VVVF Door Drive
User Manual

Model: BG101-S20P4A

Edition: 2017.A0

Content

1. Statement

BG101 series elevator door drives are high performance control drives used for elevator door. Before operation, read this m a n u a l carefully to ensure correct operation and make full use of this drive's perfect functions. This manual is delivered as an accessory of the drive. Be sure to keep it properly after using. This manual is subject to changes without notification.

2. Safety Information

2.1. Safety cautions

● Handling with care, otherwise there's the risk of damage to the equipment
● To prevent the screws, washers and other metal objects from falling into the drive. Otherwise, damage or fire may occur.
● Make sure correct Earthling as the standard specification. Otherwise, there is risk of electric shock.
● If cable end has bare metal, it must be wrapped with insulating tape. Otherwise, an accident may occur.
● Please confirm whether input voltage supply accords with the drive's rated voltage level. Otherwise, it will cause damage to the drive.
● After power on, do not touch any input and output terminals of the drive. Otherwise, electric shock may occur.
● Do not insert or pull out any connectors before power off.
● During running, non-professional personnel do not detect the signal. Otherwise, it may cause personal injury or equipment damage.
● Do not repair and maintain equipment when it's power on.
● If replacing the drive, parameters must be re-set.

2.2. Scrap disposing

When scrapping the drive, please note:
● Electrolytic capacitors on main circuit and electrolytic capacitors on the PCB may explode in fire.
● The device will produce toxic gases when incinerated. Please

treat it as industrial waste.

3. Product Information

3.1. Applicable scope

● The drive can be adapted to BST asynchronous motor
● Use beyond the rated voltage values
If the input supply voltage is not within permitted voltage range as manual required, it is likely to cause drive damage. Therefore, use the pressure regulating device to process the input power.
● Protection class IP20
Elevator door drive BG101 protection class is IP20, even reach IP21 if mounting plate is installed.
● Derating use
At area where the altitude is over 1000 meters, the thin air causes deterioration of drive cooling, please use it by derating.
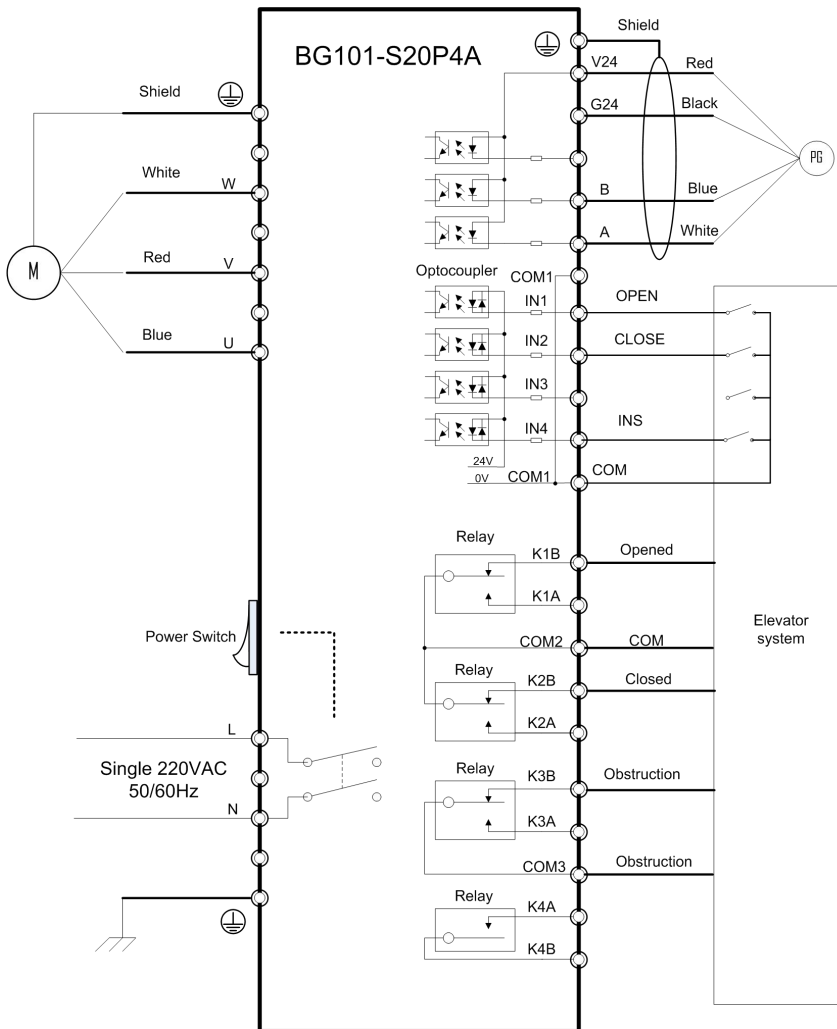
3.2. Technical specifications

Project	Sub-project	Description
Input Power	Rated voltage	Single-phase AC180V ~AC264V
	Rated frequency	50 Hz±5%,60Hz±5%
Motor	Motor type	Asynchronous motor Rated Power：100W Rated voltage：220V Rated current：1.08A IP protection：IP20
Signal input	Open door signal input	1. Optocoupler isolated inputs; 2. Through the jumper settings, external power supply can be used; External power supply: Common Positive or Common Negative is optional. Rated load DC24V (50mA max), no more than 50mA Internal power supply: common emitter and common±10% collector are optional mode.
	Close door signal input	
	Nudging signal input	
	Reserved input	
Signal output	Open limit signal output	1. Contact max. Capacity: AC250V/2A, DC30V/1A; inductive load require derating.

