amcaremed
medical gas solution
+ (86) 550 7111326
www.amcaremed.com
info@amcaremed.com

Skid Mounted Scroll Medical Air Compressor

Operation Manual

AMCAREMED TECHNOLOGY CO., LIMITED
Building 30, No. 900 Zhong Xin Avenue, Chuzhou, Anhui, China

Contents

1. Introduction 1
2. System Overview 1
3. Safety guidance 1
4. System Introduction 2
4.1 Configuration Instructions 2
4.2 Component Introduction 2
5. Receiving inspection 4
6. Installation 4
6.1 Installation Location 4
6.2 Pipeline 5
6.3 Wiring 5
7. Run 6
7.1 Preparation before startup 6
7.2 Startup and Operation 6
8. Control system 7
8.1 Control system overview 7
8.2 Electric control cabinet interface 7
8.3 Touch screen interface 8
8.4 Summary 15
9. System maintenance 15
10. Troubleshooting 16
11. Service and Warranty 18
12. Information 18
12.1 Manufacturer information 18
12.2 After-sales service 18

1. Introduction

This operation manual will provide installation, operation and basic maintenance instructions for medical air compressor system equipment. This manual is applicable to our oil-free scroll air compressor system. Before starting the scroll air compressor, users must read the following content.

Operators of this equipment should have relevant knowledge of air compressor systems and be able to identify and avoid potential threats associated with air compressors. Improper operation will cause injuries and serious accidents. Before installing and operating this equipment, users should understand the structure, operating procedures and hazards of the air compressor. If you have any questions about the operation, safety, maintenance, etc. of the air compressor unit, please contact us.

2. System Overview

Medical air compressor systems are designed to supply medical compressed air to medical gas pipeline systems in medical facilities.

Amcaremed medical air compressor system consists of main components such as electric control box, air compressor, dryer, air tank, pipeline, pressure sensor, etc. The electric control box monitors the pressure in the air tank in real time through the pressure sensor, and controls the start and stop of the compressor through the logic program, so that the pressure in the air compressor system is always balanced within the preset range. The touch screen main screen will display the real-time system pressure value and the status of each compressor.

3. Safety guidance

Operators should read this manual carefully before installing, wiring, starting, operating, adjusting and maintaining the system.

Operators should use common sense safety precautions, good workmanship practices and follow any relevant local safety precautions.

This manual contains information that is very important to know and understand. For safety and to prevent equipment problems, pay special attention to the following information:

- Before starting any installation or maintenance procedure, all power to the equipment must be disconnected and a pre-power-on inspection performed.
- This is a high speed machine. Do not attempt to service any parts while the machine is operating.
- All electrical procedures must comply with all national, state and local codes and requirements.

AMCAREMED TECHNOLOGY CO., LIMITED
Building 30, No. 900 Zhong Xin Avenue, Chuzhou, Anhui, China

- All wiring should be connected by a certified electrician.
- The waste discharge and scrapping procedures of air compressor system should comply with local environmental protection regulations.
- The high temperature surface of the compressor may cause burns. Please wait until the pipe or compressor surface cools down before repairing or maintaining it.
- The wire size should be able to handle the peak value of all operating units and the full motor load. Please read the wire size for the full motor load and full system load on the electrical wiring diagram.
- Before removing, loosening, or servicing any covers, guards, accessories, connections, or other equipment, release all air from the affected components.
- If repairs or maintenance will affect available pressure levels, notify appropriate hospital personnel.

4. System Introduction

4.1 Configuration Instructions

Medical air compressor system meets CE requirements and has two or more oil-free scroll air compressors. The system is suitable for three-phase four-wire power supply, 220V/380V, 50Hz/60Hz and other working environments. Other accessories include precision air intake filter, adsorption dryer/refrigeration dryer, stainless pipe pipeline, electric control box, carbon steel gas storage tank, etc.

4.2 Component Introduction

4.2.1 Compressor

Oil-free scroll air compressor.

