

(LM-ZMD-01)

Use of instructions

Chapter 1 Technical requirements

One、Functional overview

LM-ZMD series of micro-heat combined dryer controller adopts LM-32PLC four-line LCD display automatic control, adopts the international standard MODBUS communication protocol, all sensors are connected to the bus, which is more reliable and simple than the scattered connection; Chinese interface; parameter setting and data acquisition and monitoring can be carried out online with the PC machine through the RS485 interface. .

The whole machine has advanced technology, reliable performance, complete function, beautiful shape, convenient operation, installation and maintenance, and adopts independent power processing module and temperature processing module, the overall performance of the machine is more reliable.

Two、 qualification

- (1)Temperature measurement :0~300°C, accuracy of 1°C
- (2)Power input: DC24V \pm 5.
- (3)Power consumption :24 W.
- (4)Switch output: 16 point relay contact, voltage AC220V or DC24V, inductive current load 0.8 A resistive load :2 A.
- (5)Switch input :16 point input GND public input.
- (6)Working environment: temperature 0~50°C, humidity not more than 85, vibration not more than 0.5 g. No visible dust, acid, corrosive gas or substance in the surrounding air.
- (7)Analog quantity: 5-channel input (0-20mA)
- (8)Communication: RS485 interface, half duplex mode, MODBUS-RTU communication protocol, effective distance \leq 1200m

Chapter 2 Operation and maintenance

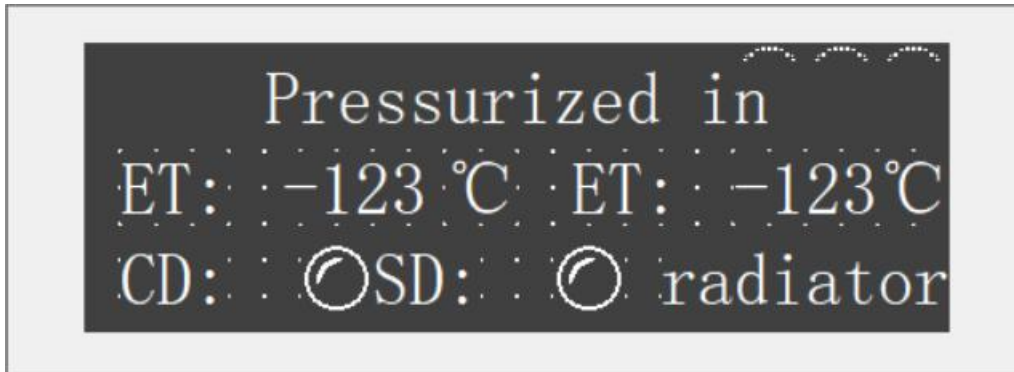
一、LCD panel key function sheet





key	basic function
[ESC]	No matter the display is showing any screen, once you press this key, return to the system running screen. Confirm the alarm by pressing the ESC button 3 times.
[ALM]	Once this key is pressed, the return system automatically switches to the defined alarm message screen.
[←]	stop key
[→]	Open key
[↑]	Flip the screen to the front page, When in the data setting state, the modified digit adds 1, increasing the range :0→9→0
[↓]	Flip the screen to the next page, When in the data setting state, the modified digit subtracts 1, decreasing range :9→0→9
[SET]	Press this key to start modifying the register value, where the register window is currently being modified The modified number of bits flashes display. If the current screen does not have a register setting window part, an empty operation is performed. Press [SET] key again before pressing [ENT] key, the current modification operation is cancelled and the next data register continues to be modified.
[ENT]	When the user uses the encryption function, press this key to set the screen. In 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.
[CLR]	When setting the register value, press this key to zero the historical data, press the digital key directly to enter the parameters, press the ENT key to confirm.

二、Boot screen (running screen)

Users in accordance with the attached figure 3 to connect the line, check the correct, before the power on. The screen shows the following:



This screen is automatically switched to screen one every time power on, press ESC key under any screen to return to run the screen.

key	Functions and (Permissions)	Purpose
	Function key (press) without permission (under any screen)	stop button
	Function key (press) without permission (under any screen)	Boot button
【0】 \ 【1】	Function key (press) without permission (under current screen)	A or B tower select boot
【2】	Function key (press) without permission (under current screen)	stop button

Note: The indicator light is white filled to be electrically operated.

