

Chapter 6 AKS 5L/10L Series Hot Melt Adhesive Machine

6.1 AKS 5L/10L Series Hot Melt Adhesive Machine System Introduction

The AKS 5L/10L series hot melt adhesive machine uses a dedicated temperature control screen to regulate the temperature of each zone. The entire temperature control system is intuitive, simple, and easy to maintain.

The AKS 5L/10L series hot melt adhesive machine uses sequential heating control. Upon cold start, the main melting tank and all hose/gun temperature controllers are energized simultaneously. The entire system reaches ready temperature in approximately 0.3 hours. Once all zones reach their set temperatures, operation can begin.

The hot melt machine adopts PID temperature control technology matched to the characteristics of hot melt adhesives. The machine can connect up to 2 hoses and 2 guns externally. Temperature settings support up to 5 heating zones. The control terminal automatically alarms and alerts for operator errors and faults.

The hot melt machine precisely controls the temperatures of the melting tank, hot melt hoses, and guns. The delayed heating function delays heating of hoses and guns, which reduces adhesive carbonization. The cooling function lowers the temperatures of the tank, hoses, and guns during line stoppage; when production resumes, heating restarts immediately so each heating zone reaches operating temperature in the shortest possible time, further reducing adhesive carbonization. These advanced features extend the service life of the machine, preserve adhesive performance, and reduce downtime caused by adhesive carbonization. The main control terminal has multiple anti-interference measures; the temperature control system can be interlocked with the host machine for automatic startup, better meeting production process requirements. Temperature setting and adjustment are simple and convenient. The Teflon-treated melting tank accommodates hot melt adhesives in various forms, including pellets, granules, and blocks, and works with pneumatic automatic guns, electric automatic guns, and manual guns for various applications. A glue pressure gauge and heating fins are available as options for the tank section.

AKS 5L/10L Series Hot Melt Adhesive Machine



The system has a total of 6 independent heating zones, each with independently settable temperatures.

6.2 AKS 5L/10L Series Hot Melt Adhesive Machine Parameters:

Power Supply: 220VAC/50Hz

Installed Power: 2800W

Tank Capacity: 10L

Melting Rate: 10L/h

Applicable Adhesive Viscosity: 200-10000 cP

Operating Temperature: Max 220C

Compressed Air: >0.7MPa

Output Ports: 2

Dimensions: 550X450X500 (LxWxH)

6.3 AKS 5L/10L Touchscreen Version Hot Melt Adhesive Machine Technical Parameters

Working Environment

Storage/Transport Temperature.....	-30C to 50C
Ambient Operating Temperature.....	-15C to 50C
Ambient Noise.....	<30 dB (at 1m, excluding solenoid valve noise)

Performance Parameters

Dimensions.....	550x450x500 (LxWxH)
Output Connections.....	1-4 nozzles / hot melt hoses
Tank Heating Zones.....	1 (heating fins optional)
Pump Quantity.....	1 (piston pump)
Outer Protection.....	Waterproof, dustproof, high-temperature resistant composite material
Electrical Connection.....	Standard military aviation connectors
Tank Capacity.....	AKS 5L/10L=10L (effective capacity)
Melting Tank Type.....	Built-in heater, permeable Teflon coating
Filter Type.....	Tank-bottom primary filter, output filter
Weight (empty).....	AKS 5L/10L=30Kg
Adhesive Form.....	Accepts all forms

Power Supply Requirements

Supply Voltage.....	220VAC (system-dependent)
Total System Power.....	3000W (excluding guns)
Tank Power.....	2500W
Tank Heating Type.....	Tubular built-in heater (main tank)
Temperature Control Method.....	PID control
Temperature Sensor.....	K/PT100 thermocouple (default PT100)
Electrical Connection Type.....	Lock-type aviation connector
Hose/Gun Fuse Current.....	Tank 25A
Hose 15A	
Gun 25A	
Max Load per Hose & Gun Circuit.....	4000W

Air Supply:

Air Pressure.....	>=0.7MPa dry compressed air
-------------------	-----------------------------

Max Pump Speed.....	10L/hour
Max Air Consumption.....	90 L/min

Machine Parameters:

Temperature Range, Standard Mode.....	10C~220C
Temperature Control Accuracy.....	+/-0.5C
Standby Cooling Temperature (optional).....	Set to 80C (adjustable)
Backup Temperature Control Range.....	10C~220C (optional)
Tank Over-temperature Shutoff.....	218C (snap-action thermostat, self-resetting)
Gun Over-temperature Shutoff.....	Micro contactor; cuts main power at 15C
over-temp (adjustable)	
Hose Over-temperature.....	Audible/visual alarm (over-temp range adjustable)
Low-temperature Pump Protection.....	130C (preset, adjustable)
Applicable Adhesive Viscosity.....	500 to 5000 cP
Max Viscosity for Spray Application.....	3000 cP
Warm-up Time (full tank).....	Approx. 0.5 hour
Melting Rate (depending on adhesive type).....	10.5 kg/hour
System Glue Pressure.....	Max 90MPa (closed loop)

