



***SHENXI* Temporarily Installed  
Suspended Access Equipment**

**OPERATION MANUAL**

**for Shenxi ZLP Series**

**Temporarily Installed Suspended Platform**

**INSTALLATION OPERATION**

**MAINTENANCE**

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Version: 2021

**NOTE: READ OPERATION MANUAL CAREFULLY BEFORE OPERATING  
TEMPORARILY INSTALLED SUSPENDED ACCESS EQUIPMENT**

# **Content**

<b>1. Brief Description.....</b>	<b>1</b>
<b>2. Main Parameters.....</b>	<b>1</b>
<b>3. Main Structure and Operation Principle.....</b>	<b>2</b>
<b>3.1 Suspension Mechanism.....</b>	<b>3</b>
<b>3.2 Suspended Platform.....</b>	<b>4</b>
<b>3.3 Hoist.....</b>	<b>5</b>
<b>3.4 Safety Lock.....</b>	<b>5</b>
<b>3.5 Electric Control System.....</b>	<b>6</b>
<b>3.6 Steel Rope.....</b>	<b>7</b>
<b>4. Installations and Adjustment.....</b>	<b>8</b>
<b>4.1 The Preparation before Installation.....</b>	<b>8</b>
<b>4.2 Installation of Suspension Mechanism.....</b>	<b>8</b>
<b>4.3 Installation of Suspended Platform.....</b>	<b>8</b>
<b>4.4 Installation of Hoists, Safety Locks and Electric Control Box.....</b>	<b>9</b>
<b>4.5 Installation of safety rope.....</b>	<b>9</b>
<b>4.6 Adjustment of Rotating Direction of the Motor.....</b>	<b>9</b>
<b>4.7 Connection Between Suspended Platform and Suspension Mechanism....</b>	<b>9</b>
<b>4.8 Special Notice.....</b>	<b>9</b>
<b>5. Operation.....</b>	<b>11</b>
<b>5.1 Checking and Adjusting after Installation.....</b>	<b>11</b>
<b>5.2 Operation Procedure.....</b>	<b>12</b>
<b>5.3 Safety Operation Regulations.....</b>	<b>12</b>
<b>6. Common Failures and Troubleshooting.....</b>	<b>14</b>
<b>7. Maintenance.....</b>	<b>15</b>
<b>7.1 Daily Maintenance.....</b>	<b>15</b>
<b>7.2 Daily Check .....</b>	<b>15</b>
<b>7.3 Check Periodically.....</b>	<b>16</b>
<b>8. Storage, Packing and Transportation.....</b>	<b>16</b>
<b>9. Documents .....</b>	<b>16</b>
<b>10. Attached Figure and Table.....</b>	<b>16</b>

## 1. Brief Description

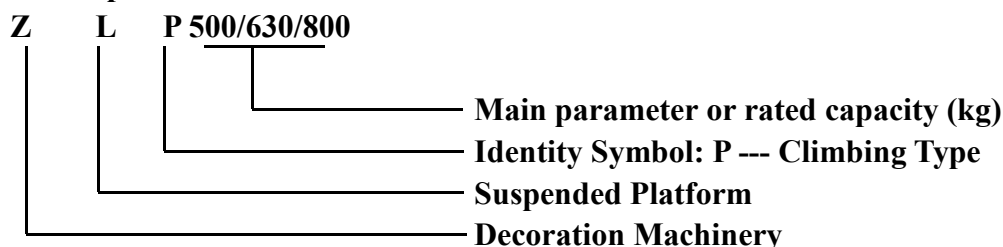
ZLP series temporarily Installed Suspended Access Equipment conforms to the standard GB19155-2003, EN1808:2015, EN60204-1:2006/AC: 2010, ENISO12100:2010.

It is ideal equipment for building facade construction, decoration, cleaning and maintenance. And it is also widely used in facade building, glass cleaning and installing, elevator installing, ship building and repairing, or in other works such as big-size tank, bridge, embankment and chimney.

It is easy for operation, flexible for moving, reliable in safety. Besides, it is not necessary to build scaffolding in the construction, the efficiency will be promoted and the cost will be reduced. Therefore, it provides workers safer, easier and more efficient platform access.

## 2. Main Parameters

### Model description



**Table 1: Main Parameters**

Item			ZLP500	ZLP630	ZLP800
Rated capacity			500Kg	630Kg	800Kg
Rated speed			8-10m/min	8-10m/min	8-10m/min
Platform length			5m	6m	7.5m
Steel rope			4*31WS+FC-8.3mm	4*31WS+FC-8.3mm	4*31WS+PP-8.6mm
Hoist	Hoist model		LTD5	LTD6.3	LTD8
	Rated lifting force		5 KN	6.3 KN	8KN
	Motor	Model	YEJ90L-4	YEJ90L-4	YEJ90L-4
		Power	1.5 KW	1.5 KW	1.8 KW
		Speed	1400 r/min	1400 r/min	1400 r/min
		Brake torque	15 Nm	15 Nm	15 Nm
Safety lock	Configuration		Anti-tilting	Anti-tilting	Anti-tilting
	Max impact force		30 KN	30 KN	30 KN
	Cable locking distance		<100mm	<100mm	<100mm
	Cable Locking angle		3°~8°	3°~8°	3°~8°
Suspension mechanism	Front beam overhang		1.3-1.7 m	1.3-1.7 m	1.3-1.7 m
	Height		1.28-1.73m	1.28-1.73m	1.28-1.73m
	Weight		310kg	310kg	310kg
	Counter weight		750kg	900kg	1000kg

### 3. Main Structure and Operation Principle

ZLP series temporarily installed suspended access equipment consists of the components as below: hoists, safety locks, electric control system, suspend platform, suspension mechanism, counter weight, steel rope, etc (see figure 1 as below).

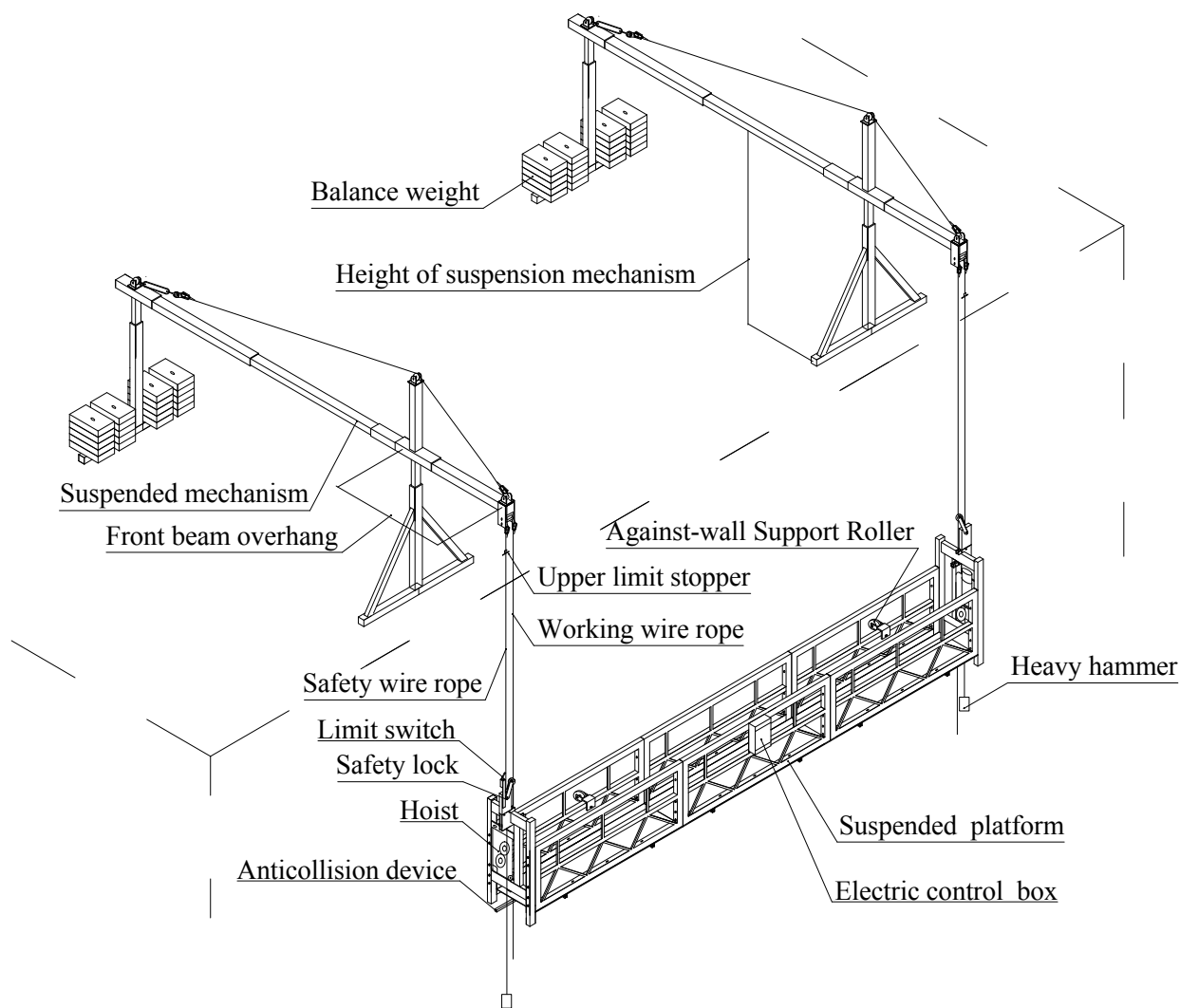
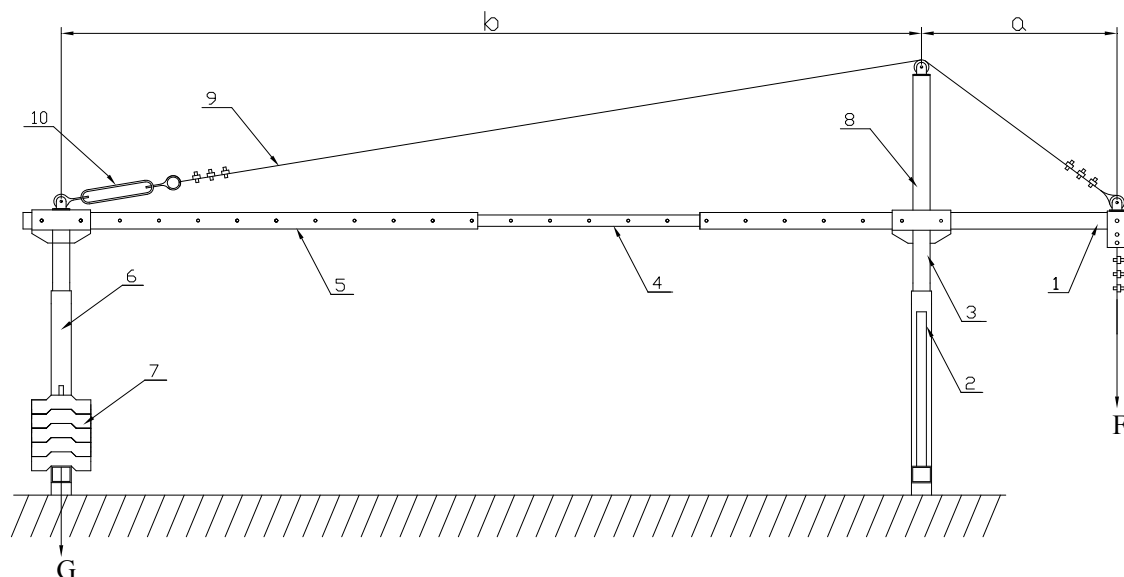