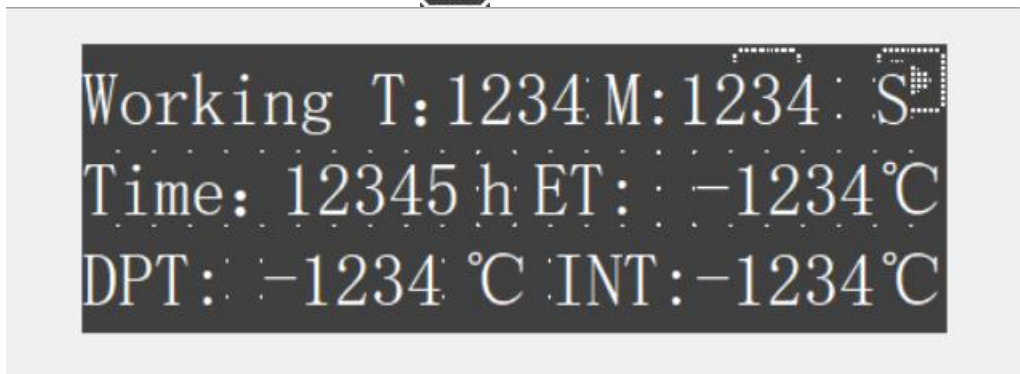
Work Status Table:

Display output	function	Purpose
Downtime Delay---	Working Condition	In the boot delay, this is the charging stage
be all set	Working Condition	The system is ready for work
A tower adsorption, B tower to be regenerated	Working Condition	Into the A tower adsorption, B tower to be regenerated state
A tower adsorption, B tower regeneration	Working Condition	Into the A tower adsorption, B tower regeneration state
A tower adsorption, B tower cold regeneration	Working Condition	Into the A tower adsorption, B tower cooling regeneration state
A tower adsorption, B tower charging	Working Condition	Into the A tower adsorption, B tower charging state
A tower adsorption, B tower pressure	Working Condition	To enter the A tower adsorption, B tower pressure state
B tower adsorption, A tower to be regenerated	Working Condition	Into the B tower adsorption, A tower to be regenerated state
B tower adsorption, A tower	Working Condition	Into the B tower adsorption, A tower

regeneration		regeneration state
B tower adsorption, A tower cold regeneration	Working Condition	Into the B tower adsorption, A tower cooling regeneration state
B tower adsorption, A tower charging	Working Condition	Into the B tower adsorption, A tower charging state
B tower adsorption, A tower pressure	Working Condition	To enter the B tower adsorption, A tower pressure state
--- in operation of cold dryer	Working Condition	During operation of the cold dryer

三、Parameter Display Screen

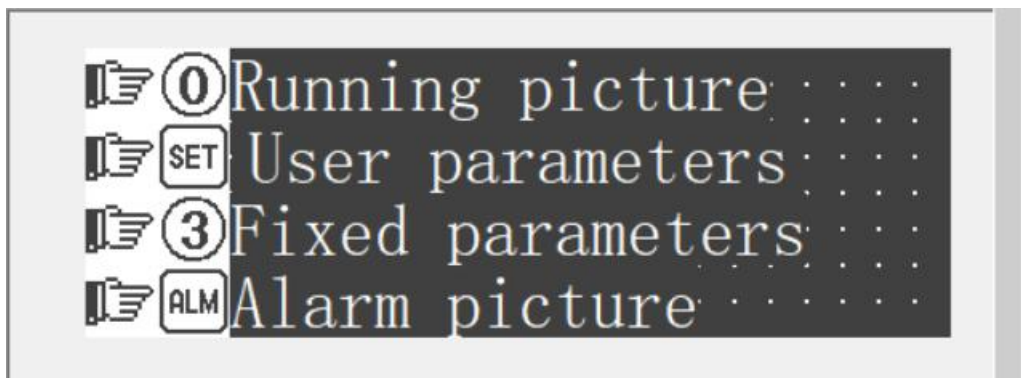
Press while running the screen  Automatically switch to this screen.







Display output	function	purpose
Current adsorption	Working hours display	Current adsorption time of single tower.
Accumulates	runtime	Elapsed time.
heat	Temperature display	Real-time display of heating temperature or evaporation temperature.
Dew point	Temperature display	Real-time display of dew point temperature.
Air Intake	Temperature display	Real-time display of inlet temperature.

四、key frame

Press while the parameters are displayed  Automatically switch to the main screen.



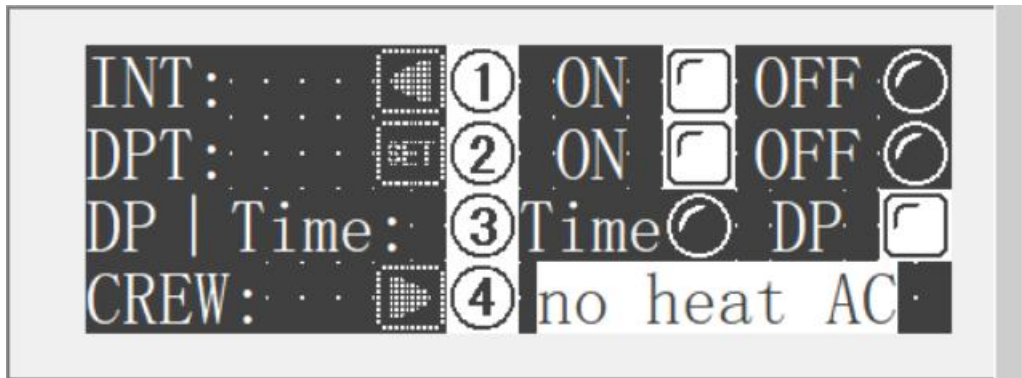
key	Functions and (Permissions)	purpose
	Function key (press) no permissions	Switch to run screen

