Use of medium press 广涡中压机用

广州广涡压缩机有限公司
Guangzhou Guangwo Compressor Co.,Ltd

operation instructions
涡旋空气压缩机
使用说明书

Product quality assurance card

Dear users

First of all, thank you for choosing our Guangzhou vortex air compressor.Please read this manual carefully before use.In order to provide you with better service, please read the operation manual carefully after purchasing the unit and keep the manual and quality assurance card properly.

If there is any fault in the process of using the product, please contact the local dealer or our company, and we will quickly remove the fault for you.

1. Please fill in the quality assurance card carefully and ask the dealer to stamp it.
2. this product is guaranteed for one year from the date of purchase.
3. during the warranty period, paid maintenance services will be provided in the following cases.
   (1) The contents below the dotted line were not completed and sent back to Guangzhou guangwo Compressor Co., Ltd.
   (2) Failure and damage caused by failure to comply with the installation, operation, maintenance and other requirements of the operation manual.
   (3) Failure and damage caused by fire, earthquake, war and other reasons unrelated to the product.
   (4) Failure and damage of the unit caused by the failure of original accessories and special lubricating oil of guangwo.
   (5) In case of any failure without the service of our company's service personnel or special service provider.
   (6) Consumables such as air filter element, oil filter, oil-gas separator element and lubricating oil are not covered by the warranty.
4. air filter element, oil filter, oil-gas separator element, special lubricating oil for scroll machine and other consumables are available from dealers, please make sure to use the original accessories.

Please cut along this line

Attention

After purchasing this product, please fill in the back content and stamp the dealer's seal carefully, cut along the dotted line and send it back to the company in time. You will get the following guarantee and service:

The warranty commitment of the product takes effect;

Enjoy the technical consulting service of the original factory;

Company name: Guangzhou guangwo Compressor Co., Ltd

Mailing address: No.11 Lijiang Road, Shilou Town, Panyu District, Guangzhou, Guangdong Province

Postal Code: 511447

Mailing Department: After Sales Service Department

User retention information

User name		Date of purchase	
contacts		contact number	
Contact address			Postal Code
Product name		Device ID	
customer (stamp)		distributor (stamp)	
			Service phone ：

Please cut along this line

Distributor stamp

Warranty and other registration information

User name		**Date of purchase**	
contacts		**contact number**	
Contact address			Postal Code
Product name		**Device ID**	
customer **(stamp)**		**distributor** **(stamp)**	

Please fill out this form according to the format requirements and send it back to the company, otherwise the product warranty will not take effect.
After receiving this form, the company will call back and inform the warranty commitment registration to take effec

catalog

PREFACE

Welcome to the wide vortex air compressor.The products of our company have been strictly inspected before leaving the factory. In order to ensure the best use effect of this machine, please read this operation manual carefully before the unit is operated.

Scope of application of this manual

This operation manual is applicable to GW series products of scroll air compressor.Please make sure to keep this manual properly until the unit is scrapped.

Purpose of this manual

This operation manual serves as the operation guide for the field operators, and also as the selection and design book for the air compressor station for the engineering designers.

Knowledge required to read this instruction manual

If you have some mechanical and electrical knowledge, then you can better understand the contents of this manual, and can carry out air compressor maintenance work.

SAFETY PRECAUTIONS

Qualified operators

Only operators trained in the system can operate the air compressor.

Safety precautions

1. The incoming power cable of the air compressor must match the power of the matching motor of the air compressor, and the motor protective circuit breaker shall be installed.In order to ensure the reliability of the equipment, it is necessary to have a reliable grounding device.
2. Before start-up, make sure that there is no one in the unit, check whether there are any leftovers and tools, and close the door.When starting the unit, the personnel around the unit shall be informed to pay attention to safety.
3. compressed air and electrical appliances are dangerous. During maintenance or repair, make sure that the power supply has been cut off and hang warning signs such as "maintenance" or "no switching on" at the power supply.
4. when the machine is started for the first time or the power line changes, it must be noted whether the unit turns in the direction indicated by the arrow.
5. do not work under the exhaust pressure higher than that specified on the nameplate of the air compressor, otherwise the motor will be overloaded and burnt out.
6. when the air compressor fails or there are unsafe factors, do not start it forcibly. At this time, cut off the power supply and make a significant mark.
7. Fingers and clothes should be kept away from rotating fans and hot parts such as oil-gas separator, pipeline, etc.Do not remove all kinds of caps, parts, high temperature liquid and pressure air in the machine during operation, which may cause serious personal injury or even death.
8. During shutdown and maintenance, it must be confirmed that the compressed air in the unit has been released, the unit has been isolated from other air sources, and the unit has been cooled.
9. when cleaning the components of the unit, the non corrosive safety solvent shall be used. It is strictly prohibited to use flammable, explosive and volatile cleaning agent.
10. The assembly of compressor host needs high-tech professionals and special tools.The user shall not dismantle and maintain the compressor host by himself.If the host fails, please contact our customer service center.
11. The compressor parts must be provided by the regular factory, and the special oil for the scroll machine must be the oil designated by the company. It is strictly prohibited to mix them, otherwise it will cause major accidents due to carbon deposition in the system. In order to ensure the safe operation of the machine and our company's maintenance commitment, the consumables such as air filter element, oil filter and oil-gas separation filter element should use the products with the company's logo.
12. When the compressor is stopped in winter, the condensate in the cooler must be completely drained to prevent rust and frost crack.
13. do not use compressed air in closed rooms or tunnels. Do not use compressed air for breathing purposes.

Precautions for use of medium press

1. Please do not press stop when the machine is loaded, but press stop when the machine is unloaded.
2. After the shutdown, it is necessary to wait for the inverter fan to stop (about 2-3 minutes) before turning off the power (otherwise, the converter module is not sufficiently cooled and may fail).
3. In non emergency state, it is impossible to press the emergency stop button or turn off the power suddenly, which will cause fuel injection or unexpected failure of the main engine.
4. Be sure to install a ball valve between the air tank and the whole machine.
5. The oil level shall not be lower than the sight glass during operation, and the oil level shall be high at the oil filler.
6. The temperature of internal parts is more than 100 degrees. Please confirm the temperature before operation to avoid scalding.

CHAPTER I PRODUCT OVERVIEW

1.1 Product introduction

Scroll air compressor is the third generation of high-efficiency displacement air compressor.Compared with the reciprocating compressor of the same capacity, the main parts are reduced to 1 / 8, the volume is reduced by 40%, the noise is reduced by 5-20dba, the efficiency is increased by 10-30%, the weight is reduced by 10-30%, and the fluctuation range of driving torque is only 1 / 8; compared with the screw compressor of the same capacity, the performance is higher by 10-20%, and the noise is lower by ~ 3dba.

Guangzhou vortex compressor is the fourth generation of the vortex compressor with radial flexible structure developed by our company.Light load start-up, resistance to impurities and liquid compression, high reliability, and has the following advantages:

1) Simple structure, small volume and light weight;
2) High volume efficiency;
3) Low vibration and noise;
4) Low energy consumption and long life;
5) Continuous and stable air supply;
6) Simple operation and high degree of automation;
7) Reliable operation.

It is widely used in industry, agriculture, transportation, medical machinery, food, pharmaceutical, construction, textile and other sectors and other occasions requiring compressed air.

1.2 Host structure

The main engine of GW series scroll air compressor includes: 1) the compression part composed of moving plate, static plate, cross ring and frame. The static plate is fixed on the frame. The moving plate is driven by the crankshaft. The cross ring is to prevent the rotating motion of the moving plate; 2) the motor is the driving part.The motor and the compression part are directly connected by an integrated crankshaft, without coupling or belt drive

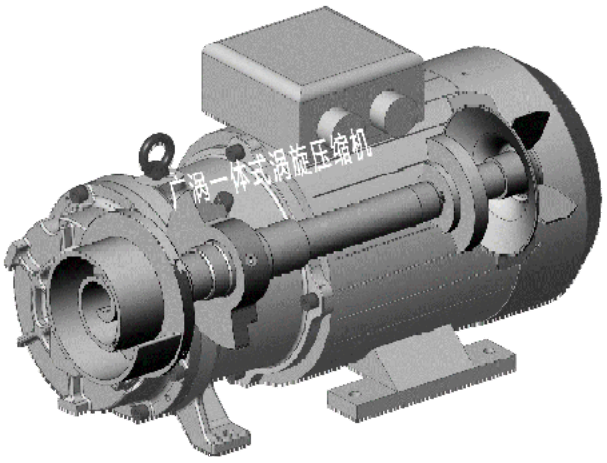


Fig. 1-1 host structure

1.3 Working principle of main engine

GW series scroll air compressor is a work process of suction, compression and exhaust, which is completed by the meshing of dynamic and static vortices of two involute lines.

The static disk is fixed on the frame, and the moving disk moves in a plane with small radius under the phase of the crankshaft drive and the cross ring.When the crankshaft is running, the dynamic and static vortices mesh to form several pairs of crescent shaped closed compression cavities.As shown in the figure, the gas is drawn into the compressor

by the air filter. With the rotation of the main shaft, the gas drawn into the working chamber is gradually compressed by the crescent shaped compression chamber formed subsequently, and then discharged from the center of the static disk.

According to the structure and working principle of the compressor, it has the following characteristics:

The 4D type line is adopted to remove the auxiliary exhaust valve. The components of the scroll compressor are reduced and the volume is reduced. The structure is very compact, so it is convenient and reliable to use, and the failure rate is low.

Adopting radial flexible technology, the compressor is in light load state when starting, reducing the leakage clearance, saving more than 10% energy compared with the fixed eccentricity scroll machine; greatly improving the bearing force, the bearing life is increased to more than 20000h

The pressure difference between the adjacent chambers of the scroll compressor is small, the leakage is small, and the volume efficiency is very high.

Multiple compression chambers work at the same time, and the torque is even, so the vibration of the machine is small and the noise is low.

During the operation of the scroll compressor, the suction, compression and exhaust are continuous, and the air supply is continuous and stable.The rotating radius of the moving disk is very small, the mechanical wear is small, and the mechanical efficiency is high

1.4 Schematic diagram of main engine

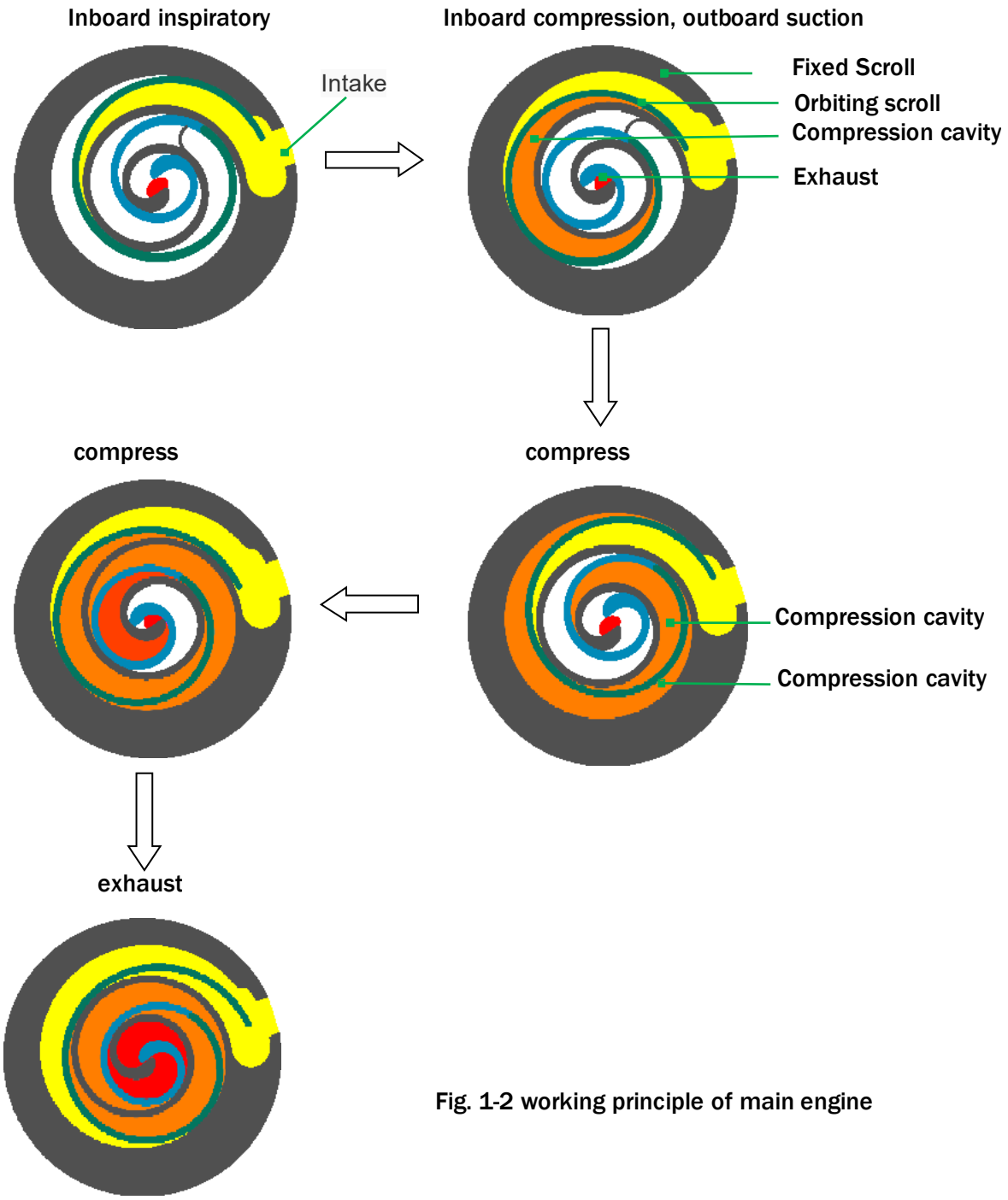


Fig. 1-2 working principle of main engine

1.5 Product model and technical parameters

Table 1-1 technical parameters

Model / project		GW-15DH16	GW-30DH16	GW-15DHY18
Exhaust volume (m3 / min)		1.0	2.0	1.0
Exhaust pressure (MPA)		1.6	1.6	1.8
Intake air temperature (℃)		≤40	≤40	≤40
Air supply temperature (℃)		Ambient temperature + 45		ambient temperature
Cooling mode		Air cooling	Air cooling	Air cooling
Transmission mode		Integrated drive	Integrated drive	Integrated drive
Exhaust oil content		≤ 3ppm, micro oil		≤0.001ppm
Brand of lubricating oil		Special oil for Guangzhou vortex air compressor		
Lubricating oil consumption (L)		4.5	8	4.5
Noise [dB (a))		65+ 3	65+ 3	65+ 3
Main motor	Power (kw)	11	11+11	11
	Speed (RPM)	2919	2919	2919
	Starting mode	Star triangle	Star triangle	Star triangle
	Voltage (V)	380	380	380
	Frequency (Hz)	50Hz	50Hz	50Hz
	Number of phases	3	3	3
Fan motor	Power (W)	170	216	170
	Speed (RPM)	1380	1362	1380
	Starting mode	Direct start	Direct start	Direct start
	Voltage (V)	380	380	380
	Frequency (Hz)	50	50	50
	Current (a)	0.48	0.46	0.48
Boundary dimension L × w × h (mm)		880×600×900	1000×640×1110	1700×720×1550
Net weight (kg)		205	360	450
Pipe Size		Rc3/4	Rc3/4	Rc3/4

Table 1-2 technical parameters

Model / project		GW-15DH20	GW-30DH20	GW-15DHY20
Exhaust volume (m3 / min)		1.2	2.0	1.2
Exhaust pressure (MPA)		2.0	2.0	2.0
Intake air temperature (℃)		≤40	≤40	≤40
Air supply temperature (℃)		Ambient temperature + 25		ambient temperature
Cooling mode		Air cooling	Air cooling	Air cooling
Transmission mode		Integrated drive	Integrated drive	Integrated drive
Exhaust oil content		≤ 3ppm, micro oil		≤0.001ppm
Brand of lubricating oil		Special oil for Guangzhou vortex air compressor		
Lubricating oil consumption (L)		4.5	8	4.5
Noise [dB (a))		66+ 3	66+ 3	66+ 3
Main motor	Power (kw)	12.5	11+11	12.5
	Speed (RPM)	3600	3000	3600
	Starting mode	Frequency converter		
	Voltage (V)	380	380	380
	Frequency (Hz)	60Hz	50Hz	60Hz
	Number of phases	3	3	3
Fan motor	Power (W)	190	250	190
	Speed (RPM)	1400	1380	1400
	Starting mode	Direct start	Direct start	Direct start
	Voltage (V)	380	380	380
	Frequency (Hz)	50	50	50
	Current (a)	0.48	0.60	0.48
Boundary dimension L × w × h (mm)		1000×640×965	1250×750×1150	1000×640×965
Net weight (kg)		240	380	465
Pipe Size		Rc3/4	Rc3/4	Rc3/4