Figure 1: Temporarily Installed Suspended Access Equipment

### 3.1 Suspension Mechanism

The suspension mechanism is the heavy-duty steel frame structure fixed on the top of the building as the supporting equipment.

**3.1.1** It consists of the components as figure 2 shows. For details of structure, see attached figure 1: suspension mechanism on page 17.



**Figure 2: Suspension Mechanism**

1. Front beam    2. Front base    3. Tommy bar    4. Middle beam  
5. Rear beam    6. Rear base    7. Counter weight    8. Upper column  
9. Reinforcing steel rope    10. Turnbuckle

**3.1.2** The Relation between Permissible Load and the variables as Working Height , Front Beam Overhang (**a**), Distance between the Front Base and Rear Base (**b**). See “a” & “b” in the figure 2.

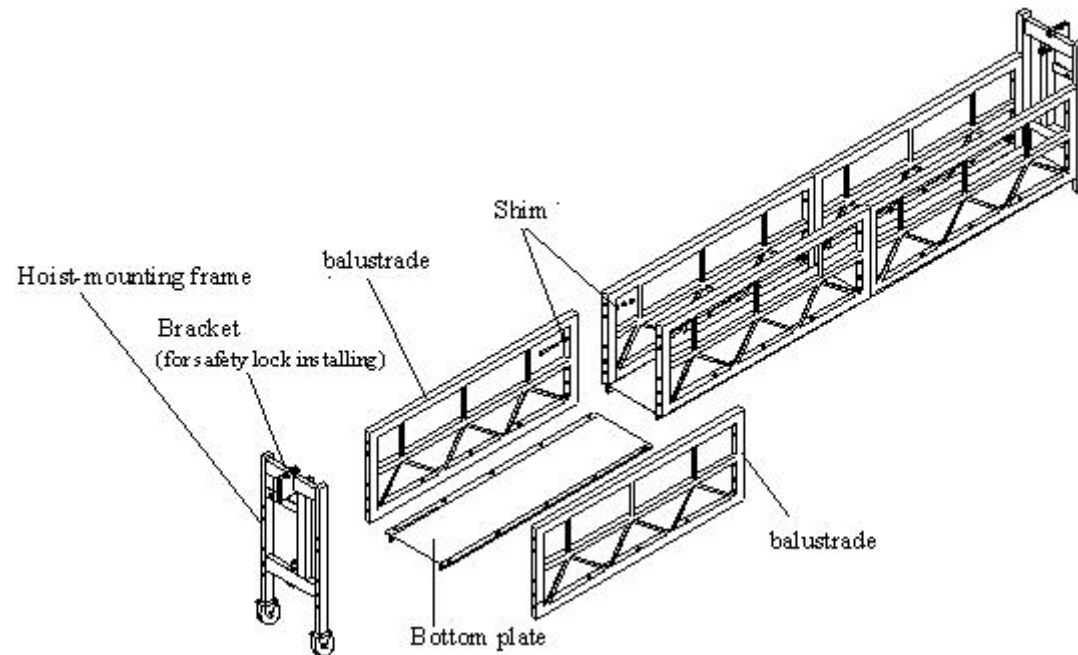
**Table 2**

Working Height	a	b	Permissible Load		
			ZLP500	ZLP630	ZLP800
50 m	1.3 m	4.6 m	500 kg	630 kg	800 kg
	1.5 m	4.6 m	500 kg	630 kg	800 kg
	1.7 m	4.4 m	400 kg	550 kg	550 kg
100 m	1.3 m	4.6 m	500 kg	630 kg	800 kg
	1.5 m	4.6 m	500 kg	630 kg	700 kg
	1.7 m	4.4 m	350 kg	500 kg	460 kg
120 m	1.3 m	4.6 m	450 kg	630 kg	800 kg
	1.5 m	4.6 m	450 kg	630 kg	680 kg
	1.7 m	4.4 m	300 kg	450 kg	440 kg
150 m	1.3 m	4.6 m	420 kg	630 kg	730 kg
	1.5 m	4.6 m	420 kg	630 kg	630 kg
	1.7 m	4.4 m	250 kg	400 kg	400 kg

### 3.2 Suspended Platform

Suspended platform is the workplace at heights for the workers. A modular system with the options 1m, 1.5m, 2m, 2.5m, 3m, gives you the flexibility. The users can combine and match sections to achieve different lengths. With caster wheel, the platform is easy to move.

It (see figure 3 as below) consists of balustrades, bottom plate and hoist-mounting frames on the both ends of the platform and the hoists & safety locks should be fixed on the frames.



**Figure 3: Suspended Platform**

**Note :** All the load including people and material on the platform cannot be more than the rated load capacity and that per unit area ( $\text{kg/m}^2$ ) max  $200\text{kg/m}^2$

$$\text{The load capacity per unit area (kg/m}^2\text{)} = \frac{\text{Permissible load capacity (kg)}}{\text{Platform length L (m)} \times \text{Platform net width B(m)}}$$

### 3.3 Hoist

The hoist is the powered unit for the platform with the climbing structure.

**3.3.1** The hoist consists of electromagnetic brake motor, centrifugal speed limiter, dual speed reduction system and “α” cable-guiding system. It is driven by the electromagnetic brake three-phase asynchronous motor through the worm gear and a pair of reduced gears. The suspended platform will be moved upward and downward with the movement of the hoist.

**3.3.2** The hoist is provided with automatic rope feeding function and operators just need to insert steel rope into the inlet of the hoist.

**3.3.3** The electromagnetic brake of hoist motor is able to be auto-engaged to produce braking torque that stops and supports the suspended platform. In the event of power failure or emergency, the manual descending device can be used to prompt the suspended platform to slide downwards at even speed.

**3.3.4** The hoist structural diagram and the exploded view are on the page 18 and 19. The components list is on the page 20.

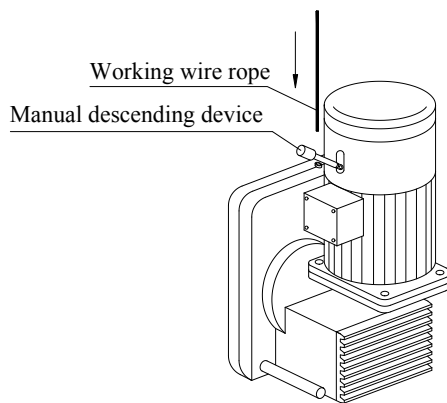


Figure 4: Hoist

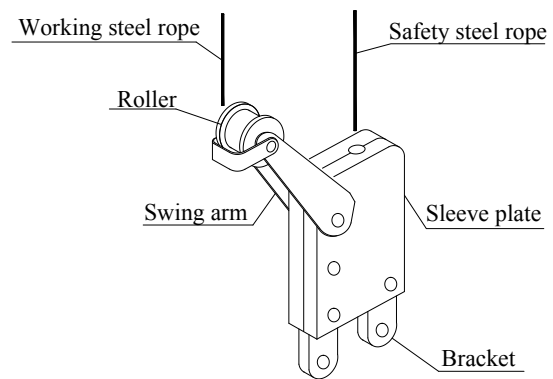


Figure 5: LSB30 Safety Lock

### 3.4 Safety Lock

Model LSB30 anti-tilting safety lock is the safety-protecting device for the suspended platform. When the working steel rope is broken or the suspended platform is inclined to certain angle, the safety lock will be actuated to lock the safety steel rope to prevent the suspended platform from falling down.

