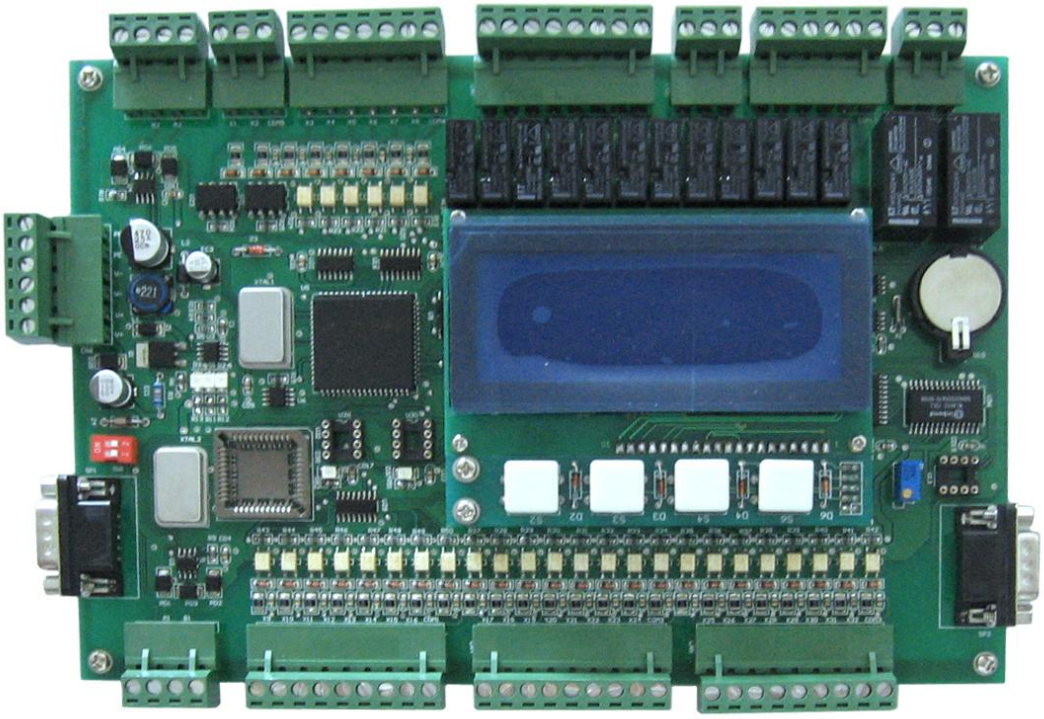
USER MANUAL

SP-3000

Please read this manual carefully so that when you have any questions , it can help you.
Thank you for using it.



SP-3000V

Index

Preface

Thanks for using SP-3000 Series lift control system. This manual will tell you about the product's installation, test, maintenance etc. please read this book carefully so that it can help you if you have any questions.

SP-3000 is one set of control system purpose-designed for lift. It is PC controlled, intelligent & serial communication. This system, which introduces PHILIPS advanced technology, integrates design & sales engineers' wisdom & efforts, can fulfill nearly all the end-user's requirements.

Following is the main functions of the SP-3000:

Efficient & Safe Running Control

The system adopts 2pcs-accelerated CPU for data processing so that little responding time can control the lift's running.

Remote terminals gather Real-time signals from car & car tracks, RS485 data bus transfer those signals to main board, then the main board process those data to ensure the efficient & safe control.

RS485 Data Bus Serial Communication

To transfer data among parts, RS485 data bus is adopted. It's anti-interference designed & popular in international.

A few transmission lines effects data transfer. It's fast & safe. It's not only reduces the working, but also increases the system's stability.

SMT Technology

SP-3000 adopts SMT technology. Each board has a compact structure, enhanced stability & higher nature price ratio.

Enhanced Anti-interference Design

The main board is anti-interference designed. It can work stably under very bad circumstances. It has a built-in switching power supply as well.

The key parts are separately powered. Power voltage can be from DC15V to DC24V;

Hardware & software double watchdog, system can itself resume running if chance failure.

Photo coupler input, relay output; main board is isolated from the outer circumstances. Good anti-interference performance of RS485.

Parallel Connection Group Control & Remote Monitoring System

SP-3000 advanced group control making groups stable, schedule reasonable and running efficiency much enhanced.

The remote monitoring system can monitor the lift's running. Only 1 line in the building can monitor 8 lifts maximum at the same time. The monitoring system has friendly interface & powerful functions. It reduces much maintenance working.

Powerful operation function, flexible & practical

Powerful, advanced & reasonable functions;

large capacity & human person-computer operation interface;

Flexible locale configuration; intuitionistic & simple debug

LCD can show not only running status but also the Real-time error record.

Comprehensive Application

The main board is applicable for lifts varied with floor, speed & function requirements. Standard configuration of inverter include Emerson, KEB，MICO，YASKAWA，FUJI and those compatible to the above mentioned 6 types. You can equip a increment (common) encoder or absolute value encoder (Germany HEIDENHAIN absolute value encoder or those compatible with it).

Safety Precautions

Please pay attention the following points not only for main board, but also for the others electronic, electric parts & equipments that are in one group with main board.

Please check carefully if any damage occurred during transportation when you opening the box. Please check whether you received meets your order or not. Please contact the supplier or us for solution if any damage or shortage.

Cautions: 

If the system is not properly operated, it may cause light or medium injury or components damaged.

1: when delivery, please handle with great care. Otherwise it may cause damage to the controller.
2: No touching the components of the controller, otherwise it will be destroyed by static electricity.
3: please install the system on noncombustible materials like metal otherwise there will be a fire danger.
4: please keep the installation environments far away from explosive gases, oil mists to prevent fire danger or controller damaged.

DANGER – Please Pay High Attention 

Danger 1: Only qualified engineer can connect wires. Make sure the main board power is off in case of board damage or fire.
Danger 2: No testing of pressure resistance on the main board. Please check carefully: the anode/cathode is rightly connected; the voltage meets the design requirement.
Danger 3: Running admitted when the security return route & the security devices are working to avoid person casualty/device damaged.

CHAPTER ONE Main Board

1. SP-3000-V main board outlines

SP-3000-V main board consists of a single board.

The parts include 1pc LED (64*196 dots-matrix); 4pcs operation buttons; 32 positive-shared input points; 14 relay output points; 4 RS485 serial communication ports (port 1,2,3,4), 3 indicator lamp and 1 button battery.

The 3 lamps from top to bottom are:

Power Supply indicator (light on all the time)

Main CPU working (blink all the time)

Communication port 1 working indicator (blink when working)

Operation buttons used for status view & parameter modification

Enter enter next window or set the parameter

ESC return to the previous window or cancel what you modified on parameter

UP page up or increasing the parameter

DOWN page down or decrease the parameter

The button battery supplies power for real-time clock chip. The clock chip benchmarks system time. Its power voltage ranged from 10.V to 5.5V. The button battery's lifetime will be affected by actual capacity & circumstances. Please change new one when battery is insufficient. Rated voltage is 3.3V.

RS485 serial communication connects the main board and the terminals.

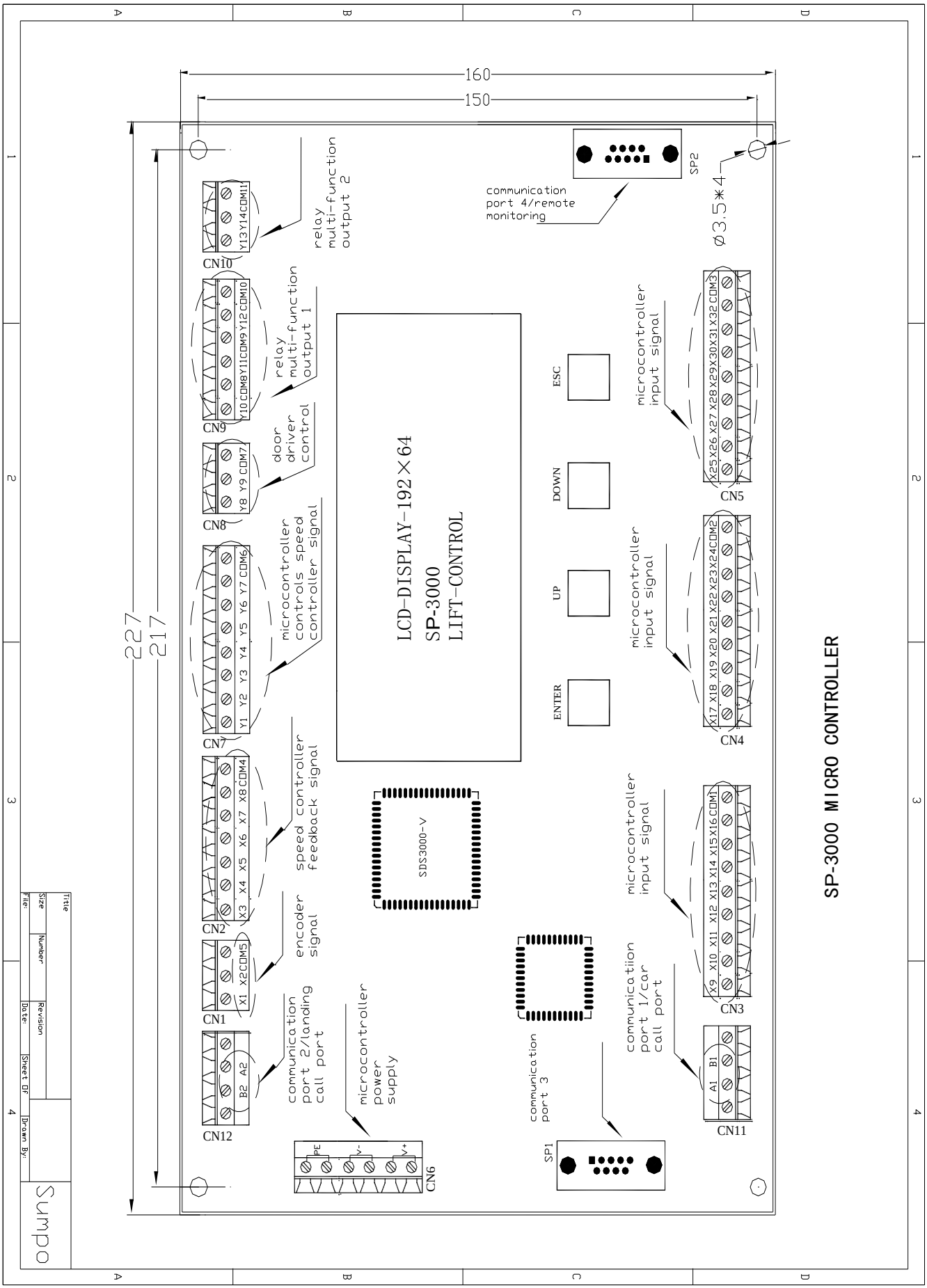
Communication port 1: I/O of car call signals & instruction signals in car.

Communication port 2: I/O of all signals from car guide rail.

Communication port 3: parallel communication or group control.

Attention: 2 types terminals for port 3.

Communication port 4: remote monitoring. In this case, RS485 signals must transformed into RS232 signals at first, then go from RS485-232 commutator to Modem.


160
150
227
217
Ø3.5*4
SP2
communication
port 4/remote
monitoring
relay
multi-function
output 2
CN10
Y13 Y14 COM11
relay
multi-function
output 1
CN9
Y10 COM8 Y11 COM9 Y12 COM10
door
driver
control
CN8
Y8 Y9 COM7
microcontroller
controls speed
controller signal
CN7
Y1 Y2 Y3 Y4 Y5 Y6 Y7 COM6
LCD-DISPLAY-192×64
SP-3000
LIFT-CONTROL
ESC
DOWN
UP
ENTER
microcontroller
input signal
CN5
X25 X26 X27 X28 X29 X30 X31 X32 COM3
microcontroller
input signal
CN4
X17 X18 X19 X20 X21 X22 X23 X24 COM2
speed controller
feedback signal
CN2
X3 X4 X5 X6 X7 X8 COM4
encoder
signal
CN1
X1 X2 COM5
SDS3000-V
microcontroller
input signal
CN3
X9 X10 X11 X12 X13 X14 X15 X16 COM1
communication
port 2/landing
call port
CN12
B2 A2
microcontroller
power
supply
CN6
PE V- V+
communication
port 3
SP1
communication
port 1/car
call port
CN11
A1 B1
SP-3000 MICRO CONTROLLER
Title
Size
File:
Number
Revision
Date:
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Sunpo

CHAPTER TWO

Serial Communication Car Call Board

1.car call board outline

The board has 16 bidirectional ports (Input & output shared one port). Each port corresponds to one floor's car call signal. I/01 corresponding floor 1 signal; I/02 corresponding floor 2 signal；the others analogized in turn. The car call board is reliably grounding via PE port; public button signals terminal connect with negative 24V; answer light signals connect with positive 24V. Please add another board for floor above 16 and be aware software between the 2 boards is different. Details please consult from producer.

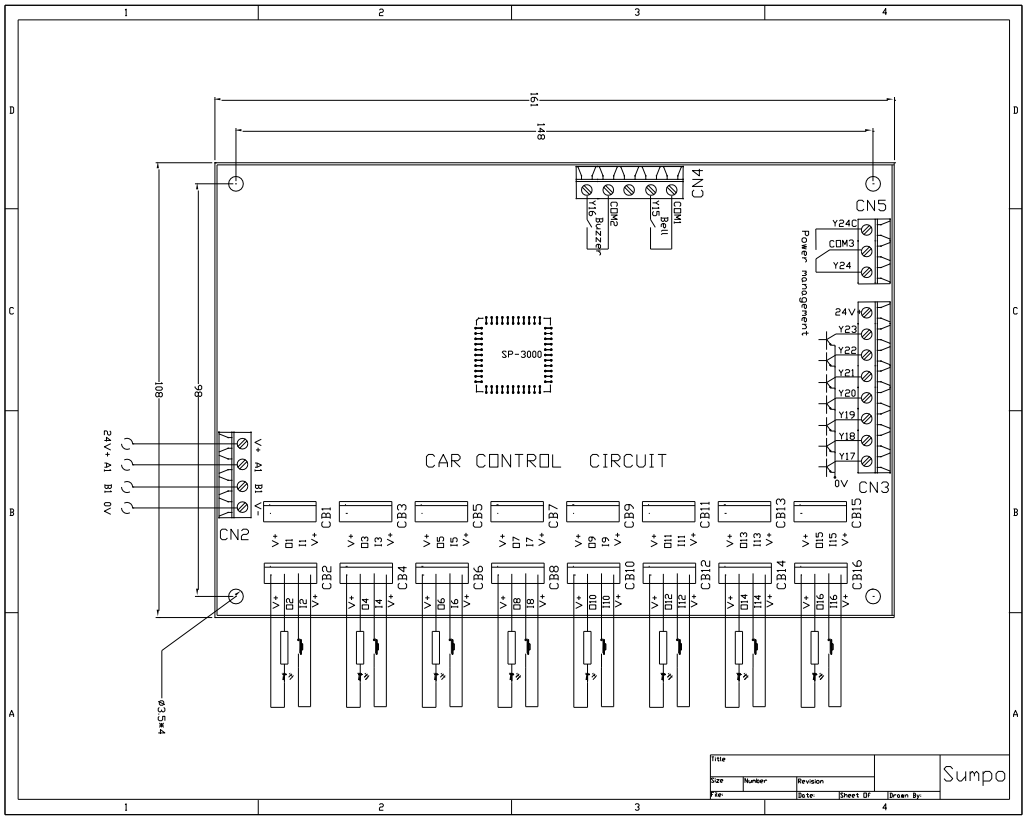
2. Indicator lamp

LP1 communication on or off (the light blinks if communication on)

LP2 CPU working on or off (the light always blinks if CPU working)

LP3 Power on or off (the light always on if working)

Illustration –car call board physical appearance & dimensions



CHAPTER THREE

Serial Communication Landing-Call Board

1. Address setting of Landing-call:
   We use a 5-digit code switch to set landing-call board address, which is recorded by binary system. Code switch 1 is the lowest bit, code switch 5 is the highest bit. Address setting shows by station (absolute floor). If you set address as 0, the landing-call board can serve for display board in car.
2. Landing-call board：
   Standard landing-call board is serial communication. Floor number & run direction showed by dots & matrix.

