KERUNDE TDTG Series

Bucket Elevator

Operation Manual

Note: Prior to operation, please read over this operation manual carefully and keep it properly for future reference.

YANGZHOU KERUNDE MACHINERY CO., LTD.

Congratulations, you have selected Kerunde Brand bucket elevator. This bucket elevatorl can fulfill your requirement to lift materials. Prior to operation, please read over this operation manual carefully, well know attention items for safety, different performances, requirements to installation and operation etc. of this equipment so that you are able to adroitly operate and use this machine, and create more benefits.

Important Explanation

Documents

The operating instruction is specially compiled for your working personnel responsible for operation and management of the equipment manufactured by Yangzhou Kerunde Machinery Co., Ltd. Please deliver these documents to the personnel concerned.

If the contents of this Operation Manual and specifications of this product are to be changed, we would not notify of them further. Yangzhou Kerunde Machinery Co., Ltd. will reserve the right to modify the specifications of this product and the contents in this Operation Manual.

Measures for delivery taking

Once the machine arrives, make a visual inspection immediately. If there is any damage caused during transport, take necessary procedures to claim for compensation according to the supply contract. The repair expense should be borne by the risk undertaker concerned.

Storage

The machine and equipment that can't be installed at predetermined site immediately must be stored with the original packing in a place where is weatherproof and free of any other external damage. The storage loss can only be handled in light of the supply contract.

Installation

Only specially trained technical personnel are allowed to install the machine and machine parts produced by Yangzhou Kerunde Machinery Co., Ltd. according to various installation specifications attached.

Equipment structure

If several machine structures are involved in the documents provided, only the one stated in the supply contract is effective. We reserve the right to make improvements prior to delivery.

Start-up and commissioning

Start-up and commissioning work can only be conducted by specially trained technical personnel. Before the initial start-up, operators must be familiar with all instructions and operation rules stated in the documents provided by us. And it is a must to fill lubricant like speed variator oil prior to the initial start-up.

Accident precautions

Relevant accident precaution regulations in the documents provided by us must be carefully studied and observed. Yangzhou Kerunde Machinery Co., Ltd. makes every effort to manufacture equipment according to the latest Chinese national safety standard and European safety standard (or the CE standard), and customers must tell us the local safety regulations prior to our production. And the extra cost resulted here from should be borne by the customer.

Maintenance/cleaning work

Maintenance can only be carried out by professionals, and they should know well in advance the regulations in the documents provided by us. These regulations are favourable for keeping the machine and equipment intact, reducing abrasive wear and prolonging the service life. Cleaning work must be carried out according to legal regulations as well as the instructions in our documents.

Copyright

Quality guarantee

We are only responsible for quality guarantee stated in the contract. The precondition is: what is used is the authentic equipment made by Yangzhou Kerunde Machinery Co., Ltd. We are not responsible for any loss resulted by using the spare parts produced by other manufacturers. We are not responsible for compensation of any loss caused by improper operation or breach of the operation regulations, or incorrect operations by non-professional personnel.

Educational obligation

The enterprise leaders who own the machines and equipment produced by Yangzhou Kerunde Machinery Co., Ltd. have the duty to enable the machine operators to be familiar with these operating instructions and emphasis them where the especial danger is during operation of these machines.

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1. Personal protection: Countermeasures against Accidents

All the mechanical equipments produced by Yangzhou Kerunde Machinery Co., Ltd. are equipped with safety devices, which are consistent with modern technical level and universally effective safety rules prior to ex works, so that the customers can use the machines in accordance with the regulations.

1.1 Safe Production

1.1.1 The coupling shield cap for belts and chains must be mounted and closed at any moment. It is very dangerous to personal safety, if they are open or disassembled. This point is also applicable for the preventive device of manipulator.

1.1.2 The safety limit switches should always be kept in good order. The safety limit switch may not be overlapped or discarded.

1.1.3 The grating cover plate, grid bar or guard grating are usually installed and delivered together with the machine. They can only be disassembled with tools. And the machines with such kind of devices can never put into work until the above-said devices have been properly installed.

1.1.4 The driving motor must be switched off completely when carrying out inspection, commissioning, repair and maintenance. This can be realized through a full-phase separating and lockable switch installed near the machine or on the operation desk and control panel on the site. It is not enough only to screw off the fuse wire!

1.1.5 If the machines need other energy like pneumatic, hydraulic, steam and hot water energy, it is necessary to cut off their energy supply or turn off the switch, and eliminate the pressure in the internal pipeline system of the machine.

1.1.6 As for handling heated or cooled parts and components of the machine, especial care should still be taken for the danger of burning possibility.