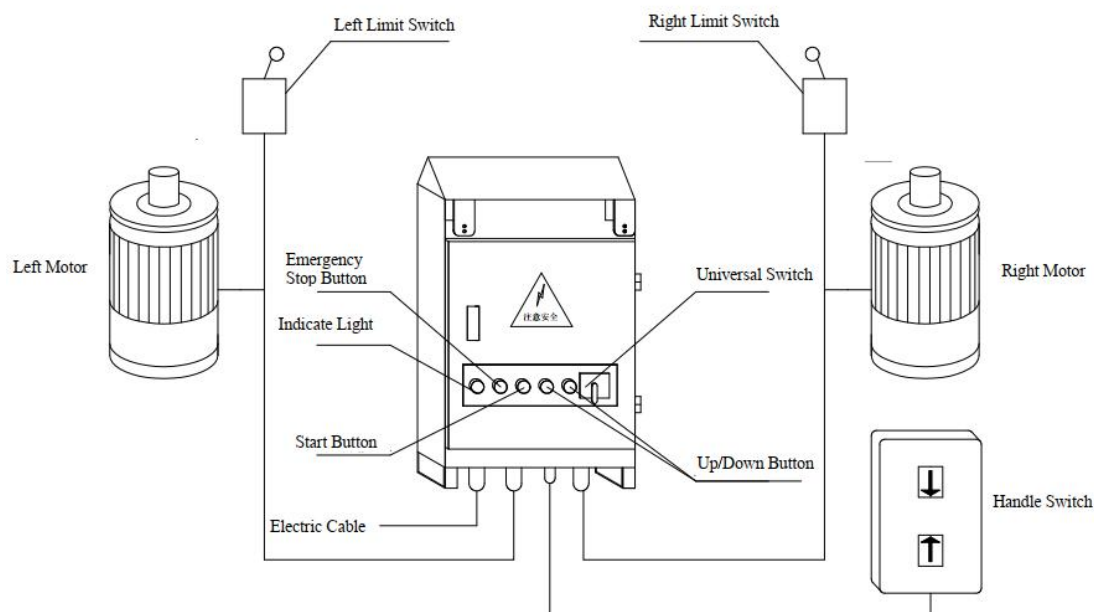
**Note:** The safety lock is marked by factory for the first time. After the first marking is effective, the professional technician should conduct maintenance and service at an interval of 12 months and remark it.

The safety lock exploded view are on the page 24 and the components list is on the page 26.

There is **SL30 centrifugal type safety lock** as option especially for the single suspension point platform. The exploded view are on the page 25. The components list is on the page 26.

### 3.5 Electric Control System

The electric control system consists of electric control box, electromagnetic braking motor and handle switch etc. The up and down movement of suspended platform is controlled by two electromagnetic braking motors (see figure 6 as below).



**Figure 6: Electric Control System**

The electric control box is used for the control of the up and down movement of the suspended platform. The main elements are mounted onto an isolated plate and the universal switch, power indicator light, starting button and emergency stop button are fixed on the panel.

**3.5.1** The diagrams are on the page 21 and 22.

**3.5.2 Table 3: The main electric elements**

Code	Name	Specification	Code	Name	Specification
KM1,2,3	AC Contact	CJX2-1810	STP	Emergency stop button	NP2-BE102
QF1	Power leakage breaker	DZ47LE-32	U1,2	Rectifier for brake	
QF2	Miniature circuit breaker	DZ47-60 D2	HL	Power indicator light	ND16-22DS/2
TC	Control transformer	BK-100	SL1,2	Limit switch	YBLX-K1/111
FR	Thermal overload relay	JR36-20	XP/XS 1,2	10-core plug	P32-10
QC	Universal switch	LW5-16D/3	XP3, XS3	5-core plug	P32-5
SB1,3,4	Button	NP2-BE101	HA	Buzzer Switch	
SB2	Handle Switch	COB61	YB1,2	Electromagnetic brake	



### 3.5.3 The principle of electric control is as below:

#### a. The operation for “UP” and “DOWN” movement of the platform

Close the Power leakage breaker QF1 ( Inside the control box) and check if the emergency stop button is released. Press the start button SB1, the touch point of the main contact will pull in and the indicate light will be on. Turn the handle of universal switch QC to the middle position and the two motors will work simultaneously. Press the ‘UP” button SB3, the touch point of the contact KM2 will pull in and the platform will be lifted. Press the ‘Down” button SB4, the touch point of the contact KM3 will pull in and the platform will be descended.

#### b. Operation for the leveling of the platform

If the platform tilts during the lifting, turn the handle of the universal switch to right or left when the related side is lower and keep press the “UP” button SB3 until the platform gets leveling.

#### c. When the power is off :

It is necessary to release the manual descending device by two operators together and then make the suspended platform moved downward to the ground smoothly.

#### d. When there is emergency situation

Press the STP button immediately to cut the control circuit.

#### e. Limit switch

When the limit switch actuates the limit plate, the motors will stop running and the suspended platform will stop simultaneously. At the same time, the alarm buzzer will ring. It is necessary to release the manual descending device by two operators together and then make the suspended platform moved downward to the position lower than the limit plate. And press the start button SB1 and make the main touch point of the contact KM1 pull in and later the operation can be recovered.

Before each use, the limit switch should be checked if normal. ( Method: Keep press the “UP” button SB3 and later touch the limit switch and find if the control circuit is cut and if the alarm buzzer will ring.)

### 3.5.4 There is **single phase type** as option. The diagram is on the page 23.

## 3.6 Steel Rope

The steel rope is special galvanized steel rope. The structure is shown in the table 1. It should be kept and maintained in a proper way to prevent corrosion and pollution, and regularly inspected for deformation and breakage. It should be discarded in the following situation:

- The loosening, twisting, untwisting, or any other deformation and distortion.
- The rope breaking number within the range of ab spacing reaches 4 (see figure 7 )
- The nominal diameter is reduced 7%.



Figure 7: Steel Rope

## **4. Installations and Adjustment**

### **4.1 Installation of Suspension Mechanism**

Check the attached figure 1: suspension mechanism (Page 17) .

**4.2.1** Insert the Tommy bars into the front base and rear base respectively. Adjust the height of the Tommy bars and tighten the bolts to form the front base and rear base. (The height should be adjusted within 1.28~1.73 m as per the height of parapet).

**4.2.2** Lead the front beam (9 holes) and rear beam (4 holes) into sleeve on front or rear base, put the middle beam between the front and rear beams and tighten the bolts and nuts.

**4.2.3** Mount the working steel rope and safety steel rope onto the coupling sleeve of the front beam. Make sure that the ends of the ropes must be clamped well.

**4.2.4** Adjust the front beam overhang and fix the upper column with Tommy bar with the bolts and make sure that it is not inclined.

**4.2.5** Adjust the distance between the front and rear bases. Adjust the three beams to make sure that the three beams should be in the same straight line. Care must be taken that the height different between the three beams must not larger than 10 cm. Moreover, it is only allowed that the front is higher than the rear.

**4.2.6** Fix the coupling sleeve on the Tommy bar of the rear base. Lead one end of the reinforcing steel rope (7m long) into the coupling sleeve of front beam and tighten the rope clamp (see section 4.7.3). Lead the reinforcing steel rope to the rope sheave on upper column and the other end through the hole of the close side of the turnbuckle, tighten the rope clamp. Adjust the screw bar of the turnbuckle and tighten the reinforcing steel rope to raise one end of front beam about 3cm.

**4.2.7** Place the suspension mechanism to its working position with the reach of front hanger plate out of the working wall space about 60cm. The distance between two front hanger plates of suspension mechanism should be larger than the length of the suspended platform, but not beyond 10cm.

**4.2.8** Place the counter weight onto the poles of the rear holder and fix them with bolts and slowly release the steel ropes.

### **4.3 Installation of Suspended Platform**

**4.3.1** Put the bottom plate flat on the ground, mount the high and low balustrades, and place the bolts and nuts (also square shims for aluminum platform) in position without tightening them for the time being.

**4.3.2** Install the caster wheel on the hoist-mounting frame. Fix the hoist-mounting frame of at the ends of suspended platform; place the bolts and nuts (also square shims for aluminum platform) in position without tightening them for the time being.

**4.3.3** Check that the installation of above parts is correct, and make sure that the high balustrade in the same line and also the low balustrade.

**4.3.4** Tighten the bolts connecting the balustrades and bottom plate, as well as the bolts connecting the balustrades together. Tighten the bolts connecting the balustrades and the hoist-mounting frame. Fix the support pulley at one side of the balustrade.

## **4.4 Installation of Hoists, Safety Locks and Electric Control Box**

**4.4.1** Fix the hoists on the hoist-mounting frame with pins and M10 bolts: insert the pin into the hole at the low end of the hoist and at the mount frame, insert the M10 bolt into the two holes at the high end of the hoist and at the mount frame.

**4.4.2** Install safety lock on the bracket of the hoist-mounting frame and tighten with bolts. Fix the limit switch onto the right position of the safety lock.

**4.4.3** Install and hang the electric control box in the middle of balustrade of the suspended platform.

**4.4.4** Insert motor plug and handle switch plug into the power socket of the electric control box. Power plug should be inserted and power cable should be connected based on three-phase five-wire system.

