

REFRIGERANT COMPRESSED AIR DRYERS

**INSTALLATION AND
OPERATION MANUAL**

REFRIGERANT COMPRESSED AIR DRYERS

**NOTICE: PLS READ THIS MANUAL CAREFULLY BEFORE USING
THIS MACHINERY AND KEEP IT FOR THE LATER USAGE.**

Installation Manual

Maintenance Manual

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Foreword

This manual mainly instructs you on how to use the equipment properly. Its purpose is to prolong the service life and diminish operational failure, so as to guarantee the quality of the compressed air. Read this manual carefully before use, and carry out operation and maintenance according to the instructions for fear of equipment failure.

If the users do not operate the dryer according to this instruction, we are not responsible for the maintenance.

Note: Please obey the following rule to avoid danger.

1. The pressure of the compressed air should not be out of the pressure allowance of dryer.(See label)
2. Ensure no pressure within the system before maintenance or installation and detachment.
3. The operating power supply should be accordant to that in the label.
4. Please cut the power supply of the dryer before maintenance.
5. Please obey the company's public safety regulations during maintenance.

Function

The key function of the refrigerant compressed air dryer is to remove the moisture of the compressed air. Through a coolant heat exchanger (evaporator), the temperature of compressed air drops to 2°C, the dew-point temperature, and moisture or water drops in the compressed air condenses. Then through a separator, the air and drips separate. Then drips are drained from the system by an automatic drainage. The whole process of drying finishes. Commonly, the moisture content of the drying compressed air is about 0.59g/m³, and the moisture removal rate can be up to 93%. The user can select the suitable model or add filters according to the necessity.

Basic principle

1 Air compressing flow

The humid and high-temperature compressing air flows from the dryer inlet. First, it passes the front cooler (just for high-temperature model), reduces the air temperature, enters into air heat exchanger to reduce the temperature again and removes part of the drips from the compressing air. Then the compressing air enters into coolant evaporator to exchange heat with coolant. Until the temperature of the compressing air reduces to 2°C~10°C, much of the moisture in the air will condense into drip. When flows to wind separator, the air and drips will separate. The drip will be drained out of the system through automatic drainage. The dry air flows to the outlet after temperature rising a little through air heat exchanger. This step can avoid air compressing pipe rust and save energy. After drying, the temperature of compressing air is 2°C~10°C. The moisture content is about 0.59g/m³. The moisture removal rate can be 93%.

2 Coolant system flow

Compressed by the coolant compressor, the coolant will turn into high-pressure and high-temperature gas. After radiating heat by the condenser, it turns to be high-pressure medium-temperature liquid coolant. Then goes through the drying filter and window. The main function of the desiccant is to dry and filter the moisture and impurity in the coolant pipeline. The coolant volume and drying degree can be checked through the coolant window. Then the high-pressure medium-temperature liquid coolant go through the throttling device, and it turns into low-pressure low-temperature liquid and absorbs the compressed air heat, reduces the air temperature and turn the moisture condense into drip. The wind and coolant compressing load can be controlled by heat by-pass valve. Finally, coolant flows back to the compressor inlet through low-temperature liquid receiver. After being compressed, it can be used again and it forms a coolant circuit.

Installation instructions

Location

1. Choose a cool and draughty place as the best location for installation
2. The temperature of the installation place should under 35°C.
3. Do not install it outdoors, in damp and dusty place, or in a corrosive and polluted place.
4. The location shall be one meter away from the wall and two meters away from other machines, which facilitates cleaning and maintenance.
5. Install it horizontally to facilitate drainage.

Pipe

6. The dryer is commonly installed behind gas receiver and back cooler and in front of main air pipe.
7. If the air compressor heavily vibrates and cause the pipe vibration, please install the anti-vibrating high-pressure soft pipe on the inlet and outlet of the dryer to avoid failure caused by dryer vibration.
8. The inlet and outlet of the air compressor should be equal or bigger than the inlet and outlet of the dryer. Keep the pipe short and straight to avoid the pressure reduce.
9. Add an main pipe filter (3um) in front of dry to avoid impurity and carbon powder enter into dryer to influence dry moisture removal effect.
10. Add switch pressure meter and temperature meter to cooling water inlet and outlet pipe for convenient maintenance. (water-cooling model)

Power

12. Install a dedicated switch beside the power supply of the dryer for protection. For more information please refer to relevant instruction manuals.
13. The supply voltage cannot exceed the rated voltage.(Label specification±10%)
14. The power cord's specification depend on the current and the length of wires.
15. Do not share the protection switch with any other equipment.

