

KERUNDE SKLN Series

Cooler

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.

FOREWORD

1. Congratulations, you have selected Kerunde SKLN Series Dryer.
2. The operating instruction is specially compiled for the safe operation of the cooler, technical parameters of equipment running included; It serves for the whole series of the cooler, please cooperate with the specific model of the cooler you purchased while reading through the operation manual. Do not hesitate to contact with us once there is any question.
3. 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 cooler so that you are able to adroitly operate and use this machine, and create more benefits.
4. Such as improper operation or failure to comply with our operation regulation will result in significant losses.
5. Prior to operation, please read over the marks of matters needing attention, especially those safety cautions.
6. The operator and maintenance personnel of the equipment shall read over this operation manual carefully.
7. Please put the operation manual nearby the equipment for read it at any time when necessary.
8. Please fully comprehend the operation manual for the operation and maintenance of the equipment.
9. Please contact with us to buy a new operation manual if this one is lost or damaged.
10. Please send this operation manual together with the equipment once the equipment is transferred.
11. Please pay attention to the following notes about equipment application, warranty scope and warranty period and so on.
 - 1) Application: Normally it is used to cool pelletized materials, flaky materials and blocky materials .
 - 2) Warranty scope: cooler bloc.
 - 3) Warranty period: one year after purchasing the equipment, except easily worn-out parts.

Notes:

(1) The copyright of this operation manual is reserved by Yangzhou Kerunde Machinery Co., Ltd.

Without the prior written authorization of Yangzhou Kerunde Machinery Co., Ltd, this manual shall not be provided in whole or in part to a third party , nor will it be used for purposes other than originally specified.

(2) If the contents of this Operation Manual and specifications of this product are to be changed, we would not notify of them further.

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1 Safety precautions

1.1 Ambient condition

For the purpose of safe operation of the equipment, please install it according to the following conditions

(1) Indoor installation

1) Ambient temperature: $-10\sim+40^{\circ}\text{C}$;

2) Relative humidity: 30~85%;

3) Altitude: $\leq 1500\text{m}$

4) Keep the environment clean and air circulating,

5) Keep the equipment far away from corrosive gas, flammable gas and steam.

(2) Power source: voltage, frequency please refer to the motor name tag; atmospheric pressure $\geq 0.4\text{MPa}$.

(3) Reserve enough space for equipment operation, check and maintenance.

(4) Please place the equipment horizontally.

(5) Under the influence of the many complex conditions, the vibration degree cannot exceed $12\text{mm}\cdot\text{s}^{-1}$.

1.2 Regular safety precautions

(1) The operator of the equipment means the person who involves in the operation, inspection and maintenance of the equipment.

(2) The operator of the equipment must fully understand the operation manual prior to the operation of the equipment.

(3) The owner of the equipment must pass this operation manual to the operator of the equipment.

(4) The operator, while observing the precautions, must comply with the safety rules and regulations to avoid accidents.

(5) The leaders of the enterprise which owns this equipment have the duty to carry out safety education to related workers, meanwhile they must comply with the national, local and company rules and regulations on safety production.

(6) Please install and use the equipment correctly. Anyone who removes the safety guard or make it dysfunctional will be responsible for all the consequences arising therefrom.

(7) Any modification to the equipment should not affect the performance and safety of the equipment.

(8) The safety limit switches should always be kept in good order. The safety limit switches may not be overlapped or discarded.

(9) If the machine needs 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.

(10) Please strictly keep to all regulations on accident prevention during the operation of the equipment.

(11) Our company refuses to take any responsibility for the accident and damage caused by the failure to comply with the operation manual. If our company is required to fix those accidents and damage, we have the right to charge the appropriate maintenance and service fees.

1.3 Safety cautions during transportation, storage and installation

- (1) No bundling is allowed to the equipment during the delivery in order to avoid any damage to it. Any spare part missed or damaged during the delivery should be notify us.
- (2) Put the equipment horizontally in an clean, dry indoor room of ordinary temperatures for temporary storage.
- (3) The placement and carrying of the pellet mill must be conducted by the professional personnel.
- (4) It must hoist the dryer by using specified tools, such as rope, crane and so on, in accordance with arranged order and specified way.
- (5) The maximum load of the hoisting machine must be bigger than the total weight of the equipment.
- (6) No admission when hoisting the equipment.
- (7) Nobody is allowed to stand under the equipment when it is hoisted in order to avoid fatal accident.
- (8) Please put the spare parts of the equipment in the original packing box before installation. Properly cover those spare parts and packing box and put them in a place without weather stained.
- (9) Reserve enough space for the equipment during the installation for future maintenance and replacement.
- (10) The grate bars, rods or security gate grids are supplied along with the equipment, which can be dismantled by tools. Any equipment with those grate bars, rods or security gate grids can only be started up after they have been installed.

1.4 Safety cautions during operation, inspection and maintenance

- (1) The operation, inspection and maintenance can only be carried out by the specially trained technicians in accordance with the instruction of the operation manual. The electrical installation should be conducted by professionals in line with relative electrical safety standards.
- (2) The power must be switched off and locked when carrying out maintenance and repair work, in case the motor of the equipment start up accidentally; meanwhile put signs in the entrance of the workshop and the electrical control room as well as nearby the dryer.
- (3) The safety protection device should not be removed, covered or lapped at discretion. during production.
- (4) 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.
- (5) 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! Protection measure is needed when climbing.
- (6) 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.
- (7) Repair or replace the damaged spare parts once find any.
- (8) The connection box of the motor of the pellet mill is not allowed until the power is completely cut off so as to avoid electric shock to ensure the operation safety of electrical system.

1.5 Personal Protection

(1) All the mechanical equipment manufactured by Kerunde 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.

(2) The owner has the duty to explain to them clearly where dangers exist and warn them that special attention should be paid.

(3) The labor protection appliances, such as gloves, masks and work boots, must be applied during the operation in order to ensure the safety and health of workers

(4) The enterprises are obligated to execute following regulations to guarantee operators' safety:

① The inspection and maintenance can be only carried out until the machine stops running after cutting off the main power supply of the equipment

② As for handling heated or cooled parts and components of the machine, especial care should still be taken for the danger of burning possibility.

③ 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.

④ 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.

1.6 Explosion protection: Countermeasures against Dust Explosion and Fire Hazard

(1) Common cleaning work

① Keeping the working site with combustible dust clean is an important condition for safe production.

② Try not to pile bagged or bulk materials between machines.

③ In order to reduce dust emission to surrounding areas, all conveying devices, cyclone separators and dust collectors should be kept in good condition to minimize the density of dust in air on site. Make sure that the pipes and covers on these machines are in good sealing conditions.

④ In order to reduce dust explosion hazard, dust everywhere must be cleaned out frequently and effectively.

⑤ Keep motors free of deposited dust.

(2) Regular check and maintenance work

① Inspect and check the functions of main shaft and the bearings of main shaft regularly, at least once a week. And fill lubricating oil according to the regulations.

② Check the cooling chamber and clean up deposited material before start up the machine so as to avoid cross contamination.

④ After every shift, clean up the powder out of the cyclone separator so as to protect it against blocking.

(3) Electric apparatus and articles

- ① It is forbidden to use any flashlights and other lamps without shielding or explosion-proof glass.
- ② It is necessary to immediately repair or replace the electric apparatus and equipment if any failure occurs.
- ③ The cables without conduits are not allowed to be installed on the floor.
- ④ Cut off the power supply of the machine when going off work.
- ⑤ 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 every six month.

(4) Smoking and welding

- ① Smoking is forbidden on working site.
- 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.
- 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 12h. The gas cutting sparks are very dangerous, for they will fly on earth or even fly off 10m away in distance. If the sparks drop in dusts, fire accidents may occur at any time.
- 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.

(5) Effect of static electricity

- ① In order to ensure the safety of electric circuits and avoid explosion resulted from spark discharge.
- ② The paint coated at the electric connections must be removed.

1.7 Measures for environmental protection

Any machine has a certain service life, about 8-10 years. If you decide not to use the machine any longer because its service life is over or for other reasons, the machine should be disposed according to local relevant laws, and at the same time, the measures for environmental protection and reutilization should be taken:

- (1) Drain the liquids inside the machine (like motor oil, gearbox oil, brake oil and coolant etc.) into special containers and sent them to the preparation workshop;
- (2) The plastic parts shall be picked out for reutilization.
- (3) The metal parts shall be sorted out so as to be crushed or scraped.

2 General

2.1 Application and of the machine

KERUNDE SKLN Series Counter-current Cooler is used widely for cooling process in feed industry. It is applicable for cooling all kinds of pellet feeds such as pelletized feeds, expanded feeds, especially applicable for cooling expanded pellets.

2.2 Features

It is characterized by vertical layout, concise and beautiful appearance;

Advanced counter-flow cooling principle, fence type discharging mechanism making reciprocating rectilinear movement is adopted, fluent discharge and uniform discharging volume.

The cooling chamber with an octagonal section can avoid dead angles of cooling and this is favorable for material cooling;

The new rotary spreader ensures that materials can be evenly and thoroughly cooled, and can decrease the breaking ratio obviously. The material-distributing range is adjustable and the power consumption is low;

Several pressure reducing plates are mounted on the top of discharging mechanism which can improve the working load of discharging mechanism greatly and reduce distortion, and they can extend the service life of components.