## **4.5 Installation of Safety rope**

The operators should be attached to the safety ropes. The other end of the safety ropes cannot be connected to the suspension mechanism on the roof. It should be fixed firmly with the building or the structure on the roof. If the safety rope touches the corner of the building or the structure, the proper measures should be taken to avoid the breakage.

## **4.6 Adjustment of Rotating Direction of the Motor**

Turn on the power supply. Turn the universal switch to one side, press the start button and then press the control button “up”. The rotating direction of the motor should run in clockwise. If not, exchange the two wires. Turn the universal switch to the other side to check the rotating direction of the other motor. Make sure that rotating directions of the motors are correct.

## **4.7 Connection between Suspended Platform and Suspension Mechanism**

### **4.7.1 Rope passing of the hoist**

Turn the universal switch to the side where the hoist is prepared for rope passing. Insert the working steel rope into the inlet of the hoist after passing between the limiting wheel and the roller of safety lock. And then press the upward button, the hoist will wind automatically to finish the rope passing and positioning of steel rope.

### **4.7.2 Rope passing of the safety lock**

Make the suspended platform rise up until the arm of the safety lock cannot be upward, and then insert the safety steel rope into upper inlet of safety lock.

### **4.7.3 Place heavy hammer**

After the completion of the connection of the steel wire ropes, hang the heavy hammer onto the ends of the safety wire ropes.

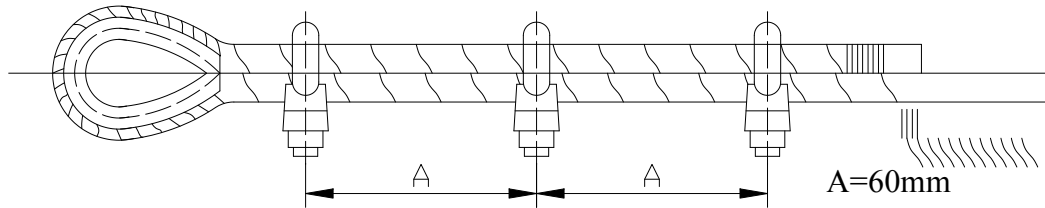
## **4.8 Special Notice**

**4.8.1** The distance between the two suspension mechanisms should be the same with the distance of the two suspension points of the platform, with the error of not larger than 10 cm.

**4.8.2** The suggested front beam overhang should be 1.3 m; the suggested distance between the front and rear should be 4.6 m. The counter weight should be placed on

the two rear beams on the average basis and fixed with the bolts.

**4.8.3** The fixing method at the end of steel rope should follow the figure 8 as below. U bolt is fixed on the rear portion of steel ropes; clamp is fixed on the working section of steel ropes, which cannot be mixed up. The steel rope clamp cannot be alternately arranged on the steel rope, and the correct clamping method is as follows:



**Figure 8: The Correct Clamping Method**

- Quantity of the clamps: 3 pieces (at least);
- Arrangement of the clamps (see figure 8 above);
- The distance between the clamps is 60 mm;
- Tightening of the clamp: the first clamp should be close to the rope ring and tightened. Care must be taken that it is not allowed to damage the steel rope when tightening, and then make the second and third clamps. It is necessary to make the clamps tightened again after the steel rope is loaded one or two times.

**4.8.4** Care must be taken that the steel ropes must not be damaged, deformed or twisted.

**4.8.5** The hoist must be fixed with the pins and bolts.

**4.8.6** Make sure that the plugs of the two motors and the control button be inserted into the sockets of the control box correctly.

**4.8.7** The power supply, connected with the control box, should have the null and earth lines and the control box should be ground contacted reliably.

**4.8.8** Make sure that the connection of the steel rope with the hoist is in normal, otherwise, stop connection for check.

**4.8.9** The remaining steel rope should be placed in order and bounded well.

**4.8.10** The 2 heavy hammers must be hung onto the bottom of the safety steel rope .

## 5. Operation

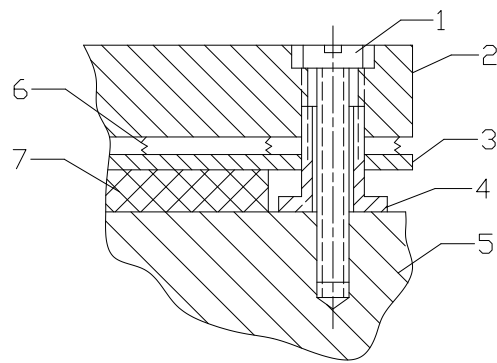
### 5.1 Checking and Adjusting after Installation

**5.1.1** Check if the connections are correct, the steel ropes are not damaged, the clamping are correct, the nuts are tightened, and the front beam overhang is in accordance with the standard. Make sure that the moment of force of the stability of the suspension mechanism is over twice than the overturning moment.

**5.1.2** Check if the wiring is correct. The voltage of power should be within the range  $\pm 5\%$ . After the power is connected, push the testing button on the power leakage breaker, and power leakage breaker should work swiftly. Close the door of electric control box, and inspect if handle switch, universal switch and motor is normal.

**5.1.3** Checking electromagnetic brake:

- a. The spacing between the armatures and the electromagnetic disk should be within 0.8-1.0 mm (see figure 9). First, loose inner hexagon screw (1) then adjust the spacing by turning hollow screw (4). Finally, tighten inner hexagon screw (1).
- b. Power on to check the operation of electromagnetic armature, the armature must separate with friction disc completely after being absorbed, and no clog after power is off. The armature should press the spring disc completely under the force of spring.



**Figure 9: Electromagnetic Brake**

- |                        |                         |
|------------------------|-------------------------|
| 1. Inner hexagon screw | 2. Electromagnetic disk |
| 3. Armature            | 4. Hollow screw         |
| 5. Motor cover         | 6. Spring               |
| 7. Friction disk       |                         |

**5.1.4** Checking safety lock: move the suspended platform upward about 1-2 m and make its one end inclined about  $3^{\circ} \sim 8^{\circ}$ , the safety lock should be actuated to lock the safety steel rope.

**5.1.5** Make the suspended platform upward and downward 3-5 times for at least 5 m travel and check:

- a. The noise of the hoist should be normal and the electromagnetic brake will be actuated reliably.
- b. Press emergency stop button or pull the limit switch, the suspended platform will stop moving immediately.
- c. Make the suspended platform horizontal, if necessary.

**5.1.6** Checking manually descending: move the suspended platform upward for about 3-5 m and stop it. Pull the manual descending device, the suspended platform can move downward smoothly.

**5.1.7** Adjustment of the upper limit stopper: move the suspended platform upward to the highest position. Fix the limit stopper and adjust the location of the limit switch and make sure that the limit switch will be actuated normally.

**5.1.8** Rated load testing: The rated load should be evenly distributed on the working platform. In the operating process no abnormal sound, and when stopping no sliding movement. The safety lock should lock the safety steel rope flexibly and reliably when the platform is in tilting.

## 5.2 Operation Procedure

**5.2.1** Turn on the power supply.

**5.2.2** Press the starting button.

**5.2.3** Double hoists operation: turn universal switch to the middle position and press the control button.

**5.2.4** Single hoist operation: turn universal switch to the side of the operating hoist and press the control button.

**5.2.5** After the work completed, cut off the power supply and make sure the control box is locked.

## 5.3 Safety Operation Regulations

The suspended access equipment is special equipment operated at the certain height, so it is very important to pay more attention to the safety operation. After installation, it is necessary to follow the procedures of 5.1 last page for checking and adjusting. Besides, the following safety operation regulations should be followed:

**5.3.1** The suspended access equipment should only be operated and maintained by qualified personnel with adequate technical training.

**5.3.2** The operators should read the operation manual and check the equipment carefully before operation strictly follow the safety regulations and “Daily Check Items” (see section 7.2) during the operation and maintenance of the equipment.

**5.3.3** The operators should wear safety helmets and should be fastened with rope lifeline with the self-lock device. Moreover, the rope lifeline should be fixed independently on the attachment over the operating area.

**5.3.4** It is not allowed to use the equipment overloaded or with troubles (the rated weight including the weight of operators). The load should be evenly distributed on the platform. The loaded weight must be decreased as the working height, the front beam overhang or the distance between the front and rear holders change. Furthermore, the loaded weight must be decreased further if the wind force is stronger. Make sure that the moment of force of the stability of the suspension mechanism is over two times of the overturning moment.

**5.3.5** It is not suggested to install the platform over the rated length or use the two platforms together. And it is also not allowed to assembly the suspended platform with the parts and elements from different manufacturers.

**5.3.6** The limit switch, emergency stop button, electromagnetic brake and manual descending device should be sensitive and reliable.

- a. When the platform is in its normal operation, it is prohibited to manually break the motors or safety lock, so as to prevent any accident from happening.
- b. The emergency stop button is the self-lock one, it is necessary to be rotated in clockwise to make the button out when reset.
- c. It is necessary to press the starting button to move the platform after the limit switch or the emergency stop button is pressed.
- d. When the limit switch is activated, the operation of platform will automatically halt and the alarm bell will ring. Under this circumstances, lower the platform promptly to have the limit switch be away from the limit stopper.

**5.3.7** During operation of platform, the operator should keep an eye on the platform's operation condition and promptly shoot any hidden trouble possibly leading to accidents.

