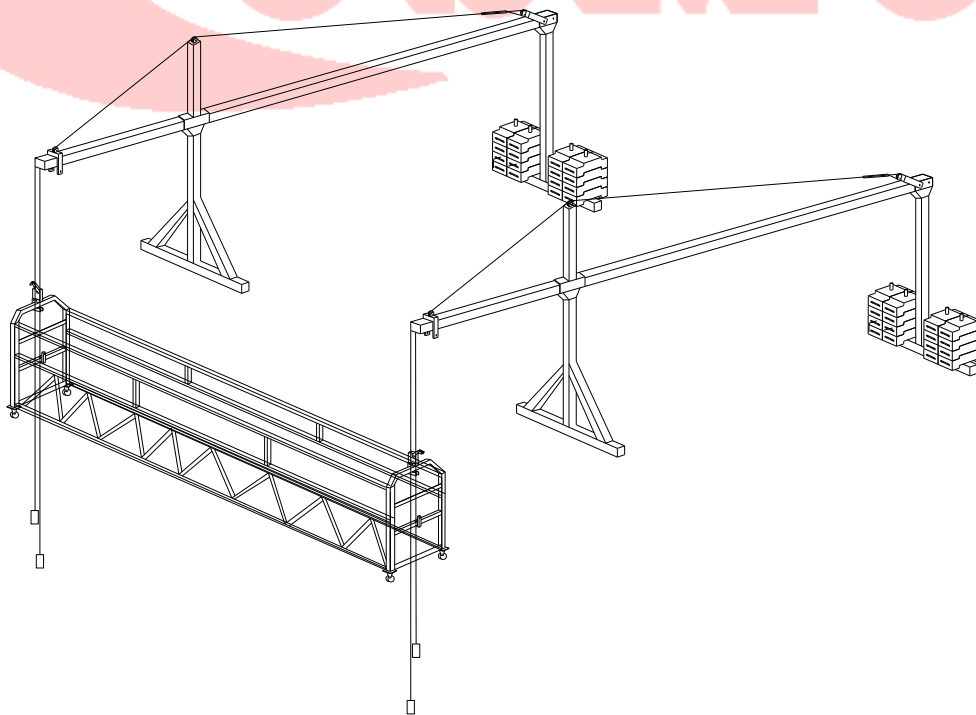

Temporarily Installed Suspended Access Equipment

OPERATION INSTRUCTION for ZLP 630 and ZLP 800 Suspended Access Platforms



Content

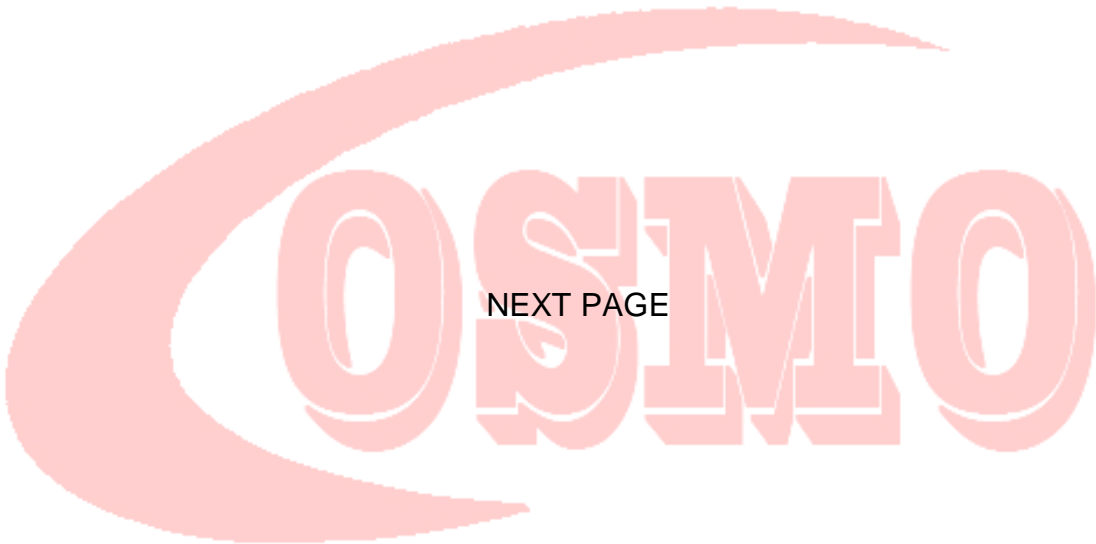
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1. Brief Description

ZLP series Temporarily Installed Suspended Access Equipment is an ideal working access for façade works of high-rising buildings as facade construction, decoration, maintenance and so on. And it is also widely used into 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. It can take the place of construction scaffolding, improve the efficiency and save cost. Above all, Platforms provides workers a safer, easier and more efficient working access.

1.1 Model Description

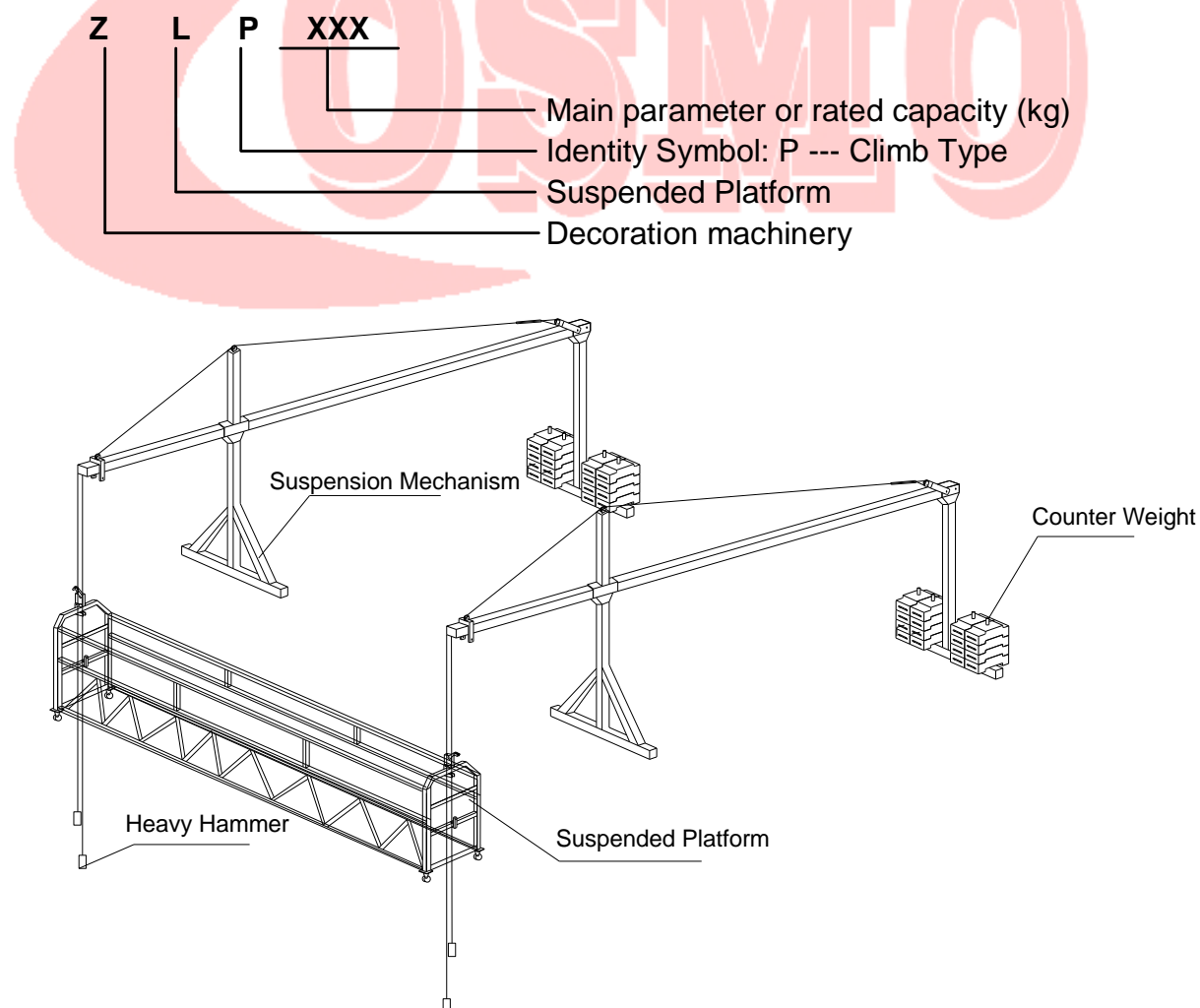


Figure 1 Whole Set of Suspended Platform

2 Safety Advice

Attention!!!