The driving device uses a geared motor to drive the eccentric shaft, it provides stable and reliable driving and the noise is small, and it makes the installation and repair convenient.

The temperature of material after cooling is not $+3\sim 5^{\circ}\text{C}$ higher than room temperature, the dehydration rate is in the scope of 1%~3.0%, so the storage time of high-quality pellets is prolonged.

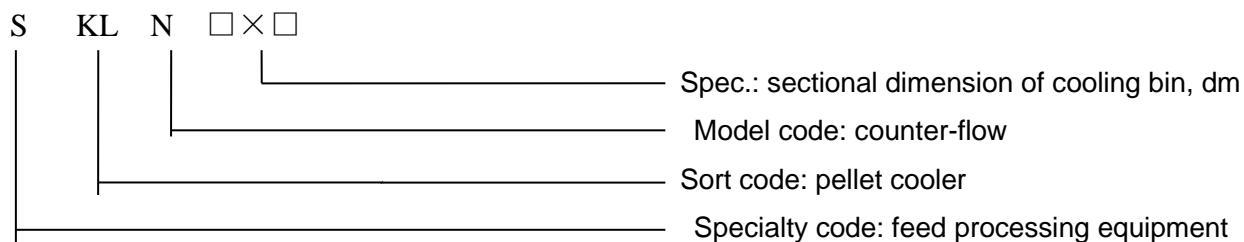
① The cooling effect of this cooler would decline sharply if the ambient temperature $\geq 40^{\circ}\text{C}$ and the relative humidity $\geq 85\%$, that may cause serious results to the safe storage of feeds.

2.3 Nameplate

冷却器		CE	
COOLER			
型号 Model		出厂编号 Serial No.	
功率 Power	KW	满负荷电流 Full load current	A
质量 Weight	KG	电压 Voltage	3Phase V HZ
尺寸 External Dimensions	mm	气动工作压力 Pneumatic working pressure	Mpa
		出厂日期 Production Date	


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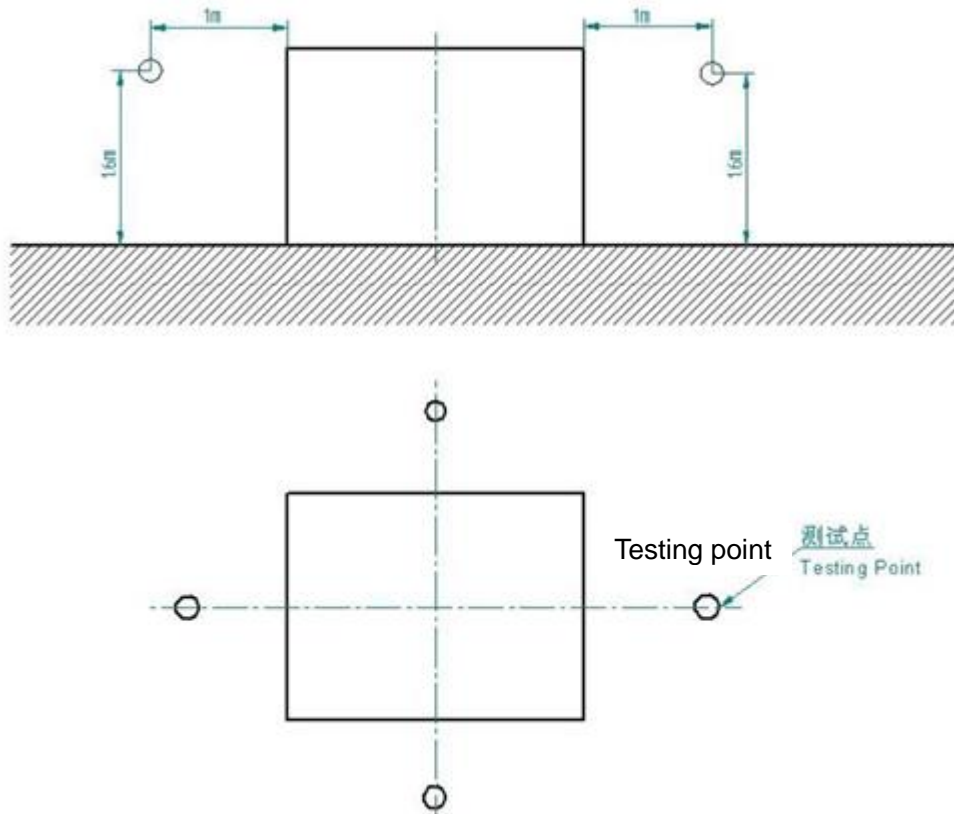
2.4 Composition and meanings of model



For example: a dryer with the sectional dimension of 2.8mX2.8m, its model is SKLN8X28C

2.5 Noise data

Noise testing



Noise testing	LP=____dB(A)
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2.6 Main technical parameters and performance index

Main technical parameters and performance index, see Table 1

Table 1

Mode Item	SKLN11X11	SKLN14X14	SKLN16X16	SKLN20X20	SKLN24X24	SKLN28X28	Remarks
Throughput (t/h)	1-3	3-5	5-8	8-12	12-20	20-30	
Amplitude (mm)	30						
Cooling time (min)	10-15						
Temperature of cooled materials (°C)	Room temperature + (3 ~ 5)						
Aspiration volume (m³/h)	4500	9000	13500	18000	35000	54000	
Power of spreader (kW)	With spreading cone, without power			1.1			
Power of discharging motor (kW)	0.75	0.75	0.75	1.5	1.5	1.5	

Overall power of equipment (kW)	0.75	0.75	0.75	1.1+1.5	1.1+1.5	1.1+1.5	Excluding fan/feeder
Type of airlock	TGFY28	TGFY28	TGFY28	TGFY40	TGFY40	TGFY60	Or other matched airlock feeders

Note: 1. The cooling air volume is the theoretical and cannot be understood as the actual measured data.

2. We reserve the right to improve the technical parameters involved in this manual. If there is any change, we will not inform you

3 Main structure and working principle

3.1 Main structure

The cooler is mainly composed of feeding airlock, upper shell, intermediate chamber, distribution system, discharging system, discharging hopper and discharging airlock. See Fig.3-1 the overall schematic drawing of SKLN Series Cooler. Fig.3-1, take SKLN28X28 as example.