Control Method

Temperature Control System.....	12 independent control channels
Backup Temperature Points.....	1 channel (standard on touchscreen version)
Control System.....	External fully automatic high-speed compensation system
or other analog output	
Display Type.....	LCD touchscreen / digital panel
Solid State Board.....	12-channel solid state relay output
Output Power.....	Tank: 4000W (max)
Per hose/gun: 700~4000W	
Max output for four hose/gun circuits: 20000W	
Inverter Control Signal.....	0-10VDC linear analog
Gun Solenoid Valve Control Signal.....	24VDC/220VAC
Fuse Specifications.....	Tank 10x38mm AC500V 25A
	Gun 10x38mm AC500V 25A
	Hose 10x38mm AC500V 15A

Other

Operation Panel.....	Simplified icons and numeric keys / temperature controller
Over-temperature Response.....	Auto power cut to that zone / audible-visual alarm
Sequential Heating Protection.....	Yes
Program Start Function.....	Yes (optional)
Sensor Open-circuit Alarm.....	Built-in

6.4 AKS 5L/10L Touchscreen Version Hot Melt Adhesive Machine System Introduction

The H9 intelligent hot melt adhesive machine control system is an intelligent controller developed by our company based on years of design and manufacturing experience in intelligent hot melt machine control systems. This integrated unit, combined with intelligent temperature control modules, integrates various circuits while retaining proven, stable circuit designs, achieving intelligence, stability, and high cost-performance.

The H9 intelligent integrated unit is equipped with a 7-inch screen and supports three sensor types: K, PT100, and Ni120, freely switchable as needed. It has built-in control programs for both gear pump and air pump models, switchable online via software parameters. It also includes built-in encoder tracking and gun control programs to support various applications under different operating conditions.

H9 Intelligent Hot Melt Machine Control System Main Technical Parameters

Model	H9-AKS	
Screen Size	7 inch	
Temperature Signal Type	K, Pt100, Ni120	
Temperature Signal Channels	6/8/12	
Temperature Input Range	K: -100.0 ~ 1300.0C / Pt100: -200.0 ~ 850.0C / Ni120: -70.0 ~ 300.0C Pt100: -200.0 ~ 850.0℃ Ni120: -70.0 ~ 300.0℃	
Temperature Measurement Accuracy	Class 0.3	
Temperature Control Output	NPN (30VDC), PID control	
Logic Control Output	3~4 channels, NPN type	
Encoder/Photo Input	Supports 1 encoder + 1 photoelectric	
Spray Control Function	4-point spray output	
Liquid Level Detection	Supported	
Communication Interface	1 independent RS485 channel	

6.4.1 Temperature Wiring Rules

Module 1# (6-channel temperature controller) wiring order:

Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	Ch.6
	2	3	4	5	6
Upper tank (spare)	Lower tank	Hose 1	Gun 1	Hose 2	Gun 2

Note: For dual-layer tanks, use Channel 1 as the upper tank layer.

Module 2# (6-channel temperature controller) wiring order:

Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	Ch.6
------	------	------	------	------	------

1	2	3	4	5	6
Hose 3	Gun 3	Hose 4	Gun 4	Hose 5	Gun 5

Temperature Module (8-channel temperature controller) wiring order:

Ch.1 1	Ch.2 2	Ch.3 3	Ch.4 4	Ch.5 5	Ch.6 6	Ch.7 7	Ch.8 8
Upper tank (spare)	Lower tank	Hose 1	Gun 1	Hose 2	Gun 2	Hose 3	Gun 3

6.4.2 Communication Parameters Required Before Using the Inverter

- Inverter parameters must be set before connecting to the touchscreen communication;
- Default maximum support is communication control of 2 inverters;
- These parameters are required for communication control; set other inverter parameters according to system requirements;
- Parameters take effect after restarting the inverter;
- The table below provides an S310 setting example; for other inverters, please consult our technical department.

