

# **Refrigeration Compressed Air Dryer**

Please be familiar with the instruction  
manual before using

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## **Instruction Book**

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## Refrigeration Compressed Air dryer

### 1、 The general safety

1.1 The working pressure of the air dryer must be less than the maximum pressure indicated on the nameplate.

1.2 The refrigerated compressed air dryer is running under the power drive, please install according to the national electric standard.

1.3 Be sure to cut off the power supply before you have any electrical repair work.

### 2、 Forewarned before using

2.1 The air dryer is a high precision equipment. The precision components, pipes and control system electronic components of the internal refrigeration system shall not be subjected to greater shocking. The speed should not be too high when it is transported by road. When the road is poor, you should slow down to avoid unnecessary losses.

2.2 When we are handling, moving or installing the machine, it is necessary to use the forklift truck to carry the machine at the bottom of the machine. Avoid to moving the machines by the air and outlet pipes.

2.3 The water-cooled dryer should be connected to the water first. Then we switched on electricity.

2.4 The cooling water temperature should be less than 32°C.

2.5 The inlet of air-cooled air dryer is more than 1.5 m above the wall in a well-ventilated environment. Two dryers air inlet and air outlet don't face to face, the environment temperature is not higher than 35 °C

2.6 The refrigerating dryer must be opened after opening water (water cooled)

and electricity.

