to the tenth floor.

- Any bit is set as 1: The corresponding floor is the service floor and allowing to park.
- Any bit is set as 0: The corresponding floor is the non-service floor and not allowing to park. This floor cannot register the calling elevator command.

Note: The LCD keypad will automatically display the significance of each binary number which only needs to be set, and therefore it need not convert all binary numbers into decimal numbers.

7.2.23 F22: Door Machine Parameters

F22.00	Door machine number	1,2 [1]

Define the door machine number. Please set this parameter in accordance with the actual door machine number used by the elevator.

- When the elevator only has one door, the door will default as the front door. When the elevator has two doors, the doors will be divided into front door and back door.

F22.01	Front door service floor	0 - 1023 [1023]

Define the physical floor of front door service.

- Any bit is set as 1: The front door of corresponding floor can normally open and close.
- Any bit is set as 0: Disable the front door of corresponding floor to open door.

Note:

1. The settings of F22.01 should not conflict with the settings of F21.03, the user must ensure that the elevator door machine service floor (F21.03) is the system service floor !

2. The LCD keypad will automatically display the significance of each binary number which only needs to be set, and therefore it need not convert all binary numbers into decimal numbers.

F22.02	Back door service floor	0 - 1023 [1023]

Define the back door service floor.

- Refer to parameters F22.01 for details.

Note:

1. The back door service will be valid when F22.00 = 2.

2. The LCD keypad will automatically display the significance of each binary number which only needs to be set, and therefore it need not convert all binary numbers into decimal numbers.

F22.03	OD time protection	5 - 99 [10s]
F22.04	CD time protection	5 - 99 [15s]
F22.05	Limited times of OD/CD overtime	0 - 20 [0]

Outputting OD/CD command and after the setting time of F22.03 (OD) / F22.04 (CD), the system does not receive the OD/CD arrival feedback signal yet, the elevator will immediately turn to close / open the door, which is the switching gate one time.

- When OD/CD number of times is consistent with the setting of F22.05, it will alarm E0048 fault (OD fault)/ E0049 fault (CD fault).
- When F22.05 = 0, no OD/CD time protection. If no OD/CD arrival signal is received during the system OD/CD process, it will continue to open door/close door.

F22.06	OD/CD torque holding	0 - 4 [3]

Define the system selection of torque holding during elevator opening/closing the door.

0: Without OD/CD torque holding.

1: With OD torque holding.

2: With CD torque holding.

3: With OD/CD torque holding.

4: During running process with CD torque holding.

F22.07	Hall call OD holding time	1 - 30 [5s]
F22.08	Internal call OD holding time	1 - 30 [3s]

F22.07 defines the time of holding open door with hall call but without internal call.

F22.08 defines the time of holding open door with internal call.

- If there is CD command input within the OD holding time, the CD command will be immediately responded.

F22.09	Door state at waiting elevator	0 - 2 [0]

Define the elevator door state at spare time.

0: Normal closes the door.

1: Base station OD waiting elevator.

2: Each floor OD waiting elevator.

F22.10	Holding time for base station OD	1 - 30 [10s]
F22.11	Delay time of OD holding	10 - 1000 [30s]

F22.10 defines the holding OD time after the elevator arriving to the base station.

F22.11 defines the elevator holding OD time when there is OD delay signal input.

- If there is CD command input within the setting time, the CD command will be immediately responded.

F22.12	Manufacturer debugging parameter, prohibit to change	
F22.13	Open-through door control mode	0 - 3 [0]

Define the open-through door control modes. Refer to section 8.2.2 Open-through Door Description (page 156) for details.

0: Open-through door control mode 0.

1: Open-through door control mode 1.

2: Open-through door control mode 2.

3: Open-through door control mode 3.

7.2.24 F23: Time Parameters

F23.00	Free return base station time	0 - 240 [10min]

Define that the elevator automatically returns to parking base station after F23.00 setting time without internal call, hall call or any other call.

- F23.00 = 0, not back to base station.

F23.01	Delay time of close lighting and fan	0 - 240 [2min]

Define that the elevator automatically cut off the car lighting and fan power in automic state without running command and after F23.01 setting time.

- F23.01 = 0, no close delay function.

F23.02	Largest floors run interval	0 - 45 [45s]

When elevator running time is over the F23.02 setting time at border upon floors and there is no leveling signals, elevator will alarm E0040 fault (elevator run timeout).

- If the setting value of F23.02 is smaller than 3s, no protection.

7.2.25 F24: Display Parameters of Floor Information

F24.00	Collective mode	0 - 2 [0]

0: Full collective. The elevator responds the up and down running call outside the hall.

1: Up collective. The elevator responds the up running call outside the hall but not responds the down running call.

2: Down collective. The elevator responds the down running call outside the hall but not responds the up running call.

F24.01	Floor 1 display	0000 - 1999 [1901]
F24.02	Floor 2 display	0000 - 1999 [1902]
……	……	0000 - 1999 [……]
F24.09	Floor 9 display	0000 - 1999 [1909]
F24.10	Floor 10 display	0000 - 1999 [0100]

Define the display content of outside hall and inside car display board of corresponding floor.

- The settings are consisted by four bits, two high bits represent tens of floors and two low bits represent units of floors.
- The meanings of high and low bits of setting are as following table:

Such: The 10th floor displays 10, F24.10 = 0100; the first floor displays -1, F24.01=1001.

Setting value	Display	Setting value	Display	Setting value	Display
00	0	09	9	35	U
01	1	10	A	39	Y
02	2	13	H	50	b
03	3	16	P	51	d
04	4	18	-	52	t
05	5	19	No display	53	G
06	6	23	C	54	L
07	7	25	E	55	J
08	8	26	F		

F24.11	Hall call output selection	0 - 3 [1]

0: Seven-segment code.

1: BCD code.

2: Reserved.

3: Binary code.

7.2.26 F25: Test Running Parameters

Group F25 parameters are especially enacted for elevator adjustment. The setting of parameters won't be saved after power failure, and it will return to default.

Note:

Group F25 can only be set by the professional person, which should be with caution.

Otherwise the resulting consequences are undertaken by the persons who set up on their own, hereby declare.

Please make sure that each parameter of Group 25 is set as zero during the elevator normal operation.

F25.00	**Test floor 1**	**0 - F19.00 [0]**
F25.01	**Test floor 2**	**0 - F19.00 [0]**
F25.02	**Test floor 3**	**0 - F19.00 [0]**

Define the target floor when the elevator is in testing operation.

- F25.00 - F25.02 are the same with the internal call commands. The command is durative availability until code is set to 0 instead or power is failure.
- Set as 0, no testing floor.

F25.03	**Test times**	**0 - 60000 [0]**

F25.03 defines the testing operation times.

- Set as 60000, it will run all the time. When set as other value, the elevator will not stop testing operation until the running times reach the setting value.

F25.04	**Special test parameter**	**0 - 65535 [0]**

Bit0: Hall call enable

0: Enabled hall call.

1: Disabled hall call. The MCB does not communicate with HCB, the hall call elevator signal is invalid and the HCB displays E52.

Bit1: OD enable

0: Enabled OD. The OD/CD buttons are normal.

1: Disabled OD. The OD/CD buttons are un-useful and doors don't automatically open.

Bit2: Over-load enable

0: Disabled over-load.

1: Enabled over-load. After the elevator reaches the over-load and there is no over-loaded protection, it will run in accordance with the full load state.

Bit3: Limitation enable

0: Enabled limitation.

1: Disabled limitation. It only can be used in detecting the limitation switch.

Bit4: Random run enable

0: Disabled random run.

1: Enabled random run. According to the internal random function, the controller can randomly assign the hall call registration command between the first floor and the highest floor.

Bit5 – Bit6: Reserved

Bit7: Start UCMP test

0: Do not enable this function.

1: Enable UCMP test.

Bit8: Start brake force test

0: Do not enable this function.

1: Enable this feature.

Bit9 - Bit15: Reserved

7.2.27 F26: Elevator Function Selections

F26.00	Call elevator floor setting	0 - F19.00 [0]

When use for debugging elevator, calling elevator via keypad is the same with the internal call floor command registration.

F26.01	Shaft self-learning	0,1 [0]

0: Does not work.

1: Start shaft self-learning

F26.02	Driver function	0 - 65535 [3]

Bit0: Open driver function

0: Without driver function.

1: With driver function.

Bit2 - Bit1: Hall call disposal at driver mode

00: Buzzer no action, and internal call is not flashing.

01: Buzzer no action, internal call is flashing.

10: Buzzer action, and internal call is not flashing.

11: Buzzer action, internal call is flashing.

Note:
When the internal and hall call are valid at the same floor, the car display defaults 00 (buzzer no action, internal call is not flashing).

Bit3: CD arrival without registration command and auto open door

0: Auto open door.

1: Do not auto open door.

Bit4 - Bit6: Reserved

Bit7: Closed door mode selection

0: Long press the CD button to close the door.

1: Jog to close the door.

Bit8: Automatically close the door

0: The inside of the pull door software is automatically closed.

1: Close the door with the close button.

Bit9 - Bit15: Reserved

F26.03	Firefighting function	0,1 [1]
F26.04	Re-leveling function	0,1 [0]
F26.05	Advanced open function	0,1 [0]

F26.03 - F26.05 define the corresponding function selection.

0: Without corresponding function.

1: With corresponding function.

Note: If you want the re-leveling function and the advanced open function, you should have the advanced open block (MT70-AOB-A).

F26.06	Hall call Modbus communication	0,1 [0]

0: Do not open the hall call Modbus communication.

1: Open this function. When MONT71 requires the hall call board of MONT70, the various floors of the key information will be transmitted to the main control board through Modbus communication

- This method can reduce the hall call wiring, referring to "MONT70 Series Elevator Integrated Controller User Manual".
- For this method, the L1-L24 terminals in response to hall call function (group F13) are invalid.

F26.07	Isolated run	0,1 [0]

0: Do not open this function.

1: Open this function.

F26.08	Locked-elevator BCD code hall call display	0 - 255 [0]

Bit0: To set the SegA output

Bit1: To set the SegB output

Bit2: To set the SegC output

Bit3: To set the SegD output

0: No output.

1: Output.

Bit4 - Bit7: Reserved

F26.09, F26.10	Manufacturer debugging parameter, prohibit to change	

F26.11	Miss delete car command	0,1 [1]

0: No open.

1: Open.

F26.12	Inspection parameter setting	0 - 255 [5]

Bit0: Inspection auto close door

0: Inspection without close door.

1: Inspection auto close door. At inspection operation, press the up/down run button, the elevator will automatically close the door; otherwise, will not output close door signal.

Bit1: Inspection over-current detection

0: Inspection run without limiting 110% rated current.

1: Inspection run with limiting 110% rated current.

Bit2: Stop mode selection at inspection

0: Immediate stop.

1: Dec stop.

Bit3: Detect door lock jump-out fault at inspection mode

Bit4: Detect up/down forced simultaneous operation at inspection mode

Bit5: Detect open/close door simultaneous operation at inspection mode

0: Detect.

1: Do not detect.

Bit6: Door machine non-service floor allow open/close door at inspection

0: Do not allow open/close door.

1: Allow open/close door.

Bit7: Detect the door machine CD arrival at inspection running

0: Do not detect close door arrival.

1: Detect close door arrival.

F26.13	Forced close door	0,1 [0]

0: No open.

1: Open.

F26.14	Door lock jump-out test	0 - 65535 [1]

Bit0: Door-lock jump-out test function

0: No open.

1: Open.

Bit1: Door-lock jump-out test mode

0: Test total door lock circuits together.

- All lock circuits in the door lock closed state, if a door machine OD arrival signal is received, it will alarm E0053 fault (Lock-door short-circuit fault).

1: Test each door lock circuit independently.

- Any one of lock circuits in the door lock closed state, if a door machine OD arrival signal is received, it will alarm E0053 fault (Lock-door short-circuit fault).

Bit2: Door lock short-circuit fault automatic reset

0: Do not reset automatically.

1: Automatic reset.

Bit3: Closed output test door lock short

0: Do not start.

1: Start.

Bit4: X28 high voltage door lock short input

0: Invalid high voltage door lock short input function.

1: High voltage door lock short input function is valid.

Bit5 - Bit15: Reserved

F26.15	Battery-driven run parameter setting	0 - 255 [1]

Bit0: Battery-driven self-rescue timeout protection

0: Protection.

- At battery-driven self-rescue, if the car is in balance load or the rescue driving power's capacity is not adequate, it will cause long emergency rescue time and even dangers occur.
- After Bit0 = 0, it will enable to stop rescuing when auto-running car rescue time is over 100s, and rescue driving time is over 50s.

1: No protection.

Bit1: Permanent magnet synchronous motor battery-driven auto-running

0: No open.

1: Open.

Bit2: Battery-driven direction judgment

0: Auto judge.

- The controller will automatically open the brake and detect the elevator light-load to auto judge the elevator running direction.

1: Judge in accordance with weighing signal.

Bit3: Fixed up run of battery-driven direction

Bit4: Fixed down run of battery-driven direction

0: This bit should not decide the direction.

1: The direction is fixed down run.

Bit5: Automatic torque compensation start for emergency operation

0: Do not start.

1: Start.

Bit6: Emergency Door Movement

0: Keep open the door.

1: Close the door after opening the door.

Bit7: Automatic judgment of emergency operation

0: Action 2 times.

1: Action 1 time.

F26.16	Elevator enhanced function selection	0 - 65535 [1]

Bit0: No run command at stop and auto open door

0: Do not auto open door.

1: Auto open door.

Bit1: Reserved

Bit2: Battery driven reset auto return to base station

0: Auto return to base station.

1: Do not return to base station.

Bit3: Cleared conditions of firefighting back to base station mode

0: Power off or firefighting switch is invalid

1: Fireman input valid and then clear.

Bit4: Non-service floor is allowed to open door at fireman operating elevator

Bit5: Non-service floor is allowed to open the door at fireman operating door machine

0: Not allow to open door.

1: Allow to open door.

Bit6: OD selection at firefighting back to base station power-on

0: Open door.

1: No open door.

Bit7: E0041 clear the internal call

0: E0041 fault clear the internal call.

1: E0041fault do not clear the internal call.

Bit8: Forced Dec switch types

0: Ordinary forced deceleration switch.

1: Trigger forced deceleration switch.

Bit9: Open the function of pulling door manually

0: Do not open this function.

1: Open this function.

Bit10: Selections of up/down limit switch

0: Use the actual up/down limit switch.

1: Use the synthesis of leveling floor and end station switch.

Bit11: Back to leveling automatically

0: Back to leveling automatically due to meeting the running condition.

1: Back to leveling for the setting run command.

Bit12: Car energy-saving selections at OD waiting for elevator

0: Car is not energy-saving.

1: Car is energy-saving.

Bit13: Display the running direction sparkly

0: Do not display.

1: Display.

Bit14: Logic of fan and lighting

0: The logic is normal.

1: The logic is negated.

Bit15: Light curtain action modes of door 1 and door 2

0: Light curtains of Door 1and door 2 act alone.

1: Light curtains have inside association.

F26.17	Contactor contact adhesion failure auto reset	0,1 [0]

Detect the run and the brake contactors' feedback contacts, alarm E0056 fault (run contactor feedback abnormal) and E0057 fault (brake contactor feedback abnormal) if the contacts are deviant, and they can't reset automatically.

If E0056 and E0057 faults occur, this function enables to reset automatically no more than three times as long as these faults disappear.

0: No open.

1: Open.

F26.18	Forced Dec switch adhesion detection	0,1 [1]

This function enables to monitor the forced Dec switch all the time when the elevator is running. If adhesion is detected, it's forced to decelerate.

0: No open.

1: Open.

F26.19	Synchronous motor star-delta contactor parameter setting	0 - 255 [0]

The synchronous motor star-delta contactor can assure that there won't be fast speed slide running even when the brake doesn't work.

Based on the actual wiring diagram, set synchronous star-delta contactor as normally open/ normally closed type, control signal and feedback contact detection signal.

- Details refer to the MCB terminal function parameters of Group F12.
- F26.19 is only valid for the permanent magnet synchronous motor.

Bit0: Synchronous star-delta contactor control selection

0: No control the output.

1: Control the output.

Bit1: Synchronous star-delta contactor normally open or close setting

0: Normally close. Generally the synchronous star-delta contactor uses the normally close.

1: Normally open.

Bit2 - Bit7: Reserved

F26.20	Manufacturer debugging parameter, prohibit to change	
F26.21	Open-through door control	0,1 [0]

0: No open.

1: Open.

F26.22	OD function selection at this floor internal call	0,1 [0]

0: No open door.

1: Open door.

F26.23	OD function of OD delay button	0,1 [0]

0: Pressing the OD delay button does not work during CD process.

1: Pressing the OD delay button does work during CD process.

F26.24	Position deviation too large and return station to run	0,1 [1]

F26.24 defines whether return to base station when the elevator position deviation is too large.

0: Do not return to base station.

1: Return to base station.

F26.25	Position deviation too large and base setting	180 - 700 [400mm]

F26.25 is the base value for detecting deviation too large.

F26.26	Elevator increased function 2	0 - 65535 [0]

Bit0: Close the door via CD button due to no OD arrival

0: The CD button cannot close the door.

1: The CD button can close the door.

Bit1: Detect the timeout of auto back to re-leveling

0: Detect.

1: Do not detect.

Bit2: Safety circuit fault priority

0: Normal safety circuit fault level.

1: High safety circuit fault level.

- If there are other failures in the system, this time after the safety circuit is disconnected, the system automatically resets the original fault, and then the fault code is updated to the present safety circuit disconnection fault.

Bit3: Safety Circuit Breaks Door Machine Status

0: Do not output the opening and closing door.

1: Keep open the door.

Bit4: Overhaul detection leveling signal abnormal

0: No detection.

1: Detection.

Bit5: Ultra-short layer function

0: No opening.

1: Open.

- When the elevator shaft is self-learning, it will automatically detect if there is an ultra-short layer. If it exists, Bit5 is automatically set to 1; if it does not exist, Bit5 is automatically set to 0.

Bit6: Timeout for well self-learning detection

0: Detection.

1: Not detected.

Bit7: E38\E39 fault automatically returns to the base station

0: Do not return to the base station automatically.

1: Automatically return to the base station.

Bit8: Automatic reset for one hour fault

0: Do not reset automatically.

1: Automatic reset.

Bit9: End station back leveling

0: Return to the nearest leveling.

1: Return to the leveling layer away from the end station.

Bit10: No door open signal can be automatically closed

0: Do not automatically close the door.

1: Automatically close the door with no door open signal in excess of F22.03 time.

Bit11: Closed-in-signal type

0: Normal.

1: Triggered.

Bit12: Hand pull door mode 2

0: Not enabled.

1: Enabled.

Bit13: Automatic reset of upper and lower limit faults

0: Do not reset automatically.

1: Automatic reset.

Bit14: Reverse Registration No.

0: Reverse pin number.

1: Reverse sales number.

Bit15: Unit selection for F23.01

0: Minutes.

1: Second.

F26.27	Accessaries	0 - 65535 [0]

Bit0: HDRU

0: HDRU not combined.

1: HDRU combined.

Bit1 - Bit15: Reserved

F26.28	Elevator additonal functions selection 3	0 - 65535 [0]

Bit0: Elevator R-cam output method

0: Consistent output of the relevant door command.

1: Interval output for door command.

Bit1: Door lock fault detection

0: Normal detection.

1: Quick detection.

Bit2: Operation panel Fault occurred in fault mode display

0: Go to fault mode display.

1: Maintain the original menu.

Bit3 - Bit15: Reserved

F26.29	Emergency return leveling and stop delay	0.000 - 3.000 [0.100s]

Define at emergency back to leveling operation, after receive the up/down leveling signal and the setting time of F26.29, decelerate to stop.

- Used to adjust the leveling accuracy at back to leveling floor.

F26.30	Return leveling and stop delay	0.000 - 3.000 [0.100s]

Define at auto back to leveling run and open door re-leveling run, after receive the up/down leveling signal and the setting time of F26.30, decelerate to stop.

- Used to adjust the leveling accuracy at back to leveling floor, and will be automatically update after the shaft self-learning.
- Users generally do not need to change it. When the back leveling floor has poor accuracy or returns to leveling floor more than three times at one door zone, you can adjust the F26.30 for the leveling adjustment.

F26.31	Hall call parameter setting	0 - 65535 [512]

F26.31defines the way of hall call display, used with F26.32.

- Only when F26.06 set as 1 and equipped with MT70-HCB-* hall call board, can F26.31 will work.
- When F26.06 = 1 (open the hall call Modbus communication), F26.32 - F26.34 will work.

Bit0: The way of digital arrow display

0: Scrolled.

1: Fixed.

Bit1: Format of arrow display

0: Big arrow.

1: Small arrow.

Bit2: Direction button input type

Bit3: Firefighting signal input type

Bit4: Locked-elevator signal input type

0: Normally open.

1: Normally close.

Bit5: Floor display

0: Dynamic.

1: Direct.

Bit6: Single digit display

0: Center display.

1: Unilateral display.

Bit7: Energy-saving display selection

0: Enabled energy-saving display.

1: Disabled energy-saving display.

Bit9 - Bit8: LCD bright adjustment

00: Low bright.

01: Middle bright.

10: High bright.

11: The brightest.

Bit10: HCB display fault code

0: No display.

1: Display.

Bit11 - Bit15: Reserved

F26.32	Hall call parameter setting confirm	0,1 [0]

0: No action.

1: Hall call parameter setting confirms.

Note: After modify F26.31 parameter, it will need to set F26.32 as 1, and send the hall call set to the HCB and the internal call display board of various floors by communication. If it only need modify Bit10 of F26.31, there is no need to set F26.32.

F26.33	Hall call HCB-H indicator 1 meaning	0 - 5 [1]
F26.34	Hall call HCB-H indicator 2 meaning	0 - 5 [2]

F26.33 - F23.34 define the meanings of indicator1 and indicator 2 on MT70-HCB-H.

- The positions of indicator 1 and indicator 2 refer to section 4.3 (page 30).
- The user can flexibly choose, according to the actual configuration of the elevator.

0: No function.

1: Full load indication.

2: Inspection indication.

3: Stop indication.

4: Over load indication.

5: Fault indication.

F26.35	Hall call address verification	0,1 [0]

0: Normal display.

1: Hall floor display data is changed to show hall call address.

F26.36	Manufacturer debugging parameter, prohibit to change	

7.2.28 F27: Additional parameter

F27.00	Brake force detection method	0 - 2 [Synchronous motor 2 asynchronous motor 0]

0: Invalid.

1: Start detection manually.

- The elevator control system will perform brake force detection based on the setting of F27.01-F27.04.

2: Automatically start detection.

F27.01	Brake force detection period	1 - 15 [1 day]
F27.02	Brake detection duration	1 - 10 [5s]
F27.03	Brake detection torque	60 - 150 [100%]
F27.04	Brake detection allowable pulse size	1 - 99 [5]
F27.05	Brake detection success times	0 - 65535 [0]

The braking force detection is based on an automatic detection function of the elevator brake force. The detection software is HpmontBrakeMonitor.

- The keypad F10 group from 0 to 1 or F25.04 bit8 set as 1 is to start the brake force detection manually.
- After the brake detection is successful, the F27.05 value will be automatically incremented; if the brake detection fails, the control system will report the braking force self-test failure (E66).

E66 fault reset conditions:

- When F17.07 Bit3 = 1, E66 can only be reset manually in the inspection mode.
- When F17.07 Bit3 = 0, E66 cannot be reset automatically. The self-testing of the brake force must be performed again in automatic mode and can only be reset after the test has been passed.
- After F17.07 Bit3 is powered on or it is automatically reset once, it will be automatically cleared.

Note:

1. There is no clock chip inside the MONT71 control board. Its internal time is the time accumulated by the internal timer.

2. F27.01 is 1 day when the control system does not set the brake switch detection.

3. When F27.00 is set to 1 to perform manual brake force detection, the value of F27.00 will automatically return to 0.When the manual brake force detection is started with keypad F10 group or F25.04 Bit8, the value of F27.00 is not affected.

F27.06	Second fire station	1 - F19.00 [0]
F27.07	X29 expansion terminal Function selection	0 - 51 [0]
F27.08	Y24 expansion relay function selection	0 - 46 [0]

Refer to F12.01-F12.24 (X1 - X24 terminal) for meaning of F27.07.

For the meaning of F27.08, see F12.28-F12.51 (Y0 - Y23 relay).

F27.09	Start DC braking current	50 - 150 [100%]
F27.10	Start DC brake current duration	0.0 - 3.0 [0.0s]
F27.11	DC brake current at shutdown	50 - 150 [100%]
F27.12	Stop DC braking current start frequency	0.20 - 10.00 [0.50Hz]
F27.13	Running minimum current limit	5 – 100 (F07.11) [20%]
F27.14	Running minimum current detection time	0.0 - 5.0 [0.0s]
F27.15	Brake release frequency	0.00 - 10.00 [0.00Hz]

F27.09 - F27.15 only works if theAsyn. motor does not have encoder in inspection control.

