KERUNDE KDVD Series

Dryer

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 KDVD Series Dryer.

2. The operating instruction is specially compiled for the safe operation of the dryer, technical parameters of equipment running included; It serves for the whole series of the dryer, please cooperate with the specific model of the dryer 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 dryer 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: the dryer is specialized on the drying section in grain & oil industry and feed industry. Normally it is used to dry pellet feed, especially extruded pellet.

2) Warranty scope: dryer 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.

CONTENT

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～+40℃;

2) Relative humidity: 30~85%;

3) Altitude: ≤1500m

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≥0.6MPa.

(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 12mm·s^{-1}.

1.2 Regular safety precautions

(1) The operator of the dryer 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 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 dryer.
(7) Nobody is allowed to stand under the dryer when it is hoisted in order to avoid fatal accident.
(8) Please put the spare parts of the dryer 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.

②After every shift, check the filtering screen of heat exchanger, at least once a month. Clean up deposit dust once find any so as to protect it against blocking.

③ Check the plate of each layer and clean up deposited material on the plates 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.

②If 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 a 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

Keunde KDVD Series Plate-type dryer is widely applied in the drying section in grain & oil industry and feed industry, especially for the drying treatment of extruded pellet of aqua feed, pet food, specific feed and so on. Its application in high quality aquatic feed production is very common.

2.2 Characteristics of the machine

Vertical arrangement of the machine features simple structure, easy operation, quick inspection and cleaning and nice appearance. It is also equipped with high-efficient circulatory system which is featured with high heat exchange efficiency and which is contributes to energy conservation and environment protection by using of recycled off-gas out of the cooling section.

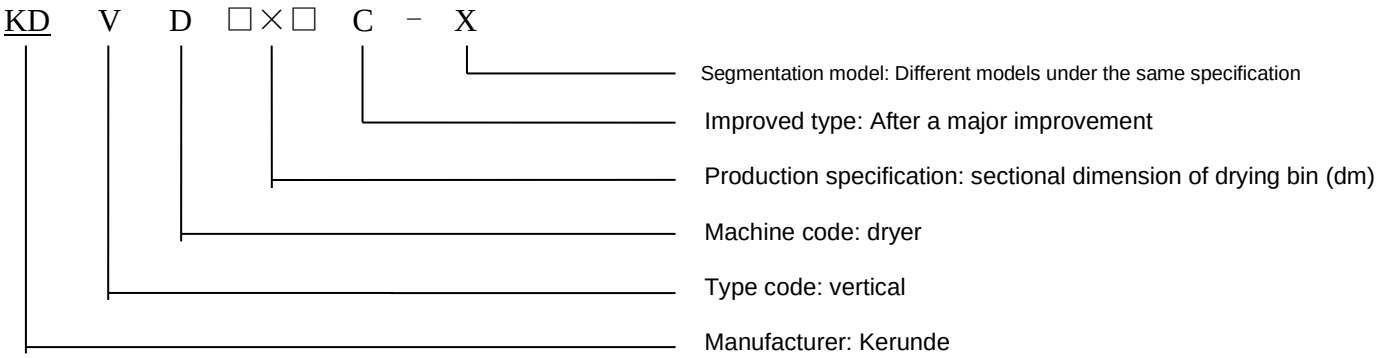
Advanced counter-current circulation drying principle is applied. It is also equipped with the oscillating plate-type discharging mechanism driven by the flexible hydraulic transmission system, which is conducive to smooth flowing, adjustable discharging amount and speed as well as uniform discharging.

The octagonal drying bin without dead corner is good for drying of materials. Every layer is equipped with the rotating distributing device to ensure uniform drying but less power consumption.

An access door is set up at the front of the machine to observe the internal running condition of the dryer, which is also easy for daily maintenance and repair.

There are four sampling ports on the intermediate chamber of the bottom layer for taking samples at anytime. It is convenient and fast to adjust the drying parameters according to the content moisture value of the samples.

2.3 Composition and meanings of model



For example: a dryer of 3 layers and the sectional dimension of 2.8mX2.8m, its model is KDVD28X28C-3.

2.4 Main technical parameters and performance index

Main technical parameters and performance index, see Table 1

Item \ Model	KDVD20X20	KDVD24X24C	KDVD28X28C				
Layer no. N	1	2	2	3	4	5	7
Working pressure of hydraulic system	≤16MPa						
Working medium of hydraulic system	N46#Anti-wear hydraulic oil or N46#hydraulic oil						
Power of hydraulic system (kW)	2.2KW*N						
Power of distributer (kW)	1.1KW*N						
Total power (kW)	5.15	9.9	9.9	13.2	16.5	19.8	26.8
Airlock model (feeding)	TGFY28C	TGFY40C	TGFY40C	TGFY40C	TGFY40C	TGFY40C	TGFY60C
Airlock model (discharging)	TGFYP28	TGFYP60					
Overall dimension mm	See the schematic drawing of equipment						

Note: Total power excludes the power of circulation air network system. The fan selection for the circulating air network is related to the design of the air network at the installation site of the dryer. Therefore, the power and related parameters of the circulating air network system are not listed in table 1.

3 Main structure and working principle

The drying treatment system is composed of the KDVD series dryer, the circulation air network system, the steam system and the electric control system.

This chapter mainly introduces the main structure and working principle of the KDVD series dryer.

3.1 Main structure

The dryer 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 KDVD Series Vertical Dryer.

Fig.3-1, take KDVD28X28C-3 as example.

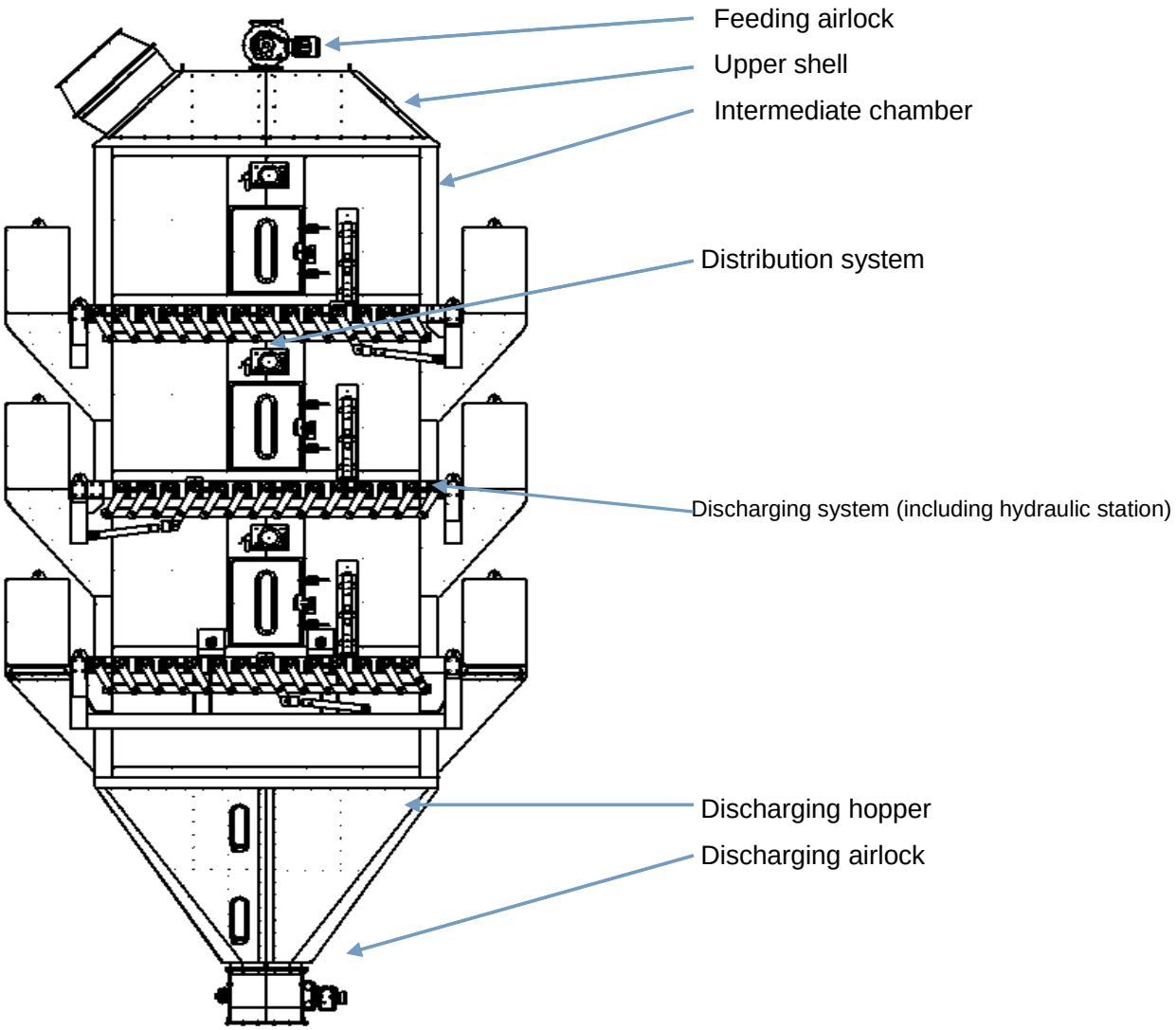


Fig.3-1 Overall structure of KDVD28x28C-3 Dryer

3.2 Working Principle

After being fed into the intermediate chamber by an airlock, the hot and humid material is evenly distributed on the tipping plates. Once the material is accumulated for a certain height, the level indicator will send out a signal to make the cylinder move to rotate the tipping plate, then material will fall down and enter into the second

drying bin through the gaps between tipping plates. When the tipping plate rotating to the designed angle, the device for indicating the opening of tipping plate will send out a signal to make the cylinder move back to make the tipping plate return to the initial state. With material in the first drying bin keep falling down to the second drying bin, the material level gradually turns to be lower than the level indicator, and the cylinder will move back to rotate the tipping plates to close, and material will not fall down anymore, as of this time, a discharging circle is completed. The discharging process is repeated again and again, and the material enters into the following bins step by step and dried.

The fan should be always opened during the above mentioned process. The cooling air is heated by the heat exchanger to be the hot air and then enters the intermediate bin by the circulation fan; it will go through material from bottom to top or from top to bottom. The material absorbs heat and gives off moisture, and the hot wind absorbs moisture and gives off heat. A small part of wet air will get out of the dryer from the air outlet. Most of the wet air, after being heated by the heat exchanger again, will enter the intermediate bin together with fresh air. Thus, the circulation of hot air is realized, and the steam consumption is greatly reduced.

See Fig. 3-2 for Schematic Diagram of Working Principle.

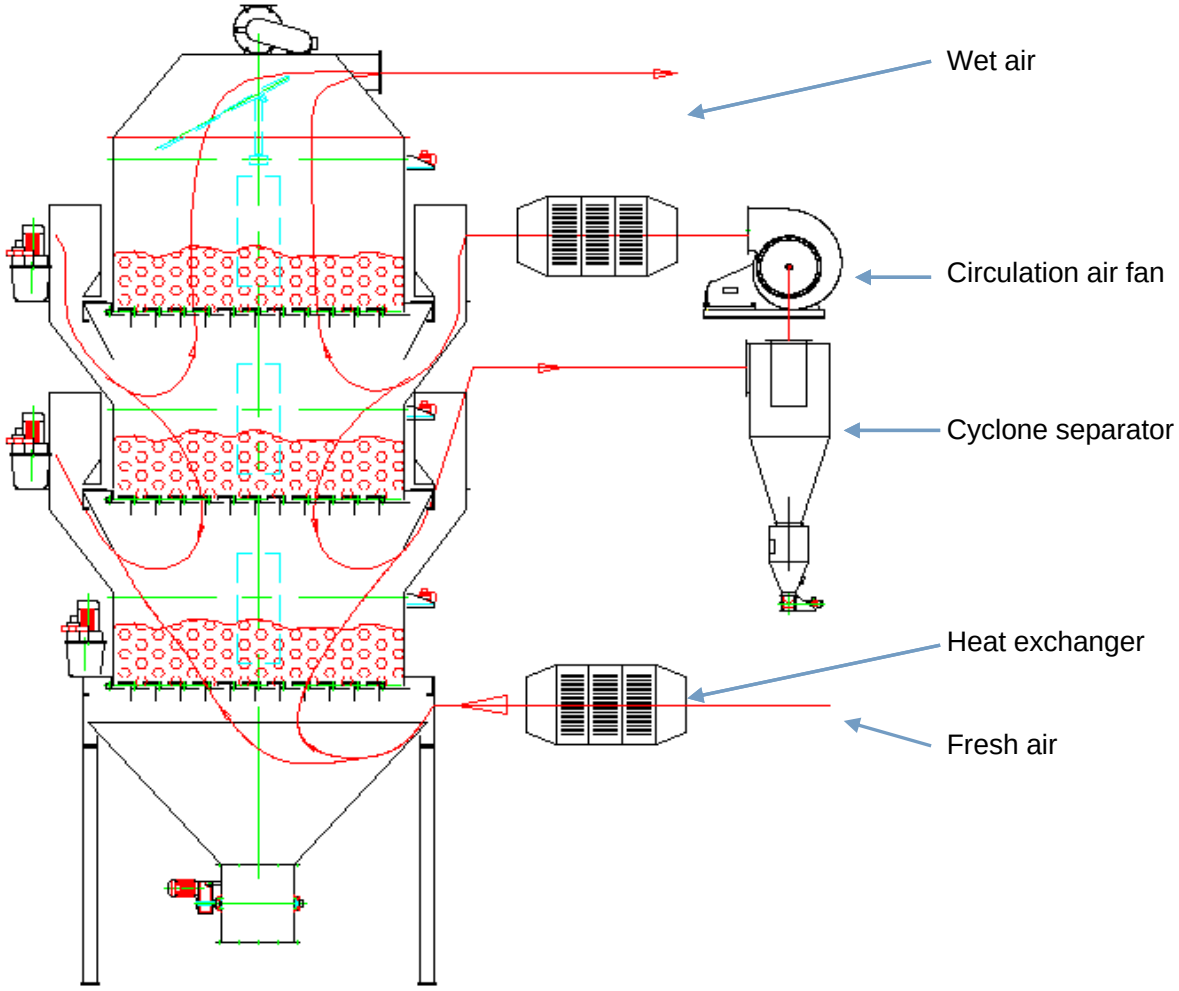


Fig. 3-2 Schematic Diagram of Working Principle

3.3 Main working parts and working principle

3.3.1 Intermediate chamber

The intermediate bin is used to store material and the drying treatment is carried out in it. The octagon drying bin without dead drying corner has eliminated bad drying effect caused by uneven distribution. A observation window is set up on the intermediate bin, 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. Four sampling ports are set up on the intermediate bin of the bottom layer for sampling at any time. Adjust the drying parameters according to moisture content of the sample, easy and fast.

ⓘ *The gate of intermediate bin 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.3-3 Schematic Diagram of Intermediate Bin

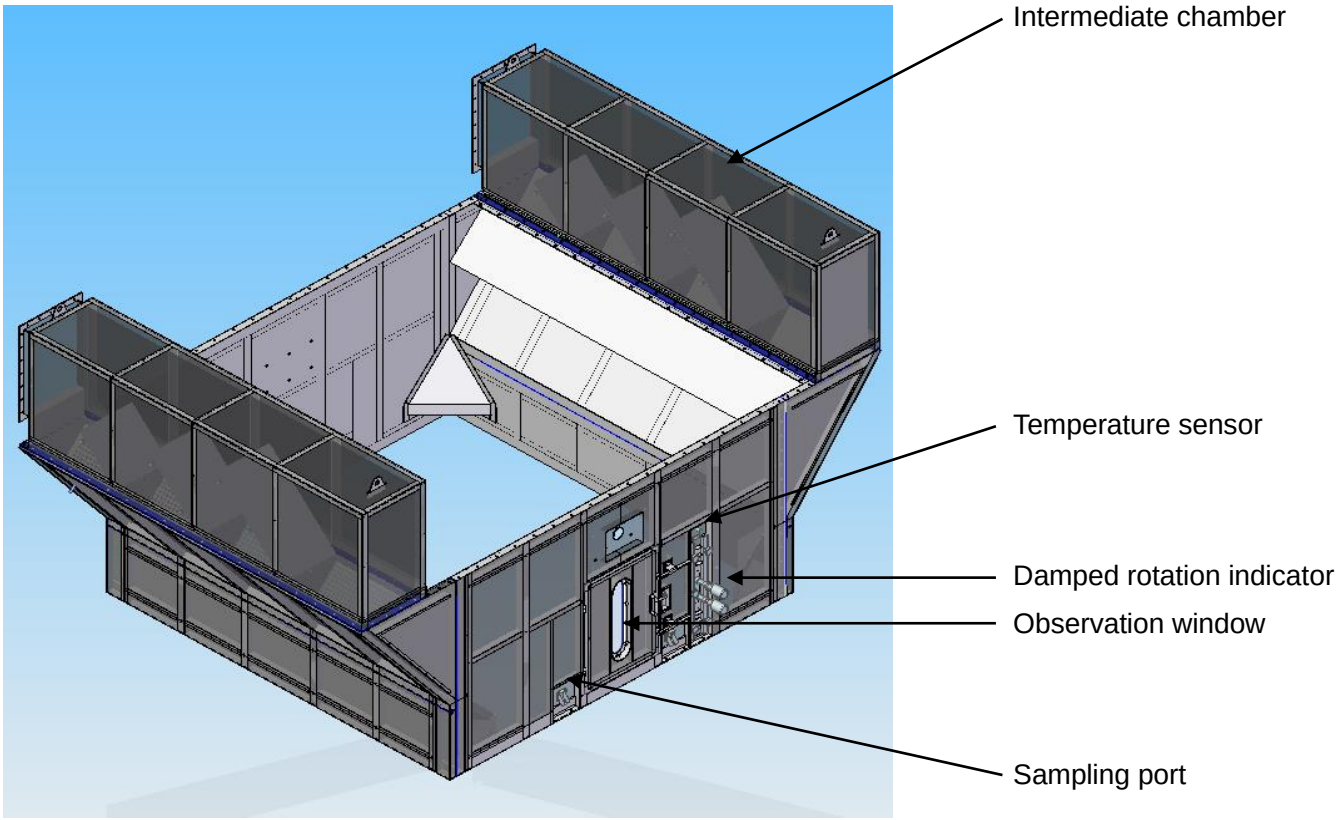
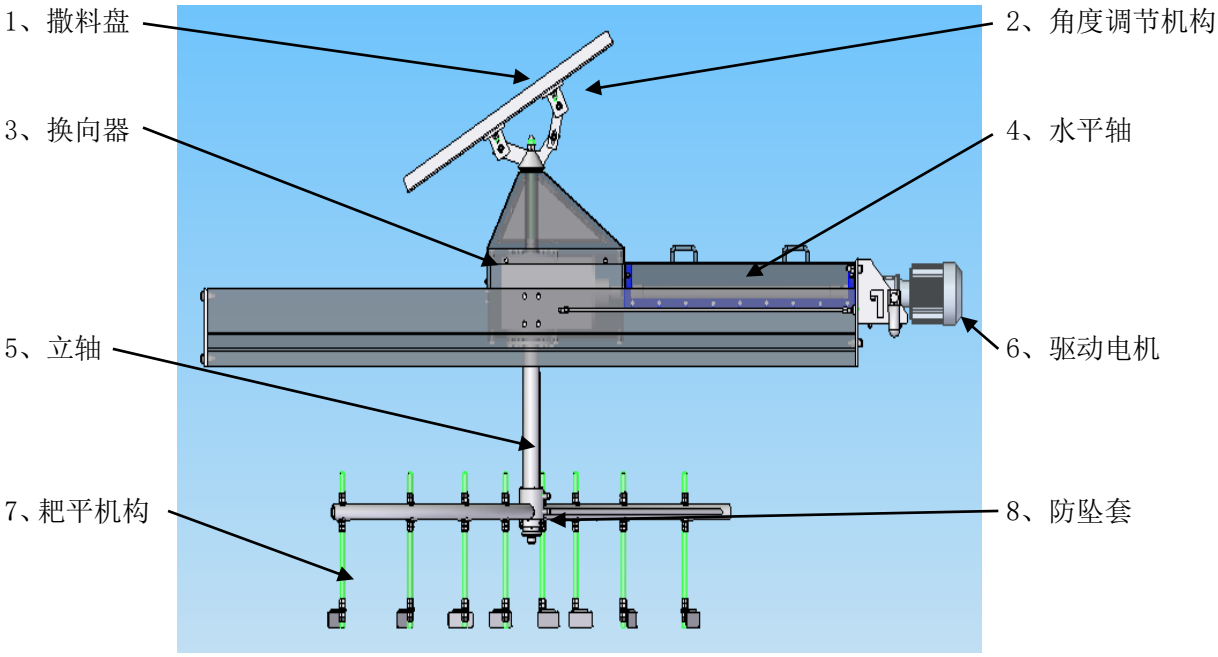


Fig.3-3 Schematic Diagram of Intermediate Chamber

3.3.2 Distribution system

The distribution system 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.3-4 Schematic Diagram of Distribution system



1. Spreading disc 2. Angle adjustment device 3. Reversing device 4. Horizontal shaft 5. Vertical shaft 6. Driving motor 7. Leveling device 8. Anti-drop sleeve

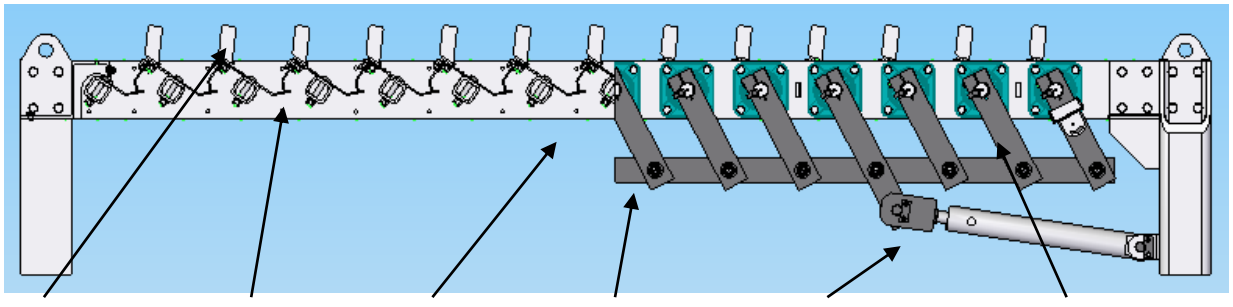
Fig.3-4 Schematic Diagram of Distribution system

The distribution system is set up in the intermediate bin. 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.