Operations

Before operation

1. Verify the power supply is under normal voltage (label specification 10%).
2. Verify the environmental temperature is normal. (Wind cool type machine is under 35°C)
3. Verify the fin of condenser and cooler is clean.
4. Verify the compressed air has not entered the dryer. (Stop the compressor or fasten the valves, and turn on the bypass valve.)
5. Verify the cold coil meter is under normal pressure. (Before running, the coolant pressure must be kept around 0.7~1.1Mpa, and not less than 0.6Mpa in winters).
6. Verify that the cooling water intake is under normal pressure and humidity. (Hydraulic pressure: 0.2~0.4Mpa, water temperature: max 35°C)
7. Verify that the exhaust rate of the air compressor matches the processing capacity of the cool dryer.

During operation

8. Turn on the power, and the dryer will begin to work.
9. Verify dryer is under normal working voltage. (See label.)
10. Verify the cooling water inlet/outlet is under normal temperature. (5~10°C)
11. Verify the cooler's fan motor is running well.
12. Verify the condenser's fan motor is running well. (The motor is controlled by the pressure switch. Run under the pressure 1.55Mpa, stop under 1.35Mpa)
13. After ten minutes running, let the compressed air in the dryer or open the valve slowly and close air bypass valve.)
14. Check whether there is air leakage.
15. Verify the intake compressed air temperature is normal. (High temperature: YCD≤80°C, Low temperature: YAD≤40°C)
16. Verify the intake compressed air is under normal pressure. (See label, the standard pressure 0.7Mpa)
17. Verify the dryer passageway is under normal temperature difference. (Temperature difference: 10~30°C).
18. Verify that coolant is under normal high/low pressure. (High pressure under zero load: 1.35~1.55Mpa, Low pressure: 0.32~0.4Mpa).
19. If the water-cooling model is under abnormal high pressure, please adjust the water-regulating valve at the cooling water entrance. (Clockwise to decrease the pressure, and vice versa.)
20. After 30 minutes operation, check whether the drainage system is under control. (Generally speaking, the high-pressure drainer will drain automatically.)
21. If the evaporator freezes and stop the compressed air, shift the temperature controller to scale of 0°C~3°C. (Red figures stands for temperature above 0°C, green figures stands that below 0°C)

If all the above items are normal, the operation is under control.

Note: 1. Idling should be not more than 30 minutes.

2. Restart machine 5 minutes after shutdown for fear of causing damage.

Routine Maintenance

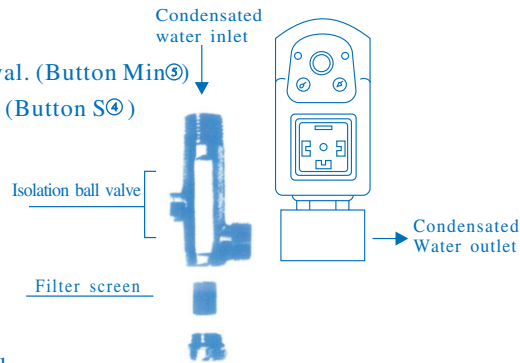
1. Check whether the fin of the condenser and the cooler is clean to avoid the bad influence on the life and dehydration effect and of the dryer causing by poor heat radiation.
2. Clean the fin of the condenser and the cooler by spraying via compressed air. If is seriously jammed, please use the detergent. Do not use the solvent that can cause copper and fin corrosion.
3. Ensure the dryer is operating under ventilating conditions all the time.
4. Ensure the inlet temperature is under the rated temperature.
5. Check whether the Coolant high and low pressure is normal. The pressure should be 0.7~1.1Mpa 4 hours after stopping the operation. Start zero load, low pressure is 0.32~0.4Mpa, high pressure is 1.35~1.55Mpa.
6. Check whether the cooling water is under normal condition every day (Standard hydraulic pressure: 0.2~0.4Mpa, inlet water temperature: below 35°C).
7. For the water-cooling model, please clean the water filter every three months or when the high pressure of the coolant is over 0.17Mpa. If the pressure of the coolant is still off standard, please clean the condenser and the front cooler,
8. Open the drainer valve at least twice a day.
9. For large models, please coordinate with our company on a thorough maintenance.