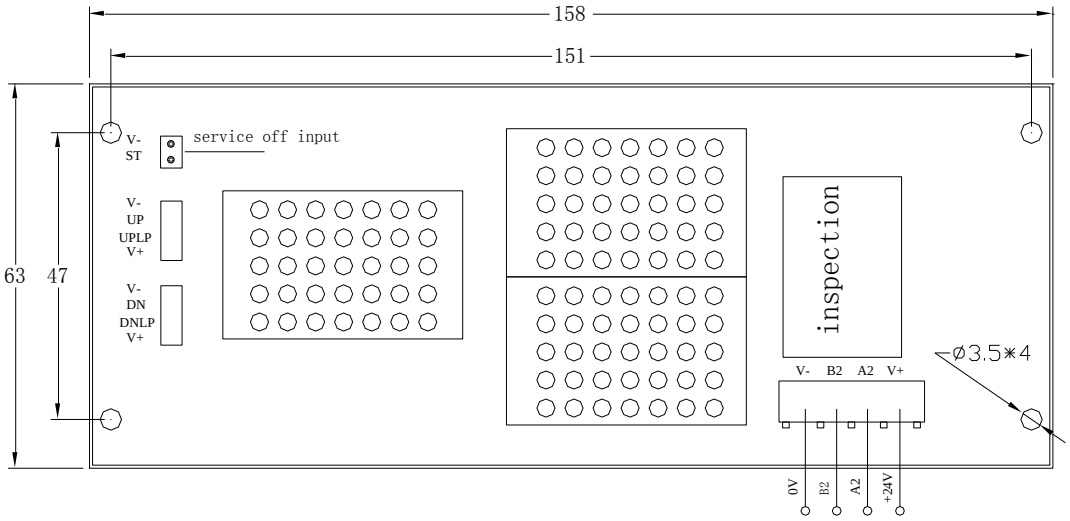
At the very beginning a landing-call board powered on, if you set address as zero, it will show “C”, which means it can serve as one display board in car. If you set address as a binary value, it will show “Fx”. Such as, setting value is 3, the board will show “F3”, which means it’s a landing-call board on 3rd floor. A few seconds after the board powered on, showing will be in good order. In case no communication, showing will black out. The board shows current floor (i.e. actual floor) & run direction in good running order. It will alternately show error No. & current floor in case of error. For example, error 3 shows a blink “E3”. If 2 or above simultaneous errors, it shows minimum error in priority. Error signal detail as follow:

E1: safety circuit error
E2: force land or limit error
E3: inverter error
E4: main contactor error
E5: brake contactor error
E6: door lock error
E7: input setting error
E8: overtime run
E9: EEPROM error
E10: encoder error

3. Landing-call button input
   When addressing a landing call board and main board defining the corresponding floor as a stopping floor, the landing call board will gather button signals and transfer them to main board. You can control certain floors non-stopped by setting parameter. In this instance, landing call board will neither gather button signals nor output answer light signals. If a pressed button blocked for over 20 seconds, the board will ignore this signal to ensure running in good order.
4. Indicator light
   There is a bigger indicator light on a landing call board. The light will show “inspection” when it is located in hall while show “overload” when located in car.
   There are 3 indicator lamps on a landing call board. Meaning as follow:
   LED1 communication indicator (blinks when the communication is on)
   LED2 CPU working indicator (always blinks)

LED3 Power lamp (always on)

Illustration: landing call board structure & sketch map

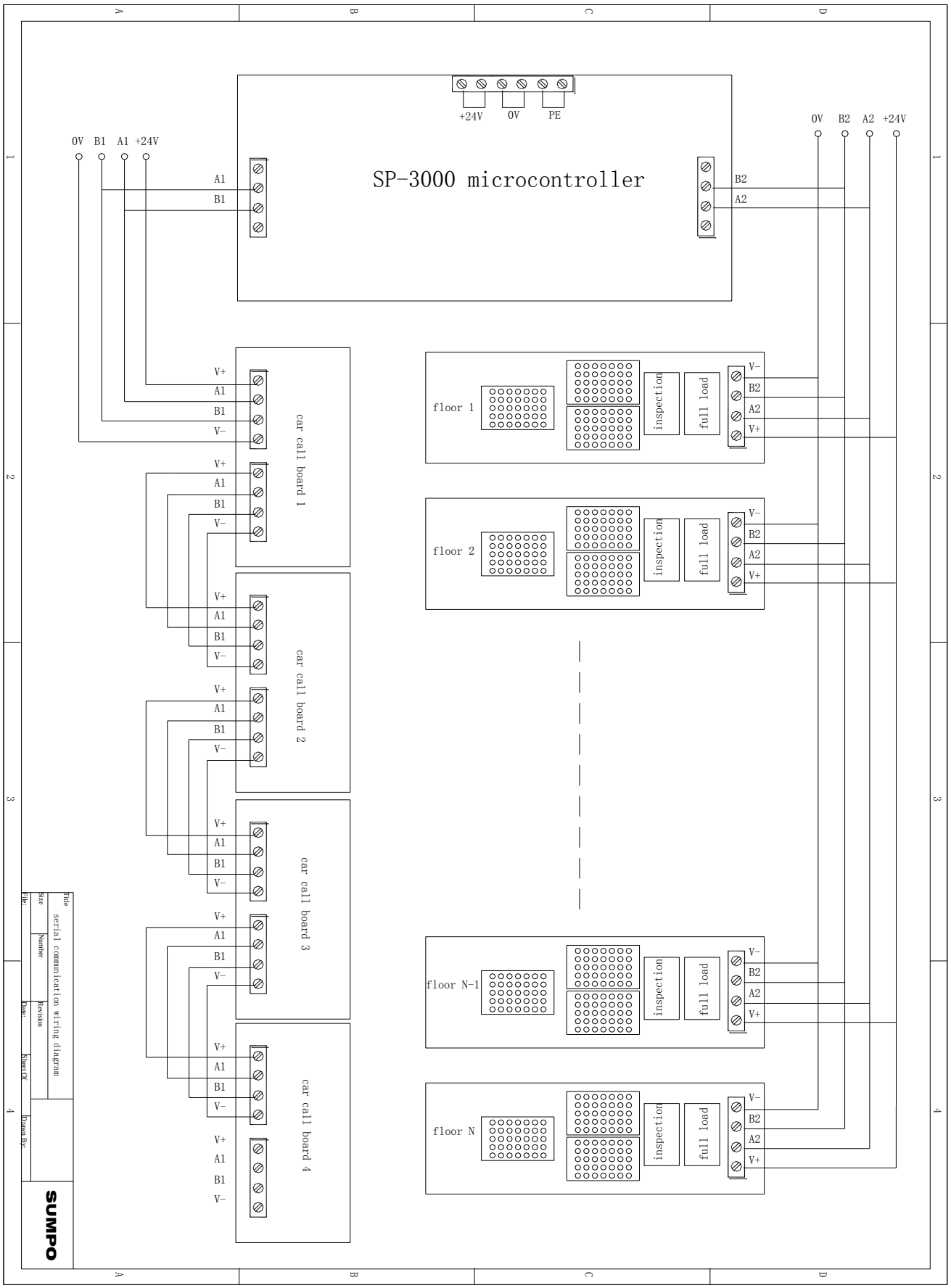


CHAPTER FOUR Control System

This chapter will tell you how the system is established by serial communication. Parallel communication, group control and remote monitoring are optional, not standard configuration.

1. Main board
   The main board takes majority working of the system. It includes I/O of all control signals, I/O of car & landing calls, emergency error handle, call processing dispatched by parallel controller, real-time status record (i.e. run time, run times, errors etc.) and an english person-computer interface.
2. Serial communication landing-call board
   In charge of gathering & registering landing calls; real time showing the current floor.
3. Serial communication car call board
   Car calls gather & register.
4. Serial communication car instruction board
   To extend I/O for main board; when main board I/O port not enough, a car instruction board needed to gather/output instruction signals in car.
5. Parallel controller
   To gather each lift's running status, register each lift's landing calls; real time by optimization calculation distribute landing calls; make reasonable running schedule. To simply describe, this book refers to 2 lifts parallel control and 3+-group control as parallel control.
6. Remote monitoring control board

There are 2 instances. Instance 1 is monitoring only 1 lift's run. Connecting RS232 serial communication port of main board with Modem; Modem then connected to telephone dialer network to carry out the monitoring. Instance 2 is to monitor multi-units lifts in one building. You should add a signal gathering control board, whose RS485 Port connected with each lift's port 4, to gather each lift's run status; then via RS232 port of signal gathering control board connecting with Modem to carry out monitoring. The software can monitor 8 lifts at the same time.


SP-3000 microcontroller
+24V
0V
PE
0V B1 A1 +24V
A1
B1
B2
A2
0V B2 A2 +24V
car call board 1
car call board 2
car call board 3
car call board 4
V+
A1
B1
V-
floor 1
floor 2
floor N-1
floor N
inspection
full load
V-
B2
A2
V+
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serial communication wiring diagram
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File:
Number
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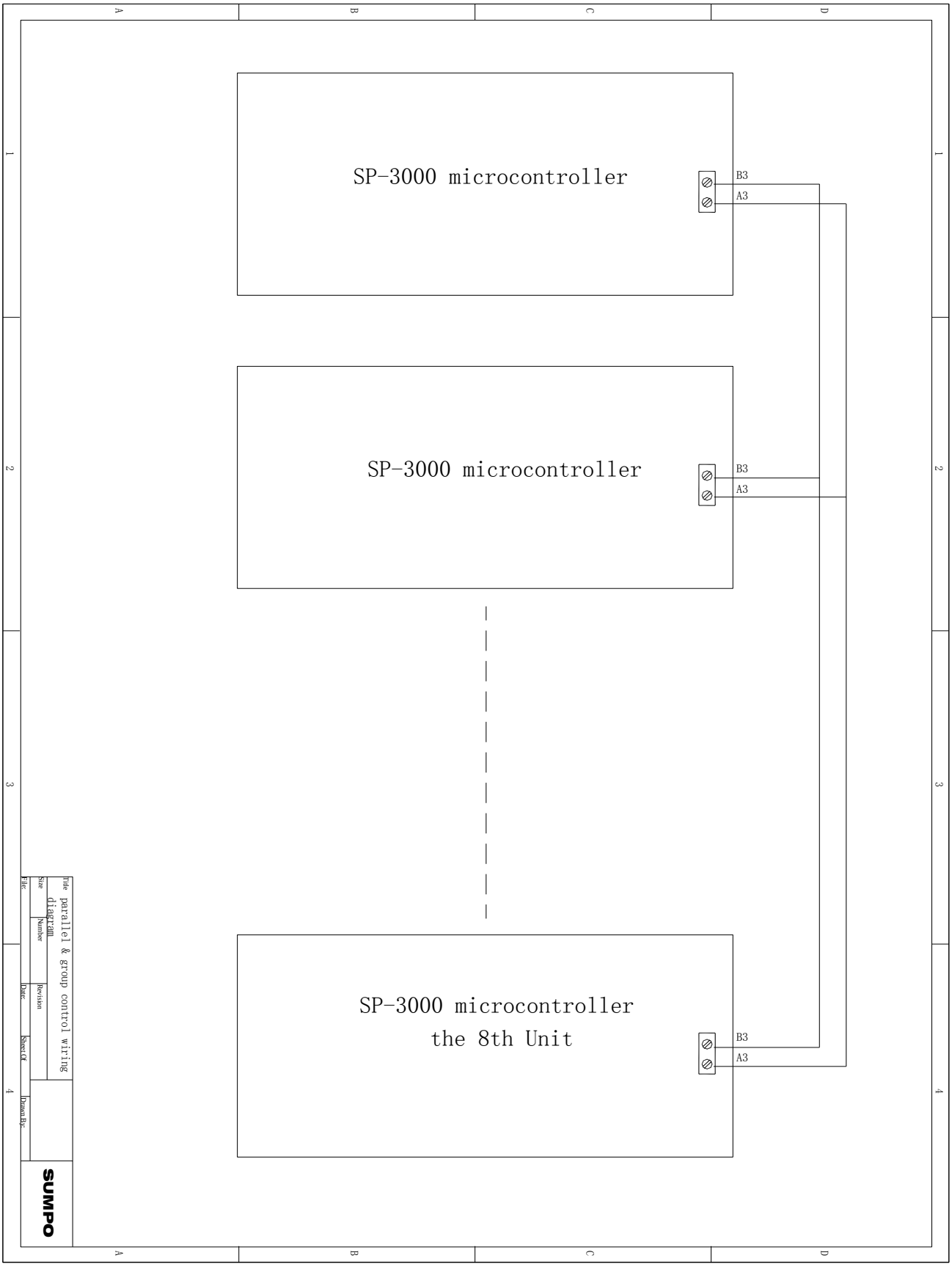
SP-3000 microcontroller
B3
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SP-3000 microcontroller
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SP-3000 microcontroller
the 8th Unit
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Title: parallel & group control wiring diagram
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CHAPTER FIVE Input Signals

Standard SP-3000 can process 45 input signals. You can define follow 45 input signals in parameter setting. Defining any input signal to any input port on main board is ok (but encoder pulse signal input can only be on X1~X2). The system can automatically recognize port definition thereby distinguish the process-needed input signals.
Input signals overview:

Sequence No.	Signal	Sequence No.	Signal
1	Car stop (Inverter zero speed)	25	Light load
2	Decelerating pass	26	Non-stop run
3	Encoder signal	27	Door open limit B
4	Inverter fault	28	Door close limit B
5	Doors lock	29	Door switch
6	Inspection	30	Level zone
7	Up Inspection	31	Force Land Up 2
8	Down Inspection	32	Force Land Down 2
9	Fireman	33	Light bar
10	Service off	34	Light bar B
11	Safety brake contactor	35	Car door lock
12	operator	36	Brake checking
13	Main output feedback	37	Safety brake relay
14	Brake feedback	38	Door lock relay
15	Over load	39	Force Land Up 3
16	Full load	40	Force Land Down 3
17	Door open button	41	Fireman mode
18	Door close button	42	Emergency power
19	Door open limit	43	Emergency run
20	Door close limit	44	Inverter working
21	Top limit	45	Pre-open door
22	Bottom limit	46	Customer
23	Force Land Up 1	47	Customer
24	Force Land Down 1	48	customer

Notes 1:

1. You can define signals you need in actual situation. Not all signals need to be defined.
2. The following signals MUST be defined in “input port definition”; otherwise there will be danger or bad order running (Arabic number in brackets is sequence No.):
   (11)safety brake contactor, (6)inspection, (7)up inspection, (8)down inspection, (13)main output feedback, (14)brake feedback, (5)doors lock, (21)top limit, (22)bottom limit, (23)force land up1, (24)force land down 1, (30)level zone, (15)over load, (33)light bar, (17)door open button, (18)door close button, (19)door open limit, (20)door close

limit, (16)full load, (4)inverter fault.

3. The following signals USUALLY be defined in “input port definition”(Arabic number in brackets is sequence No.):
   (10)service off, (36)brake checking, (9)fireman, (12)operator.
4. system with YASKASIA，Fuji inverter, “brake feedback” and “contact feedback” signals instructed by main board, you MUST define follow signals (Arabic number in brackets is sequence No.):
   (1)car stop (invert zero speed), (44)inverter working.
5. system with Emerson inverter, if specific distance of car stop request, you MUST define follow signals in “input port definition” (Arabic number in brackets is sequence No.): (1)car stop (inverter zero speed), (2)decelerating pass.
   If multi-speed control, there is no need to define “decelerating pass” and no need to define “inverter zero speed” in general.
6. if system runs at high speed (basic speed) & decelerate distance is larger than distance between one & next floors, the following signal MUST be defined in “input port definition”: (31) force land up 2, (32)force land down 2.
7. signals not mentioned define according to actual situations. If one signal not defined in “input port definition”, system will handle nothing of this signal. For example, function of “operator control non-stopped”, if system no need this function, do NOT define “operator control non-stopped” in “input port definition”.

Notes 2:

1. inspection: when the signal is disconnected, system will be on inspection running status; when it is connected, system will be on normal running status.
2. up inspection/down inspection: the 2 car signals can be used for operator to make system directional run. That is under “operator” condition, pressing “up inspection” button can up run the system, pressing “down inspection” button can down run the system.
3. main output feedback: to feedback the main output contactor’s actual working status.
4. brake feedback: to feedback brake contactor’s actual working status.
5. brake checking: it’s optional. Most brake equipment has its own brake checking switch to feedback the actual working status.
6. doors lock: to feedback doors lock contactor’s actual working status. it’s a normal open contactor.
7. car door lock: it’s optional. When the signal is not series connected in door lock circuit, it can directly connect input of main board.
8. top limit/bottom limit: they respectively installed on slightly higher location than top floor level zone and slightly lower location than bottom floor level zone. When top limit switch is normal open, fast/slow up running is not admitted. When bottom limit switch is normal open, fast/slow down running is not admitted.
9. force land up 1/force land down 1: the force land up 1 switch is installed between the top floor level zone and second top floor level zone. It’s used for up run floor regulation. Force land down 1 switch is installed between the bottom floor level zone and second bottom floor level zone. It’s used for down run floor regulation.

10. force land up 2/force land down 2: it's optional. When system runs at high speed (basic speed) and decelerating distance is larger than distance between one and the next floor, you should add a pair of force land switch, that is force land up 2/force land down 2.
11. fireman: it's optional. system will immediately switch to fire run mode when fire control switch is actuating during atuo running status. There is no need to set "fireman" signal in system without fire control switch.
12. fireman operating: it's optional. The "fireman operating" switch is located in the car. System with "fireman operating" switch, please set the parameter "fireman mode" as "return firebase". In this instance, system will directly run to firebase if there is fire control, open the door and keep the door not closed, when fireman arrives, press "fireman operating" switch, system will immediately goes into fire run mode.
13. safety brake contactor: to feedback working status of the contactor on safety brake circuit.
14. safety brake relay: it's optional. The safety brake relay & contactor both serial connected in the circuit. They magnetic suctioned and released simultaneously. If only either of them is open connected, system will regard it safety brake circuit error so as to enhance security.
15. emergency power: to feedback current working status of emergency power. It's used for system with UPS. When emergency power signal is actuating, it means power in use is emergency power. In using of emergency power, if lift is not at level zone, it will auto search the nearest one and open the door after leveling. then system will delay a "auto close door" time, The lift will output "stop emergency power" signal after the delayed time.
16. emergency run: there is no need to define this signal if no emergency power. It's optional when system with emergency power. When system supplied by emergency power and "emergency running" signal connected through, system, will not output signal of "stop emergency service" can still slow run, but not fast run.
17. light load, full load and overload: "light load" signal is optional. it's used for preventing trouble. when there is light load signal input, if car calls reach the number in parameter setting, system will regard this as trouble and clear all the car calls. When there is full load signal input, system will direct run and not respond car calls. The overload signal is only valid when system is parking. If system overloads, it will not run and the door will forcibly open, meanwhile output overload alarm.
18. non-stop run: it's optional. Under operator mode, pressing "direct run" button until system starts, the lift will run directly to the registered car call floor, not responding landing calls.
19. door open limit B, door close limit B, Door switch, Light bar B:
    They are used for system with double doors. Under inspection status, front door is in working when door switch is open. Back door is in working when door switch is closed. if only one door will open at any floor in double doors system，it means door switch doesn't work under auto run status. if either front door or back door can open at certain floor in double doors system, it means door switch works at the certain floor under auto run status.

