JAGUAR®

Refrigerated Air Dryer

Operation Manual

（V1.0）

XIAMEN EAST ASIA MACHINERY CO.，LTD.

Quality Guarantee

Thank you for choosing of our refrigerated air dryer. We hereby warrant as per below terms and conditions if there is any quality problem in material or workmanship.

Brand：　　Model No.：

Serial No.：　　Purchasing Date:

Customer Name：

Quality Inspection Pass	
Supervisor：	Inspector：

Terms and Conditions：

We warrant that the refrigerated air dryer manufactured by us conform to our quality standard in material and workmanship for period of 12 months from the date of delivery unless the contract has different stipulation. The warranty shall be granted by free repair (for domestic market only) or free parts.

1.This guarantee is valid at below conditions：

1.1. To operate and maintain strictly according to the operation manual.

1.2. The malfunction is not caused by incorrect installation, operation and repair and carelessness of operator.

1.3. Manufacturing No. is not erased, attrited or forged.

1.4. Only authorized service technician or distributor makes the repair work.

2. We make no other warranty of any kind whatsoever, express or implied. In no event shall we be liable for any consequential, incidental, indirect, special or punitive losses or damages arising out of this machine or the relevant contract, whether based on contract, warranty, tort, negligence, strict liability, indemnity, statute or otherwise, even if it has been advised of the possibility of such losses or damages.

3. To ensure you to get your warranty rights and interests, please keep it in good condition and show it if requested.

Manufacture: XIAMEN EAST ASIA MACHINERY CO., LTD.

Thank you for choosing JAGUAR refrigerated air dryer.

We have our rights to change or improve the product design. We have no liability to modify or improve the products which have been sold out.

Specification and parts application are subject to change without notice in advance.

This machine has been tested and inspected strictly before packing. To ensure it running safety and always being in good condition, please read this manual carefully before installing or operating. Please do not adjust any parameter without authorization.

Contents

1. SAFETY INSTRUCTION

Reading this manual carefully before installation or operation!

1.1 Please remove surrounding flammable goods before welding pipes. Avoid welding spark splash down into air dryer.

1.2 The power wire must be installed with rated contactor, fuse, earthing and all safety devices. Install a lightning switch if necessary.

1.3 Installation a new machine must be performed by our qualified person or authorized technician.

1.4 Air dryer can not be running when the working pressure is higher than the rating pressure.

1.5 Never start air dryer when it is with malfunction or it is in unsafe condition. A visible warning sign must be put on during in this case.

1.6 Compressing air and electric component are all risky. Please switch off and put “maintenance, do not switch on” sign on power switch, before maintenance or repair.

1.7 Never touch the hot surface of running parts such like fan.

All operation disobey above safety instruction may cause serious injury!

2. INSTALLATION AND OPERATION REQUIREMENT

2.1 Installation Requirement

Caution: the installation operations described in this chapter should be performed only by authorized technician qualified in the installation of electro-pneumatic systems. Follow the procedure below with care in order to prevent exposing personnel to danger.

2.1.1 Put air dryer on a flat floor in vertical position.

2.1.2 The pipe connecting air compressor and air dryer must be antirust. Do not make any band which may cause water storage.

2.1.3 For easy operate, maintain or repair, please keep at least 1 meter distance from surrounding devices or wall. Wind cooled type must be with good ventilation. Water cooled type must be ensured that the water inlet pressure is 0.2Mpa higher than water outlet pressure. Water cooled type should be installed with a suitable size pipe and water inlet temperature can not exceed 32 °C. Water must be without impurity (filtering before water inlet is better).

2.1.4 Air dryer is refrigeration equipment. Please avoid vibration and incline when transportation, convey and installation.

2.1.5 Install a system of by-pass valves between the dryer inlet and outlet so as to be able to service the installation, maintenance or repair..

2.1.6 Piston type air compressor has air shake and impulse. To avoid it, please install an air receiver preceding air dryer.

2.1.7 Cooling water pipe should be installed independently, which is better than using one pipe together with other equipments.

2.1.8 Check that all connectors are airtight and that the fixings are tight.

2.1.9 Fix the anchor points if it is necessary.

2.1.10 Electrical device installation:

a. Install an electrical switch independently. Do not share one starting power switch with other equipment.
b. Be sure the electrical voltage fluctuates within ±5%.
c. To avoid voltage drop too much, please choose the wire with right length and section size.
d. Install a set of device near electrical power such as magnetic starter, air brake switch, fuse, etc.
e. Be sure that air dryer is with right earthing. Neutral line and earthing line can not be same line.

2.2 Operation Requirement

Caution: Do not connect air dryer to compressed air until the installation procedure has been completed properly.

2,2.1 Operation conditions：

Environment temperature：2~40 ℃

Inlet temperature：Low temperature type ≤ 45℃

High temperature type ≤ 80℃

Water inlet temperature: ≤32℃ Water pressure: 0.2~0.4Mpa

2.2.2 The environment temperature of air dyer can not be lower than 2℃ otherwise the refrigerant compressor may be burnt due to lubricant oil coagulated.

2.2.3. To avoid dryer compressor being burnt, please complement lubricant oil in time.

2.2.4 Don't put the air dryer directly exposed to sunshine, rain or wind. The dryer must not be directly exposed to sources of heat, dust, corrosive gas, flammable gas and the place which humidity is more than 80%. Don’t put air dryer in the place with vibration, or condensate may be frozen.