Follow all instructions and safety regulations contained in this manual to avoid injuries.

Safety Advice

1. Only hoists, Safety locks, fall arrest devices, ropes, anchoring devices as well as leads and control cables in good condition must be used.
2. Before starting with the assembly, please check that all parts are complete and defect-free.
3. Anchor hoist and Safety lock fall arrest device so that the lifting or safety ropes are vertical.
4. Only anchor hoist and Safety lock fall arrest device at the points provided for this purpose (connection rods, anchor points, or load pins).
5. When using self-locking nuts please observe the following:
 - the screw must protrude from the nut with at least half of its thread diameter;
 - do not re-use nuts if they can be unscrewed by hand!
6. DO NOT overload the hoist.
7. Use only the prescribed rope in perfect condition. Use only normally commercially available multi-purpose greases for the required lubrication of the rope. Do not use any lubricants containing disulphide.
8. When using a rope other than the prescribed rope, the warranty entitlement shall not apply.
9. Checks and repairs to the electrical system must only be performed by qualified electricians.
10. Other checks and repairs must only be performed by .
11. shall assume no liability for damage as a result of conversions and

alterations to the devices supplied by itself or as a result of the use of non-original parts.

12. All pictures shown in this manual just for reference, handling should depend on specific products.

13. Trapping hazards may be caused when the clearance between the TSP (TEMPORARY SUSPENDED PLATFORM) and the building is less than 500mm.

14. Before using the equipment, the operator must read and fully understand this "User Manual". Operator must check carefully before starting, according to this regulation. After operation, good maintenance is required.

15. When platform is at height, do not touch manual descent instrument or fall arrest devices if unnecessary. Do not attempt to climb across the platform due to serious injuries may caused.

16. The platform can not work in dusty, caustic and strong wind environment ("Out of service" wind speed 45km/h).

17. Ensure that the ambient temperature is between +55°C and -10°C.

18. There must be at least 3 persons on the SAE while operation.

Exemption Clauses

We are not responsible for following situations:

1. Any injuries to person or damage to property caused by improper operations or actions against this manual.
2. Injuries or damage caused by people, who are not familiar with suspended access equipment or did not get professional training.
3. Damage resulted from rough handling during shipment.
4. Damage or loses caused by force majeure.

3. Main Components

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 2 as below).

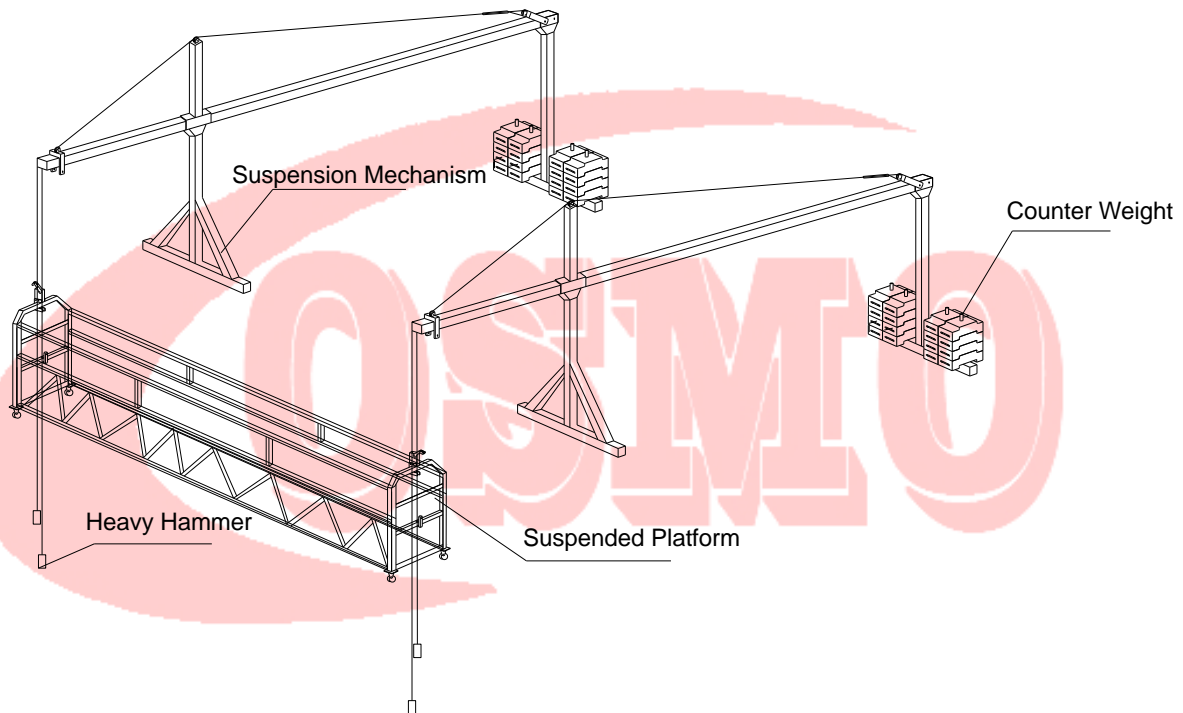


Figure 2: Temporarily Installed Suspended Access Equipment

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. It is designed for all series suspended platforms.

3.1.1 Structure of Suspension Mechanism:

Allow for adjustment of beam length to accommodate different roof obstructions. Suspension mechanisms contain followings (See Figure 3):

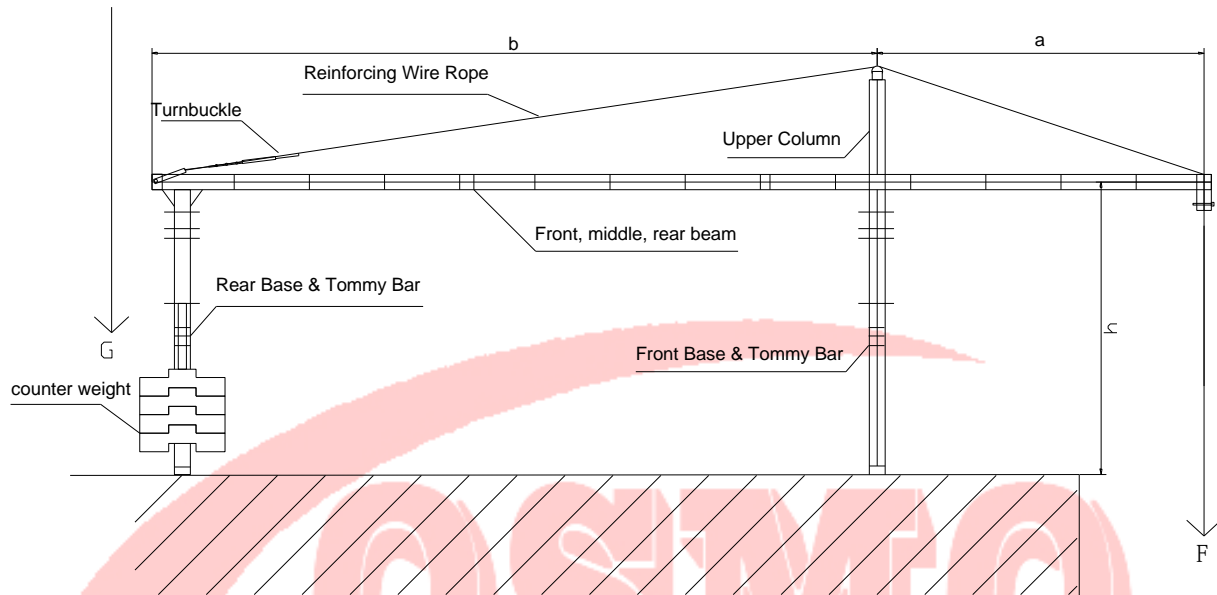


Figure 3 Structure of Suspension Mechanism

3.1.2 The suspension mechanism shall meet the following formula:

$$n = \frac{G * b}{F * a} \geq 2$$

n----- Safety coefficient against overturning;

G----- Weight of counter weight in kg;

a----- Front beam overhang in m;

F----- Total weight in kg of the platform, hoists, electric control system, safety lock, steel rope and rated load, plus wind pressure;

b----- Distance in m between the front base and rear base.

The permissible load should be adjusted according to the height, front beam overhang, distance between the front base and rear base and other variables

3.2 Suspended Platform

Suspended platform is the workplace at heights for the workers. A modular system gives you the flexibility you need to mix and match sections to achieve different lengths. With caster wheel fitted underneath, the platform is easy to move.

