EWD-RL-BSJ3

User's Guide

(V1.0)

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Technical File of RLG-BSJ3 Elevator Weighing Device [User's Guide]

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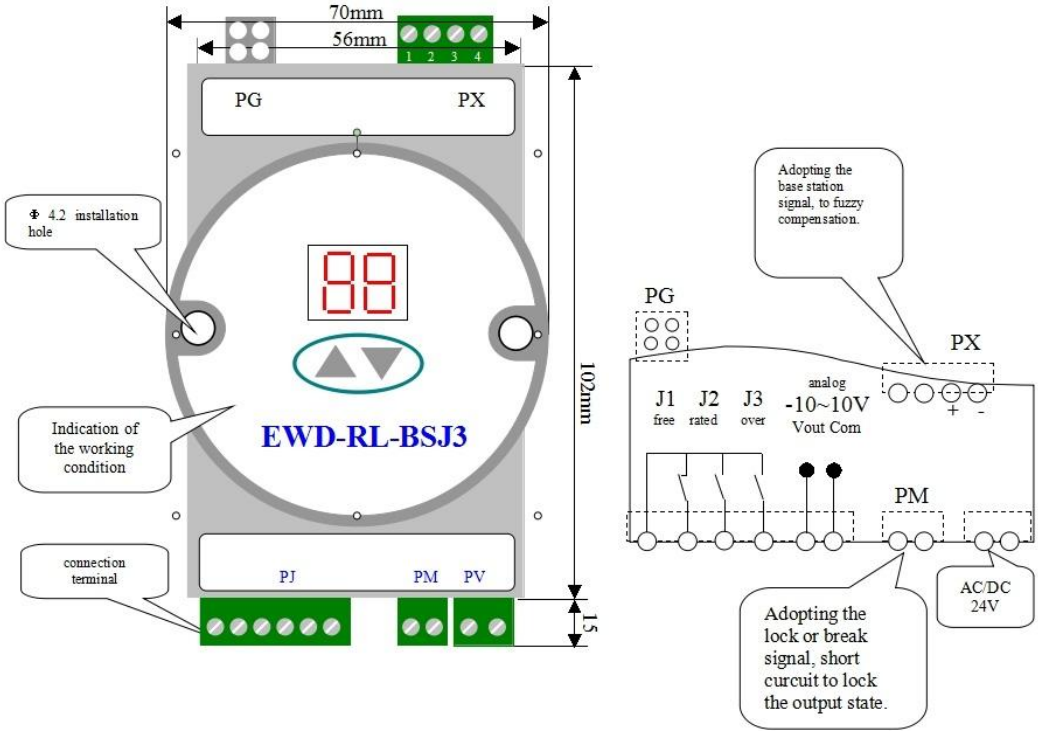
Caution: This system is applicable an elevator with **fixed car platform**. Before use, be sure to read the following sections carefully.
Note: Under any condition, our part is just responsible for the quality of product in the period of guarantee service.

Declaration: For the reason of technology advancement, our company reserves the right of improving product. As for the relevant technical parameters, Please refer to the technical handbook delivered with the product.

System Overview

1. Product Appearance and inner structure

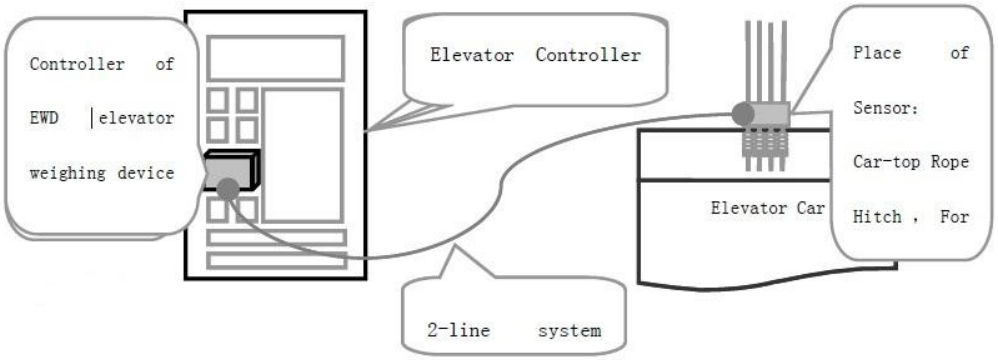
Diagram of the sensor appearance see figure[1]