4.2.2 Air Inlet Filter

Gas-water separation filter

Dust removal and filtration: imported 3 μm precision air intake filter

Oil removal and filtration: imported 1 μm precision air intake filter

High-precision filtration: imported 0.01 μm precision air intake filter

Sterile filter: Imported 0.0 1μm precision air inlet filter

4.2.3 Check valve

Imported copper check valve G1.

Each compressor is equipped with a check valve, which allows gas to pass in only one direction, preventing the gas from flowing in the opposite direction, effectively preventing the compressor from running in the opposite direction.

4.2.4 Valve

One piece manual ball valve G 1.

The valve can be closed manually to disconnect the compressor and dryer for maintenance.

4.2.5 Air pressure sensor and air pressure gauge

The pressure gauge can display the pressure in the air tank in numerical form, so that the operator can know the measurement results in a simple digital form. At the same time, the air pressure sensor detects the air pressure value in the air tank and the pipeline. The operator only needs to enter the air pressure range value, and the compressor will automatically work within this range.

4.2.6 Compressor operation timer

Record the running time of each compressor to facilitate operators to perform maintenance work on the compressor.

4.2.7 High temperature bellows

Connect the compressor to the stainless steel pipeline to prevent the vibration generated by the compressor from being transmitted to the pipeline, balance the equipment, reduce the damage of vibration to the pipeline and accessories, and reduce the overall vibration of the system and the vibration caused by system resonance.

4.2.8 Air storage tank

Material: Carbon Steel

Air storage tank is designed to be cylindrical with a compact structure, which is easy to move and transport. It is equipped with an electronic drain valve, which the operator can set to automatically drain the condensed liquid in the tank.

4.2.9 Electric control box

(1) The low-voltage electrical components and controller PLC used in the electrical control box are all Siemens or Schneider brands. TCP/IP communication is used to connect the host computer touch screen with the PLC, to operate the system on the touch screen;

(2) It uses thin-film capacitance sensor with high measurement accuracy, good corrosion resistance, and the measurement results are not affected by the measured gas;

(3) Can achieve: ① Reliable protection of the compressor ②Automatically or manually control the start and stop of the compressor ③The pressure working range can be freely set

(4) Manual control mode: Any compressor can be started and stopped by pressing a button without being affected by the pressure value.

(5) Automatic control mode: The air compressor system automatically operates within the pressure range set by the operator. When the system pressure is higher than the set value, the compressor stops working; when the system pressure is lower than the set pressure point, the compressors automatically start to operate in sequence. When the system pressure is higher than the set value of the protection pressure, one of the compressors is shut down according to the compressor running time calculation to reduce the compressor running time, save energy and reduce consumption, and realize polling start to balance the service life of each compressor.

(6) Sound and light alarm: When the air pressure reaches the set parameter value or the compressor reaches the maintenance time, a sound and light alarm will be issued to indicate that the system now needs maintenance or overhaul.

(7) The control system is equipped with protection devices such as overvoltage, overload, phase loss, and phase sequence detection. Each compressor circuit is equipped with protection components such as circuit breakers, low-voltage circuit breakers, and thermal relays.

5. Receiving inspection

Receipt of your medical compressed air system, inspect it immediately for any damage that may have occurred during shipping.

Repair or replace damaged items before use. The nameplate should be checked to verify that the model and voltage are correct.

WARNING: Use properly rated load-bearing lifting equipment and follow safe lifting procedures during all moves.

WARNING: Do not operate the device if it has been damaged during transportation, handling, or use. Damage may cause an unsafe condition and result in personal injury or loss.

6. Installation

6.1 Installation Location

1. The air compressor system must be installed in a clean, well-lit and well-ventilated area.

2. The area should be free from excessive dust, toxic or flammable gases and moisture.

3. Do not install the compressed air system where the ambient temperature is above 40° or the humidity is high.

4. Clearances must allow safe and effective inspection and maintenance.

5. For maintenance and ventilation of the system, it is recommended to leave 24 inches (60.96 cm) of clearance around the system and 36 inches (91.44 cm) of clearance in front of the control panel. Provide the system with vibration-damping pads to reduce noise caused by system vibration. The system should be leveled and placed on a concrete pad suitable for supporting the weight of the system.