3.2.1 Main Components of Suspended Platform (see Figure 4)

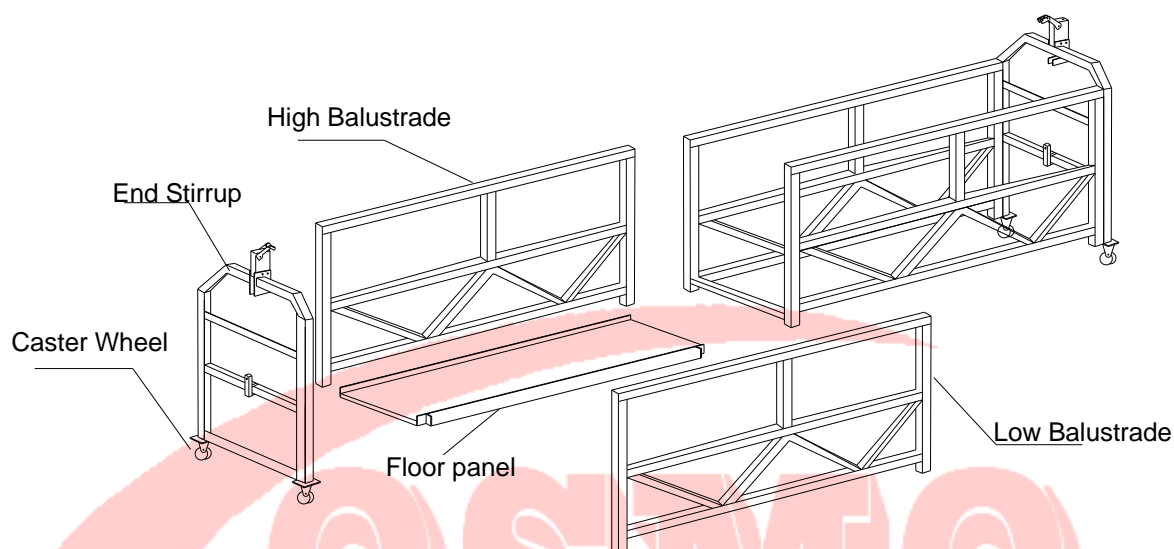


Figure 4: Suspended Platform

3.3 Hoist

3.3.1 Hoist

Hoist is a perfect electric powered hoist for man-riding applications. We designed and built to every traction hoist the durability, versatility and serviceability, critical to getting the job done, with minimum downtime.

Controlled descent: all hoists are equipped with controlled descent to lower the platform in case of power failure. The manual release to the electro mechanical brake allows the hoist to descent at a controlled speed that is lower than normal operating speed.

Hoist is a robust, heavy-duty hoist, ideal for use in any suspended platform application.

3.3.2 Technical Parameters

Model	Unit	ZLP630	ZLP800
Capacity	Kg	630	800
Rope speed	M/min	9.6	8.2
Wire rope	Φmm	8.3	8.3
Weight	Kg	48	52
Voltage	V	380	380

Frequency	Hz	50	50
Output	KW	1.5	1.8

3.3.3 Working Principle

Hoist is installed on suspended access equipment with which it moves up and down on wire ropes. For either lifting or lowering there is one corresponding push button. The wire rope is driven through the winch with constantly equal safety, and the length of wire rope i. e. the possible pulling length, is practically unlimited.

3.3.4 Main Components (See following Figure 5)

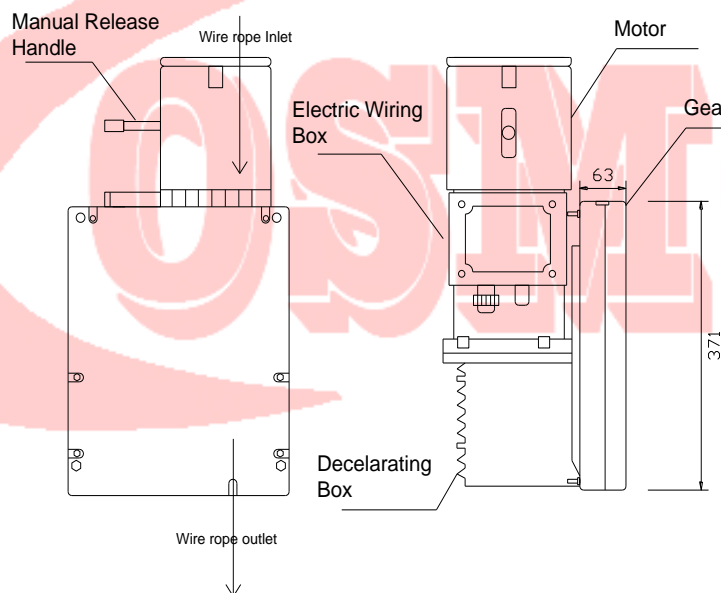


Figure 5 Main Components of Hoist

3.4 Fall arrest device

Suspended access equipment must be equipped with a **fall arrest device**, which secures the load against falling **with a safety rope**.

3.4.1 Safety Lock® Fall Arrest Device

The modules used are described below:

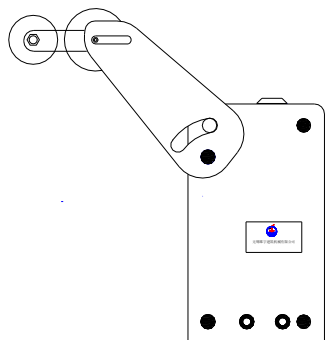


Figure 6 Safety Lock

This fall arrest device is opened by the loaded lifting rope and secures the suspended access equipment against:

- Rupture of the lifting rope,
- Failure of the hoist,
- Interlocking/becoming caught during downward travel with the result that the lifting rope is no longer under tension,
- Inclined position of more than the maximum admissible 8° (on suspended platforms with the two hoists attached at the ends).

Technical Parameter

Model	Structural principle	Wire rope	Permission Impact	Locking rope distance of free fall	Triggering angle
LSB30	Anti-tilting	Φ8.3mm	30kN	≤100mm	3°~8°

3.5 Electric Control System

Electric control system consists of an electric control box and a manual switch. (See Figure 7) Totally, on electric control box, there are 4 buttons and a 220V, 50Hz outlet for necessary use designed as below:

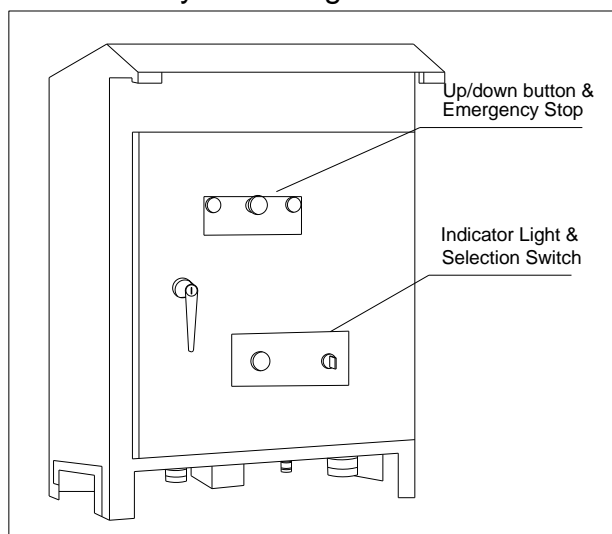


Figure 7: Electric Control System

3.6 Over-speed limiter

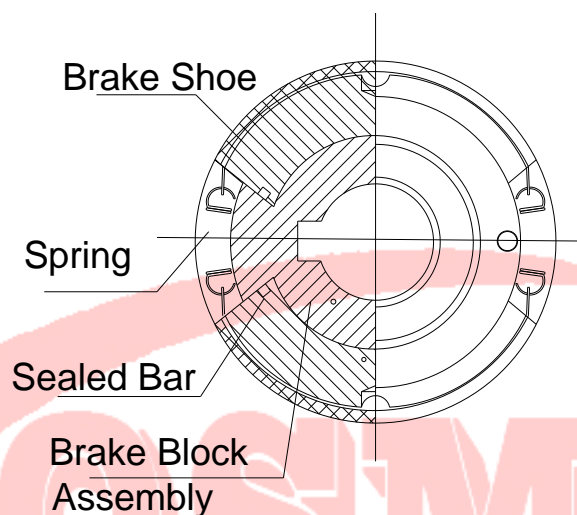


Figure 8 Over-speed Limiter

Over-speed limiter is mounted in the hoist and ensures the TSP (TEMPORARY SUSPENDED PLATFORM) is falling in a safety even speed while manual descent in emergency.