Table 1-3 technical parameters

Model / project		GW-15DH25	GW-30DH25	GW-15DHY25
Exhaust volume (m3 / min)		1.0	2.0	1.0
Exhaust pressure (MPA)		2.5	2.5	2.5
Intake air temperature (℃)		≤40	≤40	≤40
Air supply temperature (℃)		Ambient temperature + 32		ambient temperature
Cooling mode		Air cooling	Air cooling	Air cooling
Transmission mode		Integrated drive	Integrated drive	Integrated drive
Exhaust oil content		≤ 3ppm, micro oil		≤0.001ppm
Brand of lubricating oil		Special oil for Guangzhou vortex air compressor		
Lubricating oil consumption (L)		4.5	8	4.5
Noise [dB (a))		68+ 3	68+ 3	68+ 3
Main motor	Power (kw)	11	11+11	11
	Speed (RPM)	3000	3000	3000
	Starting mode	Frequency converter		
	Voltage (V)	380	380	380
	Frequency (Hz)	50Hz	50Hz	50Hz
	Number of phases	3	3	3
Fan motor	Power (W)	190	250	190
	Speed (RPM)	1400	1380	1400
	Starting mode	Direct start	Direct start	Direct start
	Voltage (V)	380	380	380
	Frequency (Hz)	50	50	50
	Current (a)	0.48	0.60	0.48
Boundary dimension L × w × h (mm)		1000×640×965	1250×750×1150	1000×640×965
Net weight (kg)		240	380	465
Pipe Size		Rc3/4	Rc3/4	Rc3/4

Table 1-4 technical parameters

Model / project		GW-20PM25	GW-40PM25	GW-20PM30	GW-40PM30
Exhaust volume (m3 / min)		1.2	2.3	1.0	2.0
Exhaust pressure (MPa)		2.5	2.5	3.0	3.0
Intake air temperature (℃)		≤40	≤40	≤40	≤40
Air supply temperature (℃)		Ambient temperature + 32			
Cooling mode		Air cooling	Air cooling	Air cooling	Air cooling
Transmission mode		Direct drive	Direct drive	Direct drive	Direct drive
Exhaust oil content		≤ 3ppm, micro oil			
Brand of lubricating oil		Special oil for Guangzhou vortex air compressor			
Lubricating oil consumption (L)		4.5	8	4.5	8
Noise [dB (a))		68+ 3	70+ 3	68+ 3	70+ 3
Main motor	Power (kw)	15	15+15	15	15+15
	Speed (RPM)	3000	3000	3000	3000
	Starting mode	Frequency converter			
	Voltage (V)	380	380	380	380
	Frequency (Hz)	50Hz	50Hz	50Hz	50Hz
	Number of phases	3	3	3	3
Fan motor	Power (W)	190	250	190	190
	Speed (RPM)	1400	1380	1400	1380
	Starting mode	Direct start	Direct start	Direct start	Direct start
	Voltage (V)	380	380	380	380
	Frequency (Hz)	50	50	50	50
	Current (a)	0.48	0.60	0.48	0.60
Boundary dimension L × w × h (mm)		1000×640×965	1250×750×1150	1000×640×965	1000×640×965
Net weight (kg)		255	490	255	290
Pipe Size		Rc3/4	Rc3/4	Rc3/4	Rc3/4

1.6 Product system flow chart

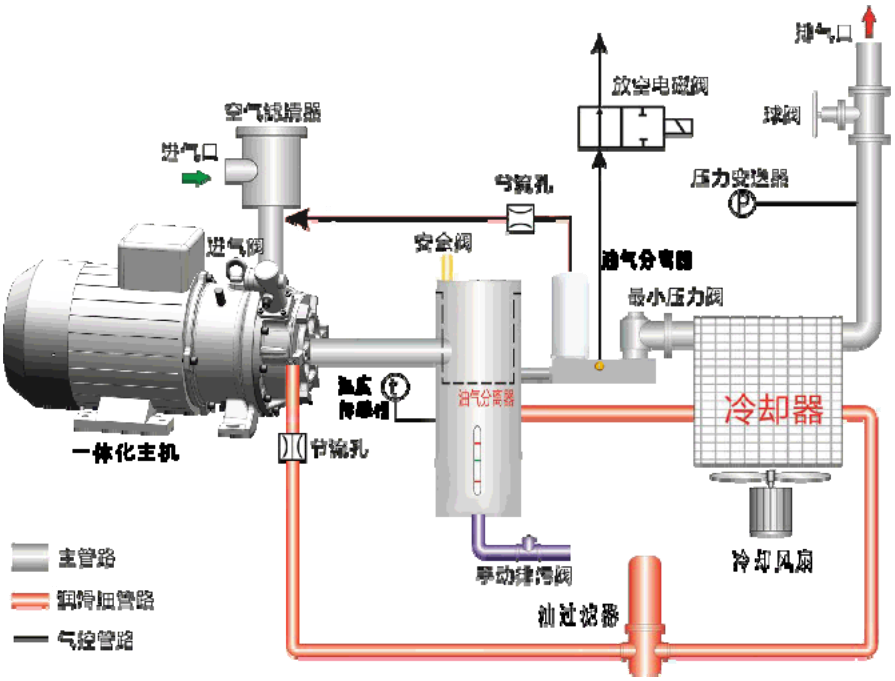


Fig. 1-3 system flow chart

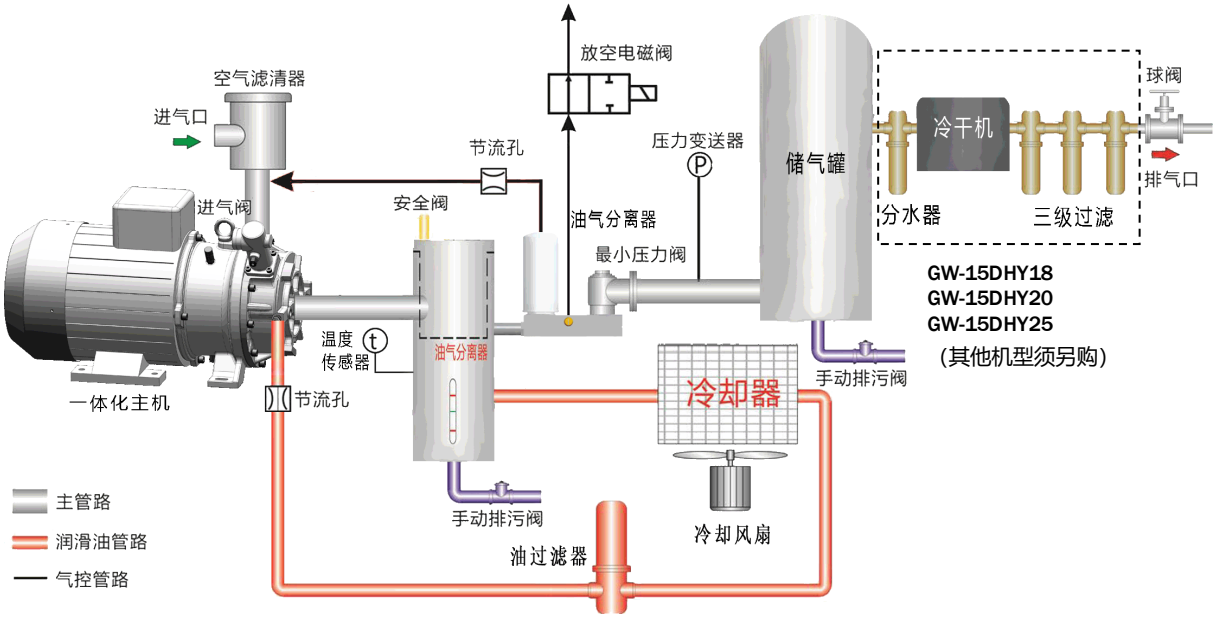


Fig. 1-4 system flow chart (with dryer)

CHAPTER II EQUIPMENT INSTALLATION

2.1 Precautions before use

2.1.1Arrival inspection

When the user receives the air compressor, he shall open the case to check the following items. If there is any problem with the product and it does not meet the order requirements, please contact the dealer.

1) Check the power supply voltage on the air compressor nameplate to confirm the specification you ordered.

2) During the transportation, visual inspection shall be carried out to see if there is any damage to electrical components, parts falling off, etc.

2.1.2carry

The LCD of the control panel is very fragile. Please pay attention to protect the control panel from being damaged during handling.

2.1.3safekeeping

2.1.3.1Short term custody

1) See table 2-1 for environmental conditions of short-term storage

project	Storage requirements	
ambient temperature	-10～+50℃	Do not store in a place where the temperature will change rapidly and condensation and freezing will occur
Storage temperature	-40～+65℃	
relative humidity	5～95%	
Environmental requirements	No direct sunlight, no dust, no corrosive gas, combustible gas, steam, dripping, vibration environment.	

If there is moisture effect, please change the desiccant regularly.

2) After a few days of shutdown, the condensate of oil-gas separator shall be discharged.

2.1.3.2Long term custody

1) Long term storage must first meet the requirements of short-term storage.

2) In order to prevent the influence of humid gas, it should be sealed strictly and put in desiccant, so that the relative humidity in the package is less than 75%.

3) For long-term storage equipment, use a 500V or 1000V megger to measure the insulation resistance of the motor winding before starting, and the value shall not be less than 1 megohm.If not, the motor shall be dried.

2.2 Installation site requirements and suggestions

1) The air compressor shall be installed in a clean, well lit and well ventilated room for use. It is strictly prohibited to use it outdoors. It is strictly prohibited to use it in an environment with exposure to the sun or rain, steam, humidity or corrosive gas, explosive gas and large dust content.
2) The ambient temperature of air compressor room shall be lower than 40 ℃ and higher than 0 ℃.High ambient temperature is easy to cause high temperature shutdown of the unit and affect the exhaust volume of the compressor; the temperature must be higher than 0 ℃, and controlled above the freezing point temperature of water and lubricating oil.

3) The distance between the air compressor body and the wall and ceiling shall be more than 600mm, and enough space shall be reserved for future maintenance.
4) It is installed on a solid and level foundation.Uneven foundation may increase the noise and vibration of air compressor.

2.3 Pipe installation

1) When piping the main pipeline, the pipeline must have a slope of 1°- 2° to facilitate the discharge of condensate in the pipeline.
2) There are two kinds of Air Compressors: the built-in air tank and the one without the air tank. If you want to build the built-in air tank, please indicate when ordering.

For the air compressor with built-in air tank, the user can directly obtain the air source from the air outlet of the air tank; for the air compressor without built-in air tank, the elbow and various valves shall be minimized in the pipeline to reduce the pressure loss.

2.4 Electrical installation

2.4.1Power supply specification reference table (table 2-2)

Motor power (kw)	Voltage (V)	Current (a)	Cable section (mm2)	Circuit breaker capacity (a)
11	380	20.89	6×4，450V/750V	63
12.5	380	23.74	6×4，450V/750V	63
15	380	28.49	6×4，450V/750V	63
22	380	41.78	10×4，450V/750V	80
30	380	56.98	10×4，450V/750V	100

2.4.2Selection of circuit breaker

1) The low-voltage circuit breaker is mainly used to cut off the main power supply of the air compressor and protect the motor.

Select the appropriate circuit breaker according to the rated current of the host motor. The circuit breaker must have the function of motor overcurrent protection and leakage automatic disconnection.

2) The circuit breaker equipped must be motor protection type with instantaneous action setting value of 8-15 times of motor rated current.Please avoid using distribution type circuit breakers.If the distribution type circuit breaker is used, its instantaneous action setting value shall be 14 times of the rated current of the motor, otherwise the circuit breaker will misoperate when the motor starts.See table 2-2 for recommended capacity.

3) The circuit breaker shall be installed beside the air compressor unit for easy maintenance of the air compressor.The installation shall comply with the corresponding safety regulations.

2.4.3Cable selection

According to the rated voltage and rated current of the air compressor, the appropriate cable shall be selected, which shall also be determined according to factors such as environmental conditions, laying mode and product technical data.Its selection and installation are generally considered according to the following principles:

1） The cable shall be laid in the way of buried or buried through pipe as far as possible to reduce the damage of external pressure to the cable.Plastic sheathed cables shall be laid through pipes.

2） The low-voltage power cable shall be four core power cable, and the cable sheath mode shall be selected according to the laying mode.

3）When the ambient temperature is high, the cable section should be increased properly, and when the laying distance is long, the section must also be increased to reduce the voltage drop.
4）The middle and low voltage cables in the table are bv type PVC insulated cables.If you choose other types of cables, please select the appropriate cables according to the above principles.If you do not have experience in cable selection, you can consult the cable manufacturer.

2.4.4Power requirements

The incoming power supply of the user shall be consistent with the rated voltage and frequency of the air compressor.

Power supply voltage requirements:

1）The voltage fluctuation shall not be too large. The voltage fluctuation shall be - 10% ~ + 10% of the rated voltage of the motor.
2）The voltage imbalance shall not be too large, and the three-phase imbalance of the three-phase power supply voltage shall not exceed 5%.If the fluctuation is too large, a voltage regulator must be provided or the power grid must be rectified.
3）The capacity of the power grid can meet the starting requirements of the motor. Otherwise, it is difficult for the motor to start, or even the breaker trips.
4）The air compressor is better to use a set of power system alone, which is convenient for maintenance.

2.4.5Grounding requirements

The air compressor body and motor shell shall be reliably grounded to prevent the fire of oil-gas separator caused by static electricity and the danger caused by leakage.Connect the grounding terminal on the right side of the air compressor to the grounding body with 2.5mm2 yellow green double color PE wire.After the completion of grounding, use the grounding resistance meter to measure the grounding resistance, which should be less than 4 ohms.

2.5 Outline dimension drawing of product

2.5.1 Outline dimension drawing of products without air tank (see Fig. 2-1)

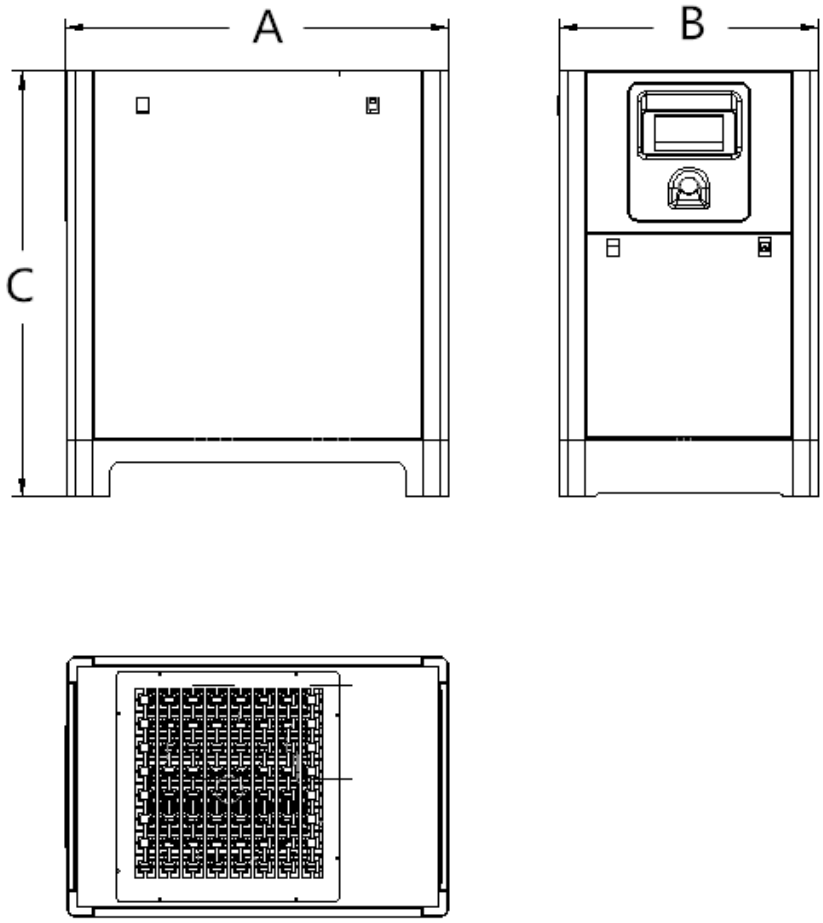


Figure 2-1 outline dimension drawing (without air tank)