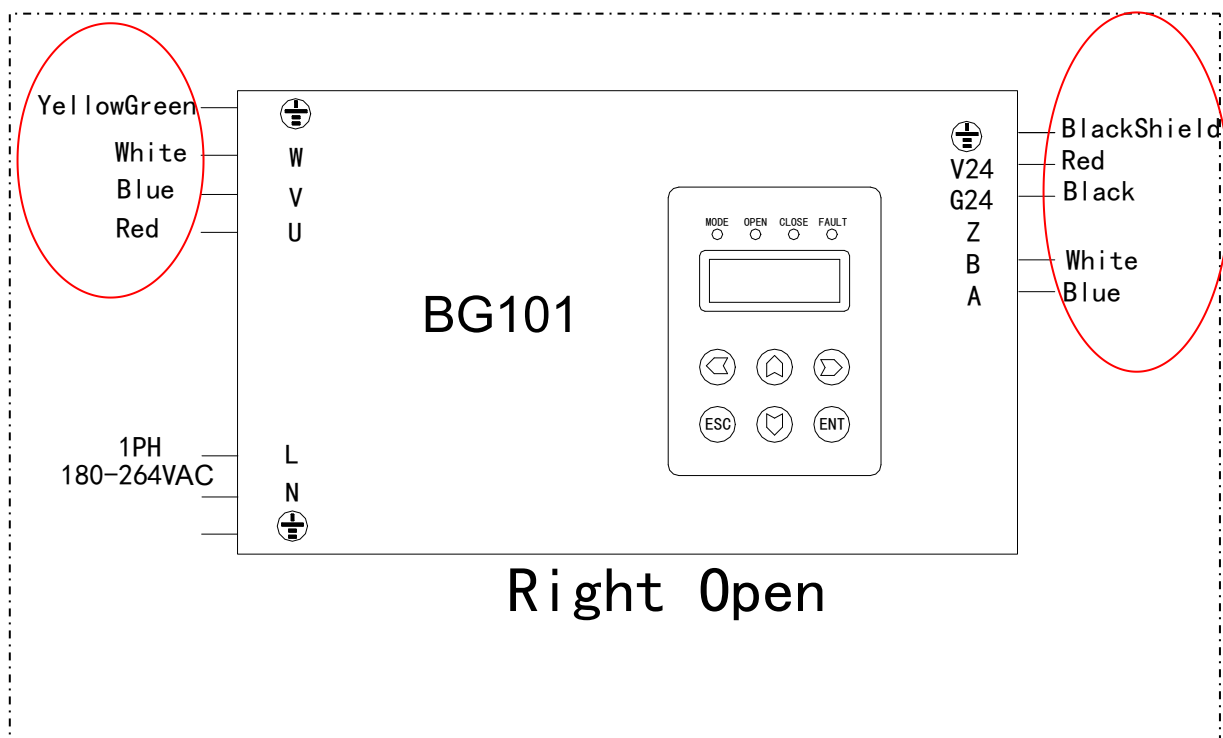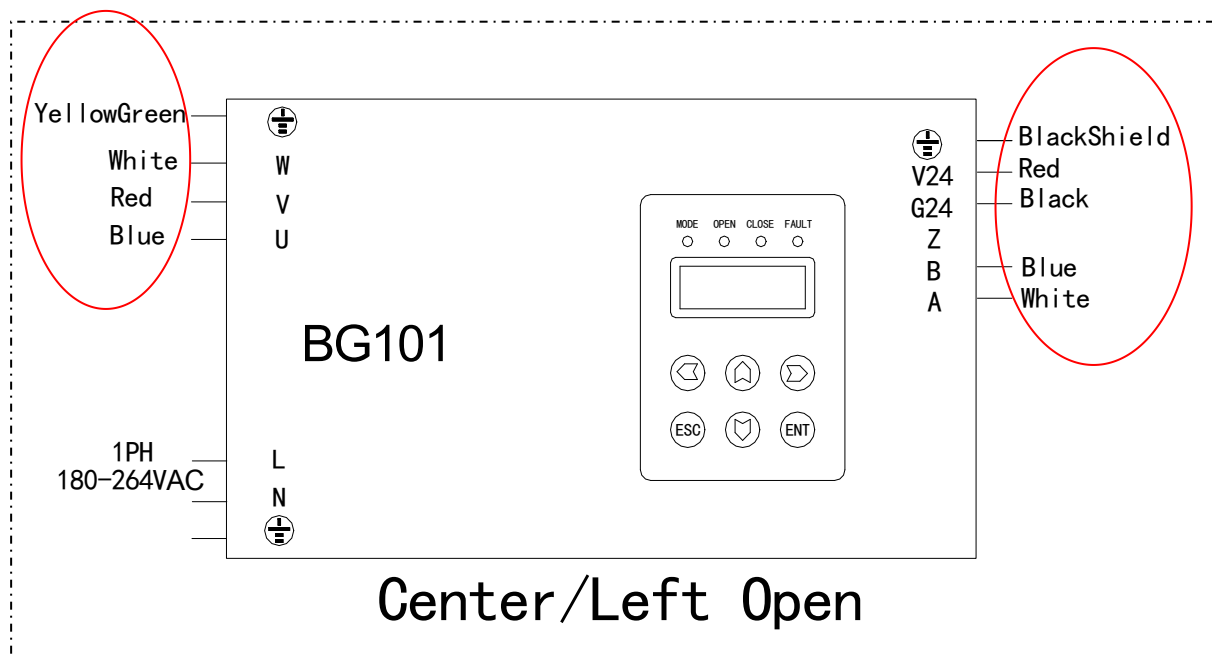|		
	Close limit signal output	2. Open limit signal and Close limit signal use a common terminal(normal open and normal close are optional);
	Obstruction signal output	3. Normal Open or Normal Close are optional for Obstruction signal
	Fault signal output	4. Relay normal open contact for fault signal default.
Encoder interface	Encoder type	Hall-ABZ encoder
Debugger	Embedded (Standard)	Simple debug function
Status LED	MODE	Four LEDs lying in the debugger panel show the drive status. MODE: When the light is on, it shows that the motor is running. When the light is off, it shows that the motor is not at work. OPEN: When the light is on, it shows that the motor is running in opening direction. CLOSE: When the light is on, it shows that the motor is running in closing direction. FAULT: When the light is twinkling, it means Fault happens
	OPEN	
	CLOSE	
	FAULT	
Communication interface	RS485	Reserved
Control ability	Control algorithm	Open loop V/F
	Frequency resolution	Digital setting:0.01Hz
	Torque Compensation	Yes
	Operating mode	IO mode, Panel mode, MODBUS mode(reserved), CAN mode(reserved), demonstrating mode,
	Fault reset	some automatically reset, some can't reset until power off
	Door width self-learning	Yes
fault		Over-voltage protection, under-voltage protection, over temperature protection, overload protection, over-torque error, Door-width self-learning fault, lack of phase protection, EEPROM read and write error alarm, ADC detection error, ADC offset error, belt slip error , encoder fault alarm, communication error alarm, temperature sensor failure, the DC bus voltage detection errors, SPM module fault, obstruction fault, open door fault, close door fault.
Environment	Application	Free from direct sunlight,

requirement	environment	no dust, corrosive gas, flammable gas, oil mist, etc.
	Altitude	Less than 1000 meters (derating is required above 1000 meters)
	Operating temperature	-10 ~ +50 (derating is required when temperature below -10 or above +40)
	Humidity	<90% RH, No condensation, no freezing
	Vibration	<5.9m/s2(0.6g)
	Storage temperature	-40~+70
	Protection	IP21 (with the mounting plate); when special needs, require additional protective measures.
	Cooling	Natural air cooling

4. System Debug

4.1. Wiring illustration

Note: INS is a custom function interface for TKE.

Center/Left Open

YellowGreen — ⏚
White — W
Red — V
Blue — U

BG101

MODE OPEN CLOSE FAULT

◁ △ ▷
ESC ▽ ENT

BlackShield — ⏚
Red — V24
Black — G24
Z
Blue — B
White — A

1PH
180–264VAC
L
N
⏚

Right Open

YellowGreen — ⏚
White — W
Blue — V
Red — U

BG101

MODE OPEN CLOSE FAULT

◁ △ ▷
ESC ▽ ENT

BlackShield — ⏚
Red — V24
Black — G24
Z
White — B
Blue — A

1PH
180–264VAC
L
N
⏚

⚠ After completing wiring, be sure to check:

● Whether wiring is correct and accords to wiring diagram. Whether connectors are in the proper position.

- Whether bare wire of the terminals contact with other terminals.

