

# Manual Instruction for Refrigerated Compressed Air Dryer



**Warning: Place the dryer machine horizontal. Never upside down**

**Dino-power Industry & Trade Co., Ltd**

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# PREPARED

Thank you for using DINO-POWER air dryer products!

Before using the equipments, please read this book carefully and make sure you are strictly following the requirements below.

1. The pressure of compressed air dryer should not exceed the maximum pressure allowed. (labeled Nameplate).
2. Before repairing or removal, make sure the system is without pressure.
3. Power must be consistent with the nameplate labeled on the machine.
4. While repairing, be sure of cutting off the power to ensure security.
5. While repairing, you should comply with the public safety codes of producer.

If you do not follow this method of operation and general maintenance, we are not responsible for the danger.

## 1 Product Overview

Our Dino-power brand refrigerated compressed air dryers is a kind of compressed air purification and drying equipment. Our dryer is improved product based on the model of advanced international level. Under the action of the machine, the pressure dew point of compressed air can reach 2-10 °C (0.7 MPa) equivalent to usual dew point about -23 °C -17 °C. In addition to, the rate of dewater up to 93 percent, containing oil no more than 5 PPM. It can filter all the impurities which are bigger than 0.01 μm, with 99.999 percent of de-oiling (see compressed air filters manual) if you equip with our high-precision filter. Then there are water-free, oil-free, dust-free high purified compressed air to meet the demands of aerodynamic control drive, precision instruments, spray painting and plastic, food, medicine, electronic components, metallurgical ships, diver breathing and so on.

We adopt advanced refrigeration technology, and lower the temperature forcibly, so that the large number of water vapor, fuel-air can turn into condensation droplets, which will be drained. Dino-power dryers equip with international famous brands refrigerant compressor, and other high-quality imported components for key components. Our products play a smooth and reliable performance, with low noise, but long life. What's more, the products have an average continuing working time of more than 10,000 hours.

## 2 Usage requirements

1. Choose proper rearward compressed air cooler, tank, filter, cold and dryer machine. The rearward compressed air cooler and tank are necessary, which must be to be installed in between the air compressors. Grade C filter should be equipped, while others can be decided by operator .

2. Using conditions:

Ambient temperature:  $\leq 42$  °C (water-cooled type are unrestricted)

Inlet temperature: general products  $\leq 45$  °C; high temperature type  $\leq 80$  °C

Inlet pressure: 0.2 MPa ~ 1.0MPa (Over 1.0 MPa can be ordered also)

Cooled water amount: calculate by 1 Nm<sup>3</sup>/min to 0.18 t / H

Cooled water temperature: inlet temperature  $\leq 35$  °C

Cooled water pressure: 0.2 ~ 0.4 MPa

Installation environment: a well-ventilated and dust-free place

### 3 install the dryer

1. Horizontal place the machine. **Never upside down**, otherwise the compressor will be broken.
2. From the outlet of air compressor to the inlet of the dryer machine, the pipe should be kept rust-free, and do not make the water pipe bend.
3. Keep at least one meter away from wall / surroundings for better operation, daily maintenance and repair. Be sure of air-cooled type machines are ventilation. About water-cooled type machines, inlet pressure shall be at least 0.2 MPa higher than outlet pressure; the flow must match up to the diameter of pipe line; inlet water temperature cannot exceed 35 °C without impurities (can be filtered at the entrance).
4. Dryer machine is refrigeration equipment, while loading, unloading; transportation and installation should avoid strong shock and with less tilt. And **Never Upside Down**.
5. At the inlet and outlet pipeline of the dryer should install repair valve and bypass valve. See the picture of illustration.
6. If it's installed for the piston compressor. the air tank can be installed in the front so as to prevent vibration and pulse.
7. For Water-Cooled type machines, cooling water pipes should be a separate installed. It's better not use one pipe both for cooling water and other cooling equipment.
8. While installation of automatic drainage, be careful of breaking the small screw .
9. Electrical installation
  - A. Private wire--make a specific mains switch, do not share with other electrical equipment.
  - B. Voltage fluctuations within  $\pm 5\%$ .
  - C. Besides electrical power set a series devices, such as electromagnetic starter, air switch (or valve switch), fuse and so on.
  - D. Correct grounding.

