SJT-ZPC-P1A/B Programmable Safety Circuit Board

(For advanced door opening, releveling safety circuit,

and unintended car movement detection device)

User

Manual

version： V1.1

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1. Introduction

The products described in this manual, the SJT-ZPC-P1A and SJT-ZPC-P1B Programmable Safety Circuit Boards, are complementary products of the Blue Light Elevator Control System. The SJT-ZPC-P1A is designed for synchronous motor applications with single-door configurations, while the SJT-ZPC-P1B is intended for through-door configurations or asynchronous motor applications.

The SJT-ZPC-P1A and SJT-ZPC-P1B Programmable Safety Circuit Boards, in conjunction with the main elevator control board, enable the following functions:

1、 Releveling Function

When the elevator stops within the unlocking zone and the car position deviates from the leveling position due to factors such as rope stretch caused by load changes, the SJT-ZPC-P1A/B Programmable Safety Circuit Board detects the upper and lower releveling door zone signals. It works with the main control board to bridge the door lock circuit. With the landing doors and car doors open, the elevator starts and runs at low speed back to the leveling position, within the speed limits specified by the national standard GB/T 7588-2020.

2、 Advanced Door Function

As the elevator approaches its target floor for deceleration and stopping, the SJT-ZPC-P1A/B Programmable Safety Circuit Board detects the upper and lower releveling door zone signals within the speed limits of GB/T 7588-2020. It cooperates with the main control board to bridge the door lock circuit, allowing the doors to open while the car is moving at low speed within the safe unlocking zone. After stopping is completed and the traction machine brake shut down, holding the car stationary, the door lock bridging is released.

3、 UCMP Detection and Brake Triggering

When the elevator is stopped at a leveling position with both car doors and landing doors open, the SJT-ZPC-P1A/B Programmable Safety Circuit Board detects the upper and lower releveling door zone signals and provides feedback to the main control board. If the car moves unintentionally outside the safe unlocking zone while a door is open, it will trigger the braking subsystem (which may activate an additional brake) to restore and maintain the car in a stationary state.

4、 Door Lock Short-circuit Detection

After the elevator arrives and the doors open, the SJT-ZPC-P1A/B Programmable Safety Circuit Board, in coordination with the main control board, can briefly short the door lock circuit within the safe door zone range. It performs segmented detection of the feedback signal to achieve detection of various types of door lock circuit short-circuits. Upon detecting a door lock short-circuit, the control system reports a fault and stops operation, preventing safety hazards caused by faulty door lock contacts or deliberate short-circuiting of the door lock loop.