1.1.7 If you have pressed the emergency stop switch to stop the machine and you want to reset the switch, so it is not permissible to only re-press this button to restart the machine. And the machine can only be started by re-closing the main switch first.

1.1.8 If some machines are equipped with a local shutdown system, especial care should be taken. Read the instruction manuals attached with the machine carefully. In such machines with a local shutdown system, temperature will rise because pressure or vacuum will occur after they have been used for a period.

1.1.9 If the operators employed cannot read or write, the owner has the duty to explain to them clearly where dangers exist and warn them that special attention should be paid.

1.1.10 The cleaning, lubricating and oiling of the machine or its parts and components may be carried out only when the machine is stopped. If you must climb on or enter the machine to do such work, the mandatory provisions shall be made without exception: the power supply of motors must be cut off completely and the switch must be locked!

1.1.11 Be careful, sampling from inside the machine can never be carried out unless there is not any danger. Usually, the samples can be taken from the pipe under the machine instead of inside machine.

1.1.12 Clear off the deposited dust, dirties and materials frequently. Keeping the machine clean can enhance production safety and the cleaning level of workshop, and is also beneficial to dust explosion prevention.

1.1.13 If oil (grease) leakage occurs, clean it immediately and seal well the place where leakage occurs, for oil or grease leaked on the floor will easily bring about hazards to the operators.

1.1.14 In production operation, the machine must be equipped with safety devices, which may be neither removed and abandoned nor reduced in functions. Otherwise, we are not responsible for any accidents resulted here from, and reserve the right to ascertain where the responsibility lies.

Please execute the special regulations on accidents prevention in the operating instructions provided us.

Only the trained professionals are allowed to operate the machine and equipment manufactured by our Company.

1.2 Measures for environmental protection

If you decide not to use the machine any longer after it is used for a certain number of years, the measures for environmental protection and reutilization should be taken: drain the liquids inside the machine (like motor oil, gearbox oil, brake oil and coolant etc.) into special containers and send them to the preparation workshop. The plastic parts shall be picked out for reutilization. The metal parts shall be sorted out so as to be crushed or scraped.

2 Explosion Protection: Countermeasures against Dust Explosion and Fire Hazard

2.1 Common cleaning work

2.1.1 Keeping the working site with combustible dust clean is an important condition for safe production.

2.1.2 Try not to pile bagged or bulk materials between machines.

2.1.3 In order to reduce dust emission to surrounding areas, all conveying devices, cyclone separators and dust collectors should be kept in good condition. Especially, the unsealing phenomena of pipes or top covers should be avoided.

2.1.4 In order to reduce dust explosion hazard, dust everywhere must be cleaned out frequently and effectively.

2.1.5 Keep all motors free of deposited dust.

2.2 Frequent inspection and maintenance

2.2.1 Regularly check the safety devices such as speed monitor or the like, at least once a week.

2.2.2 Check and clean all the magnetic separators regularly, at least once a day.

2.2.3 In order to avoid heat generation, it is necessary to regularly check the functions of all main shafts and bearings, at least once a week, and to regularly carry out lubricating.

2.3 Electric apparatus

Regularly check the electric apparatus and articles, and special attention should be paid to the following points:

2.3.1 It is forbidden to use any flashlights and other lamps without shielding or explosion-proof glass.

2.3.2 It is forbidden to use any lengthened cable or electric furnace.

2.3.3 It is necessary to immediately repair or replace the electric devices and equipment if any failure occurs.

2.3.4 The cables without conduits are not allowed to be installed on the floor.

2.3.5 Cut off power supply of the machine when going off work.

2.3.6 An electrician should be assigned to check the insulation of all the lines of electric network according to relevant regulations on heavy current, at least once a year.

2.4 Smoking and welding

2.4.1 Smoking is prohibited, which is applicable to all workers and staff of the enterprise as well as guests, customers, foreigners and drivers visiting the factory.

2.4.2 If the tools such as welding machine or soldering lamp (flame soldering lamp) etc. are required for repair or installation, do as best as possible to arrange the work in a special workshop or on a special site.

2.4.3 If it is necessary to carry out welding or the like directly in production area or storehouse once in a while, written applications must be submitted to a related supervisor in advance for written approval. The

above mentioned operations can be carried out only when special safety measures have been taken, such as laying pieces of water soaked canvas or canvas special for covering on the surrounding area and preparing fire extinguishers. After completion of the operation, the welding site and the surrounding area are to be monitored at least for 10h. The gas cutting sparks are very dangerous, for people can't see where they will fly on earth. They can cross through the narrow clearance of walls and drop downstairs or to the next rooms, or even fly off 10m away in distance. If the sparks drop in dusts, fire accidents may occur at any time.