3.3.3 The discharging system

The discharging system is very important, it is used to discharge material and control the discharging amount. It is mainly composed of arch broken assembly, plate, crank, connecting rod, hydraulic cylinders and angle sensor.

See Fig.3-5 Schematic Diagram of Discharging system.



1. Arch broken assembly 2. Plate 3. Crank 4. Connecting rod 5. Hydraulic cylinder 6. Angle sensor

Fig.3-5 Schematic Diagram of Discharging System

Special-shaped plate structure is adopted. A certain number of round holes are processed on the plate so as to increase the efficiency of hot wind through the material, and the ventilation area is much bigger than the

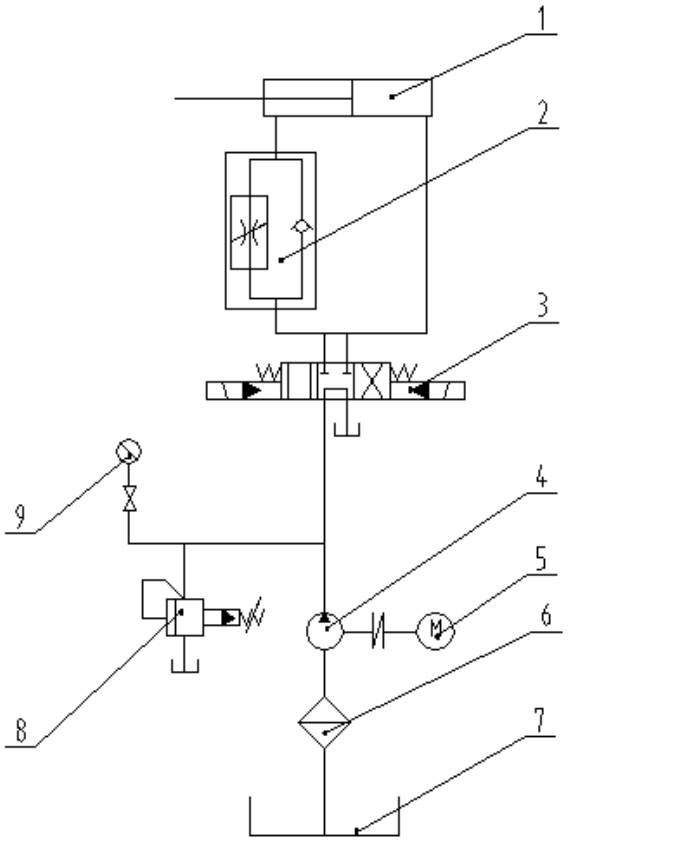
traditional plate dryer, which has a better drying effect. A anti-arch assembly is set up on the plate of the top layer, while discharging, the plate rotates to break arched materials so as to ensure the moisture uniformity of product to create more profits for customers.

3.3.4 Hydraulic system

The power of the discharging device of the dryer is derived from the hydraulic system.

A hydraulic station of the power 2.2kW is applied.

See Fig.3-6 for Schematic diagram of hydraulic system



1. Hydraulic cylinder 2. Speed-adjusting valve 3. Three-position four way directional control valve 4. Paddle pump 5. Hydraulic motor 6. Filter 7. Oil tank 8. Overflow valve 9. Pressure meter

Fig.3-6 Schematic Diagram of Hydraulic System

Hydraulic system characteristics

The hydraulic system is mainly composed of the hydraulic pump, hydraulic cylinder and pipelines. The motor of the hydraulic pump is vertical structured. Its pressure control part and valve station use the integrated block connection, compacted size. The direction control vale and overflow valve are applied to control direction and adjust pressure. The throttle valve is used to adjust the flowing amount.

Attention for usage and maintenance

a. The oil filter vehicle is suggested to use for oil filling (20ηm/30ηm).

b. The oil level inside oil tank shall be within the scale range of liquid meter, refill immediately once the liquid is insufficient.

c. The oil temperature should not exceed 60℃, otherwise it will affect the normal running of the equipment. The hydraulic station is equipped with water-cooled appliance. Keep the water-cooled appliance works properly.

d. It is suggested that change the oil filter every six months and clean the oil tank every year.

e. Shut down the oil pump and motor without delay when it stops working.

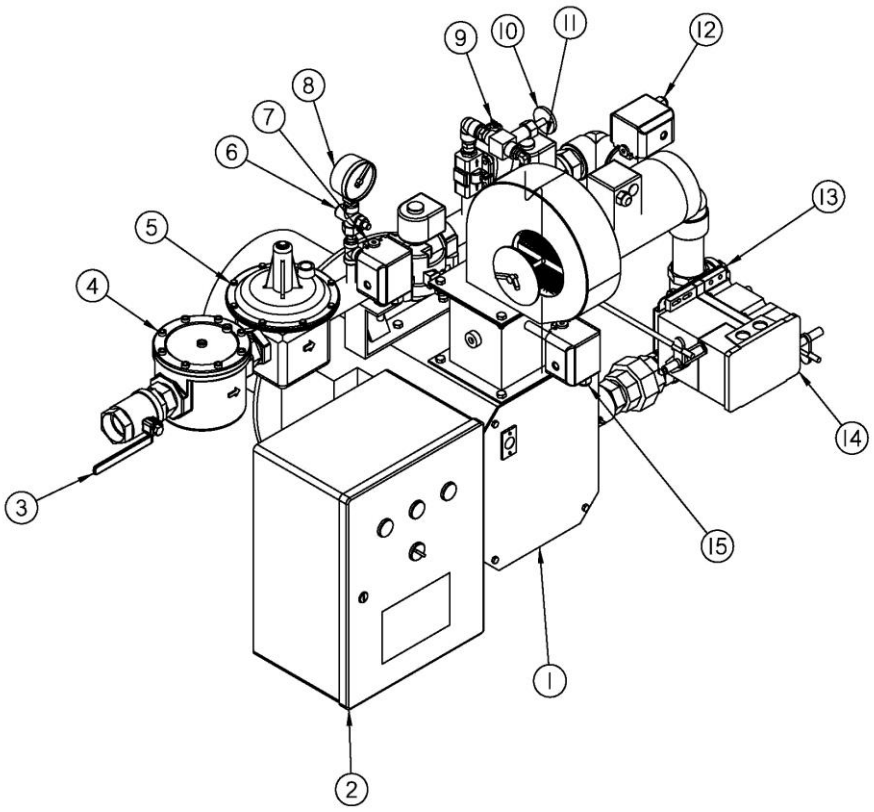
Common troubles and troubleshooting

Table 3-1 common troubles and troubleshooting

Troubles	Reasons	Methods
Cylinder does not work or cannot change direction flexibly	1. The motor does not work or rotates in opposite direction.	Check the wire connection of motor.
	2. Do not add oil or add little oil while the motor is running.	Check oil level and add oil.
	3. The motor is running but the overflow valve gets stuck.	Clean the overflow valve
	4. The solenoid directional valve is out of power or undervoltage.	Check the wire connection of the solenoid directional valve
	5. The solenoid directional valve gets stuck.	Clean the solenoid directional valve
The motor burn down	1. The voltage is inconsistent or lack of phase or the motor waters.	Check the motor voltage, or eliminate the reason that cause lack of phase and avoid the motor from watering.
	2.The overflow valve gets stuck.	Clean the overflow valve
The pressure cannot be adjusted higher.	1. The pressure of the pilot overflow valve is too small.	Increase the pressure of the pilot overflow valve
	2. The pilot overflow valve gets stuck.	Clean the overflow valve
	3. The hydraulic oil is too dirty.	Replace or filter the hydraulic oil.
Oil leakage	1. The sealing ring is aged or damaged.	Replace the sealing ring
	2. Too much oil	Reduce oil
	3. The exhaust bolts are not tight.	Tight the bolts

3.3.5 Combustor

It is optional and used for supplying heat source of the heat exchanger. Between the steam system and it, choose either-or. See the Fig. 3-7 for its structure.



序号	名称
1	燃烧器
2	点火柜
3	球阀
4	过滤器
5	调压阀
6	按钮阀
7	压力开关
8	压力表
9	电磁阀
10	针阀
11	电磁阀
12	压力开关
13	机动调节阀
14	马达
15	压力开关

1. Burner 2. Ignition 3. Ball valve 4. Filter 5. Pressure adjusting valve 6. Button valve 7. Pressure switch 8. Pressure meter 9. Solenoid valve 10. Pin valve 11. Solenoid valve 12. Pressure switch 13. Flexible adjustment valve 14. Motor 15. Pressure switch

Fig.3-7 Combustor

Operation instruction

Start-up

1. Make sure the ball valve and shut-off valve shut down;
2. Make sure the motor handle of the combustor at the position of the pre-set small fire
3. Start up all circulation fans and exhaust fan.
4. Start up the control cabinet of the system (if suitable)
5. Start up the fan of the combustor
6. Turn on the gas ball valve
7. Press the start-up button
8. Turn on the main solenoid valve (Only after all the safety circuit is finished.)

Shut-down

1. Press the shut-down button
2. The main solenoid valve shall close automatically
3. Cut off the control panel of the system and the fan motor.

4 Turn off the gas ball valve.

Common troubles and troubleshooting, see Table 3-2

Table 3-2

Troubles	Reasons	Solution
Combustor does not carry out ignition procedure	No power	Check the main power supply
		Check the power fuse
	The electrical control circuit is not connected.	Check the switches of the whole circuit
		Check all pressure switch
	Low air pressure	Check the air switch and find out the reason that why the air pressure is low
	Low gas pressure	Check the air switch and the gas pressure
Combustor stops carrying out ignition procedure	Low pressure of oxidizing air	Reset the air pressure switch
		Check the valve of air flow amount
		Check the fan and its rotation direction
Ignition failure	No spark	Check the ignition electrode
		Check the transformer and its connection with the ignition electrode
	Solenoid valve failure	Check the connection of solenoid valve
		Check the operation of the solenoid valve
	No gas supply	Check the hand valve
		Check the adjustment valve of the gas flow amount
		Check the gas outlet position
	Small Ignition position	Reset the gas valve and ignition position
The ignition is extinguished for a short time.	Control system failure	Check control switch of the temp. -proof
	Check the gas supply	Check and clean the pipelines
		Check the gas source
	Fire detection cannot detect flam	Clean the flame detection electrode
		Check the electrode connection
		Repair or replace the detection electrode.
	Insufficient combustion air	Check the fan
		Clean the fan
Flame too long	Too much gas	Check the gas pressure
		Check the control valve of gas amount
		Check the components of the solenoid valve
	Too little air	Check the fan, the air flow amount controlling valve and the controlling motor
Furnace temperature is not enough	Insufficient Power of the combustor	Re-select combustor
	Too much cool air enter the furnace	Check the furnace door
	Insufficient gas supply	Check the gas amount
	Temperature control signal failure	Check the signal receiving of the motor
Too high temperature of the furnace	Too high output power of the combustor	Check the signal receiving of the motor

4 Transportation and Adjustment

4.1Transportation

Due to the large machine size and limited to the dimension limitation of transportation, the dryer is split into a number of parts when delivery, its list is shown in table 4-1.

Table 4-1 Parts list of dryer (n stands for layer number)

	Part Description	Qty.	Remarks
Main parts of the dryer	Feeding airlock	1	Apart from the delivery of the whole machine, it is usually dispersed
	Upper shell	1	
	Intermediate chamber	n	
	Distribution system	n	
	Discharging system	n	
	Discharging hopper	1	
	Discharging airlock	1	
	Hydraulic station	n	
	Circulation air network (including heat exchanger, fan)	1 set	
	Steam valve assembly	1 set	
	Connection bolts, washer, nuts	1 set	
	Electric control cabinet	1	

Note: n stands for the layer number of the dryer. Please see the total packing list for detailed packing list. 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

③ There are four hosting points on the discharging system. two on each side. Use the four points at the same time while hoisting. See Fig. 4-1.

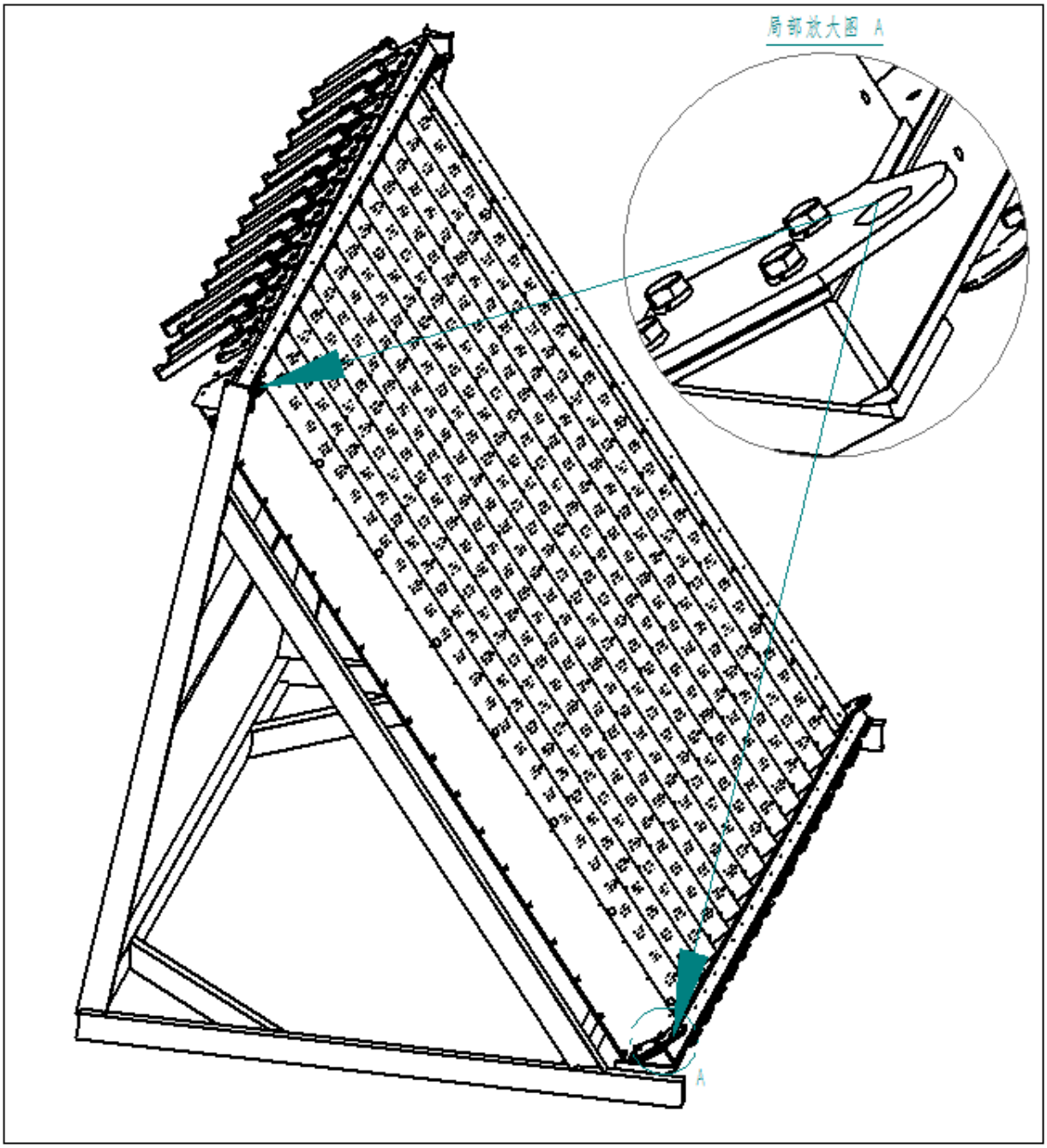


Fig. 4-1

(2) Transportation

①When 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.

②If 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.

⑤It 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.

②In order to ensure the stability of the machine, the welding plate of the foot should be reserved

③When 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 drying operation needs a great deal of dried air flow, keep the air flowing smoothly in the installation room of the dryer.

(2) Schematic drawing for installation

The installation dimensions between all main components of the dryer are completely uniform and can guarantee the interchanging assemble between all components. Even so, we still suggest that the customer should carry out the installation under instruction of installation leading personnel or strictly in accordance with marked numbers of equipment components.

See Fig.4-2 Schematic Diagram of KDVD 28x28-3

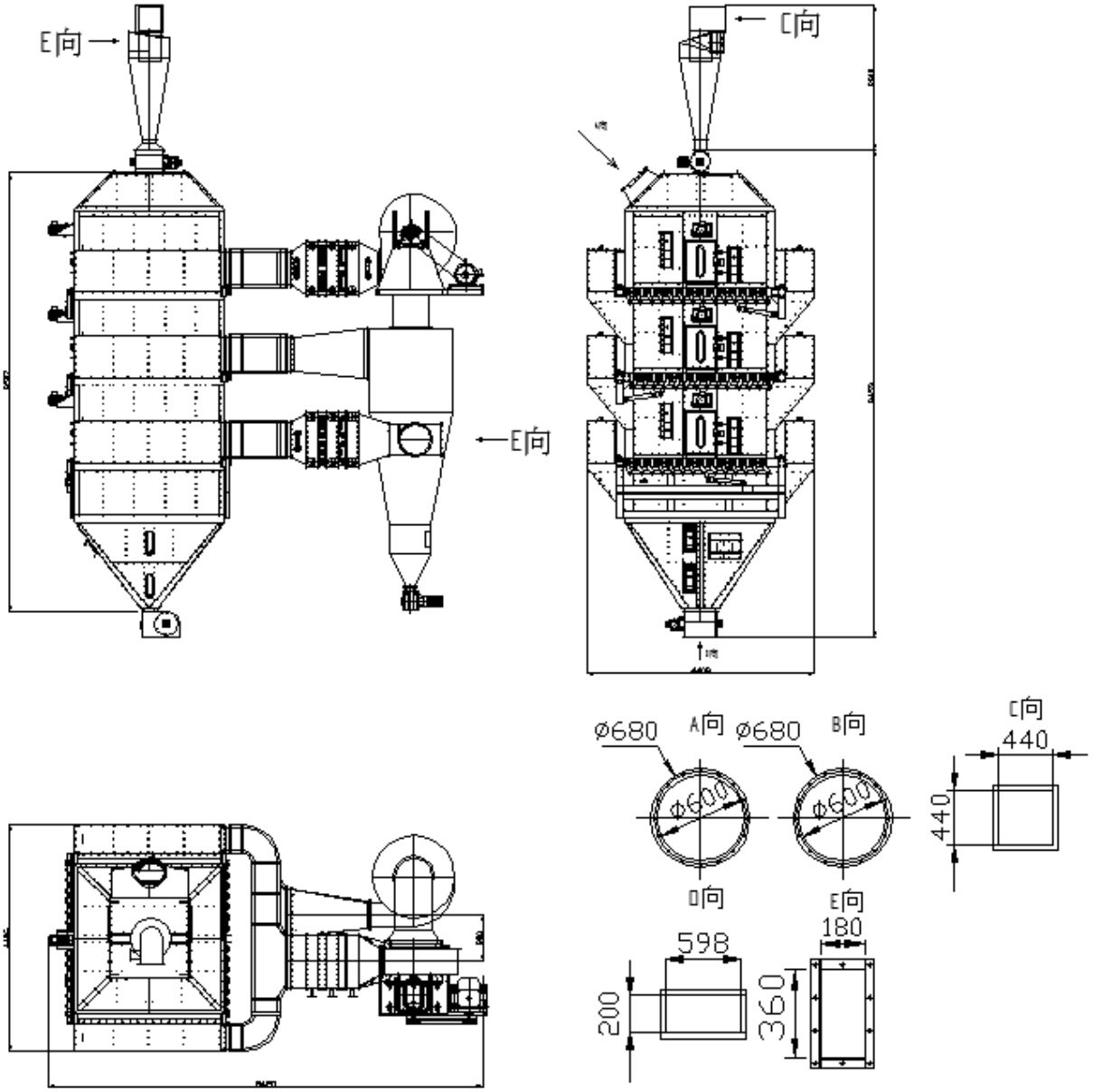


Fig.4-2 Schematic Diagram of KDVD 28x28-3

4.3 Installation of Hydraulic System

a. Two discharging ports of the assembly part are connected with two oil ports of cylinder respectively.

b. The motor rotates in clockwise direction from the view of fan blade.

c. The system pressure is loaded through the three-position-four-way solenoid commutation valve, the superimposed overflow valve pressure is adjusted according to the required work pressure. Usually, the system pressure shall not exceed 16 MPa(160 kgf/cm2). Adjustment way: Rotate the screw of the superimposed overflow valve clockwise to increase pressure, otherwise to decrease pressure. Observe the system pressure by the pressure meter while the cylinder moved to any end.

d. Change the moving direction of cylinder by the three-position-four-way solenoid commutation valve, the two-way speed of the cylinder is adjustable. Adjustment way: Rotate the screw of the superimposed overflow valve clockwise to decrease speed, otherwise to increase speed.