4. ZLP series Products

4.1 ZLP630 and ZLP800

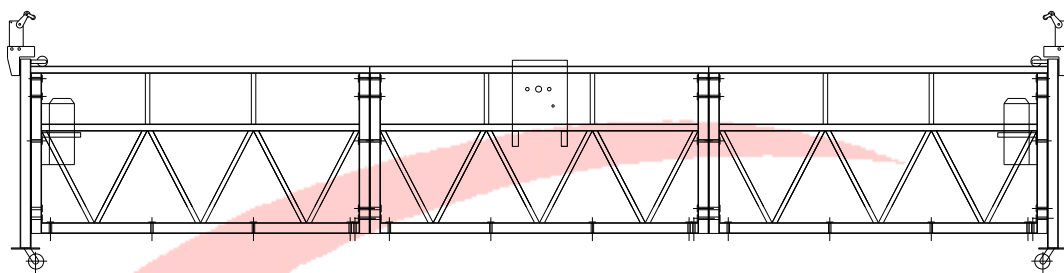


Figure 9 ZLP630 & ZLP800

ZLP630 or ZLP800, it is steel structure platform with 630 or 800kg rated load capacity and 7.5 meters detachable stages. For the extreme stability and economical design, ZLP630 or ZLP800 platform offers a fast means of access with a safe and reliable working position. We offer 2 types of products, mode ZLP630, and another is mode ZLP800

A. Main Parameters

Model	Unit	ZLP630	ZLP800
Max load	Kg	630	800
Dimension of working platform	MM	6000×6900×1180	7500×690×1180
Lifting speed	M/min	9.6	8.2
Rated power	Kw	2×1.5(380V)	2×1.8(380V)
Safety wire rope	Φmm	8.3	8.3
Working wire rope	Φmm	8.3	8.3
Cable	M	100	100
No-load weight of ZLP630/800	Kg	1900	2100

B. Main Components

Item	Number (ZLP630)	Number (ZLP800)
Floor panel	3 pcs (2m)	3 pcs(2.5m)
Guard balustrade	6 pcs (2m)	6 pcs(2.5m)

Stirrup	2 pcs	2 pcs
Hoist	2 pcs	2 pcs
LSB30 fall arrest device	2 pcs	2 pcs
Electric control box	1 pcs	1 pcs
Limit switch	2 pcs	2 pcs
Adjustable support wheel	2 pcs	2 pcs
Counter weight	900kg	1000kg
100m Φ 8.3mm wire rope	4 pcs	4 pcs
100m power cable	1 pcs	1 pcs
Complete set of nuts and bolts	01 set	01 set

4.2 Build Your Own ZLP Platform

Two models mentioned above are available all the time at Gondola®. As our customers, you can choose or book any type meets your requirements. Of course, below two models in this series can not cover each specific situation and application, so you can book and purchase a product based on what you need, by contacting our sales department. We will give you a satisfying response within the shortest time.

5. Installation

5.1 The Preparation before Installation

Prior to installation, please check up the number of parts as shown in the packing list. Check the condition of each and all the parts and components.

CAUTION!

Please wear safety clothing, helmet and boots for protection before installation. The whole process should be performed by professional personnel.

5.2 Installation of Suspension Mechanism

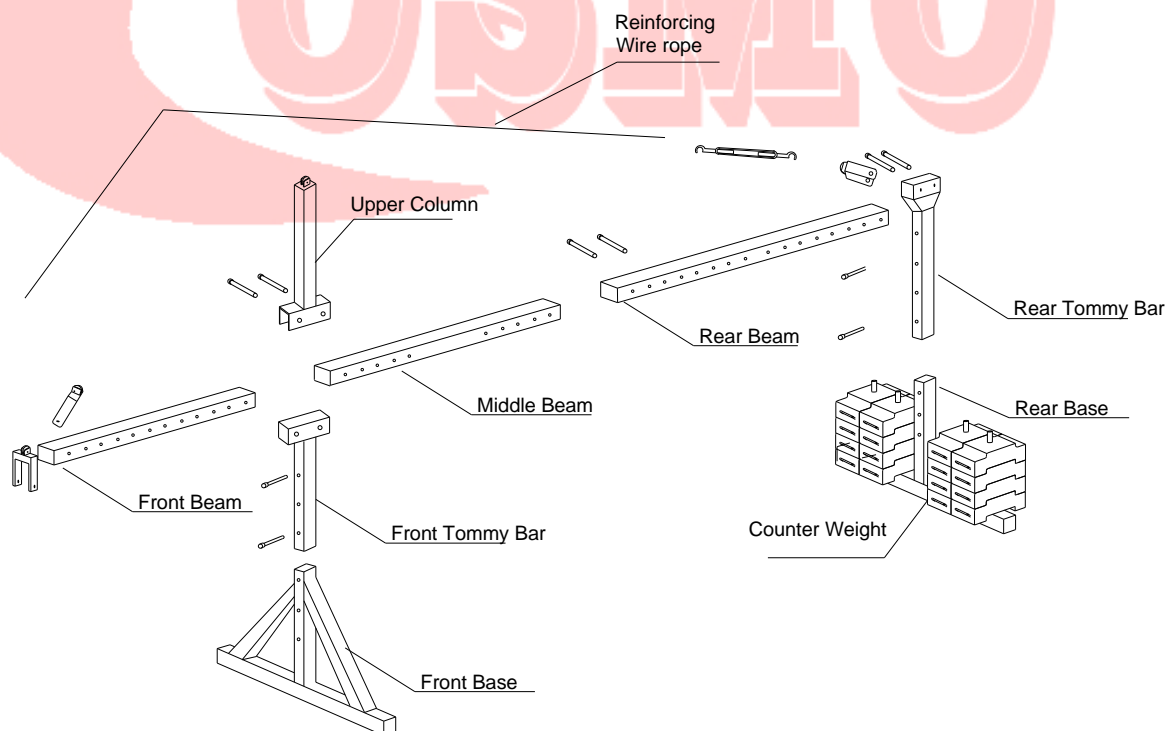


Figure 10 Installation of Suspension Mechanism

5.2.1 Before assembly, please check to ensure the roof is suitable for relevant loadings. If necessary, check the loadings with authorized responsible for this building.

5.2.2 (See figure 10) 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 of which should be adjusted according to

the height of parapet).

5.2.3 Lead the front and rear beams into sleeve on front or rear base, position the middle beam between the front and rear beams and tighten the bolts and nuts.

5.2.4 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, and then, put the stopper onto the safety steel rope at the proper position.

Make sure that the ends of wire ropes must be Ferrules well, and then, put the clamps onto safety wire rope at proper position.

5.2.5 Adjust the front beam overhang and fix the upper column with tommy bar with the bolts and make sure that it is not askew.

5.2.6 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.

5.2.7 Fix the coupling sleeve on the tommy bar of the rear base. Lead one end of the reinforcing steel rope into the coupling sleeve of front beam and tighten the rope clamp (**see Figure 11**). 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.

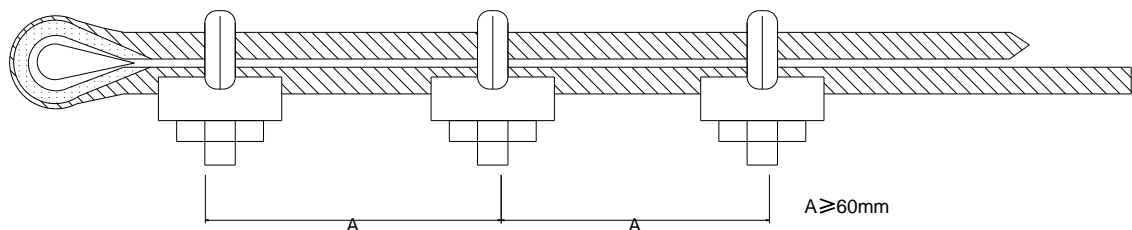


Figure 11

5.2.8 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 the same as the length of the suspended platform.

Usually, the range for COSMO® front reach, which is out of working wall, is ≤ 1.5m.

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

Please lock the counter weights to keep them from missing!!