	GW-15DH16	GW-30DH16	GW-15DH20 GW-15DH25	GW-30DH20 GW-30DH25
A	1000	1000	1000	1250
B	640	640	640	750
C	965	1110	950	1150

2.5.2 Outline dimension drawing of air distribution tank (see Fig. 2-2)

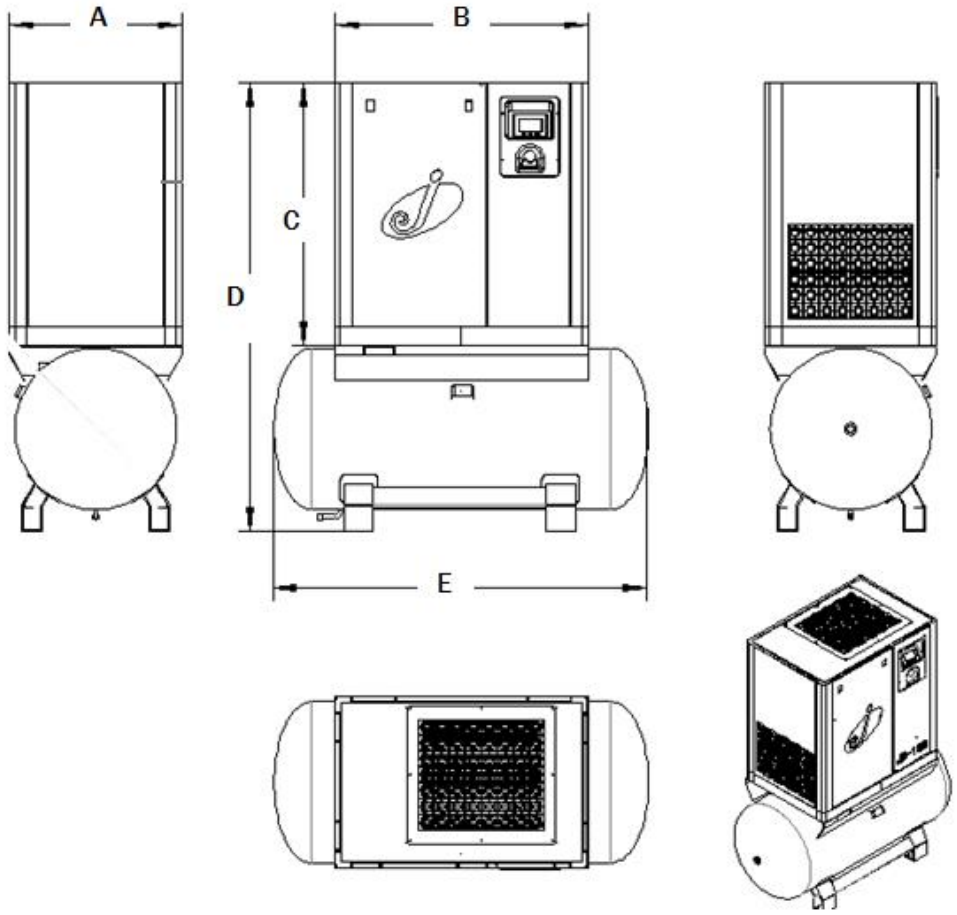


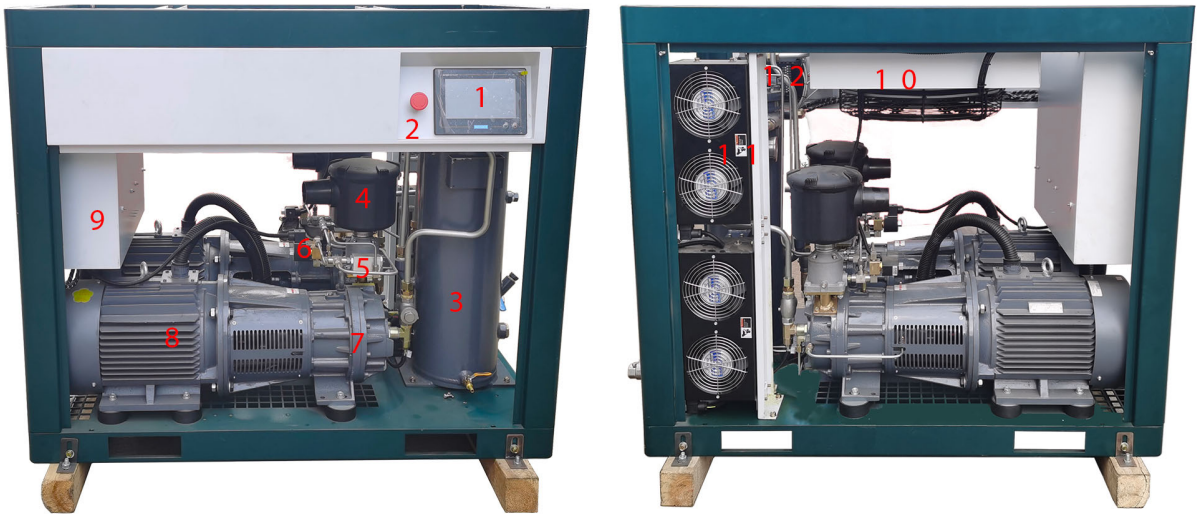
Figure 2-2 outline dimension drawing (air distribution tank)

	GW-15DHY20	GW-15DHY20	GW-15DHY25
A	1700	1700	1700
B	740	740	740
C	1550	1550	1550

2.6 Internal structure of product

1、空气滤清器　2、进气阀　3、主机头　4、电机
5、油气分离器　6、最小压力阀　7、冷却器　8、变频器
9、电磁阀　10、控制器

Fig. 2.6.1 internal structure diagram (GW-15DH20 / GW-15DH25)



1. 控制器　2. 急停按钮　3. 油气罐　4. 空气滤清器
5. 进气阀　6. 电磁阀　7. 主机头　8. 电机
9. 电箱　10. 油冷却器　11. 气冷却器　12. 保压阀

Fig. 2.6.2 internal structure diagram (GW-30DH20 / GW-30DH25)

CHAPTER III RUN OPERATION

3.1 test run

When the new machine is debugged, shut down for a long time or moved to another location for use, the trial operation procedure must be executed before starting up and running.

3.1.1Check whether all pipeline joints, instruments, circuit connection joints, etc. are loose, fallen off or damaged due to transportation, installation, etc.If so, please fasten or replace it in time; confirm whether the exhaust valve is open.

3.1.2Connect the power line and ground wire, test whether the power supply voltage is correct and whether the three-phase power supply is wrong.

3.1.3Check whether the oil level pointer in the oil-gas separator is within the range of safety line.If not, please add some lubricating oil.

3.1.4Check the cooling system.

3.1.5Check the safety valve and relief valve for damage.

3.1.6Turn on the power supply, if the display shows "phase sequence error" and alarms, please disconnect the power supply and change any two phases in the power supply incoming line.

3.1.7Press the "emergency stop" button within 1-2 seconds after pressing the start key on the display screen to check whether the main motor turns correctly (such as the direction of the arrow). If the direction is not right, please change any two of the three wires; use the same method to check whether the fan turns correctly, and the wind direction of the fan is to blow the radiator.

 WARNING	The reverse operation of the compressor will cause damage to the dynamic and static vortices. Therefore, when starting for the first time, it is necessary to jog once to observe whether the main engine turns correctly before it can be formally started for operation.

3.1.8 After the emergency stop key is reset, press the start key, and the air compressor starts to operate.

3.1.9Observe whether there is abnormal indication on the display screen and whether the unit can be loaded normally. If there is abnormal sound, vibration, water leakage, oil leakage and other abnormal phenomena, press the stop key immediately and check after shutdown.

3.1.10 Observe whether the unit can stop automatically when the exhaust pressure rises to the set value of unloading pressure, and whether the unit can start and operate when the pressure drops to the set value of loading pressure.

3.1.11Press the stop key to stop the machine normally.

3.2 Pre operation inspection

In order to ensure stable and reliable operation of the unit, please do the following checks before starting.

3.2.1Slightly open the oil drain valve at the bottom of the oil-gas separator, and close the oil drain valve after discharging the condensate in the oil-gas separator.

3.2.2Observe the oil level to ensure that the lubricating oil level is within the safety line of the oil level gauge when the unit is running.If the lubricating oil is too much, some oil should be removed. If the lubricating oil is too little, make up the oil.

3.2.3Close the power supply, open the exhaust valve, and confirm that the pressure in the system is 0mpa.

3.3 Run operation

The compressor is controlled by microcomputer, with high degree of automation, perfect safety protection, and generally no need of personnel.

3.3.1start

Press the "start" button, the main motor starts, the vent solenoid valve is closed, the air enters the compressor from the air filter, and the unit pressure rises gradually.

3.3.2function

When the pressure increases to the set value of "unloading pressure", the unit stops immediately, the vent solenoid valve opens, and the system pressure in the unit gradually drops to 0mpa; when the pressure drops to the set value of "loading pressure", the unit starts automatically, the vent solenoid valve closes, and the unit pressure increases gradually.

3.3.3Shutdown

Press the "stop" button, the main motor stops immediately, the vent solenoid valve opens, and the system pressure in the unit gradually drops to 0mpa.

3.3.4Emergency stop

3.3.4.1Fail safe emergency stop

In case of motor overload, exhaust overtemperature and other serious faults, the unit shall protect the emergency stop, lock the fault and press the "start" button to fail to start.After troubleshooting, reset the controller to start operation.

3.3.4.2Press the "emergency stop" button to stop

In case of emergency during the operation of the unit, press the "emergency stop button" to stop the unit.After pressing the "emergency stop button", the main motor and fan will stop immediately.

 DANGER	Press the "emergency stop" button, all electrical components of the system are in the state of power failure, the pressure in the system (including compressor) is in the process of gradual release and attenuation, and it will take a long time to recover to the state of normal pressure. Therefore, it is forbidden to dismantle any parts of the system immediately after pressing the emergency stop button, please confirm that the system pressure can be restored to normal pressure before relevant operation!

3.3.4.3Warning sign of emergency stop button

Do not press the emergency stop button to stop the unit during normal operation.In case of abnormal sound, vibration, smell and other abnormal phenomena of the unit, the emergency stop button shall be pressed immediately for emergency stop.

3.4 Safety protection system

3.4.1Motor overload protection

The unit has the functions of over-current protection unloading of main motor, overload protection shutdown of main motor and fan motor.

3.4.2Anti reverse protection of air compressor

The reversal of air compressor will cause serious damage to the compressor.In order to prevent inversion, the microcomputer controller has the function of phase sequence protection.

3.4.3Exhaust over temperature protection

When the exhaust temperature is higher than the set value of 105 ℃, the alarm will not stop; when the exhaust temperature is higher than 108 ℃, the alarm will stop.

3.4.4Low ambient temperature protection

The ambient temperature is lower than the set value of - 15 ℃, and the equipment cannot be started.

3.4.5Exhaust pressure overpressure protection

Safety valve: when the pressure in the control panel is set improperly or fails, and the pressure at the outlet of the oil-gas separator exceeds the rated exhaust pressure by 1.1 times, the safety valve will jump open for pressure relief.

Relief valve: when the service life of the oil-gas separation filter element has reached or is blocked, resulting in a large pressure difference, and the safety valve has not yet operated, and the pressure in the oil-gas separator has exceeded a certain value of the rated exhaust pressure (the opening pressure of the relief valve is the rated discharge working pressure + 0.15Mpa), the relief valve will jump off the pressure relief.When the relief valve acts, the oil-gas separation filter element must be replaced.

The safety valve and relief valve have been adjusted before delivery. Please do not adjust them at will and send them for inspection regularly..

3.4.6 Alarm prompt for service life of lubricating oil and loss parts

The service life time of lubricating oil, motor lubricating grease, air filter, oil filter and oil-gas separation filter element prompts the user to stop, and tells the user to replace the lubricating oil, replace the loss parts and fill the motor lubricating grease.

3.4.7Alarm prompt of loss parts blocking

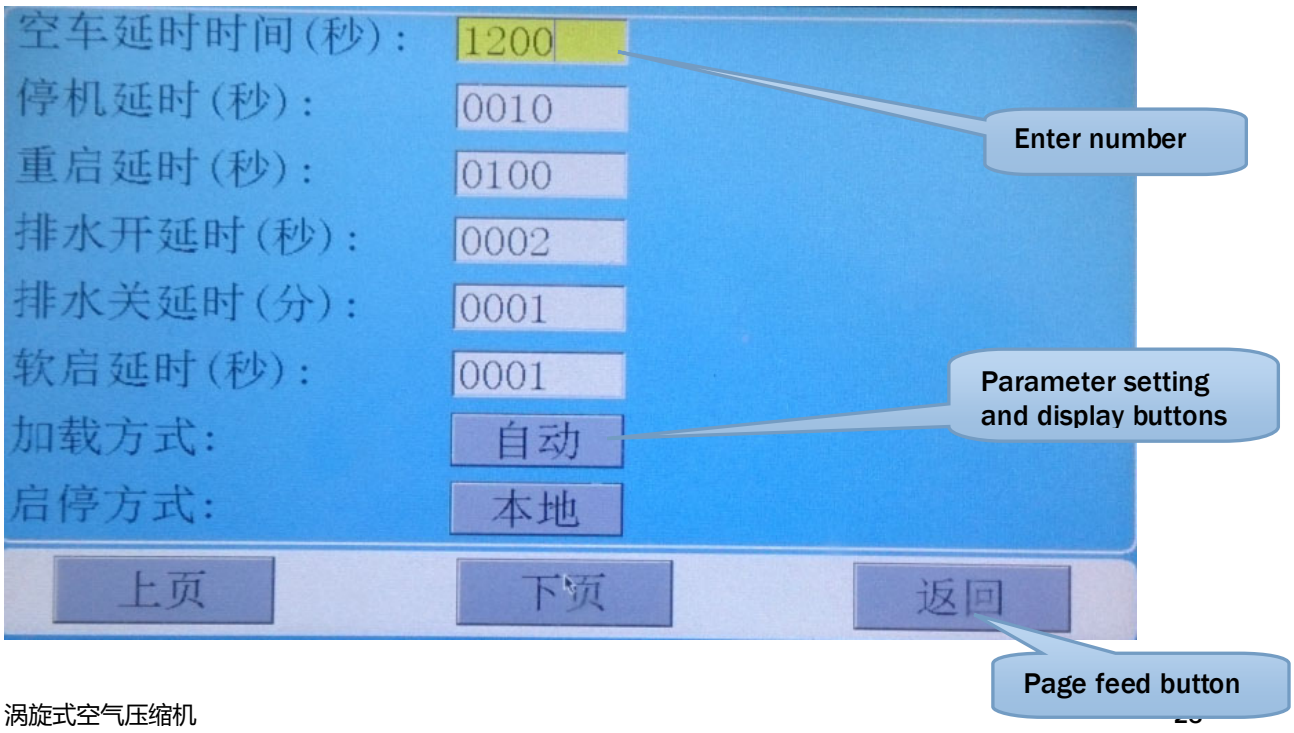
Air filter, oil filter, oil-gas separation filter element blocking alarm.The user must replace it in the shortest time, otherwise it will affect the performance and safe operation of the air compressor.

CHAPTER IV ELECTRICAL OPERATION

4.1 controller

4.1.1 Key description.

Fig. 1. 1.



 ——Start key:

- When the air compressor is in standby mode, press this key to start the air compressor;
- When the communication mode is set as linkage and the communication address is 1, press this key to start the air compressor operation and start the linkage control function at the same time.

 ——Stop key:

- When the air compressor is in operation, press this key to stop the operation of the air compressor;
- When the communication mode is set as linkage and the communication address is 1, press the stop key to stop the operation of the air compressor and stop the linkage control function at the same time. The host will not send any command to the slave.

 ——Confirm key, load / unload key

- This key is used as the loading and unloading key when the air compressor is running;
- When the input focus of the display interface is in the digital input box, and the input box is in the editing mode, press this key to exit the editing mode, and save the user's modified data;
- When the input focus of the display interface is on the page feed button, press this key to perform the corresponding function of the button;

 ——Return / reset key:

- In case of fault shutdown, press this key for 5 seconds to reset the fault;
- When setting the mode, press this key to exit the setting mode and return to view mode
- In parameter view mode, press this key to return to the previous page;

 ——Move left:

- When the focus of the display interface is in the digital input box and in the data viewing mode, press this key to enter the data editing mode, and the lowest position of the data starts flashing;
- When the focus of the display interface is in the digital input box and in the data editing mode, press this key to move the editing bit to the previous position of the current data.
- When the focus of the display interface is on parameter setting and display key, press this key to modify the current parameter and save it.
- When the focus of the display interface is on the page feed button, press this key to move the current focus to the next button.