4.2. Panel Debugger

4.2.1. Outline drawing

Outline drawing of panel debugger is shown as below. It consists of four status lights, a five-digit red seven-segment display, and six keys. Four status lights are mode indicator (run indicator), door opening indicator, door closing indicator, fault indicator. A five-digit seven-segment display is used for displaying debugging information. Key board consists of four direction keys, a cancel key and a confirm key.
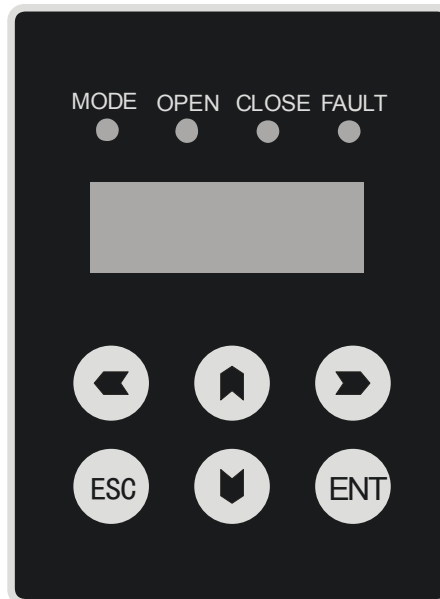

By using this panel debugger, the following functions can be realized:
- Real-time browse the status parameter (group P00), browse or revise system parameters (group P01-P09)
- Password login and parameters modification: after lodging by correct password, the user, can browse or revise system parameters, browse fault history record and revise password Initial Password: 1234
- Real-time display of fault information: if sudden fault occurs, the information will be displayed in real-time which can be ignored by pressing cancel key.
- When P01.00=1, Press "Left key" to open the door, release the key to stop opening; Press "right key" to close the door, release the key to stop closing.

4.2.2. Display Function

The panel has several display interfaces including software version , status function code, status parameter, password login, system function code, system parameter, revision, real-time warning of sudden fault.
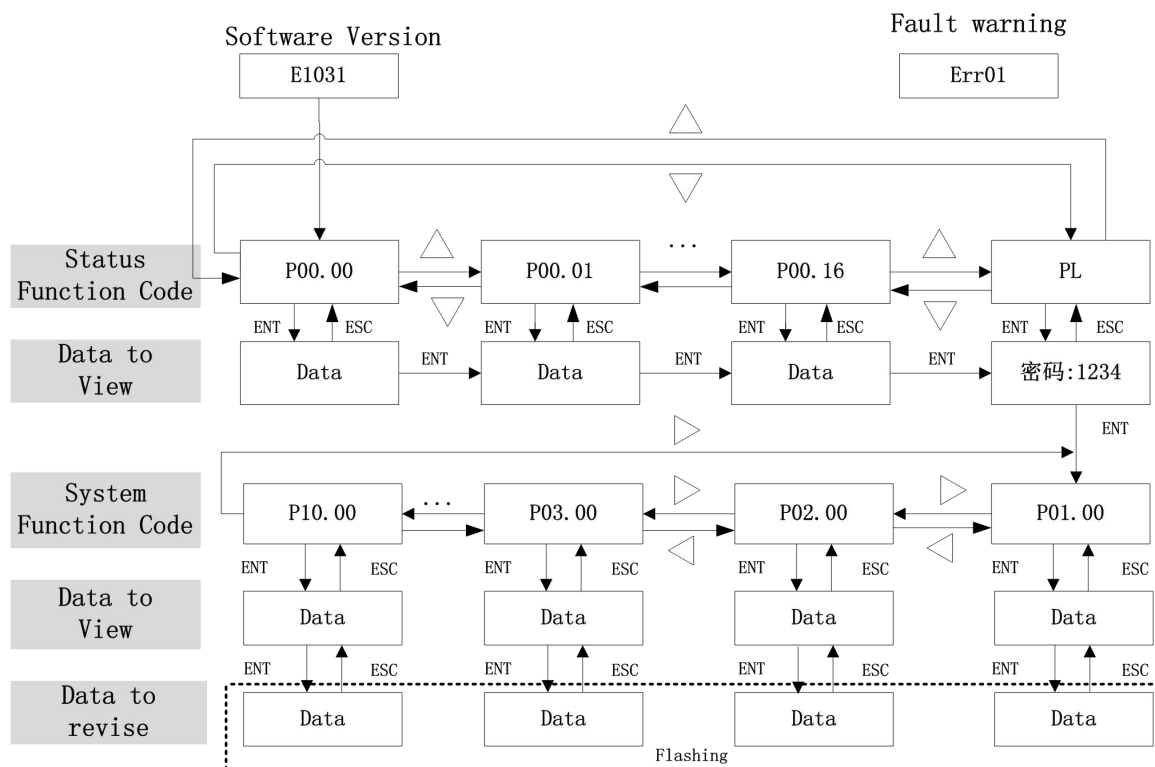
Display introduction:

	Display	Display Description
Software version	E12 10	EOP software version number: E1042, meaning: 10 years 42weeks
Status Function Code	P00.01	Status function code P00.01 interface
Status Parameters	4.98	Parameters value corresponding to status function code P00.01

Password Login		PL	Password login interface; Refer to5.14 for password login
System Function Code		P01.00	System function code P01.00 interface
System parameter		1	Parameter value corresponding to system function code P01.00
Data input		1234	Data input (when perform functions as password login or parameter revision)
fault warning		Err08	fault warning (to ignore fault code display by cancel key); it will be saved in P10 function group
IO status	Input status	1.234	Four inputs indicate: 1. Open input 2. Close input 3. Nudging input 4. Reserved input If the decimal point in the right bottom illumines, the signal input are valid(Opening signal is valid in this example)
	Output status	12.34	Four outputs indicates: 1. Open limit signal output 2. Close limit signal output 3. Blocked signal output 4. fault signal output If the decimal point in the right bottom illumines, the signal output are correspondingly valid (close limit signal is valid in this example)

4.2.3. Key functions

Functions of keys are as below：

◀	Left key	"Panel mode" (P01.00=1), in status function code interface, constantly press left key to open the door, and release the button, to stop opening. Inverter mode (P01.00=5), in status function code interface, press once left key to make motor running, press it once again, motor shall stop. In the interface "password login", left key realizes the left shift of position of password value modified. In the interface "system function code", left key enables the switching of system function code group. In the interface "parameters modification", left key realizes the left shift of position of parameters value modified.
▶	Right key	"Panel mode" (P01.00), in status function code interface, constantly press right key to open the door, and release the button, door will stop closing. In the interface "password login", right key realizes the function of right shift of password change In the interface "system function code", right key enables the switching of system code group. In the interface "parameters modification", right key enables the right shift of position of parameters value modification.
▲	Up key	In status function code interface, press upward key to progressively increase status function code, In the interface "password login", upward key realizes the function of increasing of password change In the interface "system function code", upward key enables the increasing of system function code In the interface "parameters modification", upward key enables the increasing of revision value.
▼	Down key	In status function code interface, press downward key to progressively decrease status function code, In the interface "password login", downward key realizes the negative cycle of value In the interface "system function code", downward key enables the decreasing of system function code In the interface "parameters modification", downward key enables the decreasing of revision value.