20. inverter zero speed (car stop): the signal connected with a output port on inverter. For KEB and MICO inverter, no need to define this signal. For Emerson inverter, it's optional. this signal corresponds to "car stop" output of Emerson inverter. For Yaskawa，Fuji inverter, you must define this signal. After lift decelerate to destination floor level zone, Main board, from the signal began to act, will start braking after a time lag of "brake delay", then withdraw the run instruction of the inverter after a "car stop duration".
21. inverter fault: the signal is available when the inverter is fault. Main board will ban system running when inverter fault signal acts.
22. decelerating pass: this signal is from Emerson Inverter(specific distance car stop request); system with others inverter no need this signal.
23. inverter working: after main board transmit running instruction, the signal would act within given time. That means inverter has already responded the instruction. When main board received the signal, it will start braking after a time lag of " brake delay". For instance a normal open contactor: when the inverter is powered on, "inverter working" signal should be open. When main board gives out running instruction, the "inverter working" signal will be closed, which means the inverter has already responded main board's instruction. Main board will not brake if "inverter run" not connected through. after the lift decelerate to stop, "inverter working" signal should be open to prepare the next run. Vice versa a normal closed contactor. For FuJi inverter, this signal corresponds to "35: brake signal 1". Main board transmits run instruction, inverter output "brake signal 1", which means braking is admitted. When lift decelerates to stop, the signal open again to prepare the next run.
24. Pre-open door: it's optional. when inverter output pre-open door signal at the time lift decelerate to destination floor door zone, main board output open door signal and door opened.

INPUT SIGNAL LOGIC OVERVIEW:

Signal	Logic	Signal	Logic
Car stop (Invert zero speed)	Normal open	Force Land Down 1	Normal close
Decelerating pass	Normal open	Force Land Up 2	Normal close
Doors lock	Normal open	Force Land Down 2	Normal close
Car door lock	Normal open	Force Land Up 3	Normal close
Door lock relay	Normal open	Force Land Down 3	Normal close
Up Inspection	Normal open	Level zone	Customer
Down Inspection	Normal open	Light load	Customer
fireman	Normal open	Full load	Customer
Fireman mode	Normal open	Over load	Customer
operator	Normal open	Light bar	Customer
Non-stop run	Normal open	Light bar B	Customer
Door open button	Normal open	Door open limit	Customer

Door close button	Normal open	Door close limit	Customer
Door switch	Normal open	Door open limit B	Customer
Emergency run	Normal open	Door close limit B	Customer
Inverter working	Normal open	Main output feedback	Customer
Inspection	Normal close	Brake feedback	Customer
Safety brake contactor	Normal close	Brake checking	Customer
Safety brake relay	Normal close	Inverter fault	Customer
Top limit	Normal close	Service off	Customer
Bottom limit	Normal close	Emergency power	Customer
Force Land Up 1	Normal close	Pre-open door	Either normal open or normal close

Notes:

1. if input signal's logic is normal open, that means this signal will work when it is connected (the signal will act when it is connected on).
2. if input signal's logic is normal close, that means this signal will work when it is open (the signal will act when it is open).
3. "customer" means you can define certain signal's logic as normal open or normal close by setting the parameter.
4. signals not defined in "input port defining", their logic can set as either normal open or normal close. System will deal nothing with those not defined signals. Such as a non double doors lift, defining open door limit B neither normal open nor normal close will influence the running.
5. for KEB and MICO inverter, lift can only run when "inverter working" signal connected. For YASKAWA inverter, "inverter working" signal is connected when car stop. it is open when system run.

   Signals defined in "input port defining", if its logic can customize, then you must set it correctly. Fox example: a non double doors system, you defined a unused input port as door open limit B and set its logic as normal open, in this instance, the limit B will not act and system will not run.

CHAPTER SIX Output Signals

Standard SP-3000 can process 39 output signals.

Y1-Y7、Y8-Y9、Y10-Y14 total 14 output terminals can be defined signals as follow.

Sequence No.	Signal	Sequence No.	Signal
1	Up	21	Multi-speed 3
2	Down	22	Enable, Level speed
3	Brake	23	Inverter reset
4	Main output	24	Inspection speed
5	Open door	25	Fire base
6	Close door	26	Close emergency service
7	Open door B	27	system running
8	Close door B	28	Decelerating
9	Service off 2	29	Inspection output
10	brake enable	30	Full load output
11	Bell	31	Undefined
12	Overload output	32	LCD —
13	Buzzer	33	LCD A(1)
14	Power management (normal open)	34	LCD B(2)
15	Power management (normal close)	35	LCD C(4)
16	pre-opening door	36	LCD D(8)
17	Down run, PX1	37	LCD E(1)
18	Up run, PX2	38	LCD F(2)
19	Multi-speed 1, PX3	39	LCD G(4)
20	Multi-speed 2, PX4	40	LCD 10

Car instruction board Y1-Y16 total 16 output terminals (or Y1-Y8 total 8 output points) can be defined signals as follow:

16	Fan & lighting	27	Up
17	Bell	28	Down
18	Buzzer	29	Floor indicate -
19	Inspection	30	Floor indicate A (0,0)
20	Full load	31	Floor indicate B (1,1)
21	Overload	32	Floor indicate C (2,2)
22	Door open	33	Floor indicate D (3,3)
23	Door close	34	Floor indicate E (4,0)
24	Leveling	35	Floor indicate F (5,1)
25	Decelerating	36	Floor indicate G(6,2)
26	System running	37	Floor indicate 10

Notes:

1. Defining Y1-Y7 as inverter output signals. Please do not define signals unrelated to inverter on Y1-Y7. Signals from main board to inverter will vary with inverter type. Such as signal “up run, PX1”, for Emerson inverter, it means “PX1”; while for KEB inverter, it means “up run”.
2. System with Emerson Inverter, if specific distance car stop request, Y1-Y7 should be respectively defined as PX1、PX2、 PX3、PX4、no output signal、inverter enable、inverter reset.
3. Multi-speed (binary combination) control system with KEB inverter, Y1-Y7 should be respectively defined as: multi-speed 1, multi-speed 2, multi-speed 3, up, down, inverter enable and inverter reset.
4. Parallel control (point to point) with MICO inverter, Y1-Y7 should be respectively defined as: high speed, medium speed, low speed, up, down , crawl speed, inspection speed.
5. multi-speed (binary combination) control system with YASKAWA inverter, Y1-Y7 should be respectively defined as: multi-speed 1, multi-speed 2, multi-speed 3, up, down, inverter enable and inverter reset.
6. multi-speed (binary combination) control system with FuJi inverter, Y1-Y7 should be respectively defined as: multi-speed 1, multi-speed 2, multi-speed 3, up, down, inverter enable and inverter reset.
7. Y8 & Y9 constantly output as door open signal & door close signal.
8. for SP-3000-F main board, Y15-Y18 constantly output: brake enable, brake, main output & main power.
9. for SP-3000-V main board, there are no Y15-Y18 points on it. If system with YASKAWA or FuJi inverter, the 2 essential signals “main output” & “brake” will be out from Y14 & Y13. In this instance, parameter setting on Y14 & Y13 doesn’t work.
10. service off 2 (main power) is located the input side of the inverter. The contactor will be open when service off.
11. main output, also named as main contactor, is located the output side of the inverter. It can be located the input side of the inverter in system with MICO inverter.
12. brake: it controls brake contactor. The brake contactor controls mechanical brake equipment.
13. high voltage brake release-enable: brake equipment with synchronization motor needs high voltage to make the brake open but to keep it open, only low voltage is needed. Here you need signal of “high voltage brake release-enable”.
14. pre-open door output: when system decelerates to destination floor and the “pre-open door” signal from inverter begins to act, main board output “pre-open door output” signal. The signal will be terminated when main output contactor broken.
15. Fire base: under fire control status, system will output this signal when it arrives a fire base station. The signal output will at the fireman station. Signal terminates when system leave the fire base station.
16. close emergency service: if sudden electricity break during system run, operator should shift to UPS power supply so that car can level at nearest door zone and open door to release passenger. A few seconds (auto close door time) after the door

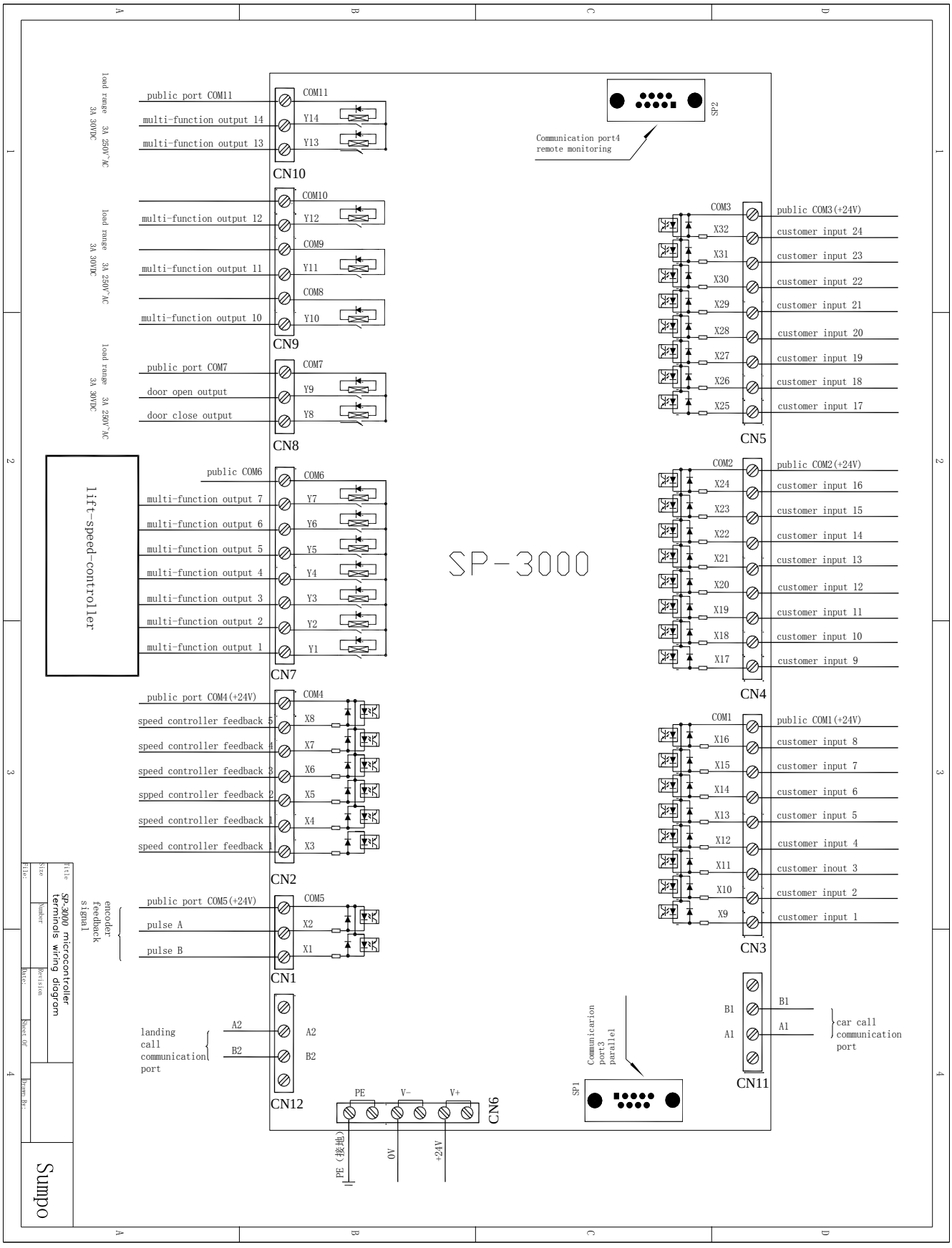
completely opened, main board will output “stop emergency service” signal to shut down the UPS; meanwhile car door keeps open. If input signal of “emergency run” comes, main board will not output “stop emergency service” signal and system can run at inspection status.

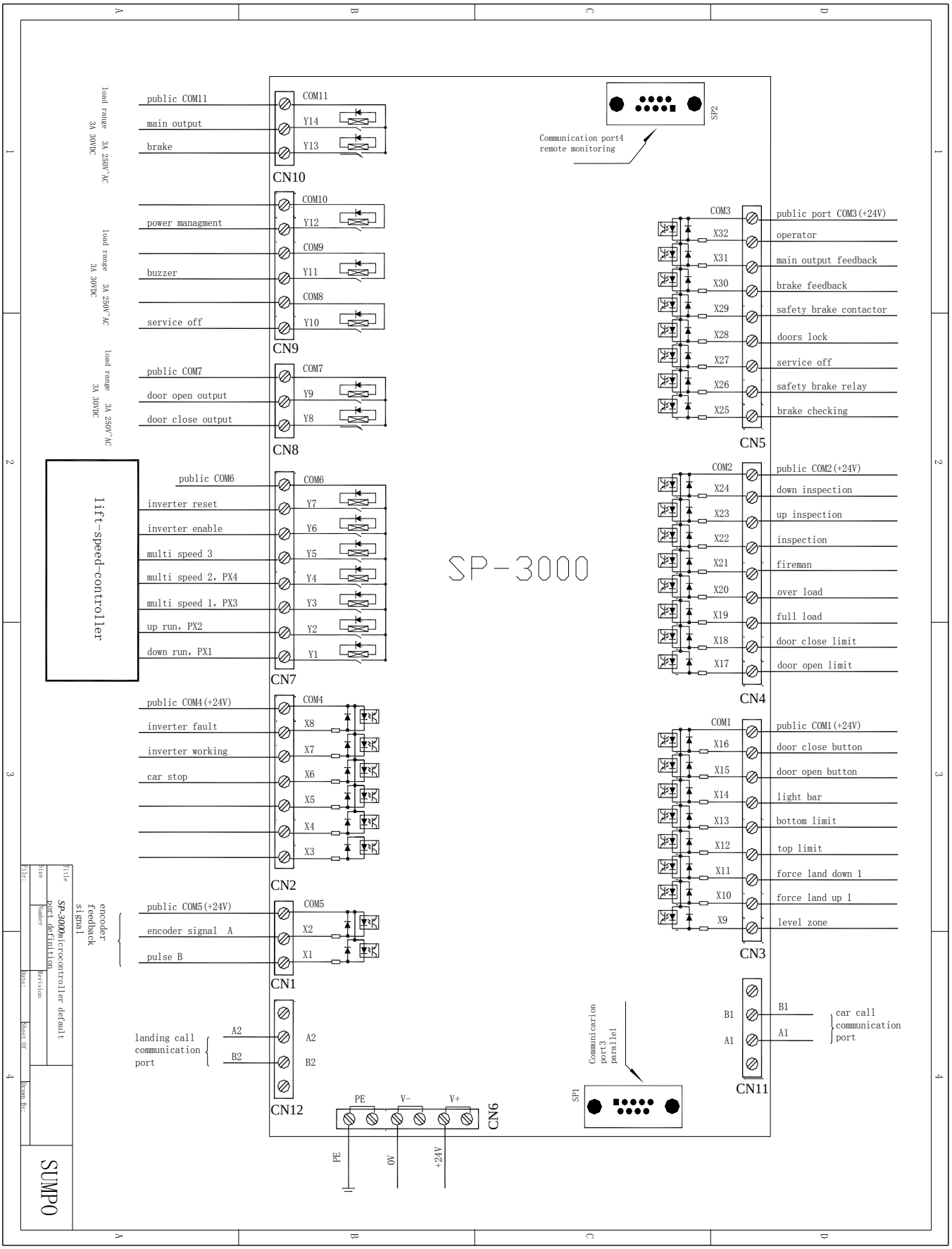
17. fans & lighting: the signal switches on when car power is off. But it will be broken if main board lose its power.
18. bell: a period of time(delay time) after system starts decelerating, there will be bell signal output. You can adjust the delay time (up/down delay time) & bell output duration by setting the parameter.
19. buzzer: there would be buzzer output if overload.
20. system running: the signal output is available from system start to end. Here “end” means main board removes all the instruction to the inverter.
21. decelerating: signal output available from system start decelerating to stop.
22. leveling: signal output: 1) when system decelerates to destination floor 2) system arrives at door zone during up/down inspection run. The signal output will be terminated if system stop running.
23. up / down : signal output available when system is running or directional running.
24. floor indicate: these signals can directly output from main board by defining output terminals. The outputs can be LCD、BCD or binary code. If output is binary code or BCD, the measure unit is station. That is the bottom floor (station 1) output as 1, station 2 output as 2, the other floors calculate in turns. Binary code or BCD outputs can be used for station phonetic declaration.