**5.3.8** The platform should be adjusted promptly if it is tilting and the height difference of two ends should be no higher than 15cm. And otherwise, it will affect the operation of the safety lock.

**5.3.9** It is not allowed to use ladders, boxes, or other tools to obtain increased height. Never use additional extensions to exceed the permissible length of the platform.

**5.3.10** It is not allowed to make use the platform as the elevator for people or goods and also it is not allowed to mount any hanging device in the platform.

**5.3.11** Once the hoist is blocked during operation, it is not allowed to move the platform. Fix the platform first and make sure it is safety, then check and eliminate the troubles.

**5.3.12** In case of working steel rope breakage during operation, the personnel in the platform should keep calm and leave the platform under the prerequisite of ensured safety. After maintenance and repair personnel enters the platform, the first thing to do is to take anti-dropping measures by having the clamp of safety steel rope hold the platform or by fastening the platform with the steel rope secured on the building roof. Then, pull the replacing steel rope through the hoist, and press the up button to have the platform move upward. If the suspended access equipment works normally, release the safety lock cautiously, detach the fixing steel rope and lower the platform down to the ground. It will not be put into operation again until it passes the stringent inspection.

**5.3.13** In case of power break during operation shut down the power first. If it is necessary to have the suspended platform lowered back onto the ground, operate manual descending device to have the platform lowered smoothly onto the ground.

**5.3.14** Site environment:

- a. No high voltage line within the 10 meters;
- b. It is not allowed to use the equipment in thunderstorm, fog or the wind of grade 5 (wind speed 8.3m/s) or higher;
- c. Make sure that the welding spark will not affect or damage the steel rope;
- d. Temperature required:  $-20^{\circ}\text{C}\sim+40^{\circ}\text{C}$ ;
- e. Error of the voltage:  $\pm 5\%$ .

**5.3.15** The suspended access equipment should avoid contacting corrosive gas and liquid. If there is no alternative available, anti-corrosion and segregation measures should be taken in its operation.

**5.3.16** Cut off the power supply, lock the control box and clean the equipment after completion of the operation. It is not allowed any foreign, dirty matter or water entering into the motor, safety lock, electromagnetic brake and control box.

**5.3.17** The working steel rope and safety steel rope should not be bent and should be prevented from the contamination of mortar and other foreign materials. They should be replaced as required by the operation manual in case of cracking, breaking, peeling, distortion, flossing and corrosion. The safety steel rope should be prevented from contacting grease or oil.

**5.3.18** The safety lock should be checked and its moving parts should be lubricated regularly during its service life and it should not be dismantled without authorization.

**5.3.19** Special attention should be paid to mark limit effective of the safety lock. When the steel rope is removed from platform, it should be winded to form a bundle and be stored properly.

## **6. Common Failures and Troubleshooting**

### **6.1 Suspended platform cannot stop in ascending**

Press the emergency stop button or touch the head of limit switch to stop the platform at first.

Cause 1: The main contact point of AC contact disengages. Replace it.

Cause 2: Control button fails. Replace it.

### **6.2 Suspended platform cannot stop in descending**

Press the emergency stop button or pull the limit switch to stop the platform at first.

Cause 1 and 2 are the same as 6.1.

Cause 3: The electromagnetic brake fails

a. The space between the electromagnetic disk and the armature is too big.

Adjust the space according to chapter 5.1.4.

b. Too small contact area between the friction disk and the armature.

Check if the space between the friction disk and the armature is well-distributed; otherwise, replace the disk or the armature.

c. Slipping between the friction disk and the armature because of the water or oil. Clean.

Cause 4: The steel rope is slipping in the hoist.

Repair the hoist.

### **6.3 Suspended platform cannot be start or cannot ascend and descend.**

Cause 1: Check the limit switch: Sometimes the platform cannot be start and you find the contact KM2 and KM3 of the electric control panel suction are not abnormal, you should check if the wiring of the limit switch gets loose. Rewire it.

Cause 2: Power supply is abnormal

a. Power leakage breaker disengages.

Check to see if any leakage, and take preventive measurements.

b. Phase lacking.

Check if the 3-phase power is normal and reconnect.

Cause 3: Failure of control circuit:

a. Control transformer or control button damaged.

b. Thermal overload relay breaks or damages.

When you start the platform, several minutes later the contact is closed and after several minutes, it recovers, but it will repeat.

Use a screw driver to set the larger value. If it doesn't work, consider to replace it.

c. Universal switch is not in good contact. Replace.

Cause 4: The steel rope is blocked in the hoist. Fix the platform and examine & repair hoist.

### **6.4 The 2 hoists cannot actuate the platform**

Cause 1: Rectifier is broken. Replace.

Cause 2: Voltage is too low. When you turn the universal switch to one side, the hoist in the side can be actuated, but to the middle, the two hoists cannot be actuated. Adjust voltage or as per chapter 5.1.2, change the output voltage of transformer to 45V.

Cause 3: The transmission unit of hoist is broken. Check and repair the hoist.



### **6.5 Abnormal noise of the motor or the motor is hot.**

Cause 1: Phase lacking. Check power supply.

Cause 2: Rectifier is broken. Replace.

Cause 3: Voltage is too high or too low. Adjust

Cause 4: The screws of the electromagnetic brake get loose or lost. Tighten or replace.

Cause 5: Bearing damaged. Replace.

### **6.6 Safety lock slip or locking angle is too big**

Cause 1: Oil dust on the safety steel rope. Clean or replace the steel rope.

Cause 2: Problem with rope clip. Replace.

Cause 3: Slow motion in safety lock. Replace torsion spring of safety lock.

If you cannot repair the safety lock, we suggest you to replace the safety lock when it is broken.

## **7. Maintenance**

The daily maintenance and check, before operation of the equipment, will be done by the operators and check periodically by the qualified personnel. The maintenance and the check should be recorded.

### **7.1 Daily Maintenance**

#### **7.1.1 Safety lock**

- a. Cleaning the surface;
- b. Cleaning the surface of the steel rope and clear out the rust;
- c. Prevent the water and dirty matter from entering the lock.

#### **7.1.2 Hoist**

- a. Cleaning the surface;
- b. Cleaning the surface of the electromagnetic brake and the end cover of the motor by removing the cover of the motor;
- c. Cleaning the surface of the steel rope and clear out the rust;
- d. Prevent the water and dirty matter from entering the hoist and motor.

### **7.2 Daily Check**

- a. Reliability of the safety lock;
- b. Emergency stop and limit switch;
- c. Reliability of the electromagnetic brake;
- d. Sensitive of the manual descending device;
- e. Steel rope, rope clamp and connections;
- f. Making the suspended platform move upward and downward 3-5 times with the travel of about 3-5 meters;
- g. Following the “Daily Check Items” (see attached table 2), check twice every day (morning and afternoon). It is not allow to use the suspended platform with any troubles.

## 7.3 Check Periodically

The safety lock must be re-calibrated in six month from the date of the delivery by the manufacturer; and the hoist must be checked by the qualified person.

Generally, the equipment should be checked at an interval of 2 months depending on the application condition and the working period. After the end of use of entire machine, a thorough keeping and examination should be done.

### 7.3.1 Hoist:

- a. Replace the oil in the gear reducer: Synthetic Oil, Oil No.: 220# and 0.8-1.0 kg; first replace in 20-30 days, then replace in three or six months intervals. Check the wear-out condition of the worm and gear.
- b. Clearing out the dirty matter by removing the cover of the hoist; cleaning the gear and replace the grease; check the wear-out condition of the bearing assembly, guide roller, steel ring and press pan.
- c. Cleaning the electromagnetic by removing it; check the wear-out condition of the armature and the brake disk. Replace if the armature is deformed or the thickness of the brake disk is less than 10 mm.

**7.3.2** Safety lock: check if the arm action of the lock and the rotation of the roller are sensitive.

**7.3.3** Electric control box: the isolated resistance should be less than  $2M\Omega$ ; check the electric elements and the connecting wire; replace the elements, if necessary, based on the diagram; check the system condition with power on.

**7.3.4** Check if the working steel rope and safety steel rope are in good condition.

**7.3.5** Check if the suspended platform and the suspension mechanism are deformed or damaged; if there is any crack and fracture in welding of the structure. Repair or reject if necessary.