	Confirm key	In the interface "status function code", press confirm key to enter the interface "status parameters"
		In the interface "status function code", press confirm key to enter the interface "status parameters" which is corresponding to next interface "status function code"
		In the interface "password login", press confirm key to enter the interface of "password input"
		In the interface "password input", press confirm key to enter the interface of "system function code" (if password is correct.)
		In the interface "system function code", press confirm key to enter the interface of "system parameters"
		In the interface "system parameters", press confirm key to enter the interface of "parameters modification"
		In the interface "parameters modification", press confirm key to complete modification and enter next interface of "system function code"
	Cancel key	In the interface "parameters modification", press cancel key to exit, and enter the interface of "system parameters"
		In the interface "system parameters", press cancel key to exit, and enter the interface of "system function code"
		In the interface "system function code", press cancel key to exit, and enter the interface of "status function code"
		In the interface "password login", press cancel key to exit, and enter the interface of P0.00 of "status function code"

4.2.4. Operation illustration

1) Status parameters browsing（P00.03 = ?）:
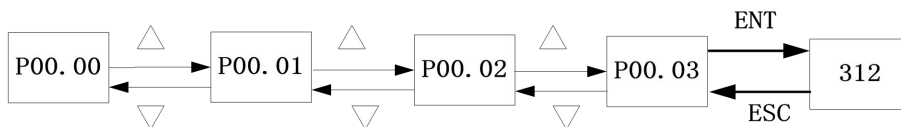
2) Password login：(Default password 1234，and it can be revised via P09.13; Never forget it if you'll have altered it)

P00.00
▽
PL
ESC   ENT
0   ENT

ESC   ESC   ESC   ESC
0 △ 4 ◁ 04 △ 34

Flashing
P01.00   ENT   1234 △ 0234 ◁ 234 △ 034 ◁ ESC

ESC   ESC   ESC   ESC
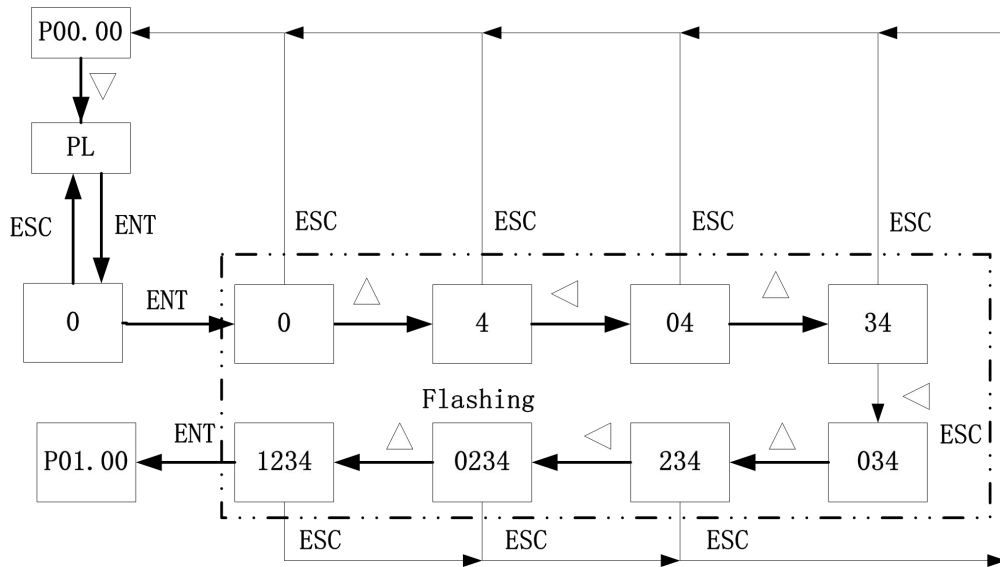
3) Change P01.00 parameter value from 0 to 1:

△
P01.00   ENT   0   ENT   0   △   1   ENT   P01.01
ESC   ESC Flashing Flashing
ESC
▽

4.3. Debugging steps

```
┌────────────────────────────────────┐
        Ready
└────────────────────────────────────┘
               │
               ▼
┌────────────────────────────────────┐
│   STEP1: Confirm the wiring        │
└────────────────────────────────────┘
               │
               ▼
┌────────────────────────────────────┐
│   STEP2: Confirm the parameter     │
└────────────────────────────────────┘
               │
               ▼
┌────────────────────────────────────┐
│   STEP3: Door width self-study     │
└────────────────────────────────────┘
               │
               ▼
┌────────────────────────────────────┐
│   STEP4: Normal operation set      │
└────────────────────────────────────┘
               │
               ▼
┌────────────────────────────────────┐
│   STEP5: Improve                   │
└────────────────────────────────────┘
```
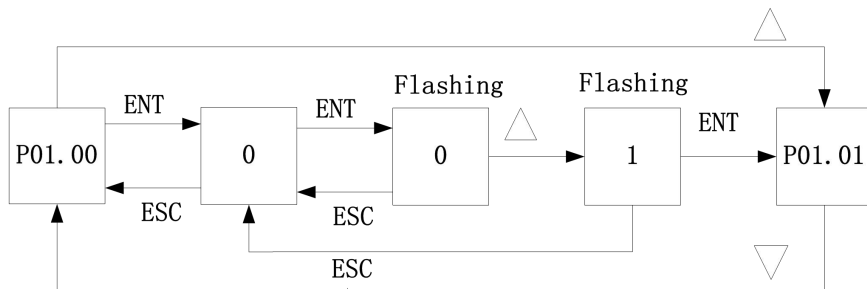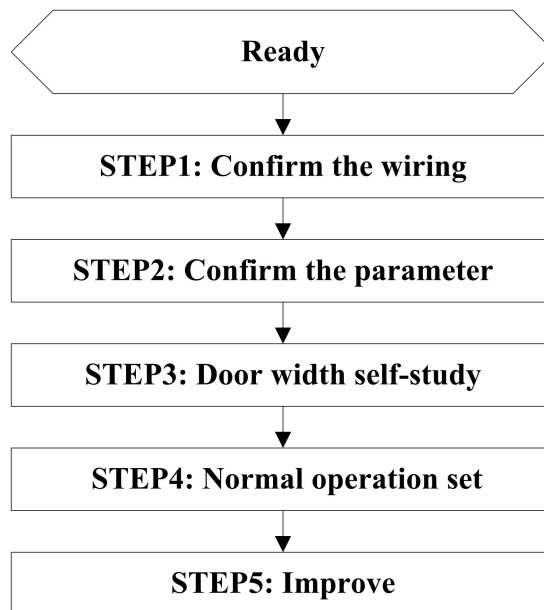
Step 1: Confirm the wiring is correct and reliable, the cable sequence of motor and encoder
You can confirm the cable sequence of motor and encoder by the following way:
Set BG101 as panel control mode (that's, P01.00=1), in the interface of P00.00, then

press ◖◗ to perform door opening action, and press ◖◗ to perform closing action.

◆ If the actual moving direction of the door is opposite to the above action, then
   swap any of the two cables of the motor (that's, two of U/V/W).
◆ If the panel indicating light (OPEN/CLOSE) is opposite to the actual moving
   direction, then swap cable A and B of encoder.