2.2.5 Make sure the connection of inlet and outlet piping is correct. Keep enough space for future maintenance or repair work. Protect from the vibration of air compressor. Don’t make the weight of connection weight onto air dryer.

2.2.6 Use cleaner to clean the intake monthly. Using blow gun to clean condensator weekly.

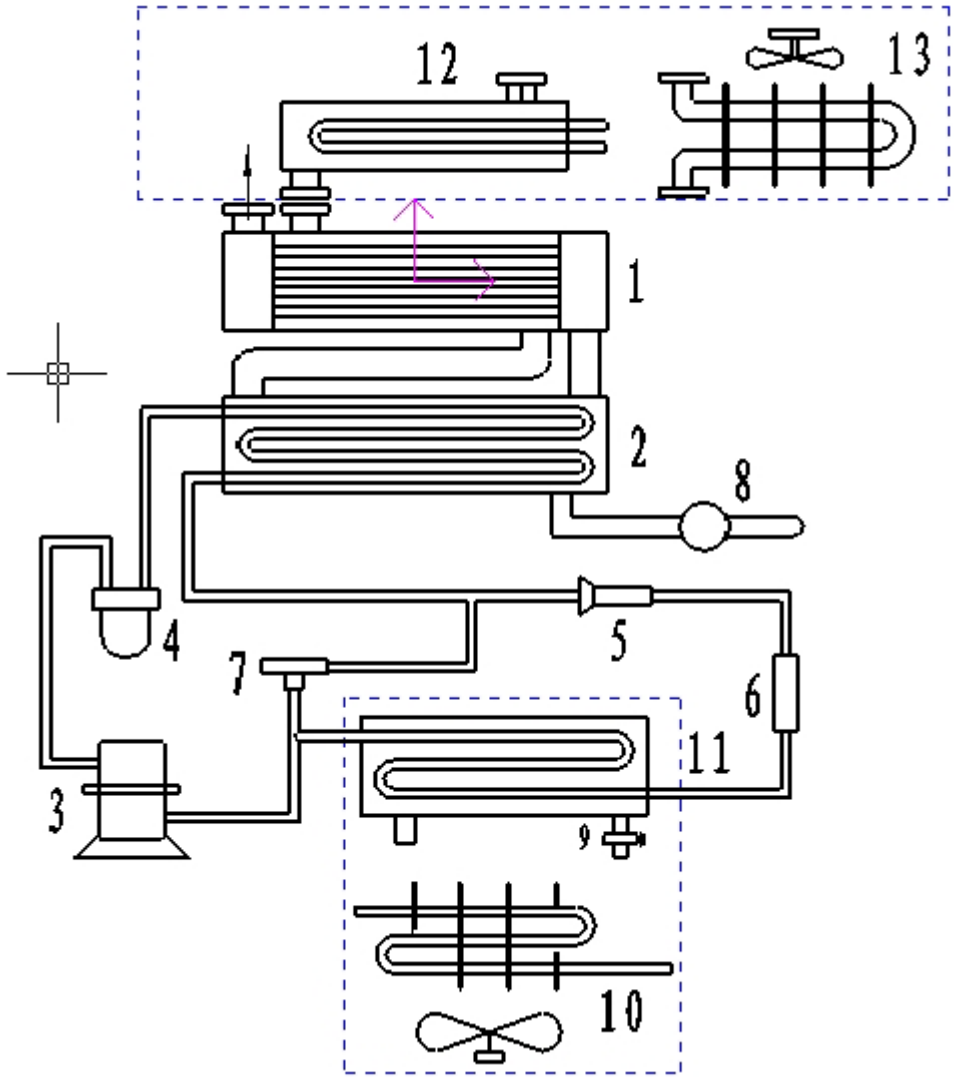
2.2.7 Connect the compressed air after the air dryer running properly. Any restarting must be 3 minutes after stop.

2.2.8 Check if the auto drain is working properly, if it is applied.

2.2.9 Switch on the electrical power one hour before running so as to prevent refrigerant and lubricant oil being dissolved each other.