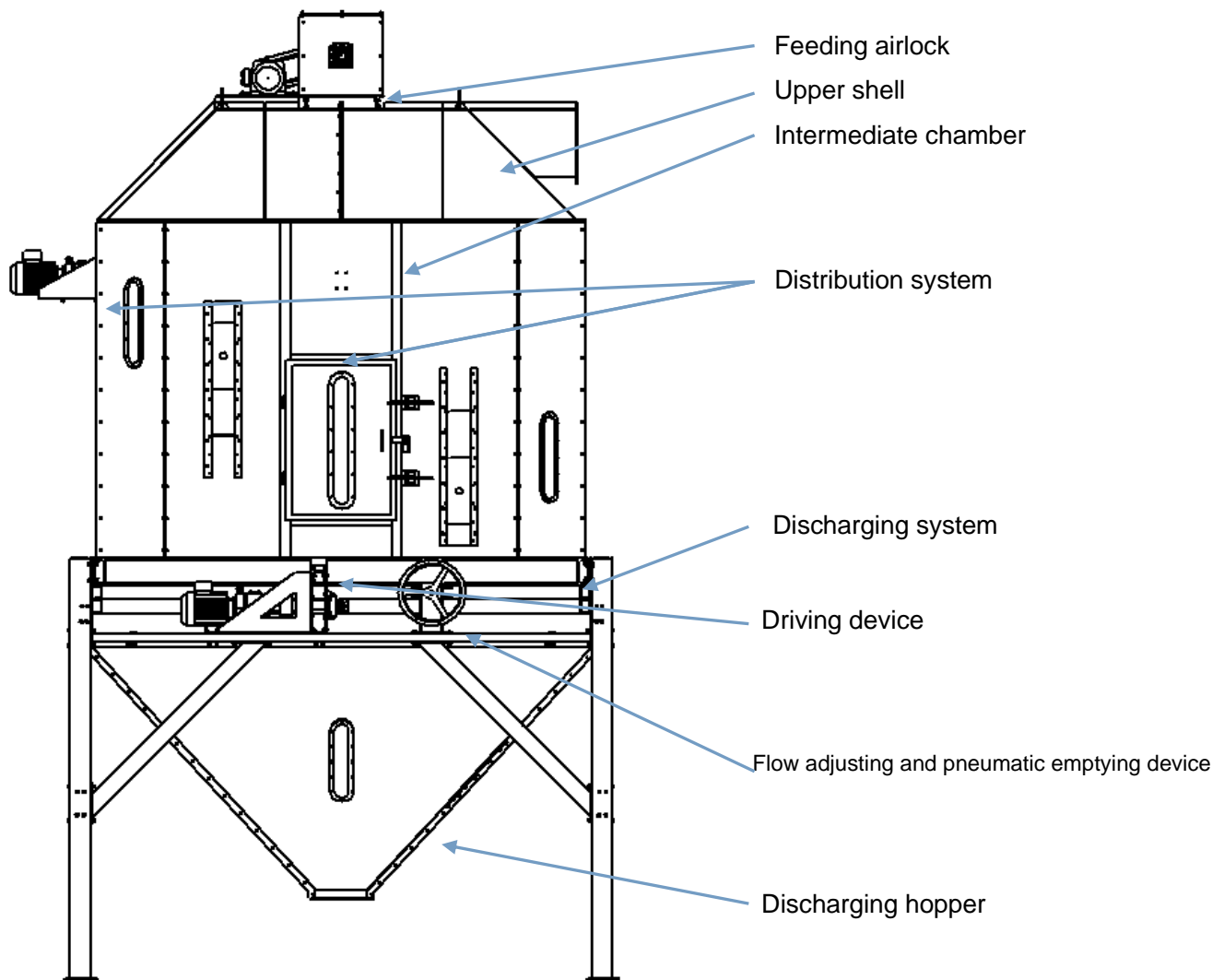


Fig 1 Schematic diagram of overall structure

3.2 Working principle

Hot pellet materials pile up gradually after entered the cooling bin through the rotary feeder till reach a certain height, the motor of driving device for discharging goes into operation when the material contacts the upper level indicator. The motor drives the discharging fence to reciprocate through the speed reducer and eccentric mechanism for discharging. At this point, the time relay goes into operation, and set a delayed discharging time for automatic discharge.

The discharging amount of materials in the cooling bin is more than the feed rate during discharging, if the delayed discharging time of time relay ends up when materials in the bin dropped down to a certain level, and

when the limit indicator board on the discharging fence approaches the horizontal level indicator mounted on the Base, the motor will stop at once, and the discharging fence will stay in a fixed position.

When the layer height reaches the upper level indicator again, the discharging fence resumes movement and discharging. Repeat the above discharging process over and over. In the aforesaid process, the cooling fan is on all along.

With the discharging of discharging fence through reciprocating motion, the materials drop down gradually, while the cooling blast rises from bottom to top and from cold to hot, in this way, hot materials in the upper part meet hot blast while those in the lower part meet cold air during operation, the materials become hard and compacted through uniform and sufficient cooling during descending, thus the moisture is further reduced. Its principle is as shown in Fig 2. See the Fig. 2 Schematic diagram for working principle

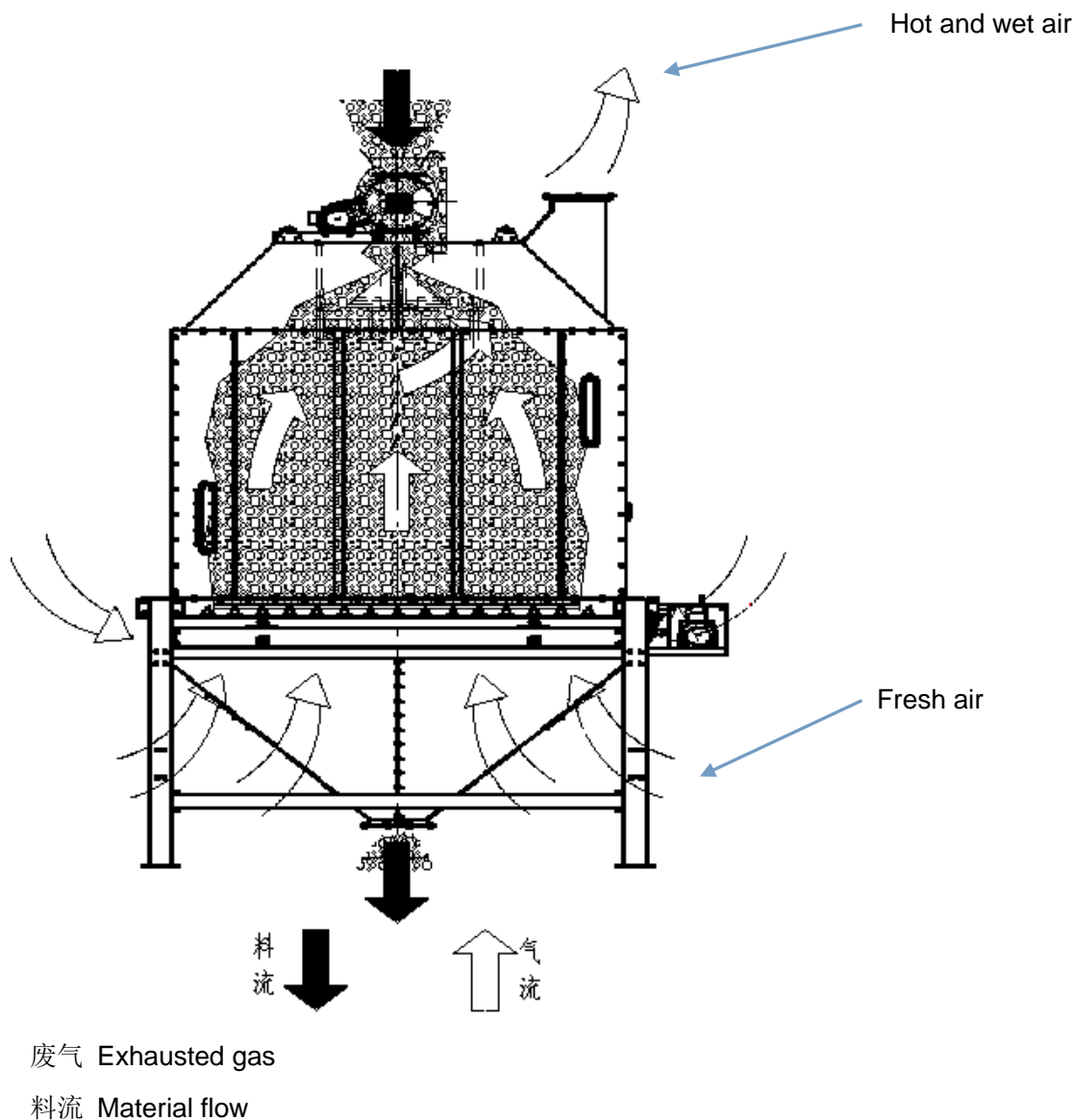


Fig2 Schematic diagram for working principle

3.3 Structure and working principle of main working components

3.3.1 Intermediate chamber

The intermediate chamber is used to store material and the materials are cooled in it. The octagon cooling chamber without dead cooling corner has eliminated bad cooling effect caused by uneven distribution. A observation window is set up on the intermediate chamber, which is convenient to monitor the internal material distribution at any time during the operation of the equipment, so that the operator can control the real situation and adjust the distribution device in time.

i The gate of intermediate chamber is equipped with a safety switch. Only when the key of the safety switch is inserted into the switch lock hole, the electrical motor and electrical components which belong to the machine can be charged.

☑ The repair personnel shall pay special attention that the repair and maintenance can only be carried out inside the intermediate bin when the equipment is under the state of power off.

The equipment is equipped with the damped rotation type level indicator so that the user can control the material level by adjusting the height of the level indicator. The level indicator maybe not set up at the required level of the customer. So it needs to adjust the indicator level before the commissioning.