F27.16 - F27.18	Manufacturer debugging parameters, prohibit changes	
F27.19	Static Current	0.0 - 9.9 [0.0A]

F27.20	Magnetic long board (MT71-SVC parameter)	500 - 1500 [700mm]
F27.21	Deceleration distance (MT71-SVC parameter)	0 - 9999mm [Actual value]
F27.22	Real-time deceleration distance (MT71-SVC parameter)	0 - 9999mm [Actual value]

F27.20 - F27.22 Only MT71-SVC is non-standard.

F27.23	Open loop machine parameters	0 - 65535 [0]

Bit0: Powering at Non-leveling Area

0: Do not return to the base station.

1: Return to the base station.

Bit1: Hierarchical deceleration mode

0: Deceleration of a leveling signal is encountered.

1: Deceleration of two leveling signals is encountered.

BIt2: Number of leveling switches

0: Double leveling.

1: Single switch.

Bit3: Open loop dining ladder function

0: Not enabled.

1: Enable special meal ladder function.

Bit4 - Bit15: Reserved

F27.24 - F27.28	Manufacturer debugging parameters, prohibit changes	
F27.29	Leveling fine-tuning enable	0,1 [0]

0: Disable.

1: Enable.

F27.30	1 floor down leveling fine-tuning	0 - 60 [30mm]
F27.31	2 floor down leveling fine-tuning	0 - 60 [30mm]
F27.32	3 floor down leveling fine-tuning	0 - 60 [30mm]
F27.33	4 floor down leveling fine-tuning	0 - 60 [30mm]
F27.34	5 floor down leveling fine-tuning	0 - 60 [30mm]
F27.35	6 floor down leveling fine-tuning	0 - 60 [30mm]
F27.36	7 floor down leveling fine-tuning	0 - 60 [30mm]

F27.37	8 floor down leveling fine-tuning	0 - 60 [30mm]
F27.38	9 floor down leveling fine-tuning	0 - 60 [30mm]
F27.39	10 floor down leveling fine-tuning	0 - 60 [30mm]
F27.40	11 floor down leveling fine-tuning	0 - 60 [30mm]
F27.41	12 floor down leveling fine-tuning	0 - 60 [30mm]
F27.42	13 floor down leveling fine-tuning	0 - 60 [30mm]
F27.43	14 floor down leveling fine-tuning	0 - 60 [30mm]
F27.44	15 floor down leveling fine-tuning	0 - 60 [30mm]
F27.45	2 floor up leveling fine-tuning	0 - 60 [30mm]
F27.46	3 floor up leveling fine-tuning	0 - 60 [30mm]
F27.47	4 floor up leveling fine-tuning	0 - 60 [30mm]
F27.48	5 floor up leveling fine-tuning	0 - 60 [30mm]
F27.49	6 floor up leveling fine-tuning	0 - 60 [30mm]
F27.50	7 floor up leveling fine-tuning	0 - 60 [30mm]
F27.51	8 floor up leveling fine-tuning	0 - 60 [30mm]
F27.52	9 floor up leveling fine-tuning	0 - 60 [30mm]
F27.53	10 floor up leveling fine-tuning	0 - 60 [30mm]
F27.54	11 floor up leveling fine-tuning	0 - 60 [30mm]
F27.55	12 floor up leveling fine-tuning	0 - 60 [30mm]
F27.56	13 floor up leveling fine-tuning	0 - 60 [30mm]
F27.57	14 floor up leveling fine-tuning	0 - 60 [30mm]
F27.58	15 floor up leveling fine-tuning	0 - 60 [30mm]
F27.59	16 floor up leveling fine-tuning	0 - 60 [30mm]

7.3 Y: Manufacturer Function Parameters

The Group Y is the manufacturer parameters group for debugging MONT71 at the factory before delivery, which need no concerned about at using.

FAMCO
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Chapter 8 System Typical Application and Adjustment

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8.1 Adjustment Process

MONT71 can be commissioned in the sequence shown in the table after mechanical installation and wiring.

sequence	Content
1	Wiring Check，See section 8.1.1, page 132
2	Parameter Setting，See section8.1.2, page 133
3	Motor Parameter Auto-tuning，See section 8.1.3, page 135
4	Inspection Operation，See section 8.1.4, page 138
5	Shaft Self-learning，See section 8.1.5, page 139
6	Check before High Speed，See section 8.1.6, page 140
7	High Speed Running，See section 8.1.7, page 140
8	Function Test，See section 8.1.8, page 142
9	Comfort Adjustment, see section 8.1.9, page144
10	UCMP function, see section 8.1.10, page 150
11	Automatic brake force detection function, see section 8.1.11, page 151

8.1.1 Wiring Check

After the control system wiring is finished, it need check the wiring:

1	Check the electrical and mechanical wiring to ensure the safety.
2	Check each connection whether is right in accordance with the manual and the wiring description. At least two staffs are required in debugging. And cut off the power immediately if abnormal situation occurs.
3	Check if the parts' types are matched. The safety circuit is passed through and the signal is normal. The door lock circuit is passed through and work reliably.
4	Shaft is smooth and no one is in the car, and it possesses the conditions suitable for the elevator safety running.
5	Really check the input power and the motor wirings whether are correct to avoid misusing power transmission and cause MONT71 damage.
6	Check the control cabinet, motor, car ground wire and hall ground wire whether is safely grounded to ensure the personal safety. *Note: The control cabinet and the motor should be confidential single point grounded.*
7	Check the short-circuiting. If there is short-circuiting, please do not power on until exclude the short-circuiting. • The input power supply interphase to the ground. • The motor interphase to the ground. • 220V interphase to the ground. • The switch power supply 24V to the ground. • The communication wire to the ground. • The encoder wire to the ground.
8	Make sure the following items are reliably grounded. • The control cabinet is grounded. • The motor is grounded. • The car is grounded. • The door machine is grounded. • The pipeline is grounded. • The shielded encoder and motor end are grounded. *Note: The encoder's shielded cable requires one terminal of MONT71 to connect to the ground reliably.*

9	Check the wirings of communication wire, encoder wire and power supply wire. • The well's communication wire is twisted pair and twisted distance is < 35mm. • The encoder wire and the power supply wire should be separated from the alignment. • The signal wire and the power supply wire should be separated from the alignment.

8.1.2 Parameter Setting

System power and check

Remove the brake control wire before power on.

1. Check the MCB +24V power supply input, and SK6 terminal of +24V and COM should be 24V.

2. Observe the corresponding LED lights of MCB X25 - X27 to confirm that the high voltage safety circuit and the high voltage door lock circuit are in normal status. If the site still has low voltage safety circuit signal and low voltage lock signal, please check the corresponding input terminals of the MCB LED lights.

3. Observe the MCB Y1 - Y23 LED lights to confirm the control brake relay without outputting, and connect to the brake control wire until power is cut down.

Set MONT71 parameters (must follow these steps)

Restore the factory parameter: F01.02 is set as 1 (restore to factory settings), press ENT key, and then the controller parameters restore to factory setting value.

Set the other parameters refer to the following table. And check the corresponding state of MCB and CTB I/O terminal setting function by group D.

Ref. Code	Function	Recommended value	Remark
F00.00	Motor type	Based on the actual setting	
F00.01	Control mode	2 (VC control)	
F00.02	Elevator max running speed	Based on the actual setting	
F00.03	Elevator rated speed	Based on the actual setting	
F00.04	Elevator rated load	Based on the actual setting	
F00.05	Controller max output frequency	Based on the motor setting	Generally set as the motor rated frequency
F00.06	Traction machine mechanical parameters	The system automatically calculate	
F00.07	Operation mode	1 (distance control)	
Group F03	Acceleration and deceleration curve parameters	Be set as needed	
Group F04	Speed Parameters	Be set as needed	

Ref. Code	Function	Recommended value	Remark
F07.00	Asynchronous motor rated power	Based on the actual setting	The motor type is asynchronous motor; you need to set the asynchronous motor nameplate parameters of Group F07.
F07.01	Asynchronous motor rated voltage	Based on the actual setting	
F07.02	Asynchronous motor rated current	Based on the actual setting	
F07.03	Asynchronous motor rated frequency	Based on the actual setting	
F07.04	Asynchronous motor rated RPM	Based on the actual setting	
F07.05	Asynchronous motor power factor	Based on the actual setting	
F10.00	Synchronous motor type	Based on the actual setting	The motor type is synchronous motor; you need to set the synchronous motor nameplate parameters of Group F10. *Note:* *If F10.00 and F10.06 - F10.09 have no accurate parameters, please set as zero, or may not run correctly.*
F10.01	Synchronous motor rated power	Based on the actual setting	
F10.02	Synchronous motor rated voltage	Based on the actual setting	
F10.03	Synchronous motor rated current	Based on the actual setting	
F10.04	Synchronous motor rated frequency	Based on the actual setting	
F10.05	Synchronous motor rated RPM	Based on the actual setting	
F10.06	Synchronous motor stator resistance	Based on the actual setting	
F10.07	Synchronous motor cross axis inductance	Based on the actual setting	
F10.08	Synchronous motor direct axis inductance	Based on the actual setting	
F10.09	Synchronous motor Back EMF	Based on the actual setting	
F11.00	Encoder interface card selection	Based on the actual setting	Set according to the encoder
F11.01	Encoder P/R	Based on the actual setting	
F11.02	Encoder direction setting	Based on the actual setting	
Group F12	MCB input terminal setting	Set according to the drawings • Select the input high or low active by jumper; • Select normally open or close input by parameter setting. • Ensure the input state through observing the corresponding LED lights of MCB input terminals. **X25 - X27 are high voltage safety and door lock input, for the safety, please ensure the safety circuit and the door lock circuit are correct.**	
	MCB relay output terminal setting	Set according to the drawings • Ensure the relay output state by observing the corresponding LED lights of relay output terminals.	
Group F13	MCB L-terminal function parameter setting	Set according to the drawings • Ensure the input and output state by observing the corresponding LED lights of MCB L- terminals.	

8.1.3 Motor Parameter Auto-tuning

Note:

1. The crane car is needed for the rotation auto-tuning but not needed for static auto-tuning.

2. The motor and the encoder parameters must be set correctly before parameter auto-tuning.

Asynchronous motor - - Parameter auto-tuning

Configure the A/B/Z/U/V/W encoder and SINCOS encoder	
1	You should set F00.07 as 0 (keypad control).
2	Setting F07.06 as 1 (static auto-tuning) or 2 (rotation auto-tuning), then press RUN key of keypad to do parameter auto-tuning. The motor does not rotate at static auto-tuning but rotate at rotation auto-tuning.
3	After finish auto-tuning, set F00.07 as 1 (distance control).
Note	
1	*When auto-tuning, it can automatically open the run contactor; if at rotation auto-tuning, it need manually open the brake contactor for the safety.*
2	*At static auto-tuning, the motor will give howling duration of about 30s.*
3	*At rotation auto-tuning, if the motor occurs to oscillation and even overcurrent, please press STOP key to stop auto-tuning.* ***Take measure:*** *Properly adjusting the F07.21 (oscillation-suppression mode) and F07.22 (oscillation-suppression coefficient) can remove the motor oscillation.*
4	*The asynchronous motor parameter auto-tuning does not require the encoder pole angle learning. After finish auto-tuning at inspection operation, if alarm E0030 fault (encoder reverse direction), the encoder AB directions may be connected reversely.* ***Take measure:*** *Please change the encoder direction (F11.02).*

Synchronous motor - - Rotation auto-tuning

Configure the A/B/Z/U/V/W encoder and SINCOS encoder	
1	You should set F00.07 as 0 (keypad control).
2	Set F10.10 as 2 (rotation angle auto-tuning), and press keypad RUN key to do parameter auto-tuning.
3	**Configure the A/B/Z/U/V/W encoder** **Auto-tuning process:** The controller with DC will locate the motor in one direction and begin to drive motor at a slow speed, and then stop running after some time, which represents that the auto-tuning is completed and obtain F10.12 (motor initial angle) and F11.02 (encoder direction setting).
	Configure the SINCOS encoder **Auto-tuning process:** The controller with DC will locate the motor in one direction and begin to drive motor at a slow speed, and then stop running after one circle, which represents that the auto-tuning is completed and obtain F10.14 - F10.17 (encoder parameters), F10.12 (motor initial angle) and F11.02 (encoder direction setting).
Note	
1	*During step 2 and step 3, it need manually open the brake contactor.*
2	*If the system has synchronous motor star-delta contactor, please refer to the function parameter setting of section 9.2.1 of power failure emergency running program, at auto-tuning the system will automatically control the star-delta contactor, otherwise it will alarm over-current fault due to the output short-circuit.*
3	*At rotation auto-tuning, it will automatically detect the encoder direction.*
4	*Encoder wiring need strictly connect in accordance with the wiring diagram of the encoder, otherwise even if the A/B/Z connections are correct, the motor will run abnormally due to the U/V/W or C/D phases connection fault.*
5	*For sine and cosine encoders, self-tuning three times, the results of the two minus, the difference should be within 5 °, or with 360 ° / traction motor integer multiples within 5 °, the result is considered normal , otherwise it needs to be re-tuned.* ***If:*** *The motor pole pairs are 12, and three times the auto-tuning results are 241.1°, 59.8° and 120.2°, the difference of three times will be less than 5°.* ***For:*** *Calculate 360°/ 12= 30°, three times result is 241.1°- 59.8°= 181.3° and 30° integer multiple is 180°, and their difference is 1.3° which is less than 5°; equally 120.2°-59.8°= 60.4° and 30° integer multiple is 60°, the difference is 0.4° which is less than 5°.*
6	*For the A/B/Z/U/V/W encoders, F10.12 is electrical angle, and each time the deviation of F10.12 results should be less than 30°, which can be considered as the normal, otherwise need to restart auto-tuning.*
7	*If the abnormal occur during auto-tuning process, press STOP key to stop auto-tuning.*
8	*After finish the parameter auto-tuning, it need set F00.07 (operation mode) as 1 (distance control).*
9	*At auto-tuning, the motor just return from standstill to start the process, if alarm E0030 fault (encoder reverse direction) or E0031 fault (encoder disconnection), you can try to reduce the KP and KI of ASR (Group F08).*

Synchronous motor - - Static auto-tuning

Before do the static auto-tuning, please refer to the preparation work of section 8.1.4 Inspection Operation, and then do the synchronous motor static auto-tuning.

Configure the A/B/Z/U/V/W encoder and SINCOS encoder	
1	You should set F10.12 (synchronous motor initial angle) as 0.
2	F00.07 is set as 1 (distance control). F10.10 is set as 1 (static angle auto-tuning).
3	**Configure the A/B/Z/U/V/W encoder** Give the signals to terminal inspection and direction, at auto-tuning, the controller issues a series of pulse voltage, and the motor issues humming. The motor will run at inspection after the humming is over, and stop running after one circle. Obtaining F10.12 (synchronous motor initial angle) presents that the static auto-tuning is over.
	Configure the SINCOS encoder Give the signals to terminal inspection and direction, at auto-tuning, the controller issues a series of pulse voltage, and the motor issues humming. The motor will run at slow speed after the humming is over, and automatically stop running after one circle. Obtaining F10.14 - F10.17 (encoder parameters) and F10.12 (synchronous motor initial angle) presents that the static auto-tuning is over.
4	After the keypad display interface exits parameter auto-tuning interface, the inspection direction command can be removed.
Note	
1	*If the system has synchronous motor star-delta contactor, please refer to the function parameter setting of section 9.2.1 of power failure emergency running program, at auto-tuning the system will automatically control the star-delta contactor, otherwise it will alarm over-current fault due to the output short-circuit.*
2	*The preset direction is inconsistent with the actual running direction.* ***Take measures:** Set the reverse value of F00.10 (elevator run direction), and re-start to do auto-tuning.*
3	*During the auto-tuning process, if over-current or encoder reverse fault is occurred, it may be the encoder reverse direction.* ***Take measures:** Set F11.02 as 1 (the reverse direction), and re-start to do auto-tuning.*
4	*Since the static auto-tuning of SINCOS encoder is over, run at inspection again to check whether operating normally. If occur fault or out of control, check whether the C/D phases of SINCOS encoder are connected reversely.*
5	*For sine and cosine encoders, self-tuning three times, the results are subtracted by two, the difference of F10.12 should be within 5 °, or difference from motor pole pairs is within 5 °, the results It is considered normal, otherwise it needs to be re-adjusted.*
6	*For A/B/Z/U/V/W encoders, F10.12 is the electrical angle. Self-tuning for three times, the results will be reduced by two, F10.12 -the difference should be within 30 °, the results will be considered normal, otherwise it needs to be re-adjusted.*
7	*If auto-tuning is unsuccessful, there will be out of control danger. It is recommended that two people with: one press the inspection button, the other press the emergency stop button, when occur out of control, you can promptly cut off power.*
8	*If F10.12 (synchronous motor initial angle) is zero, the elevator can not go staircase.*
9	*Static auto-tuning is needed to meet that the door lock circuit is closed, and the safety circuit is closed.*
10	*If the abnormal occur during auto-tuning process, press the emergency stop button to stop auto-tuning.*
11	*At auto-tuning, the motor just return from standstill to start the process, if alarm E0030 fault (encoder reverse direction) or E0031 fault (encoder disconnection), when changing the encoder direction (F11.02) is invalid, you can try to reduce the KP and KI of ASR (Group F08).*

8.1.4 Inspection Operation

Preparation work before inspection operation	
Before inspection operation, **please confirm the following points:**	
1	The inspection switch of control cabinet is in the "inspection" position, and the inspection switch of car top is in the "normal" position.
2	The safety circuit and the door lock circuit of machine room and shaft are normal and effective. *Note: No short-circuit the safety circuit or the door lock circuit.*
3	The encoder is installed correctly and wiring is normal.
4	After power on the MONT71 display is normal, and checks the MONT71 parameter settings are correct, the keypad's "status display interface" displays the elevator running state as "inspection", the MCB's INS is lighting.
5	Motor brake cable is properly connected to the terminals of the control cabinet.
6	The wirings of upper and lower terminal deceleration switch and car top inspection priority circuit are normal.
Machine room inspection operation	
1	To make sure that the direction of motor is correct. If it is not correct, please check the up/down input terminal connection and parameter setting, if the connection is correct, please set the F00.10 as 1 (elevator running direction).
2	At elevator slow speed up or down running, if MONT71 displays motor's feedback speed instability or excessive preset deviation value, you need to check the wiring between the encoder and encoder interface card: • All connections are correct. If the encoder is a differential signal, the shielded twisted pair cable should be used; otherwise, you can use the general shielded cable. • Wiring is reasonable. The encoder cable and the power line must be strictly separated, which cannot go with a trunking. • Check the shielded wire and the shielded network are reliably grounded.
3	Check up and down two leveling switches and door zone signal wiring. If the order is wrong, check the external wiring. **The correct is:** • **At the elevator slow speed up running, the successively effective signal is: up leveling signal, door zone signal and down leveling signal.** • **At the elevator slow speed down running, the successively effective signal is: down leveling signal, door zone signal and up leveling signal.** For the installation of leveling signals, see MT70-AOB-C Instruction Manual.
Note	*1 On many occasions, the slow speed running of the machine room is not inspection run, but the emergency electrical operation. At this time, in the safety circuit, the safety gear switch, the governor switch, the up overspeed protection switch, the up and down terminal limit switch and the buffer reset switch are jump out in the slow speed run, so you must pay particular attention to it.* ***Suggestion:** The emergency electrical running time and distance of the machine room are not too long, but do not run the car to the end terminal position.*
	2 When the shaft self-learning is over, and change F00.10 (elevator running direction), the shaft self-learning is needed to be restarted.

Car top inspection operation	
It can not run car top inspection until fully verify the machine room inspection run properly. During the first run, you can set a smaller inspection speed. Actually set F03.06 (Acceleration Acceleration), F04.00 (Inspection Running Speed), and F26.12 (Treating Parameter Setting).	
1	First turn the car top automatic and inspection switch to inspection position, therefore to confirm that up and down buttons in machine room control cabinet are invalid.
2	*Jog press the up and down buttons of car top to confirm the button direction and the car running direction are consistent.*
3	Operating the elevator up and down on car top for commissioning a back and forth, carefully observe the car around during commissioning process and confirm that no obstacle hinders the car running throughout the shaft.
4	Through the car top inspection operation, confirm the shaft end terminal deceleration switch action and the action in correct position.
5	Through the car top inspection operation, confirm that shaft leveling switch and leveling plate installation are correct; at every leveling position, each leveling switch action point is correct.
Note	*1 At car top inspection operation, you should always pay attention to the car whether encounter other obstacles. If so, stop in time.*
	2 At inpsection runtime, if the shaft switch is not installed in place, the system may alarm fault, which can be shielded by function parameter F26.12 (inspection parameter setting).

8.1.5 Shaft Self-learning

Before high speed running, the elevator must do shaft self-learning.	
1	The elevator is in inspection state.
2	Makes the elevator arrive to the lower limit position, and ensure that the down forced deceleration signal is valid and the present floor is floor 1.
	Note *1 For a total of two floors self-learning, you need to ensure that the down leveling switch is under the leveling plate.*
	2 For the total floors are greater than two, there is at least one leveling switch in the leveling plate.
3	Setting F26.01 as 1 (start shaft self-learning) by the keypad, then the elevator starts the shaft self-learning (or by using small keypad enter Group F7 to set zero as 1 (start shaft self-learning)).
4	At shaft self-learning, the elevator runs at shaft self-learning speed (F04.03), and records the leveling plate length, each floor height and up/down forced deceleration switch position.
5	When the elevator runs to the upper limit bit, it will automatically stop. If there is no fault alarm, indicate the completion of the self-learning process.
Note	
1	*Check parameters F19.12 and F19.13 to confirm that you learn the correct forced deceleration position; Check Group F20 function parameters to confirm whether learning the correct floor data.*
2	*Check that parameters of D03.02 and D03.03 are consistent with the actual.*
3	*Check that parameters of D05.06, D05.07 and D05.08) are consistent with the actual.*
4	*After adjust the leveling plate or the forced deceleration switch position, must restart the shaft self-learning.*
5	*The shaft self-learning can be interrupted in the following cases: 1) the inspection switch switches to normal position, this time alarms self-learning fault; 2) operation fails.*
6	*If the shaft self-learning is unsuccessful, you may refer to the reason 9.1 Troubleshooting (page 131).*

8.1.6 Check before High Speed

Check the internal/hall call elevator signal via the state parameters of Group D, as following table.

D03.00: Present floor	D03.02: Distance of lowest floor
D03.01: Present height	D03.03: Distance of highest floor
D03.04 / D03.05: Registration state of front door / back door 10 - 1 internal call floor	
D03.06 / D03.07: Registration state of front door / back door 9 - 1 hall call up run	
D03.08 / D03.09: Registration state of front door / back door 10 - 2 hall call down run	

Open/Close Door Debug	
1	Turn the inspection switch to the inspection position. Set parameter for the door machine inverter to ensure that its running curve is normal and output OD/CD arrival signal normally.
2	According to system configuration, connect the OD/CD arrival signal of the door machine inverter to the control system.
3	The elevator inspection opens to the leveling area.
4	The OD/CD command is given by the following three methods: • Via the up/down command, the elevator automatically closes the door; at the same time give the up/down command, elevator automatically opens the door. • Via the keypad, long press RUN key to open the door, and long press STOP key to close the door. • Via the car's OD/CD button to operate.
5	Check the door machine running direction whether correct, the OD/CD arrival signal whether normal, and the light curtain and touch board signal whether effective action.
Note	
1	*Using the keypad checks the D04.00 and D04.01 so as to monitor door machine OD/CD arrival signal, light curtain signal and safe touch board signal etc.*
2	*In inspection mode, light curtain and safe touch board action do not open the door but can monitor the signal whether normal.*

8.1.7 High Speed Running

High speed running precondition	
1. Door lock circuits are connected.	4. Floor storey data is correct.
2. No 2 or 3-level fault at elevator.	5. F10.12 (synchronous motor initial angle) is not 0.
3. Door machine CD arrival signal is valid.	6. No over-load signal input.
High speed commissioning	
After fully validate the inspection running normally and shaft self-learning success, the high speed commissioning can be operated. After the shaft self-learning is completed, the system will automatically calculate the speed curve adapted to the elevator operation in accordance with the elevator floor distance, and automatically store to F19.07 - F19.11 (highest speed of curve). General users do not need to modify.	
1	Turn the inspection switch to normal.
2	Using keypad to set F26.00 (call elevator floor setting), and make single-floor, double-floor, multi-floor and full-floor automatic operation.
3	To confirm the elevator normally switch door, acceleration and deceleration, call elevator and parking.