3. FLOW CHART AND COMPRESSING AIR SYSTEM

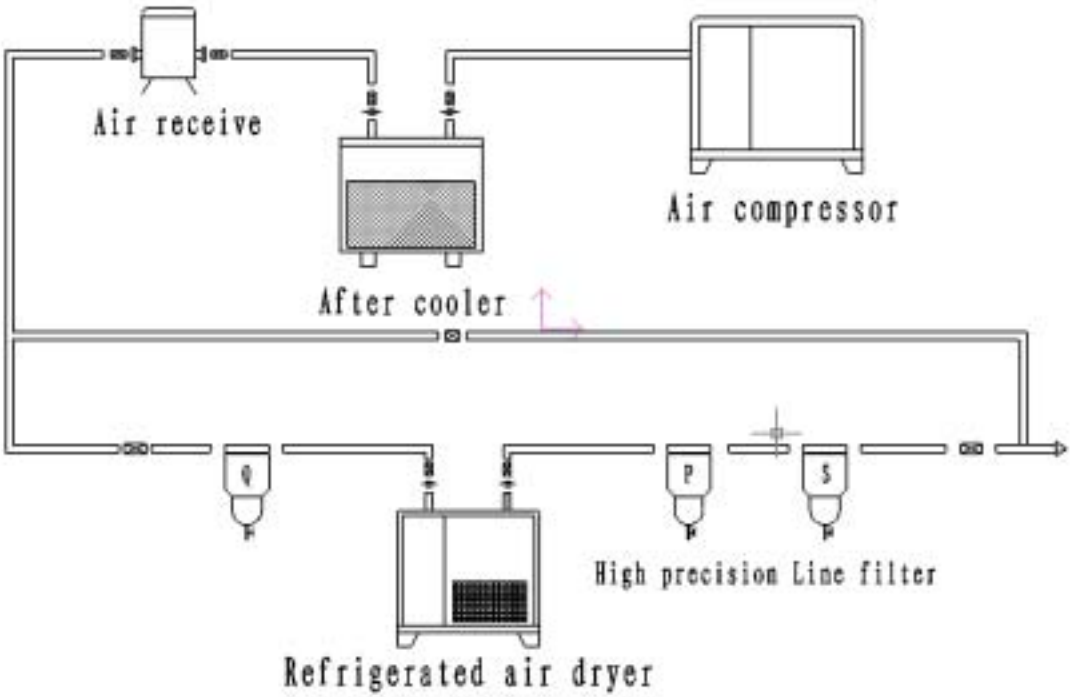
3.1 Flow Chart



1. Pre-cooler 2. Evaporator 3. Refrigerant compressor 4. Air/water separator 5. Expansion valve (capillary) 6. Desiccation filter 7. By-pass valve（solenoid valve） 8. Auto drain 9. Water regulator 10. Water condenser 11. Wind condenser 12. Wind pre-cooler 13. Water pre-cooler

3.2 Compressing Air Filtering System

Below flow chart is a basic configuration of compressing air filtering system. Please consult the professional technician if compressed air need higher quality.



4. OPERATING INSTRUCTION

4.1 Check before start

4.1.1 Check electrical power: voltage, phase and connection.

4.1.2 Wind cooling type: check if ventilation of condenser is in good condition.
Water cooling type: check if the water pipe is expedited. Check if water pressure, quality and temperature conform the requirement.

4.1.3 Check if the filter installed before and after air dryer are all correct.

4.1.4 Make sure the piping by-pass valve or inlet repair valve is close. Make sure that the outlet valve is open.

4.3.5 Make sure the auto drain is open.

4.1.6 Check if the pressure gauge of refrigerant gauge (if apply) showing right. Check if two gauges for high pressure and low pressure showing approximative figures.

4.1.7 Check if delay starting has been set (only for the models with time relay). Normally delay time is about 2 – 3 minutes.

4.1.8 Make sure the air in the pipe has been released.

4.2 Start

4.2.1 Switch on electrical power and listen to the compressor to check if it is running stable and without abnormal noise. To check if the figure of high pressure gauge is rising and if the low pressure gauge figure is declining. (if your model is without gauge, you can check if the outlet temperature is higher than inlet temperature).running

Wind cooled type:

Please check if the fan can start or stop automatically.

Fan start at 1.68Mpa (high pressure type),

Fan stop at 1.4Mpa (high pressure type)

Water cooled type:

refrigerant low pressure should be within 0.4-0.45Mpa.High pressure should be within 1.4-1.6Mpa.

4.2.2 Start the air compressor running. When the pressure of air receiver reaches 0.7Mpa, slowly open the inlet valve of air dryer. Avoid any sudden opening inlet valve or any sudden variation in pressure as this may damage evaporator or other parts in air dryer.

4.3 Stop

Stop air compressor and close inlet valve then stop air dryer.

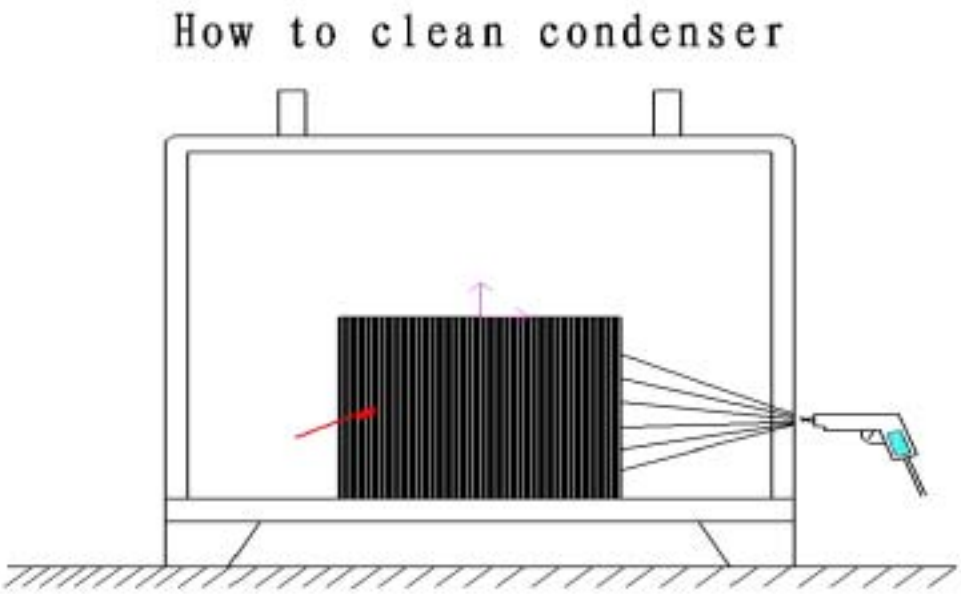
Caution: Do not start and stop air dryer frequently as it may damage motor.