2.4.4 Welding is prohibited on a running conveyor. If the welding work is necessary, shut down the machine first, and then make a thorough cleaning and isolate both sides of the welding site tightly with materials like mineral wool to avoid connecting with other conveying devices, silos or tanks. If the work is to be done on the chutes or conveying pipes, it is necessary to disassemble them or divert their lower ends and seal them to avoid welding sparks entering the conveying pipes or silos.

2.5 Effect of static electricity

In order to ensure the safety of electric circuits and avoid explosion resulted from spark discharge, the paint coat at the electric connections must be removed.

3 Safety Precautions

Safety Points

3.1 It is prohibited to open the access door until the machine has been fully stopped.

3.2 The main switch must be shut off and locked for all maintenance and inspection work.

3.3 Electric installation and the treatment of conducting parts can only be done by specialized persons in accordance with the related electric safety standards.

3.4 The bucket elevator mill must be run on the condition that all accident precaution regulations are strictly observed. Whoever takes off guarder or make it dysfunctional should be responsible for the safety result.

3.5 In case maintenance and inspection work should be done with a welder or other tools that can generate sparks, strict safety precautions must be taken against dust explosion and combustion. (See “Explosion Proof：Preventive Measure for Dust Explosion and Fire”)

3.6 When the bucket elevator is under stoppage, attention must be taken to prevent it from being started by any starting mode.

3.7 It is not allowed to take off the coupling guard.

3.8 It is forbidden to approach the rotating components by finger during running of the machine. The inspection, maintenance and cleaning work may be done only after the bucket elevator has been completely stopped.

3.9 Before the electric circuit is cut off, it is strictly prohibited to open the terminal box for avoiding electric shock. The control system of the hammer mill must be supplied by Yangzhou Kerunde Machinery Co., Ltd. or checked by an expert from Kerunde before commissioning, ***otherwise the technical safety responsibility of the supplier will be dispelled.*** Electric control is a component part of the safety regulations for accident precaution. Prior to commissioning the control system must be tested by the specially trained professionals in light of the testing list. If the control system for Kerunde machinery equipment is not used as per the conditions mentioned above, Kerunde will refuse to take any responsibility. If Kerunde is required to take responsibility, the Company will reserve the right to investigate and affix the responsibility of the operator.

3.10 The operation, checking and maintenance etc. of machine or equipment can only be carried out by the qualified professionals trained by Kerunde.

3.11 Whenever maintenance or repairing is to be done the power must be cut off first so as to prevent the motor from accidental staring.

3.12 All related employees should receive safety education, the enterprise management should be in charge of it, and the national, local or the other internal safety regulations of the enterprise should be observed.

3.13 The machine must not be used for the applications which are not in the application range.

3.14 The safety marks must be kept clean and cannot be taken off or covered.

3.15 The safety guards can never be dismounted, covered or overlapped willfully, and can never be opened until the machine has completely stopped. And the machine can only be started when these safety guards are in good order functionally.

3.16 The damaged parts must be repaired or replaced promptly.

3.17 For transportation and handling, it is not allowed to damage the equipment by bundling. In case there is any machine damage or missing of parts found in transportation or handling, it should be reported to the management immediately.

3.18 Prior to installation, all machine parts must be kept in their original packages. The machine parts and packing boxes should be properly covered and stored in places sheltered from rain, sunning and damp. The permissible load of hoister should higher than the equipment weight. As hoisting, only the hoisting points assigned on the machine can be used; the hoisting ropes must be fixed correctly and reliably; and no one is allowed to be under the equipment being hoisted.

3.19 In installation, enough space should be reserved for future maintenance and replacement of the equipment.

Noise data

The noise level (sound pressure level) of this equipment ≤85 dB; The noise caused by vibration or irrational installation should be reduced and the foundation for installing the equipment should have a sufficient strength.

4 Briefing of bucket elevator

4.1 General

4.1.1 Application and adaptability

Kerunde TGTG Series Bucket Elevator is a vertical continuous conveying equipment, and mainly used for conveying powdery materials in compound feed mills and premix feed mills. Kerunde TGTG Series Bucket Elevator is applicable to conveying powdery materials, granular materials and small lump materials. It can be used for conveying semi-finished and finished products from raw grain in processing plants, especially applicable to conveying materials during production in feed and grain processing plants, as well as conveying in warehouse, oil plant and etc.