2. Specification Definition

2.1 Product Appearance

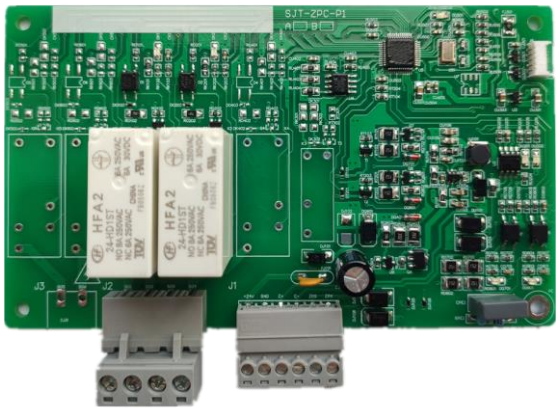

Figure 2.1 the product Appearance of SJT-ZPC-P1A

Figure 2.2 the product Appearance of SJT-ZPC-P1B

2.2 Dimension

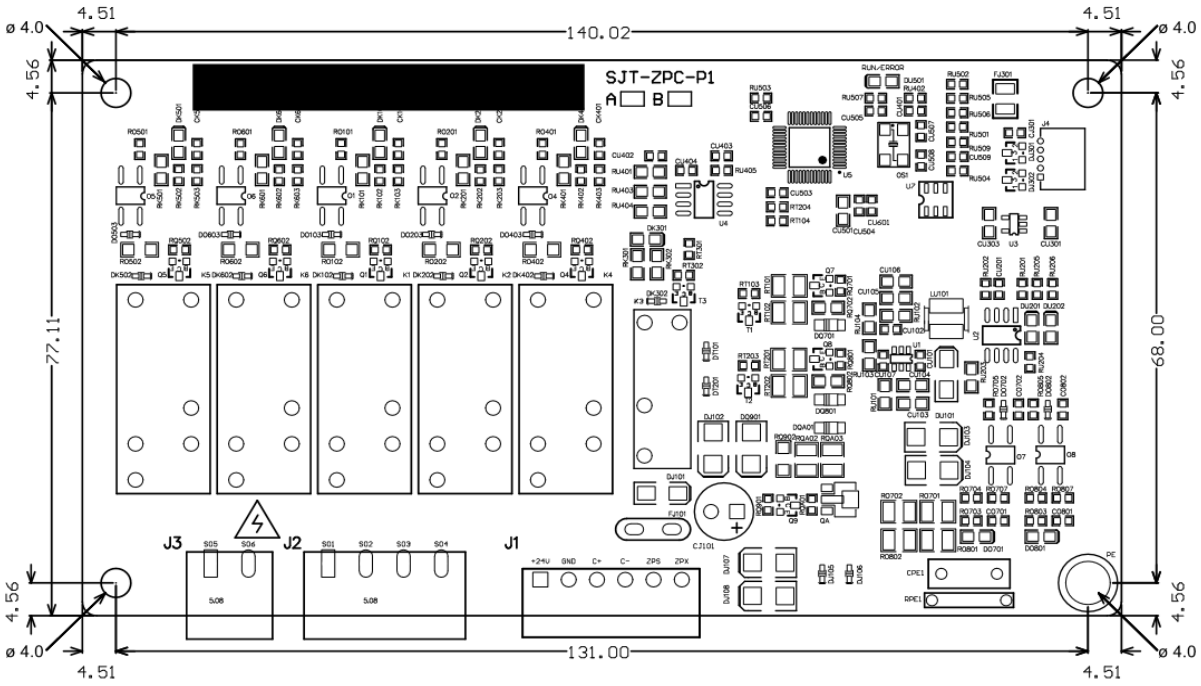

Figure 2.3 Dimension (Unit: mm)

2.3 Terminal Description

Table 2.1 Terminal Description of SJT-ZPC-P1A

Interface			Definition	Function	Remarks
J1	3.81-6P terminal	1	+24V	24V Power Input Terminal	--
		2	GND		--
		3	C+	CAN Communication Terminal	--
		4	C-		--
		5	ZPS	The upper safe door zone signal is input from this terminal	Active Low
		6	ZPX	The lower safe door zone signal is input from this terminal	Active Low
J2	5.08-4P terminal	1	S01	Provides door lock circuit disable signal. Used for the door lock circuit short-circuit output during advanced door opening, releveling, and door lock short-circuit detection.	Used for door lock circuit jumper in single-door configurations
		2	S02		
		3	--	--	--
		4	--	--	--

Table 2.2 Terminal Description of SJT-ZPC-P1B

Interface			Definition	Function	Remarks
J1	3.81-6P terminal	1	+24V	24V Power Input Terminal	--
		2	GND		--
		3	C+	CAN Communication Terminal	--
		4	C-		--
		5	ZPS	The upper safe door zone signal is input from this terminal	Active Low
		6	ZPX	The lower safe door zone signal is input from this terminal	Active Low
J2	5.08-4P terminal	1	S01	Provides door lock circuit disable signal. Used for the door lock circuit short-circuit output during advanced door opening, releveling, and door lock short-circuit detection.	Used for door lock circuit jumper in through-door configurations
		2	S02		--
		3	S03		
		4	S04		
J3	5.08-2P terminal	1	S05	Provides additional brake control signal	Used for the control signal of the additional brake in asynchronous motors
		2	S06		--

Table 2.3 Indicator Description

Name	Meaning	Description
DK101	Relay K1 Activation Feedback Indicator	Lights up when activated
DK201	Relay K2 Activation Feedback Indicator	Lights up when activated
DK301	Relay K3 Activation Indicator (SJT-ZPC-P1A without this indicator)	Lights up when activated
DK401	Relay K4 Activation Feedback Indicator (SJT-ZPC-P1A without this indicator)	Lights up when activated
DK501	Relay K5 Activation Feedback Indicator (SJT-ZPC-P1A without this indicator)	Lights up when activated
DK601	Relay K6 Activation Feedback Indicator (SJT-ZPC-P1A without this indicator)	Lights up when activated
DO701	Lower Safe Door Zone Signal Indicator	Lights up when the door zone signal is low.
DO801	Upper Safe Door Zone Signal Indicator	Lights up when the door zone signal is low.
DU201	CAN Bus TX Indicator	--
DU202	CAN Bus RX Indicator	--
RUN/ERROR	Operation/Error Indicator	Normal operation: Slow flash (1-second interval). Error condition: Fast flash (0.2-second interval).