Signal output	Binary code output	BCD output	LCD output
Floor indicate	———	———	Negative sign, underground floor
Floor indicate A(0,0)	Bit 0	Bit 0	LCD A
Floor indicate B(1,1)	Bit 1	Bit 1	LCD B
Floor indicate C(2,2)	Bit 2	Bit 2	LCD C
Floor indicate D(3,3)	Bit 3	Bit 3	LCD D
Floor indicate E(4,0)	Bit 4	Bit 4	LCD E
Floor indicate F(5,1)	Bit 5	Bit 5	LCD F
Floor indicate G(6,2)	Bit 6	Bit 6	LCD G
Floor indicate 10	———	———	Tens digit

CHAPTER SEVEN Wiring

This chapter illustrates the wiring of SP-3000-V & the default ports definition. Most ports definitions can be customized by manually changing parameter setting, but it is strongly recommended that you remain default ports definitions. Because uniform ports definition can simplify system design and bring convenience for locale maintenance & telecommunications.


SP-3000
lift-speed-controller
CN10
CN9
CN8
CN7
CN2
CN1
CN12
CN6
CN5
CN4
CN3
CN11
SP2
SP1
public port COM11
multi-function output 14
multi-function output 13
multi-function output 12
multi-function output 11
multi-function output 10
public port COM7
door open output
door close output
public COM6
multi-function output 7
multi-function output 6
multi-function output 5
multi-function output 4
multi-function output 3
multi-function output 2
multi-function output 1
public port COM4(+24V)
speed controller feedback 5
speed controller feedback 4
speed controller feedback 3
spped controller feedback 2
speed controller feedback 1
speed controller feedback 1
public port COM5(+24V)
pulse A
pulse B
encoder feedback signal
landing call communication port
A2
B2
PE
V-
V+
PE（接地）
0V
+24V
Communication port4 remote monitoring
Communicarion port3 parallel
B1
A1
car call communication port
public COM3(+24V)
customer input 24
customer input 23
customer input 22
customer input 21
customer input 20
customer input 19
customer input 18
customer input 17
public COM2(+24V)
customer input 16
customer input 15
customer input 14
customer input 13
customer input 12
customer input 11
customer input 10
customer input 9
public COM1(+24V)
customer input 8
customer input 7
customer input 6
customer input 5
customer input 4
customer inout 3
customer input 2
customer input 1
load range 3A 250V~AC 3A 30VDC
Sumpo
SP-3000 microcontroller terminals wiring diagram


SP-3000
lift-speed-controller
CN10
public COM11
main output
brake
COM11
Y14
Y13
load range 3A 250V~AC 3A 30VDC
CN9
power managment
buzzer
service off
COM10
COM9
COM8
Y12
Y11
Y10
load range 3A 250V~AC 3A 30VDC
CN8
public COM7
door open output
door close output
COM7
Y9
Y8
load range 3A 250V~AC 3A 30VDC
CN7
public COM6
inverter reset
inverter enable
multi speed 3
multi speed 2, PX4
multi speed 1, PX3
up run, PX2
down run, PX1
COM6
Y7
Y6
Y5
Y4
Y3
Y2
Y1
CN2
public COM4(+24V)
inverter fault
inverter working
car stop
COM4
X8
X7
X6
X5
X4
X3
CN1
public COM5(+24V)
encoder signal A
pulse B
encoder feedback signal
COM5
X2
X1
CN12
landing call communication port
A2
B2
CN6
PE
V-
V+
PE
0V
+24V
SP2
Communication port4 remote monitoring
SP1
Communicarion port3 parallel
CN5
COM3
public port COM3(+24V)
operator
main output feedback
brake feedback
safety brake contactor
doors lock
service off
safety brake relay
brake checking
X32
X31
X30
X29
X28
X27
X26
X25
CN4
COM2
public COM2(+24V)
down inspection
up inspection
inspection
fireman
over load
full load
door close limit
door open limit
X24
X23
X22
X21
X20
X19
X18
X17
CN3
COM1
public COM1(+24V)
door close button
door open button
light bar
bottom limit
top limit
force land down 1
force land up 1
level zone
X16
X15
X14
X13
X12
X11
X10
X9
CN11
B1
A1
car call communication port
File
SP-3000microcontroller default port definition
Size
Number
Revision
Date:
Sheet of
Drawn By:
SUMPO

CHAPTER EIGHT Function Details

Basic functions of the lift as following:

1.	Inspection run
2.	Operator
3.	Operator direction first
4.	Slow run self-rescue
5.	Emergency UPS run
6.	All calls-responding control
7.	open/cose door automatic at station, pre-open the door
8.	landing area door open
9.	door close button to close the door ahead of default time
10.	Door open repeatedly if door blocked
11.	change station to stop
12.	Non-stop when full load
13.	Non-stop when operator button pressed
14.	Bell
15.	Intelligent power management
16.	Remove mistake car call
17.	remove reverse car call
18.	absolute-value encoder optional
19.	Humanistic LCD & menu
20.	data self-learning
21.	service floor setting
22.	actual floor setting
23.	I/O ports setting
24.	input signal logic setting
25.	intelligent handle input signals
26.	dots-lattice mode floor display
27.	scrolling show running direction
28.	floor position trimming
29.	fireman return floor
30.	fireman operation
31.	fireman run
32.	door-open disable outside door zone
33.	person-pinched prevention
34.	overload protection
35.	run overtime protection
36.	Trouble car
37.	force decelerating
38.	main output & brake contactor conglutination prevention
39.	door lock contactor conglutination prevention
40.	inverter error protection

41.	real-time error show
42.	history error
43.	double built-in watchdog of main board
44.	service off
45.	Monitoring
46.	remote monitoring
47.	parallel control
48.	group control

1. Inspection Run: Pressing up/down button to run the lift at inspection speed; when service off, pressing open/close door button to open/close door.
2. Operator: change shift bar to operator mode to carry out the following functions: auto directional, manual directional, manual close door & non-stop run etc.
3. operator direction first: you can change the run direction by this function even if the lift already is auto directional.
4. slow run self-rescue: if lift stops at non door zone, under non-inspection status, as long as it meets startup requirements, the lift will slow run till level zone, then stopped and open the door.
5. emergency UPS run: if sudden electricity broken during the run, you can start UPS. The lift will slow run till level zone then open the door to release passenger.
6. All calls-responding control: landing calls from any floor will be responded by pressing the up/down button.
7. open/cose door automatic at station, pre-open the door: under auto run or operator status, system will respond calls and open the door once automatic. Until the door completely open, followed by a time delay, system will automatic close the door. The time delay is auto close door time. It's adjustable. When you give main board a "pre-open door" signal, car door can open in advance at landing level zone.
8. landing area door open: car door will open automatic when the landing call button is pressed. Keep the button pressed, the door remains open. If button pressed time beyond 20 seconds, system will ignore this call and car door will automatic close.
9. door close button to close the door ahead of default time: you can press the door close button to close the car door immediately, that is to say, no need to wait the door close automatic.
10. Door open repeatedly if door blocked: if the door lock is not connected well after period of time's shutting, system regards it as door blocked. The door will open repeatedly till it closed well. Door block time parameter setting is adjustable.
11. change station to stop: if system tried opening car door for period of time but open limit switch still doesn't respond, system would regard this as door blocked. car door will close automatic and system would respond the next call. Door block time parameter setting is adjustable.
12. Non-stop when full load: system will respond only car calls if full loaded, not responding landing calls.
13. Non-stop when operator button pressed: if operator press "Non-stop manual operation" button before system starts, the following running will directly run to the

registered car call floor, not responding the landing call.

14. Bell: there will be a bell signal output during decelerating or leveling process so that passengers in the car or on the platform can know that the lift is leveling. The bell can ring at any time from deceleration starting till landing. The bell ring duration is adjustable by setting the parameter.
15. Intelligent power management: car lighting & fan will power off if car call or landing call registered beyond the time. On the other hand, they will resume work if new car call or landing call signals in. The power management time is adjustable by setting the parameter.
16. remove mistake car call : if you pressed an floor number by mistake in car call, you can remove it by pressing the number again. The function is adjustable by setting the parameter.
17. remove reverse car call: if the lift is arriving or landing at a certain floor, reverse direction car calls will be removed automatically. The function is adjustable by setting the parameter.
18. absolute-value encoder optional: system with KEB, MICO & YASKAWA inverters can effect high accuracy if you match a absolute-value encoder to it. No matter it is inspection run, emergency brake or sudden electricity broken during run, system will not show wrong floor.
19. Humanistic LCD & menu: LCD can not only show lift's run status, direction, failure & prompt message but also can be used for setting all kinds of parameter & looking up run records etc.
20. data self-learning: before lifts runs, start self-learning function of car trail to learn all kinds of datas (floor high, total floors, door zone length，force decelerating switch position etc.) and save these data permanently.
21. service floor setting: using this function, you can set the lift to stop at which floor or non-stop at which floor.
22. actual floor setting: you can set actual floor each station corresponds to. System runs measured by station, but car display board and landing call board both show the actual floor.
23. I/O ports setting: Except encoder pulse signal, you can define any input signal onto any input port of main board. Same situation, you can define any output signal onto any output port of main board.
24. input signal logic setting: either open-circuit or close-circuit is ok for 16 input signals.
25. intelligent handle input signals: system has more than 40 input signals. Customer will use only portion signals. System will ignore those unused signal and deal nothing with them.
26. dots-lattice mode floor display: car board and landing call board both adopt dots-lattice mode display. It make display lively.
27. scrolling show running direction: car board and landing call board both scrolling show running status.
28. floor position trimming: system will trim positional signal upon self-learning position pulse when it runs to force decelerating act point or each floor's level zone. When system touches the up force-decelerating switch or down force-decelerating switch, it

will auto trim the floor number.

29. fireman return floor: setting “fireman mode” as “fireman return floor”, when you press the “fireman” button, system will immediately cancel all car calls and landing calls, return to fire station rapidly and open the door. In this case, auto close door or manual close door both disabled.
30. fireman operation: setting “fireman mode” as “fireman return floor”, when you press the “fireman” button, system will immediately cancel all car calls and landing calls, return to fire station rapidly and open the door. In this case, auto close door or manual close door both disabled. When fireman arrives, who should press the “fireman operation” button in car, system will start fire controlling. At the time, system will only respond car calls. All the car calls will be cleared when arrived at the station.
31. fireman run: setting “fireman mode” as “fireman run”, when “fireman” button pressed, system will immediately clear all car calls and landing calls, then return to station, open the door and start fire controlling. At this time, system will only respond car calls. All the car calls will be cleared when arrived at the station.
32. door-open disable outside door zone: if lifts stops at non door level, there is no auto open door or manual open door function.
33. person-pinched prevention: when light bar or security baffle act, system will unconditionally open car door. car door will not closed if light bar or security baffle action not clear.
34. overload protection: when overload switch acts, system will not close car door. overload lamp will light and buzzer will ring.
35. run overtime protection: main board real-time detect running status during run process. If floor shift not effect during period of time, system will ban running.
36. trouble car: when lightload switch acts and total car calls exceeds a certain number, system will clear all car calls. The figure of car call numbers can adjust by setting parameter.
37. force decelerating: system installs 1~2 pairs force decelerating switch on top & bottom to prevent lift beyond the field.
38. main output & brake contactor conglutination prevention: system checks main output & brake contactors acts reliably or not. If contactor conglutinated, system will ban running.
39. door lock contactor conglutination prevention: system checks door lock contactor acts reliably or not. if contactor conglutinated, system will ban running.
40. inverter error protection: system will emergently brake if received inverter error signal.
41. real-time error show: when system occurs run error, error status will real-time showed on LCD until error cleared. The 10 most security-related errors will real-time showed as error code on landing call boards.
42. history error: if run error occurred, system will real-time record error’s time, run status & details.
43. double built-in watchdog of main board: main board has watchdog of hardware & software. If CPU error or program error is inspected, main board will reset once, close all outputs by strong hand to restart system.
44. service off: under auto run or manual run status, if service off switch acts, all landing

calls will be cleared. Lift can continue responding car calls until all car calls executed over. lift will return service off base station, open/close car door automatic, and stops. Floors display blacks out. System will restart when service off switch is reset.

45. monitoring: connecting RS485 data bus, RS485-232 commutator, monitoring PC and monitoring software, you can monitor lift floor location, run direction, error status etc on PC.
46. remote monitoring: Connecting Modem and telephone cable, you can real time remote monitor locale lifts' running.
47. parallel control: parallel control is 2 lifts associate to respond car/landing calls by RS485 serial data bus to transmit data. The parallel controls distribute landing calls on principle of the nearer, the priority. Any landing calls, system will distribute it to the nearest lift to maximum shorten passenger's waiting time. The system runs 2 lifts according to principle "lift gets in first responds calls first", "the nearer, the more priority", & "same direction priority". Parallel control has another function: returning to basic station automatic. The lift nearer to the station returns first.
48. group control: group control is multi-lifts associate to respond car/landing calls by RS485 serial data bus to transmit data. The parallel controls distribute landing calls on principle of the nearest, the priority. Any landing calls, system will distribute it to the nearest lift to maximum shorten passenger's waiting time. The system runs multi lifts according to principle "lift gets in first responds calls first", "the nearest, the more priority", & "same direction priority". If one lift is out of the group for service off or inspection, the rest lifts can still group run. Group control has another function: returning to basic station automatic. The lift nearest to the station returns first.

CHAPTER NINE LCD & Parameter Setting

1. Parameter view & setting

Enter parameter setting mode

At home page, press “enter” button for parameter setting mode. You can view or change the parameter. The selection parameter will show in highlight.

Select the parameter you want to view or modify

Press “up” or “down” button to select the parameter

previeous window or next window

Select the item you want, press “ enter” key to enter the next window or ESC key to back the previous window

Parameter view or setting

Saving or cancel modification

When finished parameter setting, Press “enter” key to save it and back to the previous menu.

Press “ESC” key to cancel the modification and back to the previous menu.

2. LCD display sketch map

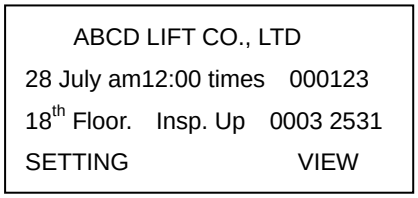
Example of running status:

Row 1：name of manufacturer;

Row 2: date, time and run frequency

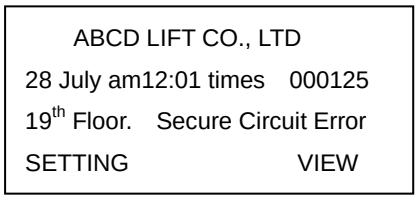
Row 3: run status & car guide position (showed by encoder pulse);

Row 4: prompt info



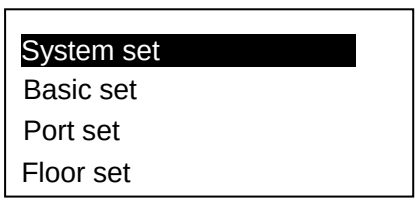
Example of error status:

Row 3 right real time shows error info



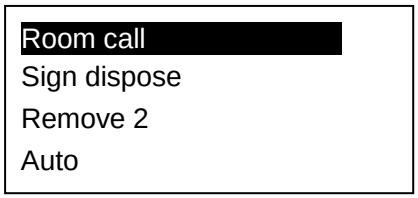
Example of parameter setting mode (press “enter”)

Initial view as follow, press “ESC” to exit and return to current page view.

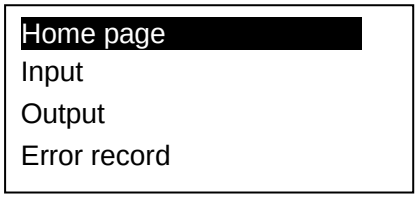


press “down” button 4 clicks, show as follow:

when “call display” is selected, Press “enter” to expand it, you can view or change some settings. Only system administer is admitted to modify the parameter. Before you modify the parameter, type PIN to put system on inspection status. Press “ESC” to exit and return to previous menu.

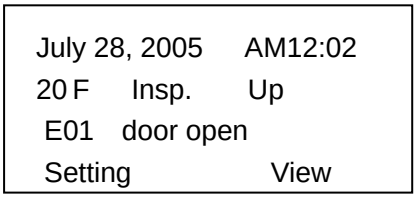


Example of view mode. “Home Page” is default selection.



Example of view mode

Press “down” button to select “error record”, press “enter” button to view the records. The following Row 1 shows date and time errors occurred; Row 2 shows system’s running status; Row 3 shows errors sequence & details.



Press “down” button to view all history errors. Press “ESC” button to exit and return to previous menu. Press “enter” button to parameter settings mode.

3. view running status

At home page, LCD can real time show lift current run status.

At home page, press “ESC” button, entering “view” menu to select the following:

Home page, input, output, error record, landing call board connection status, upward landing call, downward landing call, time record, times record, version information, registers. Details as follow:

3.1 home page

home page is default display when system starts.

Row 1: manufacturer’s name & label.

Row 2: date, time and running sequence no.

Row 3: floor No., run status, run direction, car guide rail position (encoder pulse No.) & error (prompt) information. If there is no error (prompt) information, row 3 right side will show encoder pulse number. If there is error (prompt) information, row 3 right will show either failure information when lift stops or encoder pulse when lift runs. In system with EM inverter, inverter processes car guide rail position data, so it won’t show encoder pulse. System has 9 sorts of run status and 24 sorts of errors. The 9 run status from high priority to low is: service off, self learning, inspection, door zone searching，decelerating, fireman mode, operator, parallel control & auto. The priority higher, the anterior showed. The 24 errors from high priority to low is: **safety circuit error, force land or limit error, inverter error, main contactor error, brake contactor error, door lock error, input setting error, overtime run, EEPROM error (a clip used for saving parameter settings), output interrupt, brake interrupt, brake checking error, door lock relay error, limit interrupt, inspection insert during run, open door during run, self learning successful, self learning unsuccessful, wrong floor, door jam, back door jam, car call communicate error, self learning needed & landing call communicate error.** The priority higher of above mentioned, the anterior showed.