Step 2: Confirm the motor parameter
The parameter P02.00 must be checked to confirm the amount of motors in use before
debugging (Single asynchronous motor: P02.00=0; dual asynchronous motor:
P02.00=1);

Step 3: Door width self-study
    Set P01.00 =1 and then set P03.02=1, the door will start self-study.   The
'MODE' light is on; Close the door first, then open the door, and then close the door
again. When 'MODE' light is off, self-study completes. Check door width data
through P03.03&P03.04. If self-study failed, BG101 will send an alarm signal

(Err07), check and restudy are required.

Notes: When self-study completed, BG101 will record door width data automatically.

Step4: Normal operation

◆ Set parameter: P01.00 = 0

◆ Connect open signal & close signal cable, open limit & close limit signal cable(if need), obstruction signal and fault signal cable(if need)

Notes: In panel mode (P01.00=1), external open/close signal is invalid. After finishing the debug in panel mode (P01.00 = 1), P01.00 must be changed to 0.

Repower on, when opening signal or closing signal is valid, the door will move slowly, only when the door confirms its door width, the door system then operates normally.

Step 5: Improve operation performance

Improve door operating performance by fine tuning below parameters:

◆ **Door close speed**

Door close speed is mainly affected by P05.09 (door close high speed), the door close time will be reduced by increasing P05.09 parameter value. If door impact happens, reduce P05.10 (door close low speed), and increase P05.11 (door close deceleration distance); If door stake set does not close completely, or weak in closing, then increase P05.13 (close creeping distance) and P05.14 (close creeping speed); If the creeping distance is too long or landing door can not close completely, reduce P05.11 (door close deceleration point distance).

◆ **Door open speed**

Door open speed is mainly affected by P04.09 (Door open high speed), increase P04.09, door open time will be reduced;

If creeping distance is too long, reduce P04.11 (door open deceleration point distance); If vibration occurs before completing door open, increase P04.11(door open deceleration point distance) ; meanwhile relevantly adjust P04.10 (Door open end low speed); If door skate impact happens during door opening, then increase P04.00 (Door open start distance).

◆ **Torque adjustment**

Revise P06.01 (door open maintenance torque) and P06.06 (door close maintenance torque) to achieve door open limit and door close limit maintenance torque. When abnormal impact of door occurs, reduce maintenance torque of door open or door close. If door cannot completely open or close, increase maintenance torque of door open or close; Revise P04.13 (door open limit point distance), P05.12 (Door close limit point distance) to change door open limit and door close limit relay output;

Notes: When the parameters are in disorder, please set P01.14 = 21, and then all parameters are reset to defaults (except for door width data p03.03/p03.04).

5. Parameters

5.1. Parameters Group

"●"：Means the parameter shall not be changed regardless of the motor is running or not.

"★"：Means the parameter can be changed regardless of the motor is running or not.

"☆"：Means the parameter shall only be changed during the motor stops.

	Function code	Description	Setting Range	Unit	Factory Setting	Property
P00 Status Parameter	P00.00	Feedback speed	——	0.01Hz	——	●
	P00.01	Reference speed	——	0.01Hz	——	●
	P00.02	Speed deviation	——	0.01Hz	——	●
	P00.03	DC bus voltage	——	1V	——	●
	P00.04	Output Current	——	0.01A	——	●
	P00.05	Door width low bit	——	——	——	●
	P00.06	Door width high bit	——	——	——	●
	P00.07	Door position low bit	——	——	——	●
	P00.08	Door position high bit	——	——	——	●
	P00.09	Output voltage	——	1V	——	●
	P00.10	Input signal state	——	——	——	●
	P00.11	Output signal state	——	——	——	●
	P00.12	Heatsink temperature	——	1℃	——	●
	P00.13	Software version	——	——	——	●
	P00.14	Maximum DC bus voltage	——	1V	——	●
	P00.15	Minimum DC bus voltage	——	1V	——	●
P01 Basic Parameter	P01.00	Operating command selection	0:IO mode 1:Panel mode 2:Modbus mode (reserved) 3:CAN mode (reserved)	1	0	☆

			4:Demo mode			
	P01.03	Low speed operating	1.00~10.00Hz	0.01Hz	6.00Hz	★
	P01.04	Operation direction setting	0:Same as the setting direction 1:Opposite to the setting direction	1	0	☆
	P01.14	Parameters restoration	0:No operation 21:factory settings	1	0	☆
	P01.15	Manual stop	0:No operation 1000:Forced stop 2000:Resume normal	1	0	★
P02 Motor Parameter	P02.00	Motor Number	0:Single induction motor 1:Dual induction motor	1	0	☆
P03 Encoder parameter	P03.00	Encoder pulse number per revolution	0~9999	1	4	☆
	P03.02	Door width self-study enable	1:Enable (under P01.00 = 1)	1	0	☆
	P03.03	Door width low bit	0~9999	1	95	☆
	P03.04	Door width high bit	0~9999 （*10000） Door width = P03.04*10000 + P03.03	1	0	☆
P04 Open Door Parameter (OD)	P04.00	OD Startup distance	0~65535	1	14	★
	P04.01	OD startup ACC time	0.1~20.0s	0.1s	0.2s	★
	P04.02	OD Startup speed	0~15.00Hz	0.01Hz	2.50Hz	★
	P04.03	OD ACC time	0.1~20.0s	0.1s	0.6s	★

	P04.06	OD DEC time	0.1~20.0s	0.1s	0.6s	★
	P04.09	OD High speed	0~P01.02	0.01Hz	15.00Hz	★
	P04.10	Low speed in OD ending phase	0.~15.00Hz	0.01Hz	2.20Hz	★
	P04.11	OD DEC point distance	1~65535	1	33	★
	P04.12	OD limit point distance	1~ P04.11	1	6	★
P05 Close Door Parameter (CD)	P05.00	CD startup distance	0~65535	1	8	★
	P05.01	CD startup ACC time	0.1~20.0s	1.0s	0.1s	★
	P05.02	CD startup speed	0~15.00Hz	0.01Hz	2.50Hz	★
	P05.03	CD ACC time	0.1~20.0s	0.1s	0.6s	★
	P05.06	CD DEC time	0.1~20.0s	0.1s	0.6s	★
	P05.09	CD high speed	0~P01.02	0.01Hz	12.00Hz	★
	P05.10	CD low speed	0~15.00Hz	0.01Hz	1.50Hz	★
	P05.11	CD DEC point distance	1~65535	1	40	★
	P05.12	CD limit point distance	1~ P05.11	1	10	★
	P05.13	CD creeping distance	1~ P05.12	1	10	★
	P05.14	CD creeping speed	0~50.00Hz	0.01Hz	3.00Hz	★
	P05.15	Close creeping DEC point distance	0~P05.13	1	0	★
P06 Auxiliary Parameter	P06.00	OD startup torque	10.0%~100 .0 % (Motor rated torque)	0.1%	60.0%	★
	P06.01	OD holding torque	20.0%~100.0% (Motor rated torque)	0.1%	60.0%	★
	P06.02	Motor maximum torque limit	30.0%~150.0% (Motor rated torque)	0.1%	85.0%	★
	P06.03	OD limit final holding torque	20.0%~100.0% (Motor rated torque)	0.1%	55.0%	★
	P06.04	Time of switching OD holding torque to final holding torque	0.1~60.0s	0.1s	1.0s	★
	P06.05	CD startup torque	10.0%~100.0% (Motor rated torque)	0.1%	60.0%	★
	P06.06	CD holding torque	20.0%~100.0%	0.1%	55.0%	★