6. If necessary, use metal shims or leveling pads to level the system. Do not use wood shims.

7. The system should be located as close to the point of use as possible to prevent excessive loss of working air pressure due to pressure drop.

6.2 Pipeline

1. When assembling the system pipes, make sure the pipes are arranged neatly without any strain or twisting.

2. The outlet duct should be as short as possible and the restriction should be as small as possible.

6.3 Wiring

WARNING: Before performing any electrical work, be sure to disconnect all power to the system.

Before beginning any installation or maintenance work, refer to the electrical drawings supplied with the equipment.

Do not operate the system at a voltage other than that specified on the system panel.

All user wiring should comply with the National Electrical Code and any other applicable state or local codes.

CAUTION: All voltage is disconnected from the compressor module using a circuit breaker.

Closing the appropriate circuit breaker will disconnect control power, and closing the appropriate motor circuit breaker will disconnect compressor power.

The electrical service must be the same as specified on the nameplate, otherwise damage to the equipment may occur.

Before starting the electrical installation, check the control voltage, phase, and current ratings, and make sure the voltage provided by the hospital is the same.

Vibrations during shipping may cause electrical terminals, fuse inserts, and mechanical connections to loosen. Tighten all electrical connections before applying power to the control panel.

Only a qualified electrician should connect power to the control panel and any other connected circuits.

Ensure that the power supply of the emergency power generation system is consistent with the requirements of the compressed air system.

The three-phase power provided by the emergency generator must match the normal power supply to ensure that the motor always maintains the correct rotation direction.

7. Run

7.1 Preparation before startup

1. Before operating, make sure you have read and understood all safety warnings, labels and instructions.

2. Remove any shipping materials, brackets, etc.

3. Make sure all fuses, circuit breakers, etc. are of the correct type.

4. Verify that the power and ground wires are securely connected. Make sure the electrical control box door is closed and locked.

5. Make sure the inlet bellows is properly installed and all pipes are connected. Open the isolation valve, open the receiver valve, and close the receiver drain valve and bypass valve.

WARNING: Risk of injury. Make sure that no one touches any moving parts during the rotation check.

7.2 Startup and Operation

1. Follow all steps under "Preparation before startup" before attempting to operate the compressor.

2. Turn on the power.

3. Fully open the connecting valve.

4. Check the home page of the screen and the compressor status is automatic.

5. Check the alarm display status. If there is a phase sequence error alarm, the system cannot run. You need to disconnect the incoming power supply and swap the order of any two of the three live wires. After powering on again, open the alarm record. After clearing the alarm record, if there is no prompt of phase

sequence error or other fault prompts! (When the system pressure is low, the low pressure alarm will be prompted, which only serves as a prompt and will not affect the operation of the system!)

6. After the above pre-startup preparations and tests are completed, the system will run automatically.

7. Use the system pressure gauge to check the air compressor value. When the air pressure value remains unchanged and the stop conditions are met, the control system will automatically shut down the compressor.

8. Check for excessive vibration, unusual noise or leaks during operation.

8. Control system

8.1 Control system overview

Medical air compressor control systems are based on pressure sensors. Each pressure control system has an LCD touch screen that can adjust alarm set points during use; monitor system faults; monitor the air pressure value of the air compressor system and the operating status and operating time of each compressor. All compressors have a circuit breaker to control the compressor on and off.

8.2 Electric control cabinet interface



1. Display screen: Displays the working status and fault monitoring of the air compressor system, and is used to change different settings of the air compressor system