Electronic drainer (Choose according to the model)

Set the timer

- Use right knob to set spacing interval. (Button Min③)
- Use left knob to set discharge time. (Button S④)

The procedures for setting the time:
Set the discharge time 2 seconds,
set the spacing interval 20 minutes,
Then make adjustment according
To real condition.



Maintenance

We suggest pressing the manual detecting button⑤ to check the electronic water discharge system when you check the compressed air system.

Clean the filter screen③ every month to minimize the failure of the electronic water discharge valve. If jam occurs, please separate and clean the screen in time.

Before cleaning, close the ball valve. Ensure no air pressure and turn off the power at the same time.

Please shut down the switch①. Press the manual button to discharge the pressure.

Unscrew the screw nut②, take out and clean the screen③.

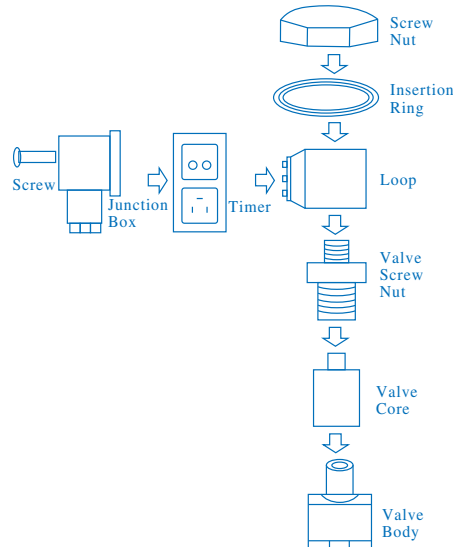
Detaching steps

1. Unscrew the screw. Take out the junction box and timer from the loop.
2. Unscrew the screw nut, take out the insertion ring and loop from the valve.
3. Fasten the valve by wrench, use gear wheel clamping valve core and unscrew out the screw nut, take out the valve core.
4. Clean valve body and valve core by air pressure gun.
5. The opposite is installation method.

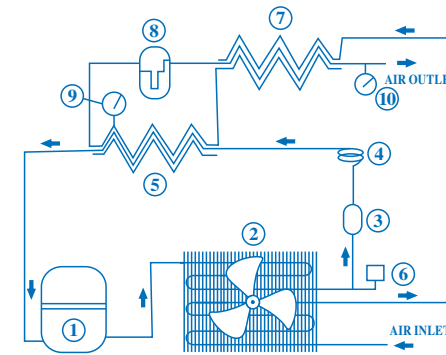
Notice

1. Screw down the screw which connected the junction box, timer and loop. Ensure the sealing packing is well working, and keep water away from the sealing packing. Or the loop and timer will burn out.

2. When the drainer is jammed, please shut off the power before detach the valve body. Or the loop and timer will burn out when the current become bigger.

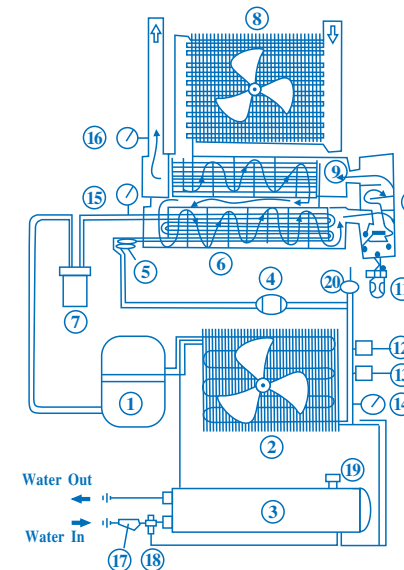


10-60 System Flow



1. Compressor
2. Front cooler and condenser
3. Drying filter
4. Capillary
5. Evaporator
6. Pressure switch
7. Air heat exchanger
8. Air and vapour separator
9. Coolant low pressure meter
10. Air outlet pressure meter