			(Motor rated torque)			
	P06.07	Maximum torque for CD	30.0%~150.0% (Motor rated torque)	0.1%	70.0%	★
	P06.08	Creeping distance torque for CD	10.0%~100.0% (Motor rated torque)	0.1%	30.0%	★
	P06.09	Final holding torque for CD limit	20.0%~100.0% (Motor rated torque)	0.1%	30.0%	★
	P06.10	The time of switching CD holding torque to final holding torque	0.1~60.0s	0.1s	1.0s	★
P07 Terminal Setting Parameter	P07.00	IO filter time	1~200ms	1ms	20ms	★
	P07.01	OD limit mode	0: Delay mode 1: Block mode	1	1	★
	P07.02	CD limit selection	0: Delay mode 1: Block mode	1	1	★
	P07.03	OD limit mode 0 delay time to output	0-10.0s	0.1s	0.6s	★
	P07.04	CD limit mode 0 delay time to output	0-10.0s	0.1s	1.0s	★
	P07.05	Operation mode for at Power on	0: Find the right door width and then enter the normal mode 1: Enter the normal mode after a block	1	1	★
	P07.06	Inspection Mode	0: IO CMD and panel CMD are both valid; IO CMD is prior to panel CMD. 1: Panel CMD only is valid.	1	0	★
P08	P08.05	CD Speed deviation	0~10.00Hz	0.01Hz	2.00Hz	★

Performance Parameter		setting				
	P08.07	OD Speed deviation setting	0~10.00Hz	0.01Hz	5.00Hz	★
P09 Enhanced Parameter	P09.00	OD time setting	0-3600s	0.1s	15.0s	★
	P09.01	CD time setting	0-3600s	0.1s	15.0s	★
	P09.02	Obstruction handling	0: follow elevator command 1: automatic anti-open	1	0	★
	P09.04	PRI of OD and CD setting	0: OD prior to CD 1: CD prior to OD	1	0	★
	P09.05	Action setting for Power on	0: no action 1: close when no elevator command	1	0	★
	P09.06	OD limit holding time for Demo mode	0.1~10.0s	0.1s	3.0s	★
	P09.07	CD limit holding time for Demo mode	0.1~10.0s	0.1s	3.0s	★
	P09.13	Login password setting	0~9999	1	1234	★
P10 History Records	P10.00	First Fault code	See note1			●
	P10.01	Second Fault code	See note1			●
	P10.02	Third Fault code	See note1			●
	P10.03	Fourth Fault code	See note1			●
	P10.04	Fifth Fault code	See note1			●
	P10.05	Bus voltage at First fault				●
	P10.06	Output current at First fault				●
	P10.07	Operating frequency at First fault				●
	P10.08	Door position at First fault				●
	P10.09	High operating frequency				●
	P10.10	Low operating				●

		frequency					
	P10.11	DC voltage max value during operation					●
	P10.12	DC voltage min value during operation					●

Note1:

Code	Description	Code	Description
1	Under-voltage	10	Belt slipping error
2	Over-voltage	11	Over torque error
3	Heat-sink overheat	12	Encoder Fault
4	Output phase loss	13	Temperature sensor fault
5	Motor-blocked	14	DC voltage sensor fault
6	EEPROM fault	15	SPM module fault
7	Door-width Self-study fault	16	Drive overload
8	ADC sensor fault	17	OD timeout
9	ADC bias error	18	CD timeout

5.2. Parameters description

P01 Basic parameters

P01.00　Operating command selection, Range：

0：IO mode: when drive works at this mode, it will receive operating order from elevator system, such as OD, CD, and LCD to drive the door. The logic is as follows;

OD	CD	LCD	Slowly Close Door
✕	✕	1	LCD
1	✕	0	OD
0	1	0	CD
0	0	0	Halt (not in the holding area)

1: Panel mode. Users can debug the controller. Enter P01.00 and set the parameter as 1, exit

to status code display interface P00.00.　Press " ⊙ " button to CD, and press " ⊙ " to OD,

release the button to stop the operation.

2: Modbus mode. Reserved.

3: CAN mode. Reserved.

4: Demo mode. Set this mode to make the door operate automatically.

Note: it's better to restart BG101 when this parameter is changed.

P01.03 Low-speed operation setting

Setting range: 1.00~10.00Hz

This function code sets the speed of low-speed operation. When conducting slow OD, slow CD, startup and other abnormalities, the door will operate at the setting speed. The drive will run at a low speed when it receives order from elevator system until it reaches the close limit or open limit, if the actual door width got is the same as that auto-learned,   then it will conduct normal OD or CD.

Note: Under the condition that the operation time of OD and CD is right to the elevator system, the value shall be as little as possible to avoid crashing during the low-speed operation

P01.04 Operation direction selection

Setting range: 0: the same as the present direction 1: reverse as the present direction.

Motor's running direction can be changed by setting the parameter. When motor is wired, change the setting to change the operation direction without rewiring the motor.

Note: it's better to rewire the motor than to change this parameter.

P01.14 Parameter restoration

Setting range: 0: No operation

21: Factory setting

Parameters P01.00~P09.12 is reset to factory values except for door width parameters P03.03/P03.04.

P02 Motor parameters

P02.00 Motor type selection

Setting range:

0: One AC induction motor

1: Two AC induction motors

Note: When P02.00 is changed, please restart BG101 and adjust current limit value in P06 group.

P03 Encoder parameters

P03.00 Encoder pulse number per revolution

Setting range: 4

The parameter is the encoder output pulse number when motor runs one revolution. The drive can not work normally if this parameter is set wrongly.

Note: do not revise this parameter.

P03.01 Speed of door width auto-learning

Setting range: 1.00~15.00Hz

The speed of door width auto-learning shall not be set too fast, in order to avoid clashing.

P03.02 Door width auto-learning enabling

Setting range: 0~1

When P01.00 set as 1, set P03.02 as 1, door width auto-learning will be carried out at P03.01. 'MODE' light is on, Close the door, open the door, and then close the door. When 'MODE' light is off, door width auto-learning completes. Check door width data via P03.03 and P03.04.

Note:

1) Please confirm pulse number (P03.00=4) before auto-learning

2) Before auto-learning, please confirm whether motor running direction and control direction are the same. If not, change any two wires of motor to change the direction.

3) Before auto-learning, please confirm the encoder's wiring. Otherwise error will occur (for example, Err07).