2. Door circuit breaker: controls the power on and off of each compressor

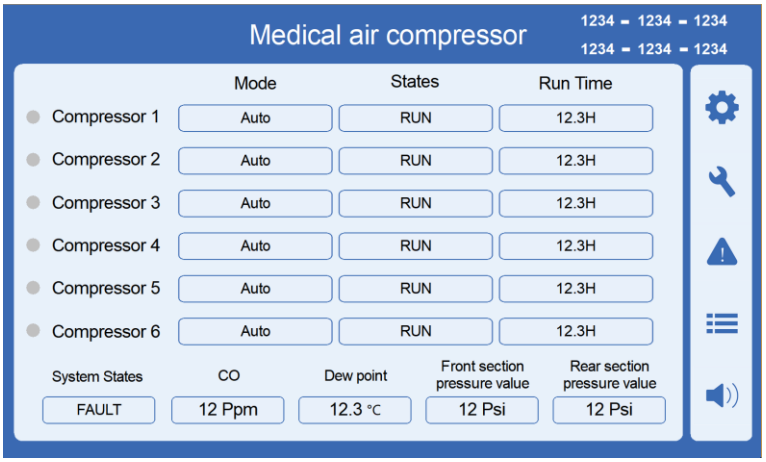
3. Power indicator: Displays the on/off status of the control power supply

4. Sound and light alarm: emits red light and sound when there is a fault in the air compressor system

5. Push button switch: start and stop the compressor in automatic mode

6. Infrared sensor: The touch screen automatically lights up when a human body is detected approaching

8.3 Touch screen interface



Operation Mode

- Press the green button on the electric cabinet door to switch the air compressor system to manual mode. The red font Manu will be displayed to enter the manual page, where the compressor can be started separately.
- After power-on, the air compressor system is in automatic state by default, and the green font Auto is displayed. The compressor starts and stops automatically according to the set air pressure start and stop set points.
- If the compressed air system is in a fault or warning state, click to enter the alarm record and view the information content.
- Regardless of the mode, if the compressor is running, the green font RUN will be displayed accordingly.
- Regardless of the mode, if the compressor is stopped, the corresponding display will be STOP in red font.

Compressor operating time display

Each **compressor** is displayed in hours.

System Status

- If the system is operating normally, “Operating” is displayed.
- If the system is stopped, “Stopped” is displayed.

• If any compressor fails, or the tank is under pressure or over pressure, the display will read "Warning"

• If the compressor is overloaded or the pressure sensor is faulty, etc., "Fault" is displayed.

Pressure and CO and dew point values

Check the air pressure of the front and rear tanks, which is used to control the operation of the compressor and the dryer. The dew point value of the air outlet and the CO content in the ambient air are detected. When the content exceeds the standard, there will be an alarm prompt.

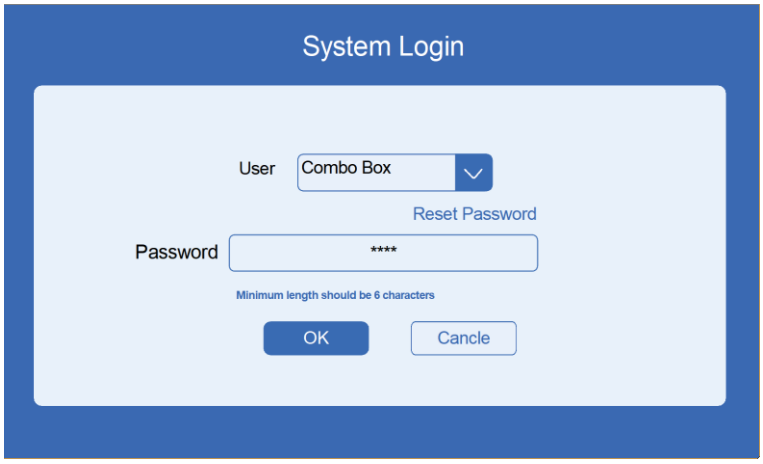
Door switch status display:

When the door switch is not turned on, the corresponding circle is gray. When the door switch is turned on, the corresponding circle is green. Only when it is green can the corresponding compressor run.

Sound and light alarm off

When an alarm occurs, the sound and light alarm will sound and flash. Click the icon , the sound and light alarm will be turned off within the set time.