5. MAINTENANCE

5.1. The condense of wind cooled type air dryer need to be clean regularly so as to avoid blocked.

Method 1: blow it by compressed air.

Method 2: brush it smoothly.



5.2 Make daily record of the meter or gauge. Be sure that:

5.2.1 Pressure difference between inlet and outlet is no more than 0.03Mpa.

5.2.2 Evaporator pressure should be within 0.35Mpa-0.6Mpa.

5.2.3 High pressure should be within 1.2Mpa – 2.0 Mpa.

5.3 Often check water drain and sewage drain.

5.3.1 Float ball drain should be clean every week so as to avoid being blocked. Sewage drain pipe should be working every week.

5.3.2 How to clean the electrical auto drain?

a. close the ball valve front of auto drain.

b. loosen top nut then take out the timer coil. Note: please do not let the coil contacting water otherwise the coil will be burnt.

c. remove soft pipe and loosen the valve core, drain out air inside of drain valve.

d. remove valve core and wipe it.

e. screw back the valve core then open front ball valve a little so as to use compressed air to remove all impurity, oil and water. Then wipe the core again by using duster cloth.

f. install back the core, timer coil and soft pipe then open the front ball valve.

5.4 Often check cooling water system and inlet temperature.

5.4.1 Cooling water: temperature should be within 2-23℃,pressure should be within 0.2~0.4Mpa.

5.4.2 Inlet temperature of compressed air:

Low temperature type: ≤45℃

High temperature type: ≤80℃

5.5 Clean the condenser

5.5.1 Clean the wind condenser weekly:

◆Be careful when clean wind condenser. Do not press the surface of wind condenser when clean it. Ensure that the condenser is with good ventilation. Never put the dryer working in sunshine. Clean the dust on surface of condenser by using air spray. Blow-dry the condenser after cleaning by water.

5.5.2 Clean the water condenser yearly:

◆Clean the water condenser very year (shorten this period if water quality is no good). To clean water condenser: close the inlet and outlet then open the end cover of water pipe which is not connected to water supply. The end cover and gasket need to be washed by clean water. The copper pipes need to be cleaned by compressed air or water. Be careful to avoid damage

copper pipe.

5.6 Often look in refrigeration system.

5.6.1 Listen to the operation and running of refrigeration compressor. See if it is running stably and smoothly. Make sure that it is without any abnormal noise.

5.6.2 Touch carefully by hand every day to make sure it is cold and frost.

5.6.3 Touch desiccation filter every week to make sure the temperature of each side should be similar. Replace it if inlet port is hot but outlet port is cold.

5.6.4 Contact our after service dept. or authorized agent immediately if there is any abnormal noise or heat.

5.7 Check electrical control system. Blow away dust and tighten wire terminal (switch off electric power firstly).

5.8 Notice

5.8.1 Do not running under situation of phase lack.

5.8.2 Feeling the temperature difference between inlet and outlet by hand. Be sure that the normal the difference is within 10~17℃.

5.9 Maintenance of the dryer case.

Cleanup oil, grease and dust on surface of dryer periodically. Keep the room and ground clean.

6. TROUBSHOOTING

6.1 Pressure drop too much

Fault	Reasons	Solutions
Piping problem	Pipe valve is not open properly.	Open pipe valve properly.
	Pipe diameter is too small.	Change bigger size pipe.
	Pipe is too long, or too many bend and connector.	Re-design the piping system.

	Two air compressors running in parallel and installation is no good.	Re-design the piping system.
	Filters in piping system blocked	Clean the filter or change a new one.
	Air leakage of piping connection	Check and fix the connector.
Air compressor's air delivery is too low	Pressure drops due to requested air volume exceeds rated air compressor delivery.	Replace a bigger compressor.
Condensate water freeze	Temperature switch or pressure switch malfunction	Repair or replace it.
	Expansion valve or by-pass Valve malfunction	Repair or replace it.

6.2 Drain water efficiency getting low or can not drain out water

Fault	Reasons	Solutions
Piping Problem	By-pass valve is not closed.	Close by-pass valve.
	Air is not going through dryer.	Open air dryer inlet valve.
	No air receiver or air receiver is installed after dryer.	Install air receiver accordingly.
	Dryer is put on non-flat floor..	Make sure the air dryer is on flat floor.
	Auto drain inclines.	Make it aclinic.
	Drain pipe is higher than auto drain.	Re-install drain pipe.
Big air flow	Pressure drops too much.	Re-setting air compressor system.
Malfunction of drain water system	Drain valve or solenoid valve malfunction	Clean or replace it.
	Drain valve is not open fully.	Make sure it is open properly.
Abnormal temperature of condensate	Dew point temperature is too low or too high.	Check and adjust pressure switch, water switch, expansion valve or by-pass valve.
	Environment temperature or inlet	No need to handle. Keep dryer

	temperature is too low.	running.
	Inlet temperature is too high.	Increase after cooler.
	Bad ventilation.	Place dryer on a right position or improve ventilation.
	Refrigerant leakage.	Fill up refrigerant.