5.3 Installation of Suspended Platform

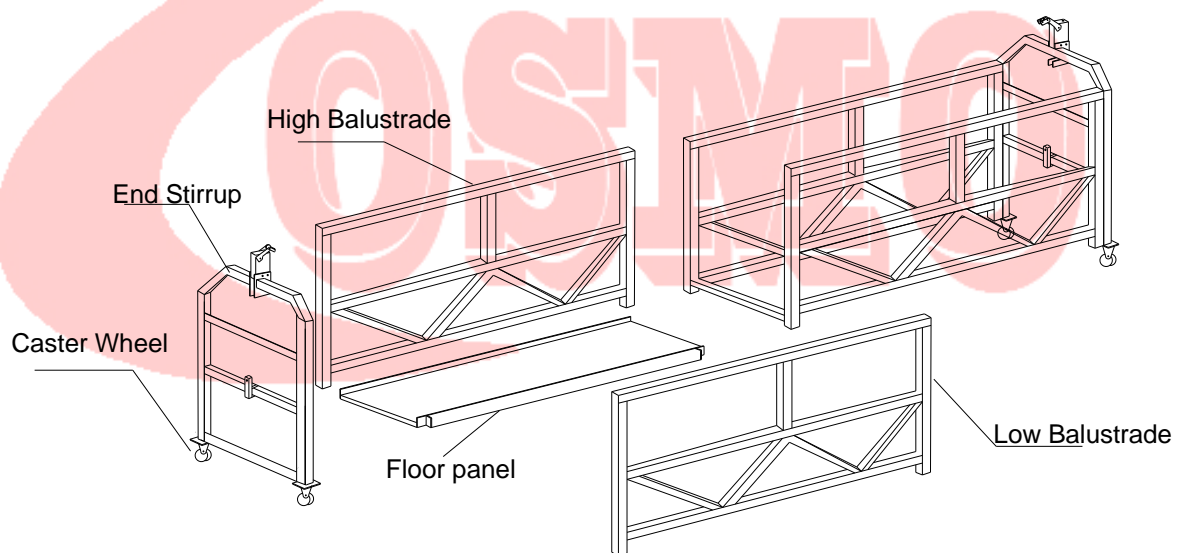


Figure 12 Installation of Suspended Platform

5.3.1 Put the bottom plate on the ground, mount front and rear guard rail and fix bolts and nuts respectively. (**See Figure 12**)

5.3.2 Install 4 castor wheels on end stirrups, fix the stirrups onto the platform and then tighten bolts and nuts in position.

5.3.3 Fix 2 support wheels at one side of rear guard rail.

5.3.4 Check each part to make sure everything is correct.

5.4 Installation of Hoists, Safety Locks

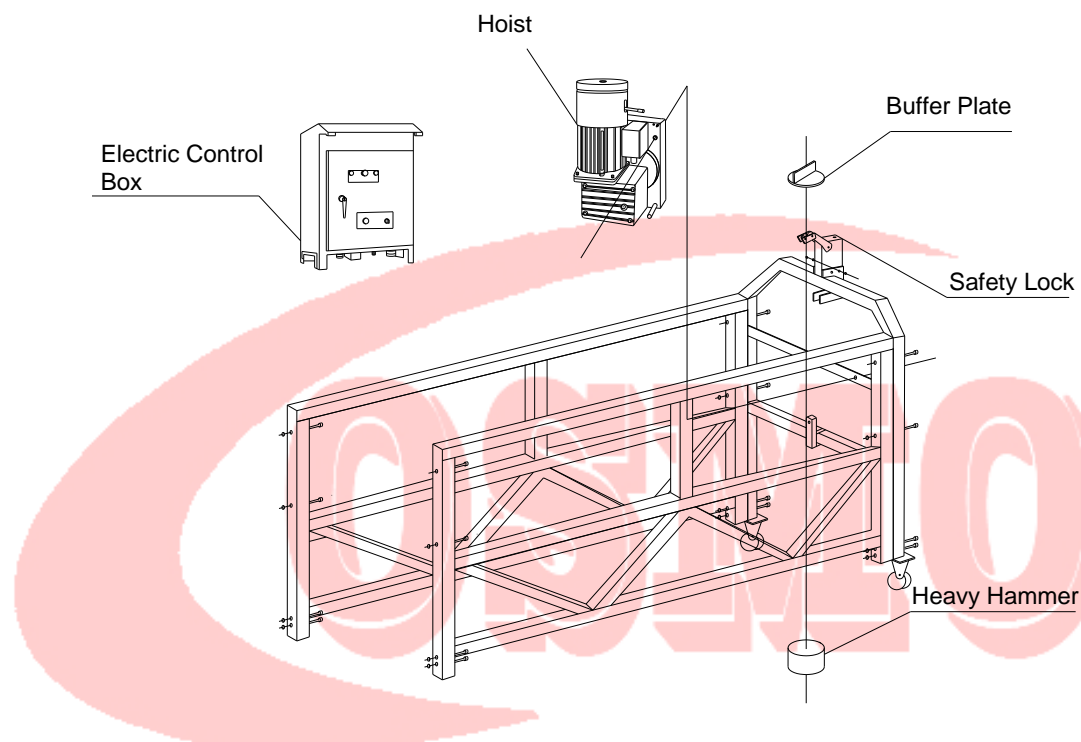


Figure 13 Installation of Hoist & Safety Lock

5.4.1 Installation of LTD hoist

5.4.1.1 Installation of **LTD** hoist(See Figure 13):We offer following two methods for your option.

- a) Anchor LTD hoist with M10 bolts at least at two anchoring points B-E; A-E; A-C. (E is also for M10 bolt.)
- b) Anchor LTD hoist with M10 bolt and M16 bolt at point C and D. (Point D is for M16 bolt.)

Attention!

Not allowed: anchoring LTD hoist only at points A-B; B-C; C-E

5.4.1.2 Installation of LTD6.3 : Anchor LTD6.3 hoist with safety pins at point A and B. (See Figure 14)

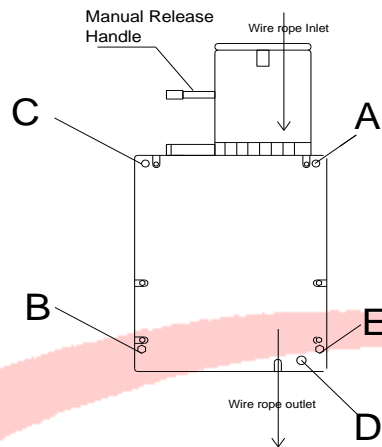


Figure 14 Hoist Installation

5.4.2 Anchor the Safety Lock® device to both anchor points (A) in such a manner (See Figure). Fix it to end stirrups with M12 bolts.

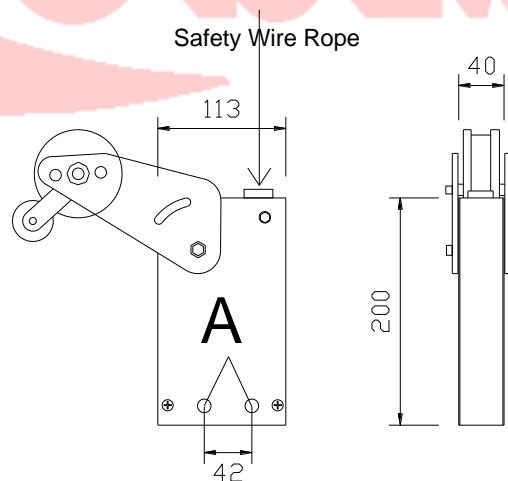


Figure 15 Safety Lock Installation

5.4.3 Anchor the electric control box in the middle of front guard rail.

Direction

All cables wind their way around front guard rail to avoid disturbing.

5.4.4 Installation of limit switch: Anchor the limit switch as following picture (See Figure 16)

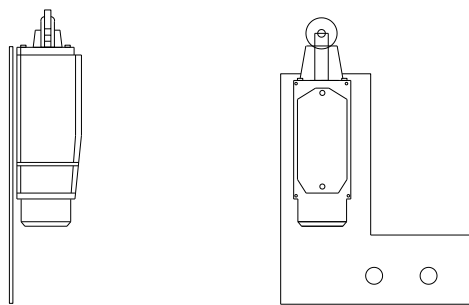


Figure 16 Installation of Limited Switch

5.4.5 Installation of buffer plate: Anchor buffer plate as following pictures. (See Figure 17)

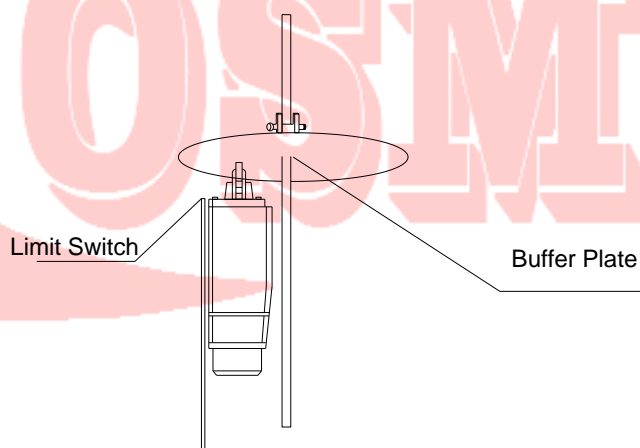


Figure 17 Installation of Buffer Plate

5.5 Electrical connections

The manufacturer of suspended access equipment is responsible for the connection of LTD hoists.