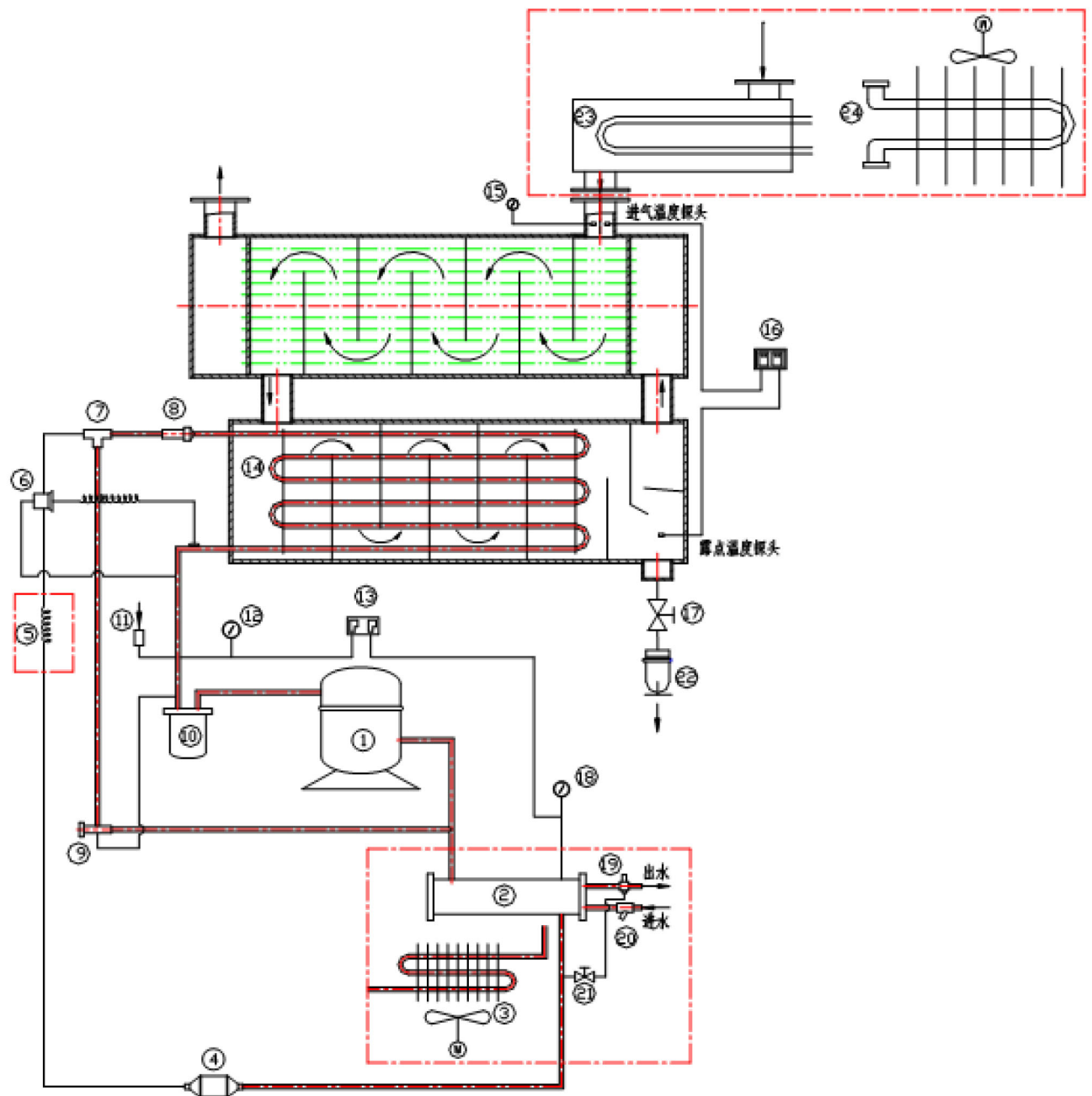
### 3、Overview

#### 3.1 Working principle of the air dryer

HDR series refrigeration compressed air dryer is according to the principle of freeze drying air, use refrigeration equipment to make the compressed air cooling reach the dew point temperature, drain the water from the air. The gas and liquid is separated from the separator. Then they will be by drawed off again by automatic drain valve. To get the purpose of freezing and dehumidification. At the same time, the amount of more than 3μ solid dust in compressed air will be filter, which will make the air source quality much more clean and dry.

#### 3.2 Working principle

- |                                    |                           |                             |
|------------------------------------|---------------------------|-----------------------------|
| 1、 Refrigeration compressor        | 9、 Energy Valve           | 14、 Vaproxzer               |
| 2、 Condenser (water cooling)       | 10、 Carburetor            | 15、 Air pressure            |
| gauge                              | 3、 Condenser (air cooled) | 11、 Filling valve           |
| 18、 Refrigerant                    | pressure table            | 4、 Dry filter               |
| 12、 Refrigerant low pressure table | 21、 Hand valve            | 5、 Capillaries (below 10M3) |
| 13、 High and                       | low pressure switch       | 22、 Automatic drain         |
| 6、 The thermal expansion           | valve                     |                             |



## 4、 Configuration and installation

### 4.1 Configuration suggestion:

(1)When the compressor exhaust temperature is more than 80 °C, We should set up a cooler.

(2)If the refrigerator is equipped with a piston type air compressor, a buffer can be configured to remove the vibrations caused by the pulsation of the air.

(3)In order to keep the heat exchanger effect, the prefilter should be setted.

(4)IF the work gas is not intermittent, the bypass valve should be set up in the system (rear cooler and dryer).

(5)Configure the filter according to the user's gas requirements.

### 4.2 Installation requirements:

(1) environmental requirements

1.The installation of the highest temperature less than 35 °C.

2. The installation should be well ventilated, but not suitable for outdoor installation.

3. The installed environment should be dry.

4. The installation position should be easy to maintain and set on horizontal position so as not to affect the discharge of condensate water