6.3 Can not running

Fault	Reasons	Solutions
Electric power supply problem	Fuse melt or switch off.	Check if phase lack, short circuit, earthing, etc. Check if switch is malfunction.
	Wire broken	Find and fix it.
There is electric power supply but dryer can not start	Power source problem.	Check if it is following the data plat. Variable range should be ±5%.
	Switch malfunction.	Replace it.
	Contactor malfunction.	Replace it.
	Overload relay malfunction.	Replace it. Please check magnetic starter and compressor connection.
	High and low pressure switch malfunction.	Replace it.
	Starting breaker malfunction.	Replace it.
	Capacitor malfunction.	Replace it.
	Temperature switch or flux switch malfunction.	Replace it.
	Compressor malfunction.	Replace it.
All power switches are good but dryer can not start.	High and low pressure switch can not reset or magnetic starter is not reset.	Reset or replace.
	Refrigerant compressor malfunction.	Replace it.
	Electric wire loose.	Find and fix it.

6.4 Abnormal starting

Fault	Reasons	Solutions
High pressure break, difficult to start even reset.	Short circuit after starting.	Find the reason of abnormal then re-configure wire and switch.
	Pressure switch or temperature Switch malfunction. Fan stop.	Replace new switch.
	Fan malfunction.	Replace it.
	Overload break	Check thermal relay.
	Condenser is too dirty	Clean it.
Overload relay break	Capacitor malfunction	Replace it.
	Pressure switch or temperature switch malfunction.	Replace it.
	Frequently starting.	Starting should be 3 min. after stop.
	Refrigerant compressor overload.	Decrease the air dryer's loading.
	Inlet temperature or environment temperature is too high.	Improve ventilation or add a new cooler.
	Current setting figure of relay is too low.	Adjust the setting current.
	Relay contact is not good.	Fix or replace it.
	Phase loss.	Check and fix it.
	Contactor is with bad contact.	Fix or replace it.
	Cooling water is not recycled.	Check and fix it.

6.5 Low efficiency running

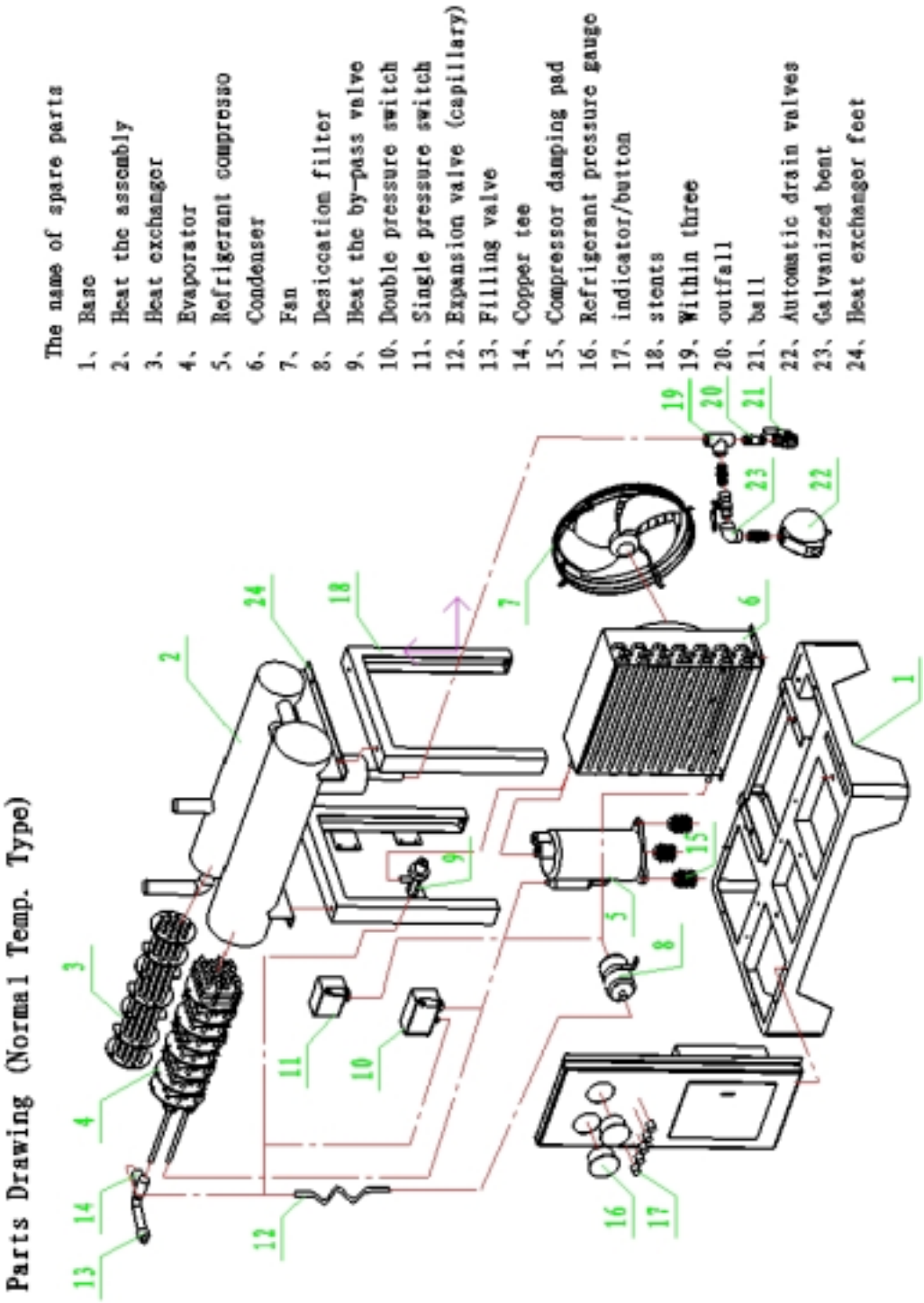
Fault	Reasons	Solutions
Evaporator temperature is too low	Evaporator malfunction	Replace it.
	Expansion valve or by-pass valve malfunction.	Replace it.
	Refrigerant leakage.	Check and fix leakage point then fill up.
	Refrigerant blocked.	Replace desiccant. Vacuumize then re-fill up refrigerant.