4.1.2 Characteristics

The boot section can be installed with forward or backward feed hopper according to customer's requirements;

The working components are mechanically bended, riveted and welded, and have good sealing performance;

The thick and flat rubber belt used as the traction belt is characterized by high strength, strong traction force, low extensibility, high durability and reliability;

The head section is equipped with explosion proof vent that can effectively prevent dust explosion;

It is possible to use straight-coupling drive of cycloid pin-gear speed reducer or secondary drive between speed reducing box and chain wheel (or V-belt), the driving is stable and reliable with low noise and easy for installation and repair.

It is possible to install alarm devices for speed measurement and sideslip as required by customers, so as to ensure safe and normal production; an automatic backstop device can be equipped against blockage of materials due to power failure;

The head section and boot section are equipped with hosting mechanism for the convenience of dismantling, mounting and maintenance.

The mounting height is optional in allowable range.

4.1.3 Working conditions

Bulk density of materials: γ=0.2—1.2t/m3;

Temperature: temperature of the materials not exceeds 60℃;

Moisture content: it is relative to materials particle size and viscosity; there is a limit that the materials should be easily loosened after being lumped by kneading with hand;

The bucket elevator can only be vertically arranged, and the length of single equipment should not be more than 60m.

4.1.4 Composition and meanings of the type

T- Specialty code: universal mechanical equipment for cereal and oil materials processing

DT- Variety code: bucket elevator

G- Type code: stationary type

□/□×□- Product specification: head pulley diameter × bucket width (cm)

Number of bucket rows: it can be omitted for single row

4.1.5 Main technical parameters (Table 1)

Table 1 ***Main technical parameters***

Item / Model	Dia. of Head and return pulley (mm)	Max. conveying capacity (m^3/h)		Linear speed of bucket belt (m/s)		Bucket spec. (mm)	Bucket space (mm)		Maximum hoisting height (m)
	/	Granular material	Powdery material	Granular material	Powdery material	Width × convexity × height	Granular material	Powdery material	/
TDTG36/23	360	25~30	15~20	1.6	1.2	235×143x96	200~250	250~300	60
TDTG36/28	360	30~40	20~25	1.6	1.2	285×143x96	200~250	250~300	60
TDTG40/23	400	30~38	20~25	1.7	1.3	235×155×91	200~250	250~300	60
TDTG40/28	400	38~48	25~30	1.7	1.3	285×155×91	200~250	250~300	60
TDTG50/28	500	45~55	30~36	2.0	1.6	285×155×91	200~250	250~300	60
TDTG50/32	500	58~70	38~46	2.0	1.6	330×165×111	200~250	250~300	60
TDTG60/28	600	65~80	42~50	2.3	1.8	290×165×108	200~250	250~300	60

TDTG60/33	600	110~135	72~85	2.3	1.8	337×215×140	200~250	250~300	60
TDTG80/33	800	220~270	/	2.7	/	339×259×170	200~250	/	60
TDTG80/46	800	310~380	/	2.7	/	470×260×170	200~250	/	60
TDTG100/33×2	1000	500~610	/	3.1	/	470×260×170	200~250	/	60
TDTG100/46×2	1000	700~870	/	3.1	/	470×260×170	200~250	/	60
TDTG100/56×2	1000	870~1050	/	3.1	/	569×260×170	200~250		60

Note: The tested material for the above output is wheat or corn; bulk density $\gamma = 0.75 t/m^3$.

4.2 Operating principle and structural features

4.2.1 Operating principle

When the motor is switched on, the head pulley is driven by coupling or chain wheel and chain or V-belt, the power is transferred to the bucket belt, and the bucket mounted on bucket belt in certain spacing does circulating motion along the leg from the bottom up; materials enter the bucket in motion from material inlet, and conveyed to the head section of the elevator when filled, When the bucket belt turns around the head pulley, materials are ejected from the bucket under the action of centrifugal force and gravity. Since the head casing is deigned in parabola, which makes materials discharged from material outlet along the casing. There is adjustable baffle device equipped at the material outlet, which can reduce the back flow of materials from the falling pipe of elevator. A symmetrical saddle is installed under the head pulley, which can prevent dust from accumulation and materials from dropping to the boot section from the pipe. And then the empty buckets come back to the boot section of elevator along the rotation of belt and are lifted after filling with materials and discharge again. By such a repeated circle the materials in bottom are lifted to a given height and then discharged, so as to meet a requirement of vertical lifting.

4.2.2 Overall structure (see Fig. 1)

TGTG series bucket elevator is mainly composed of head section, leg, bucket, bucket belt, boot section and driving device. The head section, boot section and leg flange are connected by bolts and sealed by silicone sealant or seal gasket, and the bucket is fixed on bucket belt by special bucket bolts.