(2) piping requirements

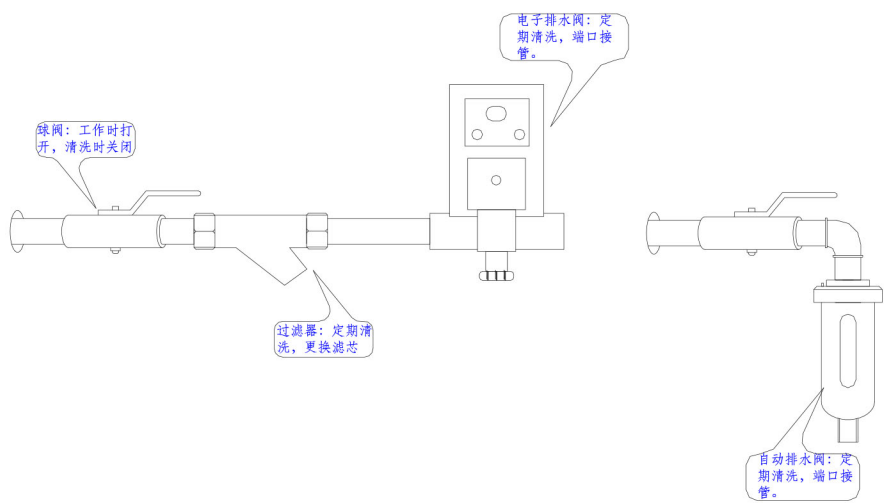
1. It is better to configure the filter before the air dryer.

2. We should avoid the vibration of cold dryer when connected to the piping system.

- 3. The diameter of the tube should not be less than that the diameter of the cold dryer.
- 4. The piping should be avoided too long to cause much water in the pipe.

4.3 Installation of the drainer:

The drainer can be divided into the electronic drainer (the timing) and the



automatic drainer.

4.4 Distribution requirements and methods

- (1) A power switch should be set separately. The voltage shall be configured according to the specified value and phase number of the nameplate.
- (2) Do not share a protective device with other equipment. Voltage fluctuation must not exceed the rated voltage 10%.
- (3) configuration of the cables should not be too small or too long, so as to avoid voltage drop;
- (4) reliable grounding of cold and dry shell, ground wire should be connected with

the grounding symbol on the bolt.

(5) 10m<sup>3</sup> refrigeration dryer supply voltage is below the 220V/50HZ, 10m<sup>3</sup> and 10m<sup>3</sup> more refrigeration dryer for 380V/50HZ.

(6) When the electricity is connected, the power cord is introduced into the electric box. 220V for the three power line, at this time should pay attention to judge the power supply line and ground wire, and then the electrical box wiring transparent small cover to open, the power line connected to the empty terminal (usually on the left). Connect the grounding wire to the terminal with the grounding mark. 380V standard wiring for five root (power line three, zero line and ground wire each one), the wiring method is the same as above. (watch out for live wiring!)

### **4.5 Safety precautions:**

(1) check the ventilation, voltage, line and earthing protection, whether it is correct or not;

(2) Check the inlet air temperature and pressure is normal;

(3) Must cut off the power supply before the repair;

(4) before maintenance or disassembly, the air line and refrigeration system must be relieved;

(5) check whether the blower is running properly;

(6) check whether the refrigerant medium leaks or not. The method is as follows:

A、 no-load operation after 10 minutes, check the freezing dryer suction and exhaust port, there is a great temperature difference,

B 、 exhaust temperature should be significantly lower than the suction temperature;

(7) under normal circumstances, you can start running, and after a few minutes you can open the air compressor, and then slowly open the intake valve (turn off the bypass valve);

(8) after running 30 minutes, check the drainage system is normal.

## **4.6 refrigeration dryer daily maintenance matters needing attention:**

(1) Non-frequent opening and closing refrigeration dryer, open and close refrigeration dryer, keep at least 3 minutes interval;

(2) Regularly clean the outside and refrigeration dryer inside, And pay attention to the drainage of the drain .

(3) Refrigerators should avoid prolonged no-load operation;

(4) Air cooled condensers should be routinely cleaned of dust, dirt, so as not to affect heat transfer.

### **Air-cooled condenser and maintenance specific methods are as follows:**

① with compressed air injection

②Using a soft wire brush or brush clearing, but not damage fins .

③ The temperature difference between the air inlet and outlet of the condenser. The normal temperature difference is 10~30 degrees centigrade;

### **Water-cooled condenser and maintenance specific methods are as follows:**

Water filter in order to prevent the precipitation of impurities into the condenser cooling water causes the cooling water tubes are not smooth, because it filters can easily be

Precipitating impurities are blocked, so should be cleaning the filters regularly, so as not to lack of water circulation, causing heat out.