	Function key (press) no permissions	Switch to user parameter screen
	Function key (press) no permissions	Switch to alarm screen
	Function key (press) factory permissions	Switch to factory parameter screen

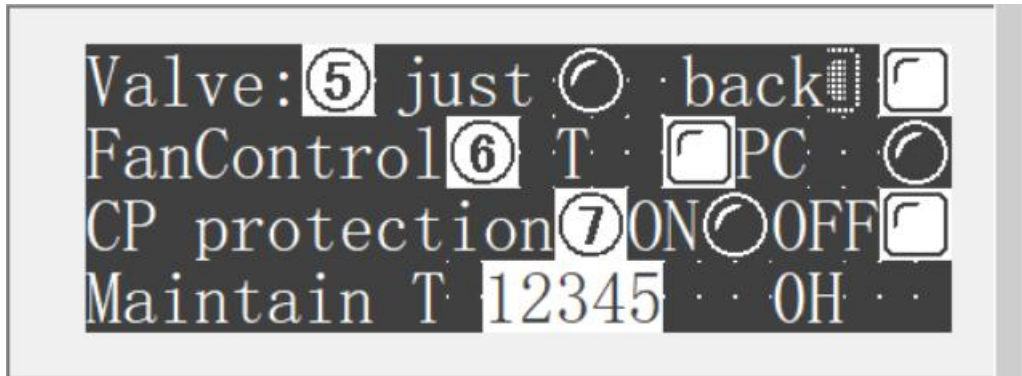
五、Fixed Parameter Picture。

Note: To enter a fixed parameter screen, you need to enter a password to enter the operation. Users are not advised to set this page.

Fixed Parameters Screen 1



Fixed Parameters Screen 2





Button Form:

key	Functions and permissions	purpose
【1】	Function key (limited manufacturer)	Turn on or off inlet temperature
【2】	Function key (limited manufacturer)	Turn on or off dew point temperature
【3】	Function key (limited manufacturer)	Dew point control and time control switching Time control is required when there is no dew point temperature
【4】	Function key (limited manufacturer) Press the choice.	Choose: No hot air cooling No hot water cooling Mild hot air cooling

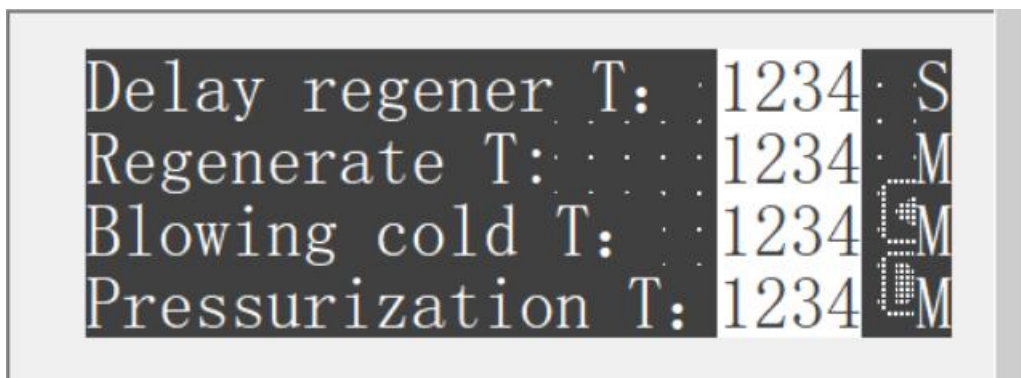
		Microthermal water cooling
【5】	Function key (limited manufacturer)	Positive valve reverse valve selection button (reverse valve: intake air often open, exhaust often closed; positive valve: intake and exhaust often closed.)
【6】	Function key (limited manufacturer)	Air cooler control mode (temperature: condensing temperature control fan start and stop), pressure: pressure switch control fan)。
【7】	Function key (limited manufacturer)	Open or close the compressor module protection channel ,(note: only the compressor has a protection module to open it.)
【8】	Function key (limited manufacturer)	Run time zero (in any screen of fixed parameters press 8 zero run time.
service time	Parameter setting (limited manufacturer)	When set to 0: refers to use without time constraints, When the setting is not 0: when the running time is greater than the setting time, the alarm stop (alarm display, maintenance time has come!)