4.4 Installation of Steam System

As the steam pipeline of KDVD Series Vertical Dryer, please see Fig.4-3.

Install a steam drum at the floor where the dryer is installed. the working pressure of the steam drum shall not be less than 0.8Mpa.

A compressed air source shall be reserved nearby the steam adjustment valve, its pressure shall not less than 0.5Mpa.

The installation angle of drain pipe is 1:100. Connect all drain pipes in according to the real situation.

The bypass pipe shall be at the same level or higher than the drain valve in order to avoid ponding inside the bypass pipe.

The installation of the pressure gauge shall be convenient to read the data.

After finish the installation of steam pipeline, take 1Mpa steam to clean the pipeline and then to clean out the filter.

Any leakage and venting of the pipeline is not allowed. If any, carry out repair welding immediately.

The pipeline shall be treated by insulation after the pressure test and cleaning.

See Steam pipeline of KDVD28x28-3 in Fig. 4-3

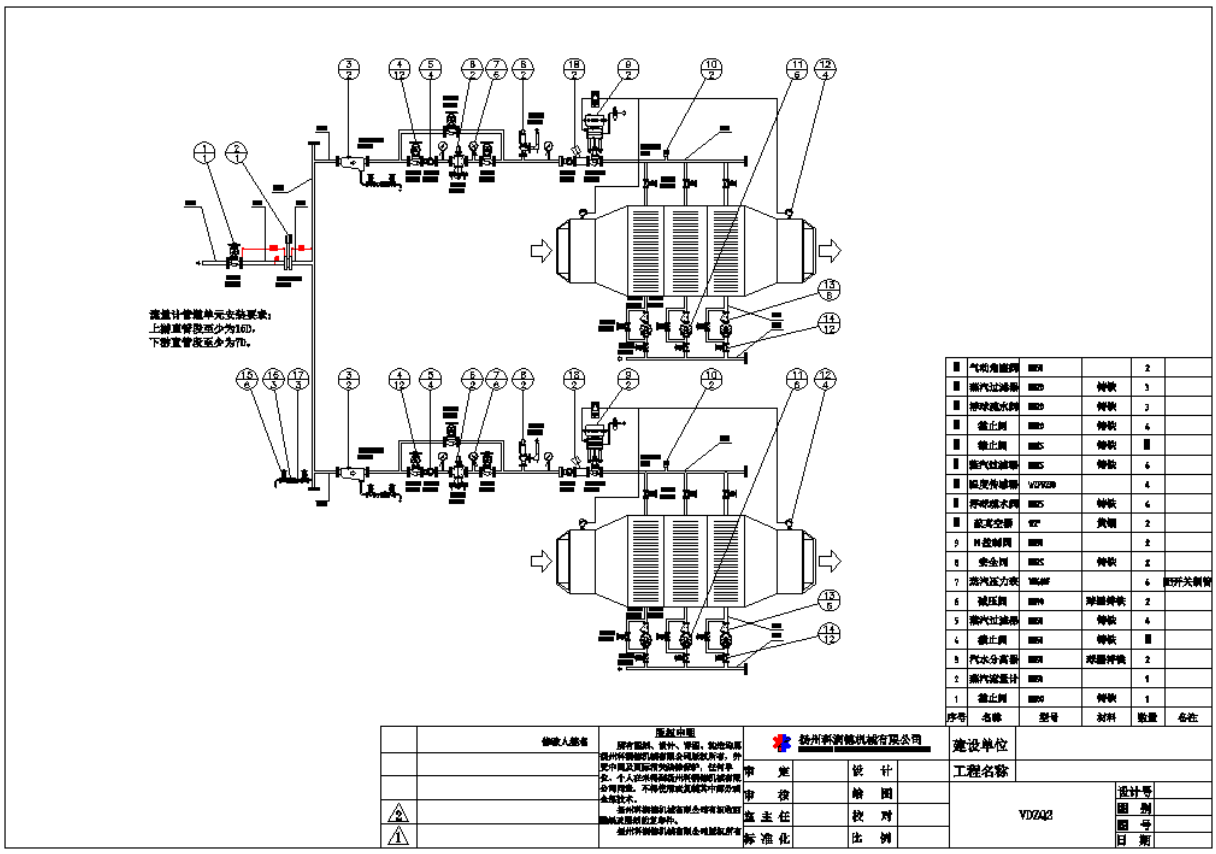
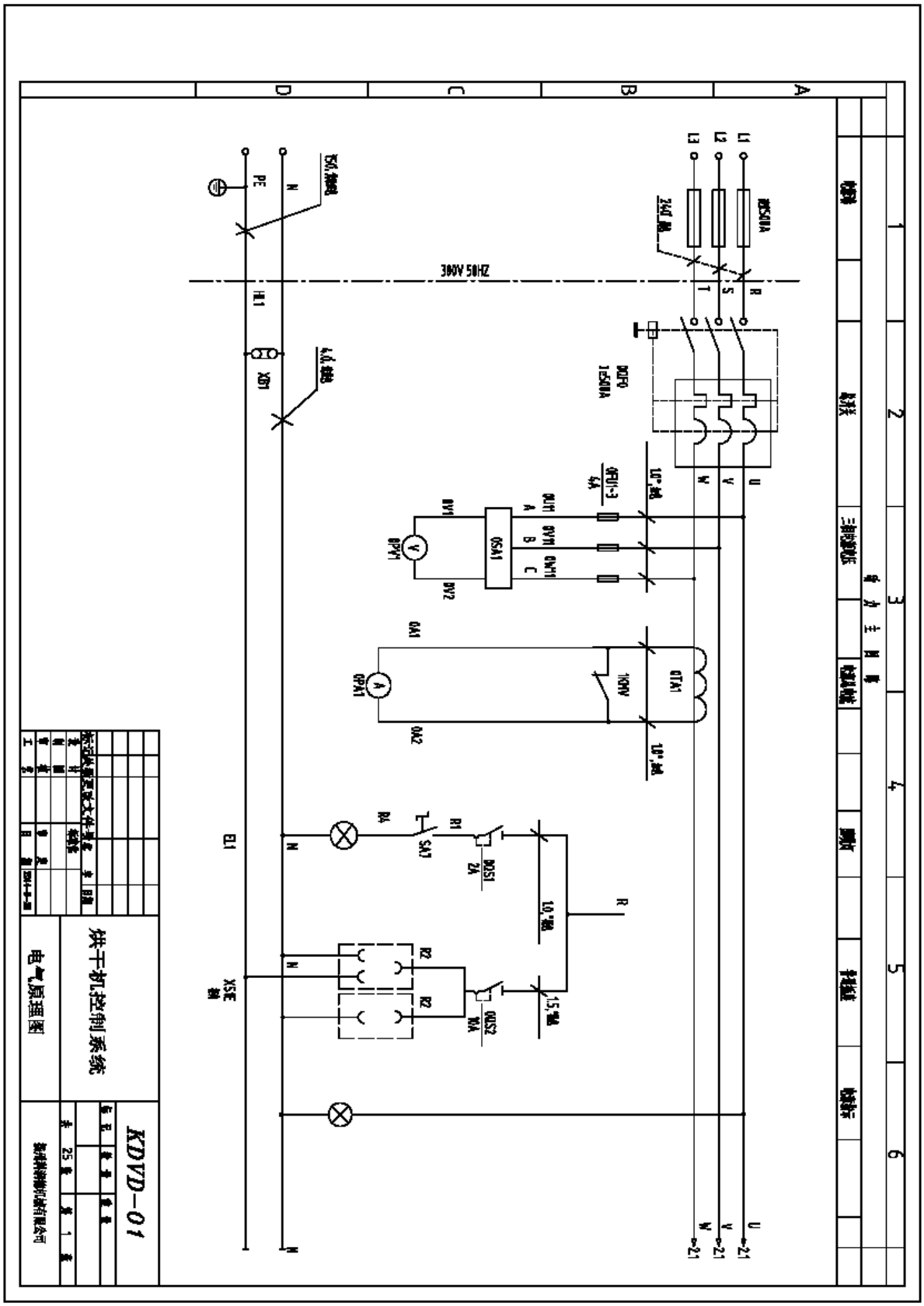
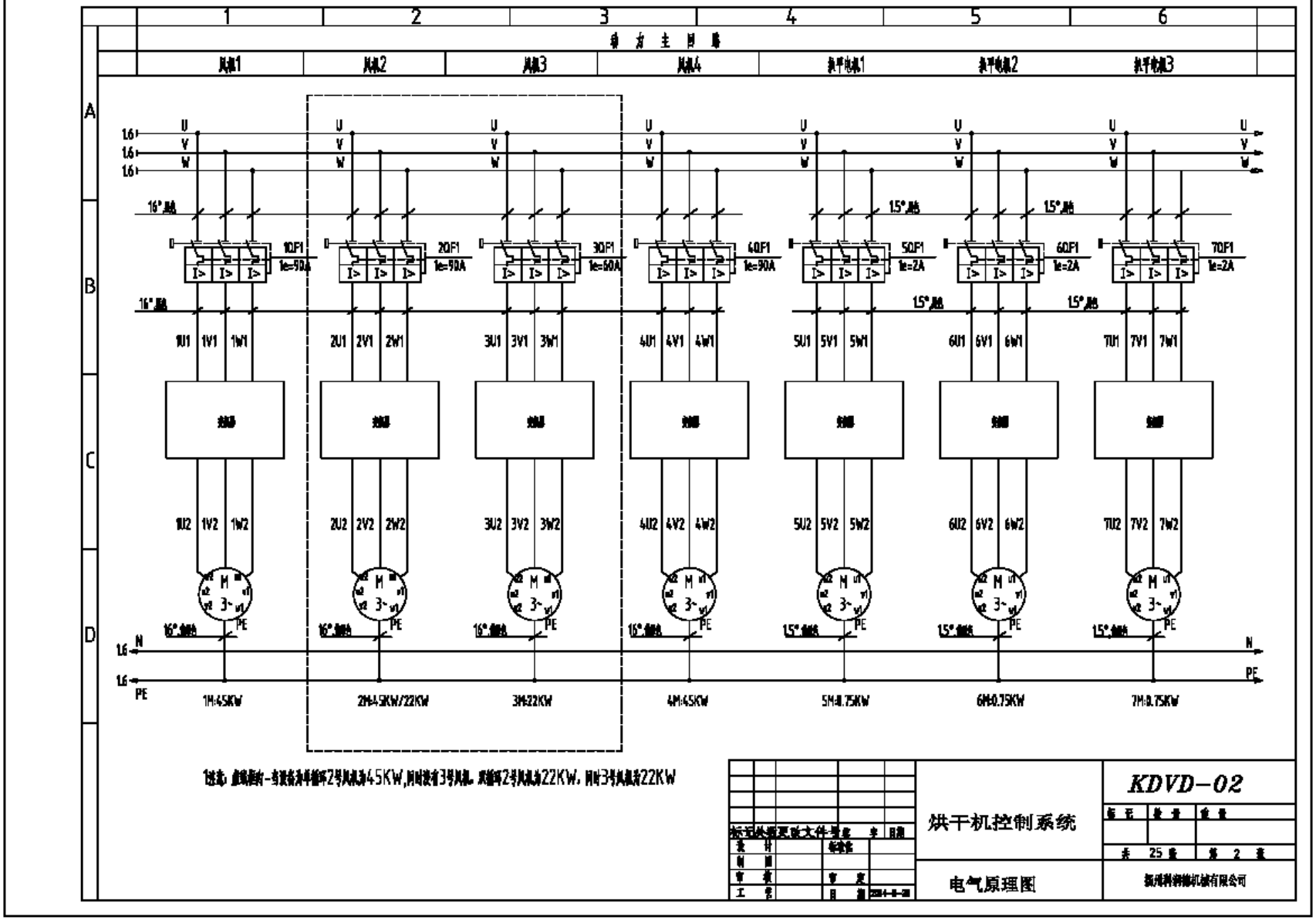


Fig. 4-3 Steam pipeline of KDVD28x28-3

4.5 Installation of Electrical Control System

The user shall designate a special electrical engineer for wiring or installation according to the following electric control schematic diagram.


KDVD-01
烘干机控制系统
电气原理图
380V 50HZ


1
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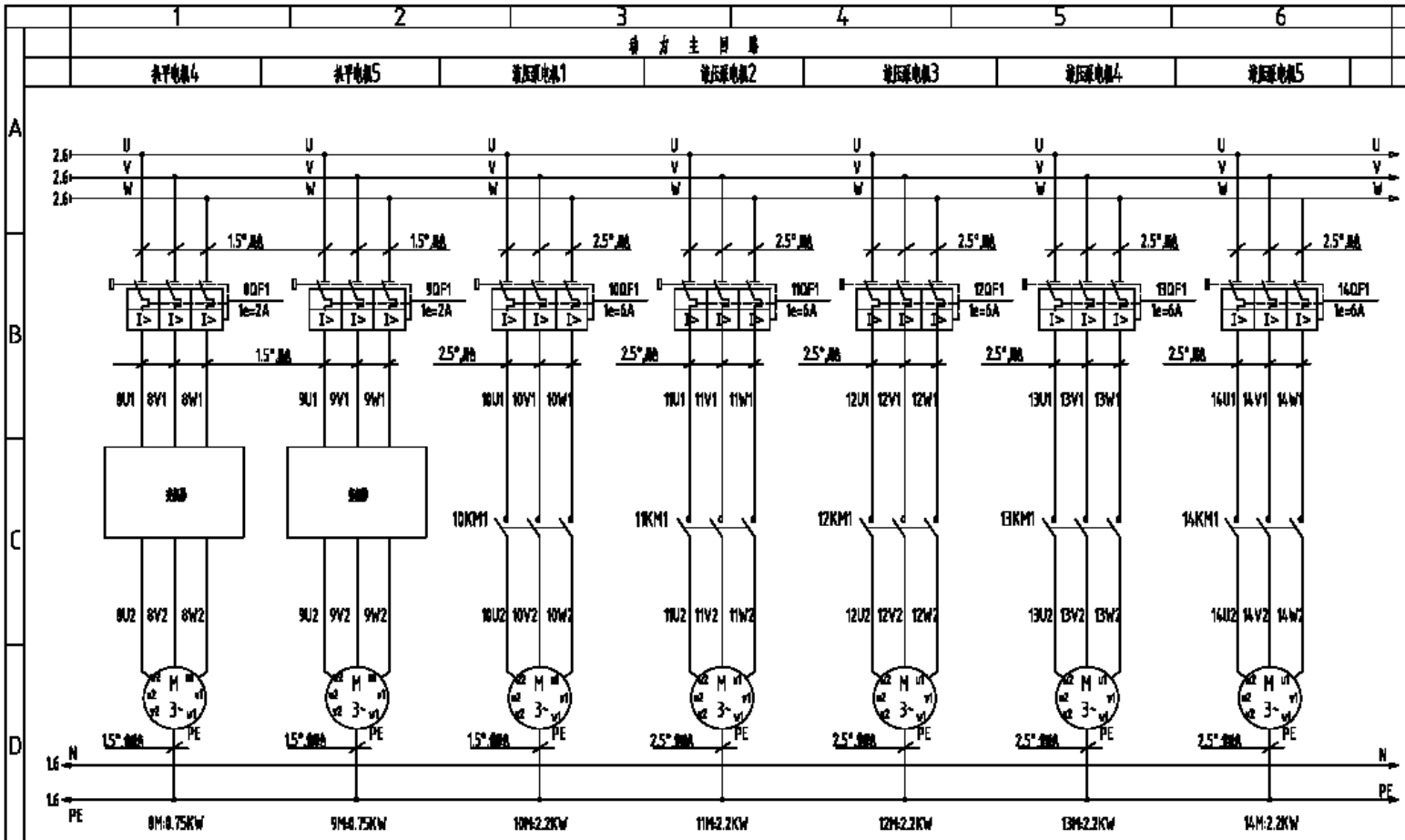
D
电 力 主 回 路
风机1
风机2
风机3
风机4
热平衡机1
热平衡机2
热平衡机3
L6
U
V
W
16°,A6
15°,A6
1QF1 Ie=90A
2QF1 Ie=90A
3QF1 Ie=60A
4QF1 Ie=90A
5QF1 Ie=2A
6QF1 Ie=2A
7QF1 Ie=2A
1U1 1V1 1W1
2U1 2V1 2W1
3U1 3V1 3W1
4U1 4V1 4W1
5U1 5V1 5W1
6U1 6V1 6W1
7U1 7V1 7W1
1U2 1V2 1W2
2U2 2V2 2W2
3U2 3V2 3W2
4U2 4V2 4W2
5U2 5V2 5W2
6U2 6V2 6W2
7U2 7V2 7W2
M 3~
PE
N
1M:45KW
2M:45KW/22KW
3M:22KW
4M:45KW
5M:0.75KW
6M:0.75KW
7M:0.75KW
注意：虚线框内一台设备为单循环2号风机为45KW,同时没有3号风机。双循环2号风机为22KW，同时3号风机为22KW
KDVD-02
烘干机控制系统
电气原理图
张 25 第 2
振州科钢机械有限公司


1
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D
单 方 主 回 路
共干电机4
共干电机5
岩压泵电机1
岩压泵电机2
岩压泵电机3
岩压泵电机4
岩压泵电机5
U
V
W
2.5
1.5°,BV
8QF1
9QF1
10QF1
11QF1
12QF1
13QF1
14QF1
Ie=2A
Ie=6A
8U1 8V1 8W1
9U1 9V1 9W1
10U1 10V1 10W1
11U1 11V1 11W1
12U1 12V1 12W1
13U1 13V1 13W1
14U1 14V1 14W1
10KM1
11KM1
12KM1
13KM1
14KM1
8U2 8V2 8W2
9U2 9V2 9W2
10U2 10V2 10W2
11U2 11V2 11W2
12U2 12V2 12W2
13U2 13V2 13W2
14U2 14V2 14W2
M
3~
PE
N
8M:0.75KW
9M:0.75KW
10M:2.2KW
11M:2.2KW
12M:2.2KW
13M:2.2KW
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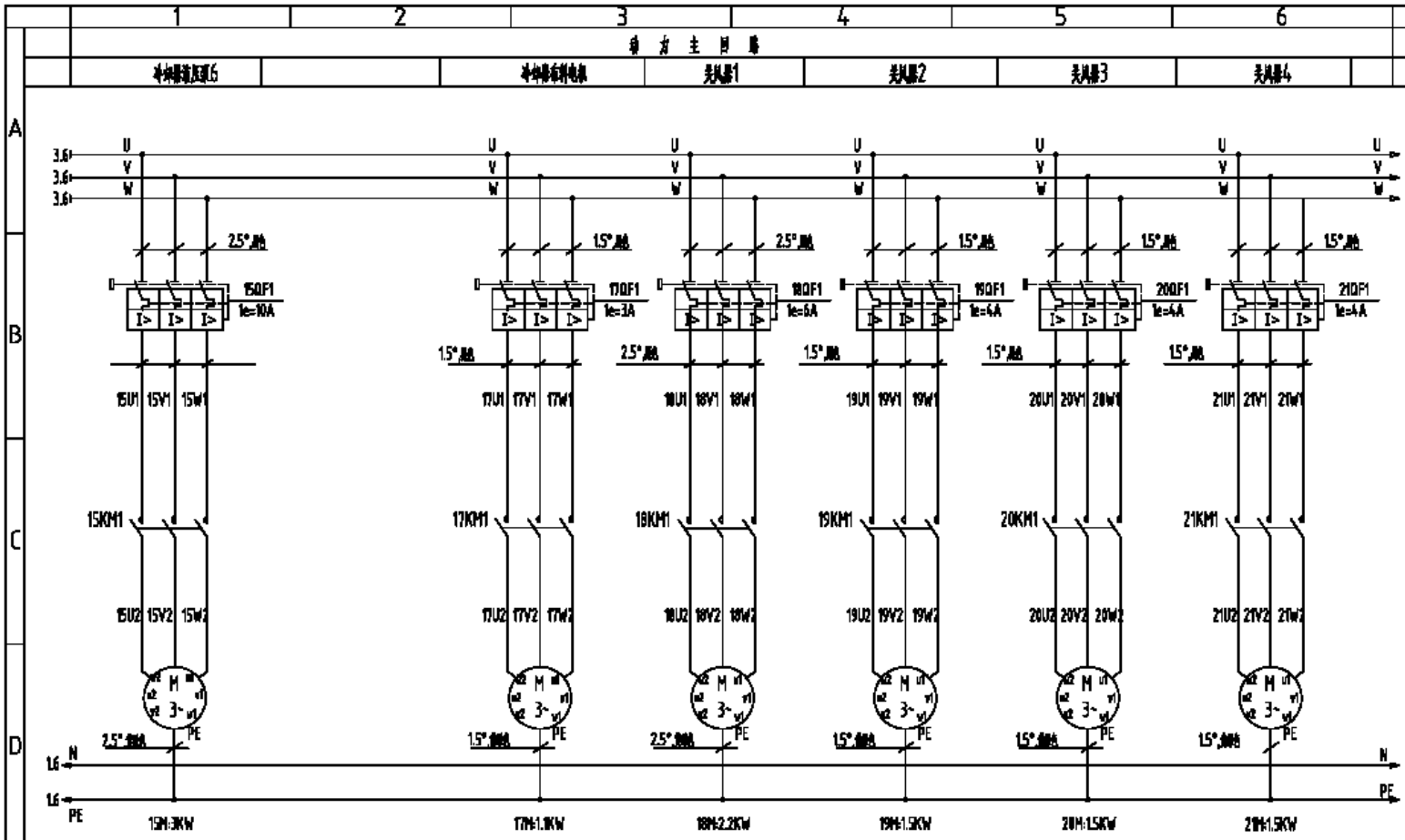
烘干机控制系统
KDVD-03
电气原理图
共 25 张
第 3 张