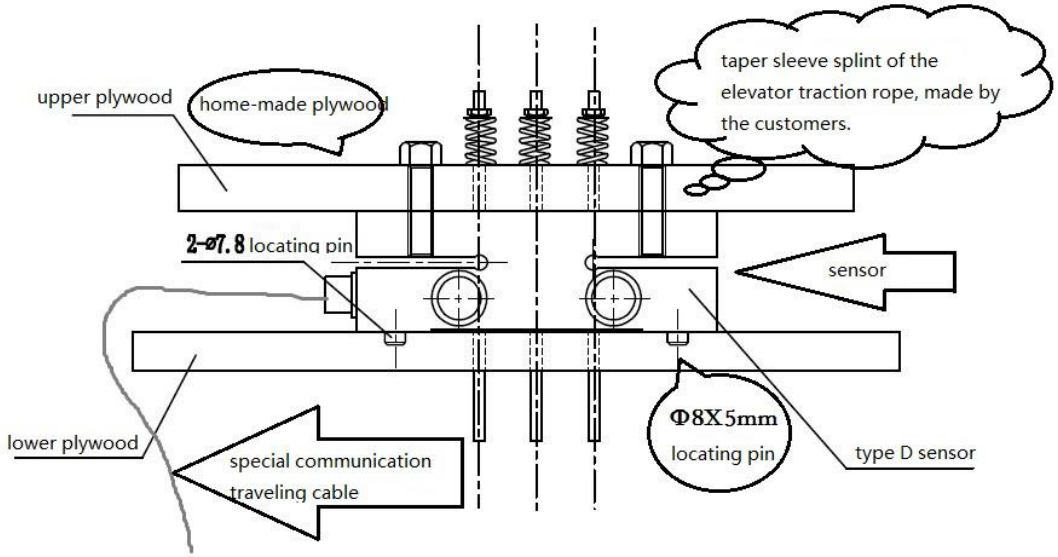
Note: The type A disc sensor and D character "—" sensor can be used; the 3T sensor is standard, please give notification if any other requirements are needed.

- **Working principle and installation method:**

There is a signal transmitting cable with the sensor. And the single-chip built-in the controller may do scientific calculations fulfilling the aim of weighing the effective load in elevator car.