The lead must be protected by fuse by customers. Always pull the plug out before opening a central control.

5.5.1 Ensure that the main voltage is suitable for the motor of the hoist
-Three phase: 380V, 50Hz, 16A rated plug and socket

5.5.2 Use only heavy duty cables with incorporated strain relief.

5.6 Wire Rope Installation

5.6.1 Preparing wire ropes

Use gloves, when handling wire ropes!

- A. Only use wire ropes prescribed by Gondola® manufacturer.
- B. Check correct diameter and sufficient length of the wire rope.
- C. Always unreel the wire rope in a straight line, to prevent it from becoming unusable because of looping.
- D. Check the rope condition for damage:
 - ☐ Proper connections (thimble, ferrule) on wire rope with hook; (Hook is not bent.)
 - ☐ The wire rope has no visible damage along its total length;

Always ensure a clear rope exit!

Always keep it lightly lubricated!

Use normally commercially available multi-purpose grease; do not use lubricants containing disulphide

5.6.2 Working wire rope installation (see Figure 18)

Attention!

When using a fall arrest device, first insert the working wire rope between roll and rope guide of the sensor arm from above.

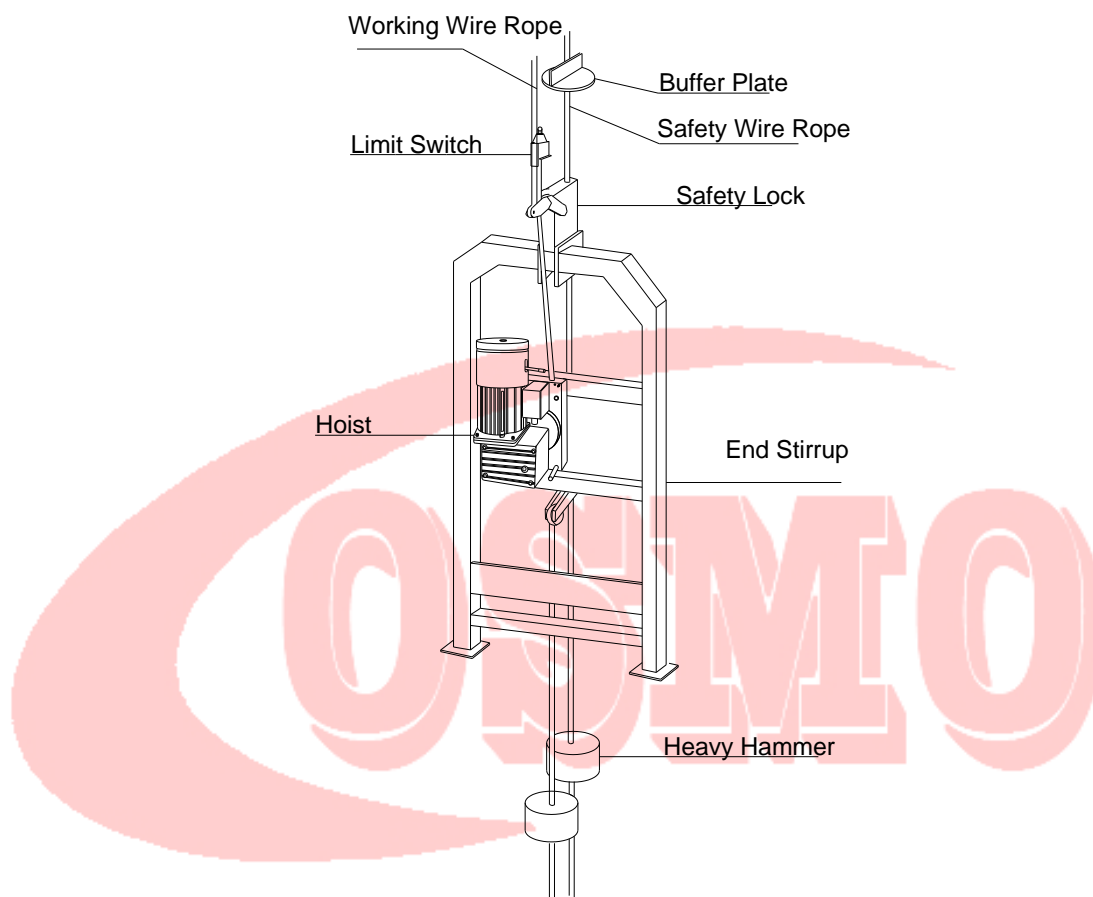


Figure 18 Wire Rope Installation

- a) Feed the wire rope as far as possible into the wire rope entry.
- b) Press up button and push in the wire rope, until it starts to reeve itself automatically and exists at the opposite side.
- c) If the wire rope doesn't reeve, please check from following aspects:
 - ☐ Is the wire rope tip in good condition?
 - ☐ Did you press the correct button?

5.6.3 Safety rope installation (See Figure 18)

A) The safety rope must hang free alongside the lifting rope.

Safety Lock® LSB30 (See Figure 19)

Push sensor arm upwards by hand, if it isn't raised by the tensioned lifting rope.

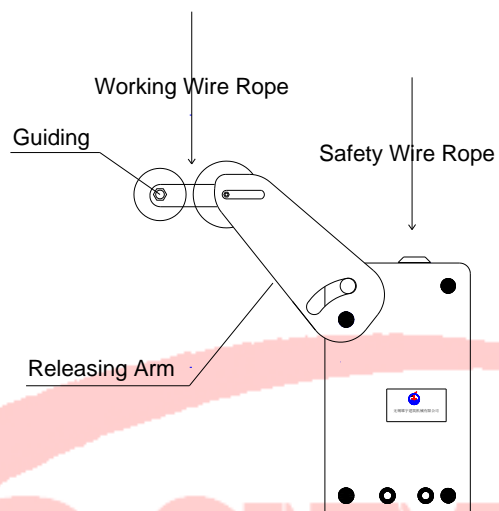


Figure 19

- a) Press lever to keep the lock in working condition.
- b) Place safety rope through the fall arrest device from above and draw it out by hand.
- c) Anchor counter weight to the safety rope approximate 20cm above the ground.

6. Operation

6.1 Check before starting

Warning and Attention

A qualified person with safety clothing, safety gloves, safety helmet and safety boots is needed for this operation!

Forbidden

People who are not familiar with suspended access equipment and not qualified must not do this operation!

6.1.1 Check each connection is correct and every anchoring is right.

6.1.2 Check the safety functions of electric control box, fall arrest devices, hoists, and limit switches.

6.1.2.1 Test run

A test run is necessary for the suspended access platform newly installed or leave unused for a long time.

a) No load test: Let the platform climb and descend three to five times, each time travel 3 to 5 meters. In this process, the lifting should be stable no noise occurs, and all connections are fixed well. Test every function of the equipment to see if everything goes well.

b) Check the function of fall arrest device:

- Safety Lock® LSB30: Lifting the platform at a height of 2 meters, stop there. Let one hoist go upwards, until the inclined angle is larger than 8 degree, Safety Lock® LSB30 locks. Until lift the lower hoist at the same level as the higher one, Safety Lock® LSB30 releases. Try this test again to check the fall arrest device on the other side. Fall arrest device closed automatically if the lifting rope is not tensioned or when the suspended access equipment is inclined. (The angle is over 8 degree.) If the safety rope still can be pulled upwards, please send your products back for checking.

- c) Manual descent: Lifting the platform at a height of 3 to 5 meters, stop there. Take the control lever from the carrying handle, insert it through the brake release point and raise it. The platform should be able to descend smoothly and steady.
- d) Test for rated load: Put rated loadings equally on suspended access platform, let the platform climb and descend in 3 to 5 meters, at least 3 times. In this process, the lifting should be stable no noise occurs, and all connections are fixed well. Test every function of the equipment to see if everything goes well.
- e) Power on check: While power on, no noise and shake occur in hoist, electromagnetic brake is flexible and credible, fall arrest devices work well.
- f) Check in operating: If the platform is inclined, stop lifting or descending. Only operate one hoist to keep the platform in horizontal position.

Do not pull the safety rope upwards when the fall arrest device is closed!!!

6.1.3 Ensure that nobody stands under the suspended access equipment. To mark the hazardous areas which are 1 meter around the platform with a warning line.

**Forbidden!!
Do not use damaged wire ropes and cables!!!**

6.2 Operation

6.2.1 Operation

- a) Press Power button, if the green light is on, everything goes well; if not, please check cables and socket used. Or send it to manufacturer for checking.
- b) To climb: Press Up button.
- c) To descend: Press Down button.
- d) Normal stops: Release up or down button, the suspended access equipment stops.
- e) Emergency stops: Press Emergency Stop button, the control must stop immediately.
- f) If d) or e) does not function, pull out the plug!