3. Installation and Settings

3.1 Wiring Diagram

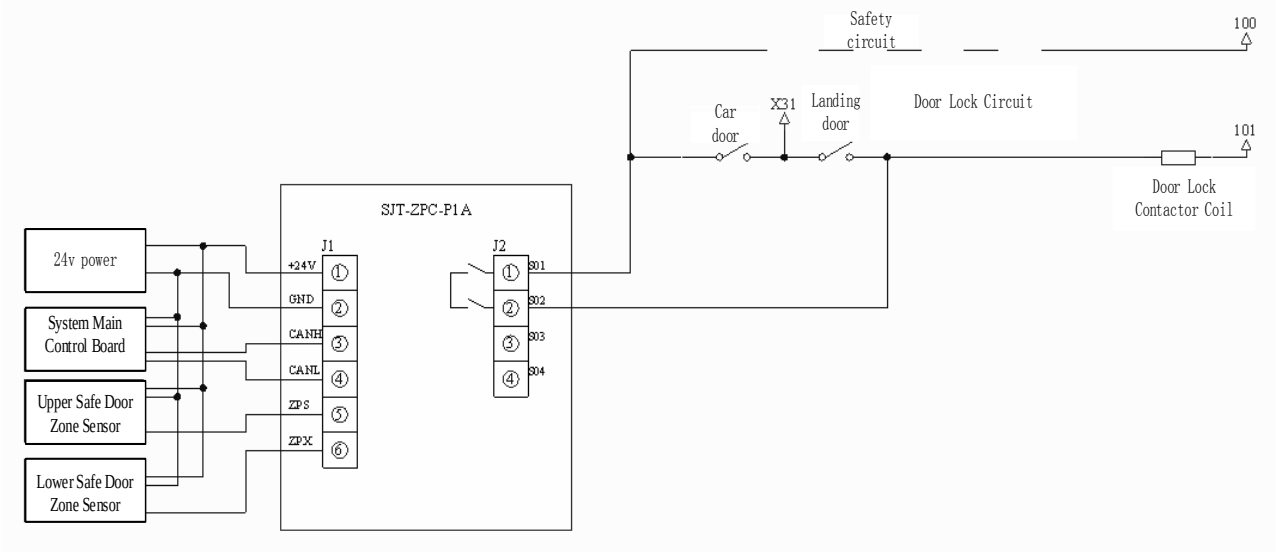

Figure 3.1 The System Wiring Diagram of SJT-ZPC-P1A

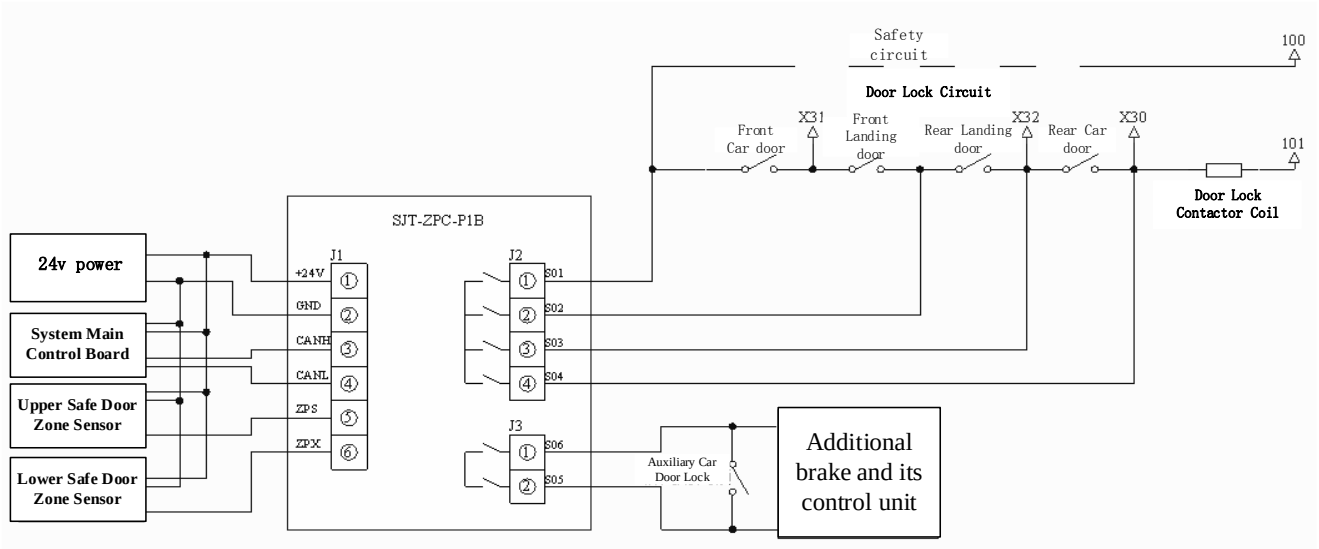

Figure 3.2 The System Wiring Diagram of SJT-ZPC-P1B

3.2 Sensor Installation

When using the advanced door/releveling function, in addition to the upper and lower door zone switches, two releveling door zone switches must be installed. The installation positions of the releveling door zone switches and the door zone switches are shown in Figure 3.3.

- SMQ: Upper door zone switch
- XMQ: Lower door zone switch
- ZPS: Upper releveling door zone switch
- ZPX: Lower releveling door zone switch

All door zone switches must be installed in the correct sequence; Otherwise, the direction of releveling operation will be reversed.

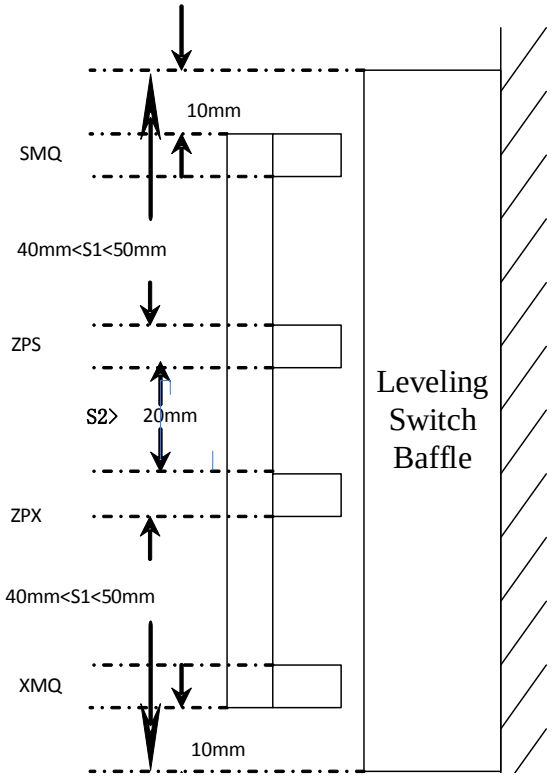

Figure 3.3 The Installation of Door Zone Sensor

Attention：

1. The distance of S1 should be greater than 40 mm and less than 50 mm. If the installation distance of S1 exceeds 50 mm, it may affect the braking distance in the event of unintended car movement.

2. The distance of S2 should be greater than 20 mm to avoid mutual interference between the ZPS and ZPX magnetic induction switches, which could cause false activation.

3.3 Parameter Settings

The control and feedback signals between the Integrated Controller Main Board and the Programmable Safety Circuit Board are transmitted via CAN communication. Compared to traditional safety circuit boards, wiring is more convenient, requiring only two communication cables. Please note that the communication cables must be connected to the main board's CAN1 (J6-5, J6-6).