Safe test running	
Safety circuit test	• At the elevator standby, and safety circuit is disconnected, the elevator can not run and alarm E0041 fault (safety circuit disconnection). • At the elevator running, and the safety circuit is disconnected, the elevator emergency stop and alarm E0041 fault (safety circuit disconnection). • After the safety circuit is closed, the fault is automatically reset.
Door lock circuit test	• At the elevator standby, and the door lock circuit is disconnected, the elevator can not run. • At the elevator running, and the door lock circuit is disconnected, the elevator emergency stop and alarm E0042 fault (door locked disconnection during running). • After the door lock circuit is closed, the fault is automatically reset.
Contactor adhesion protection	• The artificially created adhesions situation of system configuration such as: the run contactor, the brake contactor, the synchronous star-delta contactor, the locked-door contactor etc. can confirm that the system be protected.
Run timeout protection test	• At the inspection mode, operate the elevator to floors of non-leveling area, and removal of leveling signal line. • Turn the inspection switch to normal position, and the elevator returns to leveling floor at inspection speed. When the running time exceeds the preset time of F23.02 (largest floors run interval), the system will emergency stop and alarm E0040 fault (elevator run timeout). *Note: If within the F23.02 (largest floors run interval), the elevator detects E0058 fault (leveling signal abnormal) first, the system will not alarm E0040 fault (elevator run timeout), which is normal phenomenon. The leveling signal has beening detected due to a leveling abnormal signal detection module.* ***Take measure:** Set F23.02 as 10s. After fault is reset, re-start to do the run timeout protection test. When alarm E0040, it will restore F23.02 to factory value (45s).*
Over-load function test	• Test requirements: the elevator overload switch action, check the elevator should not close, buzzer inside the car, internal call board with overload display. *Note: It need set the corresponding output functions of Group Y as the buzzer output (No. 21 function) and over-loaded output (No. 22 function).*

Split-level protection test

The elevator is running to the middle floor, modify F19.01 (present floor) for other values and confirm that the elevator running to the top or bottom floor can normally decelerate without leveling hoisting or squatting.

- Change F19.01 to a smaller number and call the elevator on the highest floor to confirm that the elevator will not be topped;
- Change F19.01 to call the elevator on the lowest floor to confirm that the elevator will not bottom out.

Note	
1	*Do not set F19.01 as 1 or the heighest floor; otherwise it will alarm E0039 fault (down forced Dec switch disconnection) or E0038 fault (up forced Dec switch disconnection).*
2	*When the forced deceleration acts, elevator will creep to the end station leveling area at speed of 0.100m/s. After the leveling signal is valid, by adjusting F03.14 (forced stop Dec jerk) to ensure the leveling accuracy (F03.14 will automatically update after the shaft self-learning).*
3	*If open the position deviation too large detection function (F26.24 = 1), when the elevator detect that position deviation is greater than the preset reference value (F26.25), elevator will immediately decelerate and creep to the leveling area at speed of 0.100m/s. After open the door, the elevator will automatically return to the base station at speed of 0.200m/s.*

8.1.8 Function Test

According to the actual needs, set Group F26 parameters (elevator function selections), and adjust Group F21 parameters: parking base station (F21.00), fire base station (F21.01), Locked-elevator base station (F21.02), and service floor (F21.03).

Auto running test	
Register certain internal call signals in the car Confirm that the elevator can normally close the door, start, run at high speed, and in the recent instruction registered floors can automatically slow down, stop, correctly eliminate number (elimination number of instructions and stopping floors should be the same), and open the door.	
Register certain up/down hall call signals outside the hall Confirm that the elevator can normally close the door, start, run at high speed, and can normally stop, slow down, correctly eliminate number and open the door.	
Driver running test	
Open the driver running function via F26.02 (driver function parameter), while the factory default has opened this function.	
Turn the car switch to the driver state and register certain internal call signals Confirm that the continuous press on CD button will make the elevator close the door (if you release the CD button before the door closes, the elevator will immediately act from CD action to OD action till the door is opened). After the door is closed, the elevator will automatically start, run at high speed, and automatically decelerate in recent registered instruction floors, stop, correctly eliminate number and automatically open the door.	
Register certain up/down hall call signals outside the hall Confirm that the continuous press on CD button will make the elevator close the door (if you release the CD button before the door closes, the elevator will immediately act from CD action to OD action till the door is opened). After the door is closed, the elevator will automatically start, run at high speed and normally automatic interception, decelerate, correctly eliminate number and automatically open the door.	
Isolated running test	
1	Open the isolated running function via F26.07 (isolated run), while the factory default does not have opened this function.
2	Turn the car switch to independent state, observe outside hall that should be no floor dispaly (or there is floor display with sign similar to "disable"), and call buttons should not work.
3	Register the instruction inside the car and continuous press on CD button will make the elevator close the door (if you release the CD button before the door closes, the elevator will immediately act from CD action to OD action till the door has opened). After the door is closed, the elevator will automatically start, run at high speed, and automatically decelerate in recent registered instruction floors, stop, correctly eliminate number and automatically open the door.
Firefighting back to base station function test	
1	Open the firefighting function via F26.03 (firefighting function), and the factory default has opened.
2	According to the actual situation, set F21.01 (fire base station). The firefighting switch can be connected to the firefighting input terminals of HCB, and also can be connected to the input terminals of MCB X1 - X24 (F12.01 - F12.24 setting).
3	Turn on the firefighting switch off fire base station switching, observe whether the elevator can normally return to fire base station and keep opening the door after arrived. • Advanced options parameter settings can be seen Bit3 and Bit6 of F26.16 (elevator enhanced function selection).

Fireman running function test	
1	Open the firefighting function via F26.03 (firefighting function), and the factory default has opened.
2	Fireman input terminals can be connected to MCB input terminal X1 - X24 (F12.01 - F12.24 setting).
3	After the elevator fire back to base station, and turn on fireman running switch (that is, to enter the fireman running state), the elevator will not automatically open or close the door. To close the door in the OD arrival state, you can continuously press CD button till the door is closed, and then release the button, the elevator will remain closed. • If release the CD button when the door is not yet closed, the elevator will be changed to OD action till there is OD arrival.
4	At the fireman running mode, each time only one internal call floor instruction can be registered. If there is instruction signal registration, the elevator will immediately auto-start, run at high speed, and will decelerate, stop and eliminate number on the registration instruction floor. • At stopping the elevator does not open the door, only when you continue to press the OD button can the elevator open the door. The elevator can not keep the door opening until there is OD arrival. • If you release the OD button halfway, elevator will immediately go from door opening to door closing operation till the door is closed.
5	In the fireman operating state, the hall call button signal does not work. Only when stopping at the fire base station, the elevator in OD arrival state, and firefighting and fireman switch is reset, can the elevator return to the normal operating state. • Advanced options parameter settings can be seen Bit4 and Bit5 of F26.16 (elevator enhanced function selection).

Auto return to leveling running

Due to a fault or other reasons the elevator stops to a non-leveling area, after meet the running conditions, the elevator will run at speed of 0.200m/s to the near leveling area;

when arrive to the leveling area (wherein one switch is actuated, and another switch is unactuated), the elevator running speed is the re-leveling speed (F04.04);

when two leveling floors are effective, after the elevator delays the time of F26.30 (return leveling and stop delay), it will decelerate to stop at inspection decelerated speed (F03.07).

The relevant parameters are set as follows in table.

Ref. Code	Function	Recommended value	Remark
F03.07	Inspection Dec speed	1.000m/s^2	
F04.04	Re-leveling speed	0.040m/s	
F26.30	Return leveling and stop delay	0.100s	Automatic update after shaft self-learning

8.1.9 Comfort Adjustment

Jerk in lift starting

Fault phenomenon and troubleshooting

Fault phenomenon

When the elevator starts, the car has a sense of frustration (a feeling of stairs).

Troubleshooting

Possible Causes		Detection method	Treatment measures	Note
Parameter setting problem	Pre-torque not enable	Check whether the parameter settings are reasonable	Set parameters related to pre-torque	1
	Slow brake	Observe whether the elevator starts with the brake	Check the brake opening time and increase F02.01	
	Insufficient clearance	Observe clearance	Adjust the gap	2
Guide shoe is too tight and static friction is too large		tried to shake the car and felt the gap between the guide shoe and the guide rail	Adjust guide shoe clearance, add rail oil or adjust speed loop PI	3

Instruction

1. How to set the pre-torque parameter

Because the opening times of various brakes are are different, and the response time of the brake is affected by the ambient temperature (the brake coil temperature is too high, the brake response will slow down), and the curve running delay time F02.01 is appropriately increased. . The pre-torque parameter setting is as follows:

Ref. Code	Function	Seting range	Default	Remark
F02.01	Curve running delay time	0 - 2s	0.5s	*After the brake is opened, the elevator will run at speed F02.01 again.*
F05.00	Start pre-torque selection	0: no pre-torque 1: analog weighing 2: Digital weighing 3: Pre-torque automatic compensation	0	*According to the need to select the pre-torque compensation function, generally choose 3*
F05.16	No weighing current coefficient	0 - 9999	3000	*There is a slippery start, increase F05.16-F05.18, over the general oscillation*
F05.17	No weighing speed loop KP	1 - 9999	1000	
F05.18	No weighing speed loop KI	1 - 9999	1000	

2. The brake gap problem

Step 1: First, make sure that the brake can be opened and the brake power is sufficient and the brake coil circuit is connected.

Step 2: Check whether the brake opening is enough. If there is friction, please adjust the brake gap.

Step 3: Check whether the brakes on both sides are synchronized. If they are not synchronized, adjust them to synchronize.

Step 4: If the brake is closed, the sound is too loud. If yes, please adjust to make the sound smaller.

3. The guide shoe is too tight and the static friction force is too large

Step 1: chech if the guide shoe is too tight. If it is too tight, adjust the guide shoe

Step 2: Adjust the parameters, add the starting speed or adjust the velocity loop PI to overcome the static friction force. The parameters are as follows:

Ref. Code	Function	Setting range	Default	Remark
F02.02	Starting speed	0 - 0.030S	0	*Define the initial speed of the system start, the appropriate starting speed can overcome static friction*
F02.03	Start speed hold time	0 - 2S	0	*Start speed hold time*
F02.06	Starting ramp time	0 - 2S	2	*Define the time required for the elevator to accelerate from zero speed to the elevator rated speed F00.03, and use it with F02.02*
F08.00	Low speed speed loop KP	1 - 9999	500	*Increase the PI parameter, can increase the dynamic response of the system, too easy to oscillate*
F08.01	Low speed speed loop KI	1 - 9999	500	

Run with jitter

Fault phenomenon and troubleshooting

Fault phenomenon

There is up and down jitter during acceleration and deceleration, or up and down jitter at constant speed.

Troubleshooting

Possible Causes	Detection method	Treatment measures	Note
Guide shoe is too tight, friction is too large	The delay time F02.01 of the curve operation is used to judge whether it is the start-up or start-of-curve-induced jitter.	Adjust the gap between guide shoe and guide rail to reduce friction; Increase starting speed	1
Mechanical rotating parts problem	Check if periodic jitter	Adjust and replace mechanical parts	Bearings
Rail problems	Running in left and right shaking or relative fixed position jitter	Adjust the guide rail or polish joint	Guide rails are not horizontal, there are foreign bodies, the interface is uneven
System Control (Acceleration/Deceleration, constant speed jitter	Whether there is periodic jitter, PI parameters are too small	Adjust PI parameters	2
There are resonances in the operation	Car resonance in the car	Check for mechanical problems or adjust PI parameters	

Instruction

1. How to determine whether the jitter is in the start or curve of operation

Set the curve running delay time F02.01 to the maximum, that is, the elevator will run at speed F02.01 after it is opened from the brake, so that it can distinguish whether it is the shake caused by the rolling car or the jitter caused by the curve.

- If it is the start-up shake, after this jitter, the elevator will stabilize at zero speed for F02.01, and then start running again.
- If it is the jitter caused by the beginning of the S-curve, the elevator will wait for F02.01 to appear to be jittery again after the brake is opened.

2. System control issues

Acceleration or deceleration or constant-speed jitter in the process, adjust PI parameters are as follows:

Ref. Code	Function	Setting Range	Default	Remark
F08.00	Low speed speed loop KP	1 - 9999	1000	*Dither within frequency 1 to increase F08.00 / F08.01; dither above frequency 2 to increase F08.02/F08.03; between frequency 1 and frequency 2 takes both low-speed PI and high-speed PI average of;*
F08.01	Low speed speed loop KI	1 - 9999	500	
F08.02	High speed speed loop KP	1 - 9999	1500	
F08.03	High speed speed loop KI	1 - 9999	500	
F08.04	Speed loop PI switching frequency 1	0 - 50Hz	3	
F08.05	Speed loop PI switching frequency 2	0 - 50Hz	5	
F09.00	Current loop KP	1 - 4000	500	*Increase the jitter appropriately, but excessive adjustment of this parameter may cause system over-current*
F09.01	Current loop KI	1 - 4000	500	

Note: After the F10.20 bit15 = 1 vibration suppression function is enabled, the F08.04 (loop parameter) and F18.00 (carrier frequency) can be adjusted to avoid the mechanical resonance point.

Run curve adjustment

Acceleration/deceleration curve (S curve) adjustment

MONT70 uses S-curve acceleration and deceleration to minimize the impact during acceleration and deceleration, and is relatively stable during start-up and shutdown.

However, different acceleration and deceleration curve parameters are required for different applications. If the acceleration or deceleration is too fast, the comfort will be affected; if the acceleration and deceleration are too slow, the running efficiency of the elevator will be reduced.

Please adjust according to the actual situation. When slow acceleration or deceleration is required, decrease the value of parameter F03.00-F03.05; otherwise, increase the value of parameter F03.00 - F03.05.

- Acceleration/Deceleration (F03.00 / F03.03): Rate of change of speed.
- Rapid acceleration / rapid deceleration (F03.01, F03.02 / F03.04, F03.05): Rate of change of acceleration / deceleration.

End station has a sense of frustration

Fault phenomenon and troubleshooting

Fault phenomenon

The elevator runs to the position of the decrement switch, and the rapid traverse speed goes to the leveling area at crawl speed.

Troubleshooting

Possible Causes	Detection method	Treatment measures	Remark
Forced deceleration switch problem	Check whether the switch is normal	Change the switch	
	Check the circuit is normal	wiring	
Forced deceleration switch distance problem	Check the distance of forced deceleration switch	Adjust the installation distance	1
Rope slipping	Check wire slip	Adjust the mechanical part	2
Machine parameter setting error	Check whether the mechanical parameter F00.06 is accurate	Modify the mechanical parameters as the actual mechanical parameters	

Instruction

1. Installation distance

The calculation formula for the installation distance S of forced deceleration switch and the leveling of the terminal station:

$$S > \frac{V^2}{2 \times F03.12}$$

Rated speed m/s	0.25	0.4	0.5	0.75	1	1.5	1.6	1.75	2	2.5	3	3.5	4
First-level forced Dec. distance m	0.4	0.4	0.4	0.4	0.7	1.4	1.5	1.8	2	2	2	2	2
Secondary forced Dec. distance m	no	no	no	no	no	no	no	no	2.5	4	4	4	4
Third forced Dec. distance m	no	no	no	no	no	no	no	no	no	no	6	8	11

2. rope slip

Step 1: Inspect the steel wire rope for excessive oil bleed out. If it is, wipe it dry with a cloth.

Step 2: Whether the wrap angle of the wire rope and the traction wheel is reasonable

Step 3: The elevator balancing system is correct. If it is not correct, balance the system first, generally between 0.4 and 0.5.

Parking has a sense of jerk

Fault phenomenon and troubleshooting

Fault phenomenon

There was a sense of jerk in the car when the elevator was running to leveling.

Troubleshooting

Possible Causes	Detection method	Treatment measures	Remark
Parking momentary door lock disconnecte	Check the gap between the doorknob and gateball	Adjust the gap	
system error	Check the fault	Troubleshooting	
Speed loop PI tracking is not	Strengthen PI parameters	Appropriately increase F08.00 / F08.01	Increase the PI parameter, the system responds quickly and is too large to oscillate
Slow brake closure	Adjusting brake braking force	Adjusting brake braking force, brake closing without resistance	
	Cancel the freewheeling delay	Ensure that the brake contactor releases the brake immediately	
	Observe whether there is a car parking	Increase parking zero speed holding time F02.05	1

Instruction

1. Why Increase parking zero speed hold time

As the brake coils are energized for a long time, the heat causes the brake to release slowly, and after the operating contactor is released (the system does not output torque), the brake has not been fully closed, causing the car to slip, causing a sense of frustration in the car.

At this time, it is necessary to increase the torque output at the time of parking, that is, increase the parking zero speed holding time F02.05.

Leveling accuracy adjustment

Leveling accuracy adjustment
1. First, ensure that the leveling board is installed accurately and the length of each leveling board remains the same. 2. The speed loop parameters (F08 group) also affect the leveling accuracy, ensuring that no overshoot occurs during system operation. 3. Encoder interference is also affected by the leveling accuracy. Make sure the encoder signal is good. **The normal operation leveling accuracy adjustment method is as follows:**

No.	Method
1	F19.06 = 0 (direct stop mode 0). Fine adjustment can be made with F19.03 (leveling distance adjustment). • When the elevator stops, F19.03 is reduced if it is leveled out, and F19.03 is increased if it is leveled.
2	F19.06 = 1 (direct stop mode 1) to ensure that the elevator has a short crawl (creep distance is set by F19.03), and then it can pass F03.13 (stop emergency deceleration) and F04.02 (crawling speed) to fine-tune the leveling accuracy. • When the elevator is parked, if it is level, it needs to increase F03.13; if it is less than level, it needs to decrease F03.13. • F03.13 parameters users generally do not need to change, will be automatically updated after the shaft self-learning to ensure leveling accuracy.

New ladder fatigue test

New ladder fatigue test
After the new ladder is installed, the new ladder needs to be tested for running in. F25 group parameters can be used to set the number of elevators to run at random or the fixed operation mode of a specified floor.

Leveling method (main board software version V1.23 and above)

Leveling adjustment
• When F19.06 (independent upper and lower leveling adjustments enabled) is set to 0, the total adjustment leveling parameter is F19.03. • When F19.06 (independent upper and lower leveling adjustments enabled) is set to 1, the total upward adjustment leveling parameter is F19.14, and the total downward adjustment leveling parameter is F19.15. • When F27.29 (per leveling fine-tuning enabled (parameter set to 1), the leveling of each floor also works)

Fine-tuning leveling (per floor)

Fine-tuning leveling (per floor)
Take the level 2 floor as an example to illustrate the adjustment method: • When the elevator goes up to the 2nd floor and goes over the floor leveling 10mm, you need to change F27.45 (up leveling level adjustment on the 2nd floor) to 30 – 10 = 20mm. • When the elevator runs up to the 2nd floor, if it is less than 10mm above floor level, it is necessary to change F27.45 (upward floor level adjustment on the 2nd floor) to 30 + 10 = 40mm. • When the elevator descends to reach the 2nd floor, it will need to change F27.31 (lower leveling on the 2nd floor) to 30 – 10 = 20mm if it crosses the floor leveling 10mm. • When the elevator descends to the 2nd floor, if it is less than 10mm above floor level, it is necessary to change F27.31 (lower leveling on the 2nd floor) to 30 + 10 = 40mm. *Note: The value is 30 when the factory does not adjust;* The floor parameter adjustment parameter is F27.29 - F27.59.

8.1.10 UCMP function

UCMP detection, fault protection
1. When the controller closes the door contactor output, it detects that the door zone signal has changed from valid to invalid and the door lock signal is disconnected. The control system reports UCMP fault (E65), the elevator stops running, and the door closing contactor stops outputting. 2. When the controller is stopped, it detects that the door zone signal has changed from valid to invalid and the door lock signal is disconnected. At the same time, it is judged that any leveling signal is invalid and the control system reports UCMP fault (E65) and the elevator stops running. 3. The E65 fault cannot be automatically reset and can be manually reset in the maintenance state. *Note: When F16.05 Bit10 = 1, it is possible to reset the E65 fault by turning off the power. (It is not recommended to reset in this way)*

UCMP test function test procedure

Test procedure and supplementary instructions:

Step	Test
1	The inspection switch is valid, the elevator stops at the door area and remains closed.
2	Changing the keypad F11 from 0 to 1 or F25.04 to Bit 7 sets the UCMP test function.
3	Disconnect the "manual switch" to disconnect the system's door lock signal.(Control cabinet adds door lock disconnect switch)
4	Manually press and hold the inspection up or down button, close the door contactor output, and short the door lock. At this time, the normal inspection of the elevator starts and runs.
5	After the elevator leaves the door area, the UCMP module will disconnect the door lock and the control system will report E65 (UCMP fault) and the elevator will stop running.
No.	**Supplementary explanation**
1	When the maintenance, door area, and door lock are not in the closed state, setting the keypad F11 to 1 is invalid.
2	After the keypad F11 is set to 1, it will be cleared automatically after one operation and automatically cleared after power off.
3	In the UCMP test mode, the software automatically accelerates at an acceleration of 0.8m/s^2, and no need to set parameters to ensure that the average acceleration of start is greater than 0.5m/s^2.

8.1.11 Automatic brake force detection function

Automatic braking force detection function

The detection software is HpmontBrakeMonitor, software version V1.00 (D05.15).

In automatic mode:

- After the door lock is closed, when the system has no running direction, when the parameter of keypad F10 group is changed from 0 to 1 or F25.04, Bit8 is set to 1 to start the brake force detection.
- In maintenance mode:
- After the inspection running condition is met, when the door lock is closed, when the F10 group parameter of the keypad is changed from 0 to 1 or F25.04, Bit8 is set to 1, and the external
- After the inspection uplink command or the inspection downlink command is given, the brake holding power is manually detected. After the inspection is started, the inspection up or down command can be removed during the inspection.
- After the brake detection is successful, the F27.05 value will be automatically incremented; if the brake detection fails, the control system will report the braking force self-test failure (E66).

E66 fault reset conditions:

- When F17.07 Bit3 = 1, E66 can only be reset manually in the maintenance mode.
- When F17.07 Bit3 = 0, E66 cannot be reset automatically. The self-testing of the braking force must be performed again and it can be reset after the test is passed.
- After F17.07 Bit3 is powered on or reset automatically once, it will be automatically cleared.

Ref. Code	Function	Setting range	Advice
F27.00	Brake force detection method	0: Invalid 1: Manually start detection 2: Automatic start detection	Synchronous motor 2 Asynchronous motor 0
F27.01	Brake force detection period	1 - 15 day	1 day
F27.02	Brake detection duration	1 - 10s	5s
F27.03	Brake detection torque	60 - 150%	100%
F27.04	Brake detection allowable pulse size	1 - 99	5
F27.05	Brake detection success times	0 - 65535	0

Note: There is no clock chip inside the MONT71 control board. Its internal time is the time accumulated by the internal timer. When the control system does not set the brake switch detection, F27.01 is 1 day.

8.2 Typical Application Instruction

8.2.1 Power Failure Emergency Running Program

During the elevator running process, if the system's power suddenly broke, passengers may be trapped in the car. For this situation, MONT71 designed a power failure emergency running program which is easy and convenient to fulfill.

MONT71 power failure emergency running program are separated into two modes according to the power source of the traction machine. They are **auto-running car and emergency power supply run**.

Descriptions of two power failure emergency running programs

Auto-running car	After the MONT71 receives a power-failure-rescue signal, you should jump out the U/V/W's wire of synchronous motor via star-delta contactor, use the prevent-force limits the car's running by synchronous motor jumps out stator coil, and then open the brake. That is a rescue-way's which the car is running slowly to get to the leveling position. During this process you should monitor the elevator's speed, when detect the leveling signal, it will keep opening the door, output buzzer and stop running.
Emergency power supply run	Both the main circuit and work-power of MONT71 have adopted the emergency power supply for power failure emergency run. After MONT71 chooses the way of power failure rescue, it would run at emergency speed, the direction is the same to run direction of elevator light-load run. When detecting signal, it will open the door and stop running.

Difference of two power failure emergency running programs

It can be seen from two kinds of program descriptions:

- For the synchronous motor, elevator can choose auto-running car or emergency power supply to run.
- For the asynchronous motor, it can only choose emergency power supply to run.

In order to distinguish the two modes, their features are described in the following chart.