P03.03 The low bit of door width

Setting range: 0~9999

This parameter shows the door width low bit auto-learned. This parameter can be revised directly without auto-learning as it's known.
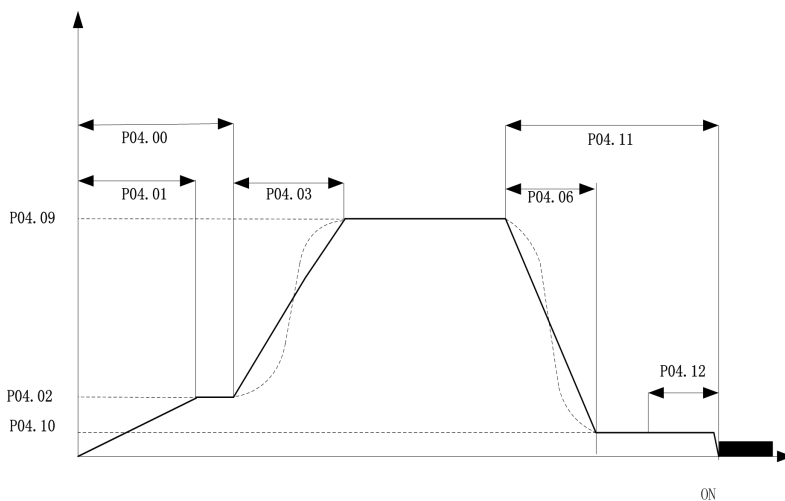
P03.04 The high bit of door width

Setting range: 0~9999

This parameter shows the low bit of door width after self-learned. This parameter can be revised directly without auto-learning as it's known.

Door width = P03.04 * 10000 + P03.03

P04 OD parameters

Door opening procedure:

1) When door opening command is active, door operator opens skate set at door opening start speed (P04.02), and accelerating time is P04.01

2) When door operator detects present door position is over than door opening start distance (P04.00) , operator accelerates speed to high level (P04.09) after time P04.03, and then open at constant speed.

3) When door operator detects present door position is over than door opening decelerating point (P04.11), operator decelerates speed to door opening completing low speed (P04.10) after time P04.06. After having completed decelerating, Door runs at speed P04.10. When door arrives at opening limited position (P04.12) and the motor is blocked. The drive will enter the opening

torque holding status and keep at P06.01. After P06.04, door will be opened completely, and then shift to opening final holding torque status.

P04.00 Door opening start distance

Setting range: 0~65535

Set the active range of start speed

P04.01 Door opening start accelerating time

Setting range: 0.1~20.0s

Set time for accelerating speed from 0 to door opening start speed

P04.02 Door opening start speed

Setting range: 0~15.00Hz

Set frequency of starting low speed running for opening

P04.03 Door opening accelerating time

Setting range: 0.1~20.0s

Set time for door opening from starting low speed to high speed

P04.06 Door opening decelerating time

Setting range: 0.1~20.0s

Set time for decelerating from high speed to door opening completing low speed

P04.09 Door opening high speed

Setting range: 0.00~P01.02

Set frequency of door opening high speed operation

P04.10 Door opening completing low speed

Setting range: 0~15.00Hz

Set frequency of door opening completing low speed operation

P04.11 Door opening decelerating point distance

Setting range: 1~9999

Set door opening decelerating point distance. This set is related to max speed and decelerating time. Suitable value can ensure better door opening
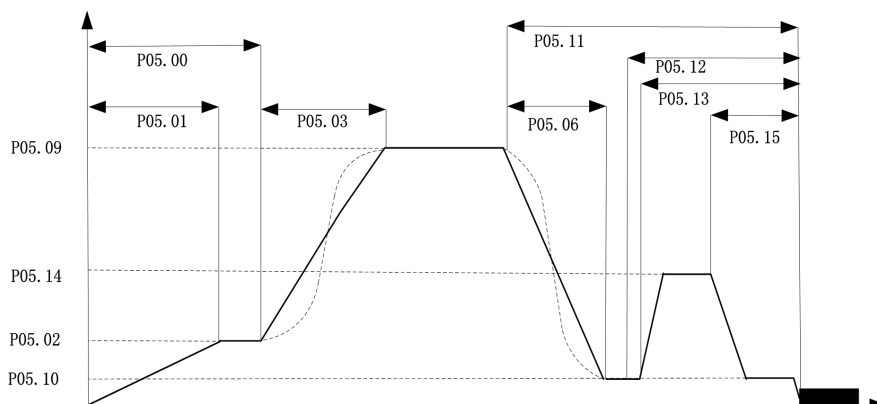
P04.12 Door opening limited position distance

Setting range: 1~65535

Set handle interval of sufficient door opening

P05 CD parameters

Door closing procedure:

1) When door closing command is active, door operator run at door closing start speed (P05.02) and accelerating time is P05.01

2) When door operator detects present door position is over than door closing start distance (P05.00), operator accelerates speed to high level (P05.09) after time P05.03, and then runs at constant speed.

3) When door operator detects present door position is over than door closing decelerating point (P05.11), operator decelerates speed to door closing completing low speed (P05.10) after time P05.06. When arriving at skate set closing position (P05.13), run at constant speed after accelerating to P05.14 at abnormal speed. After arriving at position P05.13, decelerate to P05.10 at abnormal speed. When door arrives at closing limited position (P05.12) and after the motor is blocked, shift to CD holding torque (P06.06). After keeping certain period (P06.10), shift to final holding torque for CD limit (P06.09).

P05.00 Door closing start distance

Setting range: 0~65535

Set the operation range of start speed

P05.01 Door closing start accelerating time

Setting range: 0.1~20.0s

Set time for accelerating speed from 0 to door closing start speed

P05.02 Door closing start speed

Setting range: 0~15.00Hz

Set frequency of starting low speed running

P05.03 Door closing accelerating time

Setting range: 0.1~20.0s

Set time from door closing start low speed to closing high speed

P05.06 Door closing decelerating time

Setting range: 0.1~20.0s

Set time for closing decelerating from high speed to door closing completing low speed

P05.09 High speed in CD

Setting range: 0.00~P01.02

Set frequency of high speed running

P05.10 Low speed in CD ending phase

Setting range: 0~15.00Hz

Set frequency of low speed operation in CD ending phase

P05.11 Door closing decelerating point distance

Setting range: 1~65535

Set door closing decelerating point distance. This set is related to max speed and decelerating time. Suitable setting can ensure better door closing

P05.12 Door closing limited position distance

Setting range: 1~P05.11

Perform relevant processing of sufficient closing

P05.13 Crawl distance of closing skate set

Setting range: 1~P05.12

Define distance between skate set closing position and close limit position

P05.14 Crawl speed of closing skate set

Setting range: 0~50.00Hz

Define max running frequency of skate set closing

P05.15 Decelerating point distance of skate set closing

Setting range: 0~P05.13

Define the decelerating distance of skate set closing. it can reduce skate set closing time together with P05.13/P05.14.

P06 Door opening & closing auxiliary parameters

P06.00 Door opening starting torque

Setting range: 10.0~100.0% (motor rated torque)

Define starting torque at beginning of door opening, to ensure better effects of starting door opening

P06.01 Door opening holding torque

Setting range: 20.0%~100.0% (motor rated torque) Define ending torque of door opening to avoid impact

P06.02 Door opening max. torque limit

Setting range: 30.0%~150.0% (motor rated torque)

Define max. Running torque during door opening procedure

P06.03 Final holding torque at sufficient door opening

Setting range: 20.0%~100.0% (motor rated torque)

To prevent overheat of motor which caused by long time open status of operator. Set this parameter as small as possible, but too small parameter may cause insufficient holding force.