3.3.1 F4-06 Special Function Selection: Set to enable the advanced door opening/releveling function

Table 3.1 Integrated Controller Function Parameters

Function name	Function Description
F4-06-19	ON：Door Opening Releveling Enable；OFF：No releveling function
F4-06-20	ON：Advanced Door Opening Enable；OFF：No Advanced Door Opening

3.3.2 Operation parameters related to the advanced door opening/releveling function in the F1 group of running parameters

Table 3.2 Integrated Controller Running Parameters

Function name	Function Description
F1-07	**Advanced Door Opening Speed：** The speed at which the elevator opens doors in advance after decelerating into the releveling door zone during normal operation .（Unit：m/s）
F1-08	**Releveling Stop Speed：** If the speed exceeds this limit during advanced door opening or releveling operation, the elevator will be stopped.（Unit：m/s）
F1-09	**Releveling Operating Speed：** Integrated Controller Releveling Operating Speed .（Unit ：m/s）

4. Cautions

4.1 Safety-Related

1. This device is connected to AC 110V voltage. There is a clearly marked high-voltage indicator area on the device. Maintain high vigilance at all times when approaching or operating the device.

2. To avoid safety hazards caused by incorrect installation, the system must be installed, debugged, and maintained by qualified professionals who have received necessary safety and product training and possess relevant experience.

3. The startup or input signals of this device cannot isolate hazardous voltage. Always disconnect the power supply before touching any electrical connections.

4.2 Operating Environment

1. This safety device must be installed inside the elevator's control cabinet. Its operating environment must meet the following conditions:

1） Ambient temperature：-20℃ ~+65℃；

2） Humidity: ≤95% RH, Without condensation；

3） Protection rating (board only): None.

2. During installation, be careful not to subject the PCB to excessive mechanical stress to avoid damage. It should be kept away from conductive materials, corrosive gases, flammable gases, metal dust, oil mist, dust, and similar conditions.

5. Replacement Instructions

The SJT-ZPC-P1A and SJT-ZPC-P1B Programmable Safety Circuit Boards can replace our company's SJT-ZPC-V2A (VM1) Safety Circuit Board. The specific differences and replacement methods are as follows:

5.1 Dimensional Differences

The external dimensions of the SJT-ZPC-P1A and SJT-ZPC-P1B differ from those of the SJT-ZPC-V2A (VM1). The external dimensions of the SJT-ZPC-V2A (VM1) are as follows:

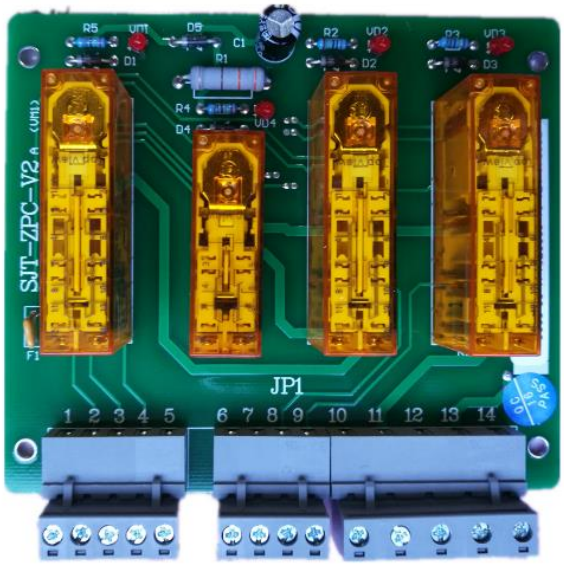

Figure 5.1 Physical Image of SJT-ZPC-V2A(VM1)

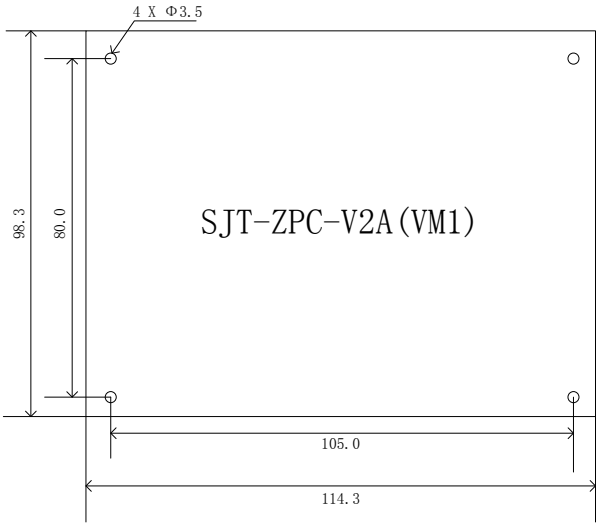

Figure 5.2 Dimensional Drawing of SJT-ZPC-V2A(VM1) (Unit ： mm)