Mode	Source of motor's power	Work-power MONT71	Work-power of elevator's safety circuit	Range	Other
Auto-running car	Synchronous motor jumps stator coil	Using the emergency power which is greater than 220V (or inverter)	Using the emergency power which is greater than 220V (or inverter)	Synchronous motor	Need the star-delta contactor to jump out U/V/W's wire
Emergency power supply run	Emergency power supply run	Emergency power supply run	Emergency power supply run	Synchronous motor or asynchronous motor	

Emergency running connection

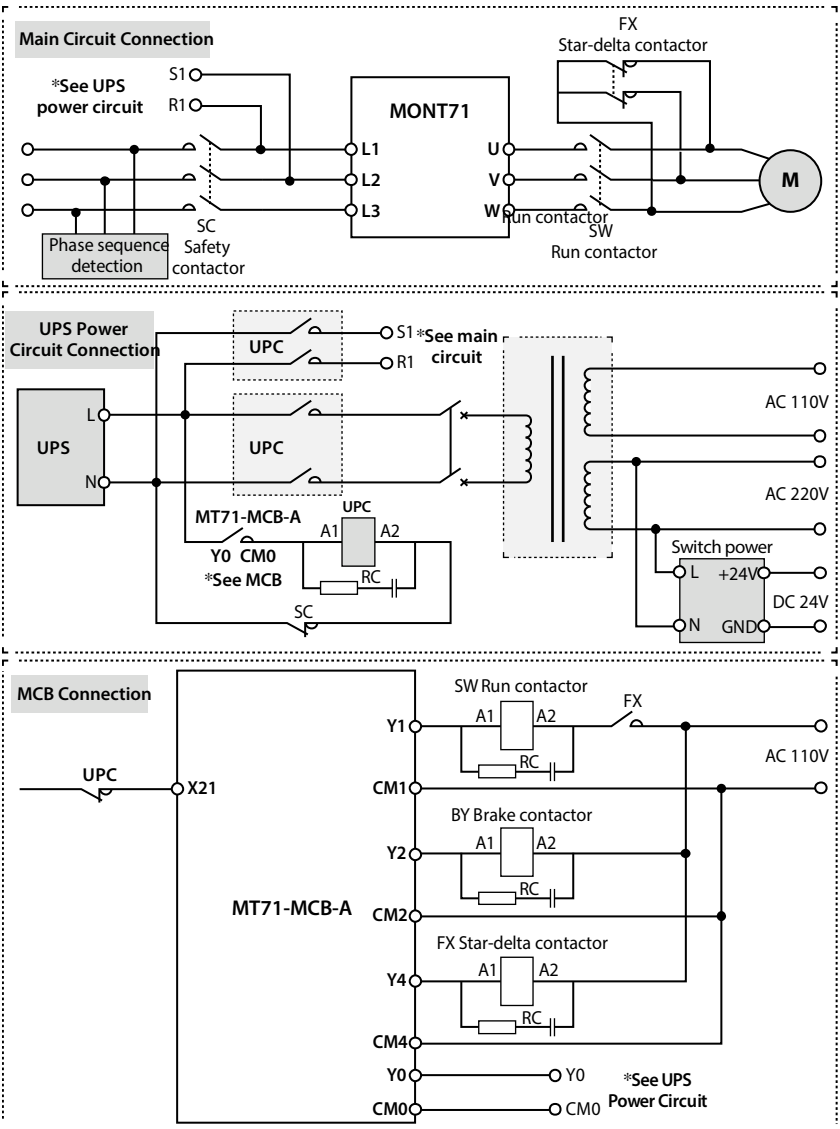

Figure 8-1 Emergency running connection

Auto-running car program

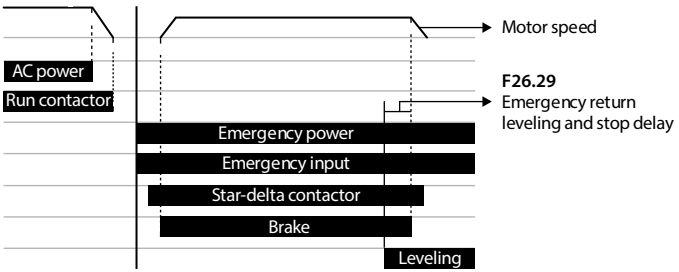

Figure 8-2 Auto-running car time sequence

Function parameter setting

According to Figure 8-1, setting function parameters of auto-running car are as follows.

Ref. Code	Function	Setting value	Meaning
F12.21	MCB input terminal X21	33	Battery driven normally open input (UPC)
F12.32	MCB relay Y4 output terminal	3	Synchronous star-delta contactor output (FX)
F12.28	MCB relay Y0 output terminal	32	Power failure emergency run is enabled (UPC)
F26.19	Synchronous motor star-delta contactor parameter setting	Set according to the actual	According to the synchronous star-delta contactor operation mode and control functions
F26.15	Battery-driven run parameter setting	Bit0 Set according to the actual	Whether open the emergency operation timeout protection
		Bit1 =1	Open the synchronous motor atuo-running car function

According to Figure 8-1, setting function parameters of emergency power supply run are as follows.

Ref. Code	Function	Setting value	Meaning
F12.21	MCB input terminal X21	33	Battery driven normally open input (UPC)
F12.28	MCB relay Y0 output terminal	32	Power failure emergency run is enabled (UPC)
F26.15	Battery-driven run parameter setting	Bit1=0	Do not open atuo-running car function
		Bit2=1	Automatically judge the direction of the emergency operation

Auto-running car description

It can be seen from Figure 8-1 emergency running connection, normality, the UPC should have disconnected, this time, when the UPS is charging, the system's power comes from main power supply.

When the main power is cut off, the controller's bus voltage is reduced to a certain value and the MCB Y0 relay outputs (the user may also manually switch), the UPC is closed this time, and the UPS power is supplied to system power.

When MONT71 receives the UPS valid signal of X21 input, and make sure that the mode is power failure emergency run, Y4 output makes the star-delta contactor close, then open the brake, the elevator will auto-running slowly; at the same time monitor elevator speed till leveling.

Note:

1. *During the auto-running is run, the MONT71 can't control the motor drive, the power of life auto-running is come from self-supply power of synchronous motor.*
2. *During the auto-running is run, if the elevator's speed is more than 1/2 rated speed, the MONT71 will alarm E0032 fault (motor over speed), don't be controlled by auto-running, and at the same time the star-delta contactor of synchronous motor maybe get abnormality.*
3. *The auto-running car emergency program is only applied to synchronous motor, and never be applied to asynchronous motor, otherwise, it will be very dangerous;*
   The auto-running car emergency program needs some gap between load in the car and load of elevator balance; otherwise, the elevator run-speed will be slow.
4. *At auto-judging direction of the emergency power supply to run, it will automatically open the brake. When the car auto-running direction is detected, it will automatically run to the light load direction.*
5. *Power failure emergency running direction priority is: automaticlly judge the direction > UPS specified running direction>weighing signal confirmed direction > position judged direction.*

8.2.2 Open-through Door Description

The open-through door control is mainly used in the same floor needing two doors or the car inside needing double internal call occasions.

The open-through door control mode is as following table:

Control mode	Set para.	Function description	Wiring description
Control the open-through door simultaneously	F26.21 = 0 (do not open the through door control) F22.13 = Any value	• Connecting the front and back door hall call button can achieve open-through door at the same time control, up to 8 floors.	
	F26.21 = 1 F22.13 = 0	• The open-through doors are consistent. • The responses of internal call /hall call /open and close door of door 1 and door 2 are completely consistent this time, and the open and close door operations too.	• At the same floor, call buttons or switch buttons of door 1 and door 2 can access the same floor input and output terminals so as to increase the maximum running floor.
Open-through door of control mode 1 (hall call separately, internal call consistent)	F26.21 = 1 F22.13 = 1	• After the call responses of door 1 and door 2 are the same, and reach the target layer, the system will decide which door to open, according to the input signal state selected by door 2. • If this signal is high level, the elevator will open door 2; if it is low level, the elevator will open door 1. • This signal can be connected to the switches or buttons in car, controlled by person in car.	• At the same floor, internal /hall call buttons or switch buttons of door 1 and door 2 can access the same floor input and output terminals so as to increase the maximum running floor. • At this method, the X-terminal needs door2 to select signal function, otherwise the elevator will only open door 1.
Open-through door control mode 2 (hall call separately, internal call control manually)	F26.21 = 1 F22.13 = 2	• After the hall call responses of door 1 and door 2 are separately, and reach the target layer, the system will decide which door to open, according to the input signal state selected by door 2. • If this signal is high level, the elevator will open door 2; if it is low level, the elevator will open door 1. • This signal can be connected to the switches or buttons in car, controlled by person in car.	• At the same floor, hall call buttons of door 1 and door 2 must access two different floors of input and output terminals separately. • At this method, the X-terminal needs door2 to select signal function, otherwise the elevator will only open door 1.

Control mode	Set para.	Function description	Wiring description
Open-through door control mode 3 (hall call separately, internal call separately)	F26.21 = 1 F22.13 = 3	• After the hall call responses of door 1 and door 2 are separately, and reach the target layer, the system will decide which door to open, according to the present internal call response, door 1 or door 2.	• At the same floor, hall and car call buttons of door 1 and door 2 must access different floor input and output terminals separately, otherwise the elevator will open door1 and door2 simultaneously.

Note:

At firefighting, inspection and back leveling floor modes, the open-through door does not separately control, but can simultaneously control.

Description of double hall calls at the same floor

If some floors of the elevator need to configure dual hall calls, MONT71 provide appropriate solutions.

1. Connect door 2 (back door) to the button input terminals of main board;

2. Set parameter F26.21 to 1 (open the open-through door control), and reasonable set F22.17 (open-through door control mode) according to the actual configuration of the open-through door.

Description of double internal calls inside the car

The double internal calls inside the car have two cases.

- If there is only one door, the significances of the two internal calls are the same. The button simple wire in parallel can be achieved.
- If there are two doors, the usage refers to section 8.2.2 Open-through Door Description.

8.2.3 Description of Over-load and Full-load

MONT71 supplies many over-load and full-load signals inputting modes.

When in use, correctly set the corresponding parameters. Briefly explain its use in the following:

Analogue input terminal inputting method	Via MCB or CTB input terminal select over-load and full-load signal input, changing normally open/ normally closed set can match different types of switches.
Analogue weighing signal inputting method	Anglogue signal input channels: MCB's AI terminal The analog can do weighing self-learning, which is referred to section 7.2.6 F05: Weighing Compensation Parameters (page 84). • When analog weighing signal is more than 80% of the full-load signal, it can be considered a full-load signal; if more than 110%, it is the over-load signal.

Note:

As long as the input terminals of MCB select full-load and over-load signal, the full-load and over-load signal input function will be valid.

This switch value can be used with analog weighing together.

8.3 Typical Application Wire

This section describes the practical application of the wiring diagram in a typical application, specifically as follows:

- Wiring diagram of full selective factory setting value;
- Wiring diagram of full selective largest floor;
- Wiring diagram of down selective largest floor;
- Wiring diagram of open-through door full selective.

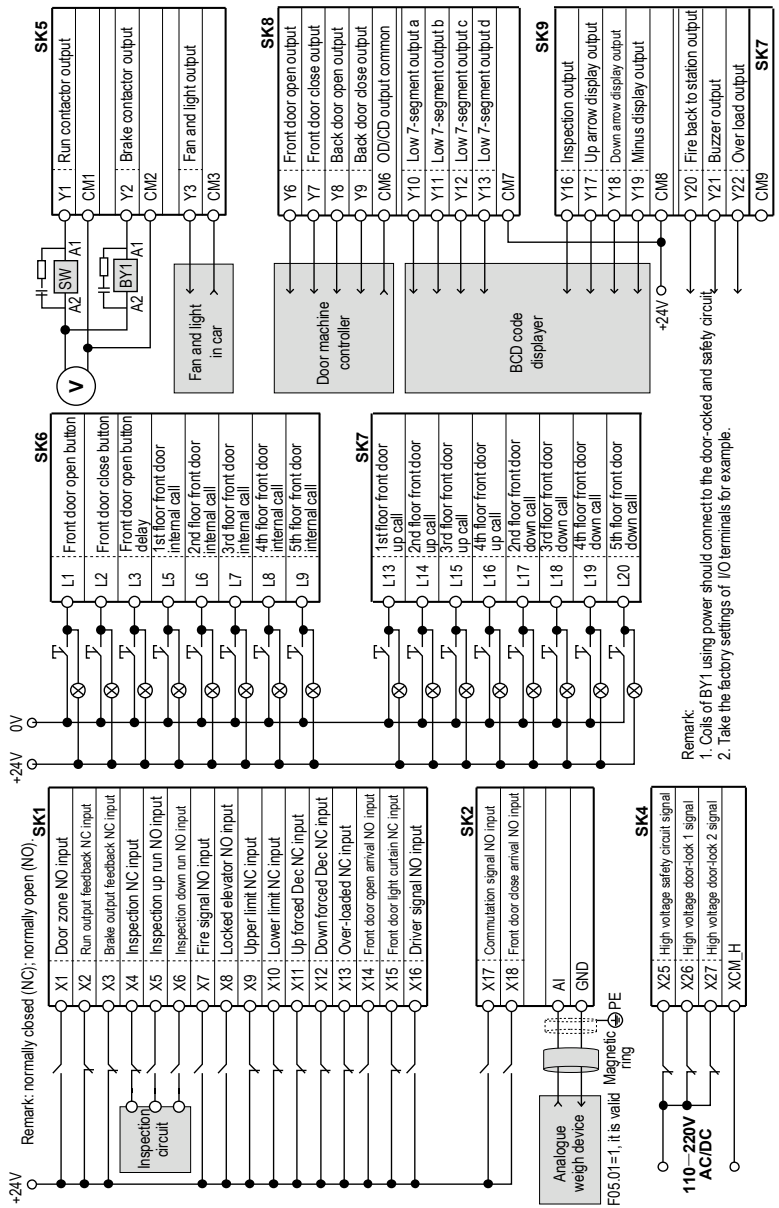

Figure 8-3 Wiring diagram of full selective factory setting value

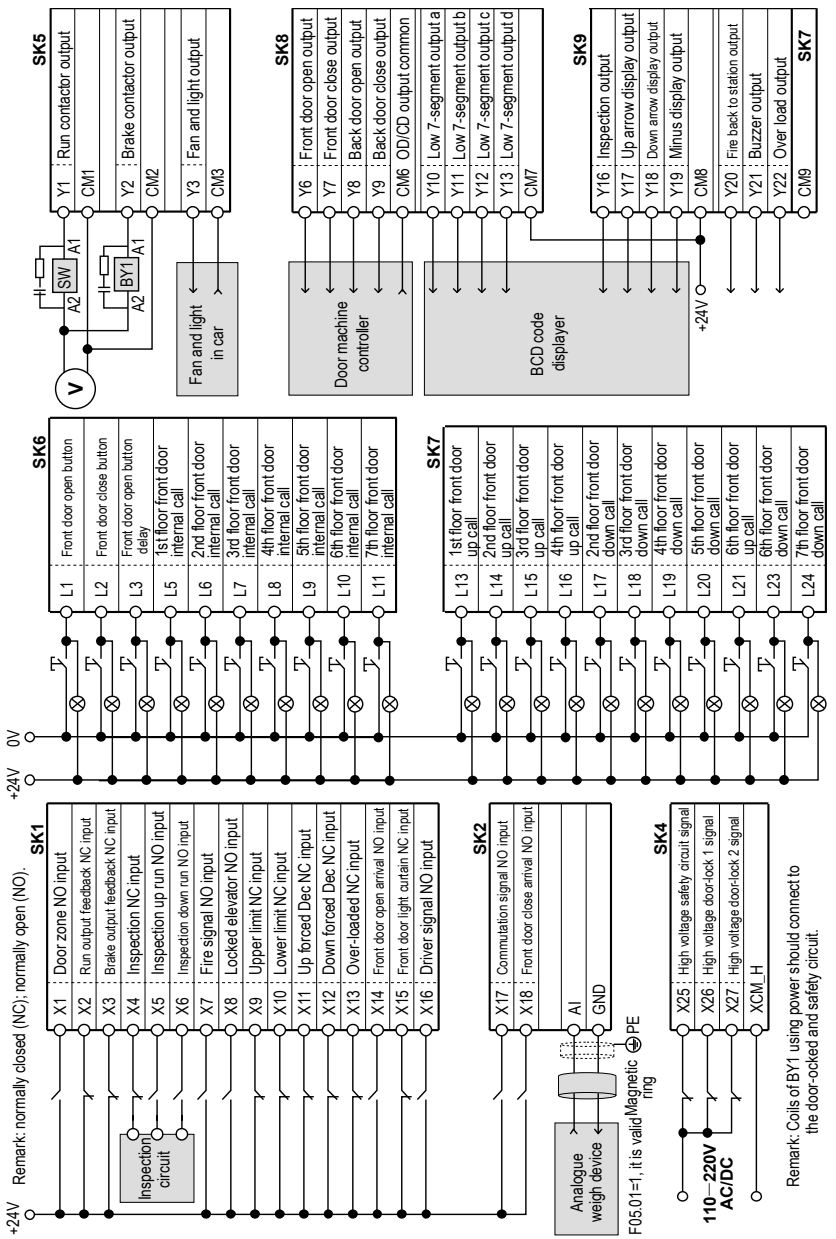

Figure 8-4 Wiring diagram of full selective largerst floor

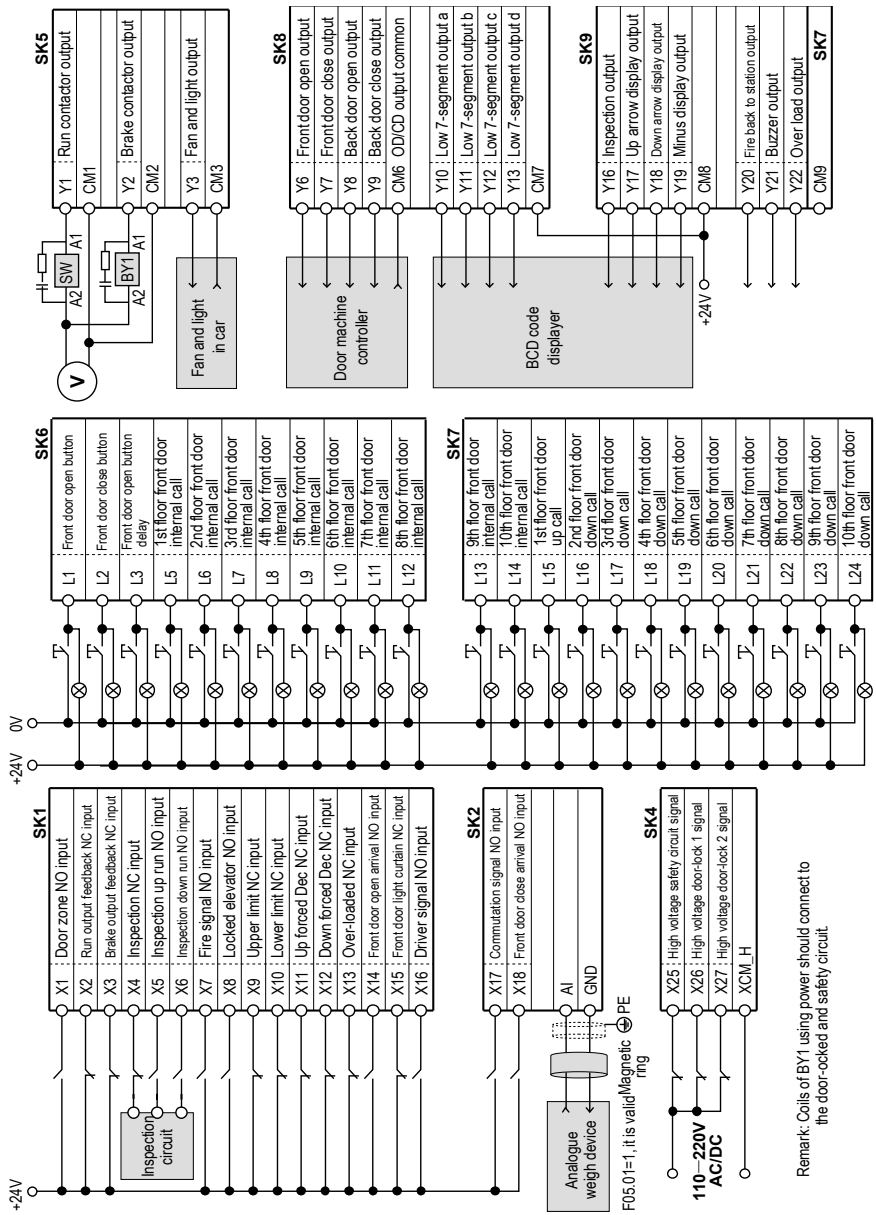

Figure 8-5 Wiring diagram of down selective largerst floor

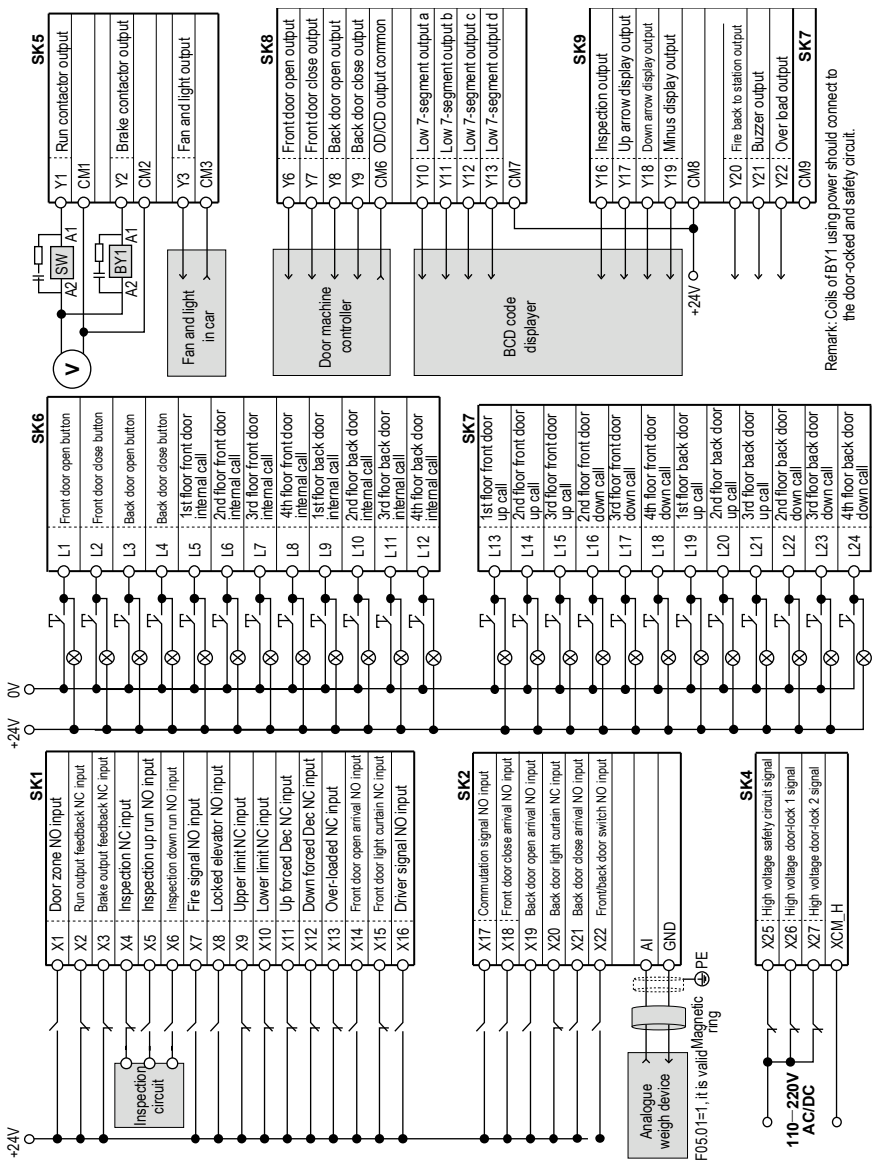

Figure 8-6 Wiring diagram of open-through door full selective

Chapter 9

Troubleshooting and Maintenance

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9.1 Troubleshooting

Fault sort explanation

MONT71 has almost 60 pieces of protection functions.

MONT71 monitors all kinds of input signal, running condition etc. If some abnormal error happens, relevant fault protection functions will act and the controller will display the fault code.

Error information produced by MONT71 can be divided into 3 sorts according to their influence to the system. Different fault has different disposal mode, which is as shown in the next table.

Fault Sort	Relevant Disposal	Remark
Level 1 fault	• Display fault code • Error relay output action	Any kind of working condition will not be influenced
Level 2 fault	• Display fault code • Error relay output action • Stop at the nearest landing when in distance control, then stop running • Stop running at once in other work condition	After stop, the system will close off output at once, and close brake
Level 3 fault	• Display fault code • Error relay output action • The system blank off output at once, close brake and stop running	Forbid running

Fault reset method

After the fault is removed, you can do fault reset through the following ways:

1. Reset through the keypad.
2. Make MONT71 completely power-down.
3. Some faults may auto-reset.

Fault code description

The fault's display code, cause, countermeasure and sort are seen in Table 9-1.

The keypad displays five data: E+ Fault code

The keypad can prompt fault code causes and countermeasures, and the detail operation is referred to section 7.1.3 (page 68).