75-120 System Flow



1. Compressor
2. Wind-cooling condenser
3. Water-cooling condenser
4. Drying filter
5. Capillary
6. Evaporator
7. Vapour and water separator
8. Front cooler
9. Air heat exchanger
10. Air and vapour separator
11. Automatic drainer
12. High pressure control switch
13. Pressure controller
14. Coolant high pressure meter
15. Coolant low pressure meter
16. Air outlet pressure meter
17. Cooling water filter
18. Constant pressure feed valve (water volume adjust valve)
19. Safety valve
20. Charging valve

The correct figure reading of coolant meter and air pressure meter

1. Read the figure in the outer circle, and the unit is Mpa.

For example, the figure in Figure 1 is 0.01 Mpa and Figure 2 is 0.01 Mpa.

2. Or read the figure next to the outer circle, and the unit is Kg/cm². The figure in Figure 1 is 0 Kg/cm², Figure 2 is 0.1 Kg/cm².

3. Coolant low pressure meter is presented by EVAPORATING, TEMPERATURE OR SUCTION PRESSURE.

4. Coolant high pressure meter is presented by CONDENSING, PRESSURE or HIGH PRESSURE.

5. Air inlet pressure meter is presented by AIR INLET PRESSURE.

6. Air outlet pressure meter is presented by AIR OUTLET PRESSURE or OPERATING PRESSURE.

7. Before operating, coolant pressure should be 0.7~1.1 Mpa.

In winter, the pressure should not be lower than 0.6 Mpa. If the pressure is under this pressure, please stop to use it.

8. 5 minutes after operating, coolant pressure should be 0.32~0.4 when zero load. Coolant high pressure should be 1.35~1.55 Mpa.

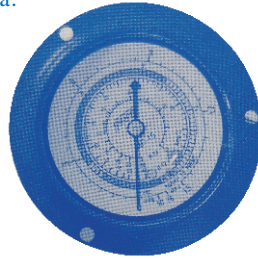


Figure 1

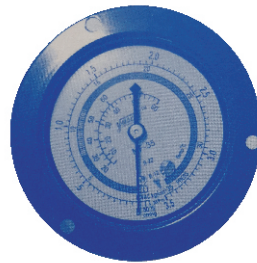


Figure 2

Failure Solutions

Fail to start

State	Cause	Solutions
Abnormal power supply	Master power supply protection switch damaged or jumped off	Ensure whether the power supply is lack of phase, in short circuit or unconnected to ground wire, and check whether the power switch is damaged.
	Abnormal voltage	Rated voltage allowance on label $\pm 10\%$
	Offline	Find and repair the offline part
Electric organ breakdown	Bad power, electromagnetic switch or fuse	Replace it.
	Overload protection, high-pressure protection switch jumped off or in bad condition	Reset or relace it.
breakdown	Poor operating capacitance	Replace it.
	Bad compressor	Replace it.

2. System halted after start

State	Cause	Solutions
Electric organ breakdown	Bad pressure switch	Replace it.
	Bad fan motor	Replace it.
	Bad overload protector	Replace it.
	Poor capacitance of blower	Replace it.
Bad operating condition or wrong operation	Continuous startup	Restart at an interval of over 5 minutes.
	Overload throughput	Precooler overload
	Precooler's inlet temperature or environmental temperature too high	Add cooling or improve ventilation.
	Fin of condenser or cooler jammed	Cleanse it.
	Cooling water is abnormal, water-cooling model condenser, water filter jammed	Improve cooling water, clean condenser and water filter