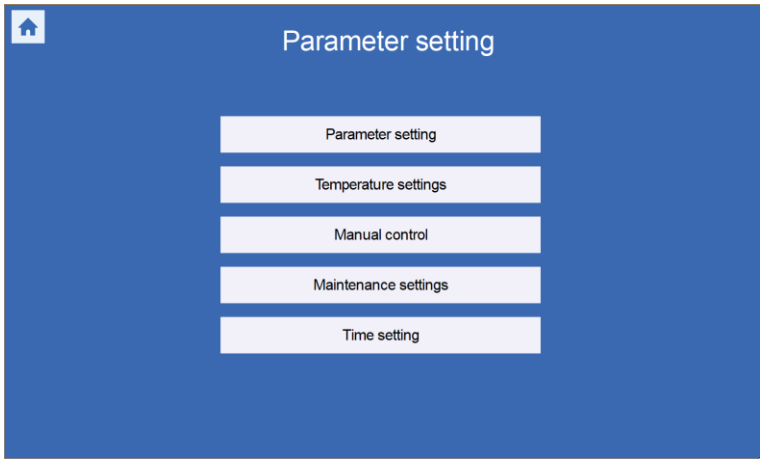
Permission login interface



You can click on the right side of the home screen  icon to enter the password page, enter the password 123456, and click OK to enter the settings page.

Settings selection interface

AMCAREMED TECHNOLOGY CO., LIMITED
Building 30, No. 900 Zhong Xin Avenue, Chuzhou, Anhui, China



You can click to enter the parameter page that needs to be set:

•Parameter setting: Click to enter the operation parameter setting page.

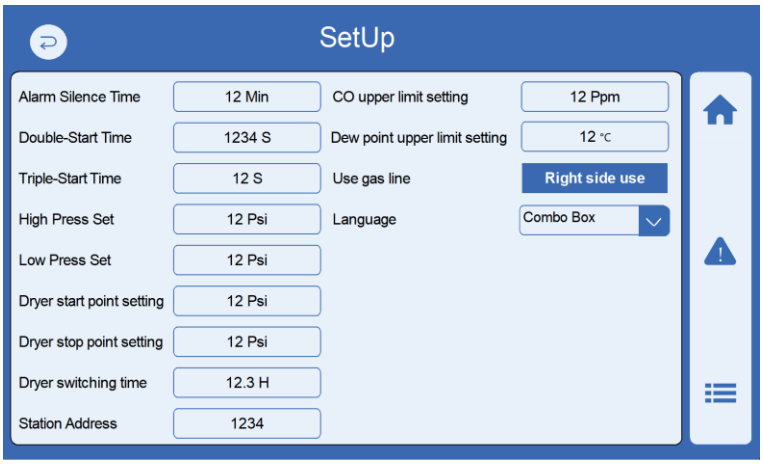
• Temperature settings: Click to enter the temperature parameter setting page.

•Manual Control: Click to enter the manual control page.

• Maintenance settings: Click to enter the maintenance settings page.

•Time Setting: Click to enter the time setting page.

Operation parameter interface



Select Parameter Settings to enter the above page:

• Alarm Silence Time: Set the alarm silence time, the default setting is 30 minutes.

• Double-Start Time: Set the delay time for running the second group of compressors, the default is 2 seconds.

•Triple-Start Time : Set the delayed start time of the third group of compressors. The default value is 600 seconds. Because this system is dual-use and one backup, the third group is generally not used, so the delay setting value is relatively large. Under normal circumstances, the gas tank can be

filled within 600 seconds and the third group will not be turned on. This parameter is reserved for special circumstances.

• High Press Set: In automatic mode, set the shutdown value of the front air tank. When the pressure is greater than this value, the compressors will shut down in sequence. The general setting value is 105psi.

• Low Press Set: In automatic mode, Set the start value of the front air tank. When the pressure is lower than this value, the compressors will start in sequence. It is generally set to 80psi.

• Dryer start point setting : Set the start value of the dryer. When the pressure of the front section gas tank is greater than 57psi and the pressure of the rear section is less than the set start value of the dryer, open the valve and run the dryer. The general setting value is 80psi.

• Dryer stop point setting : Set the stop value of the dryer. When the pressure in the rear tank is greater than the set stop value of the dryer, close the valve and the dryer. The general setting value is 98psi.

• Dryer switching time : Set the dryer operation switching time. This system has two dryers, one for backup and one for use. According to the time calculation, when the operating time is greater than or equal to the set switching time, it switches to the other side.