### 4 Analysis of the machine problem and the resolution

Faults caused by both internal and external generally are six factors, as following:

#### 1. Too much pressure drop

Status	Reason	Troubleshooting
Piping system error	Pipe valve is not fully opened	Open the Valves fully
	Diameter is too small	Increase the pipe diameter
	Pipe-Line is too long, elbow, too many joints	Pipeline system re-design
	Two or more air compressors parallel operation with non-performing district	Pipeline system re-design
	Pipeline filter blocked	Filter cleaning or replacement
	Pipeline leakage	Elbow joint inspection and change it
Air handling capacity is more than ratings	Rated over air compressor to reduce traffic pressure on the natural	1, replace of the large capacity air compressor
		2, to reduce air displacement
Water in the Evaporator freeze	Temperature switch or pressure switch broken.	Replacement, inspection lines, switching correction
	Expansion valve, air bypass valve failure	Replacement, check whether the pipeline obstruction, correction switch
	Air handling capacity is too small	Increase the air volume

## 2. Dewater not effective

Status	Reason	Troubleshooting
Piping system abnormalities	Bypass valve does not close totally	Close bypass valve
	Air Not pass the air dryer	Open all the dryer inlet valve
	No tank, or the tank equipped after the dryer machine	Re-Storage devices, as required
	Dryer-not horizontal	Set it horizontally
	Auto-drainage tilt	Set it horizontally
	Drainage pipes above the automatic drainage	Redesign the drain devices
The air displacement is too much	pressure dropped too much	Pneumatic source system re-equipped
Abnormal drainage system	Drainage is not good, or electromagnetic valve failure	Cleaning or replacement
	Drainage's front valve is not open	Make sure the valve position to be full open
Evaporative cooling temperature anomalies instructions	Dew point and humidity is too low or too high	Adjust the pressure switch, water-flow switches, expansion valve, air bypass valve
	Ambient temperature and the inlet temperature is too low	It does not matter, can continue to use the dryer
	Inlet temperature too high	Additional attach rear cooler
	The surrounding environment polluted, air ventilation bad	Choose a more appropriate location or improve ventilation
	Refrigerant coolant leakage, low frozen efficiency	Mending leakage, and irrigation refrigerant

## 3. Do not work properly

Status	Reason	Troubleshooting
Whether the normal power supply	Fuse or a switch melting trip	Make sure the power is not in short-circuit, grounding phenomenon, no fuse switch and check whether the damage
	Disconnection	Identify break, to overhaul
Have power but can not start	Abnormal voltage	Please follow the instructions nameplate on the rated voltage of 5 percent to allow
	Switching bad	Replacement
	Contacts with non-performing	Replacement
	Over-current relay bad	Replacement
	High/low pressure switch bad	Replacement
	Bad electrical on-off switch	Replacement
	Bad capacitors	Replacement
	Bad Temperature switch, bad delivery switch, oil compression	Replacement
Compressor bad	Replacement	
All normal switches are good, but could not be activated	No return back after over-loading limit.	Find out the reasons for replacement trip, and then reset
	Compressor bad	Replacement
	Wire-off	Find it, and make it tighten.