The MCB's small keypad displays three data: E+ Fault code

Table 9-1 Fault content and countermeasures

Fault		Fault Cause	Countermeasure	Sort
Lu Lu	DC bus undervoltage	1: Power-on initial state, power-down end state 2: Input voltage is too low 3: Wiring does not regulate resulting in hardware undervoltage 4: Model is set incorrectly	1: Normal power up/down status, normal correctly 2: Check the input supply voltage 3: Check the wiring and regulate it 4: Set the model (Y00.01) correctly	3
E0001 E01	Controller output Acc overcurrent	1: Main circuit output is grounding 2: Main circuit output is short wiring 3: The motor has not done parameter auto-tuning 4: Load is too heavy 5: Encoder signal is wrong 6: Encoder signal interference is serious 7: Acceleration curve is too steep	1: Check the main circuit output side whether groud is short-circuited and output phase is short-circuited 2: Check whether the power wiring is damaged and the wiring is solid 3: Check wheter the motor internal exists a short circuit or shorted to ground 4: Outputside contactor is abnormal 5: Star-delta contactor causes MONT71 output short-circuited 6: Set the correct motor parameters (Group F07 / Group F10) 7: Restart motor parameter auto-tuning (Group F07 / Group F10) 8: Check whether the brake is abnormal 9: Check whether the mechanical is stuck 10: Check whether the elevator balance coefficient is correct 11: Check whether the encoder wiring is reliable 12: Set the correct encoder parameters (Group F11) 13: Encoder is installed reliably 14: Check whether the encoder alignment is independence wear tube, trace distance is too long and the shielded cable is single-end grounded 15: Check whether the acceleration /deceleration curve (Group F03) is too large	3
E0002 E02	Controller output Dec overcurrent	1: Main circuit output is grounding 2: Main circuit output is short wiring 3: The motor has not done parameter auto-tuning 4: Load is too heavy 5: Encoder signal is wrong 6: Encoder signal interference is serious 7: Deceleration curve is too steep		3
E0003 E03	Controller output constant speed overcurrent	1: Main circuit output is grounding 2: Main circuit output is short wiring 3: The motor has not done parameter auto-tuning 4: Load is too heavy 5: Encoder signal is wrong 6: Encoder signal interference is serious		3

Fault		Fault Cause	Countermeasure	Sort
E0004 E04	DC bus voltage Acc overvoltage	1: Input voltage is too high 2: Acceleration curve is too steep 3: Brake resistance is too much 4: Braking unit is abnormal 5: Power feedback is abnormal	1: Adjust the input voltage, check whether the bus voltage (D01.06) is normal 2: Check the balance coefficient 3: Select the appropriate braking resistor, refer to section 5.7 (page 50) 4: Connect with braking unit or power regenerative unit, check the related equipment	3
E0005 E05	DC bus voltage Dec overvoltage	1: Input voltage is too high 2: Deceleration curve is too steep 3: Brake resistance is too much 4: Braking unit is abnormal 5: Power feedback is abnormal		3
E0006 E06	DC bus voltage constant speed overvoltage	1: Input voltage is too high 2: Brake resistance is too much 3: Braking unit is abnormal 4: Power feedback is abnormal		3
E0008 E08	Power module faulty	1: Short circuit between phases output or the ground 2: Motor wiring is too long 3: Work environment is overheating 4: Power module is damaged	1: Check the wiring and regulate it 2: Install the reactor or filter 3: Check whether the fan and the ventilation duct are normal 4: Please contact the supplier for repairing	3
E0009 E09	Heatsink overheated	1: Ambient temperature exceeds specifications 2: The controller external ventilation is adverse 3: Fan is faulty 4: Temperature detection circuit is faulty	1: Derated for using and increase power 2: Rectify controller external ventilation 3: Replace the fan 4: Seek for technical support	3
E0010 E10	Braking unit faulty	The braking circuit is faulty	Seek for technical support	3
E0011 E11	CPU fault	CPU is abnormal	1: Power-on observation after completely power down 2: Seek for technical support	3
E0012 E12	Parameter auto-tuning fault	1: Parameter auto-tuning timeout 2: Over current at parameter auto-tuning 3: Under the distance control (set F00.07 as 1) doing permanent magnet synchronous motor rotating auto-tuning (set F10.10 as 2)	1: Check the motor wiring 2: Input correct motor parameters (Group F07 / Group F10) 3: Do the permanent magnet synchronous motor rotating auto-tuning under the keypad control (set F00.07 as 0)	3
E0013 E13	Soft start failed	1: Contactor fault 2: Control circuit fault	1: Replace the contactor 2: Seek for technical support	3

Fault		Fault Cause	Countermeasure	Sort
E0014 E14	Current detect faulty	1: Current detection circuit damage 2: Permanent magnet synchronous motor is out of control	1: Please contact the supplier for repairing 2: Check the brake signal	3
E0015 E15	Lack of input	For three-phase input controller, three-phase input power phase loss	1: Check the three-phase input power 2: Check the settings of parameter F17.00 and F17.01	3
E0016 E16	Lack of output	1: Controller three-phase output broken or loss of phase 2: Controller with serious imbalance in three-phase load	1: Check the wiring between controller and motor 2: Check the motor 3: Check the settings of parameter F17.02 and F17.03	3
E0017 E17	Controller overloaded	1: Brake circuit abnormal 2: Load is excessive 3: Encoder feedback signal abnormal 4: Motor parameter error 5: Check motor power line	1: Check the brake circuit 2: Reduce the load 3: Check the encoder feedback signal 4: Check the motor parameters and restart the parameter auto-tuning (Group F07 / Group F10) 5: Check the power line	3
E0018 E18	Excessive speed deviation	1: Brake contactor fault or run contactor fault 2: Encoder pulse number setting error 3: Excessive deviation of detection value and time setting unreasonable 4: Controller output torque is not enough 5: Speed-loop PI parameter setting is improper 6: Encoder signal error 7: Motor parameter error 8: F10.12 error	1: Check the brake contactor or the run contactor 2: Reasonably set encoder pulse parameter (F11.01) 3: Correctly set F04.11 (detected value) and F04.12 (detected time) 4: Select larger capacity controller 5: Correctly set speed-loop PI parameter (F08) 6: Check encoder wiring and installation 7: Check the motor parameter 8: Restart parameter auto-tuning	3
E0019 E19	Motor overloaded	1: Brake circuit abnormal 2: Motor overload protect factor set incorrectly 3: Load is excessive	1: Check the brake circuit 2: Correctly set motor overload protect factor (F17.04) 3: Reduce the load	2
E0020 E20	Motor overheated	1: Motor is overheated 2: Motor overheating input signal action 3: Motor parameter setting error	1: Reduce the load 2: Detect whether the overheating input terminal signal is correct 3: Correctly set motor parameter (Group F07 / Group F10)	2
E0021 E21	MCB EEPROM read/write faulty	MCB EEPROM circuit failure	Contact the supplier for repairing	3

Fault		Fault Cause	Countermeasure	Sort
E0022 E22	Keypad EEPROM read/write faulty	Keypad EEPROM circuit failure	1: Replace the keypad 2: Contact the supplier for repairing 3: Keypad manually reset to continue normal use (exclude parameter upload and download)	1
E0023 E23	Parameter setting faulty	1: In the non-keypad mode, asynchronous motor parameter auto-tuning to set parameters auto-tuning 2: Synchronous motor selects ABZ encoder 3: Synchronous motor static auto-tuning, the operating mode is keypad setting 4: Motor current is set to zero 5: Asynchronous motor no-load current setting value is larger than motor rated current 6: The creeping speed at distance control (F04.02) is larger than highest speed of running curve (F19.07 - F19.11) 7: 0.000m/s < F19.07 - F19.11 < 0.100m/s 8: Firefighting base station, locked-elevator base station and idle base station are set to non-service floor 9: Door service floors of firefighting base station, locked-elevator base station and idle base station are set to prohibit service	1: At asynchronous motor parameter auto-tuning, set F00.07 as 0 (keypad control) 2: For the synchronous motor, F11.00 (encoder interface card selection) should be set as 2 (UVW encoder interface card) or 3 (SINCOS encoder interface card) 3: At synchronous motor static auto-tuning, set F00.07 as 1 (distance control) 4: Correctly set motor current (F07.02 / F10.03) 5: Correctly set asynchronous motor no-load current (F07.11) 6: Restart to set F04.02, F19.07 - F19.11 7: Restart to set F19.07 - F19.11 8: Restart to set F21.03, F22.01 and F22.02 9: Restart to setF21.03	E0023
E0024 E24	Input voltage detection failure	Input normal bus voltage, but the line voltage detection circuit is abnormal	1: Power-down treatment 2: Contact to factory for repairing	1
E0030 E30	Encoder reverse direction	1: The preset speed direction is inconsistent with the actual direction 2: Load is too large 3: Controller output torque is not enough 4: Brake circuit abnormal 5: Run contactor abnormal	1: At elevator commissioning, F11.02 (encoder direction) value is reverse; during normal running, do not modify F11.02 2: Reduce the load 3: Select larger capacity controller 4: Check the brake circuit 5: Check the run contactor	3
E0031 E31	Encoder disconnection	1: Encoder without input signal 2: Brake circuit abnormal	1: Check the encoder wiring and encoder installed reliably 2: Check the brake circuit	3

Fault		Fault Cause	Countermeasure	Sort
E0032 E32	Motor over speed	1: Encoder pulse number setting error 2: Controller output torque is not enough 3: Speed-loop PI parameter setting is improper 4: Encoder signal error 5: F10.12 error 6: Motor parameter error	1: Reasonably set encoder P/R (F11.01) 2: Select larger capacity controller 3: Correctly set speed-loop PI parameter (Group F08) 4: Check the encoder wiring and encoder installed reliably 5: Restart parameter auto-tuning 6: Check motor parameter	3
E0033 E33	Loss of Z signal of ABZ encoder	1: Wiring problem 2: Serious interference	Check the wiring	3
E0034 E34	UVW signal wrong of UVW encoder	UVW encoder sector confirmation is wrong	Whether the wiring of UVW is correct	3
E0035 E35	CD phase wrong of Sincos encoder	1: Encoder fault 2: Encoder disconnection	1: Check the encoder 2: Check the wirings of encoder C phase and D phase	3
E0036 E36	Shortest distance ultrahigh	1: Speed curve setting is inappropriate 2: Acceleration/deceleration setting is inappropriate	1: Set appropriate speed curve (F19.07 - F19.11) 2: Set appropriate Acc/Dec curve parameters (F03.00 - F03.05)	3
E0037 E37	Control board logic parameters	The main control board logic is abnormal	Please contact the supplier for changing the main control board	3
E0038 E38	Up forced Dec switch disconnection	Elevator on the top floor, up forced deceleration switch is turned off	1: Check the up forced Dec switch 2: Restart shaft self-learning 3: Check the leveling switch signal	3
E0039 E39	Down forced Dec switch disconnection	Elevator on the first floor, down forced deceleration switch is turned off	1: Check the down forced Dec switch 2: Restart shaft self-learning 3: Check the leveling switch signal	3
E0040 E40	Elevator run timeout	Leveling signal without any change within F23.02 specified time	1: Elevator speed is too low, or floor height is too high 2: Leveling signal is abnormal 3: Steel wire skid	3
E0041 E41	Safety circuit disconnection	Safety circuit signal disconnection	1: Check the safety circuit switch, and view the status 2: Check the safety circuit power supply circuit 3: Check the safety circuit contactor signal 4: Check the safety circuit feedback contact signal characteristics (normally open or normally closed)	3

Fault		Fault Cause	Countermeasure	Sort
E0042 E42	Door locked disconnection during running	During elevator running process, the door locked signal is disconnected	1: Check whether the hall and the car door lock contact is normal 2: Check whether the door lock contactor action is normal 3: Check the door lock contactor feedback contact characteristics (normally open or normally closed) 4: Check the door lock power supply circuit 5: If there is MT70-AOB-A, check the corresponding signal	3
E0043 E43	Up limit signal disconnection during running	1: The signal of up limit is cut off when elevator is up running 2: Encoder signal interference makes elevator position error	1: Check that the up limit switch contact is normal or not 2: Check the up limit switch signal characteristics (normally open or normally closed) 3: Up limit switch installed low, normal run to the top will be action 4: Check encoder wiring and installation	3
E0044 E44	Down limit signal disconnection during running	1: The signal of down limit is cut off when elevator is down running 2: Encoder signal interference makes elevator position error	1: Check that the down limit switch contact is normal or not 2: Check the down limit switch signal characteristics (normally open or normally closed) 3: Down limit switch installed high, normal run to the bottom will be action 4: Check encoder wiring and installation	3
E0045 E45	Up/down forced Dec switch disconnection	Up/down forced Dec switches simultaneously disconnected	1: Check whether up/down forced Dec switches are normal 2: up/down forced Dec signal characteristics (normally open or normally closed) 3: F26.12 (inspection parameter setting) of Bit4 is set as 1	3
E0046 E46	Re-leveling abnormal	1: Elevator actual speed is larger than re-leveling speed +0.050m/s 2: Re-levelling position is not in the leveling area	1: Check the encoder signal 2: Check the leveling signal 3: Check the advanced open door block	3
E0047 E47	Lock-door contactor adhesion	Lock-door contactor feedback signal abnormal	1: Check lock-door contactor feedback signal characteristics (normally open or normally closed) 2: Check lock-door contactor action is normal or not 3: Check lock-door contactor feedback signal 4: Check the advanced open door block	3

Fault		Fault Cause	Countermeasure	Sort
E0048 E48	OD fault	OD continuous non-arrival times are over F22.09	1: Check the door machine system 2: Check the OD arrival signal is normal or not	3
E0049 E49	CD fault	CD continuous non-arrival times are over F22.09	1: Check the door machine system 2: Check the CD arrival signal is normal or not 3: Check the door lock circuit	3
E0050 E50	Shaft self-learning fault	**At the beginning of the learning, if any of the following conditions is met, the fault will be alarmed:** 1. The present floor is not the first floor 2. The self-learning direction is not up running 3. Down forced signal is invalid 4. Initial angle of the synchronous motor is 0 5. At two floors, the down leveling sensor isn't out off the leveling plate **Run to the second floor, if meet the following condition, alarm fault:** At the second floor self-learning, the learned adjustment distance is greater than 50cm **Run to the top floor, if meet any of following conditions, alarm fault:** 1. Up forced Dec 1 action is valid and in the door zone, and the present floor is inconsistent with the preset maximum floor 2. Elevator reaches the set floor and in the door zone, and the up forced Dec 1 is no action 3. The learned height of total floor is lower than 50cm 4. The learned up/down forced Dec 1 position is 0 5. If configured 2 and 3 level forced Dec switches, the learned up and down forced Dec position is 0	1: Check the up/down forced Dec switch signal 2: Actual floor is consistent with present floor (F19.01) or not 3: Synchronous motor is auto-tuning parameters or not 4: Check whether the motor actual running direction is correct 5: Check whether the leveling plate installation is correct 6: Check whether the leveling switch normally open/closed setting is right	3

Fault		Fault Cause	Countermeasure	Sort
E0050 E50	Shaft self-learning fault	6. If you select multiple forced Dec signal, if does not meet the following conditions, it will alarm fault: Down forced position 1< Down forced position 2< Down forced position 3 Up forced position 1> Up forced position 2> Up forced position 3		3
E0053 E53	Lock-door short-circuit fault	OD arrival signal and lock door closure signal are valid at the same time	1: Check the door lock circuit action is normal or not 2: Check the door lock contactor feedback is normal or not 3: Check the door machine OD arrival signal 4: F26.12 (inspection parameter setting) of Bit3 is set as 1	3
E0054 E54	Synchronous motor star-delta contactor feedback abnormal	Synchronous motor star-delta contactor feedback abnormal	1: Check whether the contactor feedback contact is consistent with MCB parameter setting (normally open or normally closed) 2: Check whether the indicator on MCB output side is consistent with contactor action	3
E0054	Synchronous motor star-delta contactor feedback abnormal	Synchronous motor star-delta contactor feedback abnormal	3: After the contactor acts, check whether the corresponding feedback contact and MCB corresponding feedback input point acts 4: Check whether the output characteristics of contactor is consistent with that of MCB 5: Check the contactor coil circuit	3
E0055 E55	Changed floor park fault	When elevator runs automatically, the floor has not received OD arrival signal	1: Check the door machine OD arrival signal 2: Check the door mechanical system	1

Fault		Fault Cause	Countermeasure	Sort
E0056 E56	Run contactor feedback abnormal	Run contactor feedback abnormal	1: Check whether the contactor feedback contact is consistent with MCB parameter setting (normally open or normally closed) 2: Check whether the indicator on MCB output side is consistent with contactor action 3: After the contactor acts, check whether the corresponding feedback contact and MCB corresponding feedback input point acts 4: Check whether the output characteristics of contactor is consistent with that of MCB 5: Check the contactor coil circuit 6: F26.17 is set as 1, the fault will restore	3
E0057 E57	Brake contactor feedback abnormal	1: Brake contactor feedback signal abnormal 2: Brake mechanical switch feedback abnormal 3: Brake forced feedback abnormal	1: Check whether the contactor feedback contact is consistent with MCB parameter setting (normally open or normally closed) 2: Check whether the indicator on MCB output side is consistent with contactor action 3: After the contactor acts, check whether the corresponding feedback contact and MCB corresponding feedback input point acts 4: Check whether the output characteristics of contactor is consistent with that of MCB 5: Check the contactor coil circuit 6: Check the brake mechanical switch feedback signal 7: Check the brake forced feedback signal 8: Check the brake forced contactor coil 9: F26.17 is set as 1, the fault will restore	3
E0058 E58	Leveling signal abnormal	Leveling/door zone signal is adhesion or cut off	1: Check whether the leveling and the door zone can work normally 2: Check the vertical and depth of leveling plate installation 3: Check the MCB input point	3
E0059 E59	Receive OD and CD arrival signals at the same time	Receive door machine OD and CD arrival signals at the same time	1: Check the door machine controller 2: Check OD/CD arrival signal characteristics (normally open or normally closed) 3: At inspection mode, F26.12 (inspection parameter setting) of Bit5 is set as 1, which can shield the fault	3

Fault		Fault Cause	Countermeasure	Sort
E0060 E60	Forced Dec distance is too short	Forced Dec distance is too short	1: Check up/down forced Dec 1 switch installation 2: Check the forced Dec speed (F03.12)	3
E0062 E62	Inspection run overcurrent	Inspection running current is 110% over motor rated current	1: Reduce the load 2: F26.12 of Bit1 is set as zero 3: Permanent magnet synchronous motor identified the encoder angle does not match with the actual, restart parameter auto-tuning 4: Encoder abnormal 5: Brake circuit abnormal	3
E0063 E63	Advanced open door abnormal	1: Speed is larger than advanced open speed + 0.050m/s 2: Advanced open operation is not in the leveling	1: Check the encoder signal 2: Check the leveling signal 3: Check the advanced open block (MT70-AOB-A)	3

The following faults can automatically reset:

1. E0009 heatsink overheated fault: After the heatsink temperature drops to 50℃, the fault will reset automatically.

2. E0020 motor overheated fault: After motor overheated switch recovers, the fault will reset automatically.

3. E0041 safety circuit disconnection fault: After the safety circuit is connected, the fault will reset automatically.

4. E0042 door locked disconnection fault: After locked-door is connected and auto reset, or door zone signal is valid, 1s later, the fault will reset automatically.

5. E0055 changed floor park fault: The fault only recorded once at power-on.

6. E0059 OD and CD arrival signals at the same time fault: The fault only recorded once at power-on, and if OD/CD arrival signals are not valid at the same time, the fault will reset automatically.

7. E0048, E0049 and E0055 faults can be reset by inspection button.

9.2 Maintenance

Many factors such as ambient temperature, humidity, dust, oscillation, internal component aging, wear and tear will give rise to the occurrence of MONT71 potential faults. Therefore, it is necessary to conduct daily maintenance to MONT71.

- If MONT71 has been transported for a long distance, please check whether the components are complete and the screws are well tightened.
- Please periodically clean the dust inside MONT71 and check whether the screws are loose.

Danger

- Only a trained and qualified professional person can maintain MONT71.
- Maintenance personnel should take off all metal jewellery before carrying out maintenance or internal measurements. Suitable clothes and tools must be used.
- High voltage exists when MONT71 is powered up or running.
- Checking and maintaining can only be done after MONT71 AC power is cut off and wait for at least 10 minutes. The cover maintenance can only be done after ensured that the charge indicator inside MONT71 are off and the voltage between power terminals (+) and (-) is below 36V.

Warning

- For MONT71 stored for more than 2 years, please use voltage regulator to increase the input voltage gradually.
- Do not leave metal parts like screws or pads inside MONT71
- Do not make any change to the MONT71 inside without instruction from the supplier.
- There are IC components inside the MONT71, which are sensitive to static electricity. Directly touch the components on the PCB board is forbidden.

Daily Maintenance

MONT71 must be operated in the specified environment (refer to section 5.2, page 44). Besides, some unexpected accidents may occur during operation, and you should check the items in accordance with Table 9-2 to do well daily maintenance.

Maintain good operation condition and record the operation data to solve problems immediately.

Table 9-2 Daily checking items

Items	Content	Criteria
Operating environment	Temperature and humidity	-10 - +40℃, derating at 40 - 50℃
	Dust and water dripping	No water dripping
	Gas	No strange smell
MONT71	Oscillation and heating	Stable oscillation and proper temperature
	Noise	No abnormal sound
Motor	Heating	No overheating
	Noise	No abnormal sound
Operating state parameters	Output current	Within rated range
	Output voltage	Within rated range

Periodical Maintenance

Customer should check MONT71 in short time or every 3 to 6 months according to the actual environment so as to avoid hidden problems and make sure MONT71 runs well for a long time.

General Check:

- Check whether the screws of control terminals are loose. If so, tighten them with a screw driver.
- Check whether the main circuit terminals are properly connected; whether the mains cables are over heated.
- Check whether the power cables and control cables are damaged, check especially for any wear on the cable tube.
- Check whether the insulating tapes around the cable lugs are stripped, and for signs of overheating near terminations.
- Clean the dust on PCBs and air ducts with a vacuum cleaner.

Note:

1. Dielectric strength test of MONT71 has already been conducted in the factory. Do not do the test again. Otherwise, MONT71 might be damaged.

2. If insulation test to the motor is necessary, it should be done after the motor's input terminals U/V/W have been detached from MONT71. Otherwise, MONT71 will be damaged.

3. For MONT71 that have been stored for a long time, they must be powered up every 2 years. When supplying AC power to MONT71, use a voltage regulator to gradually raise the input voltage to rated input voltage at least 5 hours.

Replacing Damaged Parts

The components that are easily damaged are: cooling fan and electrolytic capacitors of filters. Their lifetime depends largely on their application environment and preservation. The users can decide the time when the components should be replaced according to their service time.

Cooling fan

Life: 60,000 hours.

Possible cause of damages: Wear of the bearing, aging of the fan vanes.

Criteria: After MONT71 is switched off, check if the abnormal conditions such as crack existing on fan vanes and other parts. When MONT71 is switched on, check if MONT71 running is normal and check if there is any abnormal oscillation.

Electrolytic capacitors

Life: 50,000 hours

Possible cause of damages: High ambient temperature, aging of electrolyte and large pulse current induced by rapid changing loads.

Criteria: Check if frequent overcurrent or overvoltage failures occur during MONT71 start-up with load. Check if there is any leakage of liquids. Check if the safety valve protrudes. Measure the static capacitance and insulation resistance.

Unwanted MONT71

When disposing the controller, please pay attention to the following factors:

The capacitors of MONT71 may explode if they are burnt.

Poisonous gas may be generated when the plastic parts like front covers are burnt. Please dispose the unwanted MONT71 as industrial waste.

FAMCO
هایپرصنعت

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Chapter 10

Parameters

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Function parameter descriptions

There are three function parameter groups:

Group D is monitoring group, which is used to check MONT71 the various states of the configuration parameters and the system.

Group F is the changeable function parameter group.

Group Y is manufacturer parameters, which can not be changed. If the main control board is changed, you should input the manufacturer password. Please contact with agents or our company.

Attributes are changed:

"*": It denotes that the value of this parameter is the actual value which cannot be modified.

"×": It denotes that the parameter cannot be modified in run state.

"○": It denotes that the parameter can be modified in run state.