• Station Address: Set the 485 slave station address range 1-255.

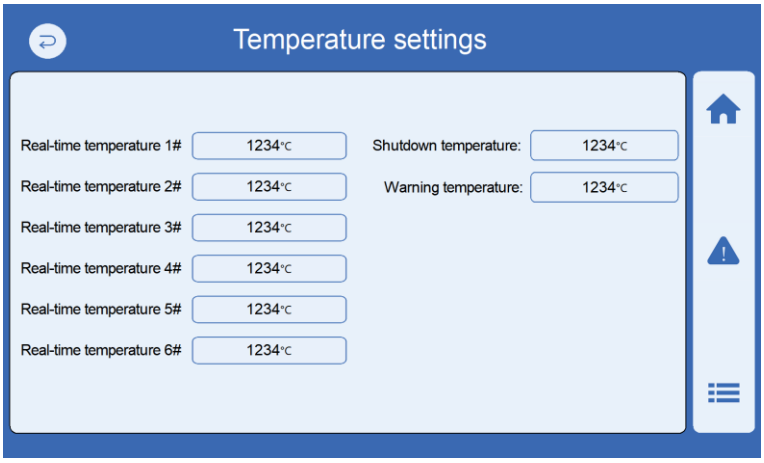
• CO upper limit setting : Set the CO alarm value. When the real-time value monitored is greater than or equal to the set CO alarm value, an alarm will be given.

• Dew point upper limit setting : Set the dew point alarm value. When the monitored real-time dew point value is greater than or equal to the dew point alarm value, an alarm will be given.

• Use gas line : Set to use the left or right side of the dryer gas line. It can be switched manually or automatically according to time.

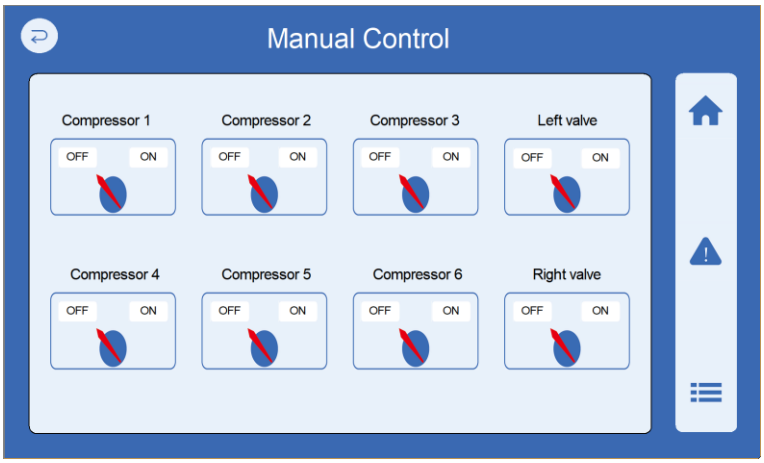
• Language : Set the system language. Chinese and English are supported by default.

Temperature setting interface



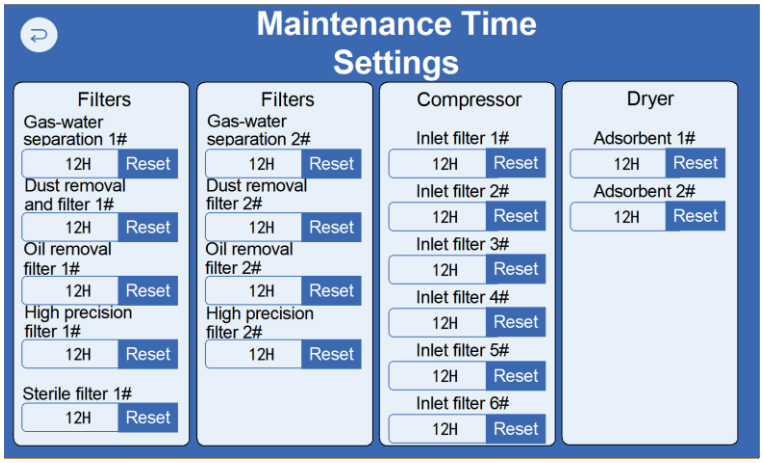
- Real-time temperature: 1#, 2#, 3#, 4#, 5#, 6#: Displays the temperature value of the corresponding 1-6# compressor.
- Shutdown temperature: Set the shutdown temperature. When the temperature of the corresponding compressor is greater than or equal to the set shutdown temperature, the corresponding compressor will stop running after a delay of 3 seconds.
- Warning temperature: Set the early warning temperature. When the temperature of the corresponding compressor is greater than or equal to the set early warning temperature, an alarm will be prompted.