See Fig.3 Schematic Diagram of Intermediate chamber

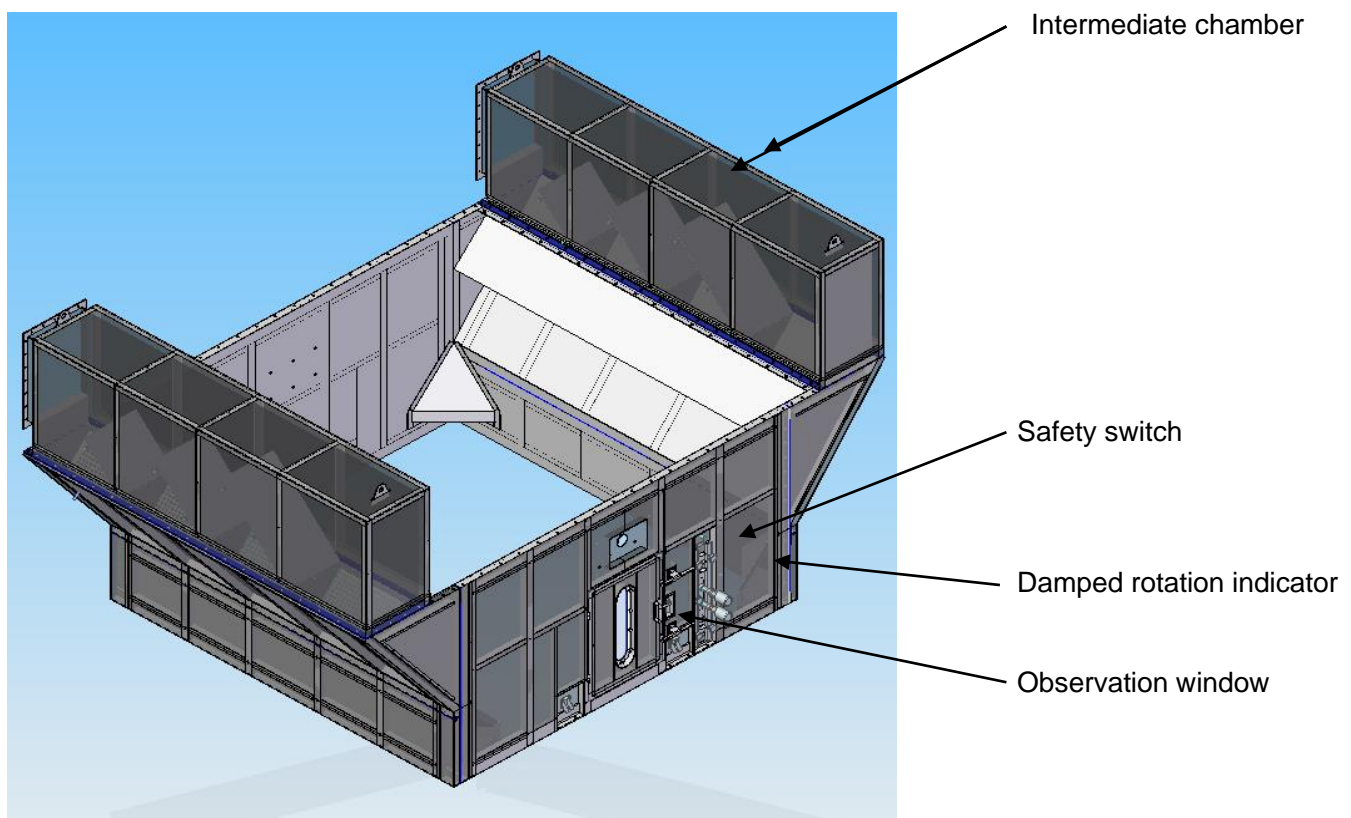


Fig.3 Schematic Diagram of Intermediate Chamber

3.3.2 Spreader

The spreader serves the function of spreading materials uniformly in the chamber, and it is a functional component ensuring a uniform thickness of material layer.

Three types of coolers SKLN20×20, SKLN24×24, SKLN28×28 are equipped with rotary spreaders, other coolers are equipped with spreading cones.

The spreader is composed of the spreading disc, the reversing device, the horizontal shaft, the vertical shaft, the driving motor, the leveling device and the anti-drop sleeve and so on.

See Fig. 4 Schematic Diagram of Spreader

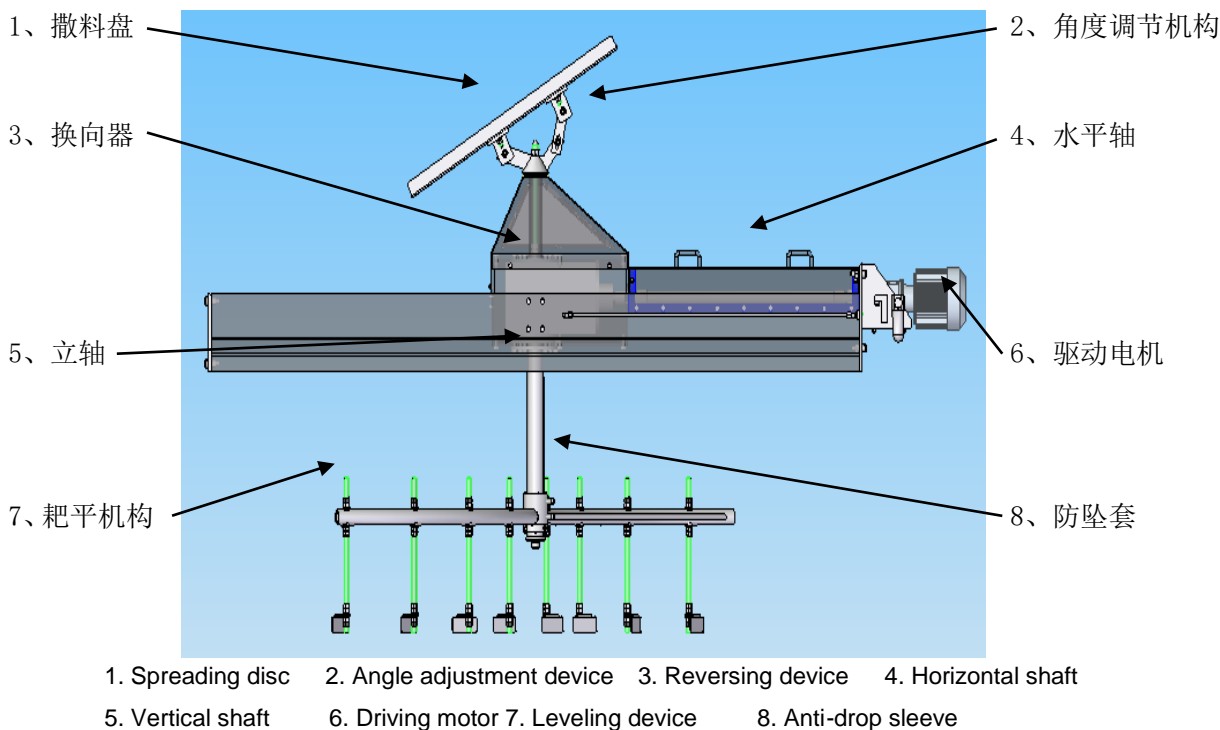
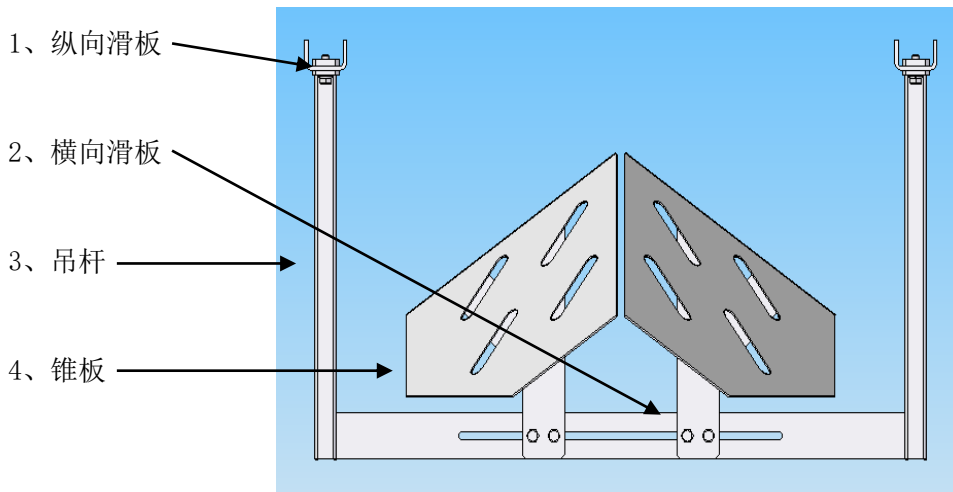


Fig. 4 Schematic Diagram of Spreader

The spreader is set up in the intermediate chamber. The material falls into the spreading disc through the airlock. The spreading disc, rotating along with the vertical shaft, spreads the material evenly in the intermediated bin by means of centrifugal force. The spreading disc is divided into two parts. Adjust its angle and opening to achieve good leveling effect. The leveling device is able to smooth the uneven material, thus ensuring that the hot air is evenly distributed through the material, ensuring that the moisture of the material is uniform. If necessary, a frequency converter can be equipped to control the rotating speed of the spreading disc.

The spreading cone is composed of a vertical sliding bar, a horizontal sliding bar, suspension arms, cone plate and corresponding fasteners. See Fig 5



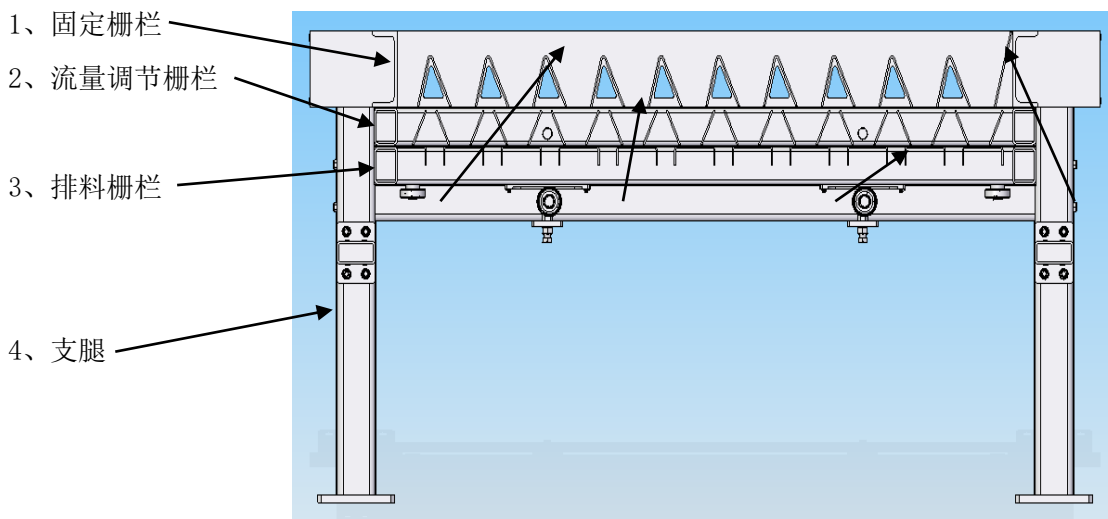
1. Vertical sliding bar, 2. Horizontal sliding bar, 3. Suspension arm, 4. Cone plate

Fig.5 Schematic Diagram of Spreading cone

The spreading cone is mounted on the cooler shell, the position of spreading cone on the horizontal can be adjusted through the horizontal sliding bar, and the position of spreading cone on the vertical can be adjusted, so that the materials are avoided to pile up at one side and preferable distribution effect can be obtained.

