

(LM-ZMD-S)
Operating instructions

Chapter 1 technical conditions

一、Function overview

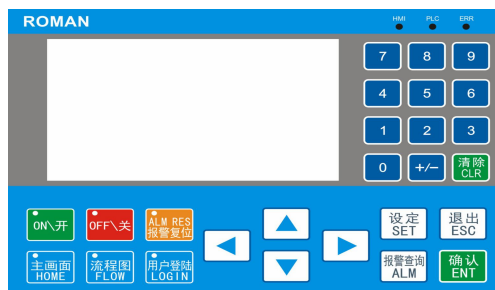
LM-ZMD series combined adsorption dryer control box adopts high-performance PLC + color screen display all-in-one automatic control. The whole machine has advanced technology, reliable performance, complete functions, beautiful appearance, more convenient operation, installation and maintenance, and adopts independent power processing module, temperature processing module and two-way temperature output, which makes the overall performance of the machine more reliable.

1.1、Technical index

- (1) Temperature measurement accuracy: $-20 \sim +300$ °C and ± 1 °C
- (2) Power input: DC voltage DC24 V。
- (3) Power consumption: 24W。
- (4) Switch output: 8-point relay contact, voltage AC220 V or DC24 V, inductive current load 0.8 a。 Resistive load: 2A.
- (5) Switch input: 12 point input, GND is public input.。
- (6) Analog input: 2 4-20mA
- (7) Working environment: temperature $0 \sim 50$ °C, humidity no more than 85%, vibration no more than 0.5g. There is no obvious dust, acid, corrosive gas or substance in the surrounding air.。
- (9) Communication: None
- (8) Opening dimension mm: 162x112; overall dimension mm: 171.5x120.7x58.5