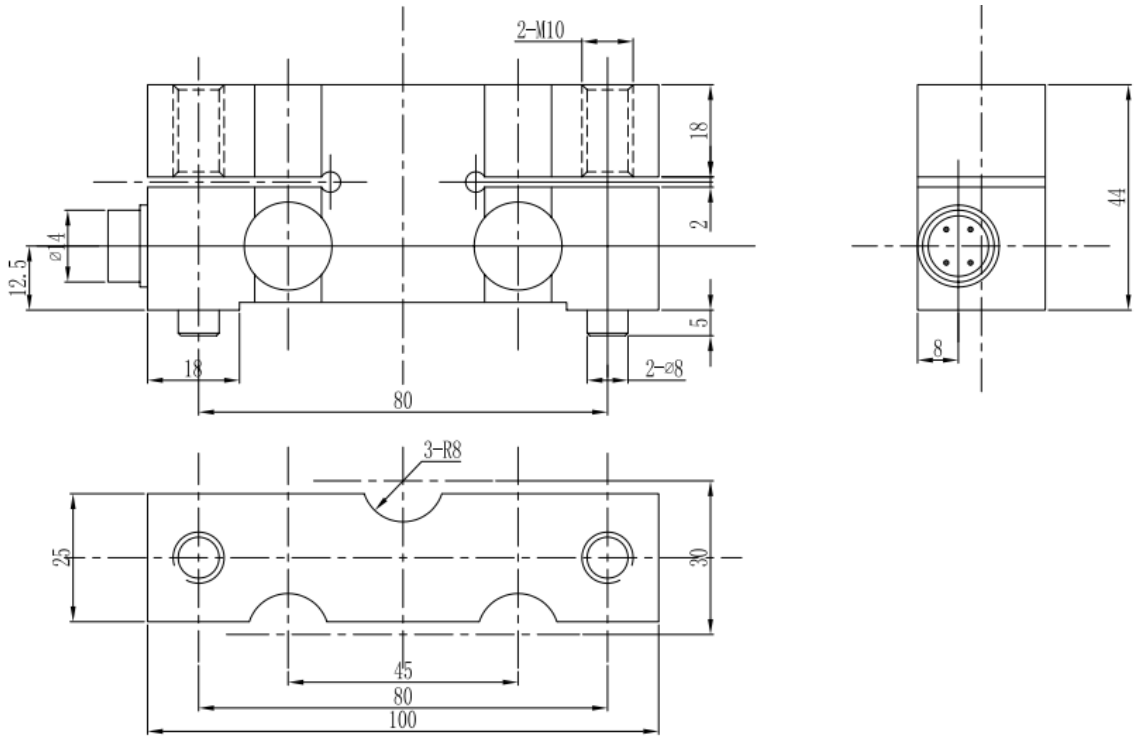


Assembly diagram of the D type sensor

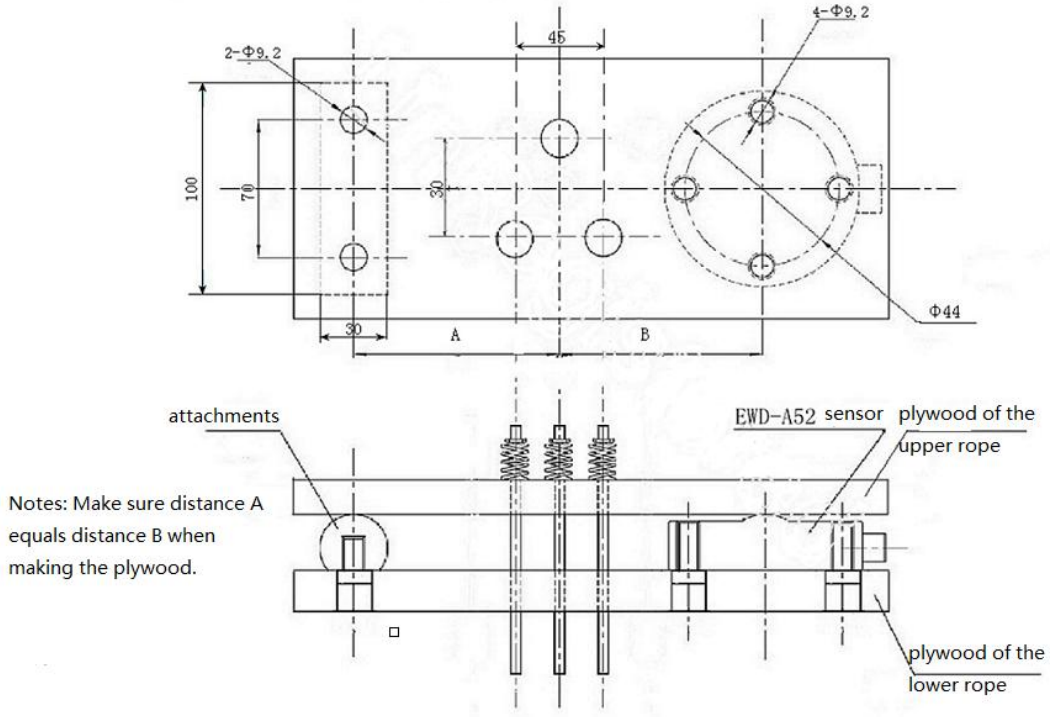


Special note on the taper sleeve splint: 1. Users made it according to the concrete condition. 2. The rod hole diameter should be 3-5mm wide than the previous one, to insure the moving of the rod.
3. The thickness of the plywood should be no less than 15mm.

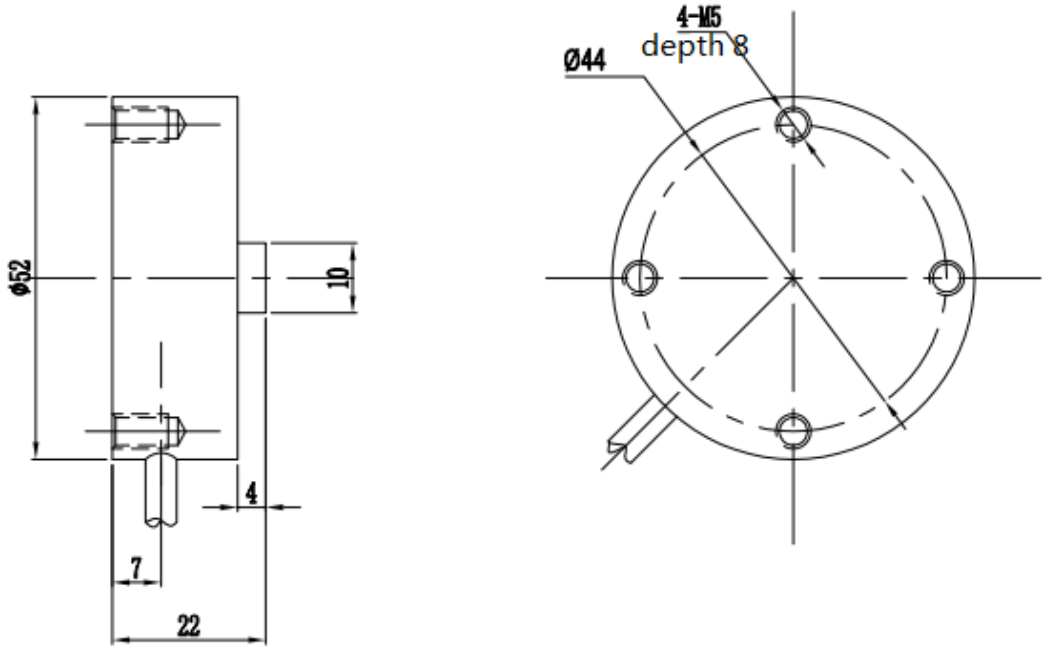
The appearance and dimension of the EWD-25E sensor



The installation diagram of the EWD-A52 sensor



The appearance and dimension of the sensor



2. Description of the Terminals

① Schematic diagram of the inner system see figure［1］

② Terminals description

			Function	Explanation	
PJ	Switching	. 1	COM of J1~2 Relay	In coordination with Pj.2～4 to produce effective logic	1. Effect：Be programmed as"no load～overload"output signals to participate in elevator logic control 2. Max loading Capacity: DC/AC 48V/500mA
		. 2	J1 Relay Output Terminal	System Default"J1"：**No load** Output；；	
		. 3	J2 Relay Output Terminal	System Default"J2"：**Rated load** Output；	
		. 4	J3 Relay Output Terminal	System Default"J3"：**Over load** Output；；	
	Analog	. 5	-10～10V Analog Voltage Output	Being used for pre-torque compensation for driving system	
		. 6	COM connected to analog common terminal of speed regulator		
PM	1[+]～2[-]		Lock output signal control terminal. Be connected in system door lock signal circuit, pay attention to connecting polarity.		
PV			System Power Supplying Terminal: AC/DC 24V / 200mA		
PX	3[+]～4[-]			Parameter P5=4	1.No wiring: system unnecessary of landing compensation; 2. See attached figure for wiring.