六、Parameter Setting Screen

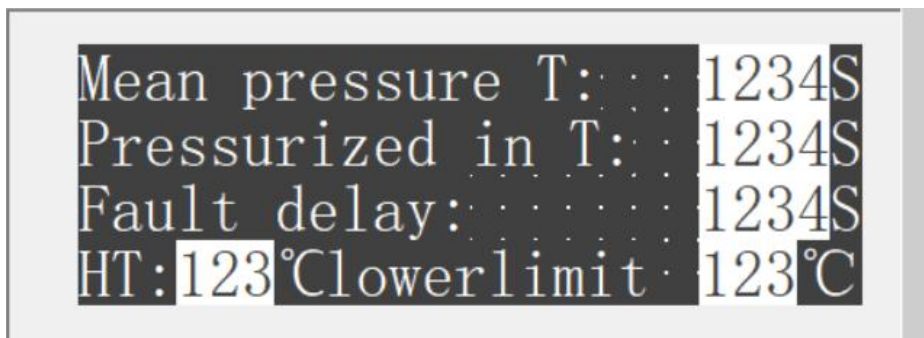
Press the shortcut key on the main menu screen  Or  The screen

automatically converts the parameter setting screen as follows:

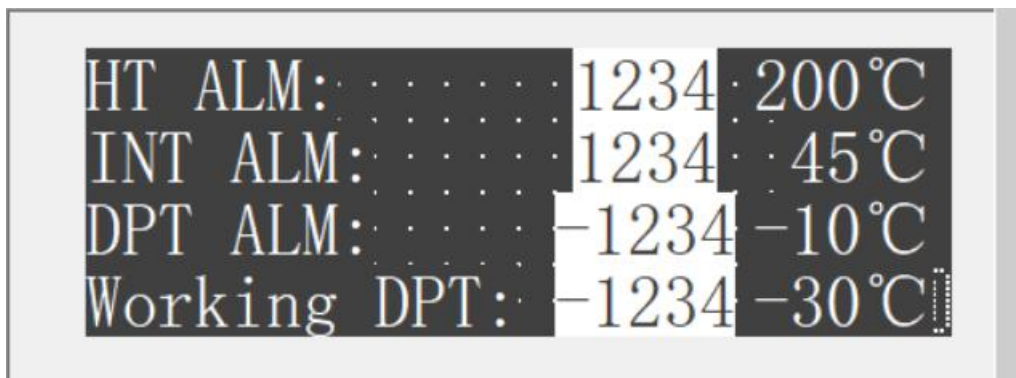
Parameter setting 1:



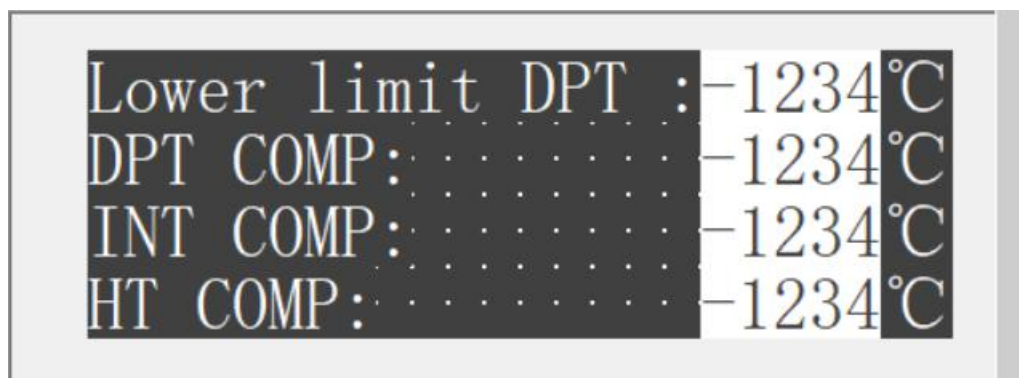
Parameter setting 2:



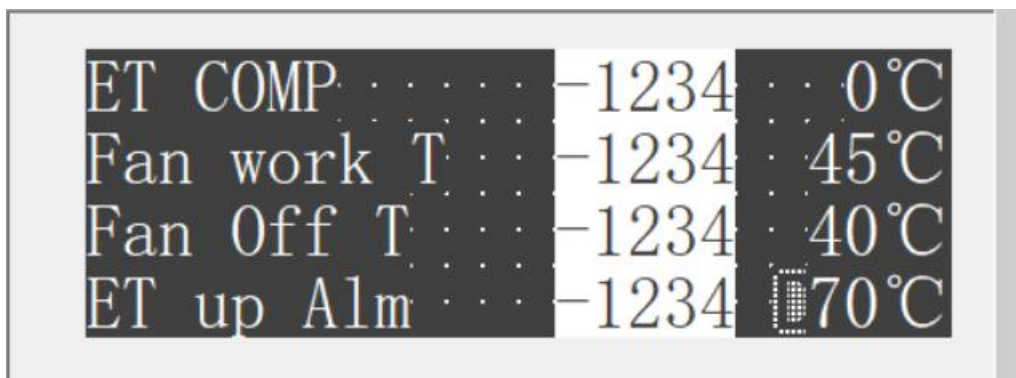
Parameter Setting 3:



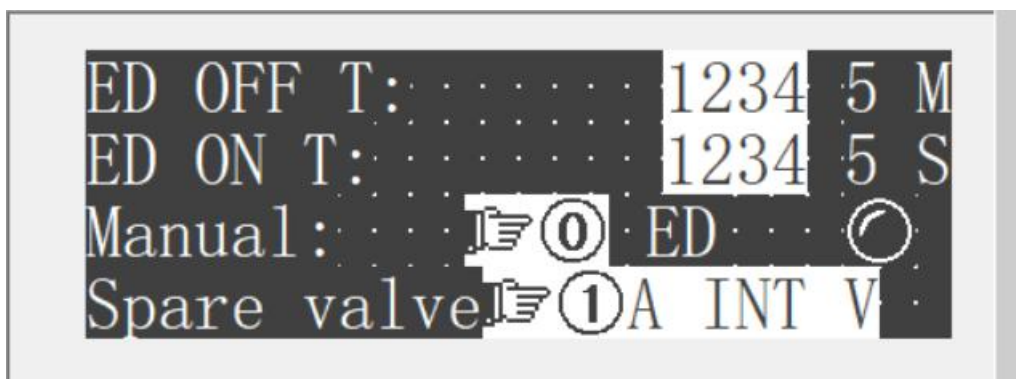
Parameter setting 4:



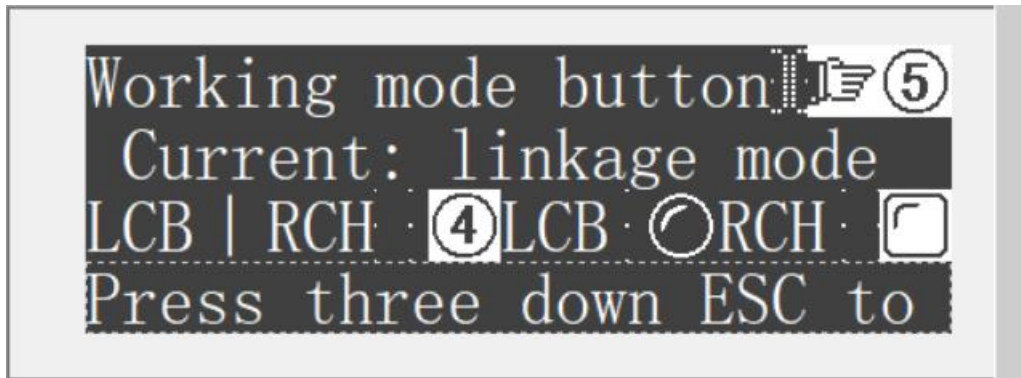
Parameter setting 5:



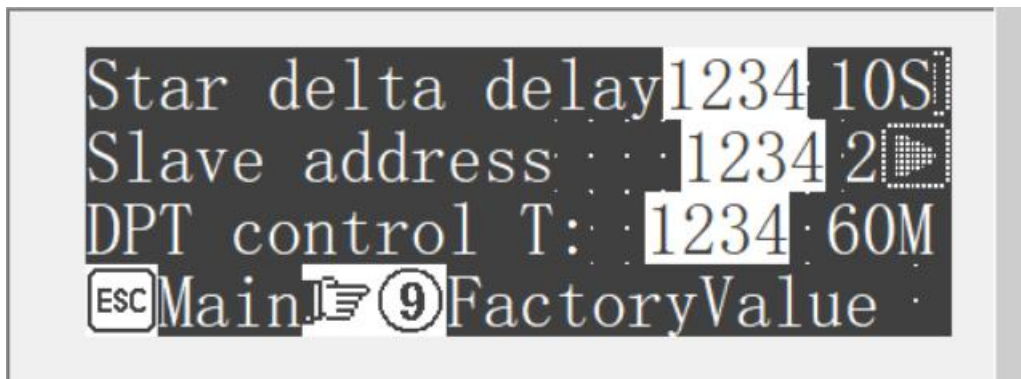
Parameter setting 6:



Parameter setting 7:



Parameter setting 8:



User parameter settings

Name	set value	Scope
Upper heating temperature limit	120°C (Unauthorized)	0~300°C
Lower limit of heating temperature	100°C (Unauthorized)	0~300°C
Heating over temperature alarm	200°C (Unauthorized)	0~300°C
Air intake temperature alarm	45°C (Unauthorized)	0~300°C
Exposed temperature	-10°C (Unauthorized)	-100°C~30°C
Working dew point temperature	-30°C (Unauthorized)	-100°C~30°C
Lower limit of dew point range	-80°C (Unauthorized)	-100°C~30°C
Heating temperature compensation	0°C (Unauthorized)	-500°C~500°C
Air intake temperature compensation	0°C (Unauthorized)	-500°C~500°C
Dew point temperature compensation	0°C (Unauthorized)	-500°C~500°C
Condensation temperature compensation	0°C (Unauthorized)	-500°C~500°C
Fan working temperature	45°C (Unauthorized)	0°C~300°C
Fan Shutdown Temperature	40°C (Unauthorized)	0°C~300°C