Chapter 2 Operation and maintenance

1、Display panel key menu

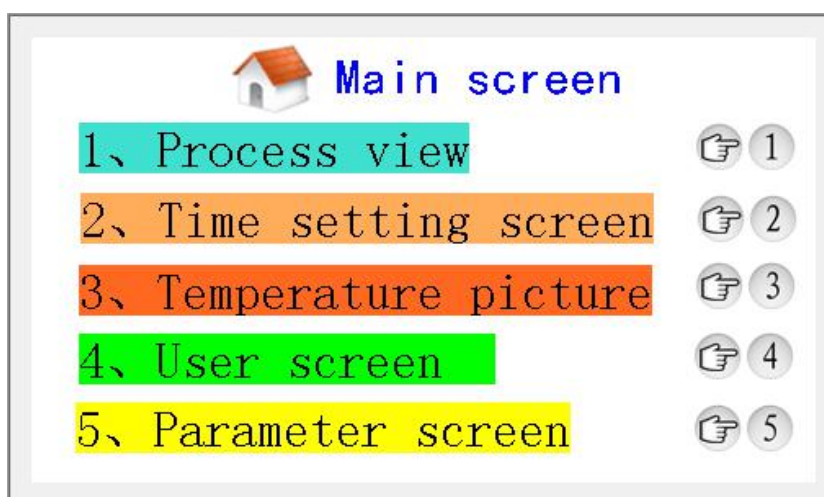


Key	basic function
[ESC]	No matter the display is in any picture, once you press this key, you will return to the previous picture.
[ALM]	Once you press this key, you will return to the system and automatically switch to the defined alarm information screen.
[SET]	Press this key to start modifying the register value, and the register window being modified will be displayed in reverse color The number of bits to be modified is flashing. If there is no register setting window in the current screen, a null operation is performed. Press the [set] key again before pressing the [ent] key, the current modification operation will be cancelled and the next data register will be modified.
[←]	When modifying the register data, move the modified data bit to the left, that is to say, the flashing number moves one bit to the left.
[→]	When modifying register data, move the modified data bit to the right, that is to say, the flashing number moves one bit to the right.
[↑]	Flip the screen to the previous page. The screen number of the previous page is specified by the user in the screen properties (the default value is the current screen number) If in the data setting state, the modified digit is added with 1, and the increasing range is 0 - > 9 - > 0
[↓]	Flip the picture to the next page, and the next page picture number is specified by the user in the picture properties (the default value is the current picture number) If it is in the data setting state, the modified digit is subtracted by 1, and the decreasing range is 9 - > 0 - > 9.
[SET]	Press this key to start modifying the register value, and the register window being modified will be displayed in reverse color The number of bits to be modified is flashing. If there is no register setting window in the current screen, a null operation is performed. Press the [set] key again before pressing the [ent] key, the current modification operation will be cancelled and the next data register will be modified.
[ENT]	When the user uses the encryption function, press this key to pop up the password setting screen. In the register setting state, write the modified data to the register and continue to modify the next data register. After the last register of the current screen is modified, exit the modified register state. Memory.
[CLR]	When setting the register value, press this key to clear the historical data, directly press the number key to input parameters, and press ent key to confirm.
ON/开	Power on key, the red light is on during operation (the two towers start and stop alternately), when it is remote control, the key does not start.

OFF关	Boot key. This key can also be shut down when it is under remote control.
ALM RES\ 报警复位	When the alarm is generated, the red light will be on. Press this key to confirm and reset the alarm.
主画面\HOME	Press this key under any screen to return to the main screen.
流程图\FLOW	Press this key under any screen to return to the flow chart screen.
用户登陆\LOGN	Press this key in any screen to return to the user login screen.

2、 Main screen

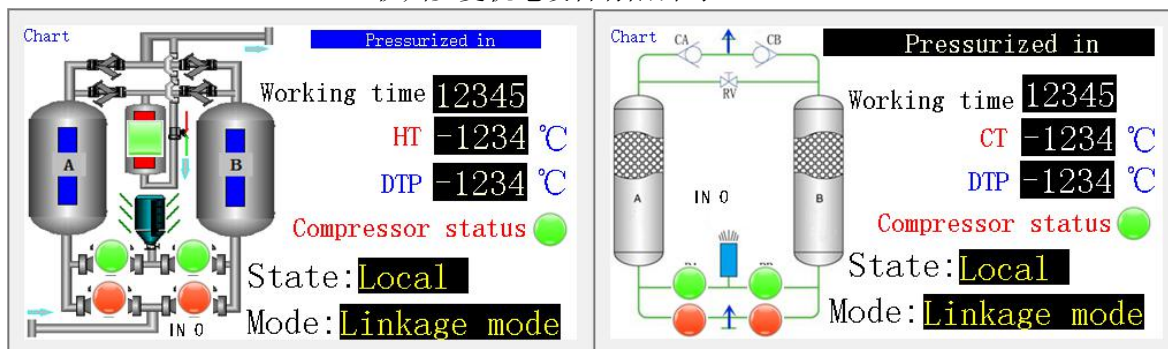
Press the key of the main screen on the panel to switch to the main screen automatically,



Key	Function and authority	purpose
【1】	Shortcut key (no permission)	Switch to flowchart screen
【2】	Shortcut key (no permission)	Switch to the time setting screen
【3】	Shortcut key (no permission)	Switch to the temperature setting screen
【4】	Shortcut key (with permission)	Switch to the fixed parameter setting screen

3、 Flow chart screen

When pressing the flow chart key on the panel, it will automatically switch to the flow chart screen, with (slight heat / no heat) flow chart attached

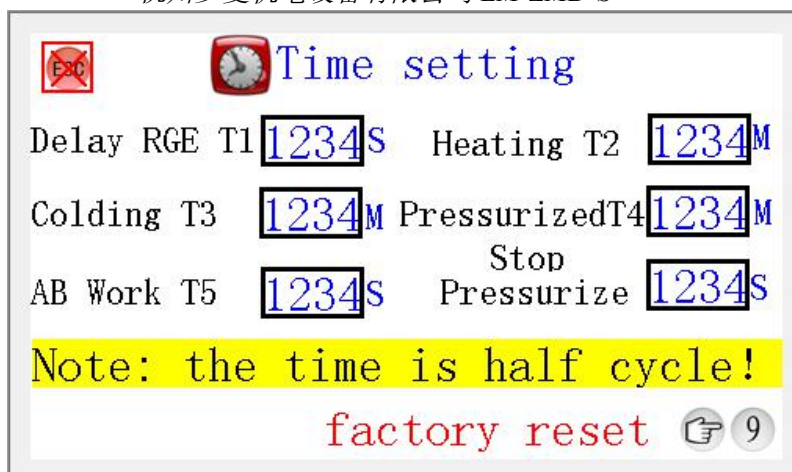


Working status table:

display output	function	purpose
Pressurized in	working condition	During the shutdown delay, this is the charging stage.
Readiness	working condition	The system is ready for work.
A drying B delay regener	working condition	Enter tower a for adsorption and Tower B for regeneration
A drying B heating	working condition	Enter into a tower adsorption, B tower heating regeneration state
A drying B blowing cold	working condition	It enters tower a for adsorption and Tower B for regeneration.
A drying B filling press	working condition	Enter tower a for adsorption and Tower B for pressurization
A drying B Mean pressure	working condition	Enter into a tower adsorption, B tower equalizing state
B drying A delay regener	working condition	Enter Tower B for adsorption and tower a for regeneration
B drying A heating	working condition	Enter into Tower B for adsorption and tower a for heating and regeneration
B drying A blowing cold	working condition	Enter into Tower B for adsorption and tower a for cooling regeneration
B drying A filling press	working condition	Enter Tower B for adsorption and tower a for pressurization
B drying A Mean pressure	working condition	Enter into Tower B for adsorption and tower a for pressure equalizing.
Cold dryer in operation	working condition	In operation of single cold dryer
Working time	Time display	Current step countdown (seconds) cold dryer is (minutes)
HT/CT	Temperature display	Current temperature (°C)
DPT/ET/INT	Temperature display	Current temperature (°C)
current state	Working status display	Local control / remote control
control model	Working mode selection	Time mode / dew point mode

4、Time setting screen

Press the number key [2] under the main screen to switch to the time setting screen

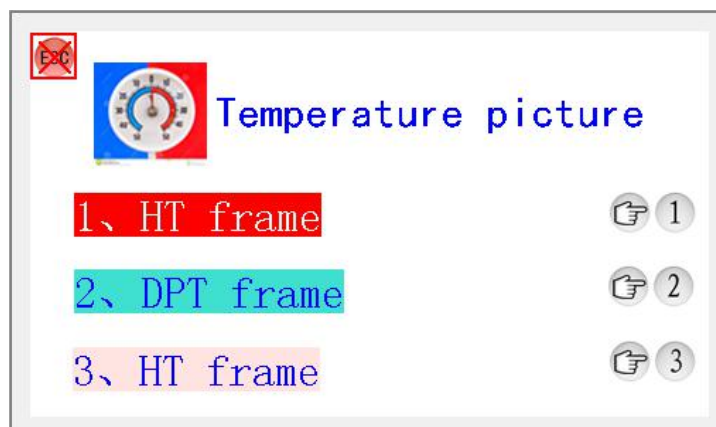


Enter the default factory value of button parameters:

name	Default value	Setting range
Delay RGE T1	5S (No permission)	1~999S
Heating T2 (Once REG T2)	25M (No permission)	1~3600M
Colding T3 (Twice REG T3)	15M (No permission)	1~3600M
Pressurized T4	5M (No permission)	1~3600M
AB Work T5	10S (No permission)	1~3600S
factory reset	Key (Have authority)	Press the number key [9]