Absolutely don't connect the output terminals (except "PV") of this device to the external power source directly and the resulted permanent damage to the device is beyond our responsibility.

Installation and Adjustment

3. Schematic Diagram for System Construction and Installing Method:

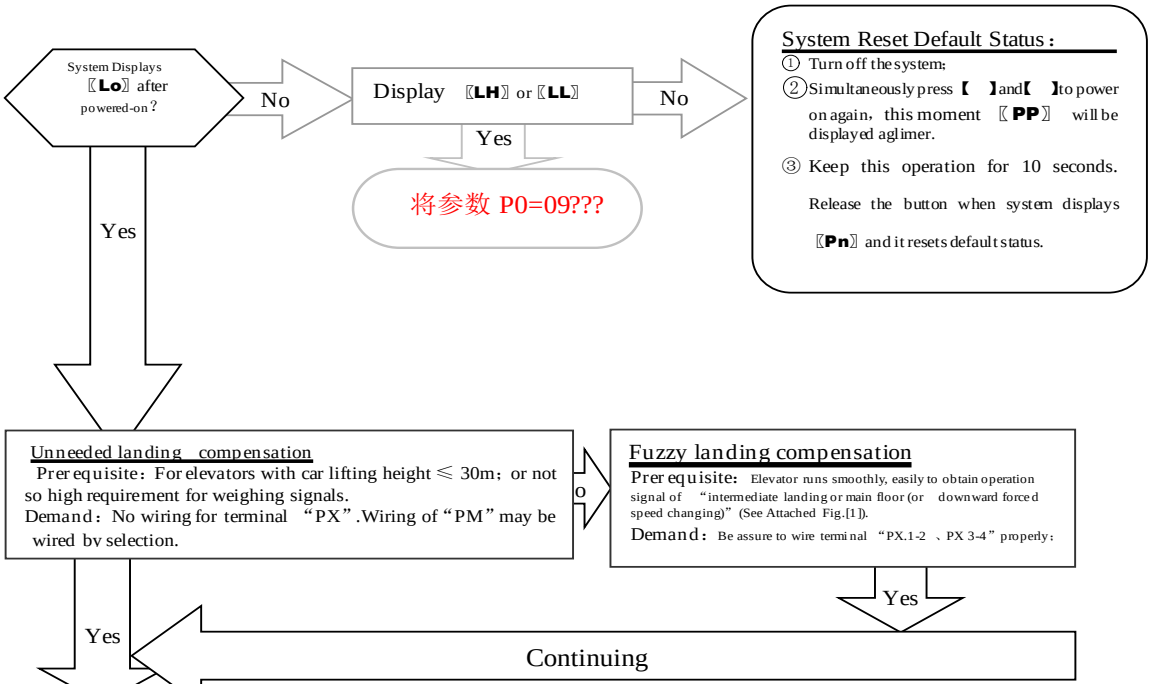
Schematic Diagram of the appearance of the whole set： Controller Section See Fig. [1]
Controller section see fig.[2]