	Temperature switch or pressure switch is set too low.	Re-setting.
Evaporator temperature is too high	Inlet temperature is too high.	Add a cooler or change to use a bigger air dryer.
	Environment temperature is too high.	Improve ventilation.
	Expansion valve or by-pass valve malfunction.	Replace it.
	Condenser blocked or bad ventilation.	Clean it or improve ventilation.
	Cooling water is too hot or bad recycle.	Improve cooling water condition.
	Volume of handling air is too big but with low pressure.	Parallel connection a new air dryer.
	Valve plate of compressor worn out.	Replace it.
Overload Running	Inlet temperature is more than 45℃(more than 80℃ for high temp. type dryer).	Add a cooler.
	Volume of handling air is too big but with low pressure.	Parallel connection a new air dryer.
	Refrigerant leakage.	Check and fix leakage point then fill up.

6.6 Auto drain system malfunction

Fault	**Reasons**	**Solutions**
No water drain out	Working pressure is lower than 2kg/cm2	Working pressure of auto drain is 2—10Kg/cm2
	Pipe or bend connection blocked.	Clean it.
	Drain valve malfunction.	Open it or fix it or replace it.
	Drain valve incline or damage	Correct it or replace it.
	Filter of drain blocked.	Clean it.
	Working pressure is too high.	Always use it at rated pressure.
	Water pipe blocked.	Clean it.
	Evaporator pipes rust or blocked.	Exceed time limit. Replace it.

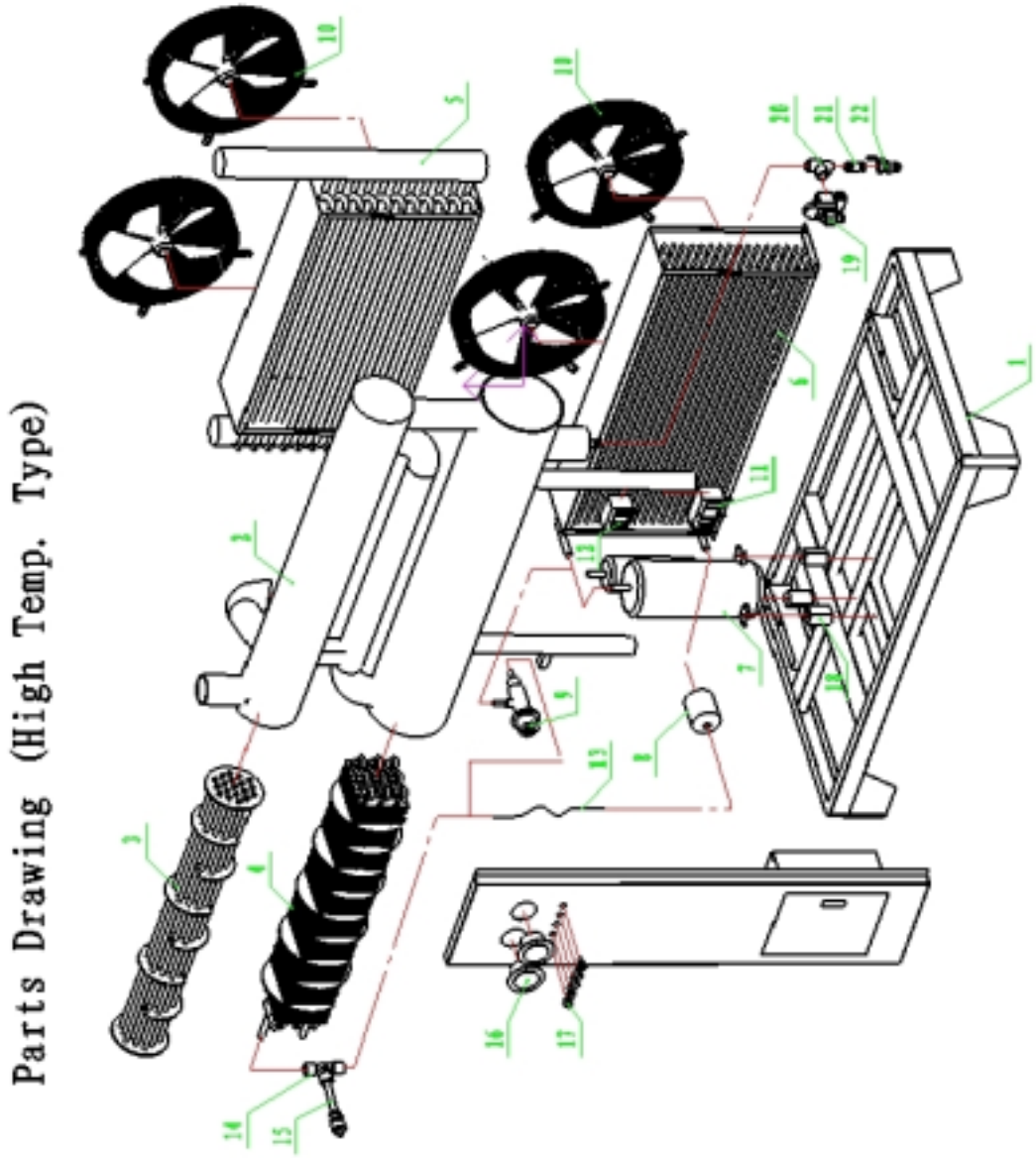
7. APPENDICES: Parts drawing and electric diagram