Row 4: prompt info.

3.2 input port status:

There are 32 input ports on main board. You can real time monitor each port status by LCD .

Row 1: prompt information

Row 2: X1~X16 input status. X1 is at the leftmost; X16 is at the rightmost.

Row 3: X17~X32 input status. X17 is at the leftmost; X32 is at the rightmost.

If one input port is disconnected, the corresponding bit will show a hollow square; if one input port is connected, the corresponding bit will show a solid square.

3.3 output port status

There are 14 standard relay output ports on main board. You can real time monitor each port status by LCD.

Row 1: prompt information

Row 2: Y1~Y14 output status. Y1 is at the leftmost; Y14 is at the rightmost. The rightmost 2 ports have no defining.

Row 3: the 8 extended output port status

If an input port is disconnected, the corresponding bit will show a hollow square; if an

input port is connected, the corresponding bit will show a solid square.

3.4 error records:

Main board can save latest 20 failure records.

Row 1: dates & times of error

Row 2: system's run status when error occurred. It includes run mode, working or not, run direction. Run mode include auto, fireman, inspection, door zone searching. Here auto also includes operator, parallel control and group control.

Row 3: error details: the details from high priority to low is: **emergency brake, force land or limit error, inverter error, main contactor error, brake contactor error, door lock error, input setting error, overtime run, EEPROM error, encoder error, output interrupt, brake interrupt, brake checking error, door lock relay error, limit interrupt, inspection insert during run, open door during run, door jam, back door jam, car call communicate error & landing call communicate error**. The priority higher of above mentioned, the anterior showed.

Page up or down can view history errors.

3.5 landing call board connection status

LCD can real time show connection status between each floor's landing call board and main board. The connection status shows by station (absolute floor). If landing call board is well connected with main board, the corresponding bit will show as a solid square. You can check landing call boards connection status by LCD.

The following may cause bad connection between main board and landing call board: 1) landing call board address is not assigned or wrong assigned; 2) although landing call board address is correctly assigned, top floor setting of main board less than actual floors. 3) cables between landing call boards not connected well or wrong connected.

3.6 car call

3.7 upward landing call

3.8 downward landing call

LCD can real time show registration of car calls, upward landing calls & downward landing calls. Floor selection or calls registration is based on station. When calls available, the corresponding bit will show as a solid square.

3.9 time records

Row 1: current time. Current time will be cleared if re-powered.

Row 2: time in total

Row 3: tractor run time

3.10 times record

Row 1: door open times

Row 2: power-on times

Row 3: emergency brakes times

3.11 version information

Main board consists of 2 circuit boards. 2pcs powerful CPU associatively control running. Here you can find basic information of software & hardware.

Row 1: prompt information

Row 2: from left to right in turn shows the upper board's software version, dates, hardware version & sequence No.

Row 3: from left to right in turn shows the lower board software version, dates, hardware version & sequence No.

3.12 registers: only for producers

CHAPTER TEN Parameter List

Menu Overview:

Sequence No.	Display in English	English Details
1	Home page	Home page
2	In	Input
3	Out	Output
4	Err rec	Error record
5	Land call	Landing call board connection status
6	Car call	Car call
7	Upw land call	Upward landing call
8	Downw land call	Downward landing call
9	Time rec	Time record
10	Times rec	Times record
11	Ver info.	Version information
12	Reg.	Registers

Sequence No.	Display in English	English Details
1	System set	System setting
2	Basic set	Basic setting
3	Port set	Port setting
4	Floor set	Floor setting
5	Call display	Call display

Sequence No.	Display in English	English Details
1.1	Days and dates	Days and dates
1.1.1	yyyy.mm.dd. week.x	
1.1.2	hh.mm.ss.	
1.2	Erase err	Erase error record
1.3	Lcd light	Lcd light
□	30 min	Black out in 30 min
□	10 min	Black out in 10 min
1.4	Pin 2	Pin 2
1.5	Change pin	Change pin

Sequence No.	Display in English	English Details
2.1	Basic set	Basic setting

2.2	Time set	Time setting
2.3	Distanc set	Distance setting
2.4	Comm. set	Communication setting
2.5	Ignore lift err	Ignore lift error
2.6	Start auto-tun	Start self-learning
2.1	Basic set	Basic setting
2.1.1	Lift No.	Lift No.
2.1.2	Spd sort	Speed sort
2.1.3	Run mode	Run mode
2.1.4	Fireman mode	Fireman mode
2.1.2	Spd sort	Speed sort
	Basic spd	Basic speed
	Basic, low spd	Basic, low speed
	Basic, mid spd, low spd	Basic, middle speed, low speed
2.1.3	Run mode	Run mode
	Single lift	
	Double	
2.1.4	Fireman mode	
	Fireman return basefloor	
2.2	Time set	Time setting
2.2.1	Cabin pwr	Cabin power
2.2.2	Return b floor	Return basic floor
2.2.3	Auto cls door	Auto close door
2.2.4	Door jammed	Door jammed
2.2.5	Open door delay	Open door delay
2.2.6	Cls door delay	Close door delay
2.2.7	Bell delay	Bell output delay
2.2.8	Bell time	Bell rings time
2.2.9	Start time	Srart time
2.2.10	Open brake	Open brake
2.2.11	Stop delay	Stop delay
2.2.12	Brake time	Brake time
2.2.13	Run time	Run time
2.2.14	Land time	Land time
2.2.15	Level time	Level time
2.3	Distanc set	Distance setting
2.3.1	Door zon length	Door zone length
2.3.2	Abs encoder	Abs encoder
2.3.3	Low spd dec. dist	Low speed decelerate distance
2.3.4	mid spd dec. dist	Middle speed decelerate distance
2.3.5	High spd dec. dist	High speed decelerate distance
2.3.6	mid spd run dist	Middle speed run distance

2.3.7	High spd run dist	High speed run distance
2.4	Comm. set	Communication setting
2.4.1	Land comm.	Land communication
2.4.2	Car comm.	Car communication
2.4.1	Land comm.	Land communication
	mid spd	Middle speed
	High spd	High speed
2.4.2	Car comm.	Car communication
	mid spd	Middle speed
	High spd	High speed
2.5	Ignore lift err	Ignore lift error
2.5.1	Port set	Port setting
2.5.2	Lock fault	Door lock fault
2.5.3	Brake fault	Brake fault
2.5.4	Main fault	Main output fault
2.5.5	Invert fault	Inverter fault
2.6	Start auto-tun	Start self-learning
	□no	
	□yes	

Sequence No.	**Display in English**	**English Details**
3.1	In port	Input
3.2	Out port	Output
3.3	Input type	Input type
3.1	In port	Input
3.1.1	X1	
3.1.2	X2	
3.1.3	X3	
…	…	
3.1.32	X32	
3.2	Out port	Output
3.2.1	Y1	
3.2.2	Y2	
3.2.3	Y3	
…	…	
3.2.24	Y24	
3.3	Input type	Input type
3.3.1	Level	Leveling
	no	Normal open
	nc	normal close
3.3.2	Overload	Overload

	no	Normal open
	nc	normal close
3.3.3	Fullload	Fullload
	no	Normal open
	nc	normal close
3.3.4	Lightload	Lightload
	no	Normal open
	nc	normal close
3.3.5	Light bar	
	no	Normal open
	nc	normal close
3.3.6	Light bar b	
	no	Normal open
	nc	normal close
3.3.7	Contact back	Contact feedback
	no	Normal open
	nc	normal close
3.3.8	Brake back	Brake feedback
	no	Normal open
	nc	normal close
3.3.9	Invert fault	
	no	Normal open
	nc	normal close
3.3.10	Service off	
	no	Normal open
	nc	normal close
3.3.11	Open limit	Open door limit
	no	Normal open
	nc	normal close
3.3.12	Cls limit	Close door limit
	no	Normal open
	nc	normal close
3.3.13	Open limit b	Open door limit b
	no	Normal open
	nc	normal close
3.3.14	Cls limit b	Close door limit b
	no	Normal open
	nc	normal close
3.3.15	Brake check	
	no	Normal open
	nc	normal close
3.3.16	Pwr	Emergency power
	no	Normal open
	nc	normal close

Sequence No.	Display in English	English Details
4.1	Fact floor	
4.2	Floor	
4.3	Park floor	
4.4	Door type	
4.1	Fact floor	
4.1.1	Floor 1	
4.1.2	Floor 2	
4.1.3	Floor 3	
…	…	
4.1.32	Floor 32	
4.2	Floor	
4.2.1	Floor number	
4.2.2	Current floor	
4.2.3	Service off	
4.2.4	Fireman floor	
4.2.5	Basic floor	
4.3	Park floor	
4.3.1	Floor 1	
4.3.2	Floor 2	
4.3.3	Floor 3	
…	…	
4.3.32	Floor 32	
4.4	Door type	
4.4.1	Floor 1	
4.4.2	Floor 2	
4.4.3	Floor 3	
…	…	
4.4.12	Floor 12	

5. call display		
Sequence No.	**Display in English**	**English Details**
5.1	Room call	
5.2	Sign dispose	
5.3	Remove 2	
5.4	Auto	
5.5	Operator	
5.1 Room Call		

call xx,xx,xx,xx
5.2 Sign dispose 5.2.1 remove car call 5.2.2 car floor 5.2.3 land call 5.2.4 floor encode
5.2.1 remove car call ☐ remove when dec. (decelerating) ☐ remove when stop
5.2.2 car floor ☐ overload ☐ insp. (inspection)
5.2.3 land call ☐ insp. (inspection) ☐ fullload
5.2.4 floor encode ☐ binary ☐ BCD ☐ LCD
5.3 Remove 2
5.3.1 trouble car: X call
5.3.2 beep when land 0.0 s
5.4 auto
5.4.1 remove mistake car
5.4.2 remove car reverse
5.4.3 blink car
5.4.4 stop when no call
5.4.1 remove mistake car
☐ no
☐ push again
5.4.2 remove car reverse
☐ no
☐ remove top or bottom
☐ remove when reverse
5.4.3 blink car
☐ no
☐ yes
5.4.4 stop when no call
☐ open door
☐ no open
5.5 operator
5.5.1 remove mistake car
5.5.2 remove car reverse

5.5.3 blink car
5.5.4 stop when no call
5.5.5 car call direction first
5.5.1 remove mistake car
☐ no
☐ push again
5.5.2 remove car reverse
☐ no
☐ remove top or bottom
☐ remove when reverse
5.5.3 blink car
☐ no
☐ yes
5.5.4 stop when no call
☐ open door
☐ no open
5.5.5 car call direction first
☐ no
☐ yes

CHAPTER ELEVEN Parameter Details

1. System settings:

1.1 days & dates: to set or verify system date & time

Erase error record: to clear all history error records

LCD light: to reduce electricity load, system will close LCD light automatically if long time no button pressed.

1.4 pin 2: pins for producer, customer no need to care it.

1.5 change pin: you can only change the pins after you logged on.

2. Basic settings:

2.1 basic settings:

(1) Lift no.: label a number for each lift.

(2) Speed sort

(3) Run mode: selecting single lift run mode in parallel communication, system will separately run the lift; selecting double lift run mode, system will run 1 or 2 lifts according to actual situations. When lift is in service off, inspection, fireman, overload and error status or there is no communication between parallel lifts, system will auto run single lift.

(4) Fireman mode: if setting is “fireman return basefloor”, when fire control, the lift will directly run to basic station, the door will open and no longer close, and will not respond calls. Until fireman arrives and pressed “fireman operation” button, system will immediately goes into fireman running mode. if setting is “fireman run”, the “fireman operation” input signal is not needed any more. Lift will immediately goes into fireman running mode after it return to basic station. If system hasn’t fireman control function, you can remove the input signal-“fireman”.

2.2 time settings:

(1) Cabin power: system will auto close fan & lighting if long time no calls in.

(2) Return basic floor: lift will auto return basic floor when it is idle for a designated time. If value is equal to 0, then no this function. In parallel communication, it means lift auto return to station (basic floor). But here returning base station is controlled by parallel controller, which will allocate only one lift to return base station when designated idle time’s up,

(3) Auto close door: under auto running status, the time from door complete open till auto close.

(4) Door jammed: under auto running status, if door will not open/close completely within designated time after door open/close output signal, system regards it as door jammed. System will execute door open/close over again. If door open/close still not works after 3 times repeated, system will stop trying door open/close & declare door jammed error.

(5) Open door delay: door open signal will continue outputting after limit switch is touched to ensure the door is opened well enough. common setting of the parameter is 0.

(6) Close door delay: door close signal will continue outputting after limit switch is touched to ensure the door is closed well enough. common setting of the

parameter is 0.

(7) Bell output delay: the delay is from decelerating starting to bell signal output. If setting is 0, it means bell signal output is synchronous with decelerating starting.

(8) Bell rings time: time duration of bell rings from starts to ends.

(9) Start time:

(10) Open brake: you need to set open brake delay time for inverters those will not output brake control signals. That is inverter will output a pre-torque before opening brake. If brake control signal is directly output from inverter, no need to set this parameter. The minimum setting can be zero, which equals there is no delay. Details of the parameter please refer to chapter 14 to 19 in this book.

(11) stop delay: for Emerson, KEB, MICO,inverter, starting from brake？passing a stop delay, that is keep the stopping for a time, then remove run instruction (direction & enable). For YASKASIA，Fuji inverter, starting from inverter zero speed signal, passing a stop delay, then remove run instruction. If parameter setting is zero, there will be no stop delay.

(12) brake time: you need to set delay brake time for inverters those will not output brake control signals. From inverter gives out “inverter 0 speed “ signal, passing by a brake delay, the brake will engage. If brake control signal is directly output from inverter, no need to set this parameter. The minimum setting can be zero, which equals there is no delay. Details of the parameter please refer to chapter 14 to 19 in this book

(13) Run time: it’s the maximum time lift took running from one door zone to the next one. Beyond “run time”, system will declare “ run timeouts” error. Only shutting down power can you clear this error. Run time calculated from you start the elevator to decelerating beginning. The lift runs slowly at starting phase. Run time of this phase will auto extend 3 second. If you set run time as 20 seconds, starting phase run time will become 23 seconds. As long as run time not exceeds 23 seconds before entering the next door zone, system will not declare run timeouts. Hereafter each door zone run time will automatically set as 20 second. When system searches for door zone, run time will auto extend decuple. It will declare “run timeouts” error as well if system hasn’t arrived the next door zone beyond the decuple run time. If you set run time as 99 seconds, system will specially handle run time. Actual run time will become 5 minutes, run time of door zone searching is 20 minutes.

(14) Land time: it’s time lift from decelerating starting run to destination floor door zone. Lift will automatically stop beyond this time.

(15) level time: for Emerson, KEB, MICO inverter, it’s the time from system entering into destination floor door zone to system has detected brake release. System will automatically stop beyond this time. For YASKAWA, Fuji inverter, it’s the time from system entering into destination floor door zone to inverter gave out inverter zero speed signal output. System will automatically stop beyond this time.

2.3 distance setting:

System with Emerson inverter no need distance setting.

(1) Door zone length: set door zone actual length. The parameter must be correctly set. there is no door zone in car guide rail in system with absolute value encoder. but you still need to set this parameter so that system can know landing area in order to land & door open.

2) Abs encoder: one rolling circle length of abs encoder.

3) Low speed decrease distance / middle speed decrease distance / high speed decrease distance

They respectively are the distance setting at low speed, middle speed and high speed. Decrease distance is distance from decelerating starting to destination floor level zone, distance inside leveling zone not included. If decelerating distance setting too long, lift would have a long creep distance. If decelerating distance setting too short, lift would have a stroke。 You'd better set a decelerating distance apparently larger than inverter's actual decreasing distance, then you adjust it according to actual situation. You can better analyze the problem in this way.

4) Middle speed run distance / high speed run distance

It's the shortest admit running distance at medium speed and high speed (rated speed). Run distance should be larger than the sum of accelerating distance and decelerating distance. System calculates distance between current floor and destination floor to decide which speed to run.

Main board calculates distance between current floor and destination floor before startup. If calculated distance is larger than high speed run distance setting, system will run at high speed. Otherwise, system will run at middle speed. If neither, system will run at low speed.

In application, lift with running speed less than 1m/s, you can set "l high speed run distance" shorter than any floor's height so that lift runs at only one speed. Lift with running speed less than 1.75m/s always run at two types speed. Here you should set middle speed run distance same as high speed run distance. In this way, system will nohow run at middle speed.

For example, one lift runs at 3 speeds. Setting middle speed run distance as 5 meter. setting high speed run distance as 10 meter. Distance between one and the next station is 3 meter. Then the lift will run single floor (distance is 3 meter) at low speed, run 2 floors (distance is 6 meter) & 3 floors (distance is 9 meter) at middle speed, run 4 floors or above (distance larger than 10 meter) at high speed.

2.4 ignore lift error:

To make initial stage testing convenient, testing person can ignore lift error during tests. Those ignored errors will not show any longer in running. Considering lift running safety, you can only temporally ignore lift error. When you re-power on the system next time, default setting is no ignore lift error.

2.5 start self-learning:

Using this parameter to learn data from car guide rail. Before self-learning, you should run lift under inspection status to bottom door zone first.

3. floor setting:

You can set each station landing call display character, total stations, basic station of service off, fireman base station, basic floor, landing floor and door open position of each station. “display character” is only used for floor display. System inside still runs according to station (absolute floor). By setting “landing area” you can decide which stations is admitted to land. Here “landing” aims at station (absolute floor, door zone), having no relation with actual floor.

Door open position setting is valid from station 1 to 12. (single door open, back door open, both doors open). Station 13 and above all default setting as single door open.