3.3.3 The discharging device

The discharging system is very important, it is used to discharge material and control the discharging amount. The slide-type discharging device mainly consists of a fixed frame, an adjustable frame, a discharging frame and supporting legs. See Fig.6 Schematic Diagram of Discharging device.



1. Fixed frame 2. Adjustable frame 3. Discharging frame 4. Supporting leg

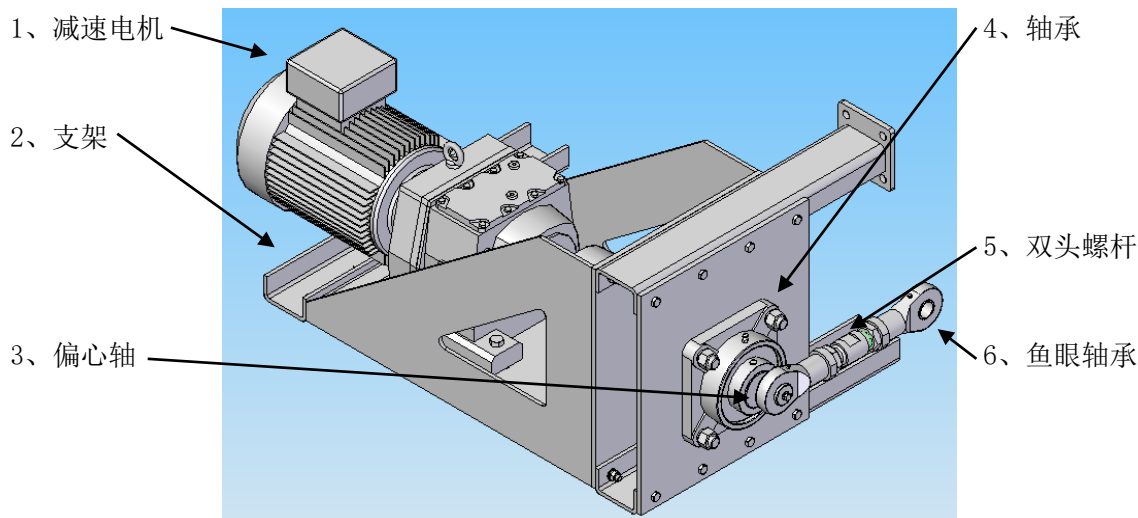
Fig.6 Schematic Diagram of Discharging device.

An additional pressure reducing plate structure is mounted on the fixed fence, it partakes the positive pressure of materials on discharging fence and solves the distortion problem of fence. Comparing with traditional counter-flow cooler, products of this series have less power consumption, broader ventilation area and preferable cooling effect.

3.3.4 Driving device

It is composed of a geared motor, a bracket, an eccentric shaft, a bearing, a double threaded screw, a fisheye bearing and so on.

See Fig 7 Schematic diagram of Driving device

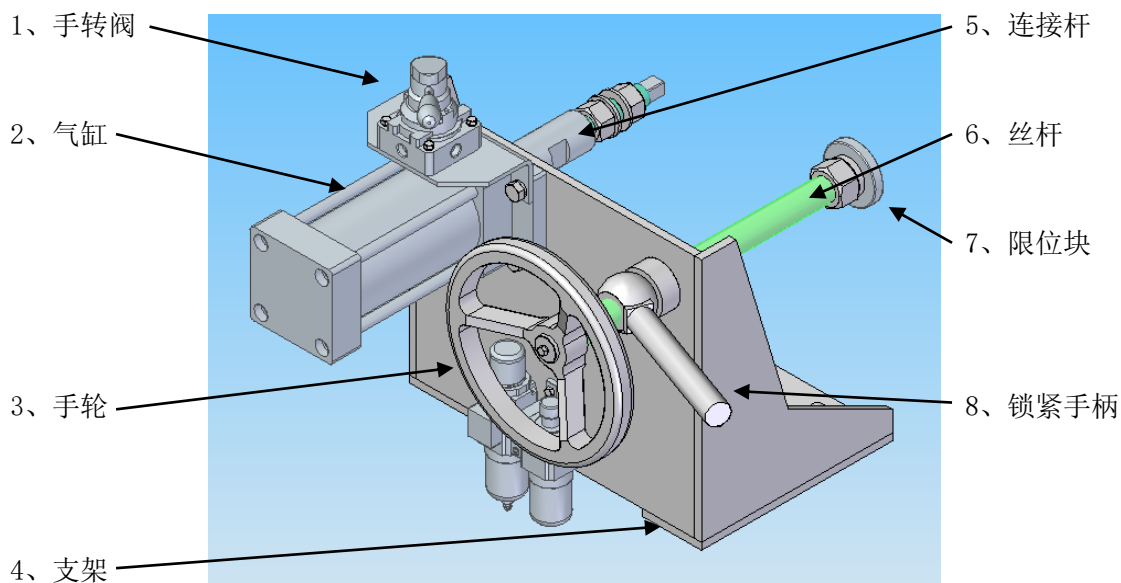


1. Geared motor 2. Bracket 3. Eccentric shaft 4. Bearing 5. Double threaded screw 6. Fisheye bearing

Fig 7 Schematic diagram of Driving device

3.3.5 Flow adjusting/pneumatic emptying device

It is composed of a manual valve, a cylinder, a hand wheel, a support frame, a jointing sleeve, a lead screw, a limited block and a locking handle and so on. See Fig. 8 for the Schematic diagram of flow adjusting and pneumatic emptying device.



1. Manual valve, 2. Cylinder, 3. Hand wheel, 4. Support frame, 5. Jointing sleeve, 6. Lead screw, 7. Limited block 8. Locking handle

Fig. 8 Schematic diagram of flow adjusting and pneumatic emptying device.

The discharging flow of materials can be adjusted by turning the hand wheel. As being in the position of operators, turn the hand wheel clockwise, the discharging flow will rise, while turn the hand wheel anticlockwise, the discharging flow will decrease. When a batch of materials is cooled or a break-down maintenance is being implemented, materials inside the bin shall be emptied, turn the manual handle, and make the adjusting frame move forward to empty materials. When the knob is turned to "reset", the air cylinder draws back, and the flow adjusting fence draws back and collides with the limited block finally and stops. This operation can be carried out for several times in order to empty materials completely. The control valve shall be adjusted to the reset position after materials are emptied. See Fig 7 Schematic diagram of flow adjusting/pneumatic emptying device.

4 Transportation, Installation and Adjustment

4.1 Transportation

Due to the large machine size and limited to the dimension limitation of transportation, the cooler is split into a number of parts when delivery, its list is shown in table 2.

Table 2 Parts list of Cooler

	Part Description	Qty.	Remarks
Main parts of the cooler	Feeding airlock	1	Apart from the delivery of the whole machine, it is usually dispersed
	Upper shell	1	
	Intermediate chamber	1	
	Distribution system	1	
	Discharging system	1	
	Discharging hopper	1	
	Discharging airlock	1	
	Connection bolts, washer, nuts	1 set	
	Electric control cabinet	1	

Note: After the installation position is determined, re-assemble the parts under the instruction of technician and technical documents from Kerunde.

(1) Hoisting

- ① Use the hoisting points correctly while carrying out hoisting.
- ② The load capacity of the hoisting tool should be greater than that of the equipment.

(2) Transportation

- ① When the machine is to be delivered out of the manufacturer plant, a decision can be made on whether a package box is to be used in accordance with the actual condition.
- ② If a package box is not to be used, weatherproof measures should be taken in transportation, and the equipment should be protected against collision and overturning.
- ③ When packing, the machine and accessory parts should be fixed rigidly in the packing box, and clearances should be reserved between them and the walls of the box for avoiding any collision damage in transportation.
- ④ DO NOT overturn, heavily press and impact the machine body in transportation.
- ⑤ It can be shipped in containers.

(3) Unpacking inspection

- ① When the machine has been delivered to a destination site, open the package and check against the packing list for any collision and wearing in transportation.
- ② Carefully check the documents and accessory parts delivered together with the machine, and place on a fine record.

(4) Storage

- ① Rainproof, sun-proof and anti-seeping facilities shall be equipped when stored in the open air, measures for good ventilation and damp proof shall be taken when stored indoors.
- ② For long term storage, the machine should be kept in an aerated, dry and cool place, and measures should be

taken for protecting the machine from humidity and rain, and the revealed surfaces should be coated with anticorrosive oil.