In case of e) and f) Stop working. Have the hoist checked or repaired by a qualified person.

g) In the case of inclined position:

- Move the lower hoist up until it reaches the same level as the higher one.

6.2.2 Manual operation

In case of power failure, you can manually open the brake:

6.2.2.1 Emergency Descent

- Take the control lever (1) from the carrying handle, insert it through the brake release point and raise it. (**See Figure 20**)
- Release the control lever to stop
- When finish, put the control lever back to the carrying handle

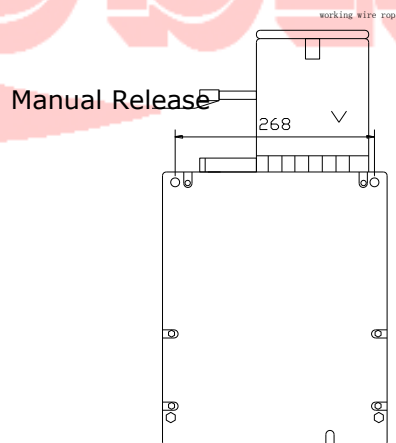


Figure 20 Emergency Descent

Attention

On the suspended access platform with more than one hoist, if possible open brakes on all hoists at the same time. If only one operator on the platform, open brake alternately so that no inadmissible inclined position occurs.

6.2.3 Instructions concerning actions of the operator shall be taken if the fall arrest device is activated.

- a) The platform comes against an obstacle on lowering, creating slack in the working wire rope.

For the incident described in a), the operator must retain the working wire rope concerned. The platform must be released from the obstacle. Press the UP button. The Safety lock releases automatically its grip on the safety wire rope as soon as the working wire rope is again under tension.

b) The slope of the platform flooring compared to the horizontal exceeds 14°

For the incident described in b), the operator must reposition the platform in the horizontal plane. To do this, the operator operates the hoist in the lower position. Press the UP button until the platform is again horizontal. The Safety lock releases automatically its grip on the safety wire rope.

While manual decent, for the incident described in b): See Figure

Reset the platform level by using the control lever (1) on the hoist which is behind. Then restart lowering by operating the control lever (1) on both hoists.

C) Failure of the working wire rope or failure of the hoist

For the failures described in c) above, a rescue operation must be initiated to evacuate the personnel from the platform.

6.3 Maintenance and Safety

You are responsible for maintenance and management of suspended access platform as per this regulation, after purchasing. Maintenance includes daily maintenance, daily check and regular check. Operator is responsible for daily maintenance and check before operation. Please choose professional personnel for operation, daily and regular check.

Direction

Please take notes for daily/regular maintenance and check.
--

- a) Operators must wear safety helmet, belt, boots, gloves and clothes.
- b) Daily maintenance: Regular adding oil and clearance of the equipment by operators.
- c) Daily check: Before operation, operator should check carefully as per **appendix Daily check table-1 and Daily check table -2**, especially for fall arrest devices, hoist and wire ropes.

- d) Take notes: Please take note on the performance of the SAE according to appendix Logbook.
- e) After 60 times (including regular inspection) or 6 times (nominal operation only) operation, the speed limiter needs a regular check. If too many damages occur, please contact the manufacture to change a new one.

Maintenance period depends on different company and users. Usually, it is 1 to 2 months. After operation, often a wholly maintenance is required. The process includes clearance, adding oil, checking for damages, etc.

In accordance with this safety regulation, hoist needs a comprehensive maintenance after working one year. Under tough environment, the comprehensive maintenance period should be much shorter than normal.

Since leave factory date, 12 months are regarded as a marked period for fall arrest devices. While expiration coming, users should contact a distributor or manufacturer for a new period and professional maintenance.

Please see 5.6.1 for detailed information in damaged wire ropes.

6.4 Daily operating regulation

Attention

Only qualified people are permitted for operation!

- a) Each operator must wear safety clothing, helmet, gloves, belt and boots. The safety belt must button up the safety rope designed separately.
- b) Before starting to work, the operator must be familiar with this “Operation Instruction”. Operator must check carefully before starting, according to this regulation. After operation, good maintenance is required.
- c) No overload! Load on the platform equally. When working position is too high and front reach of suspension mechanism too long, loadings on the platform must be cut down.
- d) When platform is at height, do not touch manual descent instrument or fall arrest devices if unnecessary.

- e) Working around high voltage cables, please keep distance and take necessary protection.
- f) While platform is in the air, do not disassembly any part of the equipment.
- g) It is recommended that access to the area at ground level below the platform and which may be in line with any object, tool or material falling from the platform be prevented by being cordoned off. This recommendation becomes a requirement when the general public may have access to this area.
- h) Ensure that the load on the platform does not exceed the rated capacity and that there is no accumulation of snow, ice, rubbish or excess of material on the platform.
- i) The equipment is intended for use in well lit areas either with natural or artificial light. Under artificial light the operator must have sufficient light.
- j) Ensure that along the facade of the building there are no obstacles with which the platform may collide.
- k) Must not use ladders, chairs or stepping-pad in the platform.
- l) Suspended access platform doesn't equal to elevator. Don't fix suspended instrument on the equipment.
- m) Make visible marks to ensure nobody stands under the platform.
- n) While the incline of both ends, please adjust it to keep balance, or that will cause damages in fall arrest devices. Ensure the TSP (TEMPORARY SUSPENDED PLATFORM) is correctly counterweighted. If it is inclined, please check the loadings of both sides. Please stop working immediately, then land the platform to the ground. To move the extra loading of one side, then keep left and right side in equal loadings.
- o) Wire ropes must not be bended, dirty or burnt. Do not use wire ropes as low voltage circuit for electric welding.
- p) Do not put suspended access platforms used for projects outside of the façade.
- q) This TSP (TEMPORARY SUSPENDED PLATFORM) is not designed for use
 - ☐ In silos
 - ☐ At drilling site
 - ☐ As a crane lift

- ☐ In environment with explosion hazards
- r) The platform must use specific wire ropes qualified in structure and mechanics. Wire ropes for different types of hoists can not mix up.
- s) It must be power off, when insert or pull out the connector.
- t) While operating, keep hoist and fall arrest device from filling by sundries. After work, descend the platform to ground and release wire ropes and fall arrest devices. Power off and lock the electric control box. Parking the platform in the “Out of Service” position, if the suspended access platform put outside, please cover it with waterproof material.
- u) The supervisor should check and maintain the equipment periodically and take note on a logbook. The logbook should contain followings:
 - a) Name of the competent person in charge of the suspended access equipments
 - b) Date and name of operators using the equipment
 - c) Serial number of hoist and fall arrest devices
 - d) Number of hours that the suspended access equipment in service
 - e) Specification of wire rope
 - f) Number of hours wire rope in use
 - g) Record of any incident and action taken
 - h) Dates of periodic inspection and record of outcomes
- v) Check security of suspension rig and ensure that no counterweights have been removed;
- w) Ensure that the suspension rig is directly above the intended position of the platform mounted hoist in order to avoid excessive horizontal forces on the suspension rig;
- x) Ensure that there is no snow, ice, debris or surplus material accumulated on the platform.

6.5 Note

6.5.1 Hoist: Ensure each time the hoist is anchored correctly and has no damage. During operation, if any part broken or damaged, stop working immediately and have repaired by qualified personnel.

6.5.2 Wire ropes: If one of following defects determined, please replace the wire rope immediately.

- a) 8 or more breaks on a length, which corresponds to 30 times the wire rope diameter.
- b) Heavy rust on the surface or inside.
- c) Heat damage, recognizable discolored wires.
- d) Reduction the diameter by 5% or more compared with normal diameters.
- e) External damage to wire rope.

6.5.3 Electric cables: Replace lead and control cables, if damage to the insulation or cable connections.

7. Common Failures and Troubleshooting

Warning

Checks and repairs of the electrical equipment must be carried out by qualified electricians! Any other repairs should only be carried out by the manufacturer or by a qualified person, and only original spare part shall be used.