4. call display:

1) remove car call: to remove current floor car call at decelerating start or at landing point.
2) Floor encode: some lift, especially rebuild lift, will use parallel communication floor display board. To match different manufacture’s circuit board, system offers 3 code: binary code, BCD & LCD .
3) Trouble car: it means when there is light load signal input, the admitted maximum car calls. when setting is 0, it means there is no this function.
4) Remove mistake car call : press same button again to cancel the car call or not.
5) Remove reverse car call: to set when you remove the opposite direction car calls.
6) Blink car if landing calls: to set if there is landing call, the corresponding floor car button blink or not.
7) Stop when no call: system will stop at the nearest leveling zone if there is no call. You can set the one time door open or not.
8) Landing call not directional: when setting is “yes”, landing call will not be directional. In this case, landing call only used for midway picking passengers.
9) beep when land: buzzer rings or not under operator mode when there is landing calls. If setting is 0.0, buzzer doesn’t ring. If setting isn’t 0, it means when there is landing calls, buzzer rings time.
10) Parameter setting of auto mode is invalid in operator mode. Parameter setting of operator mode is invalid in auto mode.

CHAPTER TWELVE Slow Test

1. Inspection Run

inspection run needs to meet the following conditions:

1) car door and floor door are both well closed. That is doors lock, open limit and close limit all meet the requirements.
2) inspection up run doesn't touch top limit switch; inspection down run doesn't touch down limit switch.
3) ensure system not occurred following errors: safety circuit error, inverter error, main output error, brake error, doors lock error, input port wrong setting, run overtime & brake checking errors.

2. self-learning (common encoder):

A newly installed lift needs self-learning before fast run. If you changed the position of landing baffle's or force decelerating switch, a self-learning for car guild rail also needed.

A unsuccessful self-learning will have no any influence for system. If system has a right self-learning before, the lift will run at previous data. If a self-learning is unsuccessful, please re-start the system to resume previous data.

After a successful learning, you need to re-powered the system to ensure the self-learning did succeed. The learned data are saved in permanent saving unit. When system is started, all parameter and learned data will read out from the permanent saving unit. At the same time, system will auto judge if these data valid or not. If data is valid, system will prompt "need self-learning".

2.1 a self-learning need to meet the following conditions:

1) to meet the conditions an inspection run needed;
2) system stops at floor 1 door zone and you can know from floor showing that current floor is station 1. if floor showing is not station 1, you should up run the lift until it touched "down force decelerating" switch, then down run it till bottom floor door zone so that the lift can auto verify the floor showing as station 1.
3) All I/O cables well connected; there is no barrier in car guide rail.

When all above conditions satisfied, you can start a self-learning. Menu flows as follow: setting→basic setting→distance setting→start self-learning→yes.

2.2 when a self-learning is successful, system will prompt "self-learning succeed". For system with Emerson inverter, main board will save self-learned total floors number. For system with others inverters, main board will save self-learned total floors numbers, each door zone's position, each force decelerating switch's position and door zone baffle's length. When a new self-learning is successful, all the previous self-learned data will be cleared. If a new self-learning is not successful, system will give it up and save nothing. For lifts only 2 stations, door zone baffle's length is invalid. System will calculate decelerating point as down force decelerating distance. The down force decelerating distance is calculated from upper edge of bottom door zone.

2.3 if a self-learning is unsuccessful, there may be for the following reasons:

1) A lift will not stop up run until it touches up-force-decelerating" switch when it will brake emergent and system declare "self-leaning unsuccessful"
2) Although a lift touched up-force-decelerating switch, it can't find door zone which will

leads it touches top limit ultimately. When system will brake emergent and will declare “self-learning unsuccessful”.

3) Error occurred during run.

2.4 The following instance need a re-powered on after a self-learning:

1) it’s the first time self-learning
2) the self-learning is unsuccessful
3) although previous self-learning, reself-learning for main board changed
4) reself-learning for pairs of force- decelerating switch changed
5) reself-learning for total floors number changed

2.5 the following no need to re-powered on the system after self-learning:

1) reself-learning for adjusting the location of force-decelerating switch
2) reself-learning for adjusting the location of landing baffle

3. self-learning (absolute value encoder):

Main board can equips with HEIDENHAIN absolute value encoder. Signal gathering is RS485 synchronous serial communication. Encode format is GRAY code. It needs 2pcs clock cables, 2pcs data cables and 2pcs power cables. Different absolute encoders have different signal gathering modes and encode format. Using others absolute encoder may cause components damaged or signal wrongly gathered.

System with absolute value encoder has no landing baffle. When self-learning, testing people will adjust the leveling accuracy in car, manually press current floor’s button, system will auto record the lift’s current absolute location.

You can have a self-learning when system runs with car door open. During self-learning run, system will check neither open/close limit switch nor door lock contactor. But you must keep door lock signal always be connected on. All floor doors must completely closed. Having a testing people short connect car door lock signal at the moment. Particularly attention: No short connecting floor door lock signal, otherwise there will be person casualty or property damage.

There should not following errors during a self-learning: safety circuit error, inverter error, main contact error, brake error, doors lock error, input port wrong setting and run overtime.

Before you start a self-learning, run lift slowly first to leveling position of station 1. Then menu open as follow: setting→basic setting→distance setting→start self-learning→yes. If car door is not open, system will auto open the door, hereafter door open/close can only be manual.

When self-learning, debugging person must be a safeguard specialist. Inspection running system to each door zone, levelly landing properly and pressing corresponding floor’s car button, system will auto record the current absolute position of lift and car display board will show the current floor No. If current floor is station 1 and system has successfully self-learned before, system will record current absolute position and auto verify the others floors absolute position, thereby no need to learn the others floors.

When lift has successfully self-learned, car guide rail of station 1 can be used for verifying the others floors’ absolute position, that is self-learning of station 1 will auto verify the others floors’ absolute position. Considering this point, it had better start self-learning from station 1.

After all floors' self-learned, except station 1, there is no need to self-learn the others floors in future. There might be an offset after system runs a period of time, re-self-learning door zone of station 1 if necessary. In case lift large-scale inspection, there would be an out of gear between the belt in car and absolute value encoder rotary shaft; which will lead to an offset of level landing. If the offset were larger than 10 circles, there would be a declaration of encoder error. In such instance, you should have a self-learning of door zone to station 1.

Please immediately remove short circuit signal on car door lock after self-learning is over. If it's the first time self-learning, you should switch off control system, then re-switch on the power.

CHAPTER THIRTEEN Fast Test

1. Please ensure the following points to make preparations for fast running:
   (1) basement parts well installed; basement buffer is valid; no water in basement.
   (2) Good seal between floor door and door hole.
   (3) Car guide rail installation meets requirement; quality checking passed.
   (4) Tightrope well installed and fastened;
   (5) Limit switch well installed and fastened;
   (6) Speed limit tightrope tackle well installed;
   (7) Cable attached installed well enough so as not to touch other articles during run.
   (8) car installation finished; all parts installed;
   (9) No barriers in car guide rail;
   (10) All parts in control cabins aligned according to industry standard;
   (11) Checking oils in slowing tank of gearing tractor;
   (12) Check encoder on main unit fixed firmly enough not to shake during run;
   (13) Speed limit equipment neatly aligned;
   (14) Clear and neat cable layout; check copper connection between slots.
   (15) clear and neat cables layout in control cabinet;
   (16) Leveling sensor pin board of each floor well connected;
   (17) Checking floor door driver cable connection; checking light bar cable connection;
   (18) Checking top floor leveling sensor cable connection;
   (19) good performance of safety switch in rail;
   (20) Checking installation & performance of top safety switch & bottom safety switch in rail;
   (21) Checking up/down limit switch installation & performance;
   (22) Checking up/down force decelerating switch installation & performance;
   (23) Checking interphone cable connection & performance;
   (24) Checking cable connection of bell;
   (25) Checking cable connection of car call board;
   (26) Checking cable connection of landing call board;
   (27) Double check communication cables.

2. Procedures of fast test run:
   (1) Rightly set inverter parameter. You can set the value referring the experimental data and adjust slightly in future fast run testing;
   (2) Rightly set main board parameter. You can set the value referring the experimental data and adjust slightly in future fast run testing;
   (3) Running lift at inspection status to bottom door zone to have the system a slow self-learning;
   (4) Running lift at inspection status to floor 2 or 2nd top floor, making the lift on automatic status, not having person standing in the car;

(5) Menu selection to call car. If lift is on floor 2, call it up to floor 3; if lift is on 2nd top floor, call it down to 3rd top floor. Closely observing lift's running status, please emergently brake the lift in time if decelerating can't be effected;
(6) In good running order, setting decreasing distance to make lift decelerate properly;
(7) Menu selection to call car, confining the lift running between one and next floors and setting related parameter to make lift decelerate properly;
(8) Menu selection to call car, confining the lift running among 3 continous floors and setting related parameter to make lift decelerate properly;
(9) Better not run lift to bottom or top floor until it runs in good order;
(10) Having one testing person stand in the car so that he can set the inverter's parameter according to himself comfortable feeling, to make a public good comfortable feeling when lift accelerates or decelerates.
(11) Setting inverter & main board parameter according to testing person's comfortable feeling to make a good comfortable feeling when lift starts or stops. Meanwhile setting the related parameter of inverter to levelly land the lift properly.
(12) Setting decreasing distance parameter of main board so that lift can decelerates to creep speed as soon as it arrives at destination floor door zone.
(13) Setting others parameters of main board to optimize lift's running.
(14) Testing lift's all functions to make it meets requirements.

CHAPTER FOURTEEN Emerson Inverter

You can refer to this chapter when you use main board with Emerson Inverter. In application, please obey the manufacture's introduction.

1. The essential inverter parameter setting:

Code	Inverter LCD display	Notes
F0.02	Operation mode	Setting as "2 terminal speed control
F3.03	Multi-speed 0	Must be as 0
F3.04	Multi-speed 1	Slow speed of door zone searching
F3.05	Multi-speed 2	Fast speed of door zone searching
F3.17	Self-learning speed	
F3.19	Inspection speed	
F3.20	Inspection decelerating speed	
F3.21	Creep speed	Speed before going into the level area
F3.22	Force decelerating speed 1	Refer to code F7.11
F4.07	Leveling distance adjust	Inverter auto setting as F4.07 when self-learning, F3.21 & F4.07 is adjustable according to actual leveling accuracy
F5.10	PX1 ports function selection	Setting as " 34 programmable logic input"
F5.11	PX2 ports function selection	Setting as "34 programmable logic input"
F5.12	PX3 ports function selection	Setting as "34 programmable logic input"
F5.13	PX4 ports function selection	Setting as "34 programmable logic input"
F5.14	Logic 0000	Setting as "0"
F5.15	Logic 0001	Setting as "640", meaning up show door zone searching
F5.16	Logic 0010	Setting as "384", meaning down show door zone searching
F5.17	Logic 0011	Setting as "1024"
F5.18	Logic 0100	Setting as "1024"
F5.19	Logic 0101	Setting as "576", meaning up fast door zone searching

F5.20	Logic 0110	Setting as “320”, meaning down fast door zone searching
F5.21	Logic 0111	Setting as “520”, meaning up self-learning
F5.22	Logic 1000	Setting as “1024”
F5.23	Logic 1001	Setting as “517”, meaning up creep speed
F5.24	Logic 1010	Setting as “261”, meaning down creep speed
F5.25	Logic 1011	Setting as “514”, meaning up inspection speed
F5.26	Logic 1100	Setting as “258”, meaning down inspection speed
F5.27	Logic 1101	Setting as “516”, meaning high speed up
F5.28	Logic 1110	Setting as “260”, meaning high speed down
F5.29	Logic 1111	Setting as “1024”
F5.36	Decelerating point output	Setting as “0.200” seconds
F7.08	Force decelerating speed 3	Refer to F7.07
F7.10	Force decelerating speed 2	Refer to F7.09

2. running sequence of specific distance car stop request:

(1) When doors completely close and there is not any influencing run safety errors, Main board responds to calls and transmit running instructions (inverter enable PX1、PX2、PX3、PX4)。

(2) inverter responds the running instruction from main board & output main output contactor suction instruction (CR); the main output is engaged.

(3) when Inverter inspected main output contactor suction, inverter enables.

(4) Inverter output braking instructions, brake released.

(5) Main board will start the running when main output contactor suction, brake contactor suction & brake check switch acts, respond car calls & landing calls and pick up passengers in same direction.

(6) In good running order, passing each decelerating point, inverter will transmit the “decelerating pass” signal. when it runs to destination decelerating point, main board will transmit deceleration instruction, system starts decelerating.

(7) When inverter decelerates till speed 0, brake releases.

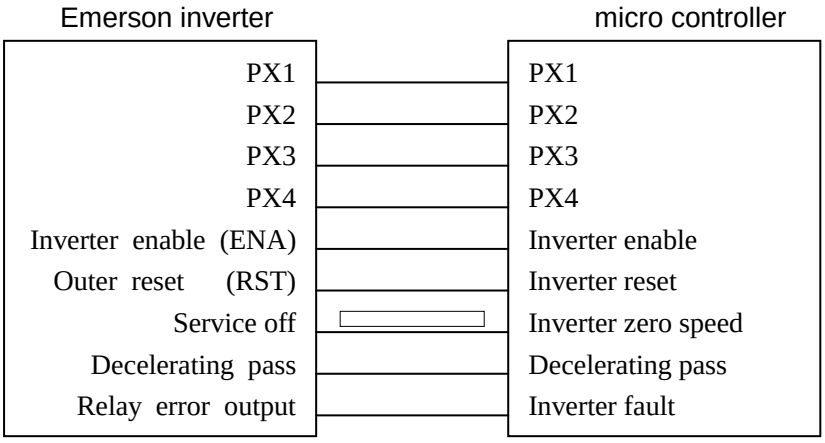
(8) When main board inspected the brake already released or received the “service off” signal, passing a stopping delay, it will remove the instructions to inverters and output door open signal.

(9) Inverter closes main output contactor, one running ends.

3. distance control speed list

Main board output signals	PX1	PX2	PX3	PX4
Rated speed up	1	0	1	1
Rated speed down	0	1	1	1
Creep speed up	1	0	0	1
Creep speed down	0	1	0	1
Inspection up	1	1	0	1
Inspection down	0	0	1	1
Door zone searching up	1	0	1	0
Door zone searching down	0	1	1	0
Door zone searching slow up	1	0	0	0
Door zone searching slow down	0	1	0	0
Up self-learning	1	1	1	0

4. distance control line connections chart:



CHAPTER FIFTEEN KEB Inverter

1. KEB inverter parameter:

Parameter	Notes
LF.0	Operation authority (-4: read only –5: allow operate)
LF.1	User's pin
LF.2	Operation mode, binary coded multi-speed run mode, setting is 1
LF.4	Motor type, 0: asynchronous motor; 1: synchronous motor
LF.5	Change tractor's run direction
LF.6	Change definition of speed, frequency and torque; if controlling a tractor without gear, setting is 1
LF.19	Direct voltage compensation, only used for open loop (LF.30=0)
LF.20	Rated system speed, the maximum lift speed
LF.21	Tractor wheel diameter
LF.22	Deceleration ratio of tractor
LF.23	Winding type（traction ratio）
LF.24	Loading weight
LF.25	Door driver start torque
LF.26	Door driver rated rotation speed
LF.27	Door driver rated frequency
LF.28	Door driver rated voltage
LF.30	Control mode, setting as "2 speed feedback closed loop control"
LF.31	KP speed. If value is too large, it will leads to shaking during constant speed motion. If value is too small, there would be an offset of run curve between setting value and actual value
LF.32	KI speed. Setting is related with inverter and motor
LF.33	KI speed offset. Adjusting it can better control the loading; avoiding opposite pulling when it starts; setting increase or decrease per 500 units
LF.34	Current proportion increase. Setting is related with inverter and motor
LF.35	Current integral increase. Setting is related with inverter and motor.
LF.36	Motor's maximum torque. Protect motor to prevent motor damaged. The acceleration time would extend at fullload; if a synchronous motor, when setting is too high and motor long time overloaded, the magnet would be demagnetized and motor would be damaged accordingly.
LF.37	Motor's start torque. Only used for open loop (LF.30=0)
LF.38	Carrier wave frequency recommended setting is 0. in case more frequency of E.0L2 error, you should use setting 0.
LF.40	Repeat leveling speed V_B
LF.41	Creep speed V_E
LF.42	Rated speed (high speed) V_n
LF.43	Inspection speed V_i
LF.44	Speed 1 (medium speed) V_1