(1) When the shutdown should have regular internal parts of cold and dry vacuum cleaning.

(2) Always pay attention to the unit square trying to keep good ventilation around and to avoid exposure to direct sunlight and all sources of heat.

(3) In the process of maintenance, refrigeration system should be protected to avoid damage.

## **Auto drain cleaning method**

1 ) Before closing the drainage valve, unscrew the drain cover fixing screw, and release compressed air from a drain.

2 ) Open drain cover, and then remove the drain core, wash with clean water and a soft brush. (Do not use gasoline, toluene, pine perfume Cleaning solvents)

3 ) After cleaning the drainage core into the valve body and install drain cover, the last open front end ball valve.

4) To barrel drain, should be filled with water before being used to form a seal to work. Work with a trace amount of leakage is normal.

5) water inlet and automatic drainage of y -type filter in use for some time after filter accumulation of impurities, resulting in increased flow resistance before the filter, affecting water flow, so that poor drainage plug, you should regularly clean and replace the filter. The newly installed equipment, due to the larger pipe is dirty, regular inspection and cleaning.

## **5 、 HDR Series refrigerated air dryer operation**

### **5.1 Before starting the examination**

Check the power supply voltage is normal;

Refrigeration system of observation: observation of high and low pressure gauge, two tables are under pressure to achieve the basic balance, and this balance is based on the surrounding temperature fluctuates, generally about (0.5MPa~1.0MPa ).

Check whether the air line normal air inlet pressure must not exceed 1.0MPa ( except for special models ), intake air temperature to no more than determine the selection of values.

If you choose is water-cooled, you should also check the cooling water is normal, water 0.2~0.4MPa, water temperature  $\leq 320^{\circ}\text{C}$ , open the water inlet valve.

Before starting the compressed air piping systems must be purging to prevent debris into the dryer and filter effects.

### **5.2 refrigeration dryer method of operation:**

#### **refrigeration dryer operation of the program:**

5.2.1 Open the air switch, plugged in, the power indicator on the Panel POWER(red light) is on.

5.2.2 Water-cooled, should turn on the cooling water in and out of the valve;

5.2.3 Now press the green button START, contactor closing, operation led RUN(green) light, compressor running;

5.2.4 Check the compressor operation is normal, there are no exception, refrigerant low pressure gauge is normal;

5.2.5 If everything works out, open the door or access to the valve of the air compressor to the cold and dry gas, and closes the air bypass valve, the air pressure gauge indicates the air pressure;

5.2.6 Open ball valve on the automatic drainage and air flow into the drainage of condensation water, passed out with its machines,

5.2.7 When you shut down, you should turn off the air, and then press the red STOP button to cold and dry off, and cut off the power supply.

5.3 Failure analysis of refrigeration dryer

5.3.1 All are not functioning:

| State                                    | Original                 | Troubleshooting                                                                 |
|------------------------------------------|--------------------------|---------------------------------------------------------------------------------|
| Check the POWER whether is normal or not | No fuse fuse or tripping | Confirm that the power is grounded and checked Fuse switch for damage           |
|                                          | Break string             | Find broken, repair                                                             |
| There's power, but it can't start        | Bad power switch         | Get a new                                                                       |
|                                          | Abnormal voltage         | Against the rated voltage on the nameplate indicates, allowing range $\pm 10\%$ |
|                                          | Thermal protection fault | Get a new                                                                       |
|                                          | Start relay fault        | Get a new                                                                       |
|                                          | Bad compressor           | Get a new                                                                       |
| Switch all normal But will not start     | Bad compressor           | Get a new                                                                       |
|                                          | Loose wire               | Find the wires does not lock, tighten the                                       |