## 8. Storage, Packing and Transportation

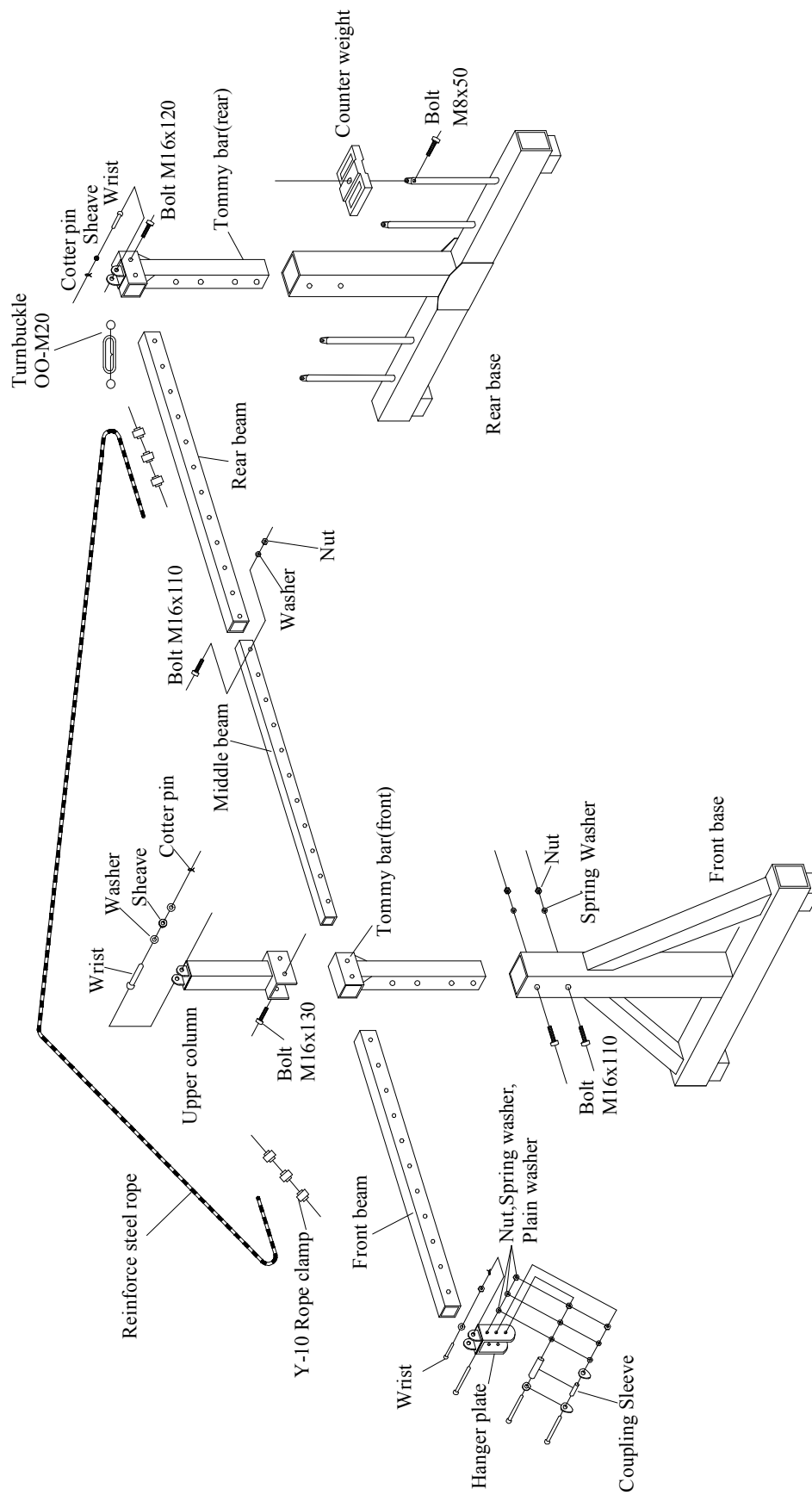
The equipment should be stored in the dry and ventilating storehouse to prevent it from rusting. It is necessary to make the maintenance if it is stored for one-year period. The hoist, safety lock and the electric control box should be packed separately. The steel ropes should be bounded and packed for transportation. Care must be taken that the bottom plate of the platform, balustrades, mount frame for hoist and the suspension mechanism should not be deformed when loading and transportation.

## 9. Documents

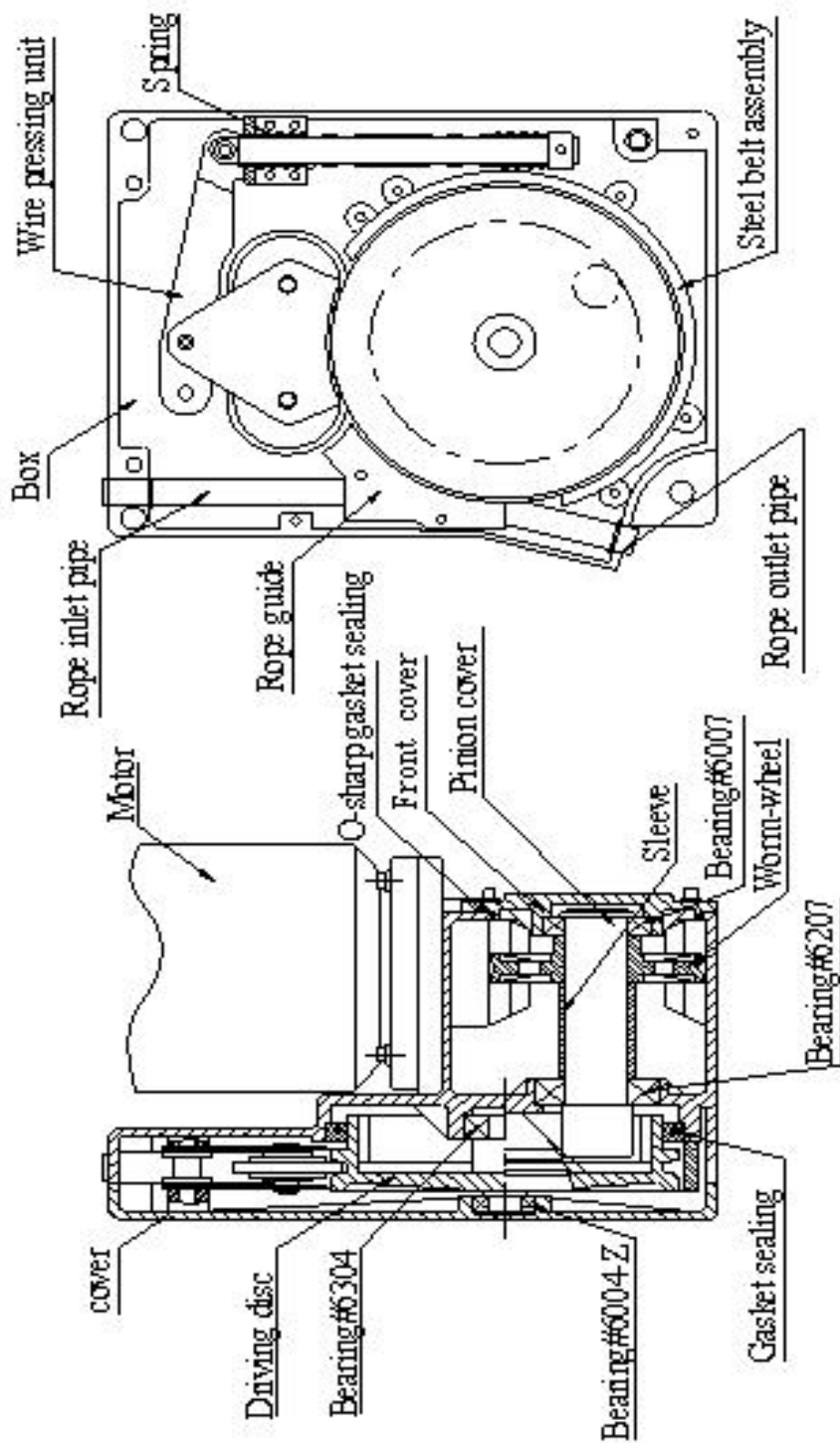
- |                                   |          |
|-----------------------------------|----------|
| a. Packing list                   | one copy |
| b. Operation manual               | one copy |
| c. Quality inspection certificate | one copy |