10.1 MONT71 Parameters

Ref. Code	Function	Setting Range	Default	Attr.	Value
D00: Configurations of Integrated Hardware and Software (on page 67 - 68)					
D00.00	Controller series	0x0000 - 0xffff LCD display: MONT71 elevator integrated controller	Actual	*	
D00.01	Controller rated power	0.1 - 999.9kW	Actual	*	
D00.02	Controller rated current	0.1 - 999.9A	Actual	*	
D00.03	Hardware version of main control board (MCB)	0.00 - 9.99	Actual	*	
D00.04	Software version of MCB	0.00 - 9.99	Actual	*	
D00.05	Software version of keypad	0.00 - 9.99	Actual	*	
D00.06	Special software version of MCB	0.00 - 9.99	Actual	*	
D01: Display Parameters in Drive State (on page 68 - 68)					
D01.00	S-curve preset speed	0.000 - 9.999 m/s	Actual	*	
D01.01	Elevator actual speed	0.000 - 9.999 m/s	Actual	*	
D01.02	Running RPM	0 - 9999rpm	Actual	*	
D01.03	Output voltage	0 - 999V	Actual	*	
D01.04	Output current	0.1 - 999.9A	Actual	*	
D01.05	Output frequency	0.01 - 100.00Hz	Actual	*	
D01.06	DC bus voltage	0 - 999V	Actual	*	
D02: Display Parameters of Main Control Board (on page 68 - 72)					
D02.00	MCB analogue input voltage	0.00 - 10.00V	Actual	*	
D02.01	MCB X-terminal input state 1	Display in 16-bit binary and from low to high bit represent: Bit0 - Bit15: X1 - X16 terminal	Actual	*	
D02.02	MCB X-terminal input state 2	Display in 16-bit binary and from low to high bit represent:	Actual	*	

Ref. Code	Function	Setting Range	Default	Attr.	Value
		Bit0 - Bit10: X17 - X27 terminal Bit11 - Bit15: Reserved			
D02.03	MCB L-terminal input state 1	Display in 16-bit binary and from low to high bit represent: Bit0 - Bit15: L1 - L16 terminal	Actual	*	
D02.04	MCB L-terminal input state 2	Display in 16-bit binary and from low to high bit represent: Bit0 - Bit7: L17 - L24 terminal Bit8 - Bit15: Reserved	Actual	*	
D02.05	MCB X-terminal input logic state 1	Display in 16-bit binary and from low to high bit represent: Bit0: Up leveling signal Bit1: Dwon leveling signal Bit2: Door zone signal Bit3: Run output feedback Bit4: Brake output feedback Bit5: Brake limit switch feedback Bit6: Synchronous motor self-locked feedback Bit7: Locked-door output feedback Bit8: Inspection input Bit9: Up inspection Bit10: Down inspection Bit11: Firefighting signal Bit12: Reserved Bit13: Locked-elevator Bit14: Up limit Bit15: Down limit	Actual	*	
D02.06	MCB X-terminal input logic state 2	Display in 16-bit binary and from low to high bit represent: Bit0: Up forced Dec. Bit1: Down forced Dec. Bit2: Over-loaded signal Bit3: Full load signal Bit4: Safe circuit 1 Bit5: Front door OD arrival Bit6: Back door OD arrival Bit7: Front door CD arrival Bit8: Back door CD arrival Bit9: Front door light curtain Bit10: Back door light curtain Bit11: Driver signal Bit12: Direct arrival signal Bit13: Commutation signal Bit14: Isolated signal Bit15: Front/back door switch	Actual	*	

Ref. Code	Function	Setting Range	Default	Attr.	Value
D02.07	MCB X-terminal input logic state 3	Display in 16-bit binary and from low to high bit represent: Bit0: Battery-driven running signal Bit1: Open door button input Bit2: Close door button input Bit3: Safe circuit 2 Bit4: Locked-door circuit 1 Bit5: Locked-door circuit 2 Bit6: Half-load signal Bit7: Fireman signal Bit8: Motor over-heated input signal Bit9: Earthquake monitoring input signal Bit10: Edge input signal of front door Bit11: Edge input signal of back door Bit12: Brake forcely feedback input Bit13: Back door prohibits the input signal Bit14: Alarm input signal Bit15: Reserved	Actual	*	
D02.08	MCB X-terminal input logic state 4	Display in 16-bit binary and from low to high bit represent: Bit0: High-voltage safe signal Bit1: High-voltage locked-door signal 1 Bit2: High-voltage locked-door signal 2 Bit3 - Bit15: Reserved	Actual	*	
D02.09	L-terminal for front/back door OD/CD signal	Display in 16-bit binary and from low to high bit represent: Bit0: Front door OD button Bit1: Front door CD button Bit2: Front door OD delay button Bit3: Back door OD button Bit4: Back door CD button Bit5: Back door OD delay button Bit6: Front/back door switch signal Bit7: Back door prohibition Bit8 - Bit15: Reserved	Actual	*	
D02.10	L-terminal for front door internal call state	Display in 16-bit binary and from low to high bit represent: Bit0 - Bit9: 1st - 10th floor of front door internal call Bit10 - Bit15: Reserved	Actual	*	
D02.11	L-terminal for front door up call state	Display in 16-bit binary and from low to high bit represent: Bit0 - Bit8: 1st - 9th floor of front door up call Bit9 - Bit15: Reserved	Actual	*	
D02.12	L-terminal for front door down call state	Display in 16-bit binary and from low to high bit represent:	Actual	*	

Ref. Code	Function	Setting Range	Default	Attr.	Value
		Bit0: Reserved Bit1 - Bit9: 2nd - 10th floor of front door down call Bit10 - Bit15: Reserved			
D02.13	L-terminal for back door internal call state	Display in 16-bit binary and from low to high bit represent: Bit0 - Bit9: 1st - 10th floor of back door internal call Bit10 - Bit15: Reserved	Actual value	*	
D02.14	L-terminal for back door up call state	Display in 16-bit binary and from low to high bit represent: Bit0 - Bit8: 1st - 9th floor of back door up call Bit9 - Bit15: Reserved	Actual value	*	
D02.15	L-terminal for back door down call state	Display in 16-bit binary and from low to high bit represent: Bit0: Reserved Bit1 - Bit9: 2nd - 10th floor of back door down call Bit10 - Bit15: Reserved	Actual value	*	
D02.16	MCB Y-terminal output logic state 1	Display in 16-bit binary and from low to high bit represent: Bit0: Run contactor output Bit1: Brake contactor output Bit2: Synchronous star-delta contactor output Bit3: Brake frocely output Bit4: Fan and light output Bit5: Front door OD output Bit6: Front door CD output Bit7: Back door OD output Bit8: Back door CD output Bit9: Low 7-segment display output a Bit10: Low 7-segment display output b Bit11: Low 7-segment display output c Bit12: Low 7-segment display output d Bit13: Low 7-segment display output e Bit14: Low 7-segment display output f Bit15: Low 7-segment display output g	Actual value	*	
D02.17	MCB Y-terminal output logic state 2	Display in 16-bit binary and from low to high bit represent: Bit0: Up arrow display output Bit1: Down arrow display output Bit2: Minus display output Bit3: Firefighting back to station output Bit4: Buzzer output Bit5: Over-loaded output Bit6: Arrival chime output Bit7: Full load output	Actual value	*	

Ref. Code	Function	Setting Range	Default	Attr.	Value
		Bit8: Inspection signal output Bit9: Fan and light output 2 Bit10: Locked-door contactor output Bit11: High bit output of BCD, Gray code, and seven-segment Bit12: Integrated run correctly output Bit13, Bit14: Reserved Bit15: Battery-driven output at power off			
D03: Display Parameters of Floors for Service and Registration (on page 72 - 73)					
D03.00	Present floor	1 - F19.00	Actual	*	
D03.01	Present height	0.00 - 299.99m	Actual	*	
D03.02	Distance of lowest floor	0.00 - 299.99m	Actual	*	
D03.03	Distance of highest floor	0.00 - 299.99m	Actual	*	
D03.04	Registration state of front door 10 - 1 internal call floor	Display in 10-bit binary and from low to high bit represent: D03.04: front door 10 - 1 floors with or without registration D03.05: back door 10 - 1 floors with or without registration • 1: This floor has registration • 0: This floor does not have registration	Actual	*	
D03.05	Registration state of back door 10 - 1 internal call floor		Actual	*	
D03.06	Registration state of front door 9 - 1 hall call up run	Display in 9-bit binary and from low to high bit represent: D03.06: front door hall call address 9 - 1 with or without registration D03.07: back door hall call address 9 - 1 with or without registration • 1: This address of the floor has registration • 0: This address of the floor does not have registration	Actual	*	
D03.07	Registration state of back door 9 - 1 hall call up run		Actual	*	
D03.08	Registration state of front door 10 - 2 hall call down run	Display in 10-bit binary and from low to high bit represent: D03.08: front door hall call address 10 - 2 with or without registration D03.09: back door hall call address 10 - 2 with or without registration • 1: This address of the floor has registration • 0: This address of the floor does not have registration	Actual	*	
D03.09	Registration state of back door 10 - 2 hall call down run		Actual	*	
D04: Display Parameters of Elevator Running State (on page 73 - 74)					
D04.00	Elevator system state	Display in 16-bit binary and from low to high bit represent: Bit0: System front door light curtain Bit1: System back door light curtain Bit2: Hall call locked-elevator Bit3: Hall call firefighting	Actual	*	

Ref. Code	Function	Setting Range	Default	Attr.	Value
		Bit7 - Bit4: Elevator state Bit8 - Bit11: Reserved Bit12: System full load Bit13: System over load Bit14: System front door edge Bit15: System back door edge			
D04.01	Door machine state	Display in 16-bit binary and from low to high bit represent: Bit2 - Bit0: Front door machine state Bit5 - Bit3: Back door machine state Bit6 - Bit15: Reserved	Actual	*	
D04.02	High bit of elevator run times	0 - 65535	Actual	*	
D04.03	Low bit of elevator run times	0 - 65535	Actual	*	
D04.04	Total running time (hour)	0 - 65535	Actual	*	
D04.05	Heatsink temperature	0.0 - 999.9°	Actual	*	
D04.06	Present fault code	0 - 100	Actual	*	
D05: Display Parameters of Elevator Hardware (on page 74 - 75)					
D05.00	C phase AD sample value of Sincos encoder	0 - 4095	Actual	*	
D05.01	D phase AD sample value of Sincos encoder	0 - 4095	Actual	*	
D05.02	A phase AD sample value of Sincos encoder	0 - 4095	Actual	*	
D05.03	B phase AD sample value of Sincos encoder	0 - 4095	Actual	*	
D05.04	UVW state of UVW encoder	0 - 7	Actual	*	
D05.05	Electrical angle	0 - 65535	Actual	*	
D05.06	Leveling switch number	1 - 2	Actual	*	
D05.07	Length between leveling switches	0 - 999mm	Actual	*	
D05.08	Leveling plate length	0 - 999mm	Actual	*	
D05.09	Encoder pulse count	0 - 65535	Actual	*	
D05.10	Manufacturer debugging parameter, prohibit to change				
D05.11	Buzzer source	0: No action 1: To remind at excessive position deviation returning to base station 2: To remind there is hall call information at driver mode 3: To remind at elevator over-loaded 4: To remind at battery-driven 5: To remind at forced close door 6: To remind at firefighting back to base station 7: To earthquake signal input 8: To remind there is alarm input	Actual	*	

Ref. Code	Function	Setting Range	Default	Attr.	Value
D05.12 - D05.49 Manufacturer debugging parameter, prohibit to change					
D06: Hall Call State Parameters of Modbus Extension (on page 75 - 76)					
D06.00	Software version of hall call board (HCB)	0.00 - 9.99	Actual	*	
D06.01	HCB communication interference evaluation	0.0 - 100.0 The larger the value is, the greater the communication interference is	Actual	*	
D06.02	Hall call node communication state 1	Communication state of hall call node 10 - 1	Actual	*	
D06.03	Hall call node communication state 2	Communication state of hall call node 34 - 25	Actual	*	
F00: Basic Parameters (on page 76 - 78)					
F00.00	Motor type	0: Asynchronous motor 1: Synchronous motor	0	×	
F00.01	Control mode	0: Constant voltage/frequency (VF) control 1: Open-loop vector (SVC) control 2: Encoder closed-loop (VC) control	2	×	
F00.02	Elevator max running speed	0.150m/s - F00.03	0.500m/s	×	
F00.03	Elevator rated speed	0.150 - 4.000m/s	0.500m/s	×	
F00.04	Elevator rated load	100 - 50000kg	1000kg	×	
F00.05	Controller max output frequency	5.00 - 100.00Hz	50.00Hz	×	
F00.06	Traction machine mechanical parameter	10.0 - 6000.0	20.0	×	
F00.07	Operation mode	0: Keypad control 1: Distance control	1	×	
F00.08	Manufacturer debugging parameter, prohibit to change				
F00.09	Speed setting via keypad	0.000m/s - F00.02	0.500m/s	○	
F00.10	Elevator run direction	0: The same as run command 1: Opposite to run command	0	×	
F01: User Parameters (on page 78 - 80)					
F01.00	User password	00000 - 65535	00000	○	
F01.01	Menu mode selection	0: Standard menu mode 1: Checking menu mode. (Only different from factory setting parameters can be displayed.) 2: Reserved	0	○	
F01.02	MCB parameter update	0: No operation 1: Restore to factory settings 2 - 12: Download the keypad parameter group 1 - 10 to MCB	0	×	
F01.03	Keypad parameter update	0: No operation 1 - 10: Upload MCB parameters to keypad parameter group 1 - 10	0	○	
F02: Start and Stop Parameters (on page 80 - 81)					

Ref. Code	Function	Setting Range	Default	Attr.	Value
F02.00	Retention time of start zero-speed	0.000 - 2.000s	0.200s	×	
F02.01	Delay time of curve run	0.000 - 2.000s	0.500s	×	
F02.02	Start speed	0.000 - 0.030m/s	0.000m/s	×	
F02.03	Retention time of start speed	0.000 - 2.000s	0.000s	×	
F02.04	Brake close delay time at stop	0.000 - 2.000s	0.200s	×	
F02.05	Zero-speed retention time at stop	0.000 - 2.000s	0.300s	×	
F02.06	Start ramp time	0.000 - 2.000s 0.000: No ramp	0.000s	×	
F03: Acceleration and Deceleration Curve Parameters (on page 81 - 83)					
F03.00	Acceleration speed	0.020 - 2.000m/s^2	0.250m/s^2	×	
F03.01	Start Acc jerk	0.020 - 2.000m/s^3	0.250m/s^3	×	
F03.02	End Acc jerk	0.020 - 2.000m/s^3	0.250m/s^3	×	
F03.03	Deceleration speed	0.020 - 2.000m/s^2	0.250m/s^2	×	
F03.04	Start Dec jerk	0.020 - 2.000m/s^3	0.250m/s^3	×	
F03.05	End Dec jerk	0.020 - 2.000m/s^3	0.250m/s^3	×	
F03.06	Inspection Acc speed	0.020 - 2.000m/s^2	0.250m/s^2	×	
F03.07	Inspection Dec speed	1.000 - 2.000m/s^2	1.000m/s^2	×	
F03.08	Battery driven Acc speed	0.020 - 2.000m/s^2	0.250m/s^2	×	
F03.09	Battery driven Dec speed	0.020 - 2.000m/s^2	1.000m/s^2	×	
F03.10	Asynchronous motor parameter auto-tuning Acc speed	0.020 - 2.000m/s^2	0.100m/s^2	×	
F03.11	Asynchronous motor parameter auto-tuning Dec speed	0.020 - 2.000m/s^2	0.100m/s^2	×	
F03.12	Forced Dec speed	0.500 - 2.000m/s^2	0.500m/s^2	×	
F03.13	Stop Dec jerk	0.002 - 2.000m/s^3	0.230m/s^3	×	
F03.14	Forced stop Dec jerk	0.002 - 2.000m/s^3	0.080m/s^3	×	
F03.15 - F03.20 Manufacturer debugging parameter, prohibit to change					
F04: Speed Parameters (on page 83 - 84)					
F04.00	Inspection run speed	0.000 - 0.630m/s	0.200m/s	○	
F04.01	Battery driven run speed	0.020 - 0.100m/s	0.050m/s	○	
F04.02	The creeping speed at distance control	0.050 - 0.150m/s	0.100m/s	○	
F04.03	Shaft self-learning speed	0.100 - 0.300m/s	0.200m/s	×	
F04.04	Re-leveling speed	0.020 - 0.080m/s	0.040m/s	×	
F04.05	Advanced open speed	0.020 - 0.100m/s	0.050m/s	○	
F04.06	Forced Dec speed setting	0.0 - 105.0%(F00.03)	103.0%	○	
F04.07, F04.08 Manufacturer debugging parameter, prohibit to change					
F04.09	Over-speed setting	80.0 - 120.0%(F00.03)	115.0%	○	
F04.10	Over-speed detection time	0.1 - 2.0s	0.3s	○	

Ref. Code	Function	Setting Range	Default	Attr.	Value
F04.11	Detected value of speed deviation	5.0 - 30.0%(F00.03)	20.0%	×	
F04.12	Detected time of speed deviation	0.1 - 2.0s	1.0s	×	
F05: Weighing Compensation Parameters (on page 84 - 86)					
F05.00	Pre-torque selection	0: No pre-torque 1: Analogue weighing 2: Reserved 3: Pre-torque auto-compensation	0	×	
F05.01	Analogue weighing selection	0: No analogue weighing 1: Analogue weighing	0	×	
F05.02	Weighing analogue filter time	0.00 - 2.00s	0.50s	×	
F05.03	Analogue weighing self-learning	0: No self-learning 1: No-load self-learning 2: Other load self-learning	0	×	
F05.04	Car no-load	0.00 - 10.00V	0.00V	×	
F05.05	Car full-load	0.00 - 10.00V	8.00V	×	
F05.06	Self-learning car load	0 - 100%	0%	×	
F05.07	Anti-nuisance function	0: No anti-nuisance function 1: In accordance with weighing 2: In accordance with light curtain 3: Both weighing and light curtain	0	×	
F05.08	Pre-torque bias	0.0 - 100.0%	50.0%	×	
F05.09	Up electrical pre-torque gain	0.000 - 9.000	1.000	×	
F05.10	Up brake pre-torque gain	0.000 - 9.000	1.000	×	
F05.11	Down electrical pre-torque gain	0.000 - 9.000	1.000	×	
F05.12	Down brake pre-torque gain	0.000 - 9.000	1.000	×	
F05.13 - F05.15 Manufacturer debugging parameter, prohibit to change					
F05.16	No weighing current coefficient	0 - 9999	3000	×	
F05.17	No weighing speed-loop KP	1 - 9999	1000	○	
F05.18	No weighing speed-loop KI	1 - 9999	1000	○	
F06: Manufacturer Debugging Parameters					
F06.00 - F06.05 Manufacturer debugging parameter, prohibit to change					
F07: Asynchronous Motor Parameters**(on page 87 - 89)**					
F07.00	Asynchronous motor rated power	0.2 - 500.0kW	Depend on model	×	
F07.01	Asynchronous motor rated voltage	0 - 999V		×	
F07.02	Asynchronous motor rated current	0.0 - 999.9A		×	
F07.03	Asynchronous motor rated frequency	1.00Hz - F00.05	50.00Hz	×	
F07.04	Asynchronous motor rated RPM	1 - 24000rpm	1440rpm	×	

Ref. Code	Function	Setting Range	Default	Attr.	Value
F07.05	Asynchronous motor power factor	0.001 - 1.000	0.850	×	
F07.06	Asynchronous motor parameter auto-tuning	0: No action 1: Motor static auto-tuning 2: Motor rotation auto-tuning	0	×	
F07.07	Asynchronous motor stator resistance	0.000 - 65.535Ω	Depend on model	×	
F07.08	Asynchronous motor rotor resistance	0.000 - 65.535Ω		×	
F07.09	Asynchronous motor leakage inductance	0.0 - 6553.5mH		×	
F07.10	Asynchronous motor mutual inductance	0.0 - 6553.5mH		×	
F07.11	Asynchronous motor no-load current	0.0 - 999.9A		×	
F07.12	Asynchronous motor of core saturation coefficient 1	0.00 - 0.50	0.50	×	
F07.13	Asynchronous motor of core saturation coefficient 2	0.00 - 0.75	0.75	×	
F07.14	Asynchronous motor of core saturation coefficient 3	0.00 - 1.20	1.20	×	
F07.15	Asynchronous motor torque boost	0.1 - 30.0%	0.1%	○	
F07.16	Asynchronous motor torque boost end-point	0.0 - 50.0%(F07.03)	10.0%	○	
F07.17	Asynchronous motor of slip compensation gain	0.0 - 300.0%	100.0%	○	
F07.18	Asynchronous motor of slip compensation filter time	0.1 - 10.0s	0.1s	○	
F07.19	Slip compensation limitation	0.0 - 250.0%	200.0%	×	
F07.20	Asynchronous motor performance optimization	Bit0: Exciting current optimization 0: Normal processing 1: Optimization processing Bit1: Method of exciting current optimization 0: Voltage method 1: Current method Bit2: New algorithm for asynchronous pre-torque compensation 0: The new asynchronous pre-torque compensation algorithm is invalid 1: The new asynchronous pre-torque compensation algorithm is valid Bit3 - Bit15: Reserved	0	×	

Ref. Code	Function	Setting Range	Default	Attr.	Value
F07.21	Asynchronous motor of oscillation-suppression mode	0: Oscillation suppression is dependent on the motor's exciting component 1: Oscillation suppression is dependent on the motor's torque component	1	○	
F07.22	Asynchronous motor of oscillation-suppression coefficient	0 - 200	100	○	
F08: Vector Control Speed-loop Parameters (on page 89 - 90)					
F08.00	Low speed ASR KP	1 - 9999	500	○	
F08.01	Low speed ASR KI	1 - 9999	500	○	
F08.02	High speed ASR KP	1 - 9999	500	○	
F08.03	High speed ASR KI	1 - 9999	500	○	
F08.04	ASR PI switching frequency 1	0.00 - 50.00Hz	10.00Hz	○	
F08.05	ASR PI switching frequency 2	0.00 - 50.00Hz	15.00Hz	○	
F08.06	ASR integral limitation	0.0 - 200.0% (motor rated current)	180.0%	○	
F08.07	ASR differential time	0.000 - 1.000s *0.000: ASR without differential*	0.000s	○	
F08.08	ASR output filter time	0.000 - 1.000s *0.000: ASR output without filter*	0.008s	○	
F08.09	Torque limitation	0.0 - 200.0% (motor rated current)	180.0%	×	
F09: Vector Control Current-loop Parameters (on page 90 - 91)					
F09.00	Current-loop KP	1 - 4000	500	○	
F09.01	Current-loop KI	1 - 4000	500	○	
F09.02	Current-loop output filter time	0.000 - 1.000s *0.000: Current-loop output without filter*	0.000s	○	
F09.03	Manufacturer debugging parameter, prohibit to change				
F09.04	Current loop execution cycle	1 - 10k	6k	×	
F09.05 - F09.07 Manufacturer debugging parameter, prohibit to change					
F10: Synchronous Motor Parameters (on page 91 - 93)					
F10.00	Synchronous motor type	0: IPM 1: SMPM	0	×	
F10.01	Synchronous motor rated power	0.4 - 400.0kW	Depend on model	×	
F10.02	Synchronous motor rated voltage	0 - 999V		×	
F10.03	Synchronous motor rated current	0.0 - 999.9A		×	
F10.04	Synchronous motor rated frequency	1.00Hz - F00.05	19.20Hz	×	
F10.05	Synchronous motor rated rpm	1 - 24000rpm	96rpm	×	
F10.06	Synchronous motor stator resistance	0.000 - 9.999Ω	0.000Ω	×	
F10.07	Synchronous motor cross axis inductance	0.0 - 999.9mH	0.0mH	×	

Ref. Code	Function	Setting Range	Default	Attr.	Value
F10.08	Synchronous motor direct axis inductance	0.0 - 999.9mH	0.0mH	×	
F10.09	Synchronous motor Back EMF	0 - 999V	0V	×	
F10.10	Synchronous motor of angle auto-tuning	0: No action 1: Static angle auto-tuning 2: Rotation angle auto-tuning	0	×	
F10.11	Synchronous motor static auto-tuning voltage setting	0.0 - 100.0%(F10.02)	100.0%	×	
F10.12	Synchronous motor initial angle	0.0 - 359.9°	0.0°	×	
F10.13	Synchronous motor of Z pulse initial angle	0.0 - 359.9°	0.0°	×	
F10.14	Sincos encoder C amplitude	0 - 9999	2048	×	
F10.15	Sincos encoder C zero-bias	0 - 9999	2048	×	
F10.16	Sincos encoder D amplitude	0 - 9999	2048	×	
F10.17	Sincos encoder D zero-bias	0 - 9999	2048	×	
F10.18	Sincos encoder CD phase	0: Normal 1: CD phase is opposite	0	×	
F10.19	Synchronous motor current filter coefficients	0 - 40	0	×	
F10.20	Performance optimization parameters	Bit0: Inspection run parameter auto-tuning 0: Do not automatically parameter tuning 1: Automatically parameter tuning Bit1: Current loop parameters are automatically optimized 0: Manually optimize 1: Automatically optimize Bit2: SINCOS encoder performance optimized 0: Normal processing 1: Optimization processing Bit3: Elevator speed and grid voltage optimization 0: Normal processing 1: Optimization processing Bit4 - Bit5: Reserved Bit6: Start comfort 0: Mode 0 1: Mode 1 Bit7-Bit8: Reserved Bit10&Bit9: Performance Optimization 00: Mode 0	0	×	

Ref. Code	Function	Setting Range	Default	Attr.	Value
		01: Mode 1 10: Mode 2 11: Mode 3 Bit11-Bit13: Reserved Bit14: Current sampling method 0: Mean sampling 1: single sampling Bit15: Vibration Optimization 0: The old method of vibration optimization 1: A new method of vibration optimization			
F11: Encoder Parameters (on page 93 - 94)					
F11.00	Encoder interface card selection	1: ABZ incremental encoder interface card (MT70-PG1-ABZ) 2: UVW encoder interface card (MT70-PG3-UVW) 3: SINCOS encoder interface card (MT70-PG2-SINCOS)	1	×	
F11.01	Encoder P/R	1 - 9999	1024	×	
F11.02	Encoder direction setting	0: The same direction 1: The reverse direction	0	×	
F11.03	Encoder signal filter coefficient	00 - 99 Units: Low speed of filter coefficient Tens: High speed of filter coefficient	11	○	
F11.04	Manufacturer debugging parameter, prohibit to change				
F11.05	Detecting time of encoder wire disconnection	0.00 - 2.00s 0.00: no detection for encoder wire disconnection	1.00s	×	
F12: Main Control Board Terminal Parameters**(on page 94 - 102)**					
F12.00	MCB input terminal filter time	2 - 40ms	10ms	×	
F12.01	MCB input terminal X1 function	*Note: Normally open is short for NO* 0: No function 1: Up leveling NO input (DZU) 2: Down leveling NO input (DZD) 3: Door zone NO input (SX1) 4: Run output feedback NO input (SW) 5: Brake output feedback NO input (BZK) 6: Brake limit switch feedback NO input (BZK1) 7: Synchronous motor self-locking feedback NO input (FX) 8: Locked door output feedback NO input (FMFB)	3	×	
F12.02	MCB input terminal X2 function		104	×	
F12.03	MCB input terminal X3 function		105	×	
F12.04	MCB input terminal X4 function		109	×	
F12.05	MCB input terminal X5 function		10	×	