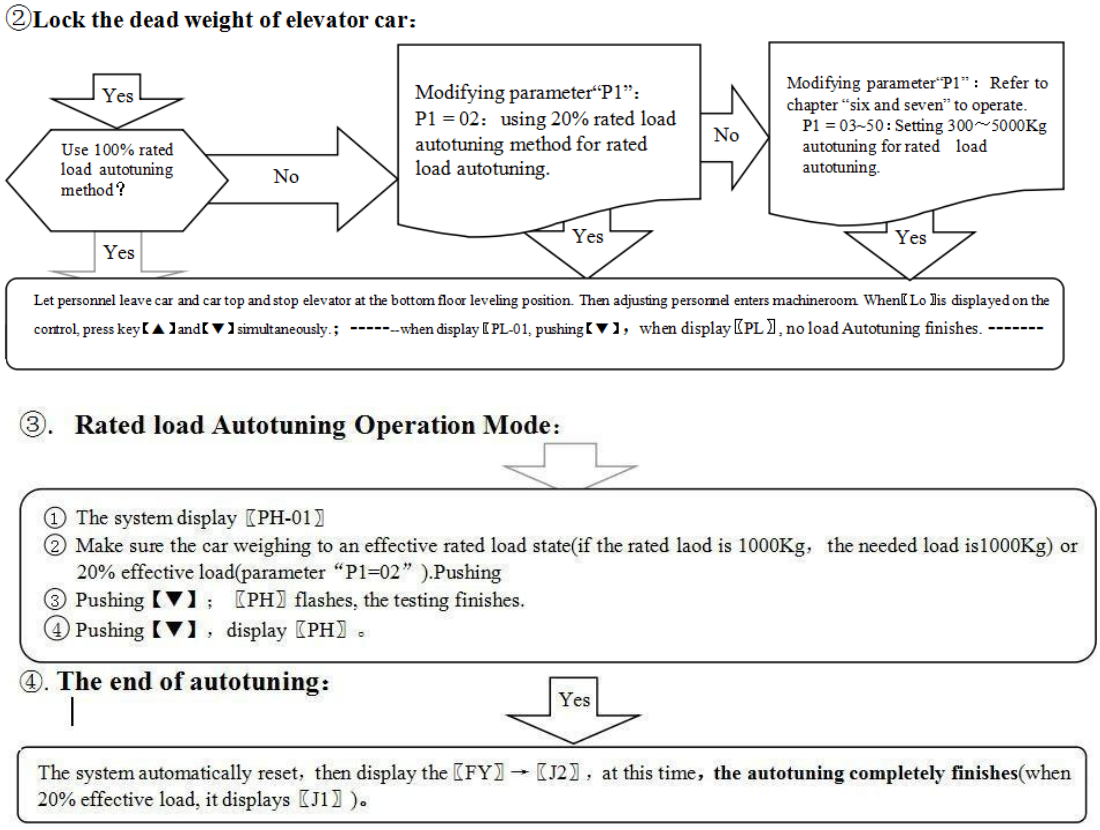
4. Install Method of Sensor and Controller:

①Adjust traction ropes so that the pull of each rope keeps coincident.
②The sensor is installed at the place of the elevator- car-side traction rope shackle according to Fig. [2] and refer to it for more details.
③Control Section should be installed in the control cabinet placed in machineroom， being away from equipments such as the transformer, speed regulator of elevator electric control system. Under any condition, sensor and controller should be far away from heat source.
④It would be better not to put the connecting cable between sensor and controller in the same wire duct with dynamic power of 110V or 220V.
⑤Connect the sensor wiring terminal to PG terminal of the control, simultaneously, connect power line to PV according to system requirement. Pay attention to the voltage level.
⑥When no error is inspected, power on the system and the corresponding operation patterns will be displayed on the control.

5. Adjustment Method and Description of the System (Autotune Operation)

①Initialization： Selection of Compensation Method





⑤System adjustment under other conditions:

For following reasons, the parameters of this system need re-modifying in the way described above.

1) Elevator car decoration changing causes its dead weight change.
2) Larger unbalance appears among traction ropes.
3) Sensor of weighing device becomes flexible.
4) Overrunning at the top or at the bottom occurs.

Operation Parameters Adjustment and the Implication

6. System Operation Parameters Adjustment

①Simultaneously press 【π】and【θ】on system control keypad to power on , this moment 〖PP〗 will be displayed aglimer, that means entering operation parameters modifying status.

②Release 【π】and【θ】buttons, system will display〖P*〗and〖**〗alternately. 〖P*〗is an indication of system operation parameters; 〖**〗is the interior data value of〖P*〗.

③When displaying〖P*〗, press【θ】, indication of system operation increases; press【π】, indication decreases.

④When displaying〖**〗, press【θ】, data value increases; press【π】, data value decreases.

⑤Release buttons, system displays operation indication and configuring data alternately.

⑥To modify other configuring datum, repeat the operation in item 3, item 4, and item 5.

⑦At the moment when system displays 〖P*〗, Simultaneously press【π】and【θ】, system will save modified datum for future

use. This moment, system displays〖Pn〗 for 1 second. System operation parameters modification of this time is completed.

(**Annotation**：***** represents for a hexadecimal value of "0～9,A～F".)

Example：**Modify parameter P1 to 10**；(the system effective load is 1000kg)

①Simultaneously press【π】and【θ】on system control keypad to power on ，this moment 〖PP〗 will be displayed aglimer, that means entering modifying status;

②Release【π】and【θ】buttons，system will display〖P0〗and〖**〗aglimer;

③When displaying〖P0〗，press【θ】to increasing it to〖P1〗;

④Release button【θ】，system alternately displays〖P1〗and〖**〗;

⑤When displaying〖**〗，press【π】or【θ】to regulate its value as〖10〗;

⑥Release button，system alternately displays〖P1〗and〖10〗;

⑦At the moment when system displays 〖P1〗，Simultaneously press【π】and【θ】，system will save modified datum for future use. This moment, system displays〖Pn〗 for 1 second. System operation parameters modification is completed.

7. Implication of parameter P：

Normally，it is unnecessary to modify parameter after "P0". System may automatically modify them in the course of Autotuning.