5.3.2 Work abnormally after startup:

| State | Original | Troubleshooting |
|-------|----------|-----------------|
|-------|----------|-----------------|

|                  |                                                        |                                                           |
|------------------|--------------------------------------------------------|-----------------------------------------------------------|
| Abnormal voltage | Shortly after the start, short circuits, burning smell | Line and switch configurations, identify abnormal voltage |
| overload trip    | Continuous start                                       | Each time you start every 3 minutes                       |
|                  | Compressor overload                                    | Dryer load, reduce the amount of air treatment            |
|                  | The dryer inlet temperature too high                   | Additional cooler or souped up improving the ventilation  |
|                  | Power supply connection is bad                         | Clean or renew                                            |
|                  | Poor contacts                                          | Clean or renew                                            |

5.3.3 Poor automatic drainage system:

|               |                                        |                                               |
|---------------|----------------------------------------|-----------------------------------------------|
| State         | Original                               | Troubleshooting                               |
| Poor drainage | Using a pressure 1.5kgf/cm2            | Auto drain minimum working pressure1.5kgf/cm2 |
|               | Clogged air filter built-in auto drain | Cleaning or replacement                       |
|               | Tilt air filter or filter blocked      | Calibration fixing, cleaning or replacement   |

5.3.4 Functioning, but not effective:

|                   |                   |                                           |
|-------------------|-------------------|-------------------------------------------|
| State             | Original          | Troubleshooting                           |
| Evaporator outlet | Condenser leakage | Trapping and then filling the refrigerant |

|                                               |                                              |                                                     |
|-----------------------------------------------|----------------------------------------------|-----------------------------------------------------|
| temperature is too low                        | Refrigerant jam                              | For drier, vacuum again, filling the refrigerant    |
| The evaporator outlet temperature is too high | Inlet temperature too high (more than 80°C)  | Improvement of air compressor discharge temperature |
|                                               | Condenser blocked                            | Cleaning                                            |
|                                               | Too much air and pressure below the 4kgf/cm2 | Controlling emissions                               |

5.3.5 refrigeration dryer’s Water removal is bad:

| State                     | Original                      | Troubleshooting                                         |
|---------------------------|-------------------------------|---------------------------------------------------------|
| Piping system error       | Bypass valve not fully closed | Close the bypass valve                                  |
|                           | Air drying machine            | Close the bypass valve, open dryer and export the valve |
|                           | Dryer is not flat             | Reset flat                                              |
|                           | Automatic drainage slope      | Reset flat                                              |
| The air flow is too large | Excessive thermal loading     | Air source design                                       |
| Abnormal drainage system  | Poor drainage                 | Cleaning or replacement                                 |

|                                                        |                                                        |                                                                       |
|--------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------------------------|
| Abnormal<br>temperature at<br>the evaporator<br>outlet | The dew point<br>temperature is too low or<br>too high | Adjust pressure switch                                                |
|                                                        | Inlet temperature<br>too high                          | Additional rear cooling or<br>improvement of inlet air<br>temperature |
|                                                        | Refrigerant leakage,<br>poor cooling effect            | Trap, add filling of refrigerant                                      |

5.3.6 Pressure drop is too great:

|                                      |                                                                      |                                                                                      |
|--------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| State                                | Original                                                             | Troubleshooting                                                                      |
| Piping<br>system error               | Line valve is not<br>fully open                                      | Valve closed                                                                         |
|                                      | Pipe diameter too<br>small                                           | Pipe diameter increase                                                               |
|                                      | Pipe is too long, too<br>many elbows, fittings                       | Piping system design                                                                 |
|                                      | Pipeline filter block                                                | Replace the filter                                                                   |
|                                      | Pipe joints leak too<br>much                                         | Check the elbow connector                                                            |
| Air<br>capacity<br><br>Over<br>rated | Over rated flow of<br>refrigeration dryer, the<br>pressure to reduce | 1 、 Replacement of larger<br>capacity refrigeration dryer<br><br>2 , Reduce air flow |

Automatic drainage device, electronic drain, float drainage belongs to the wearing parts are not included in the scope of our warranty.

If there is any modification without prior notice.