 ——Right key / enter key:

- When the focus of the display interface is in the digital input box and in the data viewing mode, press this key to enter the data editing mode, and the highest position of the data starts flashing;
- When the focus of the display interface is in the digital input box and in the data editing mode, press this key to move the editing bit to the next bit of the current data.
- When the focus of the display interface is on parameter setting and display key, press this key to modify the current parameter and save it.
- When the input focus of the display interface is the page feed button, press this key to move the current focus to the next button.

 ——Down / down:

- When the current focus component in the display interface is in data viewing mode, press this key to move the input focus to the next component.
- When the input focus of the display interface is in the digital input box and in the data editing mode, press this key to decrease the current bit data.
- When the current interface is the operation parameter display interface, press this key to switch to the next operation parameter interface.

 ——Up / up:

- When the current focus component of the display interface is in data viewing mode, press this key to move the input focus to the previous component.
- When the display interface focuses on the digital input box and is in data editing mode, press this key to increase the current bit data.
- When the current interface is the operation parameter display interface, press this key to switch to the previous operation parameter interface.

4.1.2Indicator light description

——Power supply:

The indicator lights up when the controller is powered on.

——Operation:

When the air compressor motor is running, the running indicator light is on.

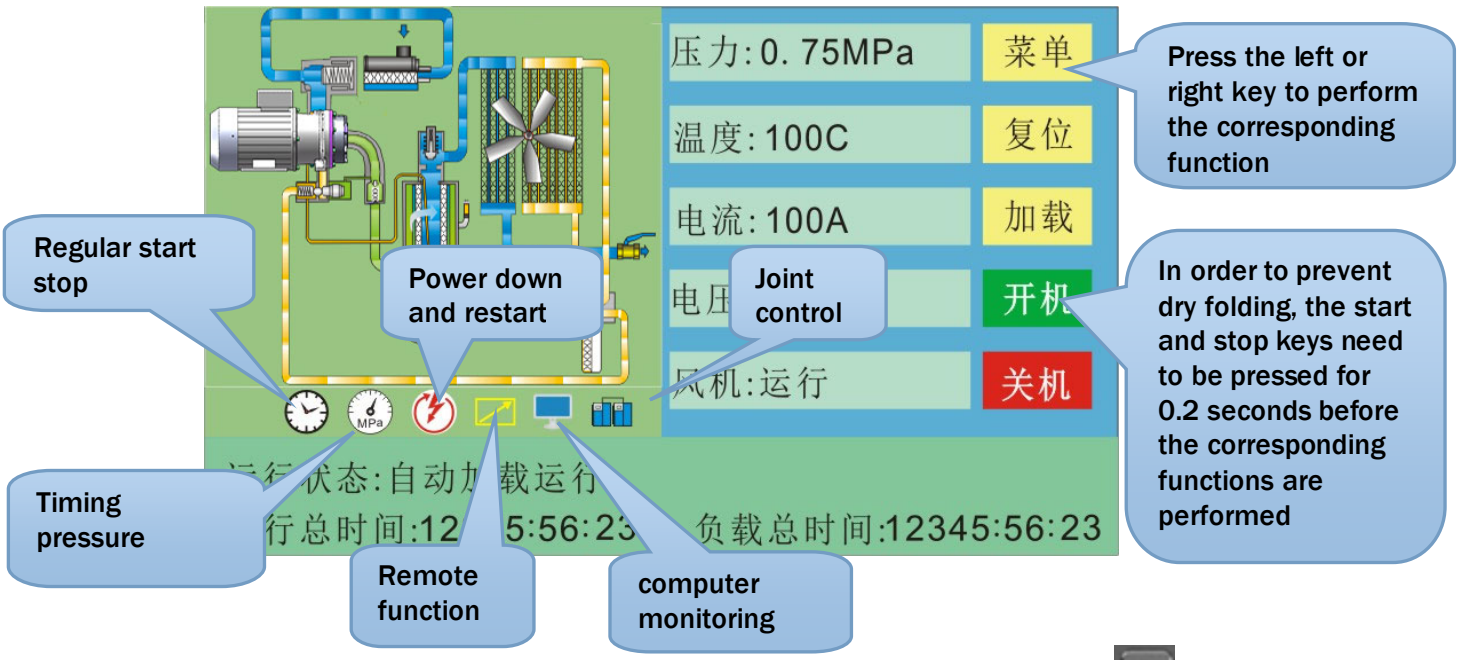
——Fault:

In case of early warning, the fault light will flash; in case of fault shutdown, the fault light will always be on, clear the fault, and turn off after reset.

4.1.3 Status display and operation

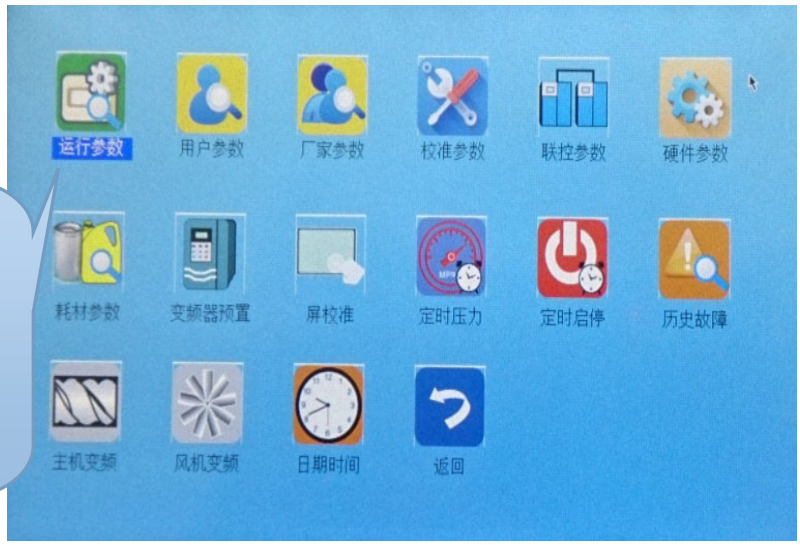
After the touch screen is powered on, the controller logo "mam-6080" will be displayed. After a period of delay, the following interface will be displayed.

After 5 seconds delay, the following operation parameter interface will be displayed:



The user can click the "menu" button on the display interface, or press "  " Enter the following menu selection interface, through which the user can enter the corresponding parameter viewing and setting interface.

The blue background indicates that the current interface focus is on this icon



The user can enter the relevant parameter interface by clicking the icon, or move the focus to the corresponding figure by pressing the mechanical key, and press the s key to enter the corresponding parameter

4.1.4 Operating parameters

Click "运行参数" to view the relevant data and settings of the following operation parameters:

menu	Set initial value	Function description
Service time of oil filter	0020H	Accumulated service time of oil filter
Service time of oil separator	0020H	Accumulated service time of oil separator
Service time of air filter	0020H	Accumulated service time of air filter
Service time of lubricating oil	0020H	Accumulated service time of lubricating oil
Service time of lubricating grease	0020H	Accumulated service time of lubricating grease
Factory code	00000000	Display factory code
supply voltage	0000V	Display supply voltage
Host current	A: 000.0A B: 000.0A C: 000.0A	Display host current

menu	Set initial value	Function description
Fan current	A: 000.0A B: 000.0A C: 000.0A	Display fan current
Engine speed	0000 RPM	Display the calculated real-time speed of the host according to the read frequency of the host
Host output frequency	000.0 Hz	Display the output frequency of the current host frequency converter
Main engine output current	000.0 A	Display the output current of the current host inverter.
Host output voltage	000.0 V	Display the output voltage of the current host inverter.
Host output power	000.0 Kw	Display the real-time output power of the current host inverter.
Power consumption of main engine this time	0000000.0Kw.H	According to the real-time power output by the host frequency converter, the display controller accumulates the power consumption of this operation.
Accumulated power consumption of main engine	0000000.0Kw.H	Display controller according to the real-time power output of the host inverter, the cumulative running power consumption.
pressure	00.00MPa	
Integral coefficient	00.00	
Host status word	0000	The controller will display the operation status register value read from the host inverter to the host status word display area.
Fault word	0000	The controller will display the fault status register value read from the host inverter to the fault word display area.

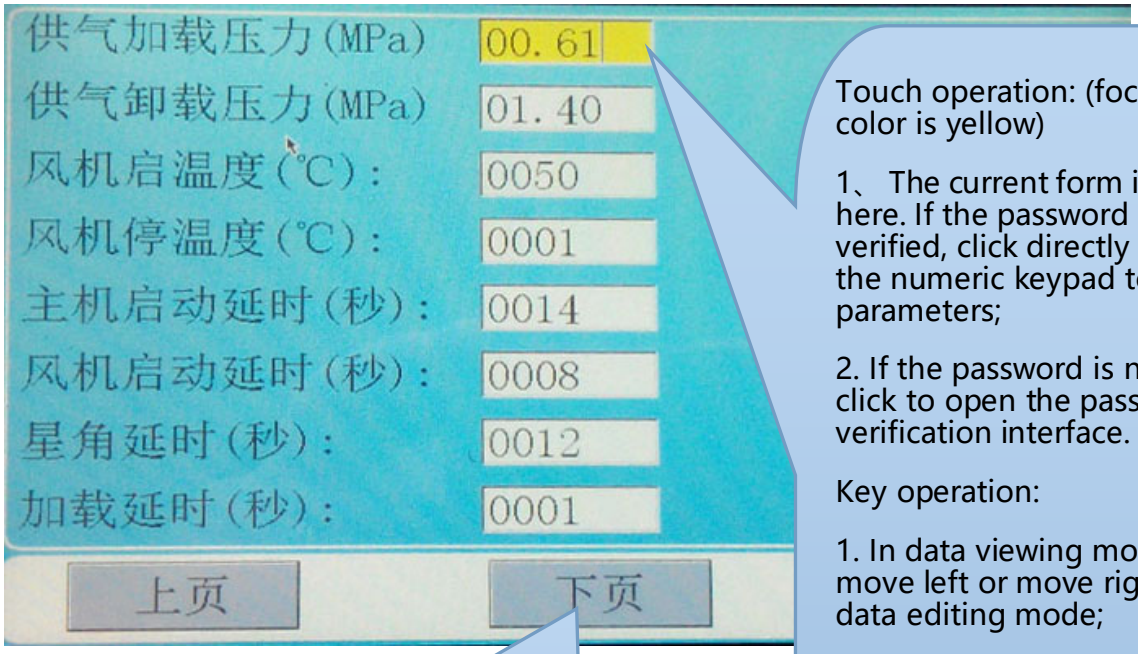
menu	Set initial value	Function description
Write frequency	000.0	The controller will display the frequency value of the host computer calculated by PID here.
Fan speed	0000 RPM	According to the read fan frequency, display the calculated fan real-time speed
Fan output frequency	000.0 Hz	Display the output frequency of the current fan frequency converter
Fan output current	000.0 A	Display the output current of the current fan frequency converter.
Fan output voltage	000.0 V	Display the output voltage of the current fan frequency converter.
Fan output power	000.0 Kw	Display the real-time output power of the current fan frequency converter.
Power consumption of fan	000000.00Kw.H	According to the real-time power output by the fan frequency converter, the display controller accumulates the power consumption of this operation.
Accumulated power consumption of fan	000000.00Kw.H	According to the real-time power output by the fan frequency converter, the cumulative operation power consumption of the display controller is accumulated.
Fan status word	0000	The controller will display the operation status register value read from the fan frequency converter to the fan status word display area.
Fault word	0000	The controller will display the fault status register value read from the fan frequency converter to the fault word display area.
Write frequency	000.0	The controller will display the frequency value obtained by PID operation to the display area of write frequency value.
date of production	0000-00-00	Show factory date
This operation	0000：00：00	Operation time of air compressor
This load	0000：00：00	This load time of air compressor
Software version	CK0000M0000	

menu	Set initial value	Function description
Check word 1	0000 3FFF	
Check word 2	7FFFFFFF_1	
Input port status	1 2 3 4 5 6 7 8 9 10 ● ● ● ● ● ● ● ● ● ● 1: Corresponding to the input state of No.5 switching value; 2: Corresponding to the input state of No.6 switch value; 3: Corresponding to the input state of No.7 switching value; 4: Corresponding to the input state of No. 8 switch value; 5: Corresponding to No.9 switching value input status; 6: Corresponding to the input state of No. 10 switch value; When the terminal is closed, the color of the circle in the input port state is Chinese red; when the terminal is disconnected, the color of the circle in the input port state is light red	
Output port status	1 2 3 4 5 6 7 8 9 10 ● ● ● ● ● ● ● ● ● ● 1: Corresponding to the relay output of terminal 17; 2: Corresponding to terminal 16 relay output; 3: Corresponding to terminal 15 relay output; 4: Corresponding to terminal 14 relay output; 5: Corresponding to terminal 13 relay output; 6: Corresponding to terminal 12 relay output When the terminal is closed, the circle color in the output port state is Chinese red; when the terminal is disconnected, the circle color in the output port state is light red	
Power frequency host ¢ UI	000000.0Kw	Display the product of real-time current and real-time voltage of the host sampled by the controller.

menu	Set initial value	Function description
Power consumption of power frequency host this time	0000000.0Kw.H	When the machine type is power frequency, the power consumption of the main motor in this operation calculated by the controller is displayed.(for reference only)
Accumulated power consumption of power frequency host	0000000.0Kw.H	Display the power consumption of the air compressor main engine calculated by the controller during power frequency operation.(for reference only)
Power frequency fan ¢ UI	000000.0Kw	Display the product of real-time fan current and real-time voltage sampled by the controller.
Power consumption of power frequency fan this time	000000.00Kw.H	When the fan is in power frequency operation, the power consumption of the fan in this operation calculated by the controller will be displayed.(for reference only)
Accumulated power consumption of power frequency fan	000000.00Kw.H	Display the power consumption of the air compressor fan calculated by the controller during power frequency operation.(for reference only)

4.1.5User parameters

User parameters are used to store the relevant data set by the air compressor user. When the user modifies the user parameters, the user password needs to be verified.



When the input focus is on the page feed button, press the "s" key to perform

Touch operation: (focus bottom color is yellow)

1、 The current form input focus is here. If the password has been verified, click directly to pop up the numeric keypad to modify the parameters;

2. If the password is not verified, click to open the password verification interface.

Key operation:

1. In data viewing mode, press move left or move right to enter data editing mode;

2. To view the data, press the down or up key to move the current focus to the next component.

3. In data editing mode, press up, middle and down to modify the current bit data;

4. In data editing mode, press the move left or right key to move the modification bit to the next data bit.

Main functions and functions are shown in the following table: (take GW-15DHY18 as an example)

menu	Set initial value	Function description
Air supply loading pressure (MPA)	01.30	1. When the loading mode is set to automatic and the air compressor is in the state of automatic unloading operation, the pressure is lower than this value to control the automatic loading operation of the air compressor. 2. When the air compressor is shut down for a long time, the pressure is lower than this value, the operation conditions are met, and the controller automatically starts the air compressor to run
Air supply unloading pressure (MPA)	01.60	1. The pressure is higher than this value, and it is in the loading operation state, to control the unloading operation of the air compressor. 2. The setting value of "air supply loading pressure" cannot be greater than this value, "air supply unloading pressure" is limited by "unloading pressure high limit" in the manufacturer's parameters.
Fan starting temperature (℃)	0096	When the air compressor is running, when the exhaust temperature is higher than the set value here, control the fan operation
Fan stop temperature (℃)	0088	When the air compressor is running, stop the fan when the exhaust temperature is lower than the setting value here
Host start delay (seconds)	0010	Set the starting time of the main motor and start timing when the main engine starts. In this time, the current overload of the main engine is not protected.
Fan start delay (s)	0003	Set the starting time of the fan, and start timing when the fan starts. In this time, the current overload of the fan is not protected.
Star angle delay (SEC)	0004	Start delay time of main engine star angle depressurization.
Load delay (seconds)	0002	After the main engine angle runs, the loading time is delayed.
Empty vehicle delay time (seconds)	0120	The longest continuous no-load operation time allowed for the air compressor. After this time, the air compressor will automatically stop running and enter the state of too long idle shutdown.
Shutdown delay (s)	0025	In case of normal shutdown, the air compressor will immediately run without load, and stop running after the set time of no-load operation.
Restart delay (seconds)	0060	After normal shutdown, too long idle shutdown or fault shutdown, it is necessary to delay the time set here before restarting the air compressor.
Drain on delay (s):	0002	Continuous drainage time (standby) for automatic drainage control

menu	Set initial value	Function description
Drainage closing delay (minutes):	0060	Drainage interval time (standby) for automatic drainage control
Soft start delay (seconds):	0006	After this delay time, enter the load delay time. (this parameter only works when the model is set to soft start)
Loading mode:	Auto / manual	Manual mode: automatic unloading when the pressure is higher than "unloading pressure"; in other cases, it is controlled by the loading and unloading key; Automatic mode: the controller automatically controls the loading and unloading of the air compressor according to the pressure and the set loading and unloading pressure.
Start stop mode:	Local / remote	Local mode: remote start terminal has no function Remote mode: remote start terminal function is effective **Note: when the hardware input terminal is set as "remote start enable", the start stop mode is determined by the hardware status.The terminal is remote when it is closed and local when it is disconnected. The setting here does not work.**
Operation mode:	Power frequency / soft start / main fan frequency conversion / fan frequency conversion / host frequency conversion	The user selects the air compressor model according to the demand.According to the selected model, refer to the corresponding electrical diagram for wiring.
postal address:	0001	When the communication mode is computer or linkage, the communication address of the controller.
Backlight brightness adjustment:	**0004**	Adjust the backlight brightness. The higher the value, the stronger the brightness.(level 1-7 brightness adjustable)
Communication mode:	Prohibition / linkage / computer	When it is set as forbidden, communication does not work; When it is set to communication, as a slave, it communicates with external devices according to Modbus RTU protocol, baud rate: 9600; data format: 8n1; check bit: even check When it is set as linkage, multiple air compressors can be networked for operation.
Pressure unit:	Mpa/PSI/BAR	If it is set to MPa, the parameter unit related to pressure is displayed as MPa. If it is set to PSI, the parameter unit related to pressure is displayed as psi.(spare) If it is set to bar, the parameter unit related to pressure will be displayed as bar.(spare)
Temperature unit:	℃/℉	If it is set to ℃, the parameter unit related to temperature will be displayed as ℃. If it is set to, the parameter unit related to temperature will be displayed as.(spare)

menu	Set initial value	Function description
Language selection:	Chinese / English	When it is set to Chinese, the display interface is Chinese; When it is set to English, the display interface is English; (standby)
User password:	****	Modifiable user password; can reset with old user password or manufacturer password
Sleep backlight brightness:	0000	It is used to set the brightness of backlight when the controller is operated by nobody for a long time.