5、Temperature setting selection screen

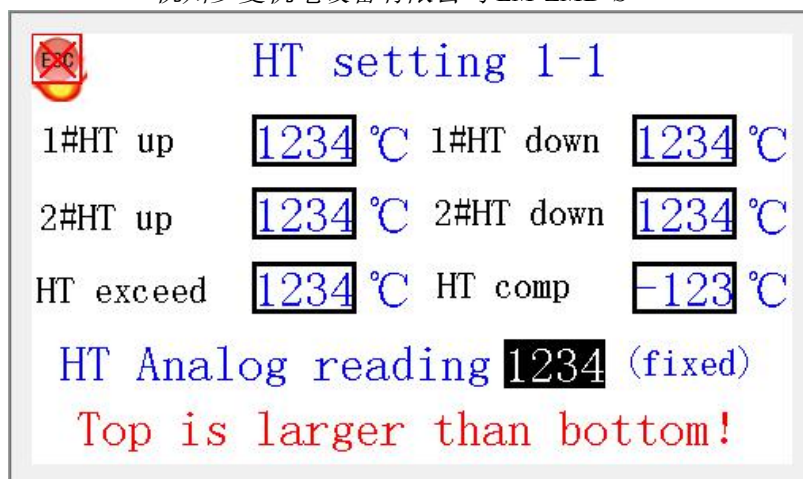
5.1 Press the number key [2] under the main screen to switch to the time setting screen



Button table:

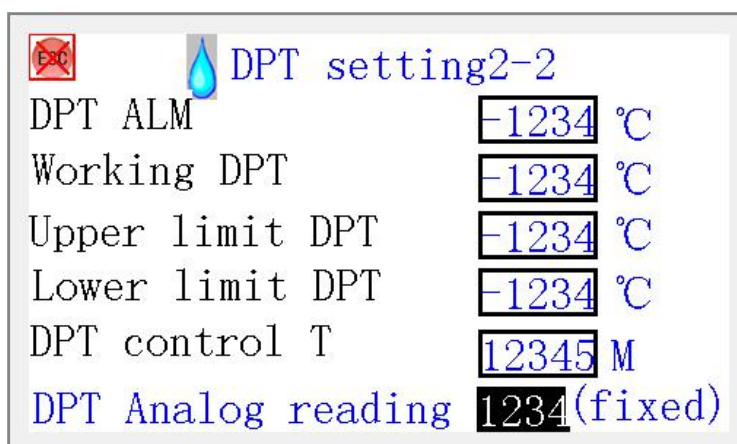
Key	Function and authority	purpose
【1】	Function key (no permission)	Turn on the heating or condensing temperature setting screen
【2】	Function key (no permission)	Open the dew point, intake air or evaporation temperature setting screen
【3】	Function key (no permission)	Open the temperature curve screen

5.2 Heating temperature setting screen



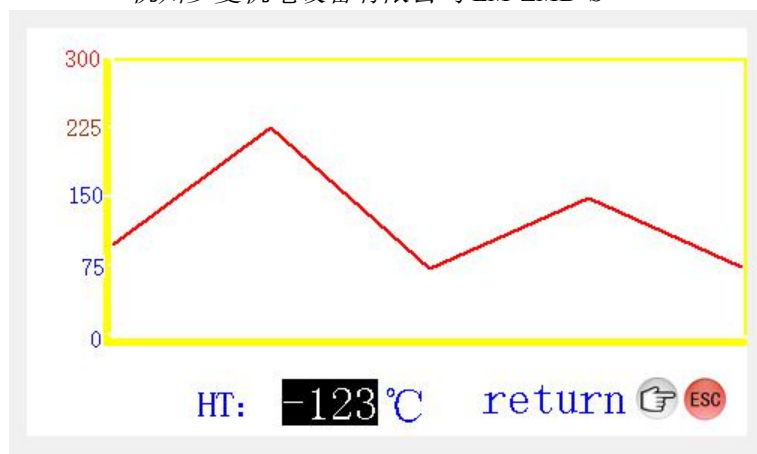
name	Default value	Setting range
1#HT up	120°C (No permission)	0~300°C
1#HT down	100°C (No permission)	0~300°C
2#HT up	120°C (No permission)	0~300°C
2#HT down	100°C (No permission)	0~300°C
HT exceed	200°C (No permission)	0~300°C
HT or CT comp	0°C (No permission)	-500°C~500°C
HT or CT Analog reading	Display real time value (not settable)	0-4095