LF.45	Speed 2 (Low speed) V_2
LF.46	Door driver speed
LF.50	Steep start accelerating, too high value will lead to oscillation
LF.51	Acceleration rate
LF.52	Steep decelerating, if setting is too low, LF.53 doesn't work
LF.53	Decelerating rate
LF.54	Steep landing decelerating, it's a decelerating of entering leveling zone
LF.55	Steep start acceleration. Only to adjust this parameter when you release safety clamp. If LF.50 changed, LF.55 will be covered by the parameter set in LF.50
LF.56	Acceleration. Only to adjust this parameter when you release safety clamp. If LF.51 changed, LF.56 will be covered by the parameter set in LF.51. To make lift release safety clamp, you should adjust this parameter and LF.55 to maximum value.
LF.57	Speed offset mode. This parameter, LF.58 and LF.59 can check speed offset. If actual speed LF.89 offset up to a pre-established value (adjustable by LF.58) and over a definite time (adjustable by LF.59), you should use LF.57 to respond its results. 0: function invalid; 1: causing errors informationE.hdS (speed offset too large), to stop lift immediately, shut down inverter power module. 2: terminal X2.8 output alarm of speed offset
LF.58	According to selected mode in parameter LF.57 to make corresponding respond for percent of certain given speed offset.
LF.59	When offset with given speed up to the setting percent and time in LF.58, making corresponding respond according to selected mode in LF.57
LF.60	Brake permitting speed; if speed below the setting value, inverter will close brake output (x3.15)
LF.61	Over speed monitoring. When speed is over the setting value, inverter declare over speed and stop.
LF.62	Decelerating monitoring (zero speed detecting); if speed below the value, X3.17 will act
LF.63	Pre-open door run speed. If speed below the value, X3.18 被置位。It is invalid on machine shell of D & E.
LF.64	Direct current monitoring
LF.65	Over heated delay time
LF.66	Radiator temperature monitoring
LF.67	Pre-torque increase. If you set pre-torque function (LF.30=3), increase of the compensation value from X2.16 input, measured by load detecting equipment should set by this parameter.
LF.68	Pre-torque offset. If imbalance less than 50%, LF.68 equalizes the difference.
LF.69	Pre-torque direction. Depending on torque compensation direction

LF.70	Open brake time. Passing a setting time after inverter output brake control signal (X3.15), motor begins to run
LF.71	High speed (rated speed V_n) decelerating path optimization
LF.72	Medium speed V_1 decelerating path optimization
LF.73	Low speed V_2 decelerating path optimization
LF.74	Creep speed V_E decelerating path optimization
LF.75	Top arc function selection 0: close 1: open
LF.76	Top arc function status
LF.77	Decelerating distance (used for top arc function)
LF.78	Maximum floor distance (used for top arc function)
LF.79	Brake acting time, it adjusts the time from broken of brake control X3.15 to closed of inverter module. I.e. the keeping time of inverter torque. If the time setting too short, inverter closing before brake properly engaging, system will slide along the load direction.
LF.80	Software version
LF.81	Software date
LF.82	Input status of X2.1~X2.7, showed by binary code. They respectively are bit 0,1,2,3,4,5,6. Display is decimal system.
LF.83	Output status of X2.8, X2.9, X20/X2.21, showed by binary code. They respectively are bit 0,1,2. Display is decimal system.
LF.84	Output status of X3.1-X3.7, showed by binary code. They respectively are bit 0,1,2,3,4,5,6. Display is decimal system. It's invalid on the inverter of D machine cover & E machine cover.
LF.85	Output status of X3.13, X3.15/X3.16, X3.14, X3.17, X3.18/X3.19, X3.20/X3.21, X3.22, X3.23, showed by binary code. They respectively are bit 0,2,3,4,5,7,10,12. Display is decimal system. It's invalid on the inverter of D machine cover & E machine cover.
LF.86	Actual assigned value. Value 0~7 respectively corresponds to V=0,V_B,V_E,V_N,V_i, V_1,V_2,V=0
LF.87	Inverter actual percentage in use (%)
LF.88	Inverter given rotary speed (rpm)
LF.89	Inverter actual speed (rpm), used only for closed loop control
LF.90	Lift actual speed (m/s), used only for closed loop control
LF.92	Creeping distance
LF.93	Running distance
LF.98	Error status (more details see LF.99)
LF.99	Inverter run status
dr. 0	Rated motor power, see nameplate
dr. 1	Rated motor speed, see nameplate
dr. 2	Rated motor current, see nameplate
dr. 3	Rated motor frequency, see nameplate
dr. 4	Asynchronous motor rated power factor, see nameplate
dr. 7	Synchronous motor stable current, see nameplate

dr. 9	Rated motor torque, see nameplate
dr. 10	Maximum torque, see nameplate
dr. 12	Asynchronous motor rated voltage, see nameplate. If you want to change the parameter setting, press “enter” key to confirm
dr. 13	Asynchronous motor maximum torque angle speed, it’s auto calculated after input of parameter dr.12
dr. 16	Asynchronous motor maximum torque under dr.19 instance. It’s auto calculated after spinput of parameter dr.12
dr. 17	Synchronous motor EMK voltage constant, see nameplate
dr. 19	Asynchronous motor low magnetic field rotary speed, It’s auto calculated after input of parameter dr.12
dr. 20	Asynchronous motor low magnetic field increase
dr. 21	Asynchronous motor magnetic flux
dr. 41	Synchronous motor coil interphase resistance, see nameplate
dr. 42	Synchronous motor coil interphase inductance, see nameplate
EC. 0	Port 1 of encoder parameter
EC. 1	Pulse number of encoder
EC. 2	To change A, B phase sequence of asynchronous motor encoder
EC. 3	Pole pairs of encoder, setting can be only as 1 if synchronous motor
EC. 4	Motor self learning; self learning starting when setting is 1. Tractor should be empty load status. self learning ending when setting is 7
EC. 5	Clock frequency of encoder 1
EC.6	Mode of encoder 1
EC.7	Location of motor rotor
EC.8	Speed sampling time of encoder 1
EC.9	Setting acting value of rotary encoder for input of parameter E.EnC
EC.10	Encoder port 2
EC.11	Encoder 2 pulse number per circle
EC.17	Output port X5 frequency factor of increment type encoder
EC.20	Hiper encoder type connected with encoder 1

2. KEB inverter multi-section speed running sequence:
   1) When doors completely close and there is not any influencing run safety errors, Main board responds to calls and transmit running instructions (directions and running speed)
   2) inverter responds the running instruction from main board & output main output contactor control signal. Main output contactor engages.
   3) Main board gives out “inverter enable” signal as soon as main output engages.
   4) Inverter output brake control signal, brake open.
   5) Main board start running, responds to car/landing calls and real time calculates decelerating point as soon as main output contactor engages, brake contactor engages and brake checking switch acts.
   6) Lift runs in good order, pick up the same direction passengers. When system runs to decelerating point, main board gives out creep speed, lift start to decelerate.

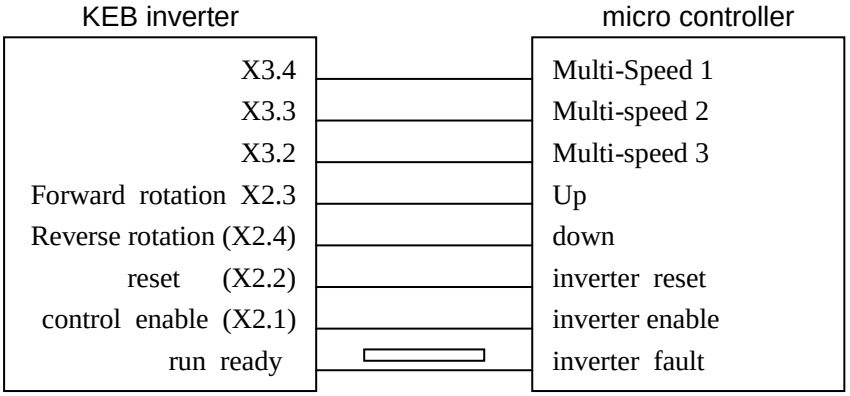
7) When lift decelerate to creep speed, it will evenly run at the creep speed.
8) Lift entering door zone at creep speed, main board remove speed instruction, only left inverter enable and direction.
9) After inverter decelerates to brake permission speed (LF.60), system close brake control signal.
10) Main board detected that brake contactor broken, passing a delay (car stopping time. Set it a little larger than LF.79 +0.3 seconds), remove inverter enable & direction signal, meanwhile output door open signal.
11) After inverter close brake control signal, passing a delay (LF.79), delay again 0.3 seconds, main output control signal close. That's all a running.

3. Notice:
If inverter declare E.EnC error, the possible reason is: motor cable UVW accords with inverter UVW or not; main output contactor not connected well; parameter EC. Setting is wrong and encoder itself problems.

4. multi-section speed control assigned value:

Main board output signal	Multi-section 1	Multi-section 2	Multi-section 3
High speed (rated speed V_N)	0	1	1
Medium speed (V_1)	1	0	1
Low speed (V_2)	1	1	0
Creep speed (V_E)	0	1	0
Entering door zone leveling	0	0	0
Inspection	1	0	0
Door zone searching (wrong floor, to top floor or bottom floor for floor verifying)	1	0	0
Door zone searching (search for nearest door zone)	0	1	0
Door zone searching (when up run touches up force shift switch or down run touches down shift decelerating switch)	0	1	0
Self learning	1	0	0

5. cable connection with KEB inverter:



CHAPTER SIXTEEN MICO Inverter

1. MICO inverter parameter:

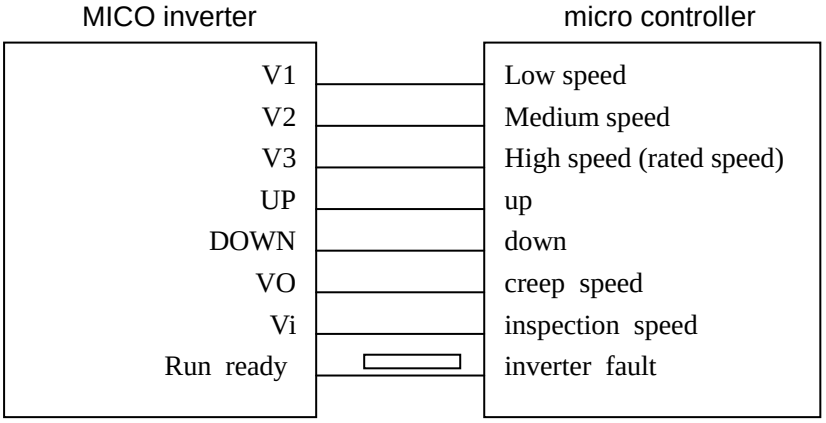
Error memory	
No.1	IPM overcurrent, because of parameter setting wrong or short-circuite
No.2	U phase overcurrent, because of parameter setting wrong or IMP damaged
No.3	V phase overcurrent, because of parameter setting wrong or IMP damaged
No.4	W phase overcurrent, because of parameter setting wrong or IMP damaged
No.5	Radiator overtemperatured
No.6	Middle loop overvoltage, brake not connected or damaged
No.7	Middle loop low temperatured, main power voltage too low
No.8	Main contactor not engaged when starting or main power least 1 phase shortage
No.9	Main contactor not engaged when running or main power least 1 phase shortage
No.10	Direction instruction loses during running or before braking ending
No.11	Direction instruction “up” & “down” both in use
No.12	Wrong direction, to change input phase of encoder or encoder damaged
No.13	Offset, inverter overload or wrong motor/encoder parameter
No.14	Encoder no pulse signal
No.15	Middle loop charged in advance, brake resistance or error of main power grounding
No.16	Changing direction instruction during run

2. MICO inverter running sequence:
   1) When doors completely close and there is not any influencing run safety errors, Main board responds to calls, transmit run instruction (direction, V0 and speed V3,V2,V1).
   2) Inverter responds to run instruction from main board, output main contactor engaged instruction, main output contactor engaged.
   3) Inverter output brake instruction, open the brake
   4) As soon as main board detects main output contactor engaged, brake contactor engaged and brake checking switch act, it will turn into running status, responds to car/landing calls and real time calculates decelerating point.
   5) Lift runs in good order, pick up the same direction passengers. When it runs to decelerating point, main board remover run speed, only left creep speed V0, system start to decelerate
   6) When lift decelerates to creep speed, it will runs evenly at the speed
   7) Lift entering door zone at creep speed, main board remove creep speed instruction, with direction instruction left.
   8) Inverter will close brake when it decelerates to zero speed
   9) Main board detects brake contactor broken, passing a delay (car stopping time), remove direction signal & output door open signal.
   10) Inverter close main output contactor. That’s all a running.

3. speed control value:

	Main board output signals	Inverter input signals
High speed running	High speed + creep speed	V3+V0
Medium speed running	Medium speed + creep speed	V2+V0
Low speed running	Low speed + creep speed	V1+V0
decelerating	Creep speed	V0
levelling	Remove speed signal	
Inspection run	Inspection speed	Vi
Door zone searching (wrong floor, to top floor or bottom floor for floor verifying)	Inspection speed	Vi
Door zone searching (search for nearest door zone)	Creep speed	V1
Self learning	Inspection speed	Vi

4. cable connection with MICO inverter:



CHAPTER SEVENTEEN YASKAWA Inverter

1. YASKAWA inverter parameter:

Parameter	Name	Setting	Remark
A1-00	Language selection	0	
A1-01	Parameter grade	2	
A1-02	Control mode selection	3 (closed loop)	
B1-01	Frequency instruction selection	0	
B1-02	Running instruction selection	1	
B1-03	Stopping ways selection	0	
B1-04	No reverse rotating	0	
B1-05	Run selection below the minimum frequency	0	
B1-06	Control terminals twice scan time selection	1	
B2-01	Direct current brake frequency	0.5	
B2-03	Direct current brake when starting	0	
B2-04	Direct current brake when stopping	0.5	
B3-01	Speed search selection when starting	1	
B4-01	On Delay time	0	
B4-02	Off Delay time	0	
B5-01	PID control mode selection	0	
B6-01	DWELL starting frequency	0	
B6-02	DWELL starting time	0	
B6-03	DWELL stopping frequency	0	
B6-04	DWELL stopping time	0	
B7-01	Droop control increase	0	
B7-02	Droop control delay time	0.05	
B9-01	Zero servo increase	5	
B9-02	Zero servo fulfill width	10	
C1-01	Accelerating time 1		
C1-02	Decelerating time 1		
C1-03	Accelerating time 2	0	
C1-04	Decelerating time 2	0	

C1-05	Accelerating time 3	0	
C1-06	Decelerating time 3	0	
C1-07	Accelerating time 4	0	
C1-08	Decelerating time 4	0	
C1-09	Emergent brake time	1.0	
C1-10	Accelerating/decelerating time setting unit	1	
C1-11	Decelerating/decelerating time shift frequency	0	
C2-01	Curve S of acceleration start		
C2-02	Curve S of acceleration end		
C2-03	Curve S of deceleration start		
C2-04	Curve S of deceleration end		
C3-01	Rotary difference compensation increase	1.0	
C5-01	ASR portion increase 1	20.00	Highest frequency
C5-02	ASR integral time 1	0.5	Highest frequency
C5-03	ASR portion increase 2	20.00	Low frequency
C5-04	ASR integral time 2	0.5	Low frequency
C5-05	ASR limit	0	
C5-06	ASR output delay	0.004	
C5-07	ASR shift frequency	0	Low frequency
C6-01	Carrier wave frequency top limit	15.0	
C8-08	AFR increase	1.0	
D1-01	Frequency instruction 1	Leveling speed after entering door zone	
D1-02	Frequency instruction 2	Inspection speed	
D1-03	Frequency instruction 3	Creep speed	
D1-04	Frequency instruction 4	Low speed	
D1-05	Frequency instruction 5	0	
D1-06	Frequency instruction 6	Medium speed	
D1-07	Frequency instruction 7	High speed (rated speed)	
D1-08	Frequency instruction 8	0	
D1-09	Frequency instruction 9	0	
D1-10	Frequency instruction 10	0	
D1-11	Frequency instruction 11	0	

D1-12	Frequency instruction 12	0	
D1-13	Frequency instruction 13	0	
D1-14	Frequency instruction 14	0	
D1-15	Frequency instruction 15	0	
D1-16	Frequency instruction 16	0	
D1-17	press-act Frequency 17	0	
D2-01	Frequency instruction upper limit	100%	
D2-02	Frequency instruction lower limit	0	
D3-01	Jumping frequency 1	0	
D3-02	Jumping frequency 2	0	
D3-03	Jumping frequency 3	0	
D3-04	Jumping frequency width	1.0	
D4-01	Frequency instruction holding function selection	0	
D4-02	Positive/negative speed limit	25%	
D5-01	Torque control selection	0	
D5-02	Torque instruction delay time		
D5-03	Speed limit selection	1	
D5-04	Speed limit	0	
D5-05	Speed limit offset	10	
D5-06	Speed/torque control shift time	0	
E1-01	Input voltage setting	400	
E1-04	Maximum output frequency	50*	
E1-05	Maximum voltage	380*	
E1-06	Basic frequency	50*	
E1-09	Minimum output frequency	0	
F1-01	PG constant		
F1-02	action selection when PG cable broken is detected	0	
F1-03	Action selection when overspeed is detected	0	
F1-04	Action selection when overlarge offset is detected	0	
F1-05	PG working direction		
F1-06	PG frequency dividing		

	ratio		
F1-08	Overspeed detecting standard	115%	
F1-09	Overspeed detecting time	1.0	
F1-10	Speed offset overlarge detecting standard	30	
F1-11	Speed offset overlarge detecting time	3.5	
H1-01	Multi-function joint input 1		
H1-02	Multi-function joint input 2	14	
H1-03	Multi-function joint input 3	3	
H1-04	Multi-function joint input 4	4	
H1-05	Multi-function joint input 5	5	
H1-06	Multi-function joint input 6	9	
H2-01	Multi-function joint output	8	
H2-02	Multi-function joint output 1	1	
H3-05	Frequency instruction selection	1F	
L1-01	Motor protection	1	
L1-02	Motor protection time	1.0	
L2-01	Instantaneous electricity broken action selection	0	
L2-02	Instantaneous protection time	2.0	
L2-03	Minimum base block time	0.7	
L2-04	Voltage reset time	0.3	
L2-05	Low voltage detecting standard	380	
L3-04	Function selection of preventing speed losing during decelerating	0*	

2. YASKAWA inverter running sequence:
   1) When doors completely close and there is not any influencing run safety errors, Main board responds to calls, output main contactor control signal
   2) Main output contactor engages normally, main board transmit lift running instruction (inverter enable, direction and section speed)
   3) From running instruction given out, main board delay 1 second. Delay time is up, if inverter doesn't transmit running 2 signal, it means inverter doesn't respond. System will remove running instruction and re-transmit running instruction. If giving out running instruction 3 times, system still not run in good order, main board will auto clear all calls.
   4) From inverter transmit running 2 signal, main board pass a "delay open brake"

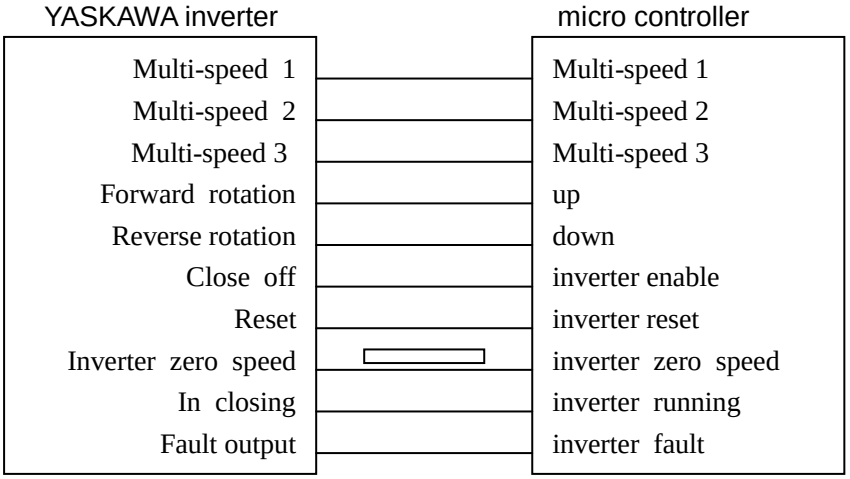
time. Delay time is up, main board output brake control signal, open the brake.