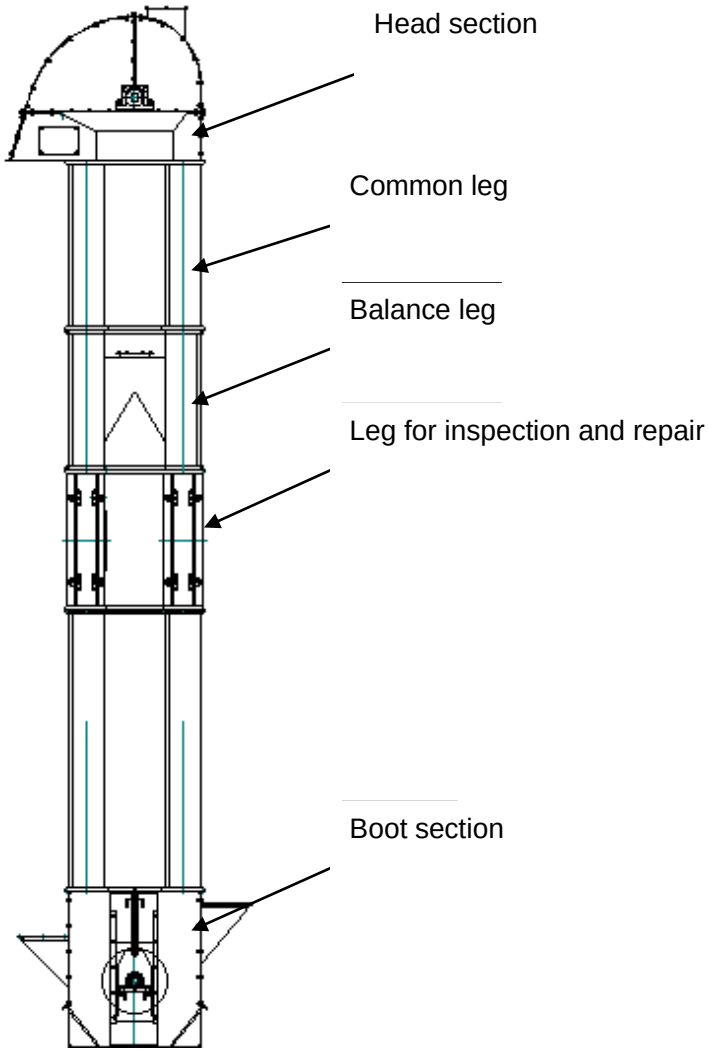

Fig. 1 Schematic diagram of bucket elevator

4.2.3 Main components

Boot section

The boot section consists of boot section casing, return pulley, return pulley shaft, tension device (including bolt tension or gravity tension), and feed hopper etc., there are forward or backward inlets on boot section to meet customers' demands in forward or backward feeding, Tension device is used to adjust the relative position of head and return pulleys and keeps bucket belt in tension against sideslip and slip; there are insert gates for material discharge at both sides of boot section to clear away surplus grains and foreign bodies.

Bucket and bucket belt

The bucket includes steel bucket and light high strength plastic bucket, customers may select according to materials' characteristics. The bucket is fixed on bucket belt with special bucket bolts in certain spacing, for the model and spacing of bucket. Use fabric enhancement type adhesive belt for the bucket belt, which is

characterized by small rate of elongation, high strength, abrasion resistant, light, non-poisonous and flavorless. The bucket model and space are shown in Table 1

Leg

Including common leg, air pressure balance pipe, and inspection and repair leg. Standard length for each section of common leg is 2m; the air pressure balance pipe is mounted on the leg through flange (position and amount of installation are determined as required), so as to keep air pressure between two legs balanced, and ensure smooth feeding and discharging of bucket; there is observation and access door on access leg, for observing and replacing bucket and bucket belt. The leg face plate and leg side plate are of undercut design, which may work as reinforcement and prevent dust from discharging.

Driving device

There are four types of driving devices for this elevator:

Type I: cycloid pin-gear geared motor, low speed coupling;

Type Ⅱ: Y series motor, ZJ type shaft mounted speed reducer, V type belt drive;

Type Ⅲ: Y series motor, ZLY (or ZSY) type speed reducer, high and low speed coupling;

Type Ⅳ: Y series motor, ZLY (or ZSY) type speed reducer, fluid coupling, and low speed coupling;

When driving power is more than 18.5kW, it can be equipped with liquid coupling, and can also be equipped with a motor for inspection and repair as required by customer; the above-mentioned components are mounted on driving device frame, and assembled in complete set. During installation, the driving device frame can be fixed on civil work foundation or drive platform according to technological requirements, and device of small specification (below TDTG50 type) can also be directly connected and fixed to the equipment body.