## 10. Attached Table and Figure

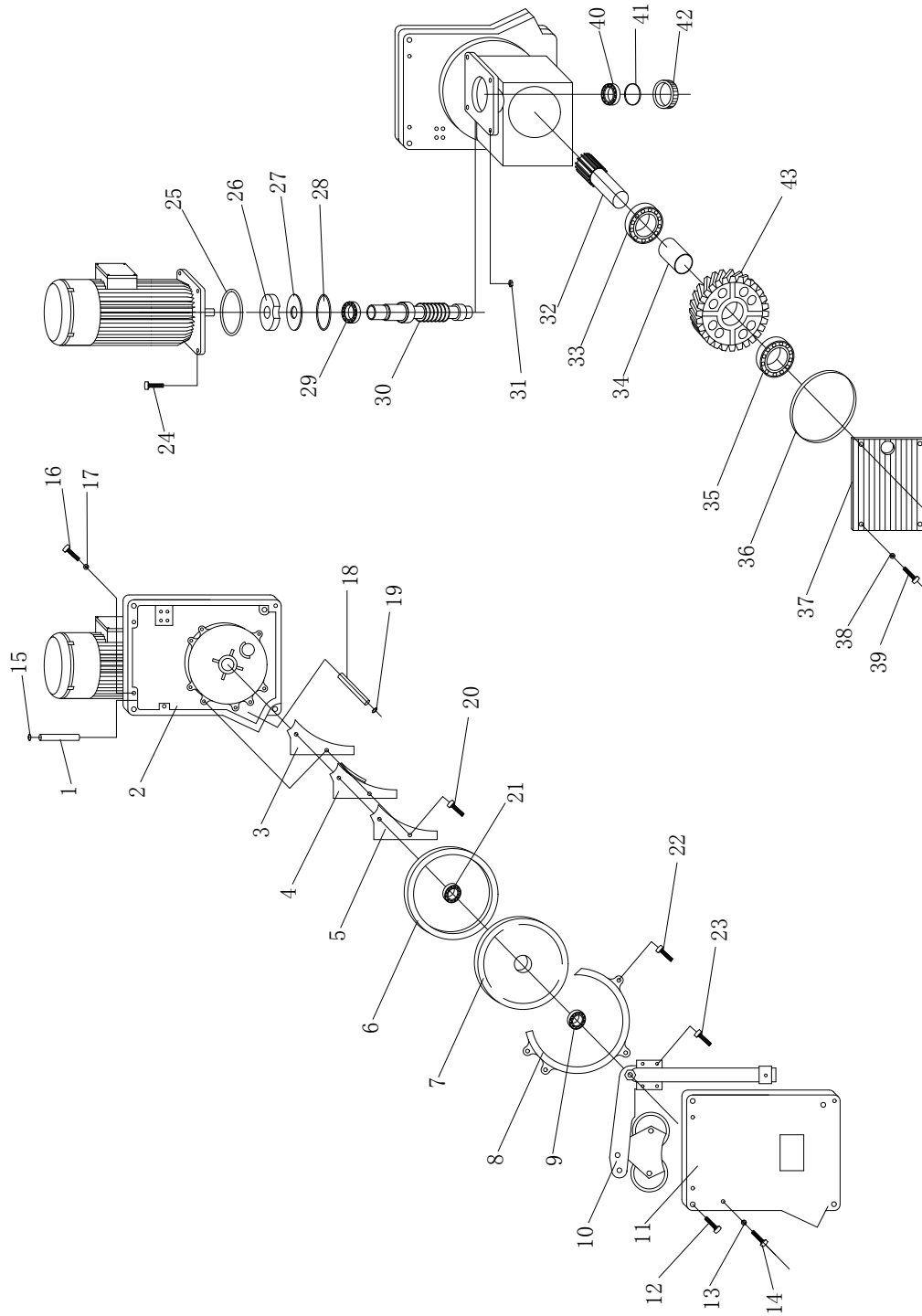
Attached Figure 1: Suspension Mechanism



Attached Figure 2: Hoist Structural Diagram



Attached Figure 3: Hoist Exploded View



Components List Table for LTD6.3 Hoist (Page 19)

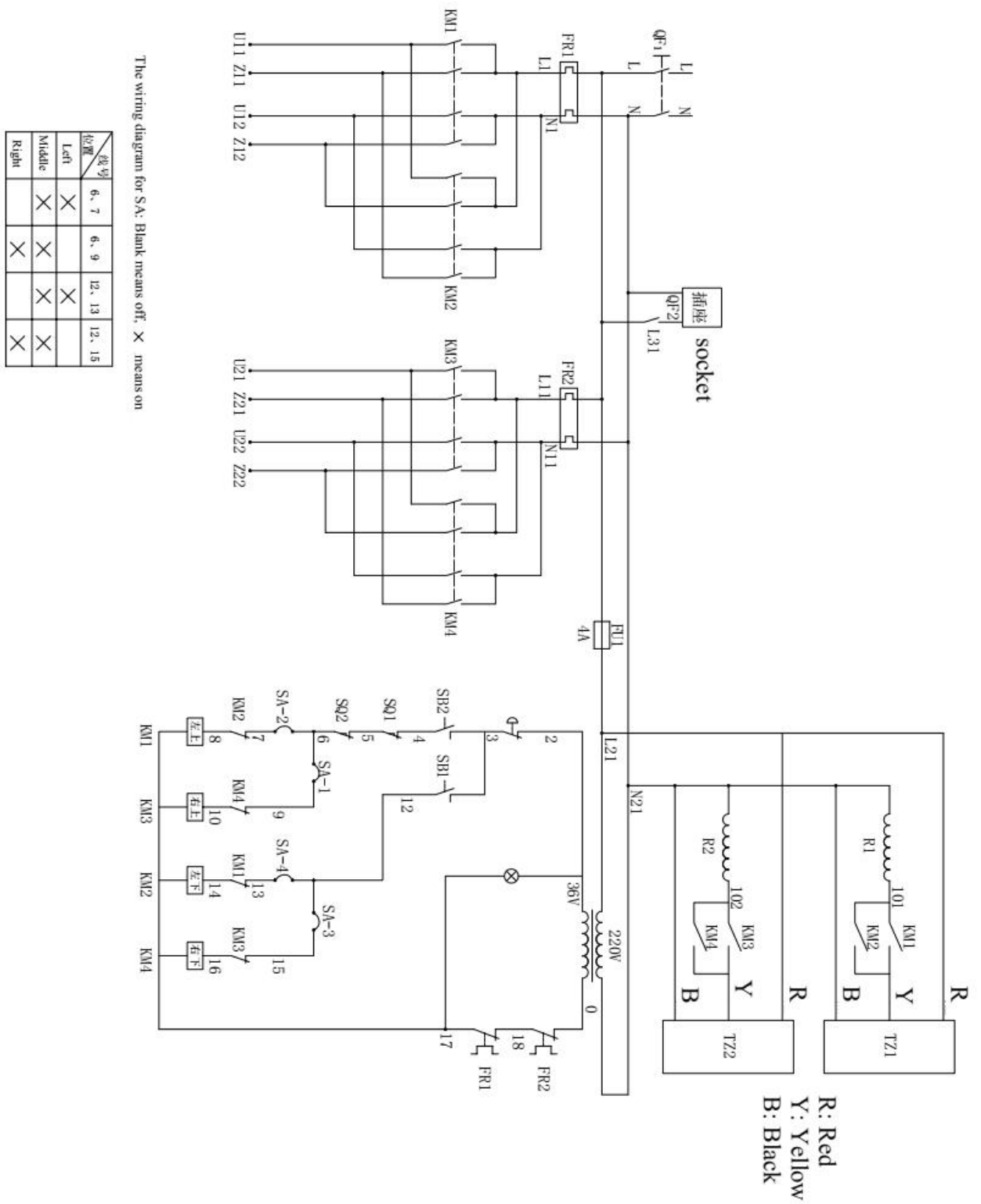
No.	Name	Specification	Qty.	No.	Name	Specification	Qty.
1	Rope inlet pipe		1	23	Screw	M6×30	4
2	Box		1	24	Bolt	M8×35	4
3	Base plate of rope guide		1	25	O-shape gasket sealing	35510460	1
4	Rope guide		1	26	Centrifugal Speed limiter		1
5	Cover of Rope guide		1	27	Gasket sealing	B47×25×7	1
6	Gasket sealing	B230×200×15	1	28	Shield ring	GB893.1-86-37	1
7	Driving disc		1	29	Bearing	#6005-2Z	1
8	Steel belt assembly		1	30	Worm		1
9	Bearing	#6004-Z	1	31	Nut	M8	4
10	Wire pressing unit		1	32	Pinion shaft		1
11	Cover		1	33	Bearing	#6007	1
12	Bolt	M10×90	2	34	Sleeve		1
13	Washer	Φ6	3	35	Bearing	#6207	1
14	Screw	M6×25	3	36	O-shape gasket sealing	35513600	1
15	Shield ring	GB894.2-86-18	1	37	Front cover		1
16	Screw	M6×70	3	38	Washer	Φ6	4
17	Washer	Φ6	3	39	Screw	M6×30	4
18	Rope outlet pipe		1	40	Bearing	#6303-2Z	1
19	Shield ring	GB894.2-86-18	1	41	Shield ring	GB893.1-86-37	1
20	Screw	M6×45	2	42	Sealing cover		1
21	Bearing	#6304	1	43	Worm-wheel		1
22	Screw	M6×25	4				