4.2 Installation

(1) Attention points for installation

- ① The ground or frame structure for installation of the cooler is required to be solid and flat, it shall have adequate stability and carrying capacity and shall be able to bear the weight of equipment in full load operation.
- ② In order to ensure the stability of the machine, the welding plate of the foot should be reserved
- ③ When installing, pay attention to adjusting the height of the foot to keep the dryer in a horizontal state.
- ④ An adequate space for operation and repair shall be vacated before installation so as to ensure that the access door can be opened when carrying out inspection and repair.
- ⑤ The cooling operation needs a great deal of dried air flow, keep the air flowing smoothly in the installation room of the cooler.

(2) Schematic drawing for installation

See Fig.9 Schematic Diagram of SKLN28X28

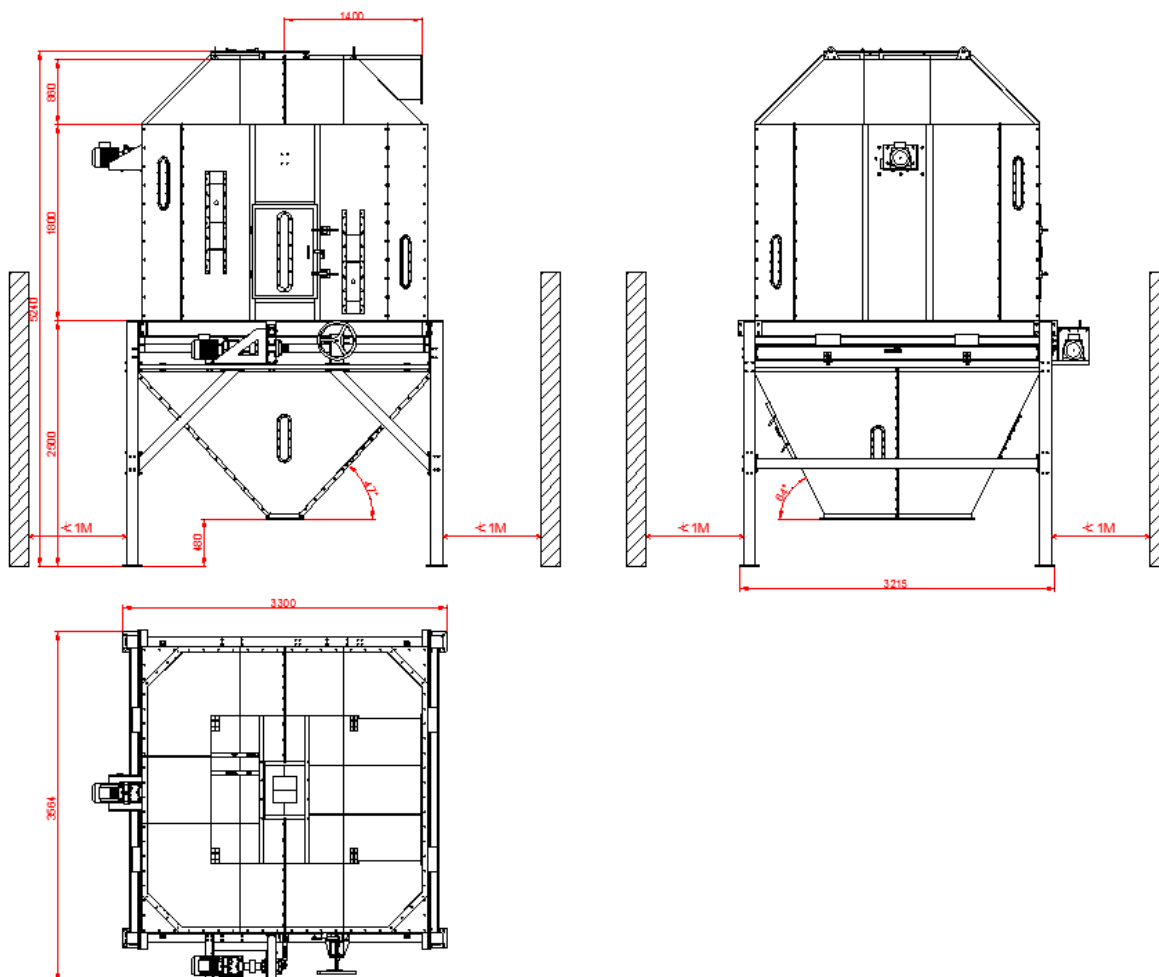


Fig.9 Schematic Diagram of SKLN28X28

4.3 Adjustment of the equipment

(1) Adjustment of distribution system

Usually, the distribution system has been pre-mounted on the top cover before the equipment leaves factory. The spreading range of materials can be controlled by adjusting the opening and angle of spreading disc (see Fig 4 and Fig. 5).

(2) Adjustment of discharging rate

Adjust the parameter of the angle sensor according to the output of the upper processing step, so as to adjust the handle wheel of the flow control device to control the discharge flow rate as per the output required. Turn the handle wheel clockwise, the discharging rate will increase, otherwise it will decrease. See Fig. 8.

(3) Adjustment of cooling time

To adjust the cooling time by changing the position of level indicator on the cooling chamber to control the thickness of material layer. Usually, it is suggested to cool the pellet for 10 minutes. However, the thicker the layer is the longer the cooling time.

5 Use and operation

① ***The cooler operating and maintenance personnel shall read through this section.***

5.1 Attention points

- ① The operating personnel shall be familiar with the working principle and operating performance of cooler, know the equipment structure and functions of each function unit, and grasp adjustment methods of all components.
- ② The machine shall be shut down at once if there is any abnormal sound during the operation of equipment, clean up residual materials and check whether there is any blockage, collision or friction in mechanical parts such as motor, discharging fence and driving device.
- ③ Attention should be paid to the inlet and outlet of the cooler during production to prevent the overload of the cooler caused by material blocking and damage to the equipment, and to ensure that the motor works under rated load.
- ④ Non-maintenance personnel or non-operating personnel are strictly prohibited to open the access door when the equipment is in motion.
- ⑤ It is strictly prohibited to touch any driving part of equipment when the equipment is in motion.
- ⑥ The interior and ambience of equipment shall be cleaned after the production of each shift, and clear off residual materials and ash for next shift.
- ⑦ Overloaded running is not allowed to prevent plates from deforming
- ⑧ In case of power failure, the residual materials in the dryer must be emptied before starting up again.

5.2 Safety marks



- ① The safety mark by the observation door, please don't open the observation door when the equipment is in operation, don't put your hands or any foreign matter into the bin body in order to avoid personal injuries or damage of equipment.



② Do not remove the safety guard while the machine is running or before it has completely stopped



③ Do not open the junction box until it is switched off to avoid electrical injury

5.5 Check and preparation prior to commissioning

- ① Check all parts of the cooler for any damage or missing;
- ② Manual check the rotation of all driving motors and fans.
- ③ Check the sensors for signal sending and response;
- ④ Check the lubrication situation of geared motors, bearings and hydraulic station.
- ⑤ Check the discharging fence and driving device for blocking, collision and friction.
- ⑥ After the above examination and solve the corresponding problem, it can prepare for the first time to run the dryer.

5.4 Emergency stop

①The machine shall be shut down at once if there is any abnormal sound during the operation of equipment and stopped feeding material; and then clean up residual materials and check whether there is any blockage, collision or friction in mechanical parts such as flow adjusting device and discharging fence.

②Only when the trouble has been solved, the equipment can be released from shutdown after the confirmation.

③Close the access door and to ensure the safety switch on it works normally.

④Reset the emergency stop and re-supply the power of the cooler before restart up the machine.

6 Malfunction and troubleshooting

See Table3 for Malfunction and troubleshooting of the Cooler

Table3 Malfunction and troubleshooting

Trouble	Cause	Solution
1. Bad cooling effect	1. Insufficient cooling time because of excessive discharge rate.	1. Re-select the model or inquire relative expert for advice according to the actual condition.
	2. Hollow space occurs in material layer	2. Adjust the position of the distribution device.
	3. Low layer height results in insufficient cooling time.	3. Re-determine the position of level indicator.
	4. Short circuit of airflow.	4. Reset the parameters of the cooling fan
2. Uneven cooling effect	1. Hollow space occurs in material layer because of uneven material distribution	1. Adjust the distribution system
	2. Big air flow for small pellet	2. Reset the parameters of air flow
	3. Uneven moisture content of the fed material	3. Reset the feeding parameters
3. Unsmooth movement of discharging fence with noise	1. Bearing failure	1. Change bearing
	2. Guide rail failure	2. Change guide rail
	3. discharging fence abrades flow adjusting fence	3. Adjust the clearance between these two fences.
4. Motor cannot be started up	1. Wiring trouble	1. Check and clear away the wiring trouble
	2. Motor failure	2. Repair or change motor
	3. The level indicator has malfunction	3. Repair or change level indicator