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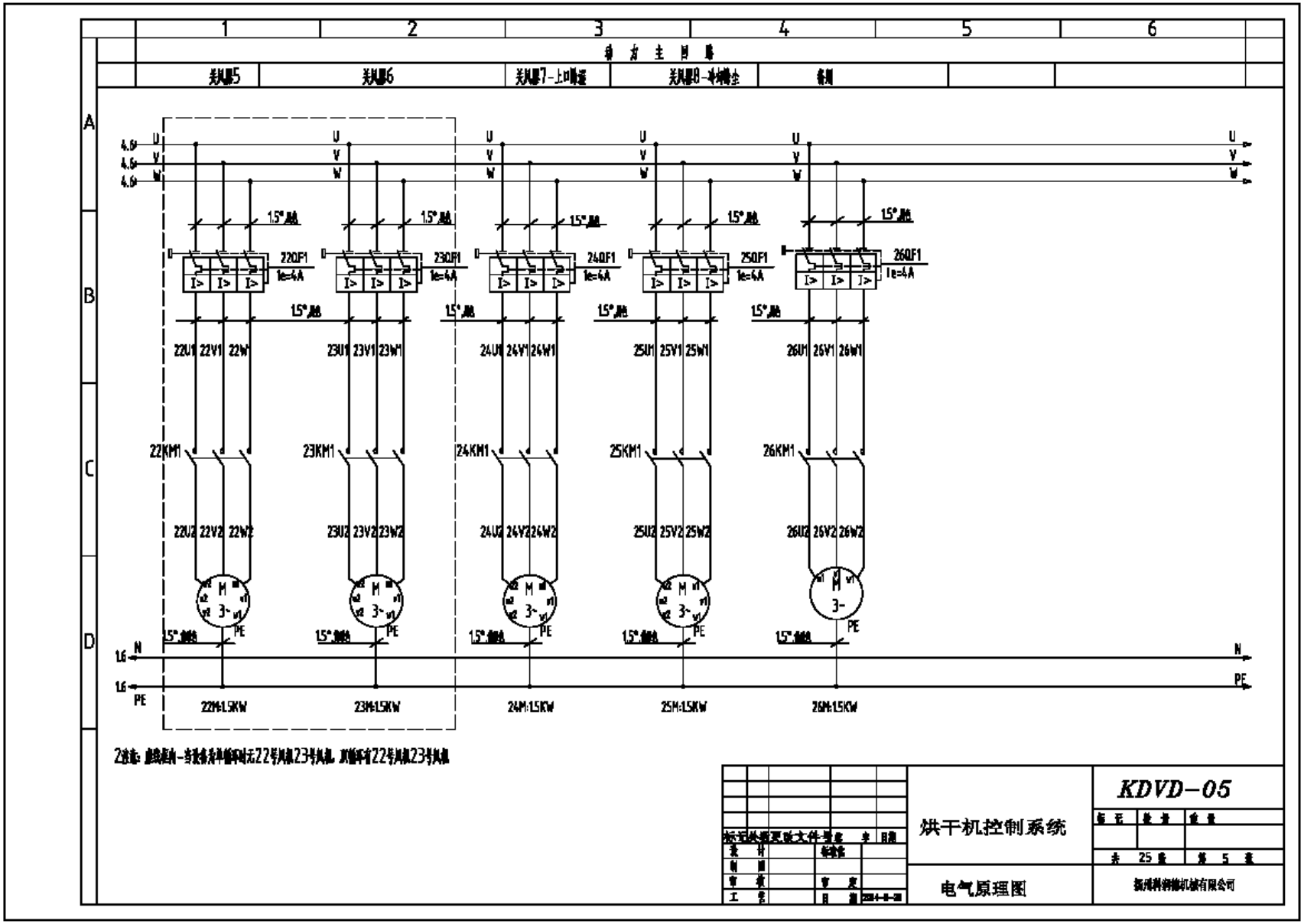
制图									
审核		审定							
工艺		批准		2014-8-28					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D
单 方 主 回 路
关风扇5
关风扇6
关风扇7-上口喷雾
关风扇8-中间喷尘
备用
U
V
W
4.6
1.5*,AR
220F1
230F1
240F1
250F1
260F1
Ie=4A
I>
22U1 22V1 22W1
23U1 23V1 23W1
24U1 24V1 24W1
25U1 25V1 25W1
26U1 26V1 26W1
22KM1
23KM1
24KM1
25KM1
26KM1
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23U2 23V2 23W2
24U2 24V2 24W2
25U2 25V2 25W2
26U2 26V2 26W2
M
3~
PE
1.5*,AR6
N
L6
22M:1.5KW
23M:1.5KW
24M:1.5KW
25M:1.5KW
26M:1.5KW
烘干机控制系统
KDVD-05
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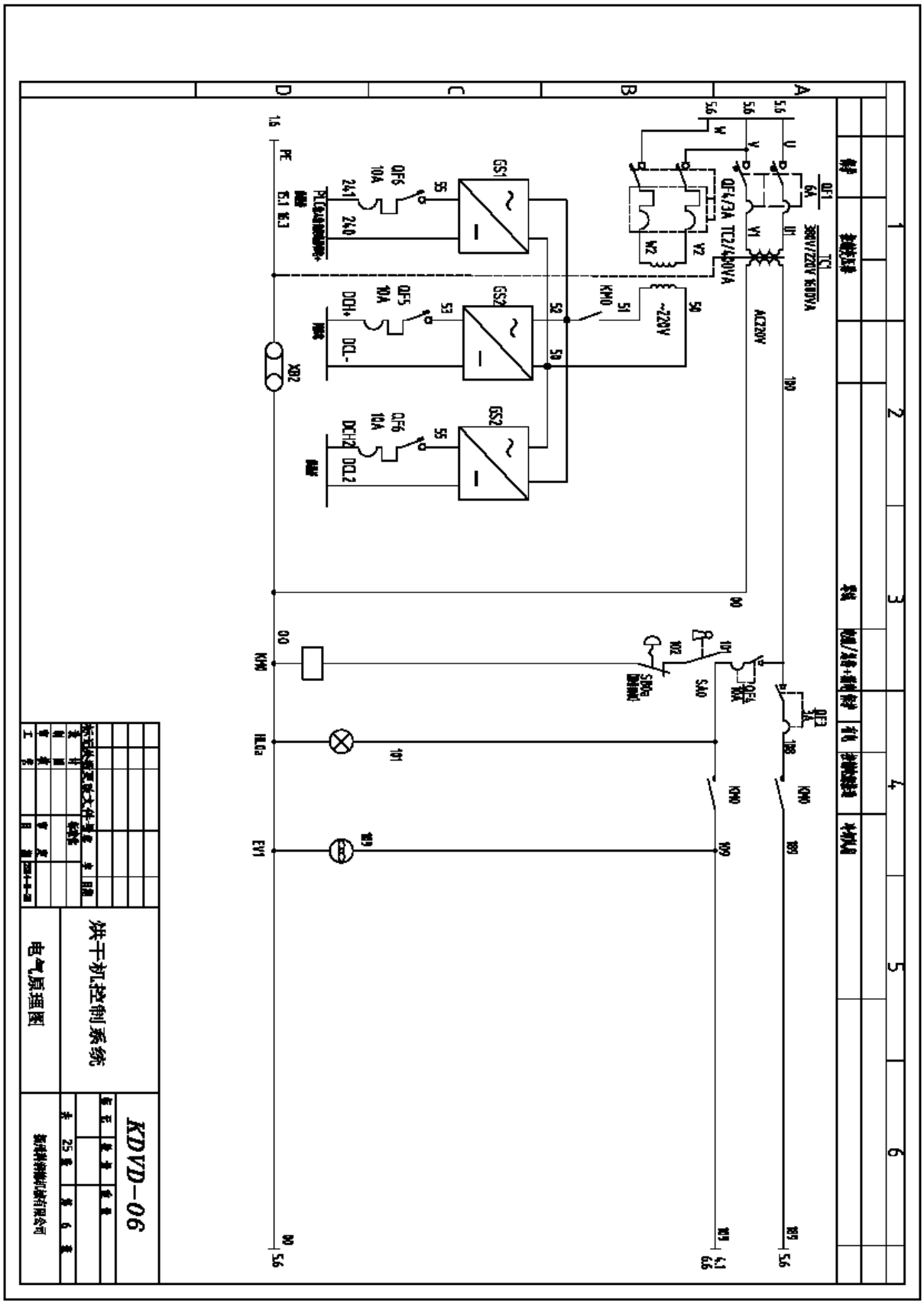
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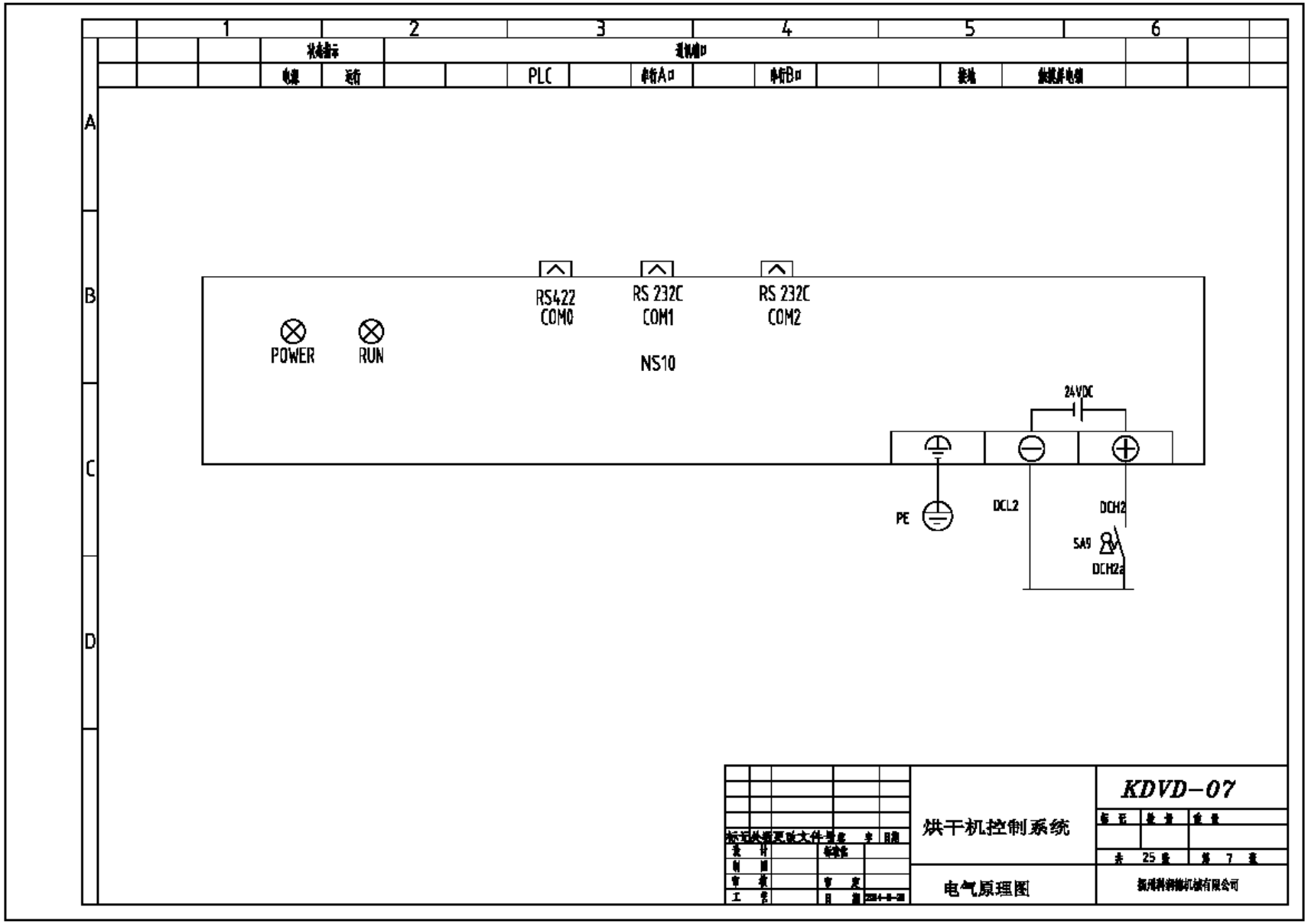
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电源
运行
PLC
串行A口
串行B口
接地
触摸屏电缆
A
B
C
D
RS422
COM0
RS 232C
COM1
RS 232C
COM2
POWER
RUN
NS10
24VDC
PE
DCL2
DCH2
SA9
DCH2a
烘干机控制系统
KDVD-07
电气原理图
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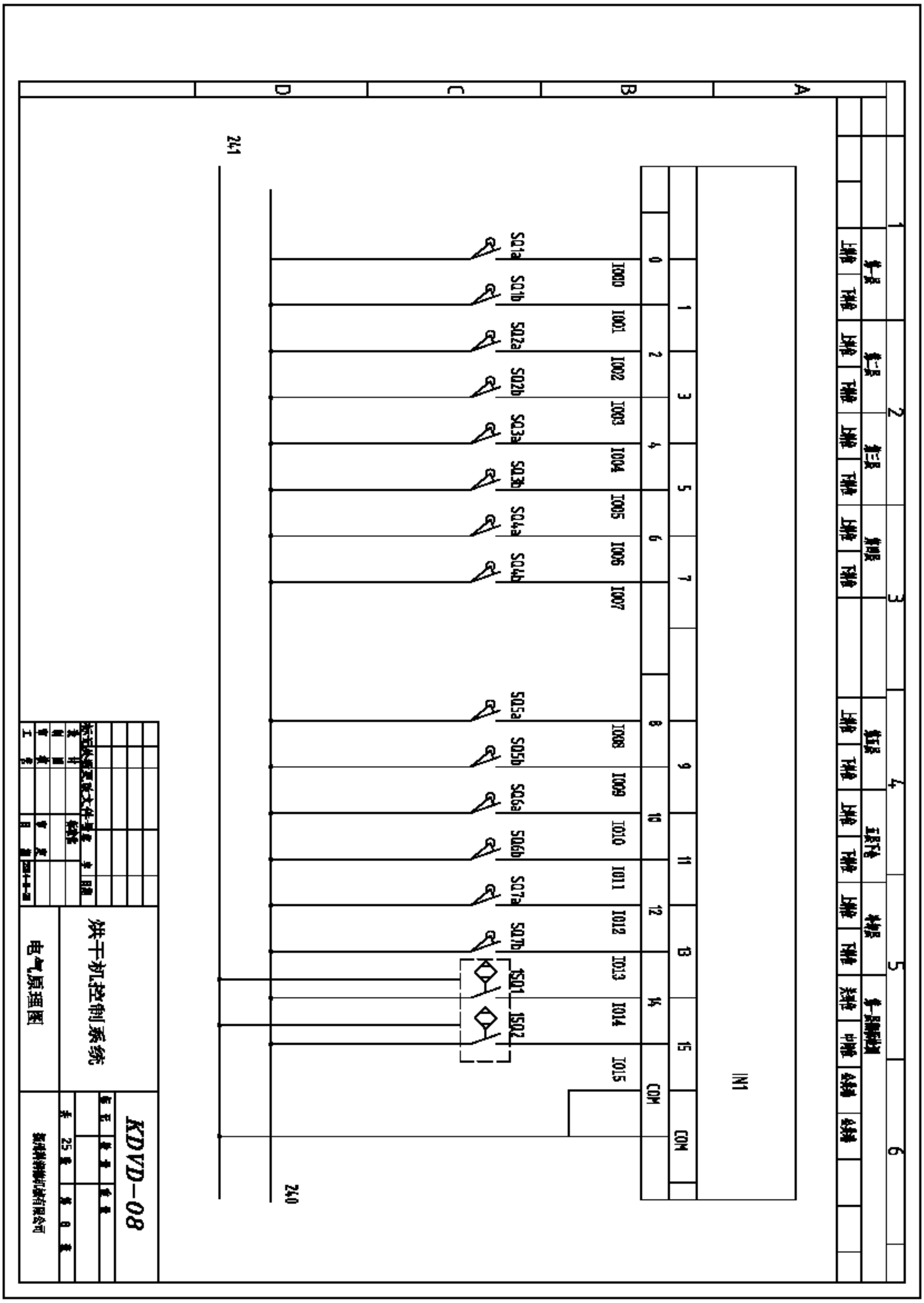