Condensation heat alarm	70℃ (Unauthorized)	0℃~300℃
Stop charging time	30 second (Unauthorized)	3~999S
Single tower to be regenerated	10 second (Unauthorized)	1~3600S
Single tower regeneration	25Minutes (Unauthorized)	1~3600M
Single tower cold regeneration	15Minutes(Unauthorized)	1~3600M
Single tower charging	8Minutes (Unauthorized)	1~3600M
Average pressure time	10second (Unauthorized)	1~3600S
Fault Judgment Delay	3second (Unauthorized)	1~3600S
Electrical discharge time	5Minutes (Unauthorized)	1~60M
Electricity discharge time	5second (Unauthorized)	0~99S
Address	2 (Unauthorized)	1~255
Maximum delay in dew point control	5Minutes (Unauthorized)	1~999M

The user can adjust the parameters according to the work needs.

Adsorption time of single tower (half cycle)=(average pressure time of single tower to be regenerated by single tower)

= regeneration time (single tower regeneration single tower cold regeneration). The heating action is within the regeneration time of a single tower.

Button Parameter Settings

key	Functions and permissions	purpose
【0】	function key	Manual drainage (press the drain to work, reset the drain off)
【1】	Function keys (continuous selection)	Alternate Solenoid Valve Selection(A tower inlet valve, B tower inlet valve: A tower exhaust valve, B tower exhaust valve) Spare a set of solenoid valve output.
【4】	function key	Local and remote control switching The boot and shutdown keys on the panel work locally and remotely. Chain start and stop can only work in remote control.
【5】	Function keys (continuous selection)	choose : Linkage mode (cold dryer and suction machine working at the same time) Cold dryer mode (separate cold dryer operation) Suction Machine Mode)
【9】	function key	Recovery of ex-factory values

七、Alarm screen and processing

Alarm content	cause	Handling method (reset three times by ESC)
No Power Display	DC24V switching power	If there is no DC24V power output, replace

Solenoid valve working	supply no output, solenoid coil short circuit or non-magnetic.	the power switch, If the solenoid valve is not electrified, please check the safety switch.
Air intake low pressure or air compressor jump	Pressure below set value or free jump	Open air compressor or close circuit breaker
Inlet high temperature alarm	Excessive intake temperature	Reduce air compressor exhaust temperature
Heating overtemperature alarm	Heating temperature above set	Check whether the heating contactor disconnects or opens the large regenerative gas regulating valve and check the silencer exhaust.
Dew temperature alarm	Dew point temperature above set value	Check for failure of dew point sensor probe or adsorbent.
Air intake sensor fault	Sensor probe broken or wiring loose	Replace probe (red and blue wire resistance should be greater than 100 Euro)
Failure of heating or evaporation sensors	Sensor probe broken or wiring loose	Replace probe (red and blue wire resistance should be greater than 100 Euro)
Fault of Dew Point Sensor	Sensor probe broken or wiring loose	Replace probe or tighten
Time for maintenance	Run time greater than set time	Contact manufacturer for maintenance equipment
Failure of heating or evaporation transmitters	Bad delivery or loose wiring	Replace or tighten wiring terminals
High pressure refrigerant fault	Refrigerant High Voltage Switch	Clean radiator and check fan or cooling water temperature is too high, manual reset switch

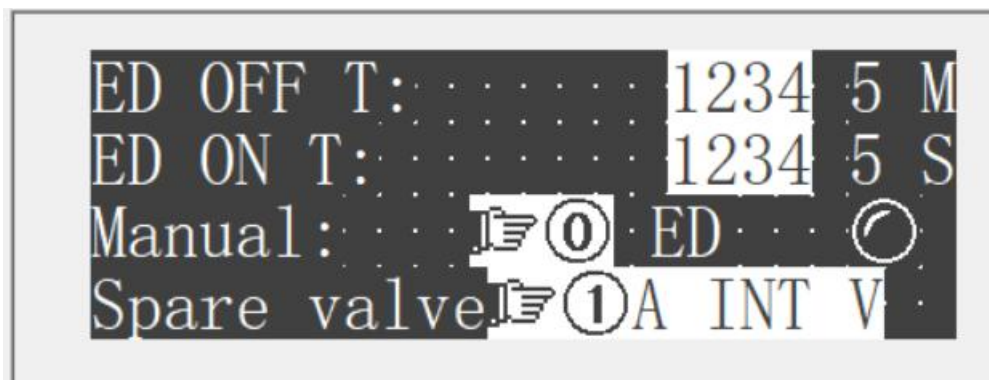
Low pressure refrigerant fault	Refrigerant low-voltage switch action	Less refrigerant or less condensed water.
Overload alarm	Hot overload switch action	Reduce compressor load or replace overload relays
Phase sequence alarm	Phase sequence switch action	Electrical missing phase or replacement phase sequence switch
Compressor module protection alarm	Compressor module action	Replacement of compressor modules and closure of module protection channels
Condenser High Temperature Alarm	Excessive condensation temperature	Check radiators and fans
Condenser sensor fault	Sensor probe broken or wiring loose	Replace probe or tighten

Note: if there is a group of solenoid valve output damage, replace to the spare solenoid valve treatment.