The head pulley is driven by driving device, which makes the bucket elevator get power and rotate.

There are several modes of power driven installation for Kerunde TGTG series bucket elevator, which can be selected for use by customers according to technological requirements.

The driving device should be fixed to the head according to actual situation, motor of small power (generally not more than 18.5kw) can be directly mounted on head cover plate, and motors of large power are arranged at right and left of the motor.

5 Transportation and installation

5.1 Transportation

When leaving the works, the equipment can be packed in a packing case according to practical situations.

When packing, the same components or several different components can be put into one packing case, but all components must be fixed in the case, and any collision should be avoided, so as not to cause deformation of casing or damage to surface coat, and affect the appearance quality. In addition there should be moisture-proof facilities to prevent machines from dampness and rusting.

5.2 Regulations on transportation

Place one or several components on a bearing plate, appropriately fix them and conveyed with fork lift;

All the cover boards of equipment are placed on bearing plate after being bundled up by hemp, appropriately fix them and conveyed by fork lift;

The conveyor chains is placed on bearing late after being bundled up by steel wire, appropriately fix them and conveyed by fork lift;

5.3 Unpacking and inspection

When the equipment arrives at the destination, unpack and carefully check the equipment whether there is any collision or abrasion during the transportation, and then count the attached documents and accessories according to the Packing List and make records.

6 Mechanical installation

Installation of mechanical part and scaled drawings of TGTG series bucket elevator

Installation of main part of the equipment

Place the boot section to designated position on the poured foundation, level it based on flange surface of the boot section, (leveling sizing block not exceeding 40mm is allowed to be underlaid), the deviation should not be more than 1/1000, and the foundation bolts should be fastened. According to the technological design requirements, install the leg section by section from the bottom up, and finally install the head section step by step and calibrate with pendulum wire; no obvious misplacement and seam is allowed at the joint in flange edge, and the joint should be sealed by silicone sealant or sealing member.

Installation of driving device

Components as motor, speed reducer, coupling, driving device frame and protective guard etc. have been assembled before leaving factory, which should be assembled with the principle machine as per detailed requirements defined in the installation and arrangement plan, and should be fixed to drive platform or head casing.

Installation of bucket belt and bucket (see Fig. 2)

If the elevator is equipped with drive platform, the allowable error of the parallelism between the reference plane for installation of speed reducer on the platform and the horizontal plane should not be more than 1mm.

When installing the bucket belt and bucket, punch bolt holes on bucket belt according to technical parameters, first adjust the boot section return pulley support to the highest position, and lead in the pre-stretched bucket belt from head section, pull out one end of the bucket belt from access door around the return pulley, and connect it with the other end, lap joint or angle joint is applicable for the connection of bucket belt, when the bucket belt width is > 250mm or hoisting height is > 25m, use angle joint. When using lap joint, the lap joint length is required to have 3—5 bucket pitches. And then install the buckets row by row on the bucket belt at the access door, the central line of bucket should be in alignment with that of bucket belt, and deviation should not be more than 4mm; as for customers having motor for inspection and repair, they may drive adhesive tape by the inching of motor for inspection and repair after the driving device is installed and the power is switched on, an then install the buckets row by row.