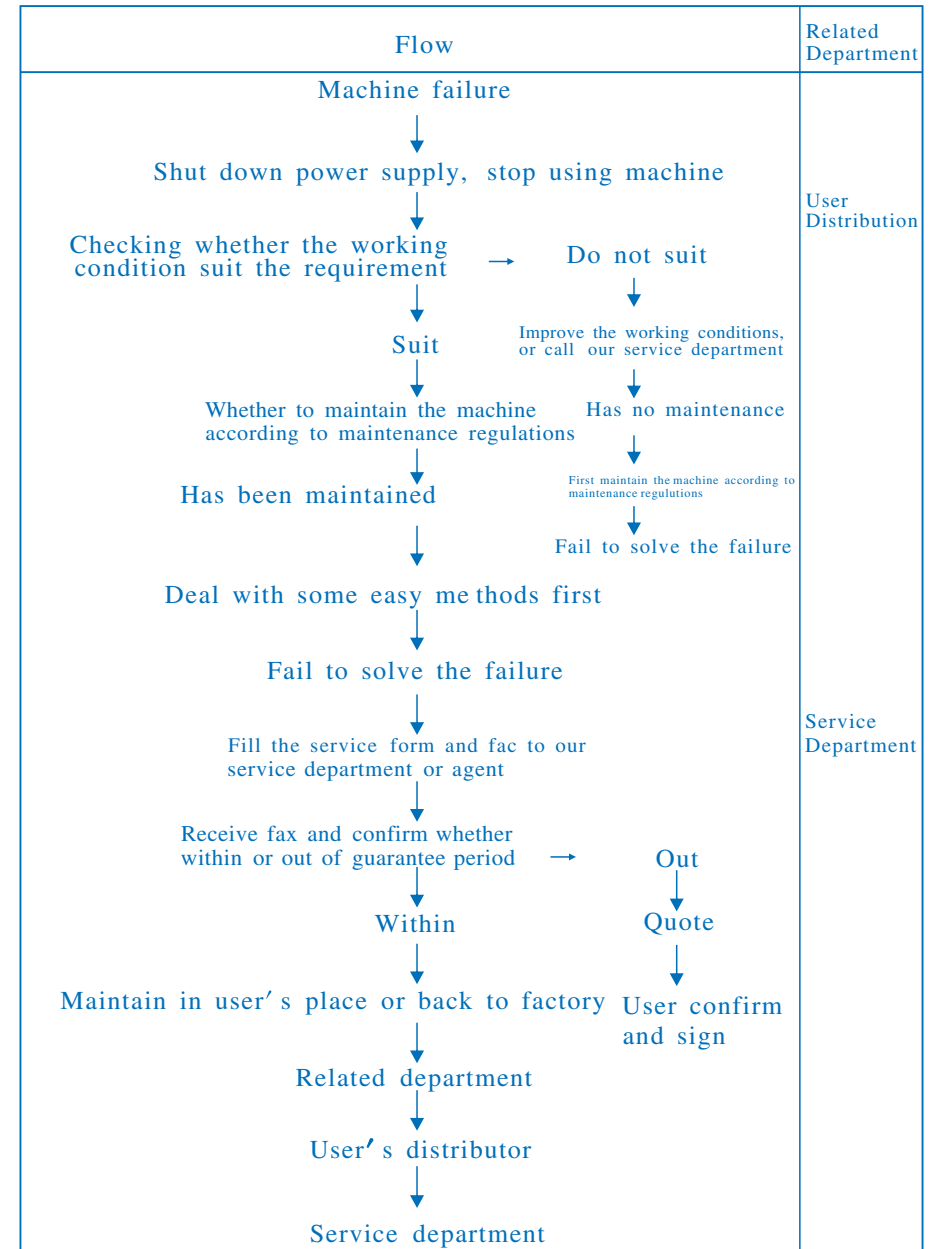
3. Pressure drop is too big

State	Cause	Solutions
The pipe system is abnormal	By-pass valve is not completely open	Open the valve completely
	The pipe is too small	Change to big pipe
	The pipe is too long	Redesign the pipeline system
	More than two compressors can not match each other	Redesign the pipeline system
	The filter in pipe is jammed	Clean the filter or change
	The pipe junction leak	Check the pipe
The air volume need drying exceeds allowance	Exceed the dryer's volume sllowance	Change the dryer or add dryers
The side board of the evaporator freezes	The pressure switch is abnormal	Change or check the circuit
	Capillary jammed	Change or check the capillary