4.1.6 Manufacturer's parameters

The manufacturer's parameters are used to store the relevant data set by the air compressor manufacturer. Users need to verify the manufacturer's password to view or modify the manufacturer's parameters.The operation method of parameter modification of manufacturer is the same as that of user.The main functions and functions are shown in the table below:

menu	Set initial value	Function description
Rated current of main engine (a):	23	If the current of the main machine is more than 1.2 times of the set value, the machine will be tripped according to the inverse time limit of overload.
Rated current of fan (a):	0.46	If the fan current is more than 1.2 times of the set value, the fan will be tripped according to the inverse time limit of overload.
Exhaust early warning temperature (℃):	0108	When the exhaust temperature is higher than the set temperature, warning prompt
Exhaust shutdown temperature (℃):	0113	When the exhaust temperature is higher than this set temperature, the fault stops
Warning temperature of front bearing (℃):	0105	When the front bearing temperature is higher than the set temperature, warning prompt (standby)
Front bearing shutdown temperature (℃):	0110	When the front bearing temperature is higher than this set temperature, the fault stops (standby)
Air supply shutdown pressure (MPA):	00.90	When the air supply pressure is higher than the set pressure, the fault stops
System shutdown pressure (MPA):	01.65	When the system pressure is higher than this set pressure, the fault stops
High limit of unloading pressure (MPA):	01.60	This item is the maximum value of "unloading pressure" in the user parameter, unloading pressure ≤ the set value here
Current unbalance:	0010	When (maximum phase current / minimum phase current) ≥ [1 + (set value / 10)], the unbalance protection will work, the air compressor will stop in case of fault, and the main engine will be reported as unbalanced. When the setting is ≥ 15, unbalanced protection is prohibited

menu	Set initial value	Function description
Phase failure protection time (seconds):	005.0	When the phase failure protection time is set ≥ 20 seconds, the phase failure protection function is prohibited.
Historical fault reset:	0000	Enter "8888" and confirm to clear the historical fault record
Warning too long shutdown (hour):	0000	Air compressor consumables warning, failure shutdown after exceeding the time set here.
Maximum usage time:	0000	When the accumulated running time of air compressor exceeds the set value here, and the air compressor is in shutdown state, the fault alarm displays "use error".
Factory password 2:		The manufacturer sets a password that can be modified.
Voltage too high (V):	0410	When the controller detects that the voltage is higher than the set value, it will shut down for protection and report that the voltage is too high. When set to 0000, the over voltage function is invalid.
Voltage too low (V):	0350	When the controller detects that the voltage is lower than the set value, it will stop the machine for protection and report that the voltage is too low, When set to 0000, the undervoltage function is invalid.
Communication timeout (seconds):	002.0	The timing starts when the controller sends the first byte. If no response from the frequency converter is received within this time, the controller determines that the timeout occurs, and then sends the command data again
Lost communication (seconds):	0020	The controller does not receive the correct data continuously for more than the set time, and the communication is interrupted.
Communication recovery:	0015	After the communication is interrupted, the correct data is received continuously more than the set number of times, and it is considered that the communication is restored to normal.
Timing start stop function:	On / off	Set to on: the timing start stop function is effective. Set as forbidden: the timing start stop function has no function.
Timing pressure function:	On / off	Set to on: timing pressure function is effective. Set to disable: the timing pressure function has no function.
Total running time:	000100Hour: 00	Modify the total running time of the air compressor.
Total load time (H):	000100Hour: 00	Modify the total load time of the air compressor.
Low temperature protection (℃):	-0050	When the machine is started, the temperature is detected to be lower than the set value, indicating that the temperature is too low, and the machine is not allowed to start; After 2 minutes of start-up, the temperature is detected to be lower than the set value, and the temperature sensor is reported to be out of order and shut down.

menu	Set initial value	Function description
Power down restart function:	On / off	Set whether to turn on the power-off restart function.
Power factor of power frequency host:	0.000	Sets the factor used to calculate the host power.
Main machine power consumption (kW. H):	0000000.0	Set and modify power consumption of power frequency host.
Power factor of power frequency fan:	0.000	Sets the factor used to calculate the fan power.
Power consumption of fan power frequency (kW. H):	0000000.0	Set and modify power consumption of power frequency fan.
Frequency selection:	50HZ/60HZ	Set the power frequency.
Oil differential pressure early warning (MPA):	00.15	When the air compressor is loaded and running, when the air supply pressure and the oil-gas barrel pressure are both greater than 0.5MPa, and the system detects that the oil-gas barrel pressure exhaust pressure pipeline pressure resistance > differential pressure warning value, the system gives an early warning
Oil differential pressure shutdown (MPa):	00.20	When the air compressor is loaded and running, when the air supply pressure and oil-gas barrel pressure are both greater than 0.5MPa, and the system detects that the oil-gas barrel pressure exhaust pressure pipeline pressure resistance > differential pressure shutdown value, the system stops
Pipeline pressure resistance (MPa):	00.05	Pipeline piezoresistance
Warning temperature of rear bearing (℃):	0000	When the temperature of rear bearing is higher than the set temperature, warning prompt (standby)
Shutdown temperature of rear bearing (℃):	0000	When the temperature of the rear bearing is higher than this set temperature, the fault stops (standby)
Factory No.:		Factory number
date of production:		date of production

4.1.7 Joint control parameters

Joint control parameters are used to set the related functions of joint control.Before users modify the joint control parameters, they need to verify the password of the joint control parameters.The main functions and functions are shown in the table below:

menu	Set initial value	Function description
Number of	0002	When the joint control is running, the

linkage:		number of air compressors in the joint control network.
Linkage loading pressure (MPA)	00.63	During joint control operation, when the host pressure is lower than the set pressure here, load or start a machine from the joint control network
Linkage unloading pressure (MPA)	00.78	When the pressure of the main engine is higher than the set pressure, find a machine on the joint control network to unload or shut down
Linkage delay time (seconds):	0020	When the joint control is running, the waiting time for the host to send the control command twice in a row.
Rotation time (min):	0060	The main engine pressure is between the "linkage loading" and "linkage unloading" pressures. In the network, there are machines running and machines shutting down. After this setting time lasts for one time, the main engine sends the shutdown instruction to the running machine and the startup instruction to the shutting down machine.
Linkage network:	power frequency-power frequency Frequency conversion power frequency Frequency conversion - frequency conversion	Power frequency - power frequency: used for joint control of power frequency air compressor and power frequency air compressor; Frequency conversion power frequency: used for joint control of frequency conversion air compressor and power frequency air compressor; Frequency conversion - frequency conversion: used for joint control of frequency conversion air compressor and frequency conversion air compressor.

4.1.8 consumable parameters

Consumable parameters are used to set the consumable time.The user needs to verify the consumables password before viewing or modifying the consumables parameters.The main functions and functions are shown in the table below:

menu	Set initial value	Function description
Service time of oil filter (hour)	0000	The accumulated service time of oil filter shall be cleared manually after the new oil filter is replaced.
Service time	0000	The accumulated service time of the oil

menu	Set initial value	Function description
of oil separator (H)		separator shall be manually reset after the new oil separator is replaced.
Service time of air filter (hour)	0000	The accumulated service time of air filter shall be manually reset after replacement of new air filter.
Service time of lubricating oil (hour)	0000	The accumulated service time of lubricating oil shall be cleared manually after changing lubricating oil.
Service time of lubricating grease (hour)	0000	The accumulated service time of lubricating grease shall be cleared manually after the replacement of lubricating grease.
Maximum use of oil filter (hour)	1000	1.When the cumulative service time of the oil filter exceeds the set value here, the controller will give an early warning; 2.When it is set to "0000", oil filter warning function is prohibited
Maximum use of oil separator (hour)	1000	1.When the cumulative service time of the oil separator exceeds the set value here, the controller will give an early warning; 2.When it is set to "0000", the early warning function of oil separator is prohibited
Maximum use of air filter (hour)	1000	1.When the cumulative service time of air filter exceeds the set value here, the controller will give an early warning; 2.When it is set to "0000", the air filter warning function is prohibited
Maximum use of lubricating oil (hour)	1000	1.When the cumulative use time of lubricating oil exceeds the set value here, the controller will give an early warning; 2.When it is set to "0000", the lubricating oil warning function is prohibited
Maximum use of lubricating grease (hour)	1000	1.When the accumulated use time of lubricating grease exceeds the set value here, the controller will give an early warning; 2.When it is set to "0000", the grease warning function is prohibited

4. 1.9 screen calibration

Screen calibration is used to calibrate screen operation accuracy.The user needs to verify the screen calibration password before entering the screen calibration.

After entering the screen calibration interface, click a, B, C, D, e with fingertips or other pointed tools in turn. If the desired effect is achieved, click confirm, and the controller will restart to save the settings; if the desired effect is not achieved, click recalibrate, and recalibrate according to the previous method until the desired effect is achieved.

4.1.10Timing pressure

The timing pressure is used to set the timing pressure value.Before users modify the timing pressure parameters, they need to verify the timing pressure password.The main functions and functions are shown in the table below:

menu	Set initial value	Function description
Loading pressure (MPa)	00.65	When the time is between "pressure opening time" and "pressure end time", the pressure is loaded below this set value.
Unloading pressure (MPa)	00.80	When the time is between "pressure opening time" and "pressure end time", the pressure will unload higher than this setting value.
Variable frequency working pressure (MPA)	00.70	When the time is between "pressure opening time" and "pressure ending time", set the air supply pressure when the variable frequency air compressor operates stably. When the pressure fluctuates near this pressure, the controller adjusts the frequency of the inverter operation, so as to make the air supply pressure close to the set value here.(this parameter only works when the machine type is set as the frequency conversion of the main machine or the frequency conversion of the main fan)
Pressure start time	00:00	When this time is not "00:00", the above setting function is activated, otherwise it is forbidden.
Pressure end time	00:00	When this time is not "00:00", the pressure end function is activated when the above settings are set, otherwise it is forbidden.

4.1.11 Regular start stop

Timing start stop is used to set the timing on / off time of a week. Four timing on / off times can be set every day.The user needs to verify the timing start stop password before modifying the timing start stop time.When the data is set to 00:00, the corresponding function does not work.

4.1.12 Historical failure

Record the historical fault information to facilitate the user to find out the cause of the fault and eliminate the peripheral fault.The controller can record up to 100 historical faults.

4.1.13 Host frequency conversion

Host frequency conversion is used to set host frequency conversion parameters.The user needs to verify the host frequency conversion password before modifying the host frequency conversion parameters.The main functions and functions are shown in the table below:

menu	Set initial value	Function description
Frequency conversion pressure of main engine (MPA)	01.60	Set the air supply pressure when the variable frequency air compressor operates stably. When the pressure fluctuates near this pressure, the controller adjusts the frequency of the inverter operation, so as to make the air supply pressure close to the set value here.(this parameter only works when the machine type is set as the frequency conversion of the main machine or the frequency conversion of the main fan)
Rising rate of main engine	1000	When PID is adjusted, it is used to limit the increment of each PID operation result.In order to prevent the excessive increase of frequency during the operation of air compressor, the motor speed will increase too fast.
Host descent rate	1000	When PID is adjusted, it is used to limit the decrement of each PID operation result.To prevent excessive frequency reduction during the operation of the air compressor, resulting in too fast reduction of the motor speed.
Host power (kw)	011.0	Set the rated power of the motor, which is used to calculate the actual power of the motor when the motor is in variable frequency operation (this parameter only works when the machine type is set as the main machine variable frequency or the main fan variable frequency)
Engine speed (RPM)	2919	Set the rotation speed when the motor works at the highest frequency, which is used to calculate the actual rotation speed when the motor works with frequency conversion.(this parameter only works when the machine type is set as the frequency conversion of the main machine or the frequency conversion of the main fan)
Initial value of main engine integral	0080	When the detection pressure is less than (set working pressure - integral range), the integral is calculated based on the set value; When the detection pressure is > (set working pressure + integral range), the integral is calculated with this set value
Integral range of main engine (MPA)	00.05	During frequency conversion operation, when (set working pressure integral range) < detection pressure < (set working pressure + integral range), the integral gain plays a role
Power factor of frequency conversion host	0.000	Sets the factor used to calculate the host power.

menu	Set initial value	Function description
Host proportional gain	0025	Tracking set work pressure fast and slow, value tracking fast, easy to oscillate; value tracking slow, slow adjustment.
Host integral gain	0030	When the value is large, the tracking speed is fast, and the steady-state error is small; when the value is small, the tracking speed is slow, and the steady-state error is large.
Host differential gain	0000	It is mainly used for lag tracking of large-scale systems (such as temperature, etc.), which is generally not used, and is set as "0000".
Upper limit of host frequency (Hz)	050.0	Maximum allowable output working frequency of air compressor when it is loaded
Lower limit of host frequency (Hz)	030.0	During the regulation, when the pressure exceeds the set working pressure but does not reach the unloading pressure, the minimum allowable output working frequency
No load frequency of main engine (Hz)	025.0	Allowable output working frequency of air compressor at no load
Host frequency converter station No	001	Set the station number of the host frequency converter, which should be consistent with the communication station number of the frequency converter.
Host PID cycle (seconds)	000.8	At the time interval set by the controller, PID operation is carried out once to adjust the speed of the main engine.
Main engine frequency converter model	Z2000	The controller can pre store up to 10 different types of converter communication addresses (Communication reads the converter parameters, the converter needs to support Modbus RTU protocol)
Main engine shutdown mode	Slow down / free stop	1. when the starting mode of main frequency converter is set as communication start stop: Slow down shutdown: when the shutdown mode in the manufacturer's parameters is set as slow down shutdown, after the controller receives the shutdown command, the loading valve is disconnected, the controller sends the slow down shutdown command to the frequency converter, and the frequency converter slows down the

menu	Set initial value	Function description
		shutdown according to the set deceleration time Free stop: when the stop mode in the manufacturer's parameters is set as free stop, after the controller receives the stop command, the loading valve is disconnected, and the controller sends the write frequency command through the 485 communication port to control the frequency reduction of the frequency converter until the stop delay countdown is completed, and sends the stop command to the frequency converter one second before the completion of the stop delay countdown. 2. when the starting mode of the main frequency converter is set as terminal start stop: Slow down shutdown: when the shutdown mode in the manufacturer's parameters is set as slow down shutdown, after the controller receives the shutdown command, the loading valve is disconnected, the operation terminal of the main engine frequency converter is disconnected, and the frequency converter slows down shutdown according to the set deceleration time Free shutdown: when the shutdown mode in the manufacturer's parameters is set as free shutdown, after the controller receives the shutdown command, the loading valve is disconnected, the operation terminal of the main engine frequency converter is kept closed, and the frequency of the frequency converter is controlled to decrease until the shutdown delay countdown is completed.
Starting mode of main frequency converter	Communication start stop / terminal start stop	Communication start stop: start the frequency converter through RS485 communication. Terminal start and stop: start and stop the frequency converter through the switching value. be careful: 1: the setting parameters of the controller shall be consistent with the start stop mode of the frequency converter. 2: when the user needs frequency conversion, terminal 12 is the input control terminal of the frequency converter, and the controller can only start and stop the frequency converter by communication.