7 Electrical safety

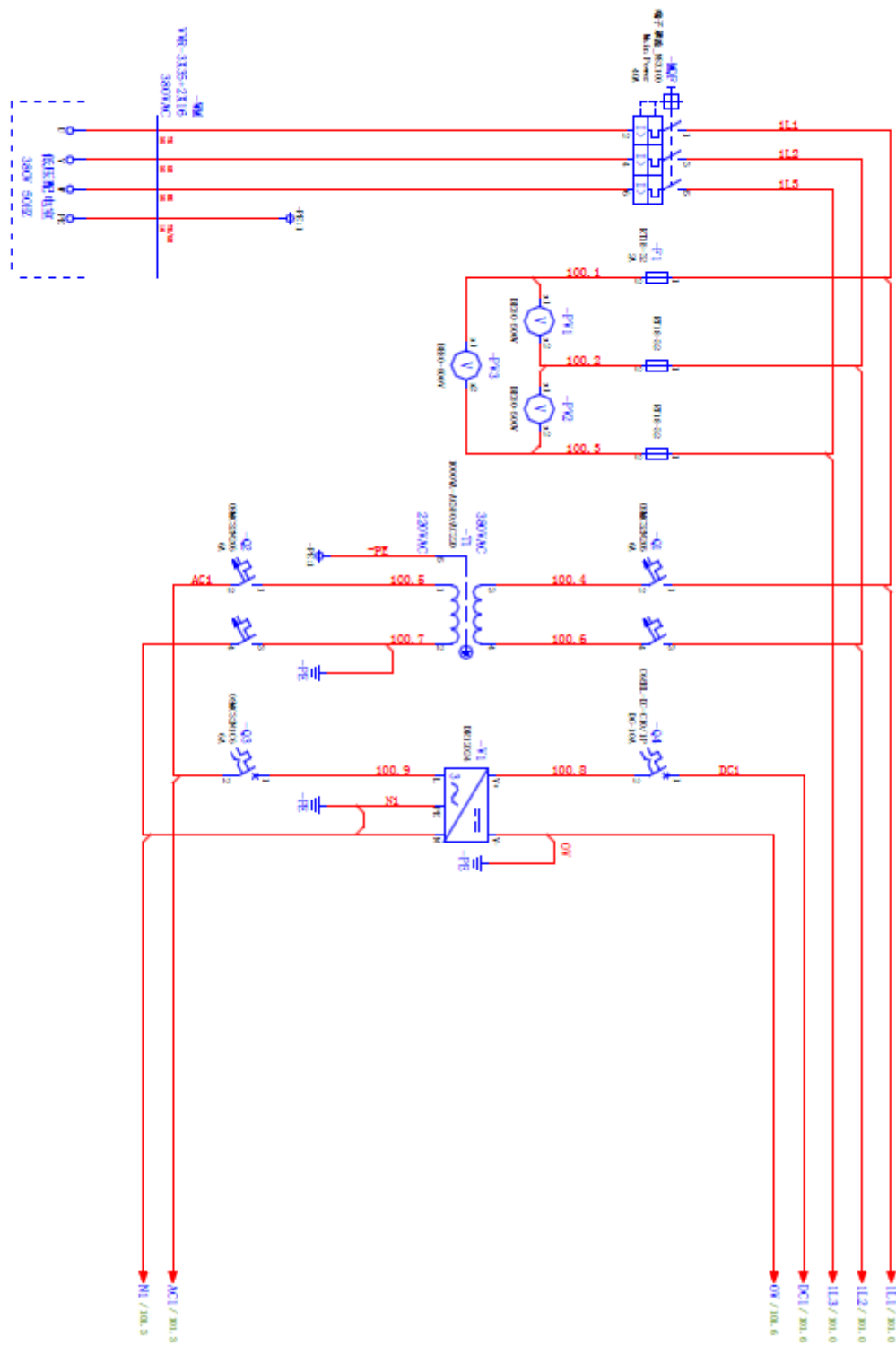
① Normal voltage: AC380V ($\pm 5\%$, frequency $\pm 1\text{Hz}$);

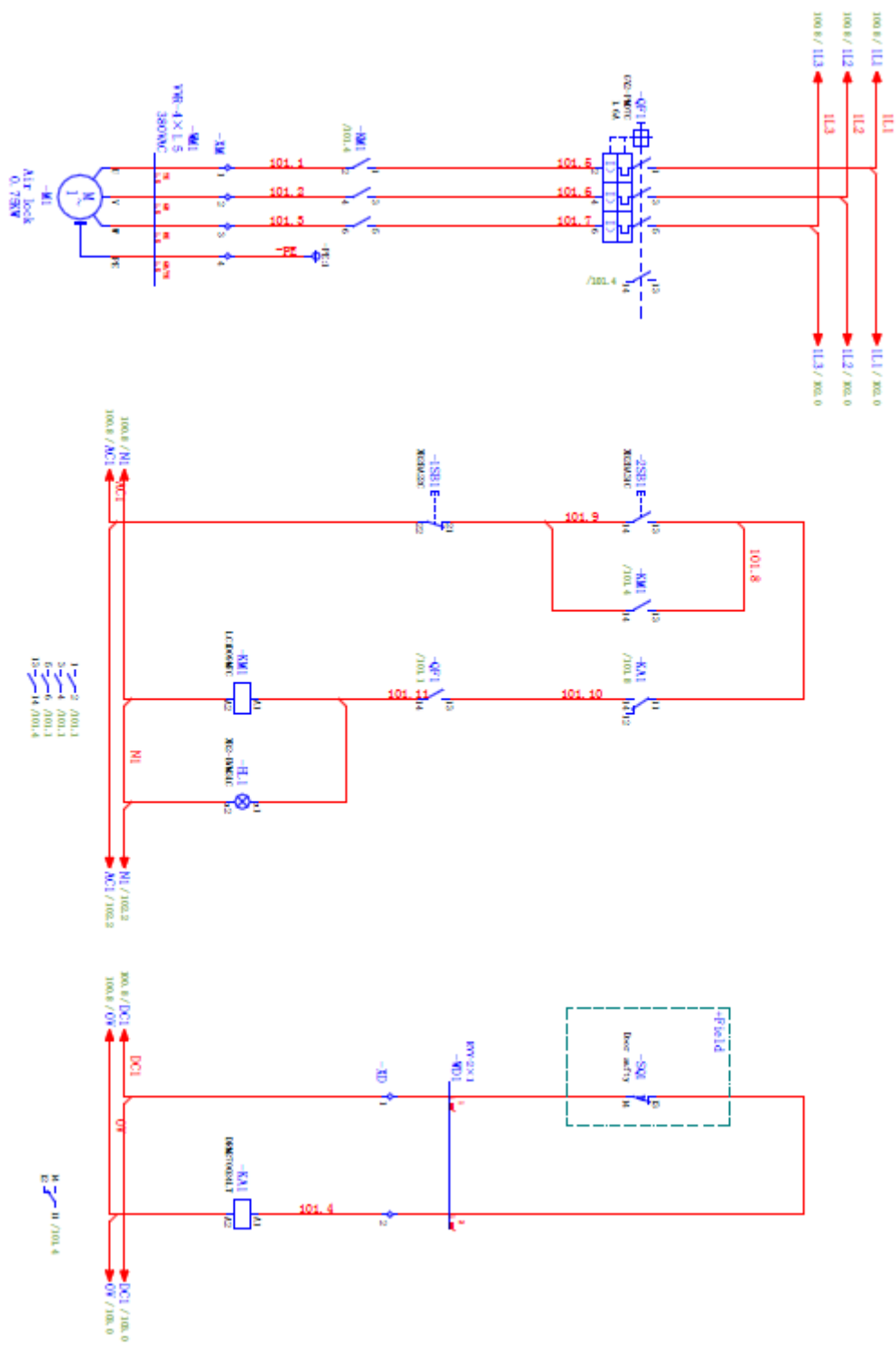
② Three phase, customized cable of the AC380V. Three line L1, L2, L3 connect solidly with MQF wiring terminal. A PE line with the cross section greater than 16MM is properly connected to the PE row.