① Directions of Parameter **P0** [System Operation Mode]：

Setting	Explanation	Default Setting	Normal Value
00	Normal Operation (Automatically modify by system after autotune.)	01 (Sensor Positioning)	00 System Auto Modifying
01	Sensor positioning, system autotuning		
09	Options for dealing with abnormality when Selecting"王"type intelligent sensor.		
0A	Forcibly set system settings as default values		

② Directions of Parameter **P1** [System Rated Load Setting Mode]：

Setting	Explanation	Default Setting	Normal Value
01/02或 05～55 ×100Kg	01— Select"100% Rated load, floor by floor" Autotune 02— Select"20% Rated load, floor by floor" Autotune； **—Select rated load setting mode(Not Recommended)Example："10"means rated load of 1000Kg. There is a certain error in this method. ***Note*：*This mode is just for type "D" sensor.***	01 (Rated load Autotuning)	

③ Implication of parameters p2、p3、p4、p5[reserved]:

④ Directions of Parameter **P6 [Logic condition Setting Relay"J1", "J2", "J3"]**：

Setting	Explanation					Default Setting	Normal Value
	Higher Bits	Lower Bits					
	0--- Selecting 0~10V	Contact Status	**J3**	**J2**	**J1**	20 (Relay Dynamic	
	1---	**0**	Dynamic Open	Dynamic Open	Dynamic Open		

00～17	Selecting 10~0V 2--- Selecting -10~10V 3--- Selecting +10~-10V	**1**	Dynamic Open	Dynamic Open	Dynamic Close	Close output，analog output of 0～10V is effective)	
		2	Dynamic Open	Dynamic Close	Dynamic Open		
		3	Dynamic Open	Dynamic Close	Dynamic Close		
		4	Dynamic Close	Dynamic Open	Dynamic Open		
		5	Dynamic Close	Dynamic Open	Dynamic Close		
		6	Dynamic Close	Dynamic Close	Dynamic Open		
		7	Dynamic Close	Dynamic Close	Dynamic Close		

⑤ Directions of Parameter **P7** [Setting Relay"**J1**"Operation Range]:

Setting	Explanation	Default Setting	Normal Value
00～99 A0~A9 b0~b9 C0~C9	When Load≥ Rated load×P9%，"J1"signal is output. **00~99**：Actuating for 0~99% rated load **A0~A9**：Actuating for 100~109% rated load **b0~b9**：Actuating for 110~119% rated load **C0~C9**：Actuating for 120~129% rated load d0**~d9**：Actuating for 130~139% rated load E0**~E9:** Actuating for 140~149% rated load **F0~F5:** Actuating for 150~155% rated load	05 Setting J1: actuating for 10% Rated Load	
	Example: P7=80：For effective load of 1T，system actuates at 800Kg. P7=A5：For effective load of 1T，system actuates at1050Kg. P7=C5：For effective load of 1T，system actuates at 1250Kg.		

⑥ Directions of Parameter **P8** [Setting Relay"**J2**"Operation Range]:

Setting	Explanation	Default Setting	Normal Value
The same as P7	The same as P7:	A0 Setting"J2", system actuates at 100% rated load	

⑦Directions of Parameter **P9** [Setting Relay"**J3**"Operation Range]:

Setting	Explanation	Default Setting	Normal Value
The same as P7	The same as P7:	A5 Setting"J3", system actuates at 105% rated load	

⑧ Directions of Parameter **PA** [No-Load Auto Zeroing Time Interval]:

Setting	Explanation	Default Setting	Normal Value
00～96 (Hours)	When it reaches the set time，system will begin the operation of no load zeroing automatically. 01—— System disables the function of no load auto zeroing. 12～96—After system powered on (for 12～96 hours)，it begins the operation of inspecting load detaining time, a part of no load zeroing operation.	00(Disable)	

⑨ Directions of Parameter **PB** [Detaining Time of No-Load Auto Zeroing]：

Setting	Explanation	Default Setting	Normal Value
10～90 (Minutes)	After auto zeroing time is reached, system load doesn't change in this period and system will allow the beginning of No-Load Auto Zeroing operation.	30(Minutes)	

⑩Directions of Parameter **PC** [No load Auto Zeroing Error Range]：

Setting	Explanation	Default Setting	Normal Value
03～20 (%)	When conditions of both (7) and (8) being satisfied and the ratio of present load to the absolute value of original no load is larger than this setting，system begins No load Auto Zeroing operation immediately.	05% (|No load Error| larger than 5%，System)	

Attentions: ① When selecting not indicated settings, system will not normally operate.

② No load auto zeroing parameters PA, PB and PC should be used cautiously because of the cause variety of elevator no load point drifting. It is recommended for the user to allow or forbid this function according the concrete conditions.

③ Even if No load auto zeroing operation enabled，in the course of elevator periodical maintenance，autotuning operation of this system should be redone without exception.