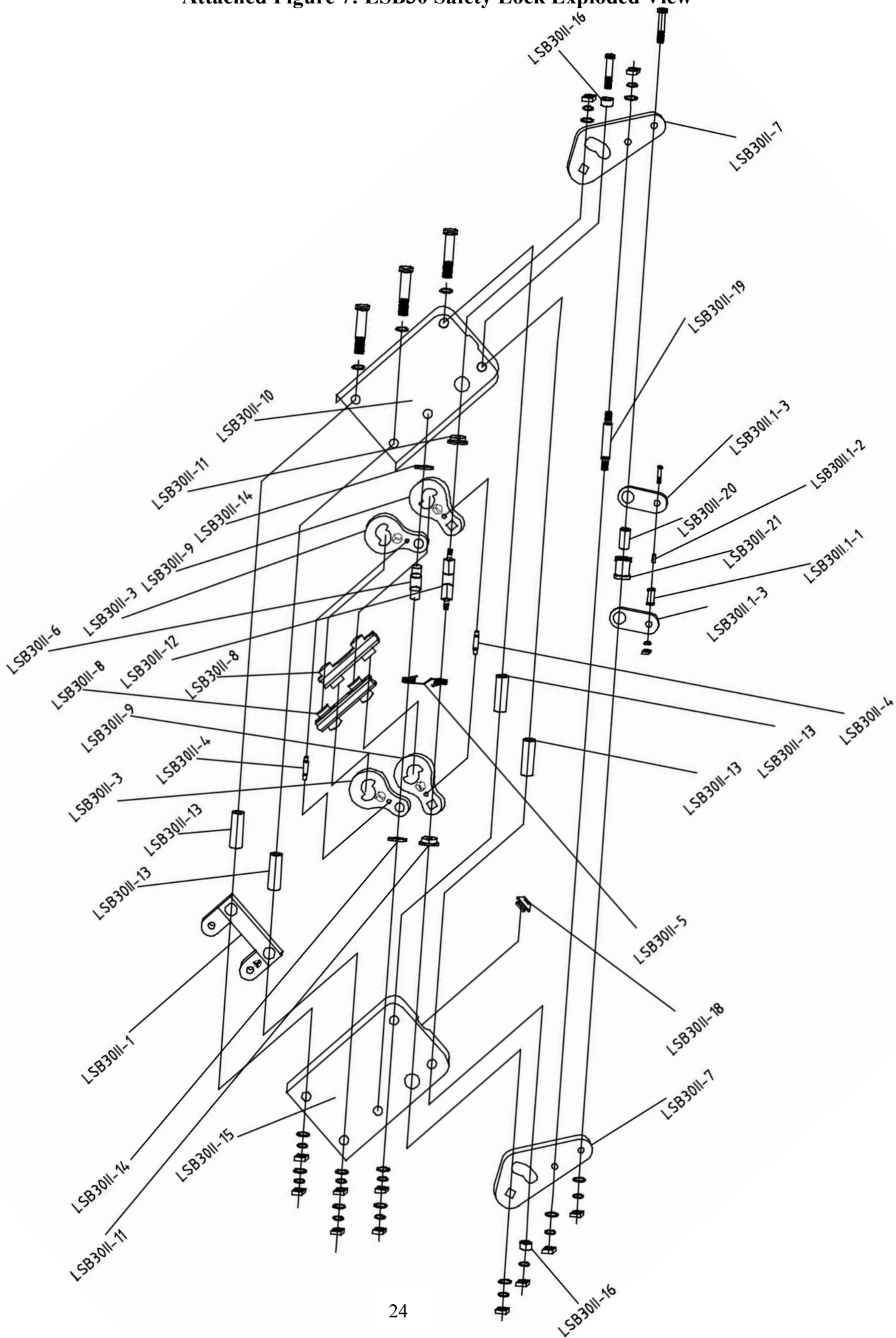




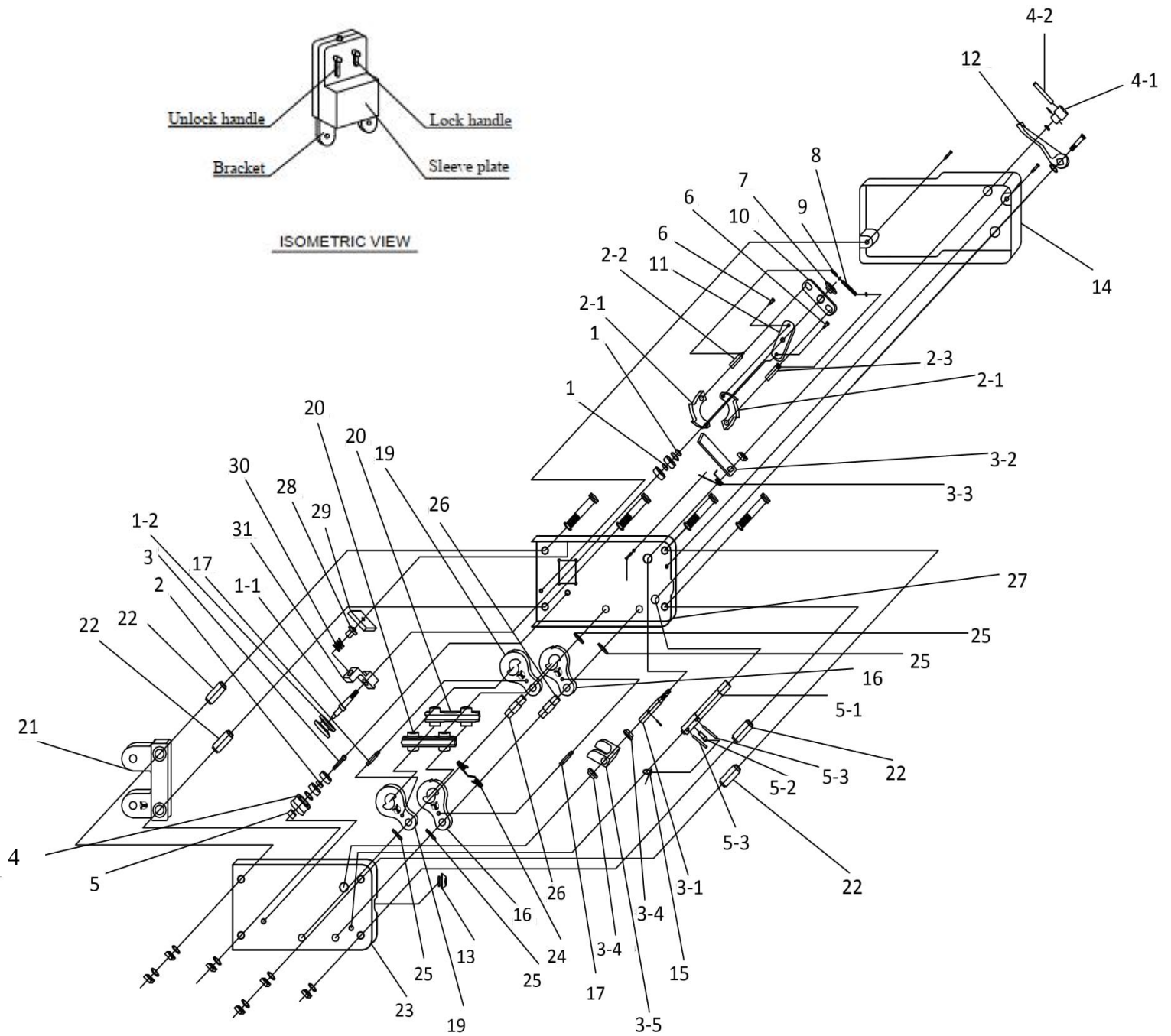
Attached Figure 6: Electric Control Schematic Diagram for Single Phase



**Attached Figure 7: LSB30 Safety Lock Exploded View**



Attached Figure 8: SL30 Safety Lock Exploded View



**Components List Table for LSB30 Safety Lock (Page 24)**

No.	Code	Name	No.	Code	Name
1	LSB30II-1	Bracket	12	II-13	Big Pin
2	II-3	Clamp Plate	13	II-14	Stainless Steel Washer
3	II-9	Clamp Plate with Square Hole	14	II-16	Washer
4	II-8	Rope Clamp	15	II-18	Rope Inlet
5	II-4	Small Pin	16	II-19	Double End Bolt
6	II-5	Torsion Spring	17	II-20	Long Shaft Sleeve
7	II-6	Pin	18	II-21	Big Roller
8	II-10	Casing Right	19	II-7	Swing Arm
9	II-15	Casing left	20	II.1-3	Connecting Plate
10	II-11	Square Gasket	21	II.1-1	Small Roller
11	II-12	Square Tenon Pin	22	II.1-2	Short Shaft Sleeve

**Components List Table for SL30 Safety Lock (Page 25)**

Code	Name	Code	Name
SL30-1	Spacer bush 1	9	Tension Spring
1-1	Axle	10	Position Limitation Plate
1-2	Roller	11	Connecting Plate
2	Spacer Bush 2	12	Unlock Handle
2-1	Spines Block	13	Rope Inlet
2-2	Upright Pin	14	Cover
2-3	Upright Pin 2	15	Unlock Torsion Spring
3	Mandrel	16	Coupling Clamp plate
3-1	Axle	17	Small Pin
3-2	Fork Bar	19	Clamp Plate
3-3	Spring	20	Rope Clamp
3-4	Axle Sleeve	21	Bracket
3-5	Pressure Block	22	Big Pin
4	Roller	23	Casing Right
4-1	Base Support	24	Rope Clamp Spring
4-2	Lock Handle	25	Copper Shim
5	Spacer bush 3	26	Pin
5-1	Rotation Axle	27	Casing Left
5-2	Baffle Pillar	28	Spring Guide Pillar
5-3	Fork Bar	29	Baffle Plate
6	Screw	30	Spring
7	Nut	31	Bearing Carrier
8	Screw Threaded Rod		

**Attached Table 1: List of Fragile Parts**

No.	Item	Installation part	No.	Item	Installation part
1	Steel rope	Working and safety steel rope	7	Centrifugal speed limiter	Hoist
2	Braking friction disc	Electromagnetic Brake of Motor	8	Rope pressing unit	Hoist
3	Armature	Electromagnetic Brake of Motor	9	Rope guide	Hoist
4	Rectifier module	Junction box of Motor	10	Steel belt assembly	Hoist
5	Sleeve plate	Safety lock	11	Rope inlet pipe	Hoist
6	Rope clip	Safety lock	12	Rope outlet pipe	Hoist

**Attached Table 2: Daily Check Items**

Item	Contents	Result	Item	Contents	Result
<b>Steel rope</b>	Any damage (broken, deformation, slacking or bending)		<b>Hoist</b>	Connections with the endstirrup	
	Dirty with oil			Oil leakage	
	Get rust and worn-out		<b>Platform Running</b>	Any abnormal noise when the platform moves upward and downward for 3-5 m in 3 times	
	Rope clip slacked			Horizontal level	
<b>Suspension mechanism</b>	Counter weight lost or damaged			Plug and socket connection	
	Screws Connections		<b>Electric control box</b>	Electric cable	
	Fixation			Power Indicate light	
<b>Working platform</b>	Screws Connections			Universal switch	
	Tube damaged or rust			AC contactor	
	Crack in welding			Limit switch	
<b>Safety lock</b>	Lock rope is reliable if platform is inclined			Emergency stop	
	Sensitive in action		<b>Comments and suggestions:</b>		
<b>Electromagnetic brake</b>	Spacing		<b>Checked by:</b> _____ <b>Date:</b> _____		
	Action blocked or not				
	Braking reliable				
	Manual descending device is sensitive				