P06.04 Switching time from door opening holding torque to final holding torque

Setting range: 0.1~60.0s

Define the switching time from holding torque to final holding torque

P06.05 Door closing start torque

Setting range: 10.0%~100.0% (motor rated torque)

Define starting torque at beginning of door closing, to ensure better effects of starting door closing

P06.06 Door closing holding torque

Setting range: 20.0%~100.0% (motor rated torque) Define ending torque of door closing to avoid impact

P06.07 Door closing max. torque limit

Setting range: 30.0%~150.0% (motor rated torque)

Define max operation torque during door closing procedure, to avoid clamping persons. Set this parameter as small as possible if it would not affect normal closing

P06.08 Skate set closing decelerating distance torque

Setting range: 10.0%~100.0% (motor rated torque)

To prevent impact caused by too fast speed of skate set closing. Set this parameter as small as possible if it would not affect normal closing

P06.09 Final holding torque at sufficient door closing

Setting range: 20.0%~100.0% (motor rated torque)

To prevent overheat of motor which caused by long time close status of operator.

P06.10 Switch time from door closing holding torque to final holding torque

Setting range: 0.1~60.0s

Define the switching time from holding torque to final holding torque

P07 Terminal setting parameters

P07.00 Terminal filtering time

Setting range: 1~200ms

Define valid minimum time of terminal signal, to prevent error action caused by interruption

P07.01 OD limit selection

Setting range: 0~1

0: mode 0

During door opening, drive pulse counter reaches set value of opening limit, output door open limit signal after a delay time.

1: mode 1

During door opening, drive pulse counter reaches set value of opening limit and the motor is blocked, then output door open limit signal

P07.02 CD limit selection

Setting range: 0~1

0: mode 0

During door closing, drive pulse counter reaches set value of closing limit, output door close limit signal after a delay time.

1: mode 1

During door closing, drive pulse counter reaches set value of closing limit and the motor is blocked, output door close limit signal

P08 Performance parameters

P08.05 Closing Speed deviation setting

Setting range: 0.70~10.00Hz

Define the closing speed deviation of AC motor to enhance speed precision. If deviation between actual speed and set speed is high, reduce the difference via this value.

P08.07 Opening Speed deviation setting

Setting range: 0.70~10.00Hz

Define the opening speed deviation of AC motor to enhance speed precision. If deviation between actual speed and set speed is high, reduce the difference via this value.

P09 Enhanced parameters

P09.00 Door open time limit

Setting range: 0~3600s

The max door opening time, correctly setting this value can achieve protect of abnormal door operation. Normal running time will not exceed this setting, and when abnormal situation occurs, such as door cannot be opened, running time is over set value, and then door open overtime protect will be triggered

P09.01 Door close time limit

Setting range: 0~3600s

The max door closing time, correctly setting this value can achieve protect of abnormal door running. Normal running time will not exceed this setting, and when abnormal situation occurs, such as door can not be closed, running time is over set value, door close overtime protect will be triggered.

P09.02 Door block handling

Setting range: 0~1

0: Follow the elevator system command. Set this mode and when the motor is blocked, BG101 will continue to run according to the elevator system command

1: Open the door regardless of the elevator system command. When the motor is blocked, BG101 will open the door automatically, and do as the elevator system after open limit. If door close command is coming, BG101 will operate according to P09.03

P09.03 Memory function selection

Setting range: 0~1

0: Invalid. Operate the door normally

1: Valid. Run to the fault position at low speed, if door operator do not meet block, then it will operate the door normally, otherwise, the operator run at low speed.

P09.05 Action setting for Power on

Setting range: 0~1

0: mode 0, perform according to the elevator system after power on

1: mode 1, if no command from the elevator system after power on, BG101 will close the

door; if there are commands from the elevator system, then it will operate according to the command.

P09.13 Set login password

Login password can be revised. the default password is 1234

Attention: make sure keep the password in mind.

6. Troubleshooting

Code	Name	Possible reason	Solution
Err01	Under-voltage	1) power off 2) abnormal power supply	check power supply voltage
Err02	Over-voltage	1) abnormal power supply 2) Sensing circuit is abnormal	1) check power supply voltag 2) seek for service
Err03	Heat-sink overheat	1) temperature is too high 2) load is too high	1)check working environment 2)check door operation smoothly
Err04	lack of phase	1) wrongly wiring of motor 2) load is serious imbalance	1)check wiring of U/V/W of motor 2) check if motor is well 3) seek for service
Err05	motor block	1)Door blocked 2)unreasonable parameter setting	1) check door 2) check parameter
Err06	E2 PROM	EEPROM R/W fault	seek for service
Err07	auto-learning fault	1)error wiring of motor 2)encoder fault	1)check wiring 2)check encoder
Err08	AD fault	main board abnormal	seek for service
Err09	AD offset fault	main board abnormal	seek for service
Err10	belt slipped fault	1) belt broken 2) door width learning 3) belt seriously loosen	1)check belt condition 2)check door width and real condition 3)check belt condition
Err11	over torque	1) Motor or door is blocked 2)Torque are set too little	1)self-recovery 2)check torque parameters
Err12	encoder fault	1)encoder wiring problem 2)encoder invalid	1)check encoder wiring 2)change encoder
Err13	temperature fault	short circuit or open circuit	check temperature sensor
Err14	DC voltage sensing abnormal	Short circuit or open circuit	seek for service
Err15	IPM fault	1) Over-current 2) IPM damage	1)check motor wiring 2)seek for service
Err16	over load	1) AC voltage is too low 2) Load is too high 3) Encoder problem	1)check AC voltage 2)check door 3)check encoder

Err17	door open timeout	1) Door operator　blocked 2) Encoder problem 3) P09.00 is set too small	1）check door operator 2）check encoder 3）check P09.00
Err18	door close timeout	1) Door operator　blocked 2) Encoder Fault 3) P09.01 is set too small	1）check door operator 2)check encoder 3)check P09.01

7. Maintenance

Lots of factors such as ambient temperature, humidity, acid/alkali substances, dust, and vibration, internal component aging and wearing may raise the chance of the occurrence of potential faults. Therefore, it is quite necessary to conduct daily checking and periodical maintenance to the drive that are operated or stored.

User shall operate drive according to user manual, maintain drive at regular intervals (12 months as general), ensure reliable running of drive. Maintenance includes:

- If heat dissipation of the drive is normal
- Check if terminal wiring has been loosened
- clean dust inside drive at regular intervals
- Check if abnormal matters inside the drive, don't touch PCBA directly inside the drive

Feedback for BG101

BG101 Serial number		**Date**	
Door Type(CO/ LO/RO)		Email	

Problem	□Appearance Damage
	□No Display
	□Door Width self-learning failure
	□Error Report（Error Code: ）
	□Parameters revision failure
	□Door open limit failure □Door close limit failure
	□No DoorOpenlimit signal output □No Doorcloselimit signal output
	□Door Open Failure □Door Close Failure
	□Collision while opening □Collision while closing
description	

Remark (door type above): Stand at the landing floor and face the cabin, when the elevator opens

the door, the moving direction of the panel is just the opening direction of car door.