Step 1: check the solenoid valve coil and make sure that the solenoid valve coil is not short-circuited.

Step 2: open the following screen, press the number key 1, switch the valve. Such as A tower intake valve burned out, press 1 to select the A tower when the valve.

Step 3: YO the inlet valve terminal of the A tower to the Y17. (Operation in case of power failure). Power up after completion.

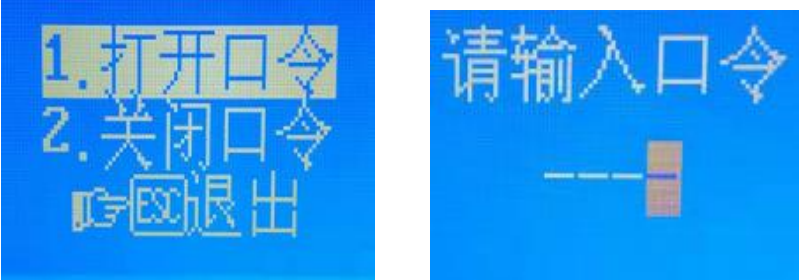


八、Password password (password: 1234)

1. LCD controller password, users can not change at will, our factory default

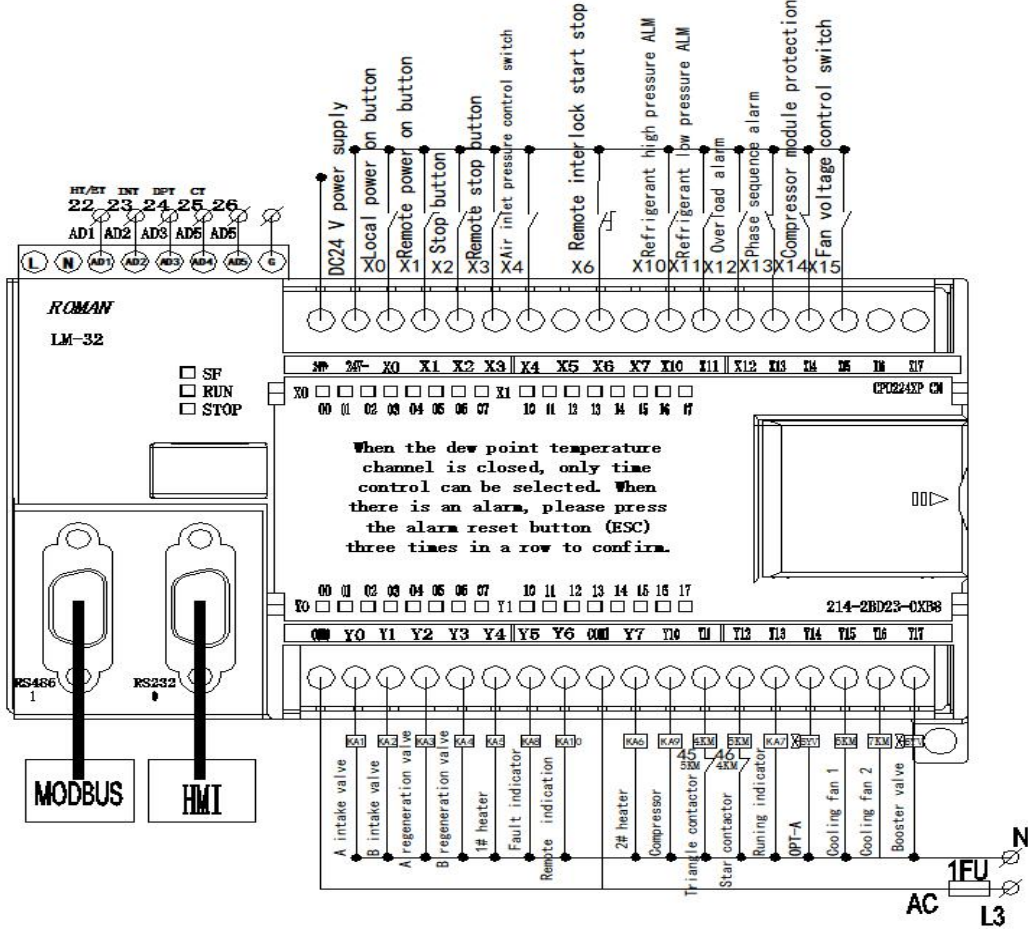
password is "1234". If you need to change the password, please inform us in advance, we will change the password according to customer needs before the product leaves the factory.