menu	Set initial value	Function description
Frequency of communication start frequency converter	06	After the controller sends the start command to the frequency converter, it is found that the frequency converter does not execute the operation command, and the set number of start commands can be sent repeatedly at most.
Frequency of communication stop frequency converter	06	After the controller sends the stop command to the converter, it is found that the converter does not execute the stop command, and the set number of times stop command is sent repeatedly at most.
Power consumption of frequency conversion host (kW. H)	0000000.0	Set the cumulative power consumption of the host frequency conversion operation
Pre open main engine frequency converter delay (s)	001.0	After pressing the start key, delay the setting time and send the start command to the frequency converter.
Integral gain 2	0000	When the value is large, the tracking speed is fast, and the steady-state error is small; when the value is small, the tracking speed is slow, and the steady-state error is large.
Integral gain 2 range (MPA)	00.00	Set the action range of integral gain 2.
Constant power pressure 1 (MPA)	0.60	When it is used for constant power operation, when it is detected that the pressure is greater than or equal to the setting value here, the output frequency can be output to the setting value of "constant power frequency 1" at most.
Constant power pressure 2 (MPA)	0.70	When it is used for constant power operation, when it is detected that the pressure is greater than or equal to the setting value here, the output frequency can be output to the setting value of "constant power frequency 2" at most.
Constant power pressure 3 (MPA)	0.80	When it is used for constant power operation, when the pressure is detected to be greater than or equal to the setting value here, the output frequency can be at most allowed to output to the setting value of "constant power frequency 3".
Constant power pressure 4 (MPA)	0.90	When it is used for constant power operation, when the pressure is detected to be greater than or equal to the set value here, the output frequency can be output to the set value of "constant power frequency 4" at most.
Constant power pressure	1.00	When it is used for constant power operation, when it is detected that the

menu	Set initial value	Function description
5 (MPA)		pressure is greater than or equal to the setting value here, the output frequency can be output to the setting value of "constant power frequency 5" at most.
Constant power pressure 6 (MPA)	1.10	When it is used for constant power operation, when the pressure is detected to be greater than or equal to the set value here, the output frequency can be output to the set value of "constant power frequency 6" at most.
Constant power pressure 7 (MPA)	1.20	When it is used for constant power operation, when it is detected that the pressure is greater than or equal to the setting value here, the output frequency can be output to the setting value of "constant power frequency 7" at most.
Constant power frequency 1 (Hz)	180.0	See Note 1 after the table:
Constant power frequency 2 (Hz)	160.0	
Constant power frequency 3 (Hz)	140.0	
Constant power frequency 4 (Hz)	120.0	
Constant power frequency 5 (Hz)	100.0	
Constant power frequency 6 (Hz)	80.0	
Constant power frequency 7 (Hz)	60.0	
Integral coefficient	00.00	
Frequency reduction	000.0	
Low frequency shutdown delay (s)	0000	Set to 0 seconds, low frequency function is invalid

Note 1: for constant power control:

Constant power pressure 1 < = constant power pressure 2 < = constant power pressure 3 < = constant power pressure 4 < = constant power pressure 5 < = constant power pressure 6 < = constant power pressure 7

Note 2: constant power frequency 1 > = constant power frequency 2 > = constant power frequency 3 > = constant power frequency 4 > = constant power frequency 5 > = constant power frequency 6 > = constant power frequency 7

Note 3: if M > N, when constant power pressure n is set to 00.00, constant power pressure m and corresponding constant power frequency m will not work.

Note 4: when the user does not need to use the constant power function, the constant power pressure 1 can be set to 00.00mpa.

4.1.14 Fan frequency conversion

Fan frequency conversion is used to set fan frequency conversion parameters.The user needs to verify the fan frequency conversion password before modifying the fan frequency conversion parameters.The main functions and functions are shown in the table below:

menu	Set initial value	Function description
Fan frequency conversion temperature (℃)	0078	Set the exhaust temperature when the air compressor operates stably. When the exhaust temperature fluctuates near this value, the controller adjusts the fan frequency converter operation frequency to make the exhaust temperature close to the set value here.(this parameter only works when the model is set as fan frequency conversion or main fan frequency conversion)
Maximum frequency conversion temperature (℃)	0085	When the exhaust temperature is greater than or equal to this value, control the output frequency of the fan frequency converter, which is the upper limit value of the frequency set in the manufacturer's parameters. (this parameter only works when the model is set as fan frequency conversion or main fan frequency conversion.)
Fan rise rate	1000	When PID is adjusted, it is used to limit the increment of each PID operation result.To prevent excessive frequency increase during fan operation, resulting in excessive fan speed increase.
Fan lowering rate	1000	When PID is adjusted, it is used to limit the decrement of each PID operation result.To prevent excessive frequency reduction during the operation of air compressor, resulting in too fast fan

		speed reduction.
Rated power of fan (kw)	001.5	Set the rated power of the fan, which is used to calculate the actual power of the fan when the fan frequency conversion works (this parameter only works when the machine type is set as fan frequency conversion or main fan frequency conversion)
Rated speed of fan (RPM)	1500	Set the corresponding speed when the fan operates at the highest frequency, which is used to calculate the actual speed of the motor when the motor operates with frequency conversion.(this parameter only works when the model is set as fan frequency conversion or main fan frequency conversion)
Variable frequency fan start (℃)	0070	When the exhaust temperature is higher than the set value, the variable frequency fan will start. (this parameter only works when the model is set as fan variable frequency or main fan variable frequency)
Frequency conversion fan stop (℃)	0065	When the exhaust temperature is lower than the set value, the variable frequency fan will stop. (this parameter only works when the model is set as fan frequency conversion or main fan frequency conversion.)
Fan integral initial value	0020	When the detection temperature is less than (set the working temperature of frequency conversion - integral range), the integral is calculated based on the set value; When the detection temperature is > (set the frequency conversion working temperature + integral range), the integral is calculated with this set value
Integral range of fan (℃)	0005	(set working temperature of frequency conversion - integral range) < detection temperature < (set working temperature of frequency conversion + integral range) integral gain plays a role. Outside this range, initial value of integral plays a role
Fan proportional gain	0100	Tracking set the working temperature fast and slow, the value of large tracking fast, easy to oscillate; the value of small tracking slow, slow adjustment.
Fan integral gain	0020	When the value is large, the fast and steady-state error is small; when the

		value is small, the steady-state error is large.
Fan differential gain	0000	Generally, it is not used. It is set to "0000".
Upper limit of fan frequency (Hz)	050.0	In the process of regulation, when the temperature exceeds the working temperature of frequency conversion, the maximum working frequency allowed to be output
Lower limit of fan frequency (Hz)	010.0	In the process of regulation, when the temperature is lower than the set frequency conversion working temperature, the minimum working frequency allowed to be output
Power factor of variable frequency fan	0.900	Calculation of power factor of variable frequency fan
Fan frequency converter station No	002	Set the corresponding fan frequency converter communication station number.
Fan PID cycle (SEC)	001.5	At the time set by the controller interval, PID operation is carried out once to adjust the fan speed.
Fan frequency converter model	ATV31	Select the built-in converter protocol.
Starting mode of fan frequency converter	Communication start stop / terminal start stop	Set the starting mode of fan frequency converter
Power consumption of variable frequency fan (kW. H)	000000.00	Power consumption of variable frequency fan
Integral coefficient	00.00	

4.2 Alarm and fault

When the controller detects the following faults, it will give an alarm without shutdown, and the LCD screen will display the corresponding fault name.And the LCD backlight flashes, the buzzer rings, and the display returns to normal after the fault is eliminated.

Table 4-2 list of light faults

No	Warning fault name	Example of handling method	Examples of failure causes
1	Overdue use of air filter	Replace the filter and set the filter service time to zero	The use time of the controller exceeds the set allowable use time

2	Overdue use of oil gas separator	Replace the separator and set the service time of oil gas separator to zero	The use time of the controller exceeds the set allowable use time
3	Overdue use of oil filter	Replace the filter and set the service time of the oil filter to zero	The use time of the controller exceeds the set allowable use time
4	Overdue use of lubricating oil	Replace the lubricating oil and set the service time of lubricating oil to zero	The use time of the controller exceeds the set allowable use time
5	High exhaust temperature (warning)	High ambient temperature, lack of oil?Fan damaged?	The corresponding input point of the controller is on

Stop when the following faults are detected.The LCD displays the corresponding fault name.And the buzzer rings.After the fault is eliminated, the display returns to normal, the buzzer continues to beep, press F2 to reset, and the buzzer stops beeping.

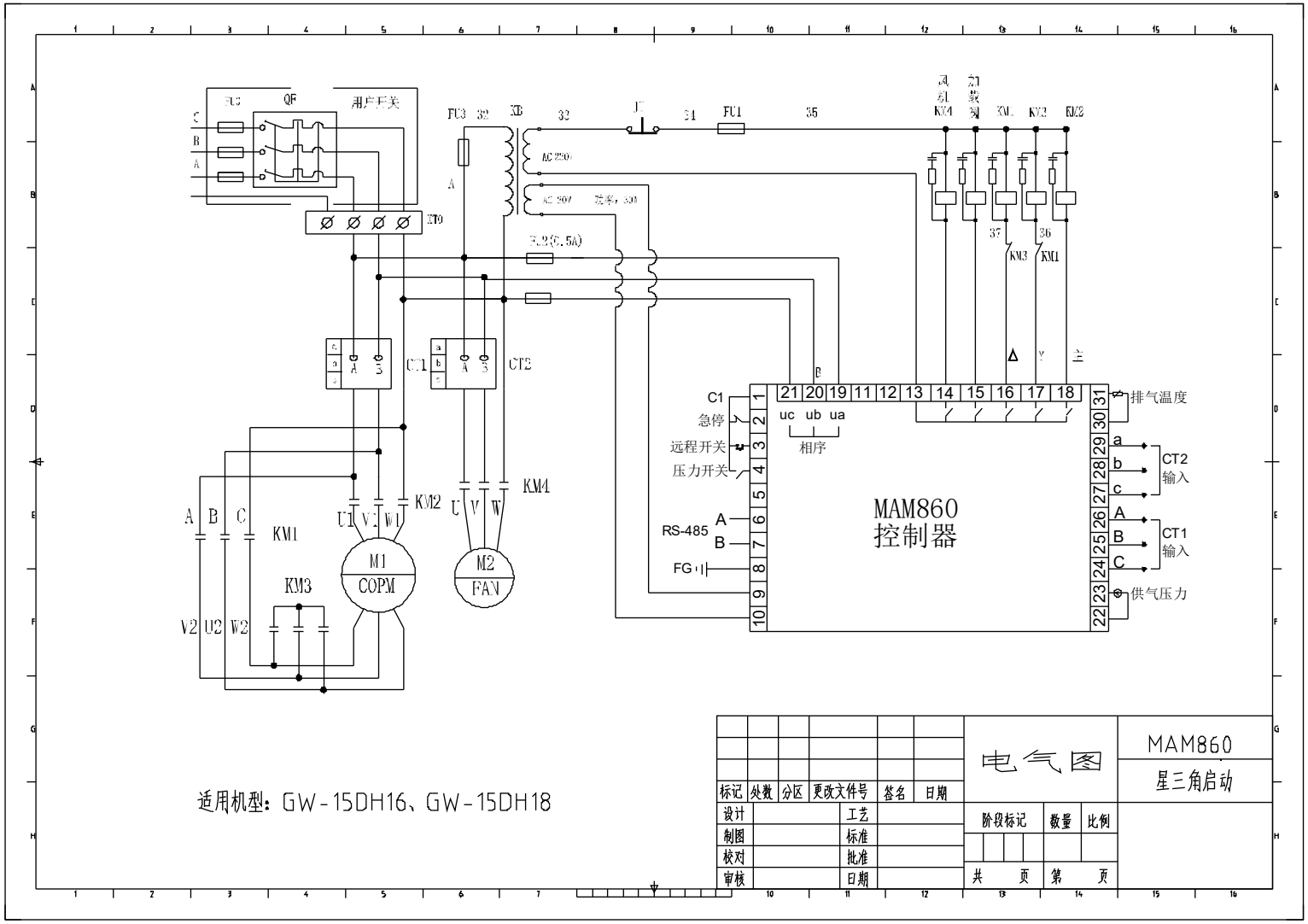
Table 4-3 list of major faults

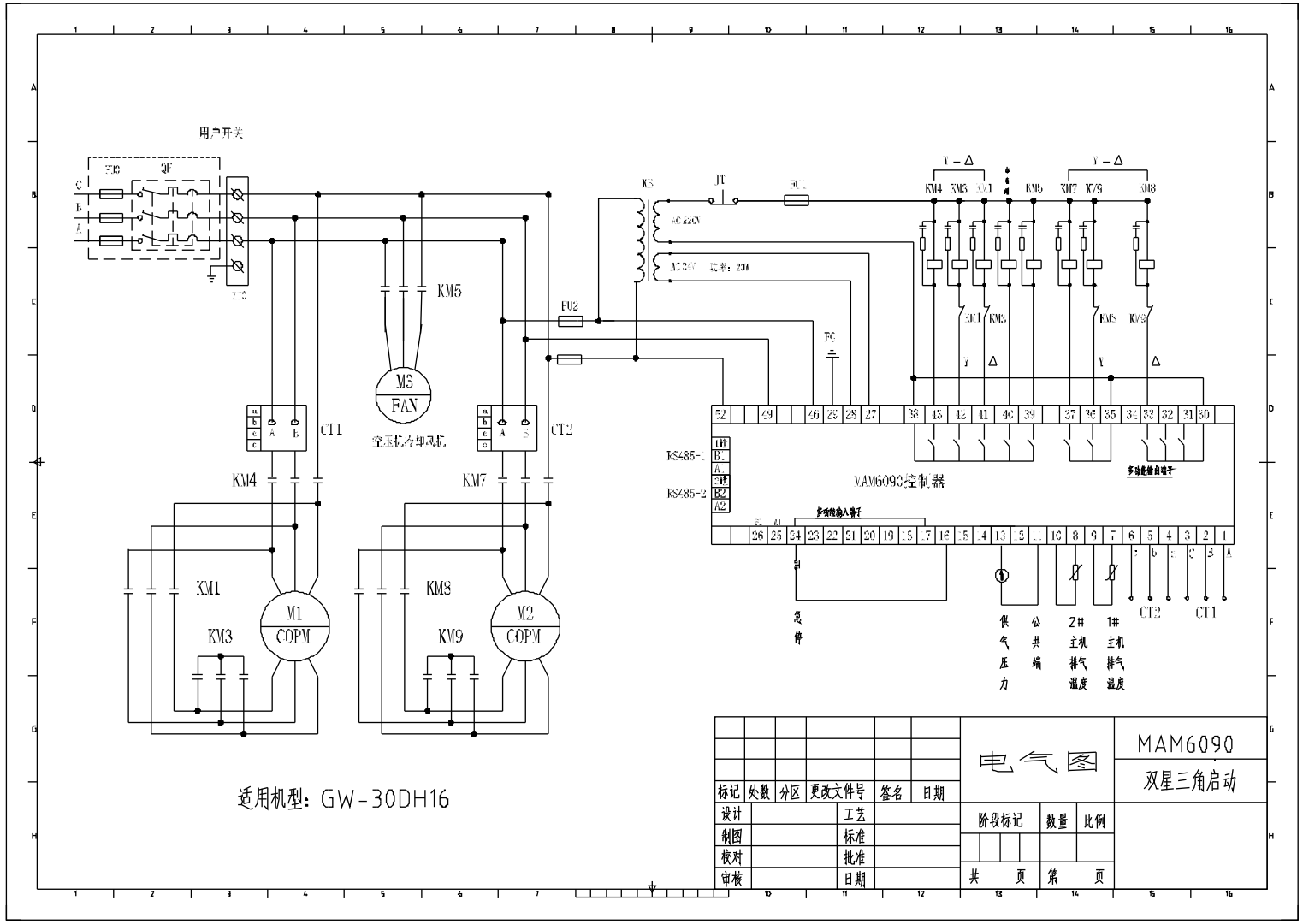
No	Shutdown fault name	Example of handling method	Examples of failure causes
1	High exhaust pressure	Refer to the troubleshooting table in the air compressor manual	Pressure above max pressure detected / pressure sensor fault / pressure sensor drift not calibrated
2	High exhaust temperature	Refer to the troubleshooting table in the air compressor manual	Over temperature detected / over temperature protection contact open
3	Main engine current overload	Refer to the troubleshooting table in the air compressor manual, check and remove the fault, and then restart the machine for observation	The current exceeds the rated current and lasts for a period of time
4	Fan current overload	Refer to the troubleshooting table in the air compressor manual, check and remove the fault, and then restart the machine for observation	The current exceeds the rated current and lasts for a period of time
5	Phase imbalance	Check the three-phase voltage; remove the large single-phase load on the line; replace the broken motor	Too large difference of AB phase current detection value