5.3 Dew point temperature setting screen



name	Default value	Setting range
DPT/ET/INT ALM	-10°C (No permission)	-500°C~500°C
Working DPT	-30°C (Have authority)	-120°C~30°C
Upper limit DPT/ET/INT	20°C (Have authority)	-200°C~100°C
Lower limit DPT/ET/INT	-80°C (Have authority)	-200°C~100°C
DPT control T	5M (Have authority)	0分~1080分
DPT/ET/INT Analog reading	Display real time value (not settable)	0-4095

5.4 Heating temperature curve screen



6、 System password (password: 1234)

Before entering the fixed parameters, open the user login or directly press the "ent" key to display the screen:



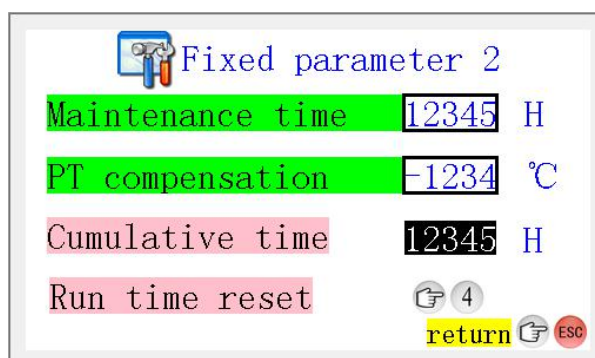
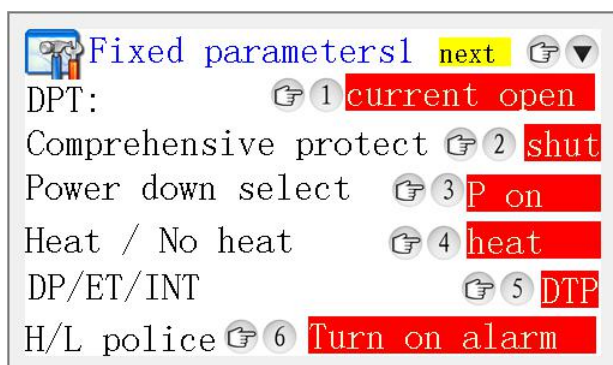
6.1.Method of operating password when modifying parameters:

1. PRESS ENT once
2. "1. Open password"
3. PRESS ENT again
4. Input the password with the number key, and then press ent to confirm

6.2.Password password

1. The password of the LCD control box of the micro heat drying machine can't be changed at will. Our default password is "1234". If you need to change the password, please inform us in advance. We will change the password according to the customer's needs before the product leaves the factory.

7、 Fixed parameters

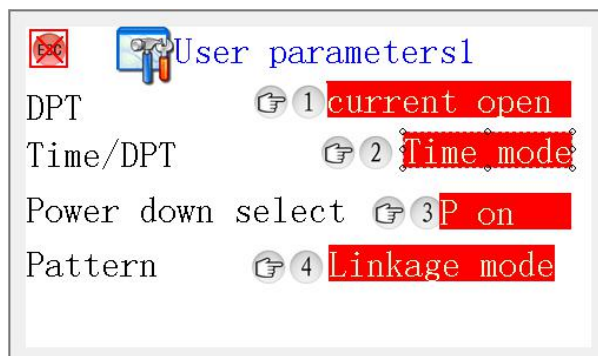


After opening the password, press the number key 5 in the main screen to enter the fixed parameter setting screen

Key	Function and authority	purpose
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【1】	Function key (with permission)	Dew point channel on or off (dew point temperature is displayed as 0 when channel is closed)。
【2】	Function key (with permission)	The normally open and normally closed contact of the comprehensive protection switch of the compressor is selected (when the comprehensive protection switch is normally open), and the comprehensive protection switch of the compressor is connected to give an alarm.
【3】	Function key (with permission)	Power down to start or not to start when starting (power down in running state, auto start or manual start when power on)。
【4】	Function key (with permission)	The current mode is slight heat operation or no heat operation mode. When no heat mode is selected, the heater does not work. Then enter the time setting screen to shorten the corresponding time and reduce the adsorption cycle. (heating regeneration 3 points, blowing cold regeneration 3 points, charging pressure 2 points, other times do not change. When no heat operation is selected, the flow chart will automatically switch to no heat screen.。
【5】	Function key (with permission)	Select the currently displayed dew point temperature, intake air temperature, or evaporation temperature (select as required)。
【6】	Function key (with permission)	High voltage, low voltage alarm contact form, on alarm or off alarm。
Maintenance time	Function key (with permission)	When it is set to 0, it will close, ranging from 0 to 65535. When it is not set to 0, it will alarm when the running time is greater than the set time, but it will not stop。
PT compensation	Function key (with permission)	It refers to the correction of pressure and temperature, - 500 °C ~ 500 °C.。
Cumulative time	Time display	Unit operation time。
Run time reset	Function key (with permission)	Press the number key 4 to clear the running time。