KDVD-08
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COM
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I001
I002
I003
I004
I005
I006
I007
I008
I009
I010
I011
I012
I013
I014
I015
SQ1a
SQ1b
SQ2a
SQ2b
SQ3a
SQ3b
SQ4a
SQ4b
SQ5a
SQ5b
SQ6a
SQ6b
SQ7a
SQ7b
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1SQ2
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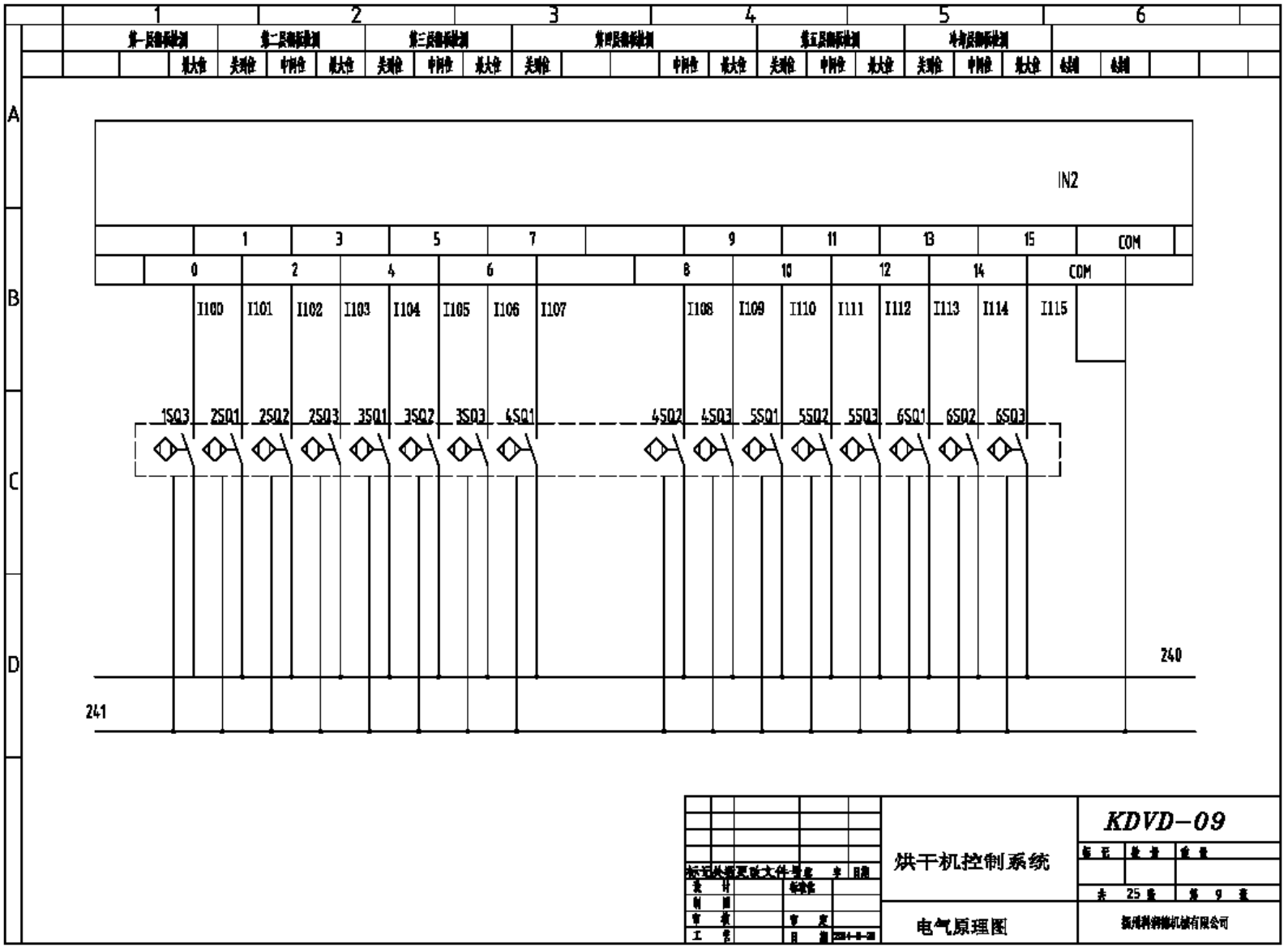
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第二层楼层检测
第三层楼层检测
第四层楼层检测
第五层楼层检测
所有层楼层检测
最大值
关到位
中间位
最大位
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I103
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KDVD-09
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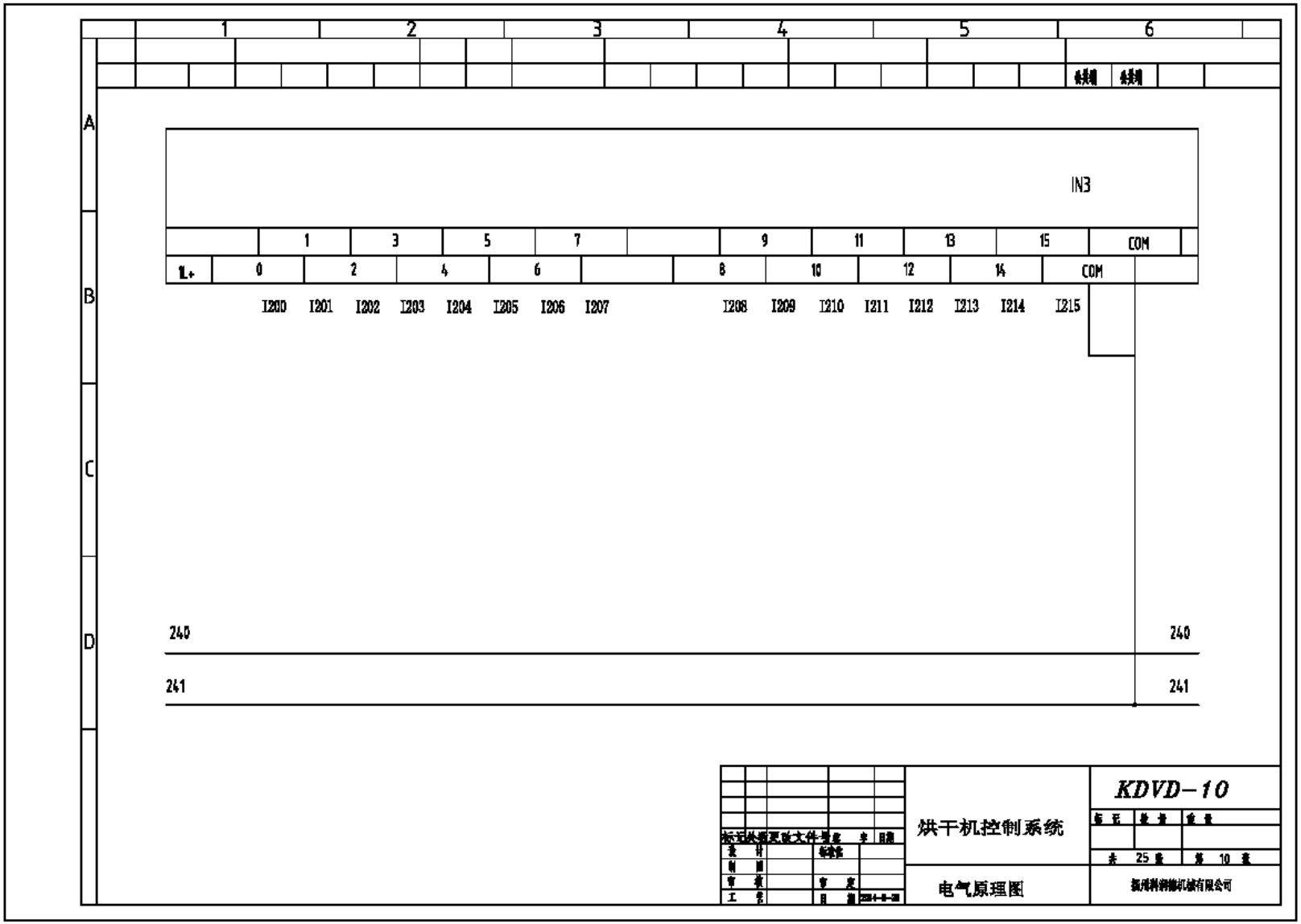
扬州利钢机械有限公司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COM
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I201
I202
I203
I204
I205
I206
I207
I208
I209
I210
I211
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I213
I214
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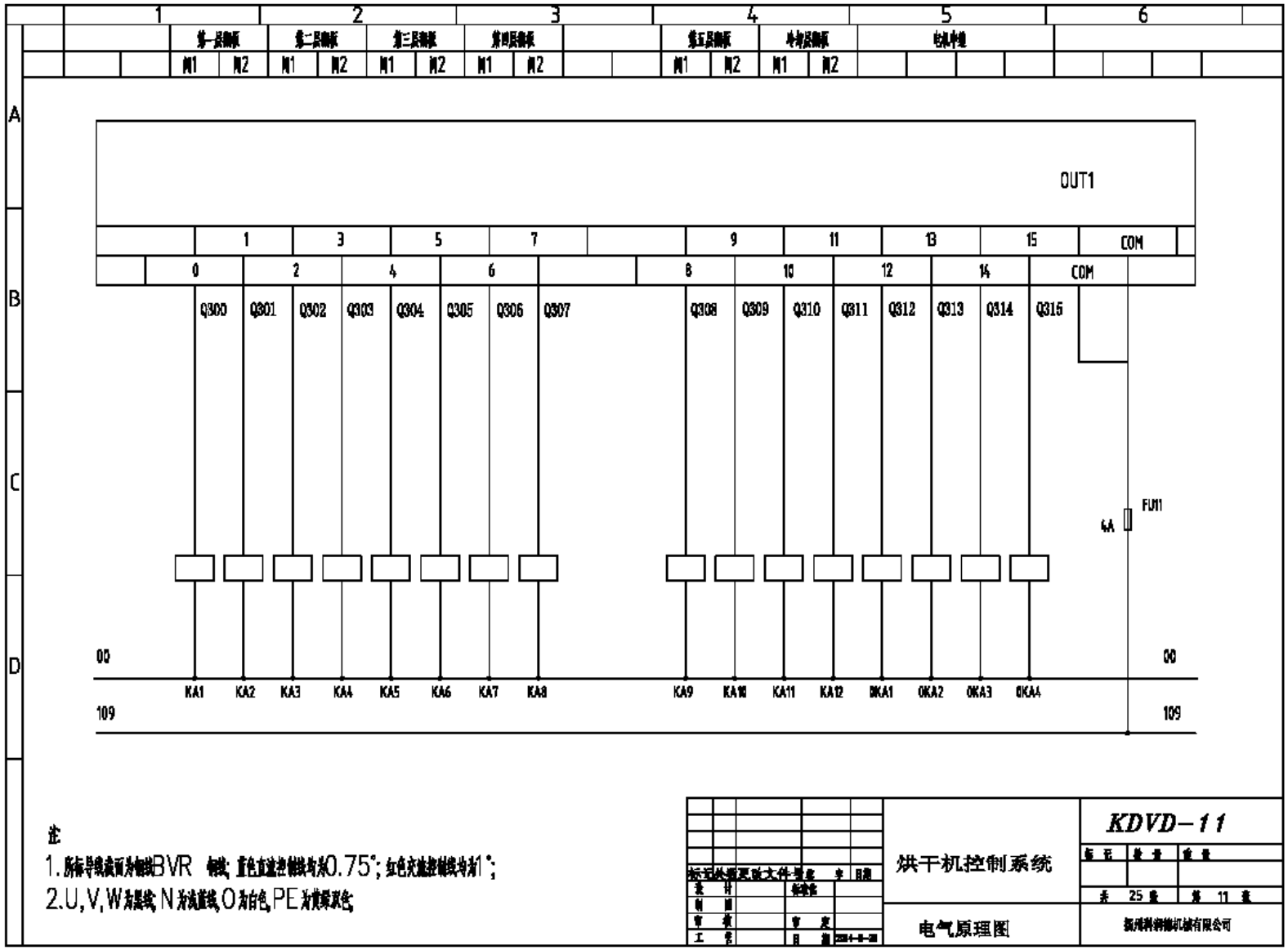
烘干机控制系统
KDVD-10
电气原理图
共 25 张
第 10 张



注

1.所有导线截面为铜线BVR 铜线；蓝色直流控制线均为0.75°；红色交流控制线均为1°；

2.U,V,W为黑线,N为浅蓝线,O为白色,PE为黄绿双色；

标记	处数	更改文件号	签名	年月日
设计		标准化		
制图				
审核		审定		
工艺		日期	2024-8-28	

烘干机控制系统

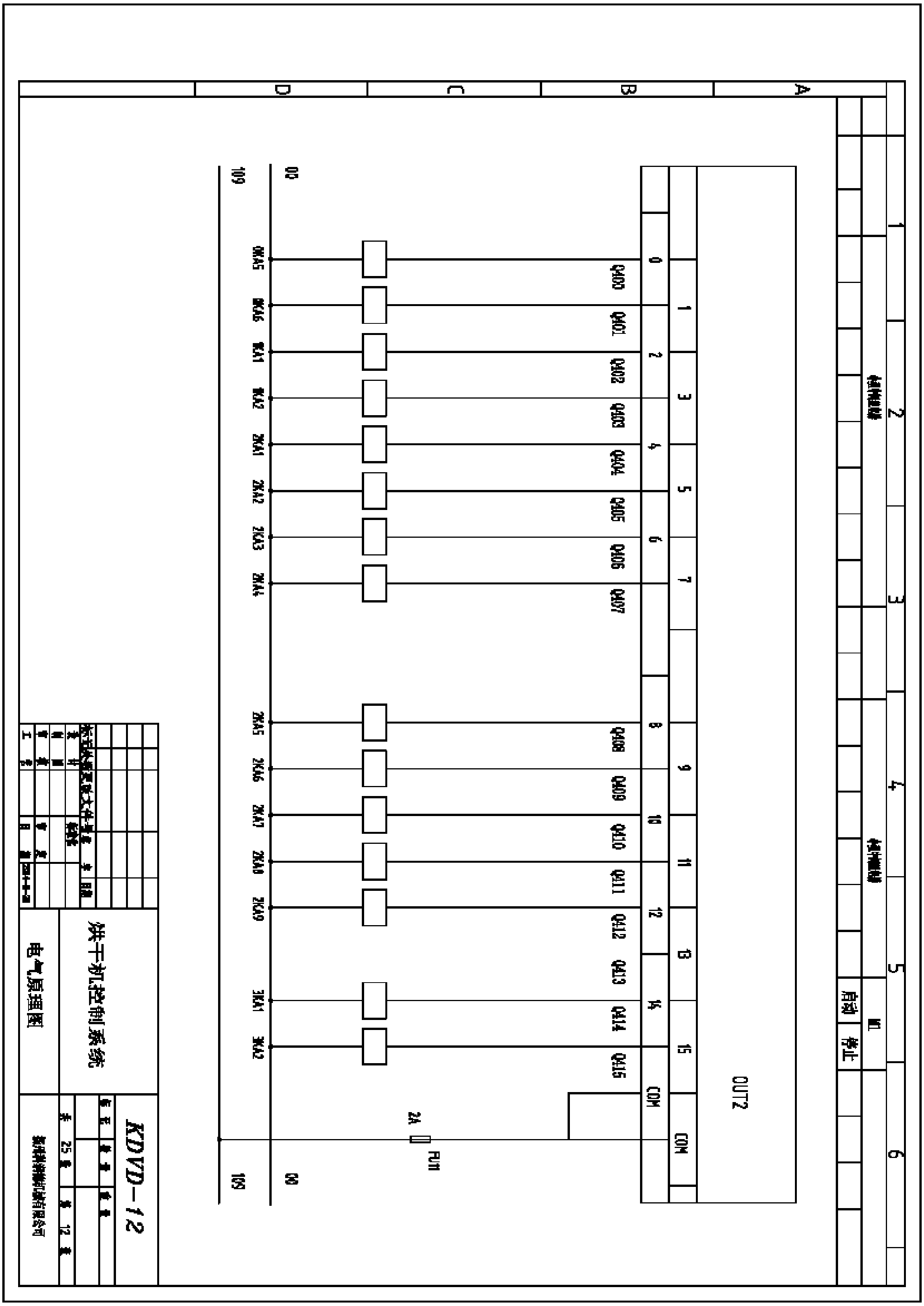
KDVD-11

标记	数量	重量

共 25 张 第 11 张

电气原理图

振博科科技机械有限公司


KDVD-12
烘干机控制系统
电气原理图
OUT2
COM
Q400
Q401
Q402
Q403
Q404
Q405
Q406
Q407
Q408
Q409
Q410
Q411
Q412
Q413
Q414
Q415
0KA5
0KA6
1KA1
1KA2
2KA1
2KA2
2KA3
2KA4
2KA5
2KA6
2KA7
2KA8
2KA9
3KA1
3KA2
FU11
2A
00
109
105
启动
停止
A
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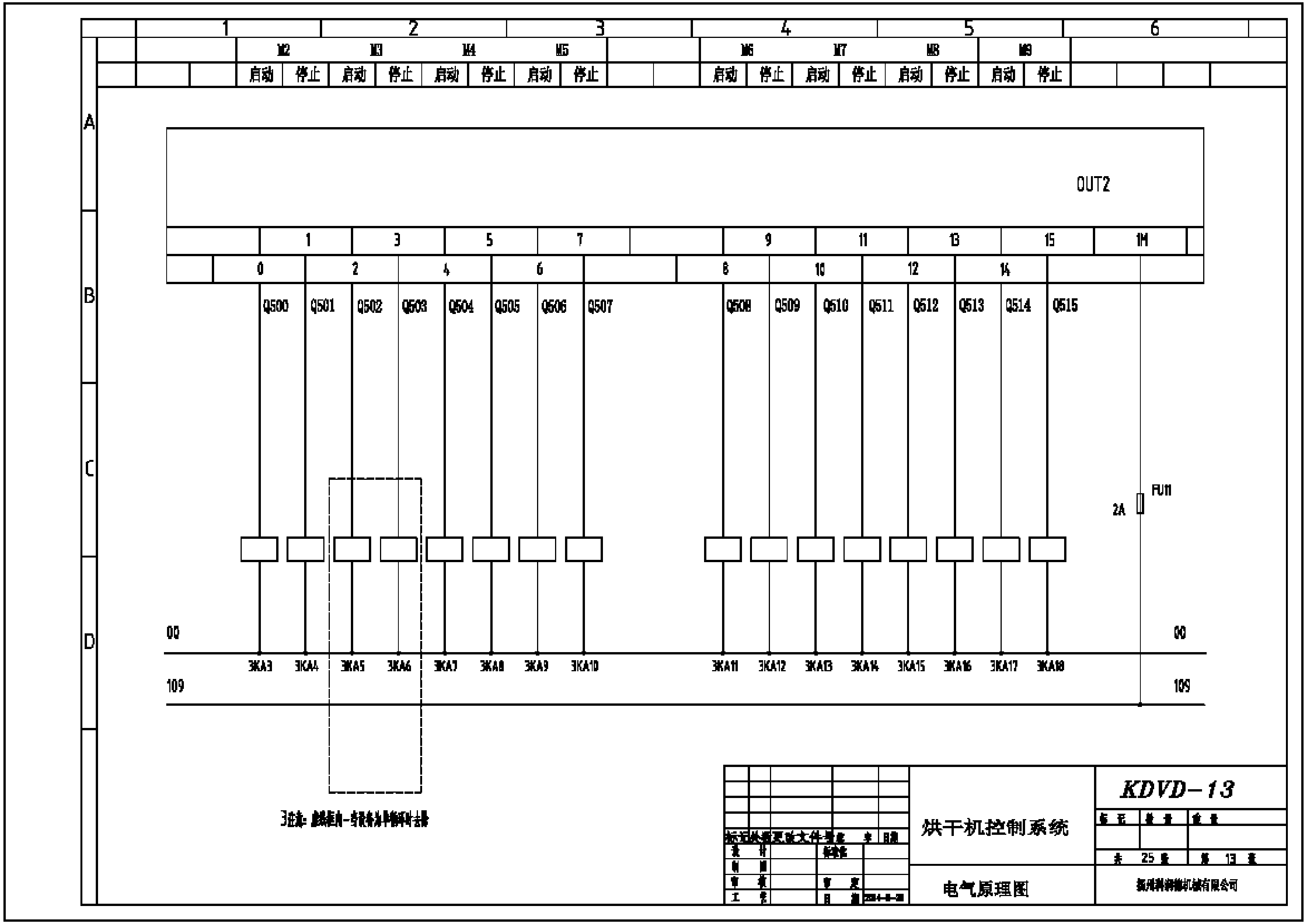
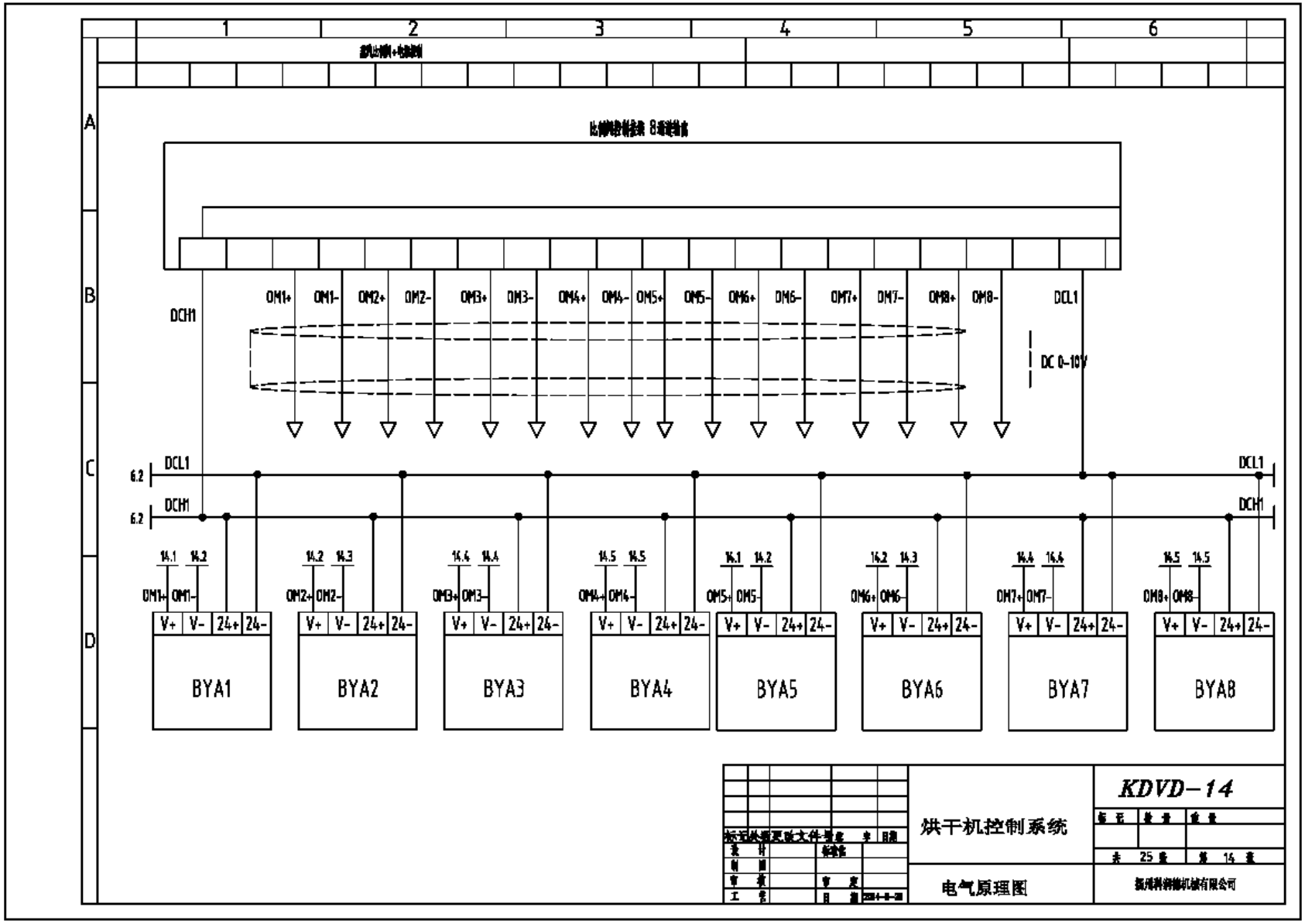
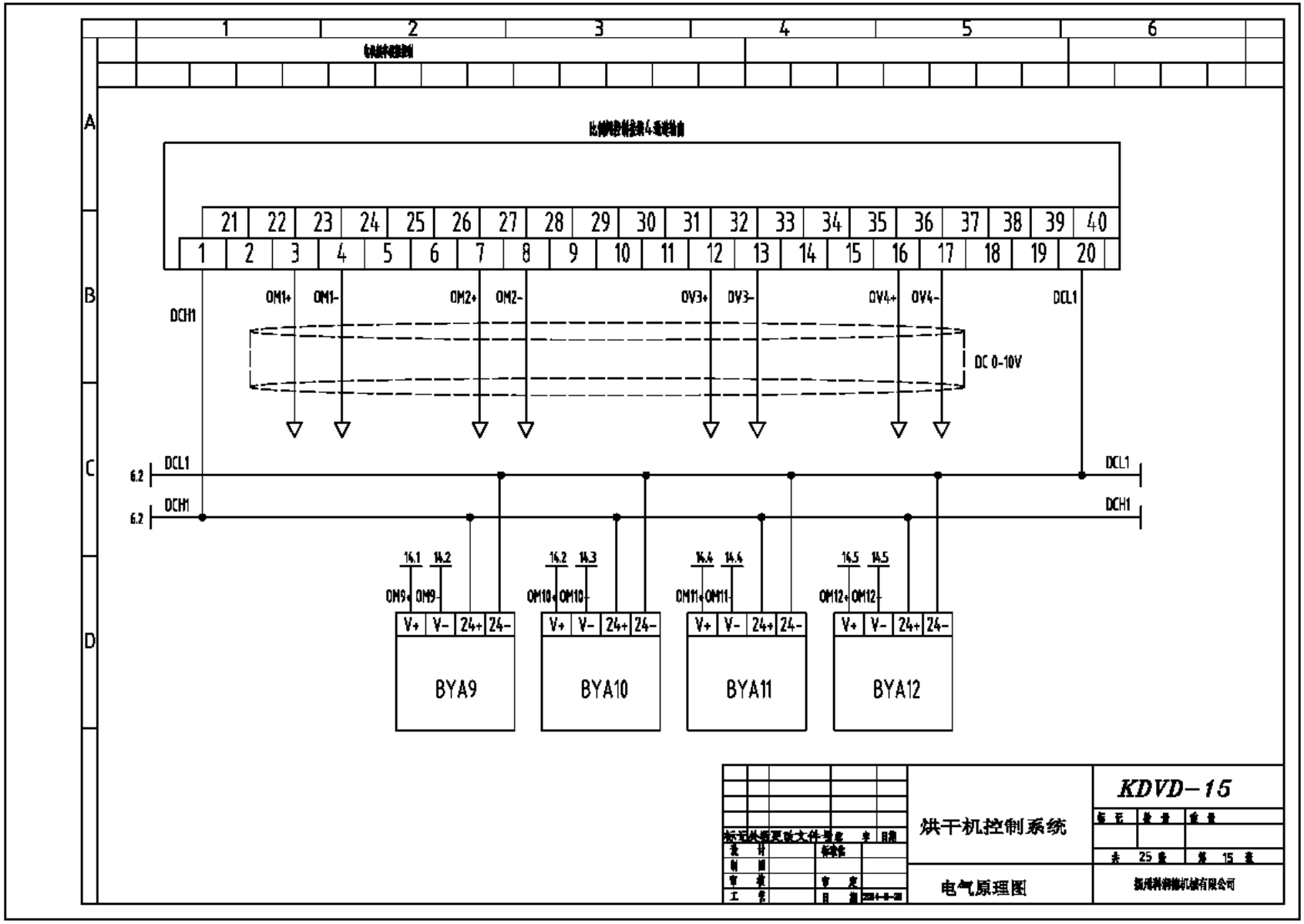


M2 M3 M4 M5 M6 M7 M8 M9
启动 停止 启动 停止 启动 停止 启动 停止 启动 停止 启动 停止 启动 停止 启动 停止
OUT2
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 1M
Q500 Q501 Q502 Q503 Q504 Q505 Q506 Q507 Q508 Q509 Q510 Q511 Q512 Q513 Q514 Q515
FU11
2A
00
109
3KA3 3KA4 3KA5 3KA6 3KA7 3KA8 3KA9 3KA10 3KA11 3KA12 3KA13 3KA14 3KA15 3KA16 3KA17 3KA18
烘干机控制系统
电气原理图
KDVD-13
共 25 张 第 13 张


DCH1
DM1+ DM1- DM2+ DM2- DM3+ DM3- DM4+ DM4- DM5+ DM5- DM6+ DM6- DM7+ DM7- DM8+ DM8-
DCL1
DC 0-10V
DCL1
6.2
DCH1
6.2
DCL1
DCH1
14.1 14.2 DM1+ DM1-
14.2 14.3 DM2+ DM2-
14.4 14.4 DM3+ DM3-
14.5 14.5 DM4+ DM4-
14.1 14.2 DM5+ DM5-
14.2 14.3 DM6+ DM6-
14.4 14.4 DM7+ DM7-
14.5 14.5 DM8+ DM8-
V+ V- 24+ 24-
BYA1
BYA2
BYA3
BYA4
BYA5
BYA6
BYA7
BYA8
烘干机控制系统
KDVD-14
电气原理图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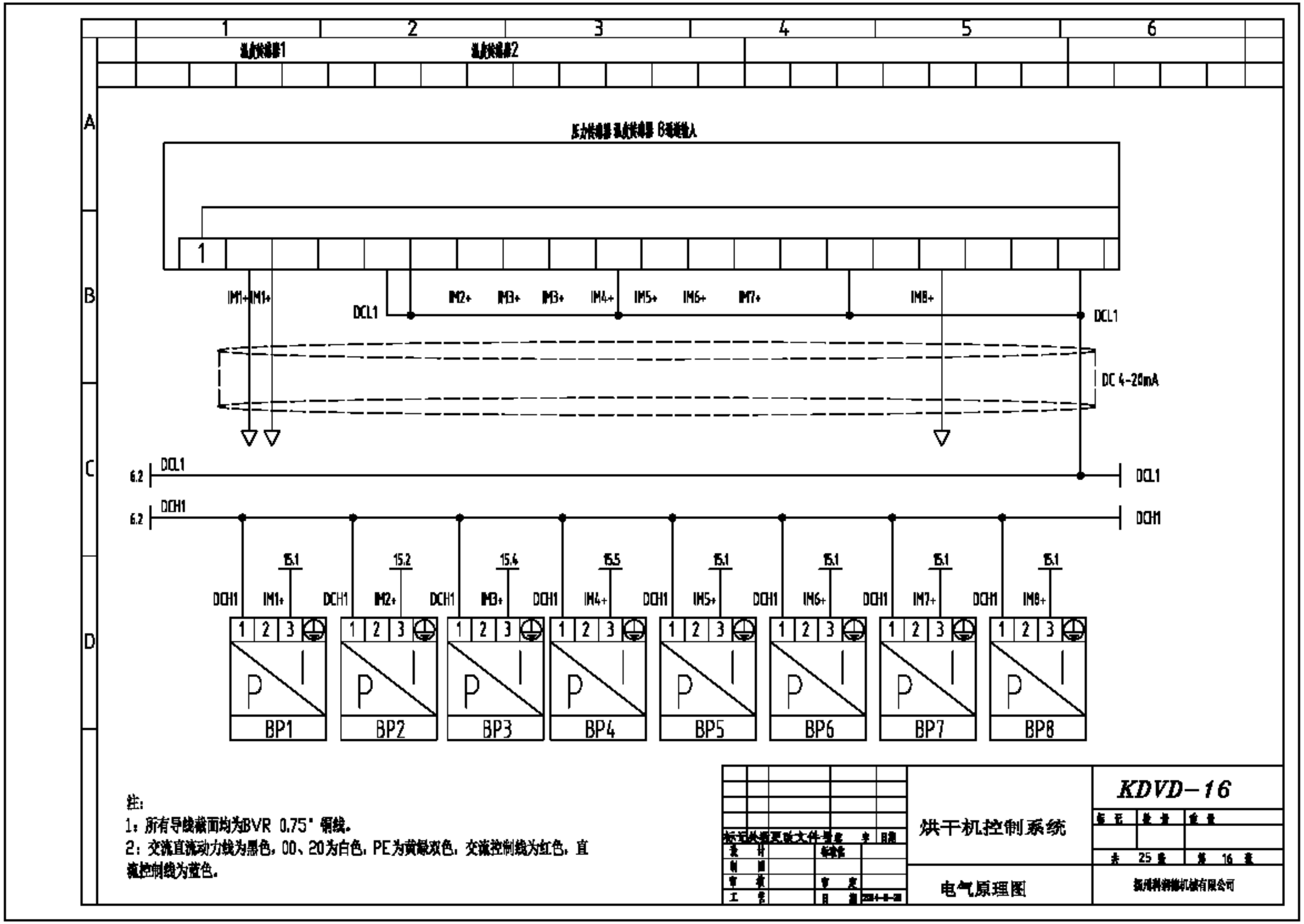
A B C D
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
DCH1
OM1+ OM1- OM2+ OM2- OV3+ OV3- OV4+ OV4- DCL1
DC 0-10V
DCL1
6.2
DCH1
6.2
DCL1
DCH1
14.1 14.2 14.3 14.4 14.5 14.6
OM9+ OM9- OM10+ OM10- OM11+ OM11- OM12+ OM12-
V+ V- Z4+ Z4-
BYA9
BYA10
BYA11
BYA12
烘干机控制系统
KDVD-15
电气原理图
共 25 张 第 15 张