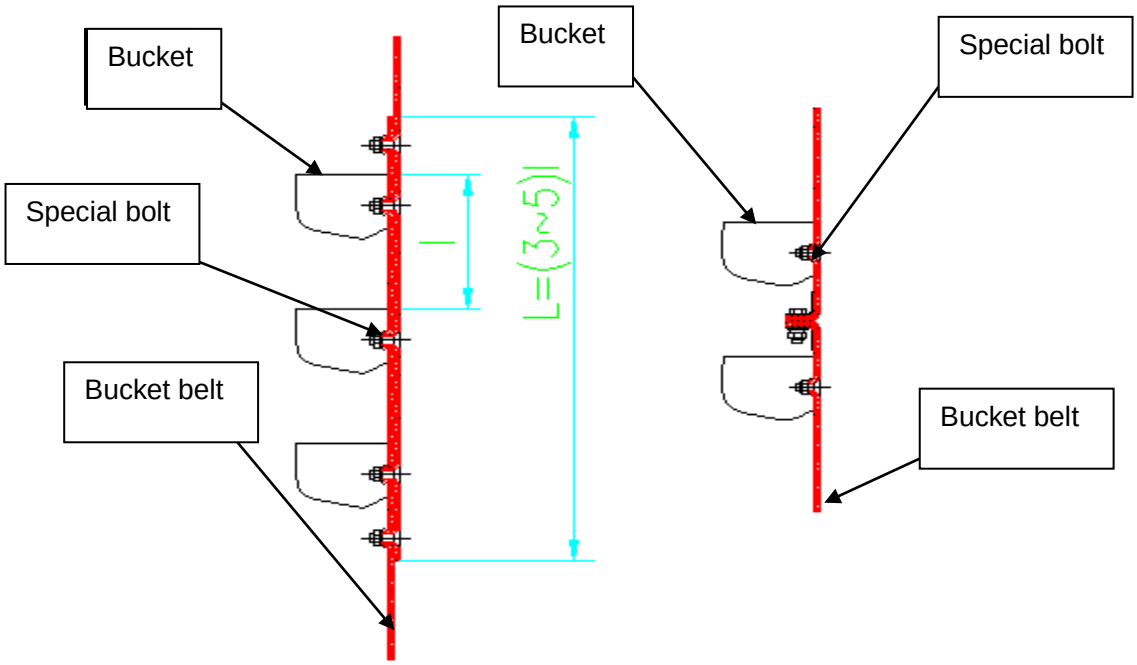

Fig.2 Installation of bucket belt and bucket

7 Operation

7.1 Functional inspection prior to the first test run

Prior to leaving the works, this machine has undergone a thorough test run in the works. The first test run can only be carried out when the following inspections are finished.

7.1.1 Please read the instruction carefully before use, and understand and correctly use the machine to avoid of any unwanted loss;

7.1.2 Open the discharge insert gate of boot section and remove foreign matters from it;

7.1.3 Check the oil supply state of bearings and speed reducer;

7.1.4 Check all parts for good condition, and degree of tightness of bucket belt

7.2 Commissioning

7.2.1 When the above works are finished, first turn the elevator with hand to observe that whether the bucket is collided with leg. If there is no problem, switch on to check running direction for correctness, and then start up by inching, if it is in well running, start idle running. 30min later, if it is in favorable no-load condition, loading test can be carried out.

7.2.2 During no-load running, there should be personnel especially designated in important parts at head, end and middle to observe the running state of bucket and drive part, and stop the machine immediately once any problem is found.

7.2.3 Before loading running, start idly until it is in well running, and feed uniformly, check all parts for running and the machine for sealing during loading running.

7.3 Use and operation

7.3.1 Starting it idly and uniform feeding are required during operation.

7.3.2 It is necessary to stop the elevator only when materials are emptied from the buckets, and stopping under loading condition is not allowed; if stopping in full load is required in special circumstance. Before starting up next time, remove the materials properly from the machine and then start it by inching.

7.3.3 When adjusting the tension device, first unscrew clamp nuts on the boot section movable plate, and then screw down them after adjusting.

7.3.4 If it composes production line with other equipments, start the back equipment first in order, and then start the front equipment; sequence for stopping is opposite to that of starting, and electrical apparatus interlocking control may also be feasible.

7.3.5 During operation, slab, lumpy hard materials etc. are prohibited to blend into the trough and cause damage to machine or accident.

7.4 Trouble analysis and troubleshooting

Malfunction and troubleshooting of bucket elevator (see Table 2)

Table 2 Malfunction and troubleshooting of TGTG series bucket elevator

Trouble	Causes	Troubleshooting
Backflow of materials	(1) Failure of subsequent equipment (2) The feed capacity suddenly increases (3) The adjusting baffle plate is not adjusted to its position and the bucket clearance is oversized.	(1) Shut down and remove failures of subsequent equipment. (2) Adjust gate of feed port to control feed capacity. (3) Open head section and adjust the position of baffle plate.
Abnormal noise in the equipment	(1) Foreign materials enter the machine. (2) Loose bucket bolt, fallen off or damaged bucket (3) Impact occurs between bucket and baffle plate for undersized clearance. (4) Bucket belt is over-loosed or slide slipped, bucket impacts with leg.	(1) Shut down and remove inside foreign matters. (2) Open inspection door on sight-inspection leg, fasten bucket bolt and replace fallen and damaged buckets. (3) Open excess opening of head section and adjust the position of baffle plate. (4) Adjust tension bolt, keep bucket belt in tension and remove sideslip.
Blockage of materials	(1) Discharge port or chute pipe is chocked. (2) Excess feed capacity exceeds the technical performance of the equipment. (3) Failure of driving device or electric control results in hard shutdown.	(1) Remove foreign matters in discharge port or chute pipe. (2) Control flow of materials. (3) Remove the Failures.

8 Repair and maintenance

The machine should be operated strictly according to operating requirements, and necessary examination and cleaning works must be done before each shift.