No.	Breakdown	Cause	Remedy
1	Platform can not move down. Always pull the plug out Before opening an electrical part.	1. The platform has hit or been caught on an obstacle.	Move the platform upwards carefully and remove the obstacle. Check each part for safety. If it can not work, please inform the supervisor or the manufacturer.
		2. The fall arrest device holds the platform. a) Lifting rope rupture; b) Hoist speed is too high; c) Inclined position of the platform;	a) Take manual descent and replace the wire rope. b) Check hoist. c) Move lower platform end upwards till the fall arrest

		d) Failure of the hoist; e) The platform being caught.	device open. d) Check hoist. e) Move upwards till the fall arrest device open.
		3. Error in down control circuit of the electric control box.	Make Emergency Descent, check each part and connection then replace.
2	Platform can not move. Always pull the plug out before opening an electrical part.	1. Defective wire rope or obstructed rope exit.	Stop working!!! And contact the manufacturer or the supplier.
		2. The platform caught by an obstacle or held tightly.	Release platform carefully from the obstacle. And inform the supervisor.
3	Platform can not move up Always pull the plug out before opening an electrical part.	1. The platform caught by an obstacle.	Move platform downwards. And remove the obstacle. Check each part for safety. If it can not work, please inform the supervisor.
		2. Overload	Check load and reduce.
		3. Upper limited switch a) working b) defective	a) Move down until the limit switch is free. b) Check its function and connection. If necessary, replace.
		4. Errors in upper control circuit of the central control box.	Check each part, if necessary, replace.
		5. One phase is missing.	Check fuses and leads.

4	Hoist can not move Always pull the plug out before opening an electrical part.	1. Power failure a) Wrong connection between power supply and hoist control. b) Interrupted power supply. c) Control switch off.	a) Check lead, cable and electric control box. If necessary, repair. b) Check and wait power return. c) Turn Emergency stop button clockwise until it releases.
		2. Protective switch off when overheating. a) One phase is missing. b) Voltage is not suitable. c) Insufficient cooling.	a) Check or repair connection, fuses and leads. b) Check voltage and current consumption on the motor under load. Inform supervisor. c) Clean air inlet.
		3. The hoist damaged.	Check and repair. Inform the manufacturer or the supervisor.
5	Motor noise or hoist is crunching.	1. Overheating	a) Check/repair fuses, leads and connections. b) Clean vent holes on the frame. c) Check voltage and current consumption on the motor under load. If necessary increase lead cross section.
		2. Dirt in the rope drive.	Replace the hoist immediately. Have it checked or repaired by the manufacturer.

8. Maintenance

8.1 Maintenance

The equipment does not need any special maintenance.

8.1.1 Hoist: The mechanism does not require any special maintenance. Add lubricating oil to hoist regularly and clean.

Lubrication

Keep wire ropes lightly lubricated. This will not affect the gripping power but will prolong the life of wire rope to maximum.

8.1.2 Fall arrest devices: The mechanism does not require any special maintenance.

Always keep the mechanism clean and lightly lubricated. Too much oil will not affect the gripping power.

8.1.3 Wire ropes:

- a) Always reel and unreel the wire rope.
- b) Do not use the wire rope for fixing a load and do not pull it over sharp edges.
- c) Always keep the wire rope clean and lightly lubricated. Normal commercial multi-purpose grease is ok. Do not use a lubricant containing disulphide.

8.2 Check

8.2.1 General information: Prior to each operation, ensure that all parts used in this suspended access equipment are properly installed and without visible damage.

If damage shows during operation, stop working immediately. Try to descend to ground and inform a qualified person for checking and repairing.

8.2.2 Checks for wire ropes: Please see 6.5.2

9. Storage and transportation

9.1 Storage: Put the equipment in the warehouse, which is dry, ventilated and without caustic gas. After one-year storage, the suspended access equipment needs a complete service.

9.2 Transportation: During transportation, the hoist, fall arrest devices and electric control box should be packed separately. Wire ropes should be reeled and packed well.

10. Appendix

10.1 Daily Check Table-1

Item	Contents for checking	Comments	Mark
Platform	Any distortion or damage on frame or each part.		
	Any cracks in welding line		
	Condition of each connection		
	Hours of SAE in service		
Hoist	Condition of each connection with stirrup		
	Condition of limit switches		
Fall arrest device Flexibility and the condition of lubricant. Flexibility and the condition of lubricant.	Flexibility and the condition of lubricant.		
	Condition of seal on setting elements		
Speed limiter	Damage checking		
Suspension beam	Condition of each connection		
	Any damage on counter weights		
	Distance between two suspension beams		
	Situation of the orientation		
Overload limiter	The equipment working under RL		
	The equipment can not ascend under 1.25 RL		
	Condition of seal on setting		

		elements					
Remedy:							
Maintenance and repair record:							
<p>Note: 1. “√”means qualification, “×”means disqualification; 2. If disqualification, please fill in “Mark” column with followings: “☆” Need to be repaired immediately; “Δ ” Need to be repaired within regulated period; “○”Should be rejected and can’t be used any more. 3. Operation must be after the checking.</p>							
Platform #		Serial No. of hoists	Left		Serial NO. of fall arrest device	Left	
			Right			Right	
Using date		Operator			Supervisor		

10.2 Daily Check Table-2

Item	Contents for checking	Comments	Mark
Wire ropes	Any distortion or damage		
	Any dirt		
	Condition of each connection		
	Hours of in use		
	Specifications and certificate		
Electric control system	Any damage on cables, plug and socket		
	Condition of limit switch		
	Condition and function of each button		
	Condition of power cable		
	Condition of Emergency stop function		
Operation	Any noise in descent and ascent		
	Is the platform horizontal?		
	Function of fall arrest devices		
	Condition and function of brake		
	Function of manual descent		

Incident and action taken			
Periodic inspection date			
Remedy:			
Maintenance and repair record:			
<p>Note: 1. “√”means qualification, “×”means disqualification; 2. If disqualification, please fill in “Mark” column with followings: “☆”Need to be repaired immediately; “Δ”Need to be repaired within regulated period; “○”Should be rejected and can’t be used any more. 3. Operation must be after the checking.</p>			
Platform #		<div>Serial No. of hoists</div> <div>Left</div> <div>Right</div>	<div>Serial NO. of fall arrest device</div> <div>Left</div> <div>Right</div>
Using date		Operator	Supervisor

10.3 Bolts and nuts packing list

ZLP630.02.03.00 Suspension mechanism					
Item	International Standard NO.	Specification	material	quantity	Packing NO.
6	GB5782-86	Bolt M14×110	45	7	B14
13	GB5782-86	Bolt M10×40	45	4	B10
14	GB6170-86	Nut M10	45	4	N10
15	GB5782-86	Bolt M14×120	45	1	B14-120
16	GB5782-86	Bolt M14×130	45	2	B14-130
17	GB6170-86	Nut M14	45	10	N14
18	GB96-85	Washer 12	45	20	W12
ZLP63.02.00 Working platform					
6	GB5782-86	Bolt M10×70	45	6	B10-70
7	GB96-85	Washer 10	45	12	W12
8	GB6170-86	Nut M10	45	6	N10
9	GB5782-86	Bolt M12×130	45	16	B12-130
10	GB96-85	Washer 12	45	64	W12

11	GB6170-86	Nut M12	45	32	N10
12	GB5782-86	Bolt M12×120	45	16	B12-120
ZLP63.01.00 Installation frame					
15	GB5782-86	Bolt M12×70	45	2	B12-70
16	GB95-85	Washer 12	45	4	W12
17	GB6172-86	Nut M12	45	2	N12
18	GB5782-86	Bolt M10×70	45	4	B10-70
19	GB95-85	Washer 10	45	8	W10
20	GB6172-86	Nut M10	45	4	N10

ZLP800.01.00 Suspension mechanism					
Item	International Standard NO.	Specification	material	quantity	Packing NO.
6	GB5782-86	Bolt M14×110	45	7	B14
13	GB5782-86	Bolt M10×40	45	4	B10
14	GB6170-86	Nut M10	45	4	N10
15	GB5782-86	Bolt M14×120	45	1	B14-120
16	GB5782-86	Bolt M14×130	45	2	B14-130
17	GB6170-86	Nut M14	45	10	N14
18	GB96-85	Washer 12	45	20	W12

ZLP80.02.00 Working platform					
6	GB5782-86	Bolt M10×70	45	6	B10-70
7	GB96-85	Washer 10	45	12	W12
8	GB6170-86	Nut M10	45	6	N10
9	GB5782-86	Bolt M12×130	45	16	B12-130
10	GB96-85	Washer 12	45	64	W12
11	GB6170-86	Nut M12	45	32	N10
12	GB5782-86	Bolt M12×120	45	16	B12-120
ZLP80.02.03.00 Installation frame					
15	GB5782-86	Bolt M12×70	45	2	B12-70
16	GB95-85	Washer 12	45	4	W12
17	GB6172-86	Nut M12	45	2	N12
18	GB5782-86	Bolt M10×70	45	4	B10-70

19	GB95-85	Washer 10	45	8	W10
20	GB6172-86	Nut M10	45	4	N10