Explanation of Displaying Code:

8. System Normal Operation Code:

〖J0〗	〖J3〗	〖J2〗
No Relay Output	Relay**J3** Output	Relay **J2** Output
	Default 105% of Rated Load	Default 90% of Rated Load

1. Displaying "HJ※※※※"when pressing【π】button indicates present car effective load. For instance, displaying"HJ0520 "indicates the load of 0520kg.
2. Displaying "0.0."in fuzzy compensation indicates compensation is effective. Displaying "0.1."indicates elevator entering modifying zone.

9. Code for Other Operation and Failures

	Display Code	Indication		Solution
1	FY	System Startup, flashing indicates P0 system parameter setting is not correct.		
2	PC	Sensor Resetting		
3	PP	Get into the status of operation parameters modification		
4	PL	Autotuning No load parameters		(**Still Displaying** indicates preparation status， **aglimmer displaying** indicates the end of inspection)
5	PH	Autotuning Rated load parameters		
6	LL	Installation and positioning	Too big Positioning	Sensor having no load
7	LH		Too small Positioning	Sensor overload
8	Lo		Accurately Position	
9	LP		Interior Auto Correction	
10	LY		Forcibly skip sensor interior auto correction	
11	P*	System Configuration Indication		
12	Pn	Saved		
13	EA	Saving Failure		Modifying operation parameters again
14	EJ	Without this system setting		Check system settings
15	EH	Applied Overflowing Pressure		Sensor pressure may beyond its withstanding range
16	EL	Applied Insufficient Pressure		Sensor being not pressed
17	EF	Memorizing abnormally		Repeat this operation.

How to do?

10. Brief Analysis of Other Conditions：

⑴Bad system Operation Stability with the main indication of large output fluctuation in the condition of fixed load and elevator motionless？

Check if PV power supply source fulfils system requirements?

⑵After long-term of operation, system no load zeroing point appears larger deviation？

May be caused by the reason described in section 8 , chapter 8. Set system Autotuning mode to calibrate again， or startup parameter"PA≠0" to realize the function of system no load auto zeroing.

（3）Bad coherence of the landing compensation?
Modify the low level of the parameter "P4".

(4)Traveling Up and down with the same load and stopping at the same floor, but the weighing result is different?

① Lift rope pull is not symmetrical，adjust please.

② Elevator guide shoes are too tightened，running friction is large. It is recommended to adjust or modify relevant mechanical part to make it move flexible，then operate the system to autotune again.

(5)System output signal doesn't change linearly along with load？

Maybe system sensor is damaged.

(6)How to descry present effective load of elevator car？

① In the period of system normal operation, press button【π】.This moment, system displays〖HJ〗→〖**〗→〖**〗 .For example ： displaying 〖HJ〗→〖09〗→〖50〗 indicates a car with rated load of

1000 Kg presently bearing an effective load of 950Kg.

② If elevator effective load is not 1000 Kg，it may be decided after system autotuning operation is finished by modifying parameter"P1".

③ Because of various impacts from outer environment，displayed data may fluctuate in a small scope.

(7)When elevator is motionless, weighing signal is normal. But in the course of door opening, it is abnormal?

Elevator door operation system causes relative car weight offset. It may be controlled by adopting door opening/closing relay output signals+ door lock signal jointly participating system PM. 1-2 locking.

(8)During system operation, analog output is abnormal, repeatedly resetting or abnormal coordination with speed regulator?

May be caused by crossing and interfering system power source. Select another set of power source to supply power to system，or equip AC/DC 24V/300mA exterior power source to supply power.

11. How to Repeat doing Autotune operation for system?

Method 1：Simultaneously press【π】and【θ】on system control panel to power on. This moment, system aglimmer displays〖PP〗.Keep 15 seconds，system will display〖Pn〗.On that occasion，all operation parameters reset to default settings.

Method 2：Modifying parameter P0=0A will reset system immediately to default status. But for users with specified code, it is necessary to modify parameter P0 as appointed code. Detailed operation is described in chapter 6.

12. How to adopt 20% rated load for rated load autotune?

After system displaying 〖Lo〗，modify parameter"P1=02".Do no load autotuning operation as described in chapter 6. In the period of displaying〖PH〗，load elevator car with a weight equal to 20% of rated load to do rated load autotuning operation. When operation is finished,〖L1〗is displayed.

13. How to get the version code of the product?

After power off, press 【θ】to supply power. System displays〖1.0〗indicating the corresponding **User's Guide** of this product being Version"V1.0".

System Features

14. Working principle of the"EWD-RL-BSJ3"elevator load weighing device

With the development of the elevator technology, the elevator load weighing has great effect on the the performance of the elevator. Higher accuracy,more reliable and more functional elevator load weighing is desperately needed. In the era of the high development of the sensor and the microcomputer, adopting the high accuracy"disc" load sensor to detect the electric signal to the change of the car load, meanwhile using the single chip microcomputer to have a scentific processing, to achieve the working function of the elevator car effective load weighing.

15. **Main Characteristic：**

① Adopting direct pressure type "disc" load weighing device, there is no need to change the pull rod of the tractive rope.

②Weighing range is wide (effective load of 500Kg～5500 Kg)，high-accuracy position，intelligent temperature compensation.