8、 User parameters



After opening the password, press the number key 4 in the main screen to enter the user parameter setting screen

Key	Function and authority	purpose
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【1】	Function key (with permission)	Dew point channel on or off (dew point temperature is displayed as 0 when channel is closed)。
【2】	Function key (with permission)	Time mode or dew point mode switching (when it is dew point mode, the charging time shows the longest dew point control time, and the dew point comparison starts after 300 seconds of operation)。
【3】	Function key (with permission)	Power down start or no start when starting (power down in running state, automatic start or manual start when power on)。
【4】	Function key (with permission)	Combined mode selection, linkage mode, cold dryer mode, dryer three modes, linkage mode: cold dryer + dryer linkage operation, cold dryer mode: cold dryer independent operation, dryer mode: dryer independent operation。

9、Alarm elimination

order number	Alarm display	reason	exclude	Response
1	No display	The power supply is broken, the fuse is burnt out or the switching power supply is broken	Replace the fuse or power switch	Shutdown
2	No output of solenoid valve	The safety light of solenoid valve is on	Replace the solenoid valve and fuse	nothing
3	Air inlet low pressure ALM Press ESC to return (Manual reset)	Alarm when the inlet pressure is lower than the set value	1. Check whether the air compressor is normal; 2. Check the pipeline for leakage; 3. Check whether the downstream gas consumption is too large; 4. Check the pressure switch;	Alarm shutdown, pressure returned to normal after manual reset alarm
4	INT ALM Press ESC to return (Automatic reset)	Alarm when the intake air temperature is higher than the set value	1. Check whether the front cooling dryer or cooler is normal; 2. Check whether the air inlet sensor or transmitter is damaged; 3. Check whether the parameters are set correctly;	The alarm does not stop, and the air inlet temperature will reset automatically after recovery
5	Heating sensor ALM Press ESC to return	Out of range, heating sensor broken, damaged or temperature transmitter failure	Replace the heating sensor probe or transmitter	Alarm without shutdown (heater not