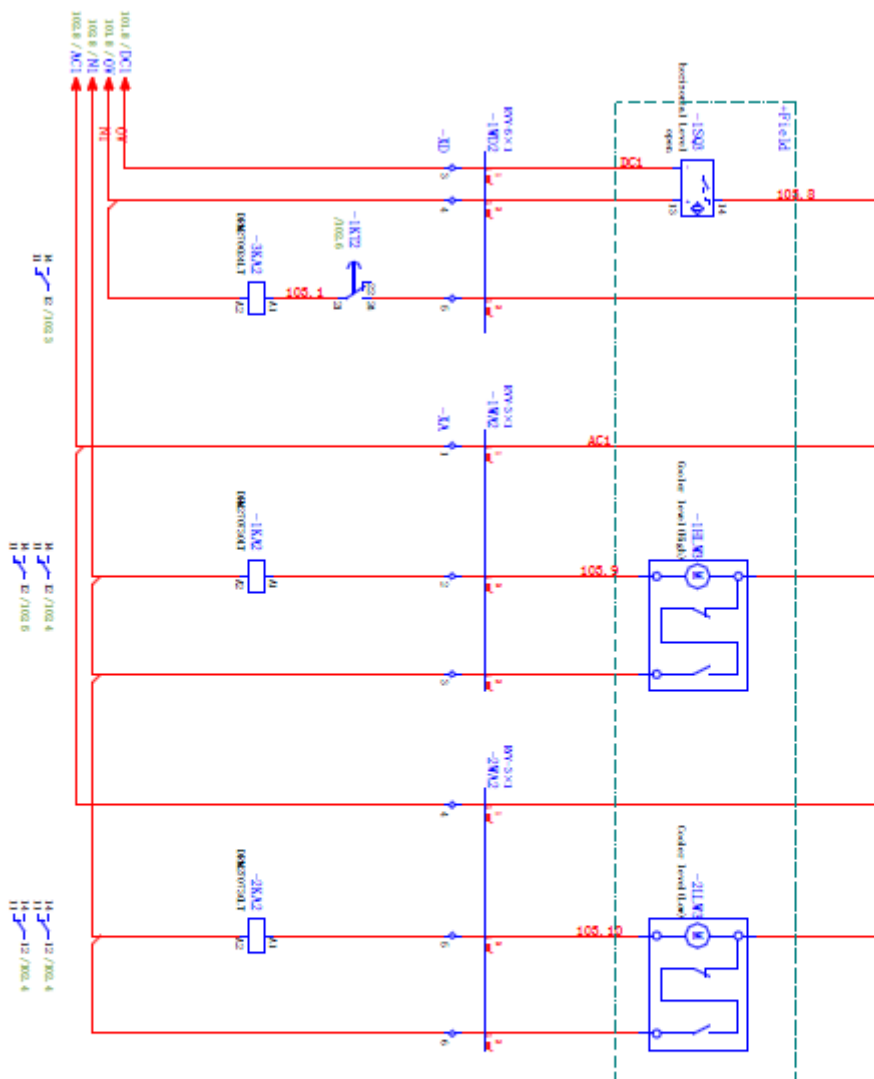
③ The power supply shall be equipped with overvoltage protection device

7.1 Circuit diagram

The user shall designate special electrical engineers for wiring or installation according to the following electrical control schematic diagrams.







7.2 Electrical component list

A	B	C	D	E	F	G
No	Code	Name	Manufacturer	Model	Specification	Remark
1	F1	Fuse	MRO	RT18-32	2A	
2	HL1	Indicator	Schneider	XB2-BVM3LC	AC220V	
3	HL2	Indicator	Schneider	XB2-BVM3LC	AC220V	
4	KA1	Intermediate relay base	Schneider	RXZE1M2C		
5	KA1	Intermediate relay	Weidmuller	DRM270024LT	DC24V	
6	1KA2	Intermediate relay base	Schneider	RXZE1M2C		
7	1KA2	Intermediate relay	Weidmuller	DRM270730LT	AC220V	
8	2KA2	Intermediate relay base	Schneider	RXZE1M2C		
9	2KA2	Intermediate relay	Weidmuller	DRM270730LT	AC220V	
10	3KA2	Intermediate relay base	Schneider	RXZE1M2C		
11	3KA2	Intermediate relay	Weidmuller	DRM270024LT	DC24V	
12	KM1	Contacto	Schneider	LC1D09M7C	AC220V	
13	KM2	Contacto	Schneider	LC1D09M7C	AC220V	
14	1KT2	Intermediate relay base	Schneider	RXZE1M2C		
15	1KT2	Timer	Schneider	REXL2TMP7	AC220V	
16	MQF	MCCB	Schneider	NSX100N-TM-40		
17	PV1	Voltmeter	KDSI	BE80-500V-CE		
18	PV2	Voltmeter	KDSI	BE80-500V-CE		
19	PV3	Voltmeter	KDSI	BE80-500V-CE		
20	Q1	MCB	Schneider	OSMC32N2C6	6A	
21	Q2	MCB	Schneider	OSMC32N2C6	6A	
22	Q3	MCB	Schneider	OSMC32N2C6	6A	
23	Q4	MCB	Schneider	C65HL-DC-C10/1P	6A	
24	QF1	Motor breaker	Schneider	GV2-FM07C		
25	QF1	Auxiliary	Schneider	GVAE1	1NO	
26	QF2	Motor breaker	Schneider	GV2-FM07C		
27	QF2	Auxiliary	Schneider	GVAE1	1NO	
28	2SB1	Button	Schneider	XB2BA31C	1NO	
29	1SB1	Button	Schneider	XB2BA22C	1NC	
30	1SB2	Button	Schneider	XB2BA31C+ZB2BE102C	1NO+1NC	
31	T1	Transformer	Schneider	ABL6TS100U	1000VA, AC380V/220V	
32	V1	Power	MW	DR12024	5A	

8 Repair and maintenance

8.1 Attention points for repair and maintenance

When maintenance, service and inspection are implemented on the machine, besides the safety points specified in Article 1, the following items shall also be obeyed:

- ① Turn off the power and cut off steam totally before any overhaul, commissioning, inspection and service;
- ② Only the specialized technical personnel are allowed to replace and repair the parts and components and carry out potentially dangerous maintenance and inspection work;
- ③ Only the specialized personnel are allowed to replace and repair the electrical control system, steam pipelines and parts and components of the machine;
- ④ The equipment are allowed to operate only after equipped with the protective devices, such as shield or safety door.;
- ⑤ When implementing maintenance and inspection works, place the vertical label "in process of maintenance and inspection" aside the door to let the other workers see it clearly;
- ⑥ Improper operation and maintenance of the machine will cause dangerous accidents, which needs special attentions;
- ⑦ The equipment should be cleaned for both inside and outside after each shift of operation.

8.2 Daily and regular inspection works

In daily and regular inspection, stop the machine rapidly and take proper measures in case of any abnormality in machine operation. Re-use the machine after confirming that the machine is recovered to normal operation.

(1) List of daily inspection items

No.	Position	Inspected items	Cycle	Method	Solution
1	Cylinder	Check whether the pressure is higher than 0.6MPa	Everyday	Observation	Increase steam pressure
2	Machine	Check for any abnormal noise	Everyday	Hearing	Inspection
3	Bearing	Check for temperature lower than 80℃	Everyday	Thermometer	Inspection
4	Fan	Check for current value	Everyday	Current meter	Inspection
		The amount of lubricant	Everyday	Observation	Refilling
		Check for any abnormal noise	Everyday	Hearing	Inspection
5	Motor	Check for temperature lower than 80℃	Everyday	Thermometer	Inspection
		Check for current value	Everyday	Current meter	Inspection
		The amount of lubricant	Everyday	Observation	Refilling
		Check for any abnormal noise	Everyday	Hearing	Inspection
6	Safety switch	Check for normality	Everyday	Observation	Replace
7	Limited switch	Check for normality	Everyday	Observation	Replace
8	Damped level indicator	Check for normality	Everyday	Observation	Replace

(2) List of regular inspection

No.	Position	Inspected items	Cycle	Method	Solution
1	Connection of reducer	Fastening	Every week	Observation	Fastening
2	Access door	Sealing	Every month	Observation	Inspection
3	Bearing	Lubrication	Every three months	Observation	Refilling

Notes: The above-mentioned cycle applies 12h a day and 25 days a month. Customers can adjust it by themselves according to actual conditions;

8.3 Equipment cleaning

- ① Clean the residual materials and dust from the cooler after stoppage of each shift;
- ② In time clean dust and materials discharged by cyclone separator during and after stoppage of each shift;
- ③ Clean the surrounding of the cooler after stoppage of each shift;
- ④ Regularly clean pulley of cooler fan to avoid greater vibration at high speed rotation arising from excessive soot deposit.
- ⑤ One overhaul shall be carried out after working for 1000 hours.
- ⑥ If the equipment is stopped or set aside for a long time, countermeasures against rain, moisture and rust shall be taken, the feed inlet and air outlet shall be sealed.

8.4 Equipment lubrication

- ① Gear oil for geared motors and lubrication grease for bearings.
- ② Lubrication oil (grease): L-CKC220 gear oil, 2# lithium grease.
- ③ Replace the gear oil of the geared motors after 1000-hour running for the first time. And add gear

oil in according to the oil level during normal production. Add lithium grease every 3 month for bearing parts.

9 Spare Parts

Some spare parts which shall be needed for customer is listed in this chapter.

1	Spare parts Qty Model	Approaching switch	Level indicator	Bearing	Cylinder	Manual valve	Remarks
		IS212MM/4N O-4NO(PNP)	SE290BCRI	6305-2Z	SC80X100FA	4HV210-08	
2	SKLN11X11	1	2	12	1	1	
3	SKLN14X14	1	2	12	1	1	
4	SKLN16X16	1	2	12	1	1	
5	SKLN20X20	1	2	12	1	1	
6	SKLN24X24	1	2	12	1	1	
7	SKLN28X28	1	2	12	1	1	

10 Attachment

10.1 Attached documents

No.	Description	Unit	Qty.	Remarks
1	Operation manual of reducer	Copy	1	
2	Operation manual of cooler	Copy	1	
3	Operation manual of Cylinder	Copy	1	
4	Qualification certificate	Copy	1	
5	Attached documents	Copy	1	In the operation manual

10.2 Customer 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			

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