温度传感器1
温度传感器2
压力传感器 温度传感器 8通道输入
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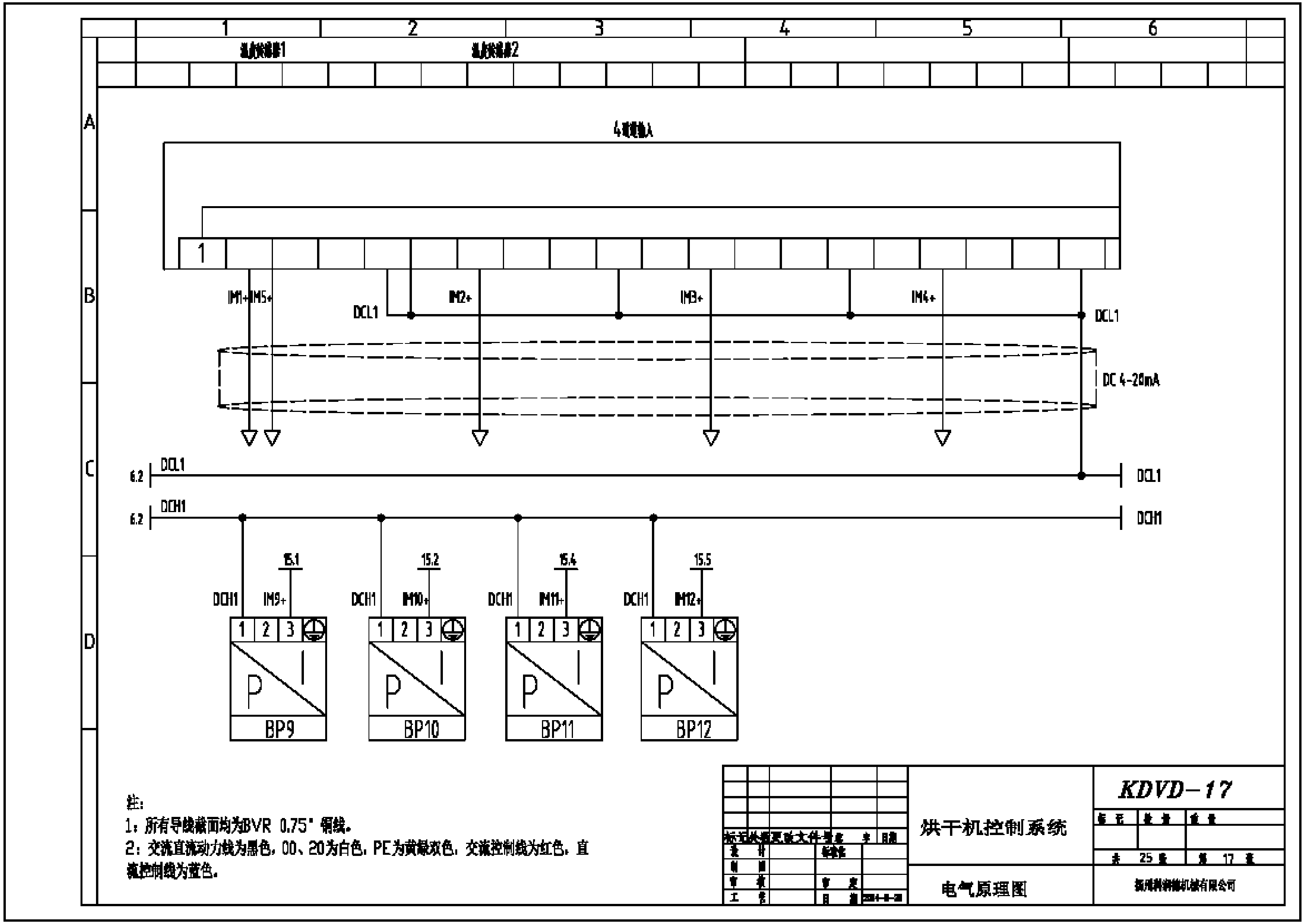
IM2+
IM3+
IM4+
IM5+
IM6+
IM7+
IM8+
DCL1
DC 4-20mA
DCH1
BP1
BP2
BP3
BP4
BP5
BP6
BP7
BP8
注:
1：所有导线截面均为BVR 0.75" 铜线。
2：交流直流动力线为黑色，00、20为白色，PE为黄绿双色，交流控制线为红色，直流控制线为蓝色。
烘干机控制系统
电气原理图
KDVD-16
共 25 张
第 16 张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A
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C
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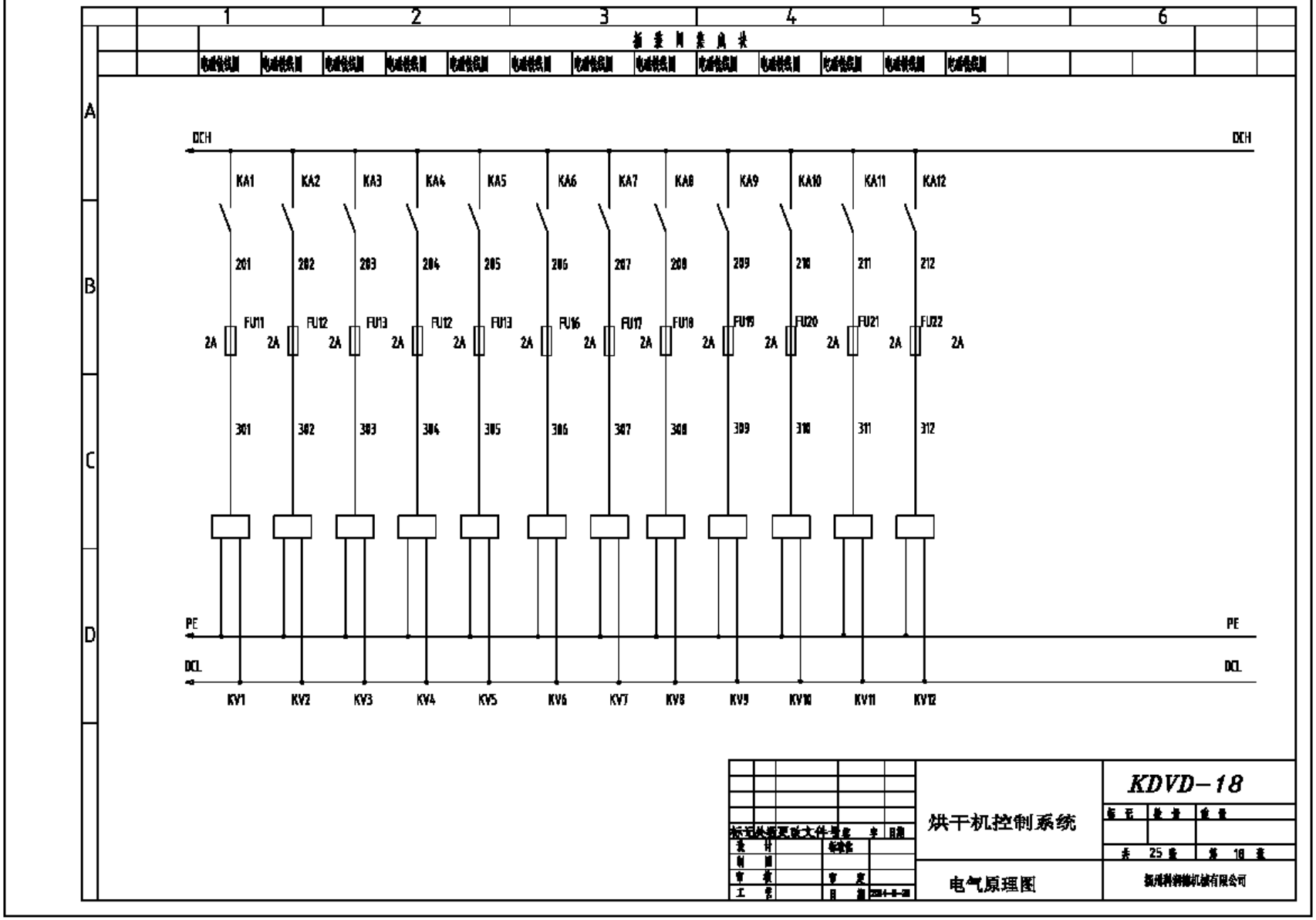
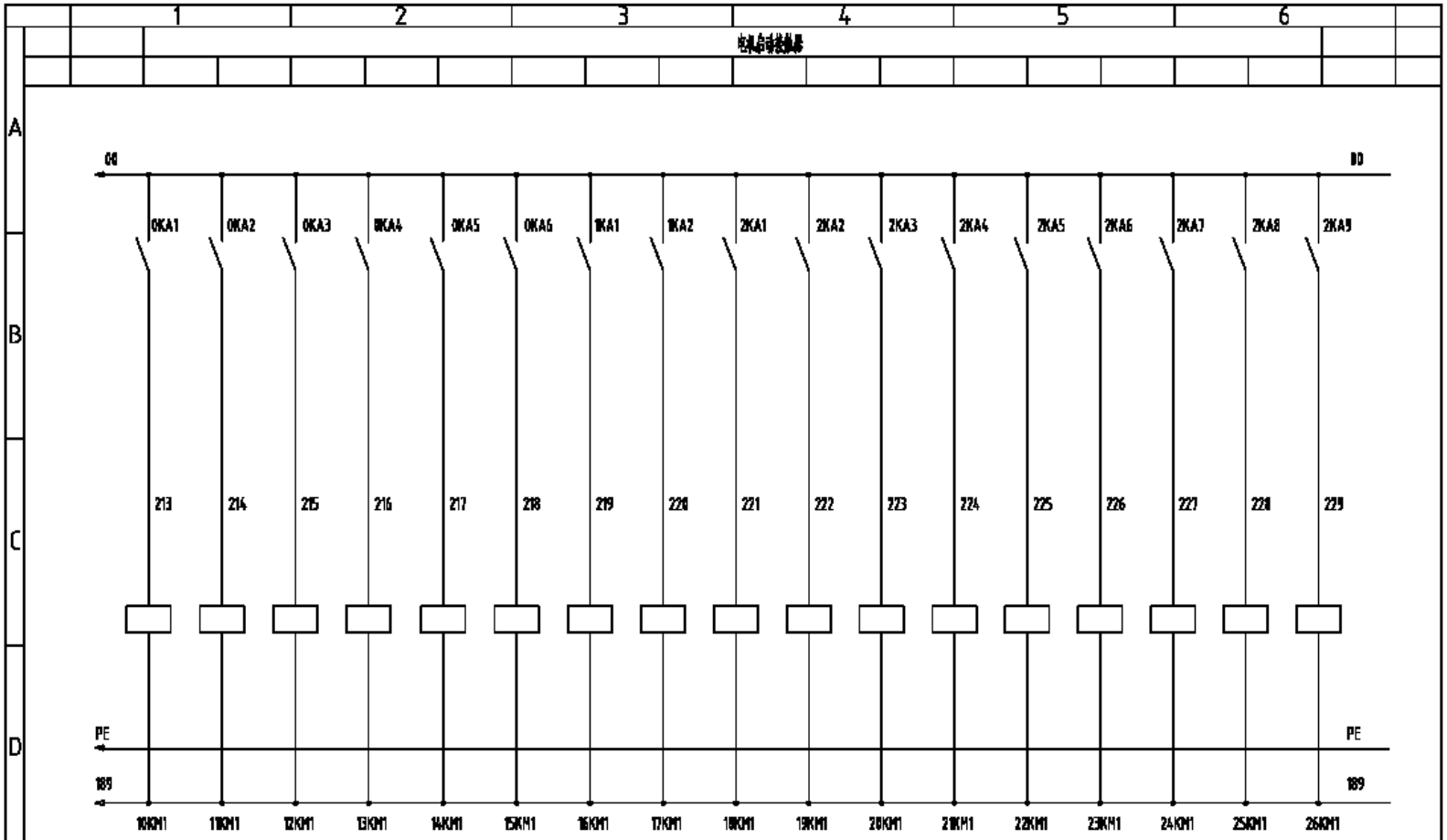
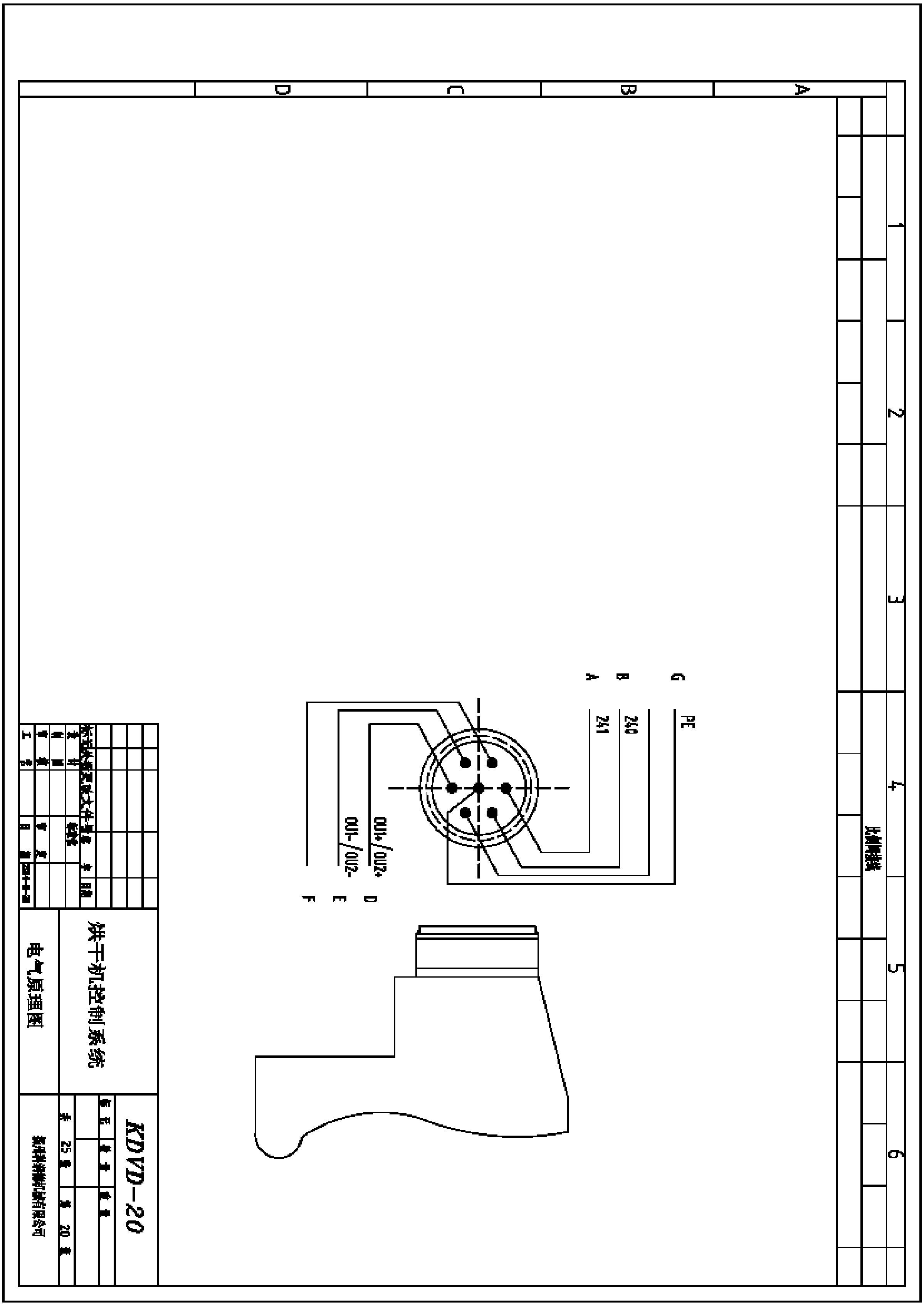
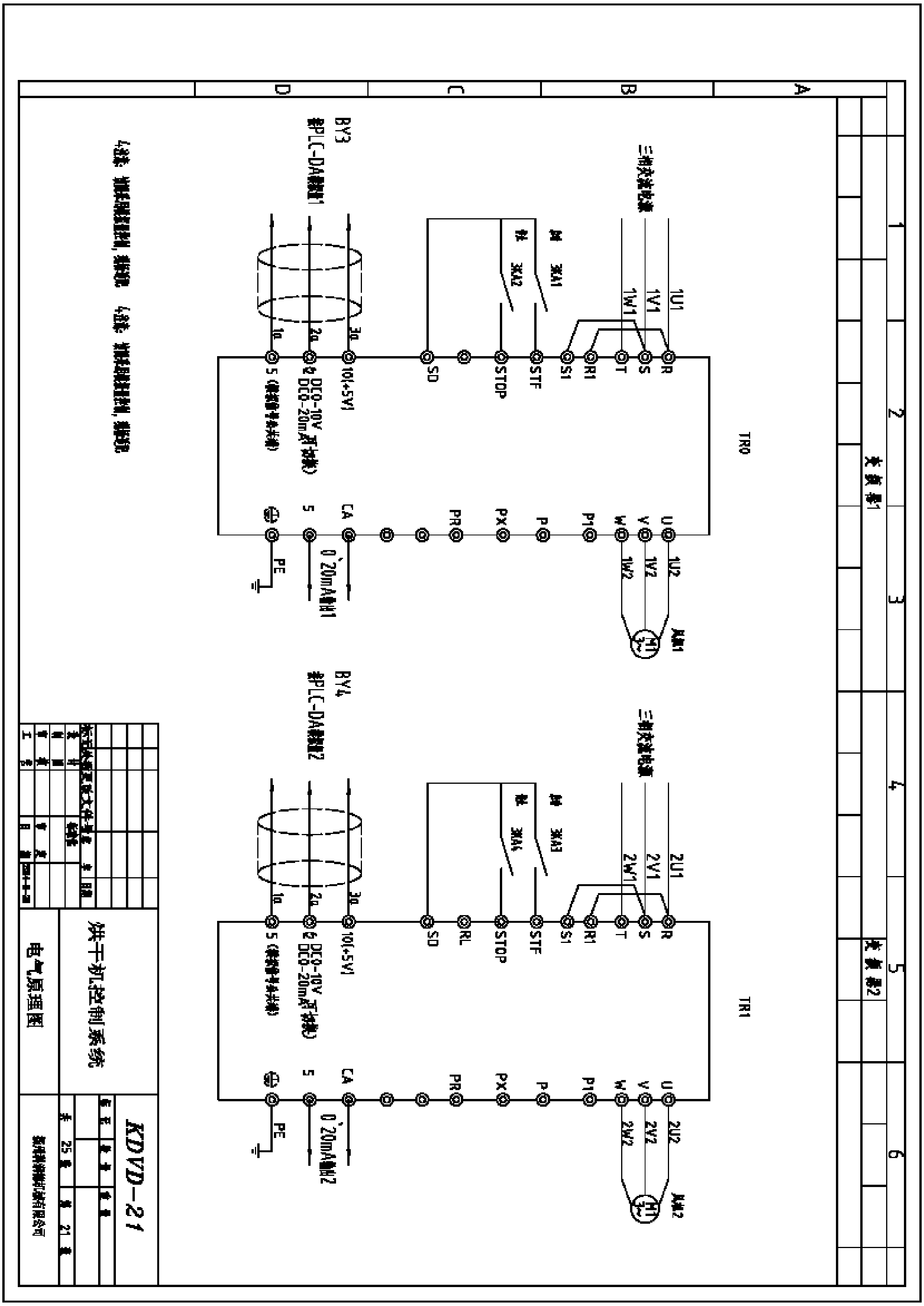
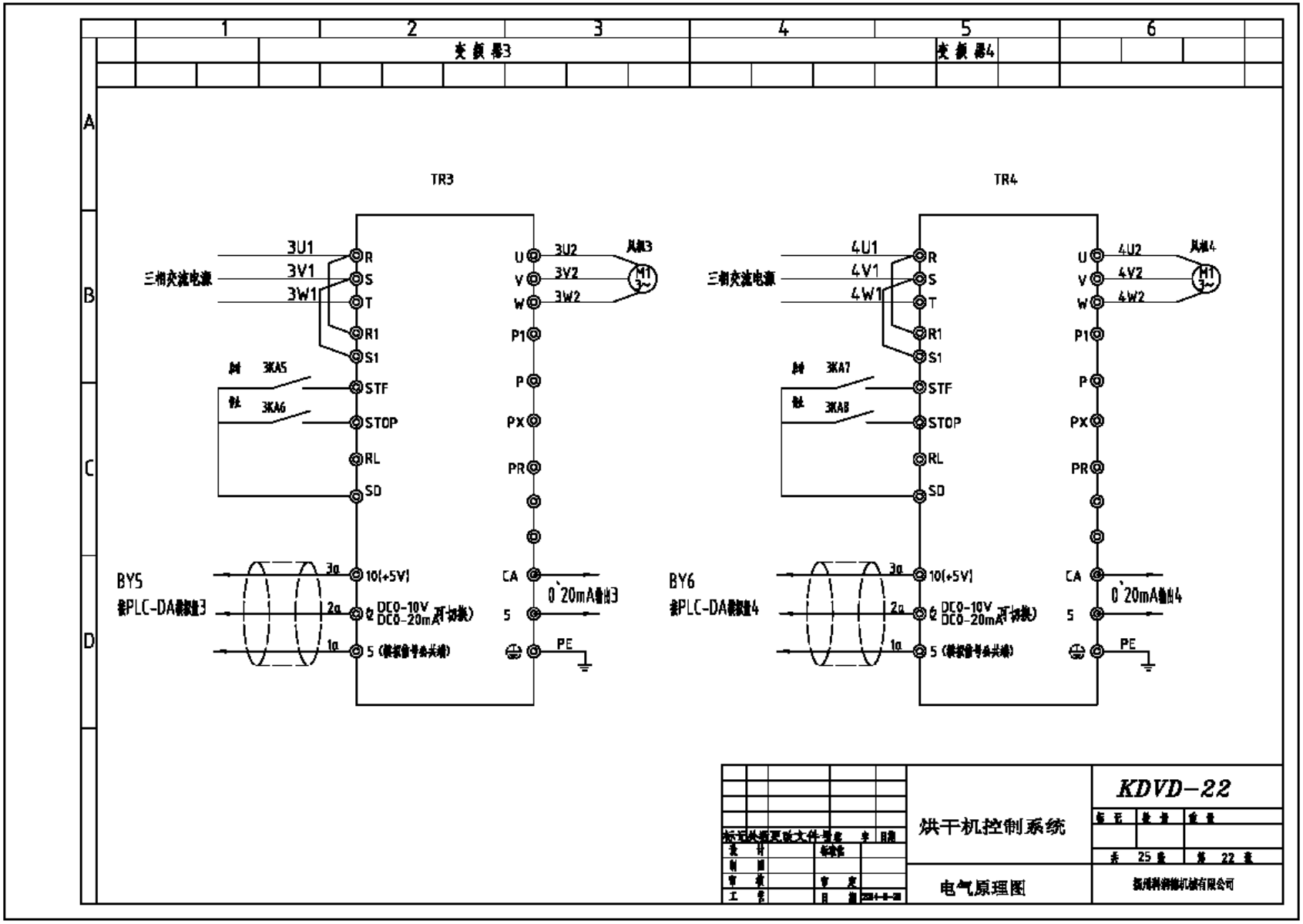
IM1+
IM5+
DCL1
IM2+
IM3+
IM4+
DC 4-20mA
6.2
DCL1
DCH1
15.1
15.2
15.4
15.5
IM9+
IM10+
IM11+
IM12+
BP9
BP10
BP11
BP12
注:
1：所有导线截面均为BVR 0.75" 铜线。
2：交流直流动力线为黑色，00、20为白色，PE为黄绿双色，交流控制线为红色，直流控制线为蓝色。
烘干机控制系统
电气原理图
KDVD-17
共 25 张
第 17 张

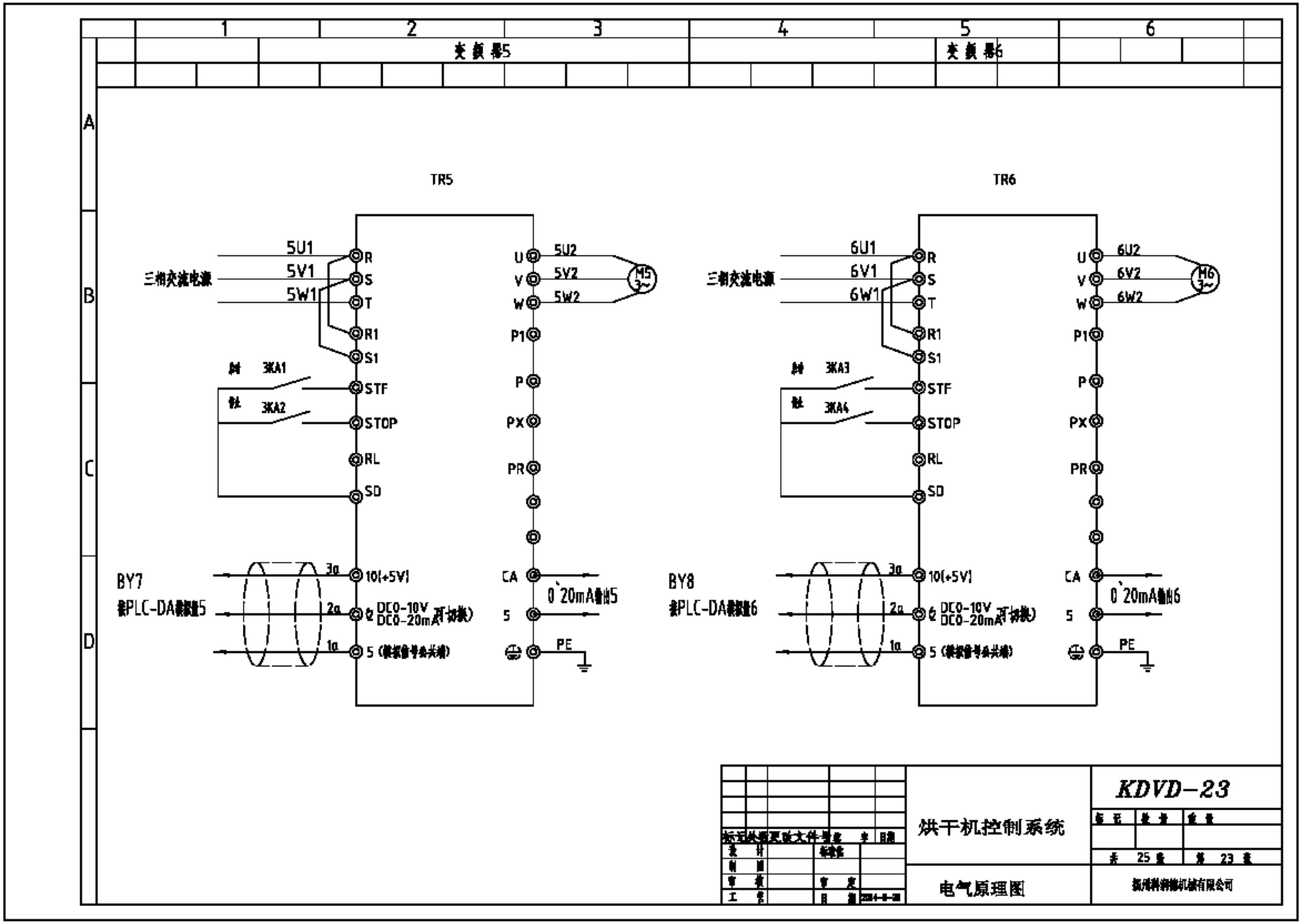

1
2
3
4
5
6
A
B
C
D
DCH
DCH
KA1
KA2
KA3
KA4
KA5
KA6
KA7
KA8
KA9
KA10
KA11
KA12
201
202
203
204
205
206
207
208
209
210
211
212
FU11
FU12
FU13
FU14
FU15
FU16
FU17
FU18
FU19
FU20
FU21
FU22
2A
301
302
303
304
305
306
307
308
309
310
311
312
PE
PE
DCL
DCL
KV1
KV2
KV3
KV4
KV5
KV6
KV7
KV8
KV9
KV10
KV11
KV12
烘干机控制系统
KDVD-18
电气原理图
共 25 张
第 18 张

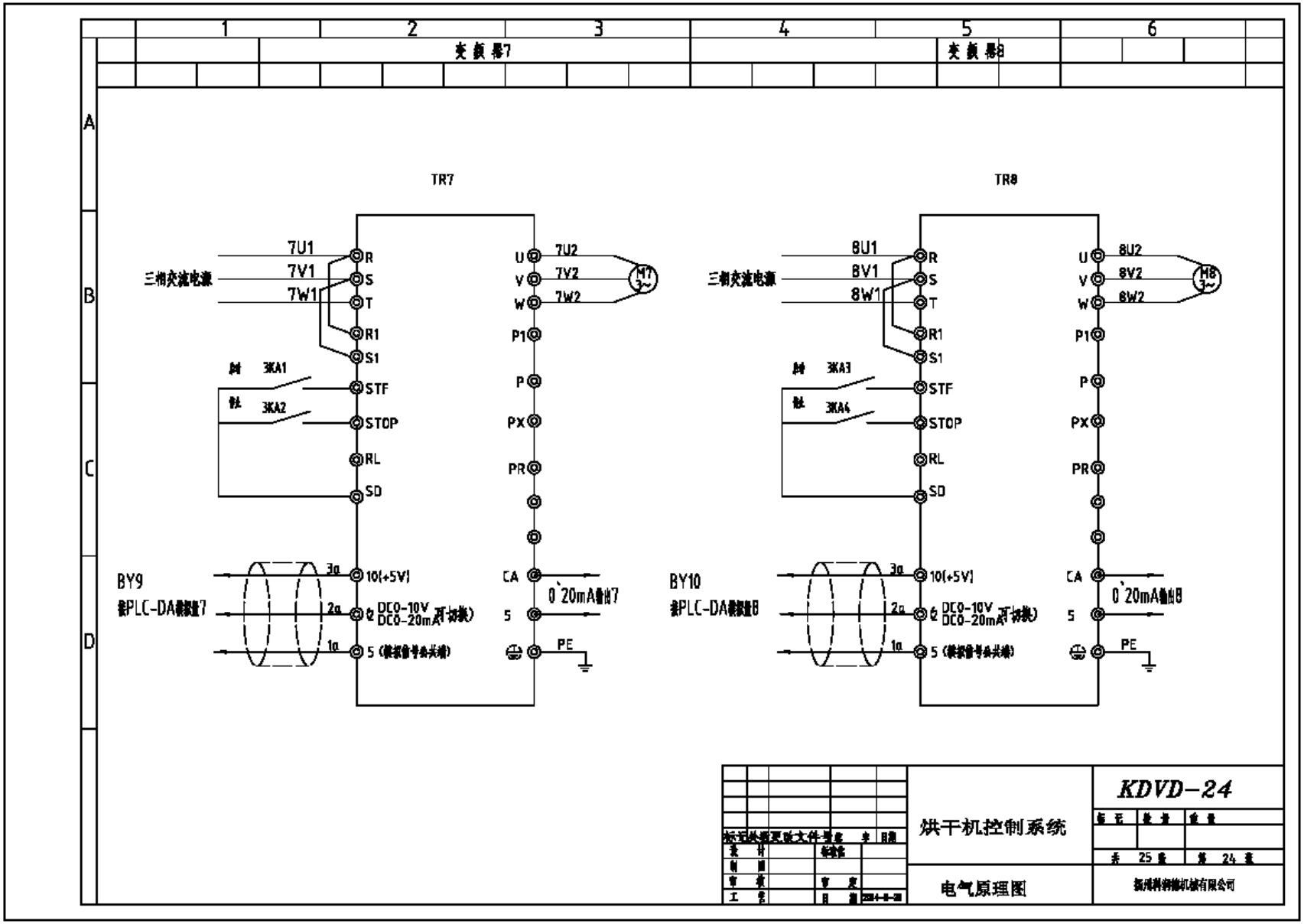

1
2
3
4
5
6
A
B
C
D
00
DD
0KA1
0KA2
0KA3
0KA4
0KA5
0KA6
1KA1
1KA2
2KA1
2KA2
2KA3
2KA4
2KA5
2KA6
2KA7
2KA8
2KA9
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
PE
PE
189
189
10KM1
11KM1
12KM1
13KM1
14KM1
15KM1
16KM1
17KM1
18KM1
19KM1
20KM1
21KM1
22KM1
23KM1
24KM1
25KM1
26KM1
烘干机控制系统
KDVD-19
电气原理图
共 25 张
第 19 张