8.1 Machine stop

Stop operation of all the machines related before carrying out repair and maintenance for the bucket elevator.

8.2 Repair and maintenance

Operators should frequently check all parts of the machine, especially the bucket, bucket belt and driving device should be kept in good condition, and immediate repair once there is severe deformation or falling off of bucket, falling off of bucket bolts, and loose connecting bolts of all parts.

Regularly check that whether the running is normal, and whether there is abnormal noise, immediately clear troubles once finding them, and any delay is not allowed.

Keep favorable lubricating state for all bearings and drive parts, the tension screw rod should be daubed with 30# machine oil, and the chain should be cleaned regularly.

8.3 For maintenance of geared motor, see the product instruction.

Bearing is lubricated by 2# lithium based grease. If it has been used for a long time, add grease regularly, and the cycle for adding grease is related to the working speed, temperature and working environment of bearing. Generally the cycle for adding grease is one month under the working environment in feed mill. Under general situation, this machine is maintained once a quarter, and repaired once a half year, and subjected to overhaul once two years; during overhaul, all parts of the machine should be dismantled for cleaning, and wearing parts should be replaced.

8.4 Equipment lubrication (Table3)

No.	Lubrication position	Lubrication oil	Lubrication period
1	Bearing with pedestal	Common 2# lithium based grease	Once a week
2	Driving reducer	See Instruction manual	See Instruction manual

8.5 Wearing parts (Table 4)

Whether the wearing parts are ordered in time and correctly will influence your production, therefore it is necessary to provide the serial number, code number, designation, quantity etc. as shown in this Chapter in time and correctly when ordering wearing parts, and fill the spare parts order form, mail or send us by worksheet. If possible, please attach with abbreviated drawing of the parts.

Table 4 Wearing parts list of TGTG series bucket elevator

No.	Model	Bearing for head section	Bearing for boot section	Bucket model	bucket belt (width: mm)	Remarks
1	TDTG36/23	22212CK	UCP209	S2314	250	1. The length of bucket belt is determined as per the height of elevator; 2. Select plastic bucket or steel bucket as required;
2	TDTG36/28	22212CK	UCP209	S2814	300	
3	TDTG40/23	22215CK	UCP210	S2315	250	
4	TDTG40/28	22215CK	UCP210	S2815	300	
5	TDTG50/28	22216CK	UCP212	S2815	300	
6	TDTG50/32	22216CK	UCP212	S3216	350	
7	TDTG60/28	22220CK	22215CK	S2816	300	
8	TDTG60/33	22222CK	22216CK	DQ3321	350	
9	TDTG80/33	22222CK～22224CK	22216CK～22218CK	DQ3325	350	
10	TDTG80/46	22224CK～22228CK	22218CK～22222CK	DQ4726	500	
11	TDTG100/33×2	22224CK～22232CK	22220CK～22224CK	DQ3325	700	
12	TDTG100/46×2	22226CK～22236CK	22220CK～22226CK	DQ4726	1000	
13	TDTG100/56×2	22230CK～22240CK	22226CK～22230CK	DQ5626	1000	

9 Appendix

9.1 Appended documents

No.	Document	Unit	Qty	Remarks
1	Operating manual of the motor	copy	1	
2	Operating manual of the product	copy	1	
3	Instruction of limit switch	copy	1	
4	Packing list	copy	1	
5	Sheet of customer’s feedback information	copy	1	

9.2 Feedback

Yangzhou Kerunde Machinery Co., Ltd.
Customer's Feedback Information

Product model		Delivery code	
Delivery date		Application date	
User's firm name		Department	
Address		Contact	
Post code		Tel.	
Application situation and existing problems	(Please specify the application process or details) Handler: Date:		
Suggestions and improvement ideas	Handler: Date:		
Comprehensive appraisal on the equipment	Seal affixation of the user's firm: Date:		
Remarks			

9.3 Packing list

Packing List

No.	Description	Box. No	Unit	Qty	S/N
1	Bucket elevator		set	1	
2	Motor operation manual		copy	1	
3	Operation manual		copy	1	
4	Product qualification certificate		copy	1	
5	Packing list		copy	1	
6	Customer's feedback information		copy	1	
Inspected by		Packing date			

YANGZHOU KERUNDE MACHINERY CO., LTD.

People's Republic of China

Add: No. 198 Ji'an Road, Hanjiang Economic Development Zone, Yangzhou, Jiangsu, China

Tel: 0086-0514-80820111-58815 Fax: 0086-0514-80820099

Http: www.kerunde.com Email: kerunde@kerunde.com