Manual control interface



In manual mode, you can click the buttons on the screen to start and stop the compressor and the left and right electric valves individually.

Maintenance settings interface



The maintenance time of the air compressor's air intake filter, adsorbent and filter can be set. The default setting of the air inlet filter is 4000 hours, the default setting of gas-water separation, dust removal filter, oil removal filter, high-precision filter, and sterile filter is 8000 hours, and the default setting of the adsorbent is 20000 hours.

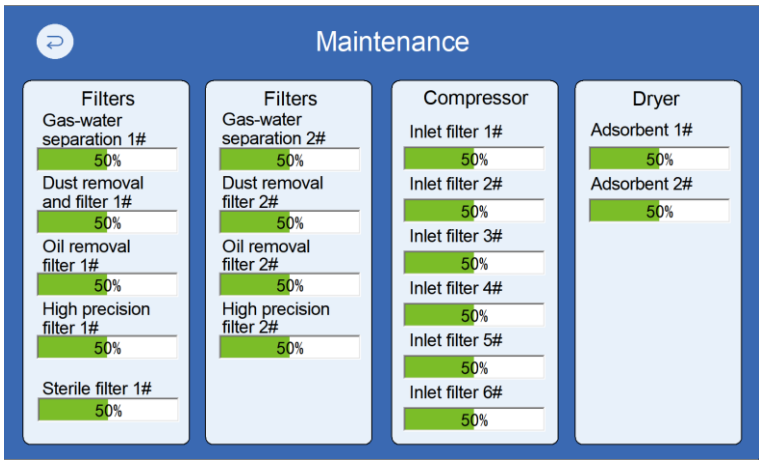
After maintenance is completed, you can reset the maintenance timer by clicking Reset.

Time setting interface



The date and time can be set according to the local time.

Maintenance view interface



You can view the usage time ratio of the air inlet filter, adsorbent and filter. When it reaches 100%, there will be a maintenance alarm. After the maintenance is completed, the maintenance setting interface will be reset and the calculation will start again from 0%.

Alarm record interface



You can view the device alarm records. If you need to clear them, click the Clear button in the lower right corner, enter the password, and click Confirm to clear the alarm records.

Company information interface



You can view the manufacturer's name, website, address, contact number and website.

8.4 Summary

The electric control cabinet is a control device for controlling the manual and automatic start and stop of the scroll machine. The working pressure can be measured by the pressure sensor on the air tank, and the start and stop pressure can be changed to achieve the constant pressure range control requirements.

1. Timer: used for the operation timing of the scroll machine and the power-on timing of the air compressor system. When the scroll machine is running, the timer starts to count, and the minimum display unit is hours (H). When the running time of the scroll machine reaches the set maintenance time, please perform maintenance; when the air compressor system electrical control cabinet is powered on, the timer starts to count, and the minimum display unit is hours (H), showing the current air compressor system has been powered on and running.
2. Pressure sensor: used to display the current pressure value of the system. By setting the parameters in the air compressor system, the start and stop pressure setting values can be changed.
3. Manual control function: After the power is turned on, press the green button on the electric control cabinet to switch to manual mode. The compressor can be started and stopped individually on the manual control page on the screen.
4. Automatic control function: After the power is turned on, the system starts to run automatically by default. When the pressure reaches the set value during automatic start, the compressors will stop running in sequence.

9. System maintenance

Daily inspection

1.Check the compressed air system for leaks.

2.Check if the scroll belt is loose.

3.Check whether the automatic drain starts and stops normally.