4. Working normally, but the moisture removal effect is not good

State	Cause	Solutions
The pipe system is abnormal	By-pass valve is not completely close	Completely close the by-pass valve
	The air does not pass through dryer	Completely open the dryer inlet valve
	The dery is not set level	Set level
The compressing air is abnormal	The air compressing volume exceed allowance	Add more dryer
	The environment temperature is too high	Improve the environment temperature
	Air pressure is abnormal	Standard is 7kgf/m2 or see the label
The freezing system is abnormal	The valve fin damages	Change new one
	Coolant pipeline jammed	Change dryer, vacuum, pour in the coolant
	Pressure switch problem	Change new one
	fan of condenser or cooler failure	Change new one
	Coolant high-pressure is too high (water cooling type)	Adjust the water volume valve or clean the water
Water removal effect is abnormal	Fin of condenser is jammed	Clean
	Cooling water abnormal, of water cooling condense, filter jammed	Improve cooling water or clean condenser, water
	Drainer valve failure or is not completely open	Change new one or open the valve
	The pressure is abnormal	Change new meter or new model
	The automatic drainer is not level	Set it level
	The drainer pipe jammed	Clean
	The pipe is jammed	Clean
	The outlet is higher than automatic drainer	Adjust the outlet height
The drainer floating ball failure	Change new one	

After Service Flow



Service Contact Form

Company name:		
Address:		
Zip code:	Contact person:	Department:
Tel:		Fax:
Type:		Identification no:
Failure:		
Low pressure for coolant 4 hours after stop: _____MPa	High pressure for coolant: _____MPa	
Low pressure for coolant after 5 minutes zero load: _____Mpa	High pressure for coolant: _____MPa	
Compressor type: _____	Voltage: _____V	
Whether the front cooler motor work (wind-coolingtype) _____ 1	Whether the cooler motor work (wind-coolingtype) _____ 1	
Air compressor displacement _____m ³ /min	Air compressor exhausting Air pressure _____ 1 Kfg/cm2 _____ 1	
The temperature of the workshop _____°C Dyer inlet temperature _____°C	Whether the automatic drainer drain _____	
Cooling water inlet temperature _____°C (water-coolingtype)	Cooling water inlet pressure _____Mpa (water-coolingtype)	

Working Condition

Specification (G) TYPE air-cooling "two machines combination" high efficient dryer

Type Specification	Type														
	AH 7.5 SG	AH 10 SG	AH 15 SG	AH 20 SG	AH 30 SG	AH 50 SG	AH 60 SG	AH 75 SG	AH 100 SG	AH 120 SG	AH 150 SG	AH 200 SG	AH 250 SG	AH 350 SG	AH 400 SG
Air compressing volume (Nm ³ /min)	1.0	1.5	2.0	2.5	3.8	6.5	7.5	10.5	13.8	14.5	20	26	30	35	45
Power	1Φ220V 50Hz	1Φ220V 50Hz	1Φ220V 50Hz	1Φ220V 50Hz	1Φ220V 50Hz	1Φ220V 50Hz	1Φ220V 50Hz	1Φ220V 50Hz	1Φ220V 50Hz	1Φ220V 50Hz	3Φ380V 50Hz	3Φ380V 50Hz	3Φ380V 50Hz	3Φ380V 50Hz	3Φ380V 50Hz
Coolant Compressor (KW)	0.2	0.43	0.52	0.73	0.92	1.38	1.38	1.78	2.57	2.57	2.94	4.4	4.8	5.5	7.35
Condenser (W)	30	45	75	120	120	240	240	240	480	480	720	720	1200	1200	1500
Full load current (A)	3.0	4.5	5.3	6.8	7.2	12.0	12.0	17.1	25	25	11.7	13.5	15	18	24
Total Current (A)	1.5	2.9	3.5	3.6	4.0	6.8	6.8	8.6	10	12.2	9.8	11.3	14	17	22
Coolant type	R-406a	R-406a	R-22	R-22	R-22	R-22	R-22	R-22	R-22	R-22	R-22	R-22	R-22	R-22	R-22
Coolant pouring volume (g)	350	650	550	750	950	1100	1200	1200	1800	1850	3400	3800	4200	5500	9000
Air inlet/outlet caliber	R1" NPT	R1" NPT	R1" NPT	1-1/2" NPT	1-1/2" NPT	1-1/2" NPT	2" NPT	2-1/2" NPT	2-1/2" NPT	2-1/2" NPT	R3" NPT	R3" NPT	R3" NPT	PN1.0 DN100	PN1.0 DN100
L	530	730	680	730	780	920	1010	1010	1220	1280	1615	1605	1470	1600	1700
H (mm)	450	890	770	940	970	5200	9900	1290	6200	610	1450	1450	1350	1580	1750
W	350	430	410	430	450	1130	6200	620	1210	1200	630	631	730	750	800
Net weight (kg)	25	82	90	98	102	120	168	205	240	360	410	480	508	633	860