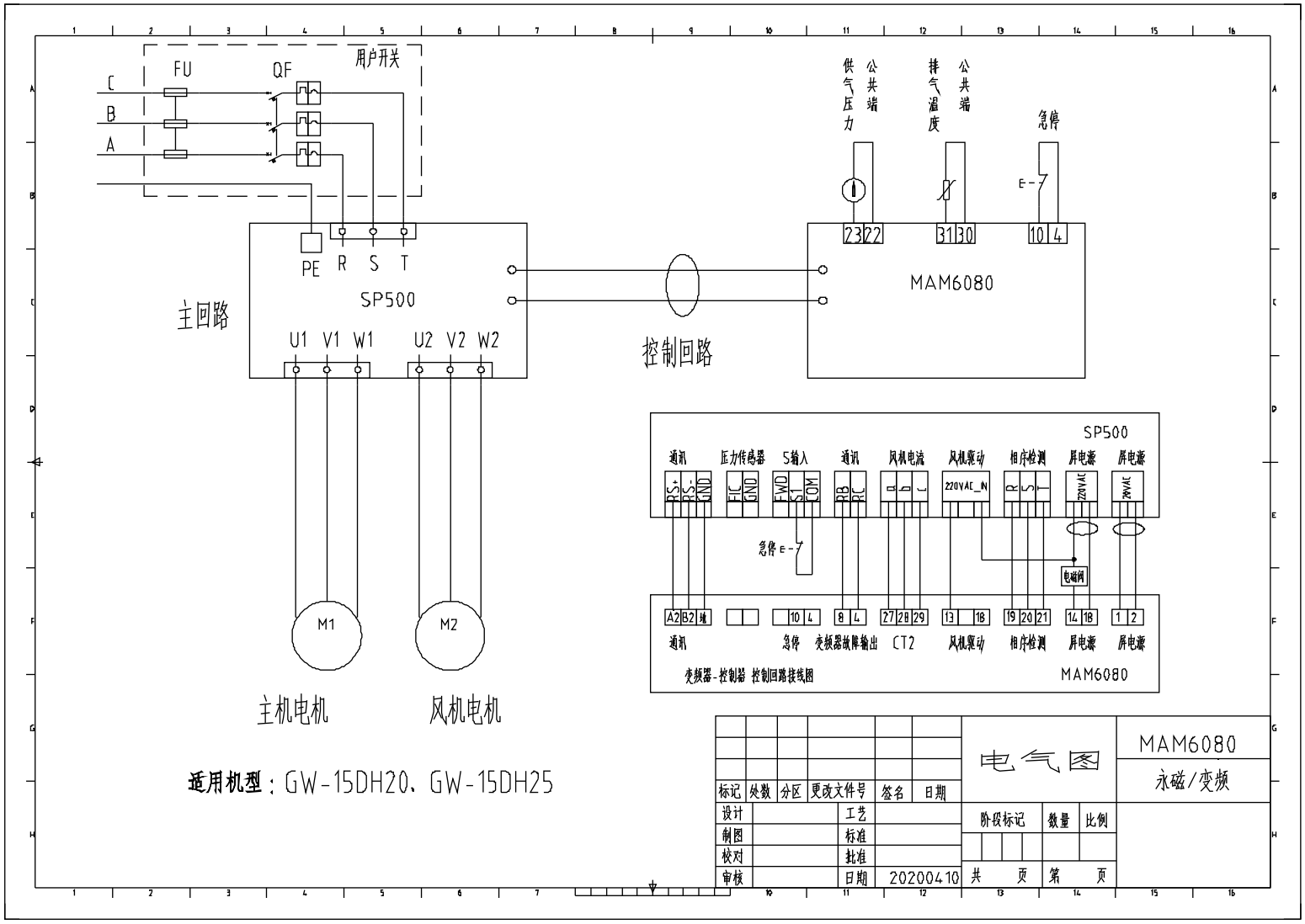
No	Shutdown fault name	Example of handling method	Examples of failure causes
6	Phase sequence error	Any two-phase exchange of power incoming line	The three-phase sequence of power incoming line ABC is different from that of motor ABC
7	Lack of phase	A. Phase B current is zero	Check whether the motor and circuit, such as contactor contact, are conductive
8	Temperature sensor failure	Is the temperature sensor short, open	Replace sensor
9	High temperature jump	Is the temperature sensor signal wire short circuited to the shield	Replace sensor
10	Pressure sensor failure	Is the pressure sensor short, open	Replace sensor
11	Operation time overdue	Procedural issues	Consult the manufacturer

After the alarm, if the buzzer beeps for more than 10 minutes, stop beeping.

4.3 Electrical schematic diagram




用户开关
KM5
M3
FAN
KM4
KM7
KM1
KM3
KM8
KM9
M1
COPM
M2
COPM
CT1
CT2
MAM6093控制器
适用机型：GW-30DH16
电气图
MAM6090
双星三角启动


用户开关
FU
QF
C
B
A
PE R S T
SP500
主回路
U1 V1 W1 U2 V2 W2
M1
M2
主机电机
风机电机
控制回路
供气压力
公共端
排气温度
公共端
急停
E-7
23 22
31 30
10 4
MAM6080
SP500
通讯
压力传感器
S输入
通讯
风机电流
风机驱动
相序检测
屏电源
屏电源
RS+ RS- GND
FIC GND
FWD ST COM
RB RA
A B C
220VAC_IN
R S T
220VAC
24VAC
急停 E-7
电磁阀
A2 B2 地
10 4
8 4
27 28 29
13 18
19 20 21
14 18
1 2
通讯
急停
变频器故障输出
CT2
风机驱动
相序检测
屏电源
屏电源
变频器-控制器 控制回路接线图
MAM6080
适用机型：GW-15DH20、GW-15DH25
标记 处数 分区 更改文件号 签名 日期
设计 工艺
制图 标准
校对 批准
审核 日期 20200410
电气图
MAM6080
永磁/变频
阶段标记 数量 比例
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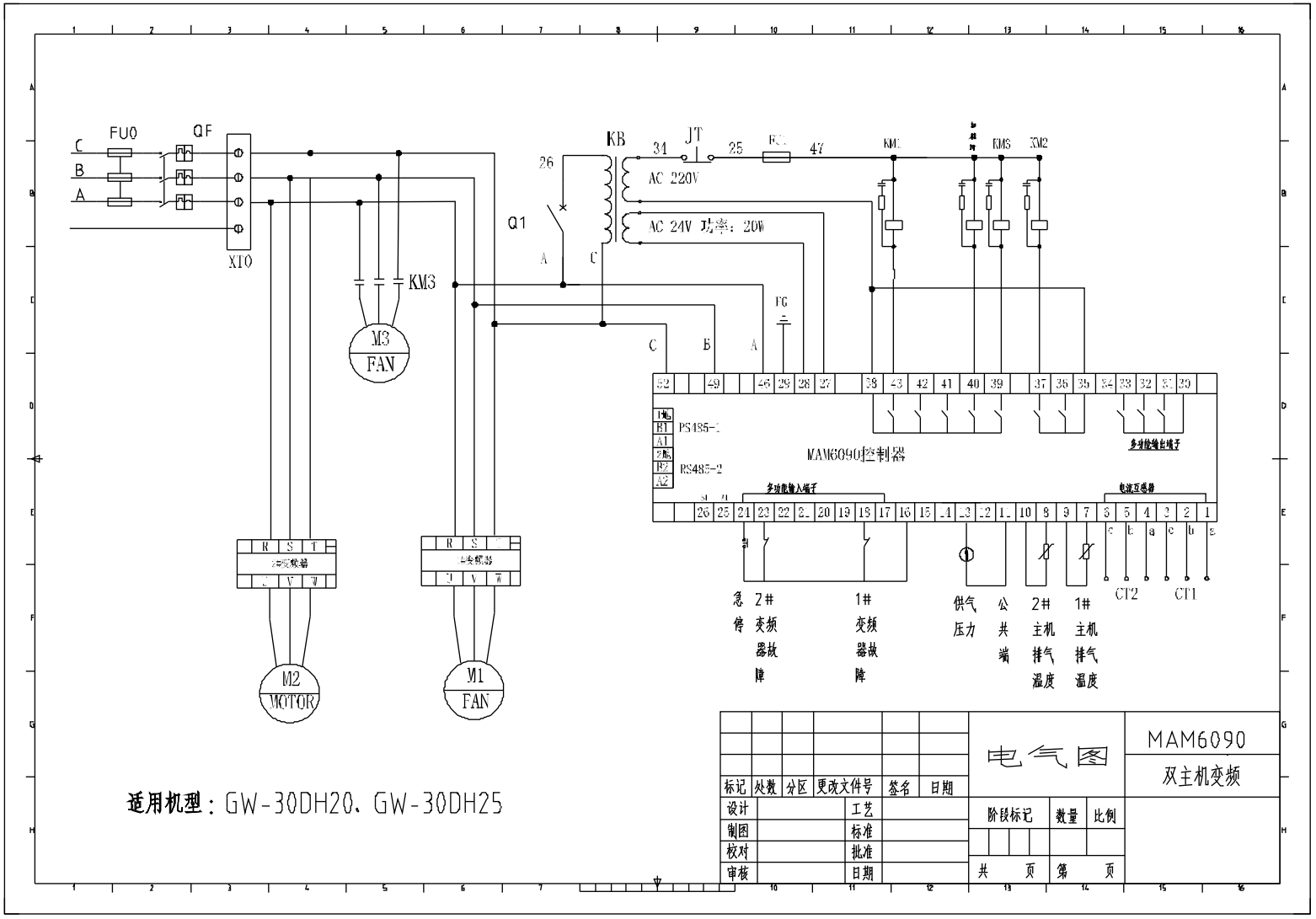
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QF
C
B
A
XT0
KB
JT
AC 220V
AC 24V 功率：20W
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KM3
M3
FAN
M2
MOTOR
M1
FAN
MAM6090控制器
RS485-1
RS485-2
急停
2#变频器故障
1#变频器故障
供气压力
公共端
2#主机排气温度
1#主机排气温度
CT2
CT1
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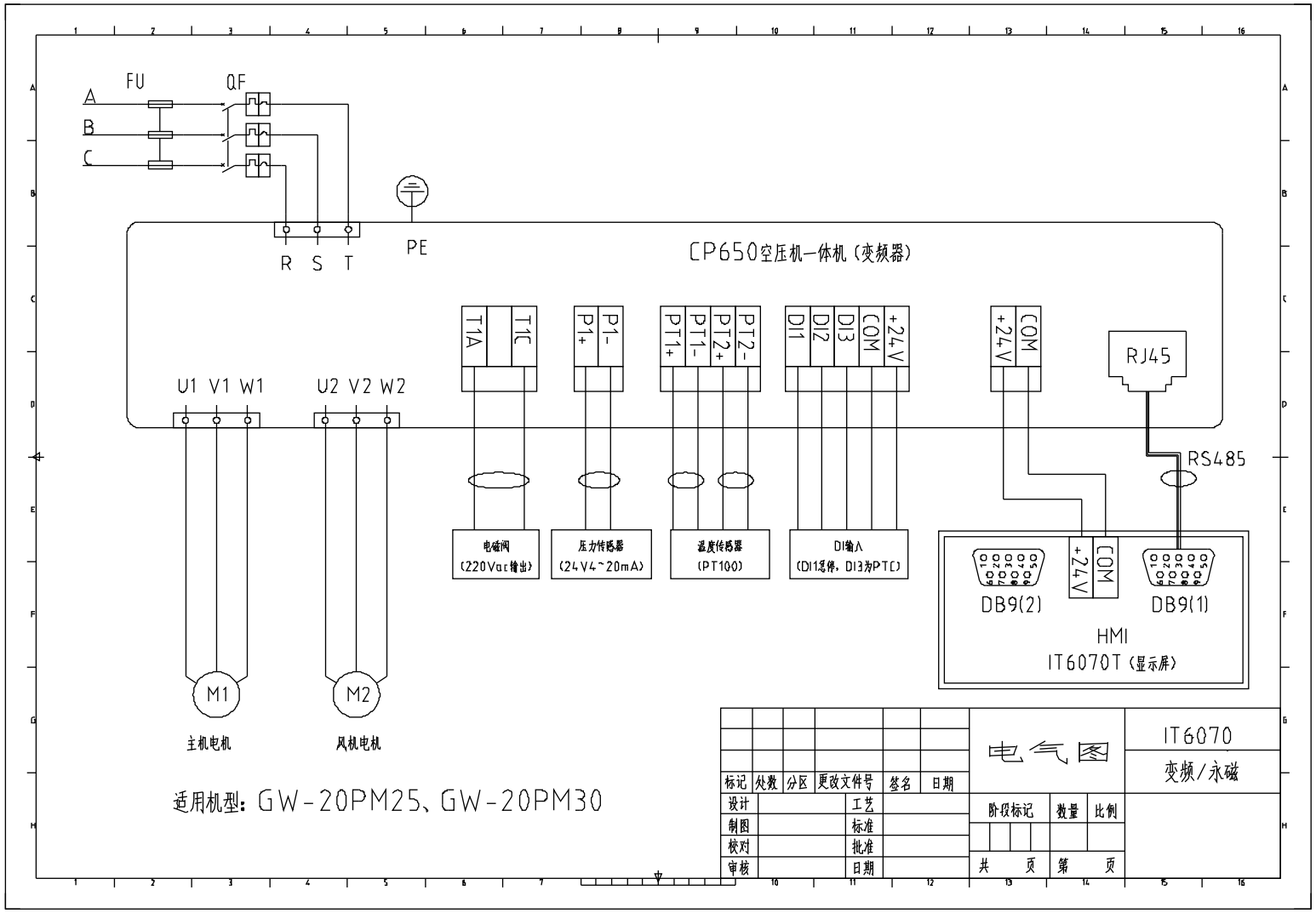
电气图
MAM6090
双主机变频