4.Check the automatic drain valve every day, rotate the copper sleeve upwards and observe the drainage volume. If the drainage volume is too small, it means it is blocked and needs to be removed and cleaned.

5.The automatic drain valve can be removed and cleaned with soapy water or degreasing detergent every month or every 500 hours of use, then rinsed with clean water and reinstalled. This method can also be used to clean the automatic drain valve if it is blocked due to excessive oil stains.

6.Observe the differential pressure pointer on the differential pressure gauge every day. If the differential pressure exceeds the red area, the filter element should be replaced in time.

10. Troubleshooting

Fault	reason	Troubleshooting
Compressor not running	Electrical circuit disconnection	Replace wiring or circuit breaker
	Motor failure	Repair or Replace
	Thermal overload protection	The motor is overloaded. Check the motor load and whether the motor is running abnormally. After eliminating the abnormality, press the reset button to clear the fault.
	Sensor failure	Repair or Replace
The pressure does not rise or rises slowly	Pressure gauge failure	Replace with new parts
	System Leaks	Check the connecting parts and piping system
	Suction and exhaust valves are damaged and leaking	Replace with new parts
	Filter silencer blocked	Clean or replace the filter
	Reduced speed	Elastic belt to make it tight enough
Compressor exhaust temperature is too high	Exhaust valve plate leaks or breaks	Check and eliminate or replace new parts
	Poor ventilation, too high intake temperature	Improve the ambient temperature to <40℃

AMCAREMED TECHNOLOGY CO., LIMITED
Building 30, No. 900 Zhong Xin Avenue, Chuzhou, Anhui, China

	Poor cooling effect	Check whether the main engine pulley rotates in the correct direction
The compressor sounds abnormal	The unit is unstable and shaking	Check and eliminate
	Loose fasteners	Tighten
	The belt is severely worn	Replace with new parts
	Bearing wear	Replace with new parts
The dryer cannot start	The air switch is burned out or tripped	Ask electrical personnel to inspect or replace related electrical parts
	Intermediate relay failure	
	Control line failure	
	Controller damage	
Abnormal display of pressure gauge of the dryer 1. The pressure gauge of the adsorption group shows too low 2. The pointer of the pressure gauge of the regeneration group does not return to zero	Pressure gauge damaged	Replace the pressure gauge with a new one
	Solenoid valve is damaged or blocked	Clean the solenoid valve or replace it
	Tracheal rupture	Replacement of air tube
	Cylinder damage	Replacement of cylinder
	The outlet check valve spring does not reset	Replace the check valve spring
	The sealing components inside the valve are damaged	Replace the seal assembly
	Regeneration air flow is too large	Adjust the regeneration air flow to the appropriate size
The outlet gas dryness does not meet the standard. 1. The outlet gas contains moisture. 2. The dew point value is too high.	Adsorbent and filter element not maintained as required	Timely maintenance of equipment consumables
	Insufficient regeneration of adsorbent moisture	Adjust regeneration air flow and pressure equalization time

AMCAREMED TECHNOLOGY CO., LIMITED
Building 30, No. 900 Zhong Xin Avenue, Chuzhou, Anhui, China

11. Service and Warranty

1. This product is strictly inspected by the company's internal warehouse. If a transportation accident occurs or it is caused by our company's fault, our company can repair or replace it free of charge.

2. The warranty period is 2 years from the date of purchase.

3. The contents of this article are subject to change without prior notice.

12. Information

12.1 Manufacturer information

Registered/manufacturer name: Chuzhou Kesheng Medical Equipment Co., Ltd.

Address: Building 30, Tiangong Science and Technology Park, Soochow University, Chuzhou City, Anhui Province

Email: info@amcaremed.com

Tel: +86 550 7111326

Website: www.amcaremed.com

12.2 After-sales service

After-sales service unit name: Chuzhou Kesheng Medical Equipment Co., Ltd.

Address: Building 30, Tiangong Science and Technology Park, Soochow University, Chuzhou City, Anhui Province

Email: info@amcaremed.com

Tel: +86 550 7111326

Website: www.amcaremed.com