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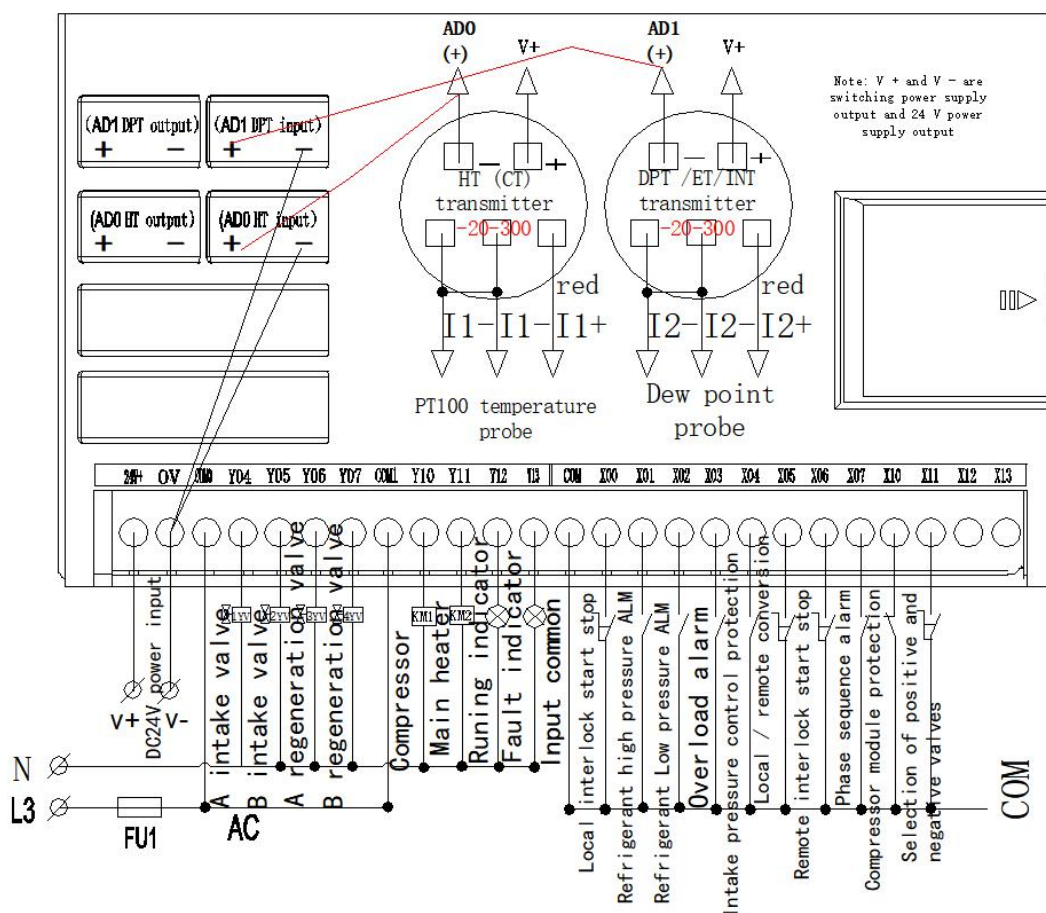
	(Automatic reset)			working)
6	HT ALM Press ESC to return (Automatic reset)	The heating temperature is higher than the set alarm value	1. Check whether the regeneration regulating valve is opened normally; 2. Check whether the heating contactor is normal; 3. Check the temperature sensor;	Alarm without shutdown (heater does not work), reset after recovery
7				
8	DPT ALM Press ESC to return	The dew point temperature is higher than the set value	1. The inlet air humidity is too high; 2. Check whether the adsorbent is normal; 3. Check whether the equipment works normally; 4. Check if the dew point sensor is normal	Alarm does not stop, dew point automatically reset after recovery
9	The maintenance time is up Press ESC to return	The accumulated operation time is greater than the maintenance time	Maintain the unit and extend the maintenance time	Alarm without shutdown (unlimited when set to 0)
10	Refrigerant high pressure fault Press ESC to return (Manual reset)	The high pressure value of refrigerant is greater than the set value.	Reset the voltage control switch and press ESC three times on the LCD.	Shutdown alarm
11	Refrigerant low pressure fault Press ESC to return (Manual reset)	The low pressure value of refrigerant is lower than the set value.	Reset the voltage control switch and press ESC three times on the LCD.	Shutdown alarm
12	Compressor overload fault Press ESC to return (Manual reset)	The compressor current exceeds the set value and the thermal overload relay is closed.	Reset the thermal overload relay manually and press ESC key three times on the LCD screen.	Shutdown alarm
13	Phase sequence fault ALM Press ESC to return (Manual reset)	Wrong phase, open phase or bad phase sequence relay.	Replace the phase sequence or replace the phase sequence relay, and press ESC key three times on the LCD screen.	Shutdown alarm
14	Compressor ALM	The protection switch of	Reduce the	Shutdown alarm

	Press ESC to return (Manual reset)	compressor module acts.	temperature of compressor exhaust and coil or turn off the protection switch of compressor module, and press ESC key three times on the LCD screen.	
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10、Three guarantees maintenance

The manufacturer is responsible for free "Three Guarantees" within 18 months after the product is sold. However, if the product is damaged due to improper use by users, the material cost will be charged as appropriate. We welcome your valuable suggestions.

11、Electrical schematic diagram



HT/CT	yes	either-or
DPT/INT / ET	yes	One out of three