③Inner core consists of highly accurate load sensor and high performance single-chip micro-computer. All operation parameters can be set on field.

④System may do scientific calculation according to mathematical equations with the function of no-load auto zeroing，automatically modifying measuring error.

⑤With the function of fuzzy compensation to improve the high requirements the elevator to the load signal.

⑥With the ability of load setting under auto tare or the working function of 20% or 100% autotuning rated load, it is very convenience to the customers.

⑦Adjusting the autotuning at the spot, and it very convenient to do the adjustment.

⑧With the ability to modify the working parameters automatically and fuzzy compensation.

⑨The whole shoot starts from users' point of view，easy installation and adjustment，decreasing users' additional cost in use，high ratio of performance to price.

16、Technical Specifications：

1.	**Application Range**		Being applicable to all traction elevators with fixed car platform with the load of 500 kg～3000/5000 kg	
2.	**Landing Compensation Method**		Auto adapting intelligent fuzzy compensation	
3.	**Sensitivity**		Elevator Rated Capacity/200 (Example： The rated capacity is 1000 kg, and the sensitivity is 5 kg) [This data may be affected by elevator mechanical performance.]	
4.	**System Error**		≤0.5% (5～40℃)	
5.	**Non-linearity**		≤0.5%	
6.	**Output Mode:**	Relay	Programmable common signals:	①2-channel programmable output modes are: No load, light load, semi full load, heavy load, rated load, overload (customer may set the changing range freely). ②Each channel can be programmed as dynamic Close or Open contact. ③Contact Capacity: DC/AC 48V/100mA.
			Analog Output:	It performs linear change (0～10V) when Elevator load is changing from "no load～rated load".
7.	**Operation Ambient Temperature**		-20～55℃	
8.	**Relative Humidity**		20%～90%RH	
9.	**Reaction Time**		≤0.3Second	
10.	**Power Supply:**		AC/DC24(±10%)V / 200mA	
11.	**Install Position**		Sensor Section: At the place of traction rope shackle Controller Section: Control Cabinet in machineroom. See the attached figure for installing dimensions.	
12.	**Overall Size**		Sensor Section: See the figure; Controller Section: See the figure	

: The intension exceeding the limit parameters listed above may result in the abnormality or permanent damage to the system.

Promise

(1)If this system appears any quality problem of product itself in 1 year after delivery, it will be replaced freely（damage of the product seal will not be dealt with）。

(2)For any requirement of special functions, make it out by mail.

(3)Any system abnormality in adjustment or operation, please contact our company directly.

Others:

1.**Packing List:**

Type A: Intelligent "Disc" type load sensor 1Set

Sensor Auxiliary Support 1

M10×35mm Fastening Screw sets 6 sets

Type D: Intelligent Character "—" load sensor 1set

EWD-LG-BSJ3 controller 1

Φ4×40mm *Fastening Screw sets* 2 sets

User's Guide 1 copy

2.**Address book:**

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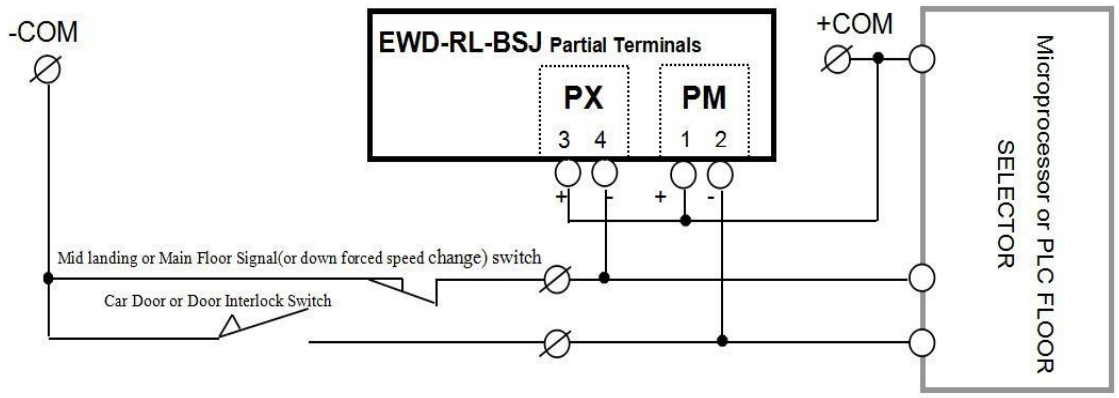
Att：PM、PX terminal，Auto accommodating fuzzy floor compensation wiring method.



Recommended Application Range of this mode: All elevators with better mechanical installation characteristic.

Notes: 1. Directly parallel connect PX1~2 and PM1~2to corresponding electric circuit. If user selects "mid landing" position signal, more accurate compensation effect may be received.

2. If the public extremely of the elevator signal is + COM power supply, then the connecting port of the PX, PM should be reserved, that is changing the PM. and PM. 2; and so on.

3. Voltage of terminal COM should be in the range of"DC12~32V".