Low-temperature water-cooling type working conditions

Working pressure: standard 0.7Mpa, highest 1.0MPa
 Inlet temperature allowance: under or equal to 40°C
 Cooling water temperature: standard 35°C
 Pressure 0.2~0.4 Mpa
 Environment temperature: under 40°C
 Dew-point temperature: 2~10°C
 Installation location: draughty and no dust place
 Accept order for special specification

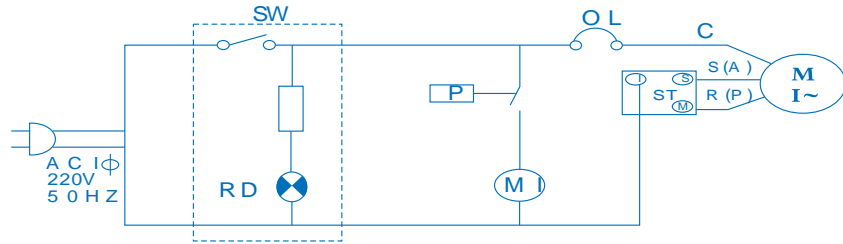
High-temperature water-cooling type working conditions

Working pressure: standard 0.7Mpa, highest 1.0MPa
 Inlet temperature allowance: under or equal to 80°C
 Cooling water temperature: standard 35°C
 Pressure 0.2~0.4 Mpa
 Environment temperature: under 40°C
 Dew-point temperature: 2~10°C
 Installation location: draughty and no dust place
 Accept order for special specification

Circuit Diagram

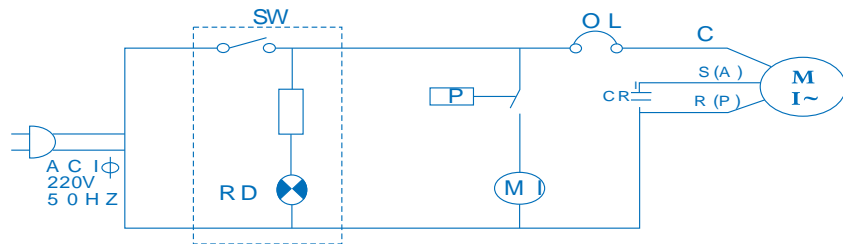
SA(RD)	MI	P	ST	OL	M
Boat style s with with indicator	Condense (cool) wind machine	Pressure control switch	Heat protection device	Working capacitor	Compressor electromotor

75-10



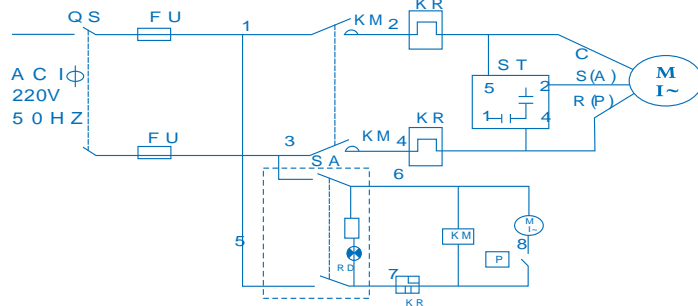
SA(RD)	MI	P	ST	OL	M
Boat style s with with indicator	Condense (cool) wind machine	Pressure control switch	Heat protection device	Working capacitor	Compressor electromotor