5) Main board will go into running status after it detected main contactor engages, brake contactor engages and brake checking switch acts, responds car/landing calls real time calculates decelerating point.
6) Lift runs in good order, pick up the same direction passengers. when it runs to decelerating point, main board transmit creep speed, lift start to decelerate.
7) when lift decelerating to creep speed, it will run evenly at the speed
8) main board transmit section speed instruction 000 after it enters door zone at creep speed
9) inverter transmit inverter zero speed signal. after main board receives the signal, passing a “delay close brake” time, it will close brake control signals output.
10) Inverter transmit inverter zero speed signal, after main board receives the signal, passing a “car stop holding time”, it removes direction signals.
11) Main board close main output control signal. that’s all a running.

3. multi-section speed control value:

Main board output signal	Multi-section speed 1	Multi-section speed 2	Multi-section speed 3
High speed (rated speed)	0	1	1
Medium speed	1	0	1
Low speed	1	1	0
Creep speed	0	1	0
Entering door zone leveling	0	0	0
Inspection	1	0	0
Door zone searching (wrong floor, to top floor or bottom floor for floor verifying)	1	0	0
Door zone searching (search for nearest door zone)	0	1	0
Door zone searching (when up run touches up force shift switch or down run touches down shift decelerating switch)	0	1	0
Self learning	1	0	0

4. cable connection with YASKAWA inverter:



CHAPTER EIGHTEEN Fuji Inverter

You can refer to this chapter when you use main board with Emerson Inverter. In application, please obey the manufacture's introduction.

1. parameter overview:

1) partial parameter (FRENIC G11UD)

o10	Multi-section speed instruction consistency timer	To prevent speed instruction wrongly given out; setting as 0.010
o11	Accelerating/decelerating time 9	Decelerating time of emergency brake
o13-o22	S curve setting	
o23	Run instruction consistency timer	To prevent instable direction instruction signal, setting as 0.005
o29	Output signal logic	Setting Y3,Y4 whether opposite phase logic output or not
o38	Start time	Time from zero speed to start frequency
o39	Select speed 0	Setting as 001
o40	Select speed 1	Setting as 111
o41	Select speed 2	Setting as 000
o42	Select speed 3	Setting as 010
o43	Select speed 4	Setting as 100
o44	Select speed 5	Setting as 110
o45	Select speed 6	Setting as 101
o46	Select speed 7	Setting as 011
o25	Brake release time	Time from main board output direction signal to brake control signal 1 (DBRS) on
E01	X1 input	0
E02	X2 input	1
E03	X3 input	2
E04	X4 input	8
E05	X5 input	31
E15	Accelerating/decelerating time 8	Decelerating time of emergency brake
E21	Y2 output	Setting as "38 speed consistency signal"
E22	Y3 output	Setting as "0 in running signal"
E23	Y4 output	Setting as "34 speed signal available"
E25	Output logic	Setting as Y5 whether logic output or not
E32	Frequency checking lag	Setting as 0.1hz
E36	Frequency checking 2	To judge whether lift output door open signal or not, used for pre-opening door
F23	Start frequency	Control beginning frequency when starting
F24	Start time	Duration time of starting frequency

F25	Inactive frequency	Main board to judge zero speed stop or not
C05	Multi-frequency 1	For emergency use
C06	Multi-frequency 2	
C07	Multi-frequency 3	Creep speed
C08	Multi-frequency 4	Inspection speed
C09	Multi-frequency 5	Low speed
C10	Multi-frequency 6	Medium speed
C11	Multi-frequency 7	High speed
C12	Multi-frequency 0	Zero speed

2) partial parameter (FRENIC lift)

F01	Speed setting	0
F03	Highest speed	Same with rated speed
F04	Rated speed	
F05	Rated voltage	Motor voltage
F07	Accelerating/decelerating time 1	Low speed run accelerating time
F08	Accelerating/decelerating time 2	Low speed run creep decelerating time
F23	Start speed	0*
F24	Duration time	Time from zero speed to start frequency
F25	Stopping speed	To judge zero speed brake signal
L01	Pulse encoder	0 asynchronous motor
L02	Pulse number	1024
L11	Zero speed instruction	Setting as 001
L12	Manual medium speed instruction	Setting as 111
L13	Maintenance speed instruction	Setting as 100; inspection speed instruction
L14	Creep speed instruction	Setting as 010
L15	Manual low speed instruction	Setting as 000
L16	Low speed instruction selection	Setting as 110
L17	Medium speed instruction selection	Setting as 101
L18	High speed instruction selection	Setting as 011
L19	Start arc curve	12%; setting value more smaller, the steeper curve. It’s an accelerate start curve.
L20	Low or high speed run setting curve	12%; setting value more smaller, the steeper curve. It’s an accelerate end curve.
L21	Low speed run setting	12%; setting value more smaller, the steeper

	curve	curve. It's a low speed decelerate start curve.
L22	Medium speed run setting curve	12%; setting value more smaller, the steeper curve. It's an accelerate end curve.
L23	Medium speed run setting curve	12%; setting value more smaller, the steeper curve. It's a medium speed decelerate start curve.
L25	High speed run setting curve	12%; setting value more smaller, the steeper curve. It's a high speed decelerate start curve.
L26	Creep run setting curve	12%; setting value more smaller, the steeper curve. It's a creep decelerating end curve.
L28	Zero run setting curve	12%; setting value more smaller, the steeper curve. It's a zero speed decelerating starts & end curve.
L36	ASR (P constant at high speed)	40*
L37	ASR (I constant at high speed)	0.1*
L38	ASR (P constant at low speed)	40*
L39	ASR (I constant at low speed)	0.1*
L42	(FF increase)	0
L49	Vibration increase	0.00
L50	Mechanical vibration integral time	0.1
L51	Mechanical vibration load inertia	0.01
L52	Control mode selection	0; speed control
L54	Torque offset	0; simulated value
L55	Torque offset (timer start)	
L56	Torque offset (timer end)	
L57	Torque offset (limit)	
L60	Torque offset (drive side increase)	
L61	Torque offset (brake side increase)	
L65	Imbalance load compensation (act selection)	
L66	Imbalance load compensation (operation time)	

L67	Imbalance load compensation (starting time)	
L68	Imbalance load compensation (ASR constant P)	When vibration occurred, please decrease constant P
L69	Imbalance load compensation (ASR constant I)	When vibration occurred, please increase constant I
E01	X1 input	0
E02	X2 input	1
E03	X3 input	2
E04	X4 input	8
E05	X5 input	60
E10	Accelerating/decelerating time 3	Accelerating time at medium speed
E11	Accelerating/decelerating time 4	Creep decelerating time at medium speed
E12	Accelerating/decelerating time 5	Accelerating time at high speed
E13	Accelerating/decelerating time 6	Creep decelerating time at high speed
E14	Accelerating/decelerating time 7	Decelerating time at zero speed; starting from door zone
E18	Run instruction consistency (function selection)	3
E19	Multi-step speed instruction consistency timer	0.01
E22	Y3 output	Setting as “35 inverter outputting” RUN2
E23	Y4 output	Setting as “1070 speed available, signal available”
E27	Terminal 30A/B/C(relay output)	99
C04	Multi-frequency 1	
C05	Multi-frequency 2	
C06	Multi-frequency 3	Inspection speed
C07	Multi-frequency 4	Creep speed
C08	Multi-frequency 5	
C09	Multi-frequency 6	Low speed
C10	Multi-frequency 7	Medium speed
C11	Multi-frequency 0	High speed

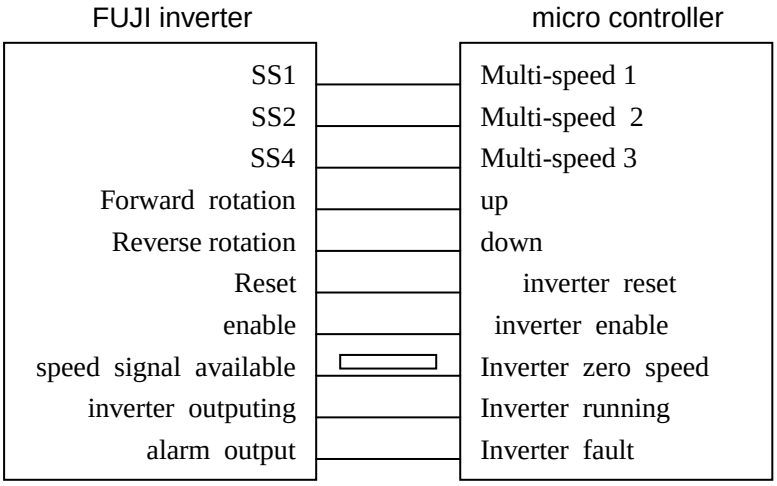
C21	Speed defination	0: measure unit is r/min; 1:measure unit is m/min; 2:measure unit is HZ
P01	Motor electrode	
P02	Motor capacity	
P03	Motor rated current	
P04	Customer rectification	
P06	No load current	
H65	Soft start speed time	
H66	Speed detect mode end	0
H67	Speed detect mode duration	0

2. FUJI inverter multi-section speed run sequence:
   (1) When doors completely close and there is not any influencing run safety errors, Main board responds to calls and output control signal;
   (2) Main output contactor is suction closed, main board gives out lift run instruction (inverter enable, direction & section speed);
   (3) From giving out direction signal, main board will delay 1 second. If inverter has not given " brake control" signal within the delayed 1 second, it means that the inverter not responded, and main board will withdraw the run instruction, re-transmit it. If 3 times run instructions given out, system still not run in good order, main board will auto clear all the calls;
   (4) From inverter gives out "brake control" signal, main board will pass a "brake release delay" time, then output "brake control" signal and brake releases;
   (5) When main board detects that main output contactor suction closed, brake contactor suction closed and brake checking switch acts, system will be in running order, respond all car calls & landing calls and real time calculate system's decelerating point;
   (6) System runs in good order, pick up same direction passengers. When system runs to decelerating point, main board gives out creep speed, lift start decelerating;
   (7) When lift decelerating to creep speed, it will run at even creep speed;
   (8) When lift runs to door zone at creep speed, main board withdraw speed instruction, with inverter enable and direction signal left.
   (9) Inverter gives out frequency detecting signal. when main board received this signal, it will pass a "brake release delay" time, to close the output of brake control signal.
   (10) Inverter gives out frequency detecting signal. when main board received this signal, it will pass a "holding car stop" time, withdraw direction signal;
   (11) Main board close main output control signal. one running ends.

3. multi-speed run control value list:

Main board output signals	Multi-section speed 1	Multi-section speed 2	Multi-section speed 3
High speed (rated speed)	0	1	1
Medium speed	1	0	1
Low speed	1	1	0
Creep speed	0	1	0
In door zone leveling	0	0	1
Inspection speed	1	0	0
Door zone searching (wrong floor, to top floor or bottom floor for floor verifying)	1	0	0
Door zone searching (wrong floor, when up run touches up force decelerating switch or down run touches down force decelerating switch)	0	1	0
Door zone searching (search for nearest door zone)	0	1	0
Self-learning	1	0	0

4. cables connection with FUJI inverter:



CHAPTER NINETEEN Errors and Prompts

1. frequently questions analysis:

questions	Possible reason
Inspection run disable	Door lock signal should connect through; open/close limit satisfies “doors completely closed well” requirements; if you defined “inverter ready” signal, it should be connected
Auto searching for door zone disable	Meets conditions of “inspection run”
Auto run disable	Meets conditions of “inspection run”; emergency power or emergency run signals act
Cabin calls is ok, directional landing calls disable	“Fulload” and/or “operator direct run” signal act; parameter “other setting”→operator running→landing calls unidirectional” already set as “yes”
Door close disable	Overload and/or light bar signal acts; “fire run mode” set as “return fire base”, fire signal act and lift stops at fire base
Door lock error	Checking open/close limit signal to door drive supply whether powered on

2. errors or prompt information:

Errors or prompt	Frequently reason	Protective measure	Error clear
safety circuit error		Emergency brake to ban system running	It will auto cleared when signal conditions meets requiremtns
decelerate or limit switch error	Up force decelerating or up limit broken, down force decelerating or down limit broken	Fast run not allowed; when both up limit and down limit are good, slow run still ok	It will auto cleared when signal conditions meets requiremtns
inverter error	Inverter output an error signal to main board	Emergency brake to ban system running	It will auto cleared when signal conditions meets requiremtns
main contactor error	Lift stops but main contactor not released	To ban system running	Switch off power or have an emergency brake
brake error	Lift stops but brake contactor not released	To ban system running	Switch off power or have an emergency brake
door lock error	Door already open (open limit signal act) but door lock	To ban system running	

	not broken		
input definition error	Repeated input port defination	To ban system running	
Run time out	Lift not shift floor out of allowed run time	Fast run not allowed, auto door zone searching not allowed; slow run is ok	To power off system then powered on
EEPROM error	Used for permanently saving parameter and run data saving unit damaged	To ban system running	
encoder error (common encoder)	No or too less pulse signal in fast run (should not less than 5 pulse per 0.1 second at rated speed)	Fast run not allowed; auto searching door zone is ok; slow run is ok	To check hardware, reasonably setting pulse frequency-divided coefficient
encoder error (absolute value encoder)	No data signal; absolute location is lower than bottom door zone 10 circles or higher than top door zone 10 circles	Fast run is not allowed; auto searching door zone is not allowed; slow run is ok; no door open/close under auto run	Please check hardware for no data signal; if hardware checked well, please self-learned bottom door zone position and switch off the power
Main output interrupt	Generally because inverter protection during run leads to run stop. Inverter released main output, but inverter not output “inverter error” signals to main board	Emergency brake	Auto cleared after run stops
Brake interrupt	Generally because inverter protection during run leads to run stop. Inverter released main output, but inverter not output “inverter	Emergency brake	Auto cleared after run stops

	error" signals to main board		
Brake checking errors	Brake contactor acts, but brake checking switch not act; or brake contactor not act but brake checking switch act. In one word, the 2 acts not consistent. If you not defined "brake checking" input, there will no the error	Emergency brake, to ban system running	Auto clear when conditions meets requirements
Limit switch interrupt	Up run touched up limit, down run touched down limit	Emergency brake	Auto clear after run stops
Door open during run	Door lock, door open limit and door close limit 3 signals not meets requirement of door well closed during run, system regard door not closed well	Emergency brake	Auto clear after run stops
Self-learning successful	When self-learning finished, system will permanently record car guild trail data. System with absolute value encoder have no prompt	Emergency brake	Auto clear after run stops
Wrong floor	Not very good of door zone signal, which lead main board received wrong door zone signal. serious interference especially in low speed run (such as in decelerating)	Auto slow run to 2-end station to verify floor after lift stopped	Auto clear after floor verification finished

Door jam	Door open/close repeated 3 times, still not worked well	To stop auto open/close door, but manual door open/close is ok	Manually open/close door or auto clear after conditions meets requirements
Back door jam	Back door open/close repeated 3 times, still not worked well	To stop auto open/close door, but manual door open/close is ok	Manually open/close door or auto clear after conditions meets requirements
Car call communication error	Communication between car call controller and main board bad or no communication	Self-learning not allowed in system with absolute value encoder	Auto clear after communication in good working
Self-learning needed (common encoder)	Not have self-learning to car guide rail; although system already have successful self-learning, system detect up/down force decelerating switch wrongly installed by car guide rail position record. System with Emerson inverter have no prompt	Fast run not allowed	
Self-learning needed (common encoder)	Have no self-learning of car guide rail at all	Fast run & auto door zone searching not allowed; no open/close door action under auto run status	
Landing call communication error	Bad or no communication between landing call board and main board		Auto clear after communication in good working

Elevator adjustment and maintenance

Operation Instruction

Technicians in elevator design, installation, commissioning, maintenance and technical support related with the product should carefully study this instruction, and please appropriately retain it for future reference.

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July, 2013