5.2 Change Instructions

1. Main Board Program Upgrade

The SJT-ZPC-P1A and SJT-ZPC-P1B use the CAN bus to communicate with the integrated controller. The latest integrated controller program is required for proper operation. Before use, please ensure that the integrated controller program (U5-00 control software version) is version 7130 or later. (For non-standard programs, please contact our company to confirm compatibility.)

2. Wiring Change

- Using SJT-ZPC-P1A to replace SJT-ZPC-V2A(VM1)

Applicable only to synchronous motor systems with single-door configurations.				
Signal	SJT-ZPC-P1B		SJT-ZPC-V2A (VM1)	MU_V61
+24V	J1-1	<------->	JP1-1	
GND	J1-2	<------->	JP1-7	
C+	J1-3	<---------->		J6-6
C-	J1-4	<---------->		J6-5
ZPS	J1-5	<------->	JP1-3	
ZPX	J1-6	<------->	JP1-4	
116	J2-1	<------->	JP1-10	
118	J2-2	<------->	JP1-12	
Null	J2-3			
Null	J2-4			

- Using SJT-ZPC-P1B to replace SJT-ZPC-V2A(VM1)

Applicable to asynchronous motor, single-door configuration				
Signal	SJT-ZPC-P1B		SJT-ZPC-V2A	MU_V61
+24V	J1-1	<------->	JP1-1	
GND	J1-2	<------->	JP1-7	
C+	J1-3	<---------->		J6-6
C-	J1-4	<---------->		J6-5
ZPS	J1-5	<------->	JP1-3	
ZPX	J1-6	<------->	JP1-4	
116	J2-1	<------->	JP1-10	
118	J2-2	<------->	JP1-14	
Null	J2-3			
Null	J2-4			
116B	J3-1	<------->	JP1-12	
117B	J3-2	<------->	JP1-13	

Applicable to asynchronous motor, through-door configuration				
Signal	SJT-ZPC-P1B		SJT-ZPC-V2A	MU_V61
+24V	J1-1	<------->	JP1-1	
GND	J1-2	<------->	JP1-7	
C+	J1-3	<---------->		J6-6
C-	J1-4	<---------->		J6-5
ZPS	J1-5	<------->	JP1-3	
ZPX	J1-6	<------->	JP1-4	
116	J2-1	<------->	JP1-10	
118	J2-2	<------->	JP1-14	
117F	J2-3	<---------->		J5-4
116F	J2-4	<------->	JP1-11	
116B	J3-1	<------->	JP1-12	
117B	J3-2	<------->	JP1-13	

Applicable to synchronous motor, single-door configuration				
Signal	SJT-ZPC-P1B		SJT-ZPC-V2A (VM1)	MU_V61
+24V	J1-1	<------->	JP1-1	
GND	J1-2	<------->	JP1-7	
C+	J1-3	<---------->		J6-6
C-	J1-4	<---------->		J6-5
ZPS	J1-5	<------->	JP1-3	
ZPX	J1-6	<------->	JP1-4	
116	J2-1	<------->	JP1-10	
118	J2-2	<------->	JP1-12	
Null	J2-3			
Null	J2-4			
Null	J3-1			
Null	J3-2			

Applicable to synchronous motor, through-door configuration				
Signal	SJT-ZPC-P1B		SJT-ZPC-V2A	MU_V61
+24V	J1-1	<------->	JP1-1	
GND	J1-2	<------->	JP1-7	
C+	J1-3	<---------->		J6-6
C-	J1-4	<---------->		J6-5
ZPS	J1-5	<------->	JP1-3	
ZPX	J1-6	<------->	JP1-4	
116	J2-1	<------->	JP1-10	
118	J2-2	<------->	JP1-14	
117F	J2-3	<---------->		J5-4
116F	J2-4	<------->	JP1-11	
Null	J3-1			
Null	J3-2			