Ref. Code	Function	Setting Range	Default	Attr.	Value
F12.06	MCB input terminal X6 function	9: Inspection NO input (INS) 10: Inspection up NO input (UP) 11: Inspection down NO input (DN) 12: Fire signal NO input (FIRS1) 13: Reserved 14: Locked-elevator NO input (LOCK) 15: Up limit NO input (LSU) 16: Down limit NO input (LSD) 17: Up forced Dec NO input (ULS1) 18: Down forced Dec NO input (DLS1) 19: Over load NO input (LWD) 20: Full load NO input (LWX) 21: Safety circuit 1 NO input (JT1) 22: Front door OD arrival NO input (OLT1) 23: Back door OD arrival NO input (OLT2) 24: Front door CD arrival NO input (CLT1) 25: Back door CD arrival NO input (CLT2) 26: Front door light curtain NO input (EDP1) 27: Back door light curtain NO input (EDP2) 28: Driver signal NO input (ATS) 29: Direct arrival signal NO input (NSB) 30: Commutation signal NO input (ACB) 31: Isolated run signal NO input (ISS) 32: Front/back door switch NO input (GABS) 33: Battery-driven NO input (UPC) 34: OD button NO input (DOB1) 35: CD button NO input (DCB1) 36: Safety circuit 2 NO input (JT2) 37: Door locked circuit 1 NO input (DLC1) 38: Door locked circuit 2 NO input (DLC2) 39: Half-load signal NO input (HALFLOAD) 40: Fireman NO input (FIRS2) 41: Motor over-heated NO input (MT) 42: Earthquake monitoring switch NO input (EQ) 43: Edges feedback for front door NO input (EDK1) 44: Edges feedback for back door NO input (EDK2) 45: Brake forced feedback NO input (KMZ) 46: Back door prohibition NO input 47: Alarm bell NO input 48: Door lock stuck normally open input 49: Brake travel switch feedback 2 normally open input 50: The second fire station is normally open	11	×	
F12.07	MCB input terminal X7 function		12	×	
F12.08	MCB input terminal X8 function		14	×	
F12.09	MCB input terminal X9 function		115	×	
F12.10	MCB input terminal X10 function		116	×	
F12.11	MCB input terminal X11 function		117	×	
F12.12	MCB input terminal X12 function		118	×	
F12.13	MCB input terminal X13 function		119	×	
F12.14	MCB input terminal X14 function		22	×	
F12.15	MCB input terminal X15 function		126	×	
F12.16	MCB input terminal X16 function		28	×	
F12.17	MCB input terminal X17 function		30	×	
F12.18	MCB input terminal X18 function		24	×	
F12.19	MCB input terminal X19 function		0	×	
F12.20	MCB input terminal X20 function		0	×	
F12.21	MCB input terminal X21 function		0	×	
F12.22	MCB input terminal X22 function		0	×	

Ref. Code	Function	Setting Range	Default	Attr.	Value
F12.23	MCB input terminal X23 function	51: bypass signal normally open input 52: Up deceleration signal normally open input	0	×	
F12.24	MCB input terminal X24 function	53: Normally open input of down deceleration signal *If hundreds is set as 1, it corresponds to normally close input.*	0	×	
F12.25	MCB high voltage input terminal X25	0: No function 1: High voltage safe circuit signal (JT) 2: High voltage locked door 1 signal (DS1) 3: High voltage locked door 2 signal (DS2) 4 - 99: Reserved	1	×	
F12.26	MCB high voltage input terminal X26		2	×	
F12.27	MCB high voltage input terminal X27 function		3	×	
F12.28	MCB relay Y0 function	0 -46 refer to F12.29 - F12.51	0	×	
F12.29	MCB relay Y1 function	0: No function 1: Run contactor output (SW) 2: Brake contactor output (BZK) 3: Synchronous star-delta contactor output (FX) 4: Brake forced output (KMZ) 5: Lighting and fan output (FAN)	1	×	
F12.30	MCB relay Y2 function		2	×	
F12.31	MCB relay Y3 function		4	×	
F12.32	MCB relay Y4 function		0	×	
F12.33	MCB relay Y5 function		0	×	
F12.34	MCB relay Y6 function	0: No function 6: Front door open output (OD1) 7: Front door close output (CD1) 8: Back door open output (OD2) 9: Back door close output (CD2) 10: Low 7-segment code display output a 11: Low 7-segment code display output b 12: Low 7-segment code display output c 13: Low 7-segment code display output d 14: Low 7-segment code display output e 15: Low 7-segment code display output f 16: Low 7-segment code display output g 17: Up arrow display output 18: Down arrow display output 19: Minus display output 20: Firefighting back to base station output 21: Buzzer output (BUZ) 22: Over load output (LWD) 23: Arrival chimes output 24: Full load output (LWX) 25: Inspection output 26: Fan and light output 2 (FAN2) 27: Locked door contactor output (FM)	6	×	
F12.35	MCB relay Y7 function		7	×	
F12.36	MCB relay Y8 function		8	×	
F12.37	MCB relay Y9 function		9	×	
F12.38	MCB relay Y10 function		10	×	
F12.39	MCB relay Y11 function		11	×	
F12.40	MCB relay Y12 function		12	×	
F12.41	MCB relay Y13 function		13	×	
F12.42	MCB relay Y14 function		0	×	
F12.43	MCB relay Y15 function		0	×	

Ref. Code	Function	Setting Range	Default	Attr.	Value
F12.44	MCB relay Y16 function	28: High bit output of BCD code, Gray code, and seven-segment code 29: Integrated run correctly output 30: Elevator up run output 31: Elevator down run output 32: Power failure emergency run is enabled (UPC) 33: R-cam valve 1 output. The output conditions are 34: Locked ladder normally open output 35: Locked ladder normally closed output 36: High 7 segment a Display output 37: High 7 segment code b display output 38: High 7 segment code c display output 39: High 7 segment code d display output 40: High 7 segment code e display output 41: high 7 segment code f display output 42: high 7 segment code g display output 43: R-cam 2 normally open output 44: R-cam 2 normally closed output 45: Maintenance time to remind the output 46: Bypass operation signal output	25	×	
F12.45	MCB relay Y17 function		17	×	
F12.46	MCB relay Y18 function		18	×	
F12.47	MCB relay Y19 function		19	×	
F12.48	MCB relay Y20 function		20	×	
F12.49	MCB relay Y21 function		21	×	
F12.50	MCB relay Y22 function		22	×	
F12.51	MCB relay Y23 function		0	×	
F13: Main Control Board L-Terminal Parameters (on page 102 - 104)					
F13.00	Input filter settings	2 - 40ms	10ms	○	
F13.01	MCB terminal L1 function	0: No function 201: Front door OD button 202: Front door CD button 203: Front door OD delay button 204: Two doors select button input 205: Back door prohibited switch normally open input 301: Back door OD button 302: Back door CD button 303: Back door OD delay button 210: 10th floor of front door internal call 211: 1st floor of front door internal call 212: 2nd floor of front door internal call 213: 3rd floor of front door internal call 214: 4th floor of front door internal call 215: 5th floor of front door internal call 216: 6th floor of front door internal call 217: 7th floor of front door internal call	201	×	
F13.02	MCB terminal L2 function		202	×	
F13.03	MCB terminal L3 function		203	×	
F13.04	MCB terminal L4 function		0	×	
F13.05	MCB terminal L5 function		211	×	
F13.06	MCB terminal L6 function		212	×	
F13.07	MCB terminal L7 function		213	×	

Ref. Code	Function	Setting Range	Default	Attr.	Value
F13.08	MCB terminal L8 function	218: 8th floor of front door internal call 219: 9th floor of front door internal call	214	×	
F13.09	MCB terminal L9 function	310: 10th floor of back door internal call 311: 1st floor of back door internal call 312: 2nd floor of back door internal call	215	×	
F13.10	MCB terminal L10 function	313: 3rd floor of back door internal call 314: 4th floor of back door internal call 315: 5th floor of back door internal call	0	×	
F13.11	MCB terminal L11 function	316: 6th floor of back door internal call 317: 7th floor of back door internal call 318: 8th floor of back door internal call	0	×	
F13.12	MCB terminal L12 function	319: 9th floor of back door internal call 221: 1st floor of front door up call	0	×	
F13.13	MCB terminal L13 function	222: 2nd floor of front door up call 223: 3rd floor of front door up call 224: 4th floor of front door up call	221	×	
F13.14	MCB terminal L14 function	225: 5th floor of front door up call 226: 6th floor of front door up call 227: 7th floor of front door up call	222	×	
F13.15	MCB terminal L15 function	228: 8th floor of front door up call 229: 9th floor of front door up call 321: 1st floor of back door up call	223	×	
F13.16	MCB terminal L16 function	322: 2nd floor of back door up call 323: 3rd floor of back door up call 324: 4th floor of back door up call	224	×	
F13.17	MCB terminal L17 function	325: 5th floor of back door up call 326: 6th floor of back door up call 327: 7th floor of back door up call	232	×	
F13.18	MCB terminal L18 function	328: 8th floor of back door up call 329: 9th floor of back door up call 230: 10th floor of front door down call	233	×	
F13.19	MCB terminal L19 function	232: 2nd floor of front door down call 233: 3rd floor of front door down call 234: 4th floor of front door down call	234	×	
F13.20	MCB terminal L20 function	235: 5th floor of front door down call 236: 6th floor of front door down call 237: 7th floor of front door down call	235	×	
F13.21	MCB terminal L21 function	238: 8th floor of front door down call 239: 9th floor of front door down call 330: 10th floor of back door down call	0	×	
F13.22	MCB terminal L22 function	332: 2nd floor of back door down call	0	×	

Ref. Code	Function	Setting Range	Default	Attr.	Value
F13.23	MCB terminal L23 function	333: 3rd floor of back door down call 334: 4th floor of back door down call 335: 5th floor of back door down call	0	×	
F13.24	MCB terminal L24 function	336: 6th floor of back door down call 337: 7th floor of back door down call 338: 8th floor of back door down call 339: 9th floor of back door down call	0	×	
F13.25 - F13.26 Manufacturer debugging parameter, prohibit to change					
F13.27	Output logic setting 1	0 - 65535	0	×	
F13.28	Output logic setting 2	0 - 255	0	×	
F14: Communication Parameters**(on page 104 - 105)**					
F14.00	Data format	0: 1-8-2 format, no parity, RTU 1: 1-8-1 format, even parity, RTU 2: 1-8-1 format, odd parity, RTU 3: 1-7-2 format, no parity, ASCII 4: 1-7-1 format, even parity, ASCII 5: 1-7-1 format, odd parity, ASCII	0	×	
F14.01	Baud rate selection	0: 1200bps 1: 2400bps 2: 4800bps 3: 9600bps 4: 19200bps 5: 38400bps	3	×	
F14.02	Local address	0 - 247	2	×	
F14.03	Host PC response time	0 - 1000ms	0ms	×	
F14.04 - F14.10 Manufacturer debugging parameter, prohibit to change					
F15: Keypad Display Parameters**(on page 105 - 106)**					
F15.00	LCD keypad language	0: Chinese 1: English	0	○	
F15.01	LCD keypad display contrast	1 - 8	6	○	
F15.02	Small keypad display direction	0: Positive display, physical floor 1: Reverse display, physical floor 2: Positive display, hall call data 3: Reverse display, hall call data	0	○	
F15.03	Run display parameter 1 setting	0: Reserved 1: Preset speed 2: Feedback speed 3: Output frequency 4: Running RPM 5: Output voltage 6: Output current 7: DC bus voltage 8: AI input voltage 9: Present height	2	○	
F15.04	Run display parameter 2 setting		3	○	
F15.05	Run display parameter 3 setting		6	○	
F15.06	Run display parameter 4 setting		0	○	
F15.07	Run display parameter 5 setting		0	○	
F15.08	Run display parameter 6 setting		0	○	
F15.09	Stop display parameter 1 setting		2	○	
F15.10	Stop display parameter 2 setting		0	○	
F15.11	Stop display parameter 3 setting		7	○	

Ref. Code	Function	Setting Range	Default	Attr.	Value
F15.12	Stop display parameter 4 setting		0	○	
F15.13	Stop display parameter 5 setting		0	○	
F15.14	Stop display parameter 6 setting		0	○	
F16: Enhance Function Parameters (on page 106 - 108)					
F16.00	Current keep time after stop command	0 - 1500ms	300ms	×	
F16.01	Fan control mode	0: Auto stop 1: Immediately stop 2: Always run when power on	0	○	
F16.02	Fan control keep time	0.0 - 600.0s	300.0s	○	
F16.03	Braking unit action voltage	220V: 360 - 400V	380V	×	
		380V: 630 - 750V	720V		
F16.04	Contactor fault detect time	0.3 - 2.0s	1.0s	×	
F16.05	Fault shield	Bit0: E0038 and E0039 fault shield Bit1: E0024 fault shield Bit2: E0058 fault shield Bit3: E0059 fault shield Bit4: E0045 fault shield Bit5: Sine and Cosine CD Break Fault disable Bit6: sine and cosine CD signal deviation disable Bit7: UCMP 65 Fault disable Bit8: CIC-B communication fault disable Bit9: Fault disable for synchronous motor static self-tuning encoder 0: No shield fault 1: Shield fault Bit10: E0065, E0066 Fault power-off reset 0: Power failure cannot be reset 1: Power off reset Bit11: E0013 fault mask 0: Not shielded 1: Shielded Bit12 - Bit15: Reserved	0	×	
F16.06 Manufacturer debugging parameter, prohibit to change					
F16.07	Elevator manufacturers choose	0 - 999	0	×	
F16.08	Kinds of elevator parameter selection	0 - 99	0	×	
F16.09 - F16.10 Manufacturer debugging parameter, prohibit to change					
F16.11	Fault detection time for star seal contactor	0.3 – 5.0s	4.0s	×	
F16.12 - F16.19 Manufacturer debugging parameter, prohibit to change					

Ref. Code	Function	Setting Range	Default	Attr.	Value
F16.20	CIC-B parameter setting	Bit0: CIC-B function is enabled 0: No opening 1: open Bit2-Bit1: Maximum Number of Reminders for Elevator Fault Messages 00: remind 1 time 01: Remind 2 times 10: Remind 3 times 11: Remind 4 times Bit3: Elevator fault SMS alert interval 0: Remind 1 hour interval 1: Remind two hours apart Bit4: Elevator maintenance time to SMS reminder function 0: No maintenance reminder 1: Open the maintenance reminder Bit5: CIC-A cell monitoring opened 0: No opening 1: open Bit6 - Bit15: Reserved	18	○	
F16.21	Maintenance days	1 - 9999 Low two bits: Maintenance cycle High two bits: reminder for Remaining days	0015	○	
F16.22- F16.24 Manufacturer debugging parameter, prohibit to change					
F17: Fault Protect Parameters (on page 108 - 110)					
F17.00	The detect base of lack of input	0 - 100% (controller rated voltage)	30%	×	
F17.01	The detect time of lack of input	0.0 - 5.0s	1.0s	×	
F17.02	The detect base of lack of output	0 - 100% (controller rated current)	20%	×	
F17.03	The detect time of lack of output	0.0 - 20.0s	3.0s	×	
F17.04	Motor overload protect factor	20.0 - 110.0%	100.0%	×	
F17.05	Fault auto reset times	0 - 100 *0: No reset function*	0	×	
F17.06	Fault auto reset interval	2.0 - 20.0s/times	5.0s/times	×	
F17.07	Fault relay action select	Bit0: During auto reset: 0: No action 1: Action Bit1: During under voltage 0: No action 1: Action	00	○	

Ref. Code	Function	Setting Range	Default	Attr.	Value
		Bit2: Automatically reset the holding switch when the elevator starts 0: Automatic reset 3 times 1: Do not reset automatically Bit3: E66 fault can be repaired manually reset 0: Cannot be reset manually 1: Can be manually reset Bit4: Three-phase input phase loss detection imbalance 0: detection 1: not detected Bit5 - Bit3: Reserved			
F17.08	No. 1 fault type (the farthest time)	0 - 1099 E0001: Controller output Acc overcurrent E0002: Controller output Dec overcurrent E0003: Controller output constant speed overcurrent E0004: DC bus voltage Acc overvoltage E0005: DC bus voltage Dec overvoltage E0006: DC bus voltage constant speed overvoltage E0007: Reserved E0008: Power module faulty E0009: Heatsink overheated E0010: Braking unit faulty E0011: CPU fault E0012: Parameter auto-tuning fault E0013: Soft start failed E0014: Current detect faulty E0015: Lack of input E0016: Lack of output E0017: Controller overloaded E0018: Excessive speed deviation E0019: Motor overloaded E0020: Motor overheated E0021: MCB EEPROM faulty E0022: Keypad EEPROM faulty (only display but without controller protection) E0023: Parameter setting faulty	0	*	
F17.09	No. 2 fault type		0	*	
F17.10	No. 3 fault type		0	*	
F17.11	No. 4 fault type		0	*	

Ref. Code	Function	Setting Range	Default	Attr.	Value
F17.12	No. 5 fault type	E0024: Input voltage detection failure E0025 - E0029: Reserved E0030: Encoder reverse direction E0031: Encoder disconnection E0032: Motor over speed E0033: Loss of Z signal of ABZ encoder E0034: UVW signal wrong of UVW encoder E0035: CD phase wrong of Sincos encoder E0036: Shortest distance ultrahigh E0037: Control board logic parameters E0038: Up forced Dec switch disconnection E0039: Down forced Dec switch disconnection E0040: Elevator run timeout E0041: Safety circuit disconnection E0042: Door locked disconnection during running E0043: Up limit signal disconnection during running E0044: Down limit signal disconnection during running E0045: Up/down forced Dec switch disconnection E0046: Re-leveling abnormal E0047: Lock-door contactor adhesion E0048: OD fault E0049: CD fault E0050: Shaft self-learning fault E0051: Reserved E0052: Hall call communication fault E0053: Lock-door short-circuit fault E0054: Synchronous motor star-delta contactor feedback abnormal E0055: Changed floor park fault E0056: Run contactor feedback abnormal E0057: Brake contactor feedback abnormal E0058: Leveling signal abnormal E0059: Receive OD and CD arrival signals at the same time E0060: Forced Dec distance is too short E0061: Reserved E0062: Inspection run overcurrent E0063: Advanced open door abnormal	0	*	
F17.13	No. 6 fault type		0	*	
F17.14	No. 7 fault type		0	*	
F17.15	No. 8 fault type		0	*	
F17.16	No. 9 fault type		0	*	
F17.17	No. 10 fault type		0	*	
F17.18	The most recent fault type	0 - 1099	0	*	
F17.19	The most recent running speed at faulty	0.000 - 4.000m/s	0.000m/s	*	

Ref. Code	Function	Setting Range	Default	Attr.	Value
F17.20	The most recent DC bus voltage at faulty	0 - 999V	0V	*	
F17.21	The most recent output current at faulty	0.0 - 999.9A	0.0A	*	
F18: PWM Control Parameters (on page 110 - 111)					
F18.00	Carrier frequency	1 - 16kHz	Depend on model	×	
F18.01	Carrier frequency auto adjust enable	0: Disable 1: Enable	0	×	
F18.02	PWM over-modulation enable	0: Disable 1: Enable	1	×	
F18.03	PWM modulation mode	0: Two phase / Three phase switch 1: Three phase	1	×	
F19: Distance Control Parameters (on page 111 - 113)					
F19.00	Total floor	2 - 10	5	×	
F19.01	Present floor	1 - F19.00	1	×	
F19.02	Present height	0.00 - 299.99m	0.00m	×	
F19.03	Leveling distance adjustment/ Parking allowance of distance control	0 - 60mm F19.06 = 0, F19.03 is leveling distance adjustment F19.06 = 1, F19.03 is parking allowance of distance control	30mm	×	
F19.04	Leveling position correction coefficient	0 - 500mm	0mm	×	
F19.05	Dec point through output adjustment	0.050 - 2.000s	0.250s	×	
F19.06	Direct parking selection	0: Direct parking mode 0 (without creep) 1: Direct parking mode 1 (with creep)	0	*	
F19.07	Highest speed of curve 1	0.000m/s - F00.02	0.000m/s	×	
F19.08	Highest speed of curve 2		0.000m/s	×	
F19.09	Highest speed of curve 3		0.000m/s	×	
F19.10	Highest speed of curve 4		0.000m/s	×	
F19.11	Highest speed of curve 5		0.000m/s	×	
F19.12	Up forced Dec position	0.00 - 300.00m	0.00m	×	
F19.13	Down forced Dec position	0.00 - 300.00m	0.00m	×	
F19.14 - F19.17 Manufacturer debugging parameter, prohibit to change					
F20: Storey Height Parameters**(on page 113 - 114)**					
F20.00	High bit of storey 1	0 - 50000 Storey N high bit number xx = 2N – 2 Storey N low bit number xx = 2N – 1 **Storey height =** **50000 ×storey high bit + storey low bit**	0	×	
F20.01	Low bit of storey 1		0	×	
F20.02	High bit of storey 2		0	×	
F20.03	Low bit of storey 2		0	×	
…					
F20.xx	High bit of storey N		0	×	

Ref. Code	Function	Setting Range	Default	Attr.	Value
F20.xx	Low bit of storey N		0	×	
…					
F20.14	High bit of storey 8		0	×	
F20.15	Low bit of storey 8		0	×	
F20.16	High bit of storey 9		0	×	
F20.17	Low bit of storey 9		0	×	
F21: Elevator Parameters (on page 114 - 115)					
F21.00	Parking base station	1 - F19.00	1	×	
F21.01	Fire base station	1 - F19.00	1	×	
F21.02	Locked-elevator base station	1 - F19.00	1	×	
F21.03	Service floor	0 - 1023	1023	×	
F22: Door Machine Parameters (on page 115 - 117)					
F22.00	Door machine number	1 - 2	1	×	
F22.01	Front door service floor	0 - 1023 (set 10 - 1 floor)	1023	○	
F22.02	Back door service floor	0 - 1023 (set 10 - 1 floor)	1023	○	
F22.03	OD time protection	5 - 99s	10s	○	
F22.04	CD time protection	5 - 99s	15s	○	
F22.05	Limited times of OD/CD overtime	0 - 20	0	○	
F22.06	OD/CD torque holding	0: Without OD/CD torque holding 1: With OD torque holding 2: With CD torque holding 3: With OD/CD torque holding 4: During running process with CD torque holding	3	○	
F22.07	Hall call OD holding time	1 - 30s	5s	○	
F22.08	Internal call OD holding time	1 - 30s	3s	○	
F22.09	Door state at waiting elevator	0: Normal close the door 1: Base station OD waiting elevator 2: Each floor OD waiting elevator	0	○	
F22.10	Holding time for base station OD	1 - 30s	10s	○	
F22.11	Delay time of OD holding	10 - 1000s	30s	○	
F22.12 Manufacturer debugging parameter, prohibit to change					
F22.13	Open-through door control mode	0: Open-through door control mode 0 1: Open-through door control mode 1 2: Open-through door control mode 2 3: Open-through door control mode 3	0	○	
F23: Time Parameters (on page 117 - 118)					
F23.00	Free return base station time	0 - 240min	10min	○	
F23.01	Delay time of close lighting and fan	0 - 240min *0: No close delay function*	2min	○	
F23.02	Largest floors run interval	0 - 45s	45s	×	

Ref. Code	Function	Setting Range	Default	Attr.	Value
F24: Display Parameters of Floor Information (on page 118 - 119)					
F24.00	Collective mode	0: Full collective 1: Up collective 2: Down collective	0	○	
F24.01	Floor 1 display	0000 - 1999 • The high 2-bit respents the floor's tens • The low 2-bit respents the floor's units **Such as:** The 10th floor displays 10, F24.10 = 0100; The first floor displays -1, F24.01=1001. 00: Display "0" 18: Display "-" 01: Display "1" 19: No diplay 02: Display "2" 23: Display "C" 03: Display "3" 25: Display "E" 04: Display "4" 26: Display "F" 05: Display "5" 35: Display "U" 06: Display "6" 39: Display "Y" 07: Display "7" 50: Display "b" 08: Display "8" 51: Display "d" 09: Display "9" 52: Display "t" 10: Display "A" 53: Display "G" 13: Display "H" 54: Display "L" 16: Display "P" 55: Display "J"	1901	○	
F24.02	Floor 2 display		1902	○	
F24.03	Floor 3 display		1903	○	
F24.04	Floor 4 display		1904	○	
F24.05	Floor 5 display		1905	○	
F24.06	Floor 6 display		1906	○	
F24.07	Floor 7 display		1907	○	
F24.08	Floor 8 display		1908	○	
F24.09	Floor 9 display		1909	○	
F24.10	Floor 10 display		0100	○	
F24.11	Hall call output selection	0: Seven-segment code 1: BCD code 2: Reserved 3: Binary code	1	○	
F25: Test Running Parameters**(on page 119 - 120)**					
F25.00	Test floor 1	0 - F19.00	0	○	
F25.01	Test floor 2		0	○	
F25.02	Test floor 3		0	○	
F25.03	Test times	0 - 60000	0	○	
F25.04	Special test parameter	Bit0: Hall call enable 0: Enabled hall call 1: Disabled hall call Bit1: OD enable 0: Enabled OD 1: Disabled OD Bit2: Over-load enable 0: Disabled over-load 1: Enabled over-load	0	○	