FU
QF
A
B
C
R S T
PE
CP650空压机一体机（变频器）
U1 V1 W1
U2 V2 W2
T1A
T1C
P1-
P1+
PT1+
PT1-
PT2+
PT2-
DI1
DI2
DI3
COM
+24V
+24V
COM
RJ45
RS485
电磁阀
(220Vac输出)
压力传感器
(4-20mA)
温度传感器
(PT100)
DI输入
(DI1空停，DI3为PTC)
DB9(2)
DB9(1)
HMI
IT6070T（显示屏）
M1
M2
主机电机
风机电机
适用机型：GW-20PM25、GW-20PM30
电气图
IT6070
变频/永磁
标记 处数 分区 更改文件号 签名 日期
设计 工艺
制图 标准
校对 批准
审核 日期
阶段标记 数量 比例
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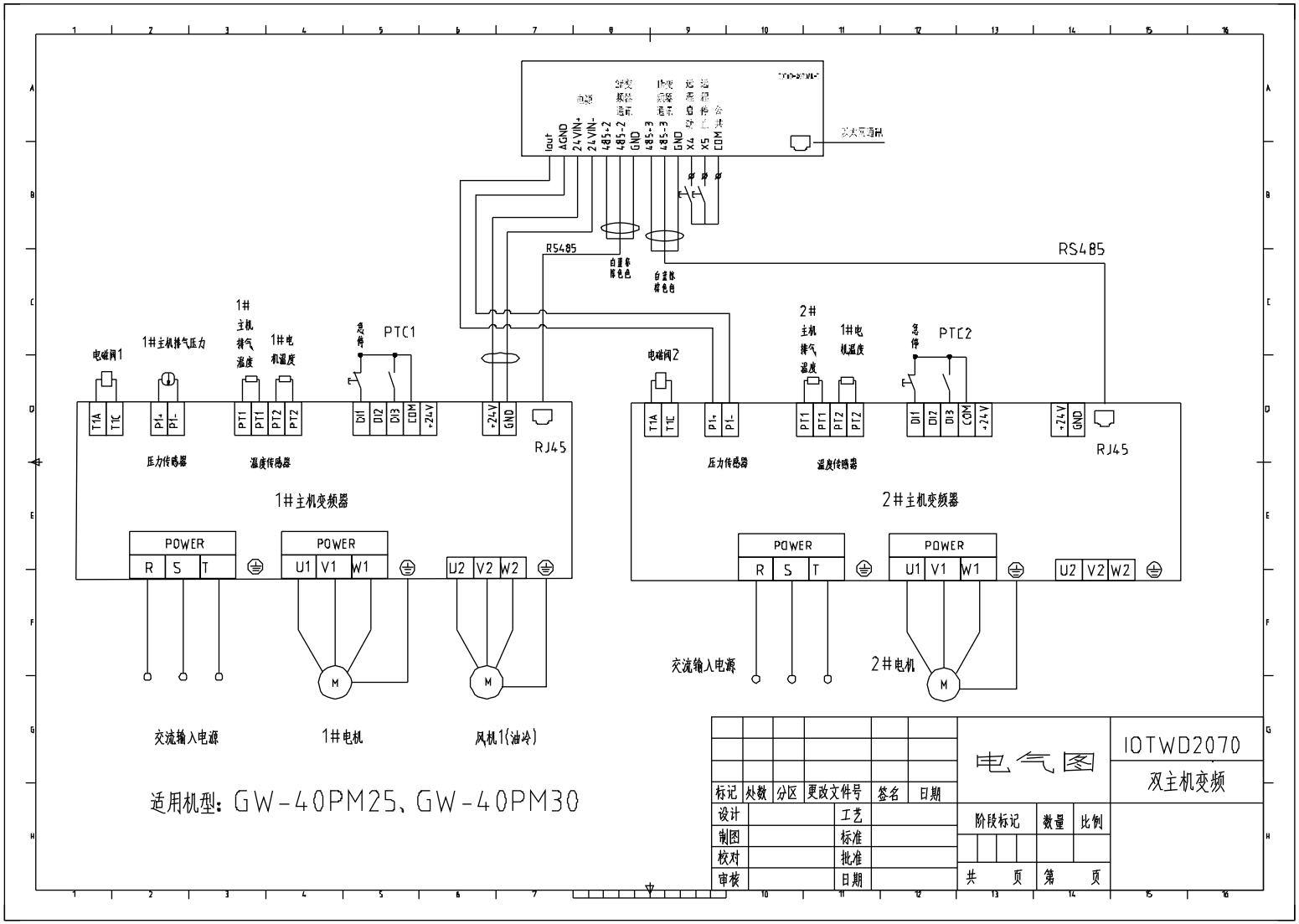
RS485
RS485
PTC1
PTC2
电磁阀1
1#主机排气压力
1#主机排气温度
1#电机温度
急停
电磁阀2
2#主机排气温度
2#电机温度
急停
T1A
T1C
P1+
P1-
PT1
PT1
PT2
PT2
DI1
DI2
DI3
COM
+24V
+24V
GND
RJ45
压力传感器
温度传感器
1#主机变频器
2#主机变频器
POWER
R
S
T
U1
V1
W1
U2
V2
W2
交流输入电源
1#电机
风机1(油冷)
2#电机
适用机型：GW-40PM25、GW-40PM30
电气图
IOTWD2070
双主机变频
标记
处数
分区
更改文件号
签名
日期
设计
工艺
制图
标准
校对
批准
审核
日期
阶段标记
数量
比例
共 页
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CHAPTER V MAINTENANCE AND TROUBLESHOOTING

5.1 Safety measures to be taken during maintenance

Maintenance personnel must have a certain knowledge of mechatronics and operation skills, and have a certain understanding of air compressor. Before maintenance, they must carefully read all contents of the operation manual.

5.1.1 The maintenance work must be carried out when the machine is stopped, the stop valve is closed and the power supply is cut off.

5.1.2 Make sure that the pressure in the system has dropped to zero before removing any pressurized components.

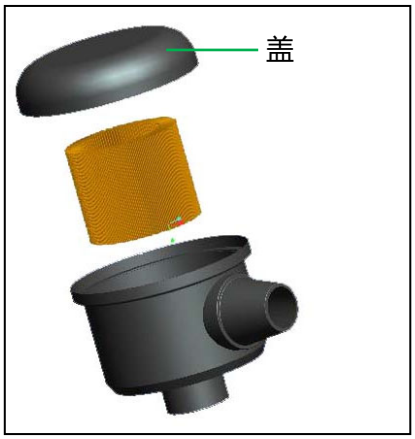
5.1.3 The temperature of internal components of the system is high when it is just shut down, so be careful to avoid scalding during operation.

5.1.4 After maintenance, it must be confirmed that there are no tools, parts, rags, etc. left in the compressor.

5.2 Maintenance items of air compressor

5.2.1 Cleaning and replacement of air cleaner element

The operating environment of the cover determines the maintenance interval of the air cleaner element.



1) Clean the air filter element

The filter element shall be cleaned regularly according to the operation environment to ensure that the air compressor operates in the best condition.

Take out the filter element of air filter and blow away the dust from the inside to the outside with compressed air.

2) Replace air cleaner element

The air filter element must be replaced when the new housing unit runs for 500 hours continuously; the second replacement time is 1000 hours.The replacement cycle should be shortened in the harsh environment.

3) Replacement method

Figure 5-1 air cleaner

a. rotate the air cleaner cover about 20 ° along the open direction indicated on the cover, and then remove the air cleaner cover.

b. Remove the air cleaner element and replace it with a new one.

c. Press on air cleaner cover.

5.2.2 Oil filter replacement

1) The oil filter must be replaced when the new machine runs for 500 hours continuously; the second replacement time is adjusted to 1000 hours.The replacement cycle should be shortened in the severe environment.

2) Schematic diagram of oil filter replacement (see Figure 5-2)

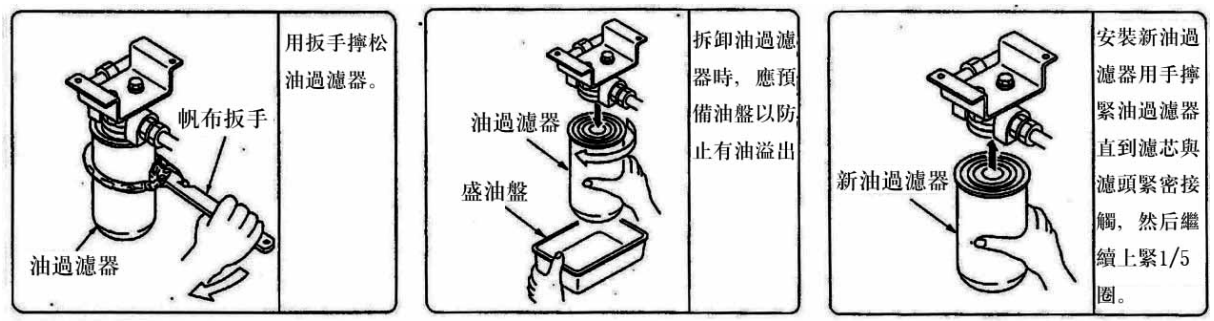


Fig. 5-2 schematic diagram of oil filter replacement

3) Start the machine to check whether there is oil leakage. If there is no oil leakage, replace it.

5.2.3Oil gas separation filter element replacement

1) The operation conditions determine the maintenance cycle. For example, the replacement time will be shortened when the environment is poor.The first replacement time of the new machine is 500 hours; the second replacement time is 1000 hours.

2) The replacement steps of oil-gas separation filter element are as follows:

a. After the air compressor is shut down, close the air outlet and confirm that there is no pressure in the system.

b. Use special tools to remove the external oil-gas separator.

5.2.4 Replacement of lubricating oil

1) After 500 hours of operation, the lubricating oil shall be replaced.The second replacement time of lubricating oil is 1000 hours. In case of serious oxidation and discoloration of lubricating oil during operation, the new lubricating oil shall be replaced immediately.

2) If the air compressor works in dusty or high temperature environment, the oil change interval should be shortened.

3) The oil change procedure is as follows:

a. Make sure that the unit is completely shut down and that there is no air pressure in the oil-gas separator.

Disconnect the main circuit, mark and disconnect the starter power.

b. Thoroughly drain the lubricating oil in the system:

- Disconnect the low point and drain the oil from the pipeline;
- Drain oil from oil and gas separator drain valve;
- Pour out the oil in the filter; install the used oil filter again.

c. Inject 50% new oil into the system:

- Start the compressor and observe its operation.
- Operate for 5 minutes or until the exhaust temperature is stable, and then shut down.

d. Thoroughly drain the oil in the air compressor.

e. Replace a new oil filter and oil-gas separation filter element (replacement is synchronous with oil change).

F. fill the system with new oil, and then reinstall the filler plug.

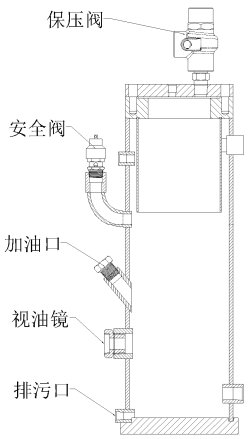


Fig. 5-3 oil gas separator

WARNING	Pressurized air and oil can cause serious personal injury or death.Before removing the valve, nut, plug, installation screw and filter, shut down the compressor and release all pressure in the system, disconnect the main circuit, mark and disconnect the power supply of the starter.

DANGER	The compressor, oil-gas separator and all pipelines in and after operation may be in high temperature state.

5.2.5 Cleaning of cooler

Dust accumulation in air-cooled cooler will affect the cooling effect of air compressor, which is easy to cause over temperature of exhaust.The heat exchanger must be cleaned regularly to maintain efficient heat dissipation.

5.2.6Oil gas separator drainage

1) Too much water is easy to cause emulsification and deterioration of lubricating oil, and even cause failure of main engine.The condensed water in the machine body must be removed before starting the next day.
2) If the air humidity is high and the air compressor does not operate continuously, the water shall be discharged three times a week, and the manual air release shall ensure that the cooling fan is started at least once every two days. If the air compressor operates continuously, the water discharge cycle can be extended.
3) When confirming that the pressure in the oil-gas separator is zero, slightly open the drain valve at the lower part of the oil-gas separator to drain the condensate at the bottom of the oil-gas separator.

5.3Maintenance items and cycle table (Table 5-1)

Project	job content	Maintenance intervals						remarks
		Every day	weekly	monthly	half a year	a year	Two years	
operation panel	Record the pressure, temperature and operation time	○						
Piping system	Check for leaks and loose joints				○		●	Replace nylon pipe
Circuit system	Check contact tightness				○			
air cleaner element	Cleaning and replacement		○		●			First maintenance 500h replacement
Oil filter	replace				●			First maintenance 500h replacement
Oil gas separation filter element	replace				●			First maintenance 500h replacement
Lubricating oil	Check the oil level and replace the lubricating oil	○		○	●			Replace the first service for 500h; be sure to use the special lubricating oil of our factory
Safety valve	Sensitive inspection action				○			Annual inspection
Oil cooler	clean				○			Deep cleaning cycle: 3 years
Drain condensate	Drain condensate	○						Every day before power on
Motor	Insulation test					○		Long term shutdown must be detected
compressor	seal up			○				

explain:

1) ○: It means that the project needs to be inspected, adjusted or cleaned on schedule; ●: it means that the project needs to be replaced on schedule.

2) The content of this table is only for the user's reference. The user shall change the maintenance and maintenance cycle appropriately according to the actual operation environment and working performance of the unit.

3) The first running in period of the machine is required, and the corresponding consumable parts must be replaced within the first maintenance period, so as to ensure the stable and reliable operation of the air compressor.

5.4 Troubleshooting (table 5-2)

Fault	Causes	Exclusion method
1. Unable to start	(1) small circuit breaker trips. (2) the connector of control panel is not plugged tightly. (3) the phase sequence of power supply is reversed. (4) the operation button is in poor contact. (5) the emergency stop button is not reset. (6) motor failure. (7) the electrical circuit is loose. (8) read the error information from the control panel. (9) main engine failure.	(1) the electrical personnel shall check the control circuit and close it. (2) inspection by electrical personnel. (3) the electrical personnel shall adjust the phase sequence of the power supply. (4) maintenance and replacement of electrical personnel. (5) reset the emergency stop button. (6) maintenance and replacement of electrical personnel. (7) the electrical personnel shall be connected firmly for maintenance. (8) take appropriate measures according to the instructions. (9) manually rotate the main engine. If it cannot rotate, please contact our customer service center.
2.The running current is too high, the main motor is overloaded, and the fuse is blown	(1) the exhaust pressure is too high. (2) the specification of lubricating oil is incorrect. (3) the oil-gas separation filter element is blocked. (4) the power supply voltage is abnormal. (5) there is strong shock vibration nearby. (6) main engine failure. (7) the contact of AC contactor is poor.	(1) check the pressure gauge and adjust the pressure setting. (2) check the oil number and change the oil. (3) replace the oil-gas separation filter element. (4) electrical personnel adjust the power system. (5) keep away from vibration source or take vibration reduction measures. (6) rotate the main engine manually, if it cannot rotate, Please contact our customer service center. (7) maintenance by electrical personnel.
3. The exhaust temperature is often too high	(1) insufficient lubricating oil. (2) the oil cooler is blocked. (3) the dust screen is blocked. (4) the specification of lubricating oil is incorrect. (5) the oil filter is blocked. (6) fan failure. (7) the temperature sensor connecting wire is loose. (8) choke plug of oil return pipe is blocked.	(1) check the pointer of oil level gauge. The pointer shall be in the green area. (2) repair the oil cooler. (3) cleaning and dedusting. (4) check the oil number and replace the oil. (5) replace the oil filter. (6) the electrical personnel shall repair and replace the fan. (7) the electrical personnel shall repair or replace the corresponding devices. (8) clean the plug.

Fault	Causes	Exclusion method
4. Failure to start normally under low pressure	(1) the pressure setting in the control panel is not correct. (2) the control pipeline is blocked. (3) the discharge pipeline is in fault. (4) pressure sensor failure. (5) serious leakage of control pipeline. (6) the action of the minimum pressure valve is poor.	(1) check and reset. (2) clean the control pipeline. (3) adjust the discharge flow. (4) check the pressure sensor. (5) check the leakage position and lock it. (6) repair, adjust and replace new products.
5. Unable to stop automatically under high pressure	(1) the pressure setting in the control panel is not correct. (2) the control pipeline is blocked. (3) pressure sensor failure. (4) discharge solenoid valve failure	(1) check and reset. (2) clean the control pipeline. (3) check the pressure sensor. (4) replace the solenoid valve.
6.High oil content in air	(1) the oil in the oil-gas separator is too full. (2) the oil return pipe is blocked, damaged or loose. (3) the oil-gas separation filter element is broken. (4) loose assembly. (5) the minimum pressure valve does not work. (6) operate at high exhaust temperature. (5) use incorrect oil.	(1) discharge excess oil from the system. (2) clean the oil return pipe joint / plug and replace the damaged pipeline. (3) replace. (4) fasten all devices and pads. (5) clean and replace. (6) remove the high exhaust temperature fault. (7) "special oil for guangwo precision scroll machine" shall be used.
7.When the main engine is running, the current exceeds 10 ~ 20%, and the suction valve of the main engine makes abnormal noise	(1) when the main engine is started, the pressure in the oil-gas separator is not released completely or the pressure is high (more than 0.4MPa). (2) the minimum pressure valve is not tightly sealed, and the pressure of the air tank is poured back to the oil-gas separator. (3) Vent solenoid failure.	(1) ensure that the main engine is started after the pressure in the oil-gas separator is released. (2) replace or repair the minimum pressure valve. (3) replace the vent solenoid valve.

Maintenance record of air compressor

Maintenance date (date)	Running time (hour)	Maintenance content	maintenance staff

Note: (1) after the maintenance and repair of the unit, please fill in the above table carefully, and the maintenance personnel shall fill in the "maintenance" in the above table Signature in "person" column.
(2) The above table is only for the user's reference. In addition to this table, the user shall make a daily operation record table.

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