2. Remember to close the password every time you modify the parameters in case others wantonly modify it.



3. How to operate the password when modifying parameters:
1. PRESS ENT once
 2. "1. Open password"
 3. PRESS ENT again
 4. Input the password according to the figure above

九、Wiring diagram



十、Warranty Period

Under normal storage and transportation conditions and in good condition of product package or product itself, the warranty period of the product is 12 months from the date of sale. The following situations are not covered by the warranty:

- 1) Damage caused by improper use, storage and maintenance of users.
- 2) Damage not caused by the organization or personnel assigned by the company, or self disassembly and repair.
- 3) The product is beyond the warranty period.
- 4) Damage caused by force majeure.

Chapter 3 Modbus communication protocol

一、Connecting PC and controller

1. communication protocol

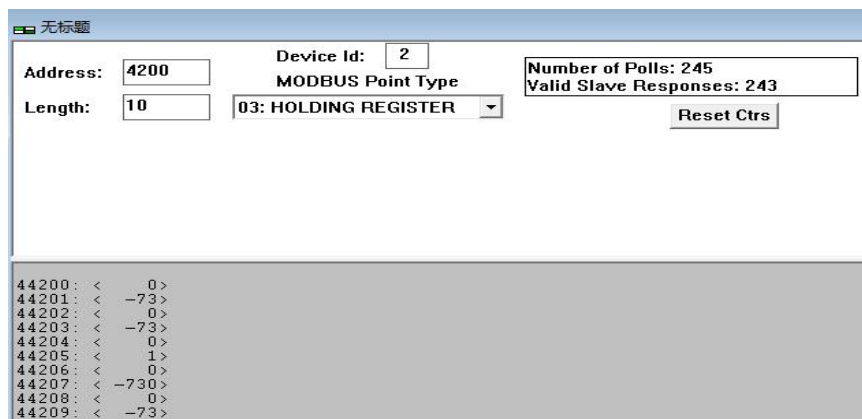
This machine adopts standard Modbus communication protocol, baud rate is 9600. The transmission mode adopts RTU mode, and the bits of each byte are: one start bit, eight data bits, one even check bit, one stop bit and CRC cycle detection。

The default slave address of the device is 2 (settable, but it is only effective after power on again), baud rate is 9600, check bit is even (settable)

2. Connector: 3=A, 8=B

二、Mailing address details:

1.The test is as follows: test software: MODSCAN32



a、Output coil: Zone 1 (Note: only the status of slave station can be read) decimal system
(Please add decimal system + 00001 for Modicon communication).1: ON 0:OFF

Modbus address	1280	1281	1282	1283	1284	1285	1286		
Device address	Y0	Y1	Y2	Y3	Y4	Y5	Y6		
state	A intake valve	B intake valve	A regeneration valve	B regeneration valve	1# heater	Fault indicator	Remote indication		
Modbus address	1288	1289	1290	1291	1292				
Device address	Y10	Y11	Y12	Y13	Y14				
state	Compressor	Triangle contactor	Star contactor	Runing indicator	OPT-A				

b、Read switching value: Zone 2 (Note: can read the status of slave station.) (Please add decimal + 00001 to Modicon communication).

Modbus address	1024	1025	1026	1027	1028	1029	1030	1031	
Device address	X0	X1	X2	X3	X4	X5	X6	X7	
state	空	空	空	空	Air inlet pressure control switch	空	Remote interlock start stop	空	

Modbus address	1032	1033	1034	1035	1036	1037	1038	1039	
Device address	X10	X11	X12	X13	X14	X15	X16	X17	
state	Refrigerant high pressure ALM	Refrigerant low pressure ALM	Overload alarm	Phase sequence alarm	空	空	空	空	

c、Start stop address input address, remote start stop equipment is not recommended: Zone 1 (please put decimal + 00001 for Modicon communication)。

Modbus address	2051	2053					
Device address	M3	M5					
state	Power on (pulse stop)	Stop (pulse stop)					

d、Read the temperature input address: Zone 3 (please put decimal + 40001 for Modicon communication). (16 bitINT)

Modbus address	4202	4220	4142	4210			
Device address	D106	D124	D46	D114			
state	HT/ET	DPT	CT	INT			

Working status address (please put decimal + 40001 for Modicon communication). (16 bit INT)

Modbus address: 44117 ,The operation status of the equipment is as follows

- =0: Pressurized in
- =1: B drying A delay regener
- =2: B drying A heating
- =3: B drying A blowing cold
- =4: B drying A filling press
- =5: B drying A Mean pressure
- =6: A drying B delay regener
- =7: A drying B heating
- =8: A drying B blowing cold
- =9: A drying B filling press
- =10: B drying B Mean pressure
- =11: Readiness
- =12: CD runing