Ref. Code	Function	Setting Range	Default	Attr.	Value
		Bit3: Limitation enable 0: Enabled limitation 1: Disabled limitation Bit4: Random run enable 0: Disabled random run 1: Enabled random run Bit5 – Bit6: Reserved Bit7: Start UCM P Test 0: Do not enable this function 1: Enable UCMP test Bit8: Start brake force test 0: Do not enable this function 1: Enable this feature Bit9 - Bit15: Reserved			
F26: Elevator Function Selections (on page 120 - 130)					
F26.00	Call elevator floor setting	0 - F19.00	0	○	
F26.01	Shaft self-learning	0: Does not work 1: Start shaft self-learning	0	×	
F26.02	Driver function	Bit0: Open driver function 0: Without driver function 1: With driver function Bit2 - Bit1: Hall call disposal at driver mode 00: Buzzer no action, and internal call is not flashing 01: Buzzer no action, internal call is flashing 10: Buzzer action, and internal call is not flashing 11: Buzzer action, internal call is flashing Bit3: CD arrival without registration command and auto open door 0: Auto open door 1: Do not auto open door Bit4 - Bit6: Reserved Bit7: Closed door mode selection 0: Long press the CD button to close the door 1: Jog to close the door Bit8: Automatically close the door 0: The inside of the pull door software is automatically closed	3	×	

Ref. Code	Function	Setting Range	Default	Attr.	Value
		1: Close the door with the close button Bit9-Bit15: Reserved			
F26.03	Firefighting function	0: Without corresponding function 1: With corresponding function	1	×	
F26.04	Re-leveling function		0	×	
F26.05	Advanced open function		0	×	
F26.06	Hall call Modbus communication	0: No open 1: Open	0	×	
F26.07	Isolated run		0	×	
F26.08	Locked-elevator BCD code hall call display	Bit0: To set the SegA output Bit1: To set the SegB output Bit2: To set the SegC output Bit3: To set the SegD output 0: No SegD output 1: SegD output Bit4 - Bit7: Reserved	0	×	
F26.09, F26.10 Manufacturer debugging parameter, prohibit to change					
F26.11	Miss delete car command	0: No open 1: Open	1	×	
F26.12	Inspection parameter setting	Bit0: Inspection auto close door 0: Inspection without close door 1: Inspection auto close door Bit1: Inspection over-current detection 0: Inspection run without limiting 110% rated current 1: Inspection run with limiting 110% rated current Bit2: Stop mode selection at inspection 0: Immediate stop 1: Dec stop Bit3: Detect door lock jump-out fault at inspection mode 0: Detect door lock jump-out fault 1: Do not detect door lock jump-out fault Bit4: Detect up/down forced simultaneous operation at inspection mode 0: Detect 1: Do not detect Bit5: Detect open/close door simultaneous operation at inspection mode 0: Detect 1: Do not detect	5	×	

Ref. Code	Function	Setting Range	Default	Attr.	Value
		Bit6: Door machine non-service floor allow open/close door at inspection 0: Do not allow open/close door 1: Allow open/close door Bit7: Detect the door machine CD arrival at inspection running 0: Do not detect close door arrival 1: Detect close door arrival			
F26.13	Forced close door	0: No open 1: Open	0	×	
F26.14	Door lock jump-out test	Bit0: Door-lock jump-out test function 0: No open 1: Open Bit1: Door-lock jump-out test mode 0: Test total door lock circuits together 1: Test each door lock circuit independently Bit2: Door lock short-circuit fault automatic reset 0: Do not reset automatically 1: Automatic reset Bit3: Closed output test door lock short 0: Do not start 1: Start Bit4: X28 high voltage door lock short input 0: Invalid high voltage door lock short input function 1: High voltage door lock short input function is valid Bit5 - Bit15: Reserved	1	×	
F26.15	Battery-driven run parameter setting	Bit0: Battery-driven self-rescue timeout protection 0: Protection 1: No protection Bit1: Permanent magnet synchronous motor battery-driven auto-running 0: No open 1: Open Bit2: Battery-driven direction judgment 0: Auto judge	1	×	

Ref. Code	Function	Setting Range	Default	Attr.	Value
		1: Judge in accordance to weighing signal Bit3: Fixed up run of battery-driven direction 0: This bit should not decide the direction 1: The direction is fixed up run. Bit4: Fixed down run of battery-driven direction 0: This bit should not decide the direction 1: The direction is fixed down run. Bit5: Automatic torque compensation start for emergency operation 0: Do not start 1: Start Bit6: Emergency Door Movement 0: Keep open the door 1: Close the door after opening the door Bit7: Automatic judgment of emergency operation 0: Action 2 times 1: Action 1 time			
F26.16	Elevator enhanced function selection	Bit0: Stop without run command and auto open door 0: Do not auto open door 1: Auto open door Bit1: Reserved Bit2: Battery driven reset auto return to base station 0: Auto return to base station 1: Do not return to base station Bit3: Cleared conditions of firefighting back to base station mode 0: Power off or firefighting switch is invalid 1: Fireman input valid and then clear Bit4: Non-service floor is allowed to open door at fireman operating elevator Bit5: Non-service floor is allowed to open the door at fireman operating door machine 0: Not allow to open door 1: Allow to open door	1	×	

Ref. Code	Function	Setting Range	Default	Attr.	Value
		Bit6: OD selection at firefighting back to base station power-on 0: Open door 1: No open door Bit7: E0041 clear the internal call 0: E0041 fault clear the internal call 1: E0041fault do not clear the internal call Bit8: Forced Dec switch types 0: Ordinary forced deceleration switch 1: Trigger forced deceleration switch Bit9: Open the function of pulling door manually			
F26.16	Elevator enhanced function selection	0: Do not open this function 1: Open this function Bit10: Selections of up/down limit switch 0: Use the actual up/down limit switch 1: Use the synthesis of leveling floor and end station switch Bit11: Back to leveling automatically 0: Back to leveling automatically due to meeting the running condition 1: Back to leveling for the setting run command Bit12: Car energy-saving selections at OD waiting for elevator 0: Car is not energy-saving 1: Car is energy-saving Bit13: Display the running direction sparkly 0: Do not display 1: Display Bit14: Logic of fan and lighting 0: The logic is normal 1: The logic is negated Bit15: Light curtain action modes of door 1 and door 2 0: Light curtains of Door 1and door 2 act alone 1: Light curtains have inside association	1	×	

Ref. Code	Function	Setting Range	Default	Attr.	Value
F26.17	Contactor contact adhesion failure auto reset	0: No open 1: Open	0	×	
F26.18	Forced Dec switch adhesion detection		1	×	
F26.19	Synchronous motor star-delta contactor parameter setting	Bit0: Synchronous star-delta contactor control selection 0: Not control the output 1: Control the output Bit1: Synchronous star-delta contactor normally open or close setting 0: Normally close. Generally use the normally close 1: Normally open Bit2 - Bit7: Reserved	0	×	
F26.20 Manufacturer debugging parameter, prohibit to change					
F26.21	Open-through door control	0: No open 1: Open	0	×	
F26.22	OD function selection at this floor internal call	0: No open door 1: Open door	0	×	
F26.23	OD function of OD delay button	0: Pressing the OD delay button does not work during CD process 1: Pressing the OD delay button does work during CD process	0	×	
F26.24	Position deviation too large and return to run	0: Does not return to base station 1: Return to base station	1	×	
F26.25	Position deviation too large and base setting	180 - 700mm	400mm	×	
F26.26	Elevator increased function 2	Bit0: Close the door via CD button due to no OD arrival 0: The CD button cannot close the door 1: The CD button can close the door Bit1: Detect the timeout of auto back to re-leveling 0: Detect 1: Do not detect Bit2: Safety circuit fault priority 0: Normal safety circuit fault level 1: High safety circuit fault level Bit3: Safety Circuit Breaks Door Machine Status	0	×	

Ref. Code	Function	Setting Range	Default	Attr.	Value
F26.26	Elevator increased function 2	0: Do not output the opening and closing door 1: Keep open the door Bit4: Overhaul detection leveling signal abnormal 0: No detection 1: Detection Bit5: Ultra-short layer function 0: No opening 1: open Bit6: Timeout for well self-learning detection 0: detection 1: not detected Bit7: E38\E39 fault automatically returns to the base station 0: Do not return to the base station automatically 1: Automatically return to the base station Bit8: Automatic reset for one hour fault 0: Do not reset automatically 1: Automatic reset Bit9: End station back leveling 0: Return to the nearest leveling 1: Return to the leveling layer away from the end station Bit10: No door open signal can be automatically closed 0: Do not automatically close the door 1: Automatically close the door with no door open signal in excess of F22.03 time Bit11: Closed-in-signal type 0: Normal 1: Triggered Bit12: Hand pull door mode 2 0: Not enabled 1: Enabled	0	×	

Ref. Code	Function	Setting Range	Default	Attr.	Value
		Bit13: Automatic reset of upper and lower limit faults 0: Do not reset automatically 1: Automatic reset Bit14: Reverse Registration No. 0: Reverse pin number 1: Reverse sales number Bit15: Unit selection for F23.01 0: Minutes 1: Second			
F26.27	Accessaries	Bit0: HDRU 0: HDRU not combined 1: HDRU combined Bit1 - Bit15: Reserved	0	×	
F26.28	Elevator additonal functions selection 3	Bit0: Elevator R-cam output method 0: Consistent output of the relevant door command 1: Interval output for door command Bit1: Door lock fault detection 0: Normal detection 1: Quick detection Bit2: Operation panel Fault occurred in fault mode display 0: Go to fault mode display 1: Maintain the original menu Bit3-Bit15: Reserved	0	×	
F26.29	Emergency return leveling and stop delay	0.000 - 3.000s	0.100s	×	
F26.30	Return leveling and stop delay	0.000 - 3.000s	0.100s	×	
F26.31	Hall call parameter setting	Bit0: The way of digital arrow display 0: Scrolled 1: Fixed Bit1: Format of arrow display 0: Big arrow 1: Small arrow Bit2: Direction button input type Bit3: Firefighting signal input type Bit4: Locked-elevator signal input type 0: Normally open 1: Normally close	512	×	

Ref. Code	Function	Setting Range	Default	Attr.	Value
		Bit5: Floor display 0: Dynamic 1: Direct Bit6: Single digit display 0: Center display 1: Unilateral display Bit7: Energy-saving display selection 0: Enabled energy-saving display 1: Disabled energy-saving display Bit9 - Bit8: LCD bright adjustment 00: Low bright 01: Middle bright 10: High bright 11: The brightest Bit10: HCB display fault code 0: No display 1: Display Bit11 - Bit15: Reserved			
F26.32	Hall call parameter setting confirm	0: No action 1: Hall call parameter setting confirm	0	×	
F26.33	Hall call HCB-H indicator 1 meaning	0: No function 1: Full load indication 2: Inspection indication 3: Stop indication 4: Over load indication 5: Fault indication	1	×	
F26.34	Hall call HCB-H indicator 2 meaning		2	×	
F26.35	Hall call address verification	0: Normal display 1: hall floor display data is changed to show hall call address	0	×	
F26.36 Manufacturer debugging parameter, prohibit to change					
F27: Additional parameter (on page 128-130)					
F27.00	Brake force detection method	0: Invalid 1: Start detection manually 2: Automatically start detection	Synchronous motor: 2 Asynchronous motor: 0	×	
F27.01	Brake force detection period	1 - 15 day	1 day	×	
F27.02	Brake detection duration	1 - 10s	5s	×	
F27.03	Brake detection torque	60 - 150%	100%	×	

Ref. Code	Function	Setting Range	Default	Attr.	Value
F27.04	Brake detection allowable pulse size	1 - 99	5	×	
F27.05	Brake detection success times	0 - 65535	0	*	
F27.06	Second fire station	1 - F19.00	0	×	
F27.07	X29 expansion terminal Function selection	Refer to F12.01-F12.24 (X1-X24 terminal)	0	×	
F27.08	Y24 expansion relay function selection	Refer to F12.28-F12.51 (Y0-Y23 relay)	0	×	
F27.09	Start DC braking current	50 - 150%	100%	×	
F27.10	Start DC brake current duration	0.0 - 3.0S	0.0S	×	
F27.11	DC brake current at shutdown	50 - 150%	100%	×	
F27.12	Stop DC braking current start frequency	0.20 - 10.00Hz	0.50Hz	×	
F27.13	Running minimum current limit	5 - 100% (F07.11)	20%	×	
F27.14	Running minimum current detection time	0.0 - 5.0s	0.0s	×	
F27.15	Brake release frequency	0.00 - 10.00Hz	0.00Hz	×	
F27.16 - F27.18 Manufacturer debugging parameter, prohibit to change				×	
F27.19	Static current	0.0 - 9.9A	0.0A	×	
F27.20	Magnetic long board (MT71-SVC parameter)	500 - 1500mm	700mm	×	
F27.21	Deceleration distance (MT71-SVC parameter)	0 - 9999mm	Actual	*	
F27.22	Real-time deceleration distance (MT71-SVC parameter)	0 - 9999mm	Actual	*	
F27.23	Open loop machine parameters	Bit0: Powering at Non-leveling Area 0: Do not return to the base station 1: Return to the base station Bit1: Hierarchical deceleration mode 0: Deceleration of a leveling signal is encountered 1: Deceleration of two leveling signals is encountered Blt2: number of leveling switches 0: Double leveling 1: Single switch Bit3: Open loop dining ladder function 0: Not enabled 1: Enable special meal ladder function Bit4-Bit15: Reserved	0	×	
F27.24 - F27.28 Manufacturer debugging parameter, prohibit to change					
F27.29	Leveling fine-tuning enable	0: Disable	0	×	

Ref. Code	Function	Setting Range	Default	Attr.	Value
		1: Enable			
F27.30	1 floor down leveling fine-tuning	0 - 60mm	30mm	×	
F27.31	2 floor down leveling fine-tuning	0 - 60mm	30mm	×	
F27.32	3 floor down leveling fine-tuning	0 - 60mm	30mm	×	
F27.33	4 floor down leveling fine-tuning	0 - 60mm	30mm	×	
F27.34	5 floor down leveling fine-tuning	0 - 60mm	30mm	×	
F27.35	6 floor down leveling fine-tuning	0 - 60mm	30mm	×	
F27.36	7 floor down leveling fine-tuning	0 - 60mm	30mm	×	
F27.37	8 floor down leveling fine-tuning	0 - 60mm	30mm	×	
F27.38	9 floor down leveling fine-tuning	0 - 60mm	30mm	×	
F27.39	10 floor down leveling fine-tuning	0 - 60mm	30mm	×	
F27.40	11 floor down leveling fine-tuning	0 - 60mm	30mm	×	
F27.41	12 floor down leveling fine-tuning	0 - 60mm	30mm	×	
F27.42	13 floor down leveling fine-tuning	0 - 60mm	30mm	×	
F27.43	14 floor down leveling fine-tuning	0 - 60mm	30mm	×	
F27.44	15 floor down leveling fine-tuning	0 - 60mm	30mm	×	
F27.45	2 floor up leveling fine-tuning	0 - 60mm	30mm	×	
F27.46	3 floor up leveling fine-tuning	0 - 60mm	30mm	×	
F27.47	4 floor up leveling fine-tuning	0 - 60mm	30mm	×	
F27.48	5 floor up leveling fine-tuning	0 - 60mm	30mm	×	
F27.49	6 floor up leveling fine-tuning	0 - 60mm	30mm	×	
F27.50	7 floor up leveling fine-tuning	0 - 60mm	30mm	×	
F27.51	8 floor up leveling fine-tuning	0 - 60mm	30mm	×	
F27.52	9 floor up leveling fine-tuning	0 - 60mm	30mm	×	
F27.53	10 floor up leveling fine-tuning	0 - 60mm	30mm	×	
F27.54	11 floor up leveling fine-tuning	0 - 60mm	30mm	×	
F27.55	12 floor up leveling fine-tuning	0 - 60mm	30mm	×	
F27.56	13 floor up leveling fine-tuning	0 - 60mm	30mm	×	
F27.57	14 floor up leveling fine-tuning	0 - 60mm	30mm	×	
F27.58	15 floor up leveling fine-tuning	0 - 60mm	30mm	×	
F27.59	16 floor up leveling fine-tuning	0 - 60mm	30mm	×	

10.2 IOB Parameters

Ref. Code	Function	Setting Range	Default	Attr.	Value
F13: Main Control Board L-Terminal Parameters (**4.5.4, on page 36**)					
F13.01	MCB terminal L1 function	240: Reserve 241: 11 floor front door internal call	201	×	
F13.02	MCB terminal L2 function	242: 12 floor front door internal call	202	×	
F13.03	MCB terminal L3 function	243: 13 floor front door internal call 244: 14 floor front door internal call	203	×	
F13.04	MCB terminal L4 function	245: 15 floor front door internal call 246: 16 floor front door internal call	0	×	
F13.05	MCB terminal L5 function	340: Reserve	211	×	
F13.06	MCB terminal L6 function	341: 11 floor back door internal call 342: 12 floor back door internal call	212	×	
F13.07	MCB terminal L7 function	343: 13 floor back door internal call	213	×	
F13.08	MCB terminal L8 function	344: 14 floor back door internal call 345: 15 floor back door internal call	214	×	
F13.09	MCB terminal L9 function	346: 16 floor back door internal call	215	×	
F13.10	MCB terminal L10 function	250: 10 floor front door up call 251: 11 floor front door up call	0	×	
F13.11	MCB terminal L11 function	252: 12 floor front door up call	0	×	
F13.12	MCB terminal L12 function	253: 13 floor front door up call 254: 14 floor front door up call	0	×	
F13.13	MCB terminal L13 function	255: 15 floor front door up call 256: Reserve	221	×	
F13.14	MCB terminal L14 function	350: 10 floor back door up call	222	×	
F13.15	MCB terminal L15 function	351: 11 floor back door up call	223	×	
F13.16	MCB terminal L16 function	352: 12 floor back door up call 353: 13 floor back door up call	224	×	
F13.17	MCB terminal L17 function	354: 14 floor back door up call 355: 15 floor back door up call	232	×	
F13.18	MCB terminal L18 function	356: Reserve	233	×	
F13.19	MCB terminal L19 function	261: 11 floor front door down call 262: 12 floor front door down call	234	×	
F13.20	MCB terminal L20 function	263: 13 floor front door down call 264: 14 floor front door down call	235	×	
F13.21	MCB terminal L21 function	265: 15 floor front door down call 266: 16 floor front door down call	0	×	
F13.22	MCB terminal L22 function	361: 11 floor back door down call	0	×	
F13.23	MCB terminal L23 function	362: 12 floor back door down call 363: 13 floor back door down call	0	×	
F13.24	MCB terminal L24 function	364: 14 floor back door down call 365: 15 floor back door down call 366: 16 floor back door down call	0	×	

Ref. Code	Function	Setting Range	Default	Attr.	Value
		Note: For the setting of 1 - 10th floor see F13.01 - F13.24 parameters in 10.1 or 7.2.14			
F20: Storey Height Parameters **(4.5.4, on page 36)**					
F20.18	floor height 10 high bit	0 - 50000 **Floor height =** **50000 ×Floor High + Floor Low**	0	×	
F20.19	loor height 10 low bit		0	×	
F20.20	floor height 11 high bit		0	×	
F20.21	floor height 11 low bit		0	×	
F20.22	floor height 12 high bit		0	×	
F20.23	floor height 12 low bit		0	×	
F20.24	floor height 13 high bit		0	×	
F20.25	floor height 13 low bit		0	×	
F20.26	floor height 14 high bit		0	×	
F20.27	floor height 14 low bit		0	×	
F20.28	floor height 15 high bit				
F20.29	floor height 15 low bit				
F24: Display Parameters of Floor Information **(4.5.4, oa page 36)**					
F24.11	Floor 11 display	0000 - 99999 High 2 represents ten floors Low 2 floors represent floor spaces Such as: The 11th floor shows 11, F24.11 = 0101;	0101	○	0
F24.12	Floor 12 display	00: Display"0" / 01: Display"1" 02: Display"2" / 03: Display"3"	0102	○	0
F24.13	Floor 13 display	04: Display"4" / 05: Display"5" 06: Display"6" / 07: Display"7" 08: Display"8" / 09: Display"9" 10: Display"A" / 13: Display"H"	0103	○	0
F24.14	Floor 14 display	16: Display"P" / 23: Display"C" 25: Display"E" / 26: Display"F"	0104	○	0
F24.15	Floor 15 display	16: Display"P" / 23: Display"C" 25: Display"E" / 26: Display"F" 35: Display"U" / 39: Display"Y" 50: Display"b" / 51: Display"d" 52: Display"t" / 53: Display"G"	0105	○	0
F24.16	Floor 16 display	54: Display"L" / 55: Display"J" 18: Display"-" / 19: No display	0106	○	0
F24.17	Hall call output selection	0: 7 segment. 1: BCD code.	0	○	0

Ref. Code	Function	Setting Range	Default	Attr.	Value
		2: Reserve. 3: Binary			
F28 IOB Output Parameter (4.5.4, oa page 36)					
F28.00	IOB enhance parameter	Bit0: Reserve Bit1: Reserve Bit2: IOB expansion Functions 0: Forbiden 1: Enable Bit3 - Bit15: Reserve	0	×	0
F28.01	IOB relay Y1 Functions	Same as Motherboard Relay Y6 - Y23 output settings For details, see F12.34 - F12.51 parameters in section 10.1 or 7.2.13		×	0
F28.02	IOB relay Y2 Functions			×	0
F28.03	IOB relay Y3 Functions			×	0
F28.04	IOB relay Y4 Functions			×	0
F28.05	IOB relay Y5 Functions			×	0
F28.06	IOB relay Y6 Functions			×	0
F28.07	IOB relay Y7 Functions			×	0
F28.08	IOB relay Y8 Functions			×	0
F28.09	IOB relay Y9 Functions			×	0
F28.10	IOB relay Y10 Functions			×	0
F28.11	IOB relay Y11 Functions			×	0
F28.12	IOB relay Y12 Functions			×	0
F28.13	IOB relay Y13 Functions			×	0
F28.14	IOB relay Y14 Functions			×	0
F28.15	IOB relay Y15 Functions			×	0
F28.16	IOB relay Y16 Functions			×	0
F28.17	IOB relay Y17 Functions			×	0
F28.18	IOB relay Y18 Functions				
F28.19	IOB relay Y19 Functions				
F28.20	IOB relay Y20 Functions			×	0
F28.21	IOB Y1 - Y16 states	16-bit binary numbers, from low to high represent: Bit0: Y1 relay Bit1 - Bit14: Y2 - Y15 relay Bit15: Y16 relay • 0: Relay no output • 1: Relay has output	0	×	0
F28.22	IOB Y17 - Y22 status	6-bit binary numbers, from low to high: Bit0: Y17 relay Bit1 - Bit4: Y18 - Y21 relay Bit5: Y22 relay Bit6 - Bit15: Reserve • 0: Relay no output	0		

Ref. Code	Function	Setting Range	Default	Attr.	Value
		• 1: Relay has output			
F29 IOB Input Parameter (4.5.4, oa page 36)					
F29.00	Input filter settings	2 - 40ms	10ms	×	0
F29.01	IOB terminals L1 Functions	It is used to set the 16-floor internal call/up call up/down call, same as the main control board L1 - L24 terminal settings For details, see F13.01 - F13.24 parameters in section 10.2 or 7.2.14 *Note: No up call on the 16th floor, no down call on the 1st floor.*	0	×	0
F29.02	IOB terminals L2 Functions		0	×	0
F29.03	IOB terminals L3 Functions		0	×	0
F29.04	IOB terminals L4 Functions		0	×	0
F29.05	IOB terminals L5 Functions		0	×	0
F29.06	IOB terminals L6 Functions		0	×	0
F29.07	IOB terminals L7 Functions		0	×	0
F29.08	IOB terminals L8 Functions		0	×	0
F29.09	IOB terminals L9 Functions		0	×	0
F29.10	IOB terminals L10 Functions		0	×	0
F29.11	IOB terminals L11 Functions		0	×	0
F29.12	IOB terminals L12 Functions		0	×	0
F29.13	IOB terminals L13 Functions		0	×	0
F29.14	IOB terminals L14 Functions		0	×	0
F29.15	IOB terminals L15 Functions		0	×	0
F29.16	IOB terminals L16 Functions		0	×	0
F29.17	IOB terminals L17 Functions		0	×	0
F29.18	IOB terminals L18 Functions		0	×	0
F29.19	IOB terminals L19 Functions		0	×	0
F29.20	IOB terminals L20 Functions		0	×	0
F29.21	IOB terminals L21 Functions		0	×	0
F29.22	IOB terminals L22 Functions		0	×	0
F29.23	IOB terminals L23 Functions		0	×	0
F29.24	IOB terminals L24 Functions		0		
F29.25	IOB terminals L25 Functions		0		
F29.26	IOB terminals L26 Functions		0		
F29.27	IOB terminals L27 Functions		0		
F29.28	IOB terminals L28 Functions		0		
F29.29	IOB terminals L29 Functions		0		
F29.30	IOB terminals L30 Functions		0		
F29.31 – F29.32 Manufacturer debugging parameters, prohibit changes			0		