#### 4. Problems after started

Status	Reason	Troubleshooting
Abnormal voltage	electrical short circuit quickly, and smells burned.	Identify the reason of abnormal voltage, and re-configuration,
Could not be activated even though the over loaded high-pressure switch returned.	Pressure switch or temperature switch bad, fans stop	Switch replacement
	Fan bad	Replacement
	Overload trip	Check Relays
	Condenser fouling too much	Cleaning the condenser
Over-current trip relay	Relays bad start	Replacement
	Bad capacitors	
	Pressure switch or temperature switch bad, fans stop.	Replacement
	Adverse hydraulic switch	Replacement
	Row start	Each time you start to be separated from more than three minutes
	Compressor overloading	Dryer overload, reduce air handling capacity
	Drying the entrance to the ambient temperature is too high or the temperature	Additional coolers or improve ventilation
	Relays set current value is too low	Current value adjustments
	Relays connection is bad	Clean-up or replacement
	Power is owed	Fuse or off the power switch connection is bad
	Contacts with non-performing contact bad	Clean-up or replacement
No cooling water cycle	Check the cooling water	

#### 5. Work fine, but not so effective

Status	Reason	Troubleshooting
temperature of refrigerant evaporation indicates too low	Thermometer different evaporation	Replacement
	Heat expansion valve or bypass valve failure	Replacement
	Refrigerant leakage	Mending leakage reperfusion refrigerant charge
	Refrigerant obstruction	Replacing the desiccant, re-vacuum, Filling refrigerant
	Temperature or pressure switch switches set too low fan running continuously	Set temperature adjustment switch or pressure control switch
Refrigerant instructions excessive evaporation temperature	Entrance temperature is too high (over 45 °C more)	Attach with extra cooler, or replace to the larger capacity dryer
	The ambient temperature too high	Additional ventilation equipment
	Heat expansion valve or bypass valve failure	Replacement
	Condenser obstruction, poor ventilation	Cleansing, improving the ventilation equipment
	Cooling water temperature too high, or bad cycle	Improve the cooling water

	Air-handling capacity, but low pressure	Parallel to install dryer
	Refrigerant compressor into the exhaust valve-wear	Replacement
Overload operation	Entrance temperature is too high (over 45 °C more)	Additional cooler
	Air handling, but low pressure	Parallel to install dryer
	Refrigerant leakage	Filling mending leakage reperfusion

#### 6. Automatic bad drainage system

Status	Reason	Troubleshooting
	The use of pressure in the 1.5 Kg / cm below	Automatic drainage for the normal operating pressure in the 2-10 Kg / cm
	Festival part of obstruction	Cleaning
	Drainage valve damage or full	Replacement or open valves
	Drainage is tilted or damaged	Correction fixed or replacement
	Some filters for blocking drainage	Cleaning
	The use of high pressure	According to the automatic use of drainage-rated pressure
	Blocked drains	Cleaning
	Evaporator, rusty or Pipeline dirt obstruction	Life over, replacement

## 5 Notice and warning

1. Check the third step whether meet the requirement.
2. Check the power whether the voltage/phase is correct. The electrical wiring whether correct.
3. Make sure Air-cooled dryer are ventilation. And Water-cooled type machine whether smooth enough. And pay attention to water pressure, water quality, water temperature.
4. Make sure the front and back filter are installed correctly.
5. Bypass and repair valve are closed or not. Repair valve at outlet is open or not.
6. Automatic drainage-ball valve is open or not.
7. Machine with pressure gauge of Freon, check the status of static observation table is normal or not. Usually, the two table static instructions of the machine with high and low pressure gauge should with similar status.
8. Models have a relay, make sure that it has set up start-up delay time (generally, delay about 2-3 minutes).
9. Entrapped air whether cleared or not.

After checking all above steps, you can start the machine; pay more attention to whether there is noise from the compressor, compressor running smoothly or not. What's more, inspecting high-pressure refrigerant gauge rise or not, low-pressure refrigerant whether decrease (If no tables, touch the refrigerant compressor to feel the temperature of vent-pipe is higher or lower than it of suction pipe).

For air-cooled type, Make sure fans of the air-cooled machine can be started and stopped automatically.

Condensing fan:

Fan worked (Low pressure: 0.44 MPa or high-pressure 1.6 MPa).