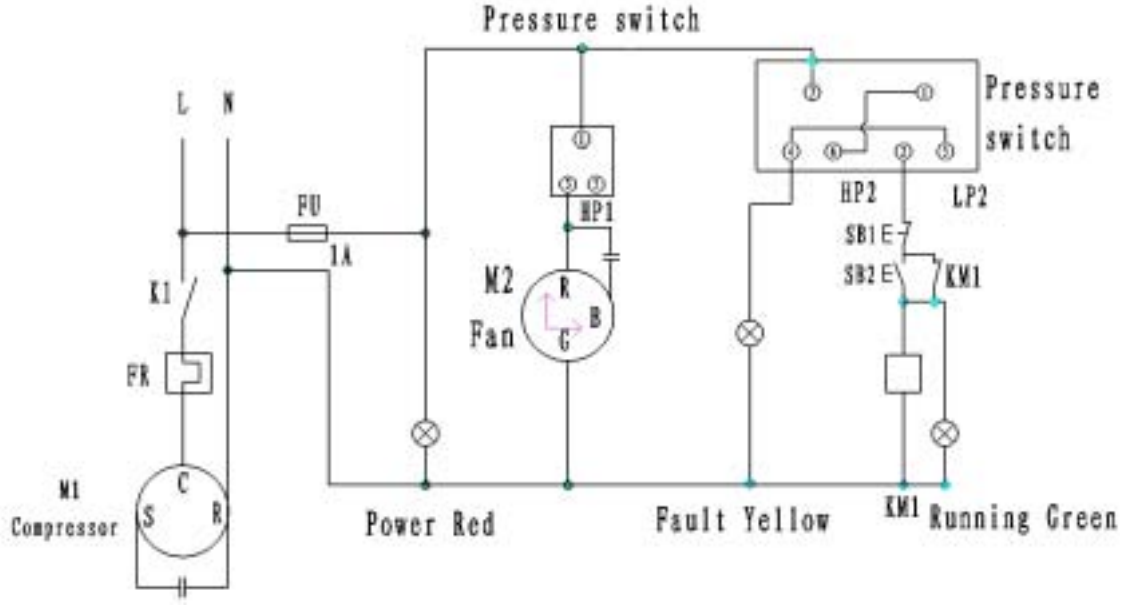


Parts Drawing (High Temp. Type)

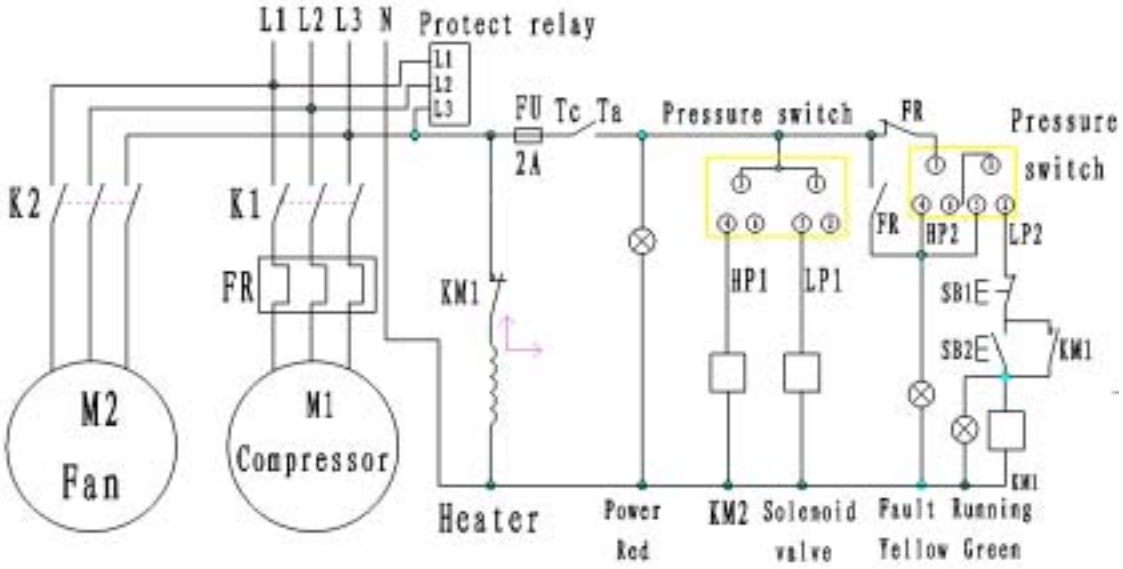
The name of spare parts

1. Base
2. Heat exchanger assembly
3. Heat exchanger's core
4. Evaporator core
5. Pre-cooler
6. Condenser
7. Refrigerant compresso
8. device for drying and filtering
9. by-pass valve
10. Fan
11. Double pressure switch
12. Single pressure switch
13. Expansion valve (capillary)
14. bronze three-way/tee
15. Filling valve
16. Refrigerant pressure gauge
17. indicator/button
18. damping pad
19. Electronic drainage device
20. tee tube
21. drain outlet tube
22. ball valve