20-30



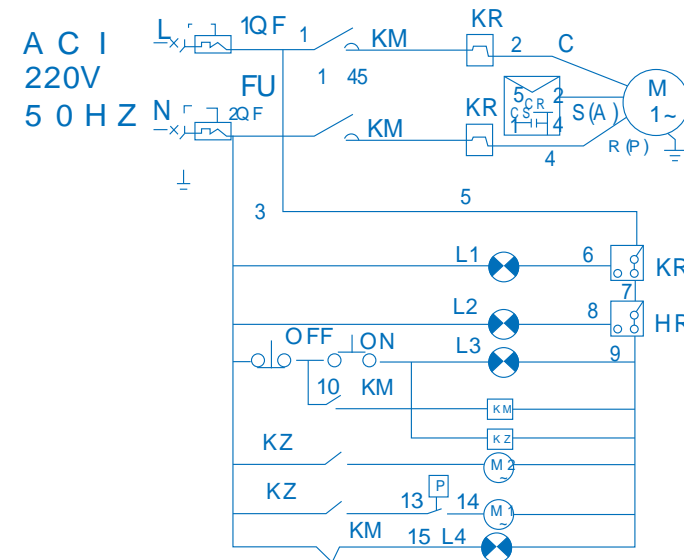
SA(RD)	MI	P	KP	KM	ST	M	FU	QS
Boat style s with with indicator	Condense (cool) wind machine	Pressure control switch	Thermo relay	AC contactor	Starter	Compressor electromotor	Fuse	Single stage switch

50-60

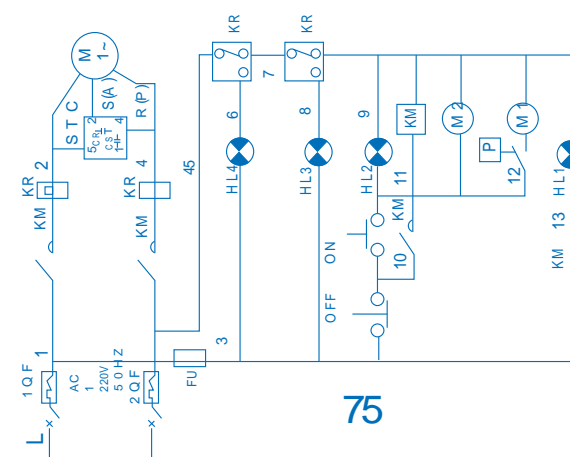


14

75-120



OFF	ON	M1	M2	KR	M	KM	ST	P
Power off	Power on	Condense wind dryer	Condense wind dryer	Gasket sealed relay	Compressor electromotor	AC Contactor	Starter	Pressure control switch
L1(white)	L2(white)	L3(green)	L3(erd)	CR	CS	KZ	1AF 2QF	
Overload indicator	High jump indicator	Operating indicator	Stop indicator	Operating capacitor	Operating capacitor	intermedi ate relay	Automatic switch	



75

CODE	OFF	ON	M1	M2	P	KP	KM	ST	M	FU
NAME	Stop Button	Start Button	Wind Button	Wind Condenser Cooler	Pressure Control Switch	Thermo Relay	AC Contactor	Starter	Compressor Electro Motor	Fuse
CODE	H11	H12	M13	M14	CR	CS				
NAME	Stop Indicator	Operating Restart Indicator	Overload Indicator	Overload Capacitor	Operating Capacitor	Automatic Switch				

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User Notice

- 1. The quality assurance of our products is according to the “three guarantees” in China.**
- 2. If the user does not install the product in time due to the project delay, please contact us as soon as you can. We can extend the period of “three guarantees” properly. The longest period is within 18 months. (count from the goods deliver day).**
- 3. Man-made damage or any other failure which is not caused by equipment during the “three guarantees” period, we take charge of the maintenance but will charge properly.**
- 4. If the payment of the goods is not received according to the contract, we will consider the property is not clear and not carry out the “three guarantees” service. Please understand and support us.**

Guarantee

- 1. We guarantee we are responsible for the maintenance of the dryer we produced when the equipment is fail without any man-made damage during the “three guarantee” period and we will do the routine maintenance according to our instructions.**
- 2. Please operate the dryer according to the relative conditions we mentioned in our instructions. If do not operate it properly, please inform our maintainer to assure the efficiency and life of the machine.**
- 3. We will provide you with the relative technology information and the best after service.**

Distributor:

Saledate:

Sign: