Operation & Maintenance Manual
KRF KRB Moving Walks

CANNY ELEVATOR CO., LTD

Contents

1.Moving walks safety use

1.1 Normal operation

The moving walks described in this manual is only applicable to transport of people and freight that will not affect the conveyors normal operation, and shall not be used for transport of improper freight or used other purposes.

It is prohibited to put the inappropriate goods on static or moving pallets or handrail in order to prevent the accident during operation.

1.2 Safety

This manual can assist you to operate the moving walks safely. Please operate the moving walks as per safety requirements listed herewith; please restrain to use the moving walks for other purpose.

The trained professional staffs shall operate the moving walks only, and the owner shall be responsible for the follow up of the operation rules.

During the maintenance, inspection and testing, the moving walks should be provided with suitable protection devices to avoid the accident. Without the permission of staff in charge, the moving walks should not be started.

— If any mechanical or electrical defects were found in the moving walks, it should not be used, specially when there is a failure in the traffic light (if any), warning and safety protection devices.

Before the connection with the power supply, carefully checks should be made to the covering plate, comb plate, comb block, pallet, skirt, handrail and the balustrade against any defects, and to make sure the warning and protection devices is in good condition.

— If the owner intend to operate this moving walks combined with other equipments, parts together, prior consulting should be made towards manufacturer or specialist, to make sure that such combination has no impact on the safety of the passengers or surrounding environment.

— If maintenance or modification are needed, CANNY ELEVATOR CO., LTD will be responsible for the safety of the products if relevant action are taken by the staffs from CANNY ELEVATOR CO., LTD or the staffs authorized by CANNY ELEVATOR CO., LTD. Periodical and proper maintenance are the guidance for the long term and good operation of the moving walks only.

— The moving walks shall be operated properly and maintained periodically as per requirements.

—CANNY ELEVATOR CO., LTD will not take the responsibility of the failure, damage or people hurting from the incorrect use of moving walks, or the incorrect manner of maintenance by the user

—Safety electric circuit or safety switch should not be dismantled or modified without right guidance.

—No dismantle of any parts or pallet and keep them in open to operate moving walks

1.3 Electric safety

Only qualified maintenance staff is allowed to dismantle or maintain the electric components; any modification and/or maintaining to the signal or control circuit should be approved by the manufacturer or by the qualified people.

1.4 Mechanical Safety

Before and during the moving walks powered, all goods should be moved away from the moving area of the moving walks.

1.5 Safety Device

Various advanced moving walks made by CANNY ELEVATOR CO., LTD meet the updated safety regulations for safety and environment protection. There is safety circuit in the moving walks, once it is initiated, the power of the moving walks will be cut off. Only the failure has been recovered or the function returns to normal, the moving walks can be put into operation again.

If the user cannot recover the failure or abnormal function, CANNY ELEVATOR CO., LTD maintenance station should be informed to make the maintenance or recover. If necessary, the power of moving walks should be cut off to prevent any mis-operation by the time being.

2.General Introduction of Moving walks

The moving walks is power-driven, horizontal or inclined (inclination not exceeding 12^0) continuous moving walkway (pallet) used for transportation of passengers in different floor of the buildings.

Its main characteristics are as follows:

1) Evenly and continually transportation equipment for passenger with big capacity.
2) Can be operated upwards or downwards.
3) Can be used as stairs when it stops due to power off (if local regulation allowed).
4) Beautiful in shape with decoration function.
5) Compact structure, occupied less area, easy to use and maintenance. Widely used in public area such as department store, supermarket, port, airport, shopping center etc.

2.1 Basic layout of Moving walks (5 types) are as follows figure 1:

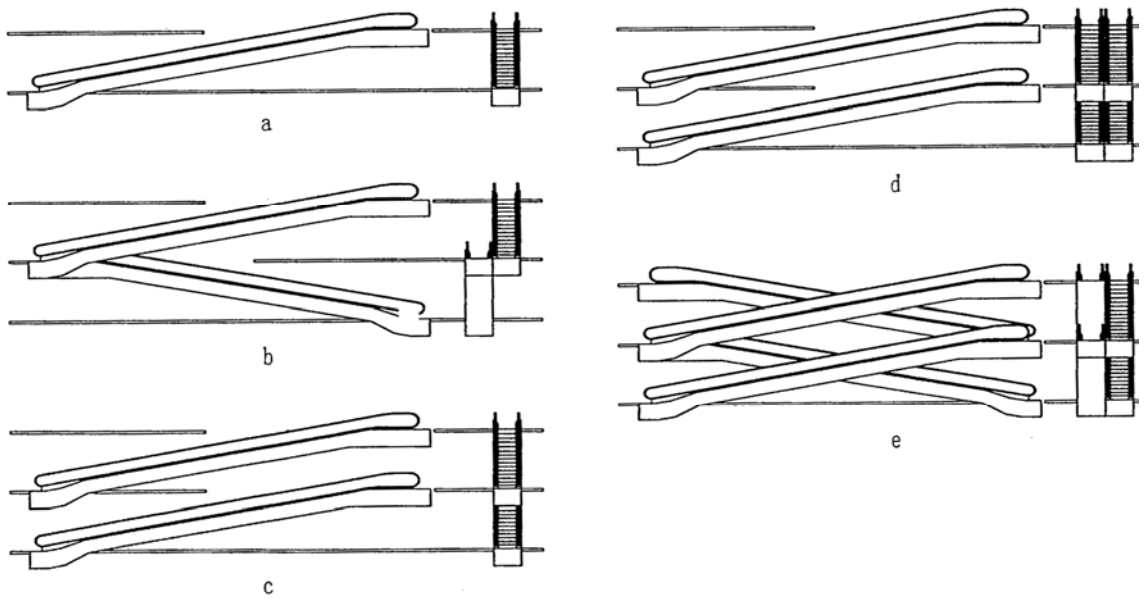


Figure 1 Moving walks Layout

2.1.1 Single unit arrangement (a):
To be used as the transportation tool between two floors.

2.1.2 Single unit in continuity (b):
This kind of layout is only used for one-way transport as the connection of 3 floors. People can directly enter the second moving walks from the first one.

2.1.3 Single unit in overlap(c):
People cannot directly enter the second moving walks from the first one.

2.1.4 Parallel layout (d):
Can be arranged in either same direction or opposite direction for the two units, also in the parallel directions for multi units.

2.1.5 Cross layout (e):
It can be operated in double directions to reduce moving time.

2.1.6 Different combination can be made in terms of needs of passenger flow rate, in order to suit for the service requests and enhance the efficiency of transportation.

2.2 Moving walks kinds

2.2.1 KRF/ KRB （two types）as commercial moving walks mainly used in shopping center, department store , airport and so on. The moving walks have such advantages as compact and agile structure, as well as smooth and beautiful profiles.

2.3 Basic specification of Moving walks

Table 1

Kinds / Specification	KRF / KRB	Pallet width 800mm	KRF / KRB	Pallet width 1000mm
Rated speed m/s	0.5		0.5	
Inclination angle	10º 11º 12º		10º 11º 12º	
Capacity persons/hour	6750		9000	

Note：1.Special specification is not included in the table.
2. Balustrade with safety glass normally.

3.Main structure of the moving walks

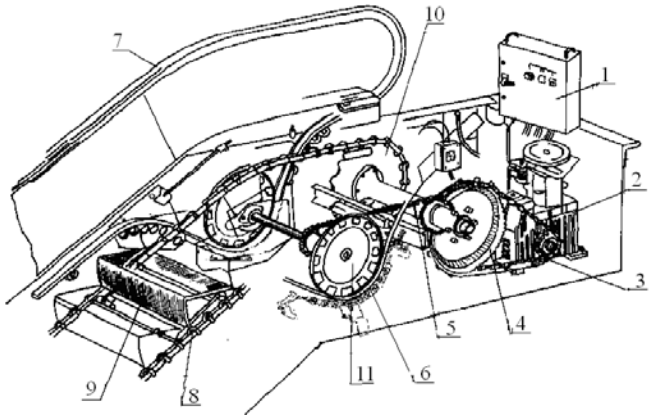
Please also refer to the moving walks installation manual

3.1 Upper parts of the moving walks

Upper part is the main structure of the moving walks, the controller is installed in the upper pit of the moving walks connected with flexible cable, and it can be lift out of the pit during maintenance.

The main shaft is driven by main drive system via driving chain. The main shaft equipped with pallet chain wheels, which drive the pallet chain, then makes the pallet moves along the pallet guide rail system.

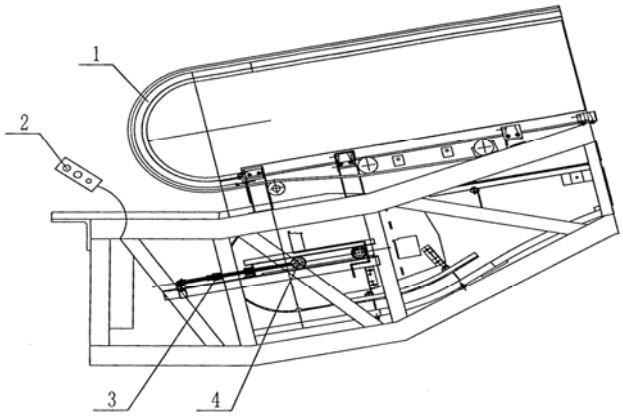
The handrail drive chain wheel is located on the main shaft too. This chain wheel drives the handrail drive shaft via drive chain. The handrail drive shaft is equipped with handrail drive wheel with rubber rim, which drive the handrail move when rotate.



1. Controller 2. Drive unit 3. Driving chain 4. Main shaft
5. Handrail drive chain 6. Handrail drive system 7. Handrail 8.pallet chain
9. pallet 10. pallet roller 11. Handrail drive wheel

Figure 2 Upper part of the moving walks

3.2 Lower parts of Moving walks refer to figure 3

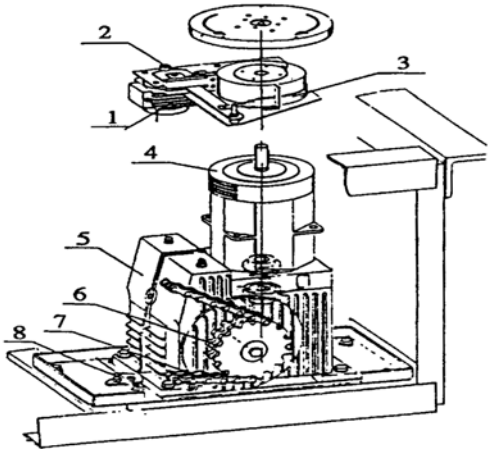


1.Handrail guide rail 2. Maintenance control box
3. Spring 4. Tension station

Figure 3 Lower configuration

3.2.1 The lower part of the moving walks including the tension station which forms the reversal and tensioning of the pallet and pallet chain. The handrail guide rail return curve (position no 1) equipped with anti-friction roller chain in order to reduce the handrail friction in the position. Position no.2 is maintenance control box, which is used during the maintenance. This box has the function of interlock with main operation key device, the other operation device will be function off whenever this control box connected to the socket in order to avoid operation accident and then guarantee the safety during the maintenance. Position no.4 is the tension station, and can be adjusted via tension spring to ensure the tension state.

3.3 Driving device see fig.4



1.brake motor 2. breaking gear 3.brake belt 4.motor
5.speed reducer 6.chain wheel 7.driving chain 8.adjust block

Figure 4 Driving device

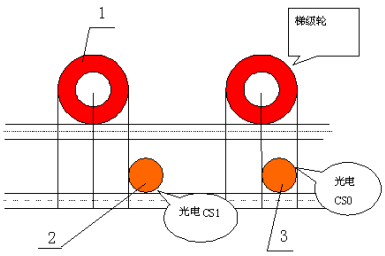
3.3.1 Driving device is consisted of motor, speed reducer and brake etc. When it is on power, the brake motor (position no. 1) start first, then drive the braking gear, pushing the braking spring, loose the brake belt. Main driving motor starts and drives the small chain wheel via speed reducer. The small chain wheel transfers the power to the main shaft.
As the whole device is highly compact designed, so it can be installed in the up machine room and occupied less space and convenient for maintenance

3.3.2 The main motor is squirrel cage type with 6 poles, which has the property of smooth running, durable and lower running noise. The speed reducer is the precision worm gear type manufactured by advanced processing technology; the main drive has much advantage such as compact structure, big load bearing capacity, smoothly in working and low noise. The speed reducer and motor are independent structure and connected with each other with elastic coupling. This structure is convenient for the assembling and maintenance.

3.3.3 Moving walks, which usually installed indoor, has high requirement to noise. The maximum value should be lower than 65dB-A. The driving device is the main source of noise, which should be controlled strictly to ensure the accurate of operation and eliminate all of the improper factors, which may cause noise, in order to ensure that sounder noise won't be in the process of running.

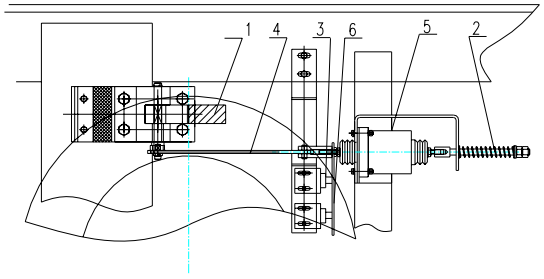
3.3.4 In order to prevent the overloading of the moving walks, which may cause the motor been destroyed, there is a thermo-sensor installed inside. Once the coil is over the initialized temperature, the electrical machine will stop running at once.

3.3.5 It is very dangerous when the speed of moving walks is higher or lower than the rated speed. So there is a speed control device in the moving walks, refer to the figure 5. The device is installed in the pallet guide rail with speed sensors to measure and control the speed. When the moving walks is higher or lower than the initialized speed, moving walks will stop running at once.



1.Pallet wheel 2. Speed sensor 1
3. Speed sensor 2

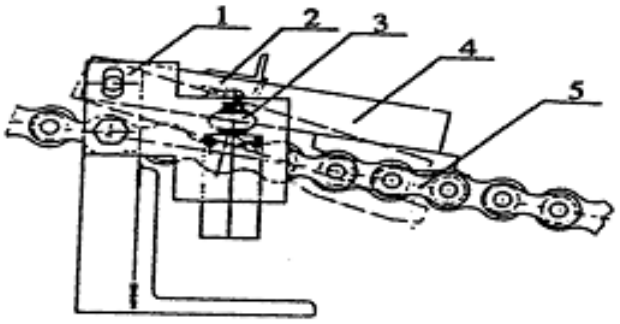
Figure 5



1 ratchet pawl 2. spring 3. switch
4. lever 5. electrical magnet 6.elbow

Figure 6

3.3.6 When the rising height of moving walks is bigger than 6m, an auxiliary brake (see figure 6) should be equipped besides the working brake. The assemble position refer to the figure 6. The working brake is standard configuration and auxiliary brake is used when rise bigger than 6 meters.
When in the normal work condition, the auxiliary brake pawl No.1 is at the close state under the action of the spring. When the speed is higher than certain value, the monitor equipment will give a signal, and then the electrical magnet will make the pawl open via connecting lever then stop the moving walks mechanically. The curved piece No.6 on the lever will drive the switch No.3 at the same time and then give the signal to cut off the electricity for the main drive to ensure safety. The function is more important when moving walks is full carried in downward direction.



1.supporting frame 2.supporting angle 3. switch 4 sliding block 5. drive chain

Figure 7

3.3.7 All moving walks use duplex chain for drive, it would be dangerous if it breaks. Hence the protection device of the drive chains is made, see figure 7. While working normally, the sliding block No.4 connected with the supporting frame No.1 keep touching the drive chain No.5. When the chain breaks or getting loose, the block would drop and touch the switch No.3 then the switch will be actuated and the moving walks will be stopped running by the cut off the electricity.

3.4 Pallet.

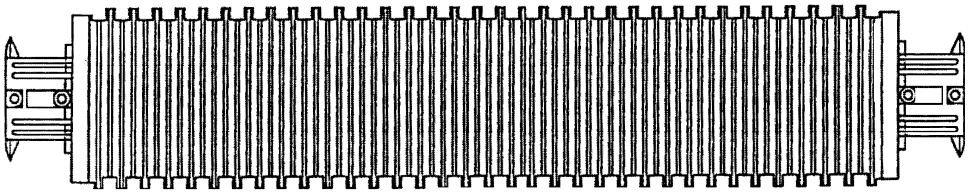


Figure 8 Pallet

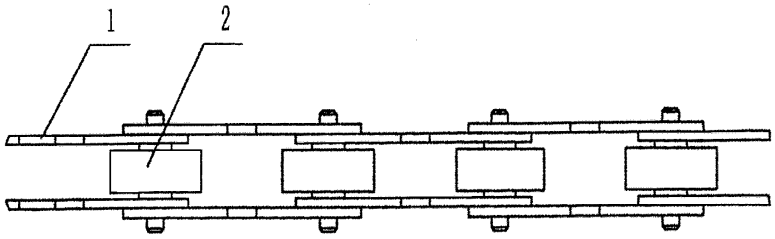
3.4.1 The pallets are made of die cast aluminum alloy completely or stainless steel assembly. There are groove in the tread surface and pallet riser which make the function of pretending slippery and guiding both the front and the rear, also mesh the pallet each other.

3.5 Pallet chain

3.5.1 The pallet chain is the main part of moving walks for the power transfer. The quality of the chain has huge effect on safety and running noise.

3.5.2 Figure 9 is the pallet chain, the pallet roller is inside the pallet chain function as supporting components for pallet on the guide rail and also as mesh part for pallet drive.

3.5.3 The pallet chain drives the pallet and the passenger load above and pallets move paralleled between the skirts. So not only the pallet chain must have enough strength, but the length tolerances are also required strictly. Hence, besides the precisely processing, we also choose and match to combine them. They will be tightened and adjusted properly during the operation. If the length extends by 3%, it should be replaced to prevent the chain failure



1. chain plate t 2.pallet chain roller

Figure 10 Pallet chain

3.6 The safety protection for comb block and pallet

3.6.1 In order to ensure the safety and prevent the clipping of object between the pallet and comb plate during the running, the comb plate was equipped with comb block fixed by screw to the comb plate and very easy to be changed. The comb blocks are made of plastic or die cast aluminums. The comb blocks are meshed with groove and rib of the pallet. Even if human's foot or materials motionless on the treadle, it will still be transited to the comb plate smoothly.

3.6.2 When the comb plate is meshed with the tread of the pallet, the depth of the mesh should be larger than 6mm, while the gap between the rib and root of the comb block should be smaller than 4mm.

3.6.3 During the running, the carefully inspection should be taken to check every pallet should be meshed with comb block properly, and without contact and friction.

3.6.4 In order to prevent pallet to be destroyed during the running while objects to be caught in between pallet and comb plate, also ensure passenger's safety, the comb

safety device is equipped. Whenever some objects such as the heel of the shoes, the tip of the umbrella and etc is caught in between, the comb plate will be pushed backward, and safety switch will be actuated to stop the moving walks.
Pallets are the key part for carrying passengers. It would be very dangerous if the pallet break or deform too much. Hence, there installed a protection device at the two ends of the moving walks. If the pallet deforms in downward severely or breaks, the vertical lever of the safety device can contact the such happening then safety switch will be actuated the stop the moving walks.

3.7 Balustrade

3.7.1 Balustrade is installed on both sides of the moving walks for the passenger safety and also has the decoration purpose. The balustrade board is normally made by safety glass or metal.

3.7.2 The handrail is consisted of rubber, nylon sliding layer and steel rope core. The nylon-sliding layer, which touches the handrail guide rail, makes the function of guiding. The steel rope inside the handrail bears the load. There is different color to be chosen for the handrail, but standard configuration is black.

3.7.3 The handrail guide rail and decking are made of stainless steel normally.

3.7.4 The skirt made of stainless steel or steel plate with coating. The safety devices are also installed inside the skirt system to prevent objects to be caught in between the skirt and pallet.

3.7.5 The handrails are driven by the fraction pulley. Pressure roller group via tension spring adjusts the tensioning state of the handrail.

3.7.6 There are handrail inlet which installed at both two balustrade end for protection children’s hand or other things been clipped.

3.7.7 Usually, the handrail should run as the same speed as the pallet during the running, the synchronization deviation should be less than 0 - +3%. At the bottom of the balustrade, there also installed handrail break protection safety switch. If the handrail is broken, it will touch switch and the effectively stop the moving walks.

4.Safety use and operation of the moving walks

4.1 Switch on of the moving walks power
Note: before switch on the moving walks, please make sure there are no passenger or goods on the moving walks.
Before put the moving walks in operation, please ensure each part of the moving walks is in right order.

On the upside and downside of moving walks, there is one marked upwards and downwards key button and one emergency red stop button with red stamped word “STOP” respectively. When the key inserted, turn the key along up or down direction as per the operation direction. The key will rebound to its original position.
When the moving walks start operation,

- Take the key out and put it in a safety place
- Observe the pallet running for one circle
- No damage should be found on the pallet and the handrail.

The handrail should be operated synchronal with pallet, no jumpiness should be occurred.
If the traffic light and lighting device is provided, then

- The indication signs of the moving direction of the traffic light should be consistence with the operation direction of moving walks (if equipped).
- The light in the gap of comb plate should be on.
- The light for the comb plate should be on (if equipped).

4.2Shut down of moving walks power
The power of moving walks can only be shut down when make sure that no body is on the moving walks.

4.3Changing moving direction
When it is necessary to change the running direction of moving walks, it can be switched off from previous direction to another one only when the moving walks completely stopped and also without passenger.

* Insert the key; turn the key along up or down direction as per the operation direction.
* The key will rebound to its original position.
When the moving walks start operation,

- Take the key out and put it in a safety place
- Observe the pallet running for one circle

4.4 The moving walks must be operated by the staff who has been trained. When the moving walks is starting, it must be in empty load state.

4.5 While standing on the running moving walks, the passengers should face with the running direction and standing inside the yellow edge of the tread, with hands on the handrail.

4.6 When children are brought with in the moving walks, they must be hold on by the adults.

4.7 If passengers carrying a pet when taking the moving walks, pets should be hold on。

4.8 Passengers should not take the moving walks with bare feet. Moving walks also cannot use for heavy cargo.

4.9 After starting the moving walks with the key switch and moving walks can't run, the operation staff should inform the maintenance staff in duty to check whether the general power switch is on, the main switch in the controller cabinet is on, maintenance control switch is with cover correctly.

4.10 If it still couldn't start at this time, you should inspect whether the four switches of handrail inlet or other safety device have in faults.

4.11 If there need to change the running direction of the moving walks, please make sure that there are no passengers on the moving walks and moving walks stop completely, then use the key to change the running direction.

4.12 If in the urgent situation, push down the emergency stop button to stop the moving walks.

5.Use and manage of the moving walks

5.1 Both of the up and down machine rooms of the moving walks could only be managed by the qualified maintenance people, other persons don't allow to enter.

5.2 The machine room should be ensured that water is impossible to get in (Indoor).

5.3 The machine room should be kept clean, dry, no mist or corroded gas, and the space are not allowed for the storage use.

5.4 When the moving walk has been out of use for a long time, the general switch in the machine room should be put off.

5.5 After being checked and accepted by the related local authorities and has been certified, then there is also a qualified company in charge of the maintenance, so moving walks could operated safely in use.

6.Urgent situations

6.1 In the case that heavy urgent problems occurred and affect normal running,

6.2 If earthquake happened, even the moving walks won't be destroyed much by the slight shake, tremor, moved horizontally or inclined, or some electric wire will be broken, at this time, if you start the moving walks, the unexpected accidents may happen. So the moving walks should be checked and maintenance before using.

6.3 When the conflagration is happened, the electric power should be cut down at once to stop the moving walks. Meanwhile, the passengers on board should be guided to the safe place.

6.4 When flood happened or driving room is soaked,

If one of the above four cases are happened, the moving walks could be in work only after the strict inspection and maintenance has been made by the related staffs.

7.Standard maintenance of moving walks

Table 2.

No	Items	Maintenance Time	Remarks
1	Running quality	once a fortnight	Execute by the professional maintenance staff Report to owner
2	Noise or vibration abnormal	once a fortnight	Execute by the professional maintenance staff Report to owner
3	The inspection of each fuse and air switch	once a fortnight	Execute by the professional maintenance staff Report to owner
4	The inspection of controller components	once a fortnight	Execute by the professional maintenance staff Report to owner
5	The inspection of the handrail inlet switch	once a fortnight	Execute by the professional maintenance staff Report to owner
6	The inspection of the comb of the comb plate up and down.	once a fortnight	Execute by the professional maintenance staff Report to owner
7	The inspection of pallet meshing.	once a fortnight	Execute by the professional maintenance staff Report to owner
8	Clean groove of the pallet.	once a fortnight	Execute by the professional maintenance staff Report to owner
9	The handrail and the pallet running synchronal	once a fortnight	Execute by the professional maintenance staff Report to owner
10	Working brake inspection	once a fortnight	Execute by the professional maintenance staff

			Report to owner
11	The inspection of the lubricating of the drive chain and the pallet chain	once a fortnight	Execute by the professional maintenance staff Report to owner
12	The cleaning of controller and the driving machine	once a fortnight	Execute by the professional maintenance staff Report to owner
13	The inspection of the gap between the pallet and the skirt	once a fortnight	Execute by the professional maintenance staff Report to owner
14	The clean of the surrounding of the moving walks	once a fortnight	Execute by the professional maintenance staff Report to owner
15	The inspect of each electric power and the voltage	once every two months	Execute by the professional maintenance staff Report to owner
16	The inspection of the brake distance.	once every two months	Execute by the professional maintenance staff Report to owner
17	The inspection of speed govermer.	once every two months	Execute by the professional maintenance staff Report to owner
18	The inspection of the action of each switch.	once every two months	Execute by the professional maintenance staff Report to owner
19	The inspection of the brake of the driving machine	once every two months	Execute by the professional maintenance staff Report to owner
20	The inspection of the motor and gearbox	once every two months	Execute by the professional maintenance staff Report to owner
21	The inspection of the output shaft chain sprocket of the driving machine	once every two months	Execute by the professional maintenance staff Report to owner
22	The inspection of the tension station tensioning state.	once every two months	Execute by the professional maintenance staff Report to owner
23	The inspection of the fixing state of the pallet fixing	once every two months	Execute by the professional maintenance staff Report to owner
24	The inspection of handrail	once a month	Execute by the professional maintenance staff Report to owner

Notes:
If the ASAP maintenance work is executed by the user appointed persons, this persons should be the qualified persons.

8.Essential requirements of maintenance

8.1 Notes of maintenance
Those who are not professional maintenance staff are not allowed to do the maintenance task without permission. As the moving walks use PLC controlling system, it must be carefully maintained.

8.1.1 While maintain the moving walks, following rules should be obeyed：

8.1.1.1 It is not allowed to take passengers or goods, there should be a warning sign ” Maintenance, stop use” and so on.

8.1.1.2 Put off the operating switch, the maintenance operation is only be allowed by inspecting box.

8.1.1.3 The general power switch should be put off while working in the machine room up and down.

8.1.l.4 The maintenance lamp used must be with protection cover and use the safety voltage under 36V. (The socket of low voltage is installed in the machine room up and down)

8.1.1.5 During the period of maintenance operation, the main member must work together with the assistant. Maintenance by only one person is prohibited.

8.1.1.6 If the assistant person is asked to operate the moving walks during maintenance, the person must be with full attention and obey the instruction of the main maintenance staff.

8.1.1.7 while dismantle some of the pallets, if the general power switch isn’t cut off; the maintenance staff is not allowed to enter the region.

8.1.1.8 When finish the maintenance in the machine room up and down, the covering plate should be put back in time.

8.1.2 During the maintenance, there are some notes while using the instruments:

8.1.2.1 The internal resistance of electric universal meters is over 200 KΩ:

8.1.2.2 The AC current meter range is bigger than Ac 100 A

8.1.2.3 The AC voltage meter should have working range of Ac460V. If finger type used, the impedance is below 300 KΩ

8.1.2.4 High voltage meter should use the type with range of 600V and battery, the internal resistance of which is over 20OKΩ.

8.1.2.5 The rotation tachometer is 0 - 6000r/min

8.2 Noted points of maintenance

Table 3

No.	Item	Content
1	Running state	Stand on the moving walks, feel the stability of pallets.
2	Noise or vibration abnormal	Check if there are friction between pallet and skirt, pallet and comb block. Please also check pallet turning is smooth, pallet and pallet chain roller broken or not.
3	The inspection of each fuse of the air switch	Check the fuse and air switch in controller to see if they are fit the standard demand.
4	The inspection of controller	Check the connection if there is loose, action of the components is correct.
5	The inspection of the handrail inlet safety switch	Check the reliability of four switches and the reset action is normal.
6	The inspection of the comb of the comb plate up and down.	Check the perfection of comb plate. See if comb teeth are in the center of the tooth space, also check if the comb block broken or not.
7	The inspection of meshing states of the pallet and comb.	See if pallet can successfully get though the comb plate. The meshing depth no less than 6mm. The gap between pallet and comb plate no higher than 4mm.
8	Clean pallet groove.	Check the groove if there exist any garbage or impurity.
9	The synchronous status between the handrail and the pallet.	See if the sync rate between handrail and the pallet is in 0～2%.
10	The inspection of working brake	Check the reliability of brake. The gap between the liners and brake wheel no higher than 0.7to 1.2 mm while declutching.
11	The inspection of the lubricating of the drive chain and the pallet chain	Lubricant state.
12	The clean work of the controller and the driving machine	Cleaning the surface of controller and the driving machine.

13	The inspection of the gap between the pallet and the skirt	Check the gap of the pallet and the skirt. The gap should not bigger than 4mm(one side). And the sum of the gaps in both side should not bigger than 7mm.
14	The clean of the out surface of the moving walks	Cleaning the surface of covering plate, comb plate, interior and exterior skirt decking profile, handrail, safety glasses etc.
15	The inspect of each electric power and the working voltage	Confirm the voltage of each power supply fits the electric schematic diagram.
16	The inspection of the bake distance	Check the braking distance (0.2~0.6m) while the moving walks descending no-load. Check the friction between the brake strap and the brake wheel. Check the reliability of operation and abnormal noise.
17	The inspection of the speed governer	Check the speed of driving machine and the pallet running speed.
18	The inspection of the driving chain and the pallet chain	Check the operation status of the driving chain and the pallet chain.
19	The inspection of the action of each safety switch.	Check the action and reliability of each switch of the moving walks.
20	The inspection of the main drive and gear box	Check the lubricating oil state in the gearbox and change the lubricant oil if necessary. Check the wearing status of the tooth and working situation of bearing.
21	The inspection of the motor	Check the temperature rising of motor during work, operation state, any abnormal vibration and noise. Check if the electric connection and insulation state.
22	The inspection of the in wheel on the output shaft of the driving machine	Check the wearing status of output shaft chain wheel. See if there exists loose status of the chain wheel.
23	The inspection of the tension device of the pallet chain	Adjust the tension force of the pallet chains via spring. Check if the tension state is proper and haven't impact about pallet running.
24	The inspection of the fixing device for the pallet	Check the center position of the pallet; check fixing state of each pallet. Make sure no loose or defective.
25	The inspection of the handrail wearing state	Check the operation status and wearing status of two handrails. See if there exist any worn on the surface, or any worn-out part of the handrail. Change the handrail if it cannot adjust to synchronized with the pallet.

8.3 Noted points for maintenance

8.3.1 Abnormal running and the vibration

8.3.1.1 During the normal operation, the working brake can't be released completely or even released but the brake belt or liner deviate from the right position then still contact the brake wheel and may cause the friction, so may generate the strike while start and run.

8.3.1.2 Pallet chain elongated or deform too much, may generate deviation of the chain pitch, and cause the pallet running deviation, may generate friction with skirt.

8.3.1.3 Over wear of the pallet roller or chain roller or roller bearing damaged.

8.3.1.4 Pallet cannot pass the returning position or the gap between the rollers and return curve guide rail is too big,

All these points should be checked and adjust carefully in case there are abnormal running or vibration.

8.3.2 Driving machine inspection
8.3.2.1 Gearbox

8.3.2.1.1 After a long period of operation, the teeth of worm gear may wearing too much and enlarge the gap in between, or the bearing wear too much, then may cause the box generate big noise or in high temperature, so the suitable adjustment or replacement should be executed accordingly.

8.3.2.1.2 Keep clear and the good performance of the lubrication in the gear box. The lubricating oil should be changed in case necessary. The oil level should be checked carefully and keep in right level range in order to keep good lubricating property. . Recommended lubrication oil please refers to the lubricating table.

8.3.2.1.3 The bearing cover and the box should be linked tightly and ensure no oil leakage.

8.3.2.1.4 The lubrication oil in the gearbox should be changed according to the lubricating table recommended on normal condition. For the new installed moving walks, lubricant should be checked frequently. The oil changing should be taken in case the oil finds impurity.

8.3.2.1.5 The machine and the bearing temperature should be no higher than 80K under normal working condition.

8.3.2.1.6 Change the bearing when find non-uniform noise or collision noise generated.

8.3.2.1.7 The anti-vibration rubber pad inside the coupling should be checked every half year, changing should be taken when find problem.

8.3.2.2 Brake

8.3.2.2.1 The brake belt should contact surface of brake wheel tightly while braking. And it should be leave the brake wheel surface after braking. The gap between them should be between 0.7-1.2mm and evenly contact while working.

8.3.2.2.2 The brake action should be smooth and reliable. The temperature rise of braking electric motor coil should be no higher than 60K.

8.3.2.2.3 No loose in the wire connection of braking electric motor and also in good insulation.

8.3.2.2.4 Connection pin should be flexible and right lubricated.

8.3.2.2.5 Keep the working surface of the brake belt clean and out of oil and paint. The screw for fixing brake belt should be submerged to the brake belt and not allow to contact with the brake wheel surface. The brake belt should be changed in time when it was worn too much to make the screw emerged or the wearing capacity reach one quarter of the total thickness of brake belt.

8.3.2.2.6 For the premise of safety and reliability, adjust the force of brake spring to meet the need of braking distance of moving walks.

8.3.2.3 Motor

8.3.2.3.1 The motor is connected to gearbox via a flange. The connection should be tight and the coaxial of worm shaft and the motor should be guaranteed.

8.3.2.3.2 The temperature rise of motor bearing should no higher than 80K.

8.3.2.3.3 The bearing should be changed while the noise is generated because that wearing makes the air gap interval non-uniform between the stator and the rotor.

8.3.3 Driving system Inspection (structure of moving walks upper and lower part)

8.3.3.1 Drive shaft is driven by main drive via duplex chain, if the chain elongate too much then will generates running noise; adjust screw in the drive machine bed for the chain tensioning in right state. The tensioning should be proper, not complete tight and sag length should be smaller than 16 mm.

8.3.3.2 The lithium-based grease should be add to the bearing of main shaft by every two-month.

8.3.3.3 There should be enough lubrication between the pallet chain plate and the big chain wheel.

8.3.3.4 The pallet chain pitch may elongate too much after long time operation and will generate deviation then affect the pallet move smoothly and may also makes the pallet contact the skirt while running. So please check the pitch length, and change the pallet chain in case the extension is over required dimension.

8.3.3.5 The lithium-based grease should be added to the rolling bearing of the tensioning sprocket by every two-month (in case sprocket type used).

8.3.4 Pallet guide rail

8.3.4.1 The middle pallet guide rail is cold rolled hollow type, upper and lower, return curve rail is welded on the vertical supporting plate. The pallet chain roller are run on the guide rail. So the working surface of the guide rail should be checked carefully to ensure the roller could contact the rail surface properly.

8.3.5 Pallet

8.3.5.1 Pallet is the circular running parts along the guide rail system and meshing with comb plate before turning. It may easily damaged in case objects are caught between the pallet and comb, if pallet deform or broken, then should be changed in time.

8.3.5.2 When the pallet is running on the guide rail, the supporting rollers on the pallet should to contact the surface of the guide tightly. After a long period of operation, when the pallet is deformed and the rollers cannot contact the surface correctly and pallet permanent deformation reaches 4mm, then the pallet should be changed.

8.3.6 Handrail
8.3.6.1 Handrail is drive by the friction wheel. And there are many supporting rollers in the handrail system that can easily worn and get in deviation or dirt, so cleaning and adjusting should be taken during the maintenance.
8.3.6.2 If the handrail is overextended and cannot keep to 0~2% sync speed with the pallet, and then it should be changed.

8.3.7 Every safety switch should be in safe and effective. All the switches should be checked thoroughly timely to make sure that all the switches are in the normal effective status.

8.3.8 Auto-lubrication system
8.3.8.1The auto-lubrication device can be installed according to customer’s order.
8.3.8.2 Auto-lubrication device is a spring piston pump type driven by a micro motor, and distribute the oil via quantifier. Its filling capacity can be adjusted in the 0.2~5 ml

range.

8.3.8.3 The filling capacity can be adjust as demand. The method can be found in the instruction book of the device.

8.3.8.4 The auto-lubrication device should use the suitable lubricant oil (refer to the lubrication table)

8.3.8.5 The oil tank should be cleaned every half year, and the oil filter should be cleaned or changed. If any containment was found in oil, then the oil pump should be cleaned thoroughly and the oil should be recharged.

8.3.8.6 Checking the lubrication system periodically to make sure it is running well. If any accessory is damaged, it should be changed in time.

8.3.8.7 Keep the oil pump outlet pipes fluently. Keep the oil brush clean and use kerosene to wash the oil brush if it was dry

9.Lubrication of Moving walks

9.1 The lubricating location refers to the moving walks lubricating drawing attached.

9.2 The lubricating cycle and the oil (grease) of each location refer to the list in below:

List of lubrication oil (grease)

No.	Components Name	Lubricating Location	Time	Oil (Grease) Code	Oil Name	Oil (Grease) standard	Oil capacity
1	Drive machine	Worm gear box I	12 month	VG460	Mineral oil (≤11kw) Synthetic oil (>11kw)		1st filling of oil at 1500 hours, normally at 10000 hours.
2	Drive machine	Brake pin	1 month	No.30	Mechanical lubricating oil	SY1608	Little add once
3	Auto-lubricating device	Chains	1 month	No.30	Mechanical lubricating oil	SY1608	Refer to instruction manual
4	Main shaft bearing	Bearing	2 month	No. 3	lithium-based grease	SH/T0380-1992	Add every two-month.
5	Tension shaft bearing	Bearing	2 month	No. 3	Lithium-based lubricant	SH/T0380-1992	Add every two month
6	Handrail drive shaft bearing	Bearing	2 month	No. 3	Lithium-based lubricant	SH/T0380-1992	Add every two month

10.Spare parts

10.1 The spare parts listed below are normal easy break parts. Alternative parts can be ordered according to customers ‘ requirement:

Spare part list

No.	Part name	Location	Replacement cycle (month)	Remark
1	Comb block	Comb plate	According to the status of wearing and broken	Polysaccharide or aluminum alloy
2	Pressing roller group for handrail	Driving device of handrail	According to the status of wearing and broken	Assembly
3	Handrail	The handrail system device	According to the status of wearing and broken	
4	Pallets	Pallet guide rail	According to the status of wearing and broken	In according to width of pallet and type
5	Pallet chain roller	Pallet chain	According to the status of wearing and broken	Changed with chain Polyethylene
6	Braking belt	Brake	According to the status of wearing	
7	UKS switch	Safety switch	broken	
8	LXW5-11Q1	Safety switch	broken	
9	ZR231	Safety switch	broken	
10	TR231	Safety switch	broken	

11.Frequent Failure Analyzing & Eliminating

Table 6

No.	Failure phenomenon	Analyzing main reason	Excluded failure
1	The Moving walks can’t start when use key switch to start	1. Whether the power is on 2. Voltage of power supply is too low. 3. The phase of power supply is connected incorrectly 4. The key switch is break off because of loosen wires	1. Inspecting whether the power supply is on 2. Stop and out of use when the voltage is too low. 3. Check the phase relay 4. Adjusting and connect

2	Stop suddenly when in operating.	1. Lost power supply 2. One of safety switch is off 3. The emergency button is pressed	1. Resume the power supply 2. Check the safety switch 3. Restart the key switch.
3	Impulsion phenomenon is found when started	1.The brake is not released completely, or the brake belt is on the deflective position, there is friction between brake belt and brake wheel. 2. The brake time delay	1. Check and adjust 2. Adjust the open time of the brake
4	Obvious shake and jumpiness are found while running	1. The pitch deviate too much 2. Pallet chain roller defective 3. Pallet roller defective	1. Inspect the pallet chain. 2. Replace 3. Replace
5	Fraction noise found between skirts and pallets while running.	1.Pallet deviate from the center line 2. Pallet guide block over wearing 3.Gap between the pallet and skirt need to be adjusted.	1.Check and calibrate to the centerline. 2.Adjust the gap between pallets and skirts 3.Change guide block
6	Bad synchronization between the handrail and the pallets	1.The pressing roller group need tightening 2. Handrail need tensioned properly 3. Handrail is too long to be adjusted.	1.Adjust the driving device of handrail. 2.Adjust the handrail tension. 3.Replace the handrail
7	Brake wheel in high temperature, and there is abnormal smell and nick on the brake wheel.	1. The gap between brake belt and brake wheel is too small. 2. The brake spring is too tight; the force for loosing brake is not enough. 3. The working voltage of brake is too low to loose the brake in time. 4. The brake mechanism is blocked. 5. Burning of brake motor 6. There is wear on the brake belt seriously, or the rivet pin is found on the surface of brake belt.	1. Adjust the gap to 0.5~0.7mm 2. Adjust the spring force 3. Measure and adjust voltage 4. Adjust and add the lubrication oil. 5. Replace the brake motor. 6. Replace brake belt.
8	There is abnormal noise or vibration or the bearing in high temperature during the driving motor in operation	1. The worm teeth gap is too large 2. The bearing is worn. 3. There is loosening between fasteners. 4. The lubricating failure.	1.Adjust worm and gear 2. Replace the bearing. 3. Inspect the fastener 4. Replace the lubrication oil.
9	Abnormal smell and heat found in the main driving unit.	1.Working environment is in high temperature. 2.Long time over load 3.Failure of thermal protective relay	1.Keep normal room temperature 2.Check if there are any mechanical fault 3.Replack the thermal protective relay
10	Action of Phase relay in the controller	1.Wrong connection of power supply phase 2.Miss power supply phase	1.Adjust the power supply phase 2.Check and replace.

12.Maintenance notice

12.1 Maintenance should follow the type requirement in the relevant manual accordingly

12.2 When doing maintenance, please refer to the relevant electric circuit diagram, working principle and elements symbol figure, cabling accordingly.

12.3. Eliminate the fault and resume the moving walks according to the relevant instruction.

12.4. Contact the technical department of our company in emergency cases.

13.Cleaning

In order to ensure the good operation of moving walks, the periodical cleaning should be done.

In selection of detergent, please note that for the surface of plastic & rubber, only the neutral liquid such as soap can be applied. If other cleaning detergent (such as high concentration of alcohol) to be used, the material may lose its fine surface or color and become fragile.

No corrosive, solvent type or abrasive detergent or polishing liquid to be used, and following requirements should be followed during cleaning:

- Shut down the power of moving walks before make any cleaning.
- To make sure that no water or other liquid flow into moving walks to prevent the parts corrosion inside the moving walks.
- For the painting surface or surface of the aluminum, stainless steel, the wet cotton cloth can be used for cleaning.

14.Suggestion:

To sign a Maintenance Contract with CANNY ELEVATOR CO, LTD, you will be ensured all your value and safety of your moving walks, such service includes all maintenance operation as well as preventive safety inspection and the necessary technical service in time. CANNY ELEVATOR CO, LTD will strictly follow the China national standards and related codes, specifications for the maintenance with our professional staffs and experiences.