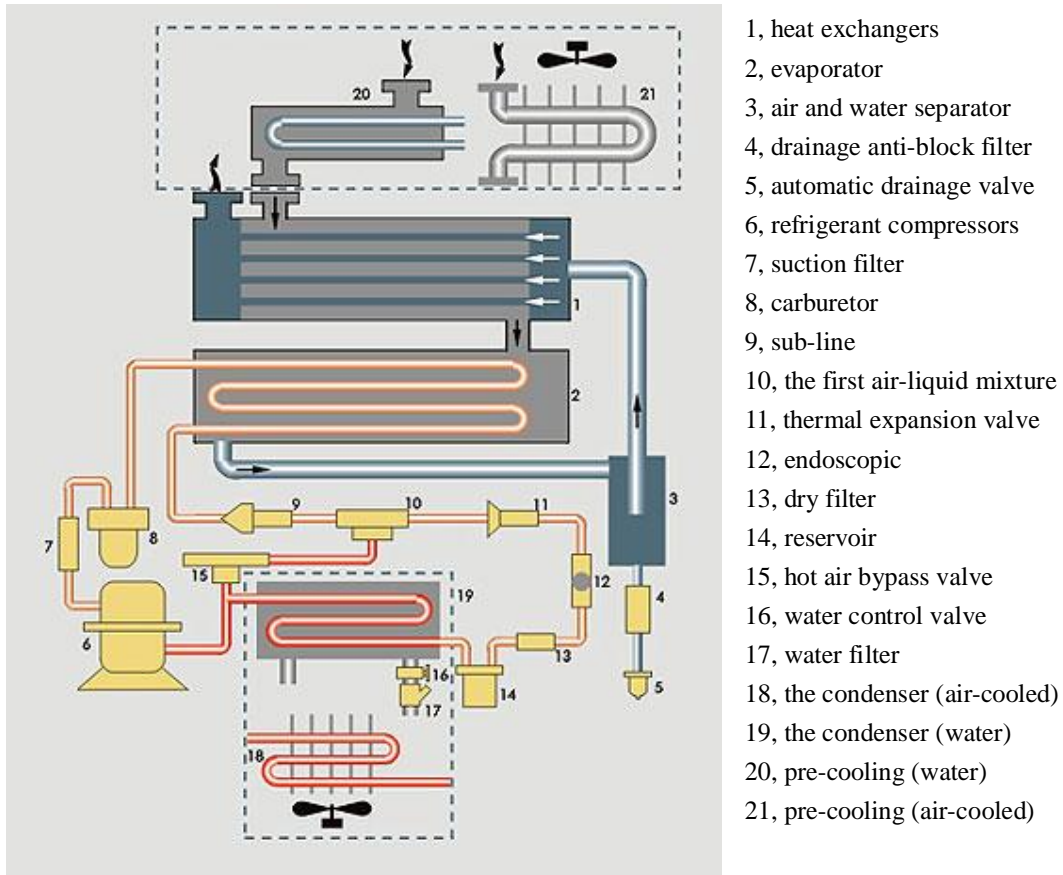
Fan stopped (Low pressure: 0.4 MPa high-pressure or 1.4 MPa)

For water-cooled type, Low-pressure refrigerant gauge should show a certain value between 0.4 ~ 0.45 MPa; and the high-pressure one shall be a data between 1.4 ~ 1.6 MPa. In this case, it works normally. Then, switch on air compressors. After the tank pressure reach 0.7 MPa, gradually open

the inlet repair-valve, and let the compressed air enter into the dryer machine slowly. Do not open the valve fully and suddenly, in order to prevent the evaporators and other components damaged by shock wave.

In addition, frequently switch on / off refrigerant compressor is prohibited, otherwise compressor motor will be broken.

## 6 Dryer installation drawing



Thanks for choosing Dino-power compressed air dryer machine.

If you have any other question, or problem with our product, please kindly contact your local distributor, or contact us freely thanks