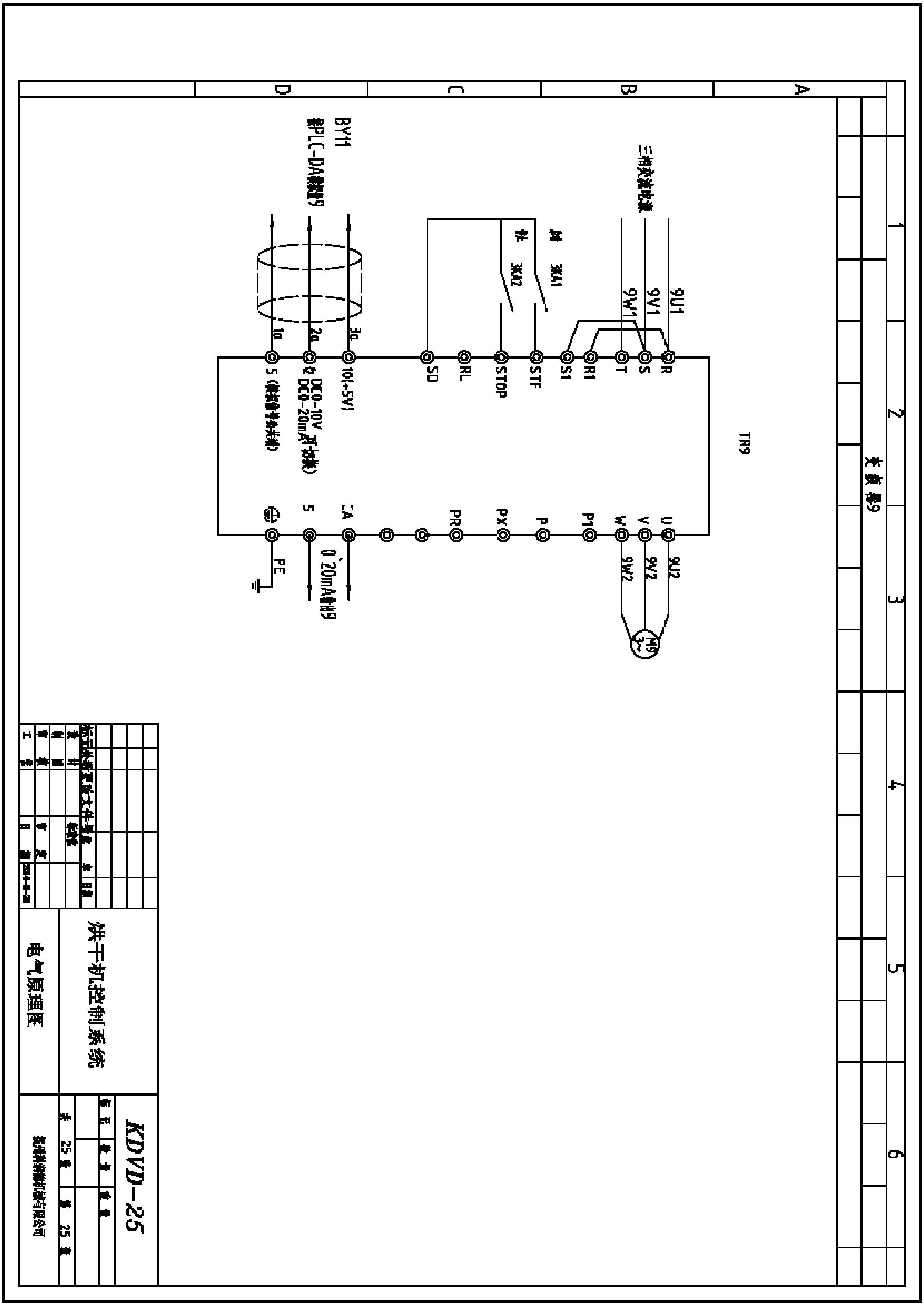

A
B
C
D
1
2
3
4
5
6
G
B
A
PE
240
241
OU1+/OU2+
OU1-/OU2-
D
E
F
烘干机控制系统
电气原理图
KDVD-20


KDVD-21
烘干机控制系统
电气原理图
TR0
TR1
R
S
T
R1
S1
STF
STOP
SD
RL
10(+5V)
DC0-10V
DC0-20mA
U
V
W
P1
P
PX
PR
CA
PE
0`20mA
1U1
1V1
1W1
1U2
1V2
1W2
2U1
2V1
2W1
2U2
2V2
2W2
3KA1
3KA2
3KA3
3KA4
BY3
BY4
1a
2a
3a
A
B
C
D
1
2
3
4
5
6


1
2
3
4
5
6
A
B
C
D
交换器3
交换器4
TR3
TR4
3U1
3V1
3W1
三相交流电源
R
S
T
R1
S1
3KA5
3KA6
STF
STOP
RL
SD
BY5
接PLC-DA模块3
3α
2α
1α
10(+5V)
DC0-10V
DC0-20mA
5
U
V
W
P1
P
PX
PR
3U2
3V2
3W2
风机3
M
3~
CA
0`20mA输出3
PE
4U1
4V1
4W1
4U2
4V2
4W2
风机4
3KA7
3KA8
BY6
接PLC-DA模块4
0`20mA输出4
烘干机控制系统
KDVD-22
电气原理图
扬州科润机械有限公司


1
2
3
夹 板 器5
4
5
夹 板 器6
6
A
B
C
D
TR5
TR6
三相交流电源
5U1
5V1
5W1
R
S
T
R1
S1
STF
STOP
RL
SD
3KA1
3KA2
U
V
W
P1
P
PX
PR
5U2
5V2
5W2
M5
3~
BY7
接PLC-DA模块5
3α
2α
1α
10(+5V)
DCO-10V
DCO-20mA
(可切换)
5 (模拟信号地共端)
CA
5
PE
0`20mA输出5
6U1
6V1
6W1
3KA3
3KA4
6U2
6V2
6W2
M6
3~
BY8
接PLC-DA模块6
0`20mA输出6
烘干机控制系统
KDVD-23
电气原理图
共 25 张
第 23 张


1
2
3
4
5
6
变频器7
变频器8
A
B
C
D
TR7
TR8
三相交流电源
7U1
7V1
7W1
R
S
T
R1
S1
STF
STOP
RL
SD
闭 3KA1
触 3KA2
U
V
W
P1
P
PX
PR
7U2
7V2
7W2
M7
3~
BY9
套PLC-DA模拟量7
3a
2a
1a
10(+5V)
DCO-10V
DCO-20mA(可切换)
5 (模拟信号公共端)
CA
5
PE
0`20mA输出7
三相交流电源
8U1
8V1
8W1
闭 3KA3
触 3KA4
8U2
8V2
8W2
M8
3~
BY10
套PLC-DA模拟量8
0`20mA输出8
标记 处数 更改文件号 签名 年月日
设计
制图
审核
工艺
标准化
审定
日期 2014-8-28
烘干机控制系统
KDVD-24
电气原理图
共 25 张
第 24 张



变频器9
TR9
三相交流电源
9U1
9V1
9W1
R
S
T
R1
S1
3KA1
3KA2
STF
STOP
RL
SD
BY11
10(+5V)
DC0-10V
DC0-20mA
3a
2a
1a
U
V
W
9U2
9V2
9W2
M9
P1
P
PX
PR
CA
5
PE
0`20mA
烘干机控制系统
电气原理图
KDVD-25
25
25

4.6 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 3-4**).

(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 angle of plate to control the discharge flow rate as per the output required. Be sure the discharge speed is larger than the feeding speed in order to avoid blockage.

(3) Adjustment of drying time

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

5 Use and operation

ⓘ ***The dryer 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 dryer, 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.

③Attention should be paid to the inlet and outlet of the dryer during production to prevent the overload of the dryer caused by material blocking and damage to the equipment, and to ensure that the motor works under rated load.

④Non-maintenance personnel or non-operating personnel are strictly prohibited to open the access door when the equipment is in motion.

⑤It 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

⑧In 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.

②Do 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

④ Burn injury: Do not touch the machine with bare hands when the machine is running.

5.3 Check and preparation prior to commissioning

① Check all parts of the dryer 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 steam system for correction installation;

⑥ Check steam pipelines to ensure whether they are clean out or not and check whether valves are normal or not. Adopt 1Mpa steam to check whether there is any power supply handle

⑦ Start up the circu touch screen to check whether there is any air leakage or whistle sound in drying chambers.

⑧ After the above examination and solve the corresponding problem, it can prepare for the first time to run the dryer.

5.4 Operation regulation of commissioning with load

① Start up the preheating process.

② Start up the circulation fan system. The dehumidification fan and the circulation fan shall under

the low frequency operation (15-30Hz) during the preheating process.

③ Start up the steam system to preheat the dryer. Feed material once the temperature inside all drying bins reaches 100-110℃.

④ Start up the feeding airlock and open the distribution device of the first deck at the same time. The dehumidification fan and the circulation fan shall under the low frequency operation, no material splashing or floating in the first deck.

⑤ Once the material reaches the high indicating level, the tipping plate will rotate and meanwhile start up the distribution device of the second deck. When the material under the low indicating level, it will stop discharging material.

⑥ Take samples from the cooler after the drying section to test moisture content. Reset the parameters of the dehumidification fan, the circulation fan, the steam system, the opening of tipping plates and the thickness of material layer and so on until the moisture content up to requirement.

⑦ Make records on feeding amount, material diameter, formula, moisture content of feeding materials, fans frequency, steam flow amount, steam pressure, material layer thickness, tipping plate opening, moisture content of discharging material and so on during the whole commissioning process.

⑧ After producing the qualified materials, optimize the relevant parameters of the dryer to achieve the most energy saving state. Save this parameter to the drying process, and can be used directly when producing the material in the future.

⑨When stop feeding materials, the dryer will enter the procedure section of drying tailings.

⑩ When the dryer is in the procedure section of drying tailings, the frequency of the topping plate movement is the same as it in normal production. Stop the dryer when it is emptied and then stop the steam system, the dehumidification fan and the circulation fan in order.

6 Malfunction and troubleshooting

See Table6-1 for Malfunction and troubleshooting of the dryer

Table6-1 Malfunction and troubleshooting

Trouble	Cause	Solution
1. High moisture content after drying	1.Material feeding amount is too large, exceeding the dealing capacity of the dryer	1. Re-select the model or inquire relative expert for advice according to the actual condition.
	2. Non-uniform distribution of materials result in short circuit of airflow.	2. Adjust the distribution device
	3. Great fluctuation of steam pressure or low efficiency of heat exchanging.	3. Keep the steam pressure and clean the heat exchanger
	4. Insufficient air amount	4. Adjust the parameter of the dehumidification fan and the circulation fan
2. Non-uniform drying	1. Non-uniform distribution of materials result in short circuit of airflow.	1. Adjust the distribution device
	2. When drying small pellet, the opening of air door is too big resulting in a high air speed.	2. Reset the air amount parameter
	3. Moisture of feeding material is not uniform.	3. Adjust the parameter of feeding equipment
3. Material deformation after drying	1. Material level is too high at the first deck	1. Lower the height of level indicator properly.
	2. The teeth of the spreader inserts too deep in the material.	2. Keep the teeth submerged properly under materials
	3. The angle of the plate of the first deck is too small while closing so that it clamps materials	3. Enlarge the angle of the plate of the first deck

7 Repair and maintenance

7.1 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.

7.2 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	Steam	Check whether the pressure is higher than 0.6MPa before passing through pressure reducing valve	Everyday	Observation	Increase steam pressure
		Check for any leakage in the pipeline	Everyday	Observation	Repair of steam exhaust
		Check for normal operation of drain valve operates	Everyday	Observation	Repair of steam exhaust
2	Machine	Check for any abnormal noise	Everyday	Hearing	Inspection
3	Bearing	Check for temperature rise lower than 45℃	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 rise lower than 45℃	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	Hydraulic station	Hydraulic oil amount	Everyday	Observation	Refillinf
7	Safety switch	Check for normality	Everyday	Observation	Replace
8	Angle sensor	Check for normality	Everyday	Observation	Replace
9	Temp. sensor	Check for normality	Everyday	Observation	Replace
10	Damped level indicator	Check for normality	Everyday	Observation	Replace
11	Pneumatic Angle Seat Valve	Check for normality	Everyday	Observation	Replace
12	Pneumatic control valve	Check for sensitivity	Everyday	Observation	Replace

(2) List of regular inspection

No.	Position	Inspected items	Cycle	Method	Solution
1	Steam filter	Cleaning	Every three months	Observation	Cleaning
2	Bearing	Lubrication	Every three months	Observation	Refilling
3	Access door	Sealing	Every month	Observation	Inspection
4	Heat exchanger screen	Cleaning	Every week	Observation	Cleaning
5	Ventilation circuit	Cleaning	Every month	Observation	Cleaning

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

7.3 Equipment cleaning

①Clean the residual materials and dust from the dryer after stoppage of each shift;

②In time clean dust and materials discharged by cyclone separator during and after stoppage of each shift;

③Clean the surrounding of the dryer after stoppage of each shift;

④Regularly clean pulley of circulating fan to avoid greater vibration at high speed rotation arising from excessive soot deposit.

⑤One overhaul shall be carried out after working for 1000 hours.

⑥If 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.

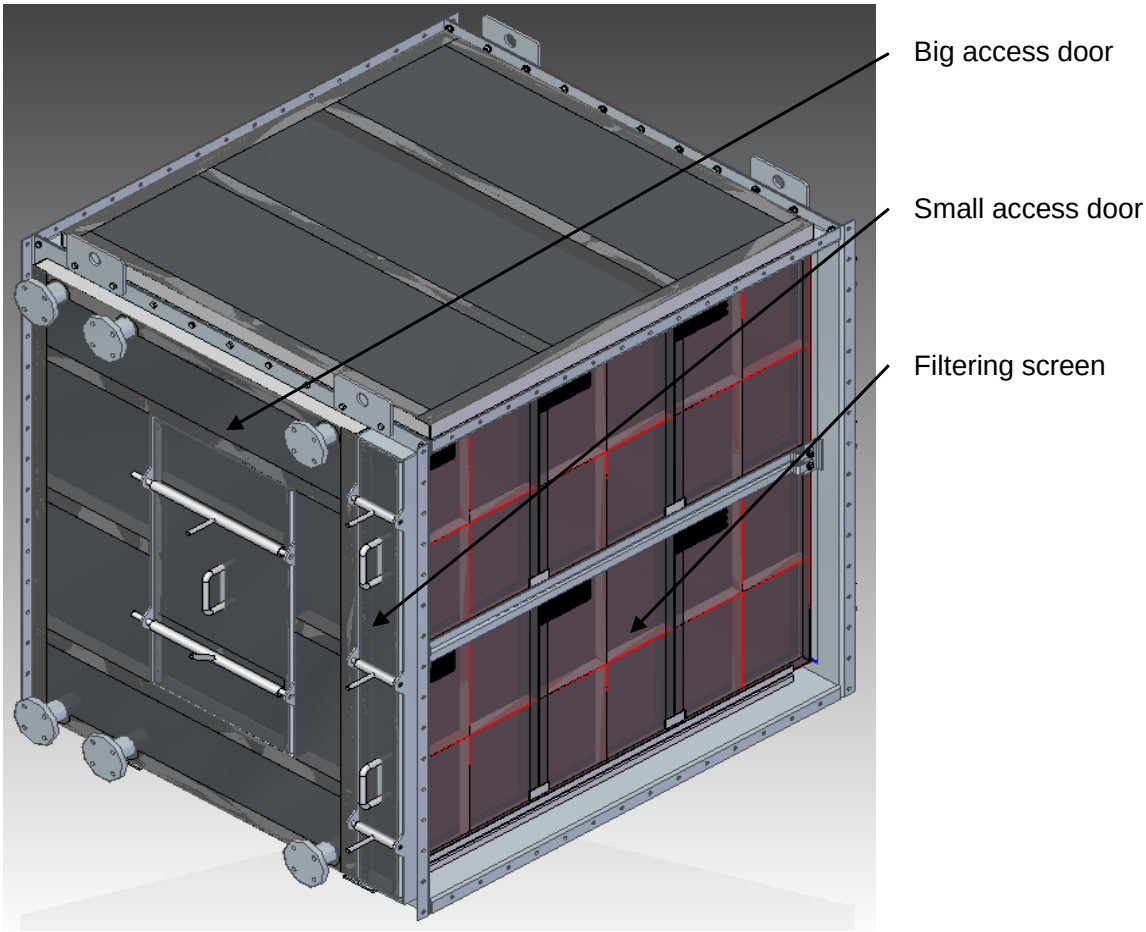
7.4 Equipment lubrication

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.

7.5 Maintenance of Heat exchanger

ⓘ Clean the deposited dust inside the heat exchanger and the ventilation circuit regularly so as to prevent the dryer against fire risk.

(1) Maintenance of Heat exchanger



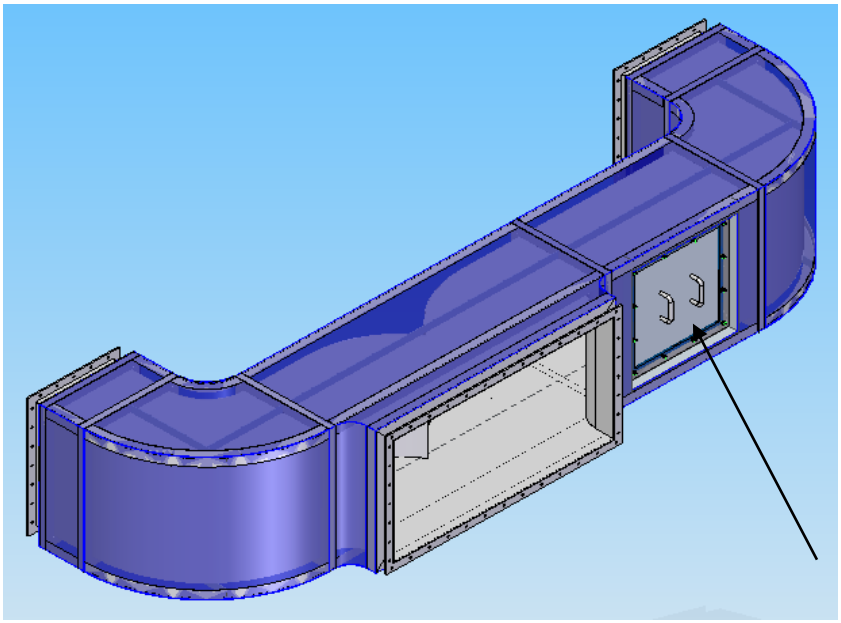
①The heat exchanger is one of the important components of the dryer. If there is too much dust deposited on it, its heat exchanging efficiency will be impacted, so that the product quality will be also affected and the energy consumption will be increased.

②Make sure that there is no any impurity inside the heat exchanger and keep it unblocked

before the dryer enters to normal operation.

③Check the heat exchanger and its filtering screen every month after the dryer enters to normal operation for deposited dust. If there is any dust inside the heat exchanger, dismantle the big access door and then use compressed air to clean the dust. If there is any dust deposited on the filtering screen, dismantle the small access door and then use compressed air to clean the dust. If necessary, take off the screen to clean with high pressure washing.

(2) Maintenance of the ventilation circuit



Access door

Open the access door to clean the piled dust inside the ventilation circuit after the dyer running for a month.

8 Spare Parts

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

1	Spare parts / Qty. / Model	Temp. sensor	Level indicator	Bearing with solid lubricant	Mounted bearing	Proximity switch	Remarks
		WZPB230	SE3820BCRI0300-0250KA	COB05 30X40X40	UCF210	IS212MM/4NO-4NO	
2	KDVD20X20	（N+2）(M12)	2（N+1）	21N	20N	5N	N stands for dryer deck no.
3	KDVD24X24C	（N+4）(M12)	2（N+1）	25N	24N	5N	N stands for dryer deck no.
4	KDVD28X28C	（N+4）(M12)	2（N+1）	29N	28N	5N	N stands for dryer deck no

9 Attachment

9.1 Attached documents

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

9.2 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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People’s Republic of China

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

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