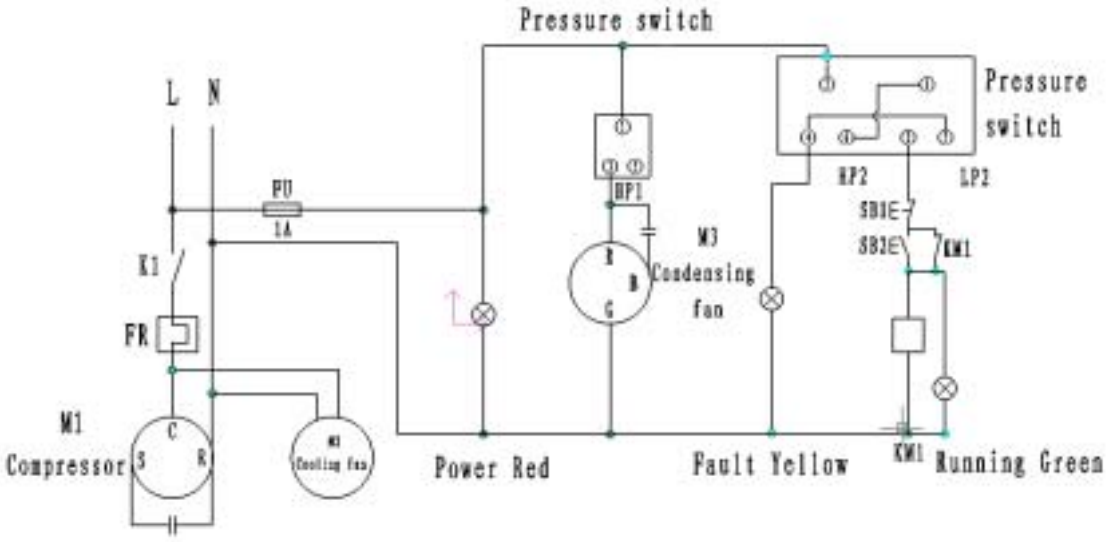




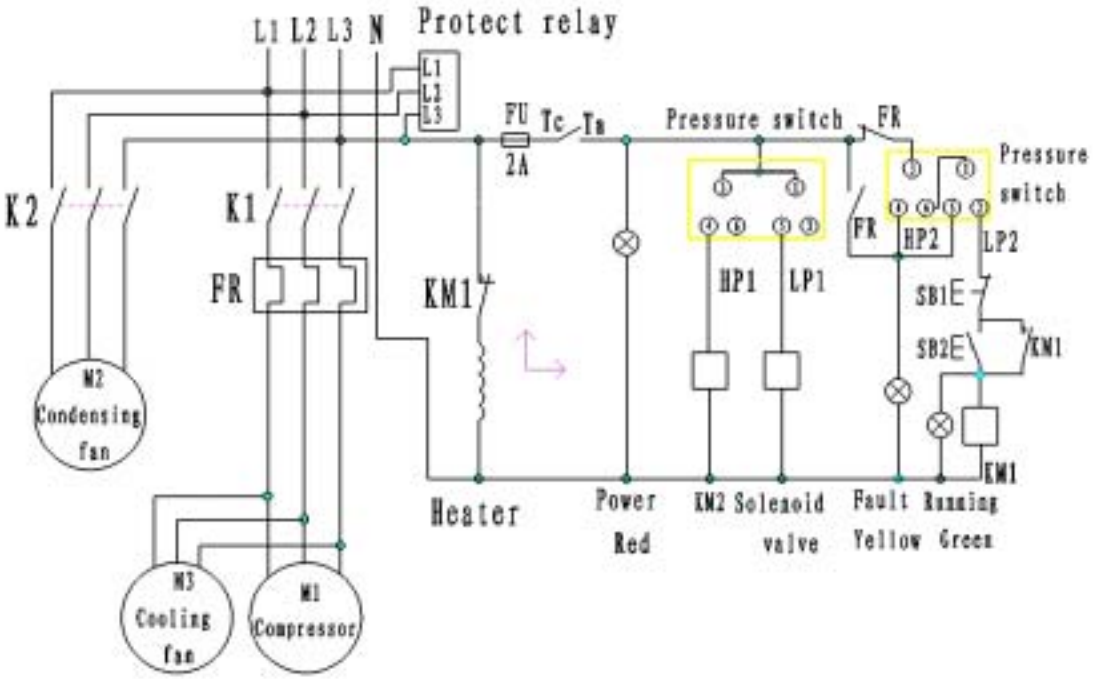
Electric diagram (single phase, normal temp. type)



Electric diagram (three phases, normal temp. type)



Electric diagram (single phase, high temp. type)



Electric diagram (three phases, high temp. type)

MEMO