TECO S310 Inverter Parameter Setting Table

Code	Function	Setting	Note
08-00	Inverter Station Address	3~4	Set to 3 for 1 inverter; Set to 3 and 4 for 2 inverters respectively;
08-02	Baud Rate	2	19200
08-03	Stop Bits	0	1 stop bit
08-04	Parity	0	No parity
08-05	Data Bits	0	8 data bits
08-06	Comm Fault Detection Time (s)	5.0	
08-07	Comm Fault Handling	2	Continue running after comm loss and display COT
08-08	Err6 Fault Tolerance Count	5	
00-03	Main Run Command Source	2	Communication control
00-05	Main Frequency Command Source	3	Communication control
00-09	Acceleration Time (s)	1.0	As small as possible depending on system;
00-10	Deceleration Time (s)	1.0	
04-09	Direct Start After Power On	0	Direct start when external command is present after power-on;

Yudian 6-channel Temperature Module Parameter Setting Table

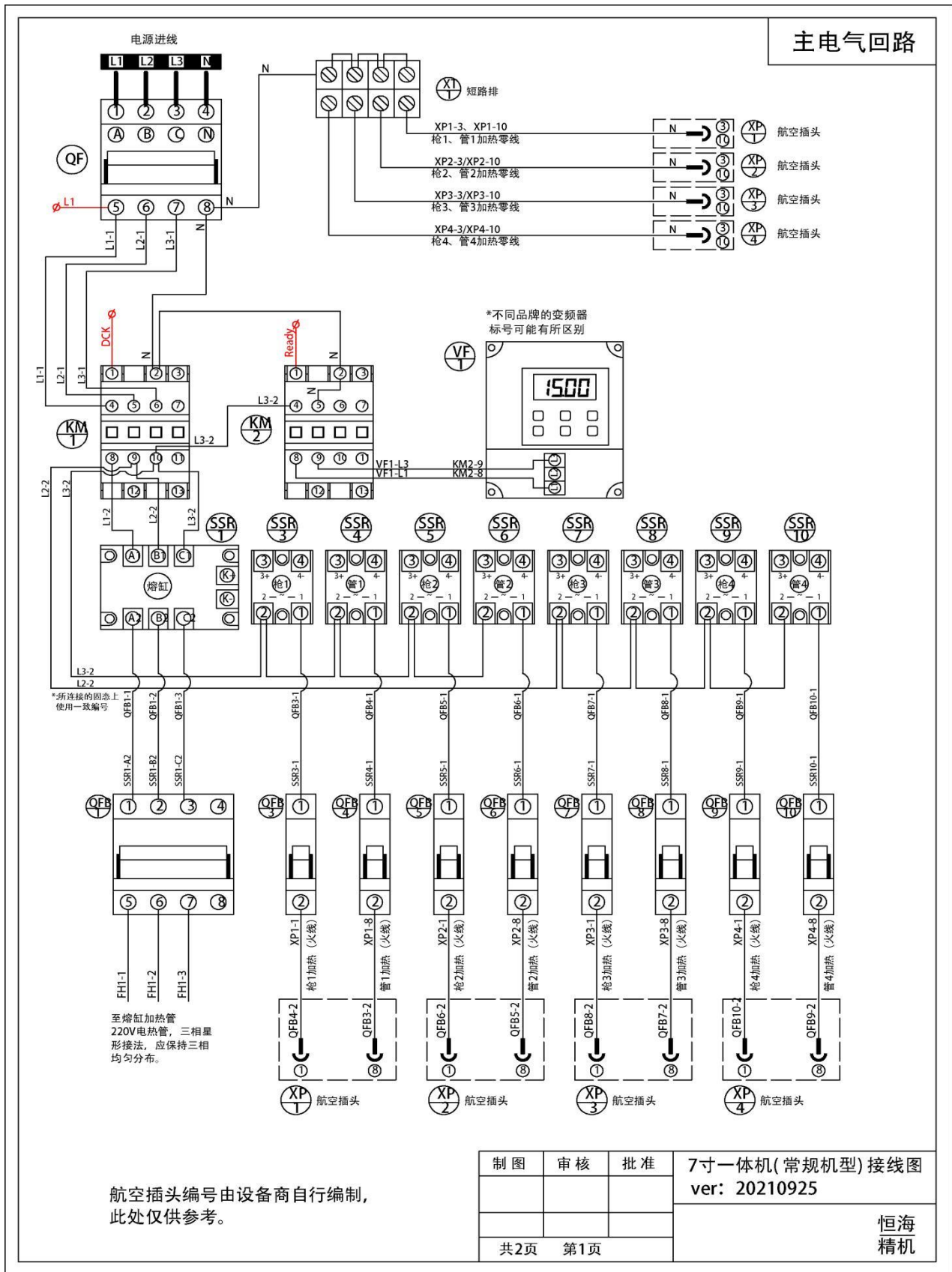
Code	Function	Setting	Note
Addr	Module Station Address	1~2	Set to 1 for 1 module; Set to 1 and 2 for 2 modules respectively;

bAud	Baud Rate	19.20	19200
AFC	Comm Protocol	0	Standard Modbus protocol

Yudian 8-channel Temperature Module Parameter Setting Table

Code	Function	Setting	Note
Addr	Module Station Address	1	Set to 1 for 1 module;
bAud	Baud Rate	19.20	19200
AFC	Comm Protocol	0	Standard Modbus protocol

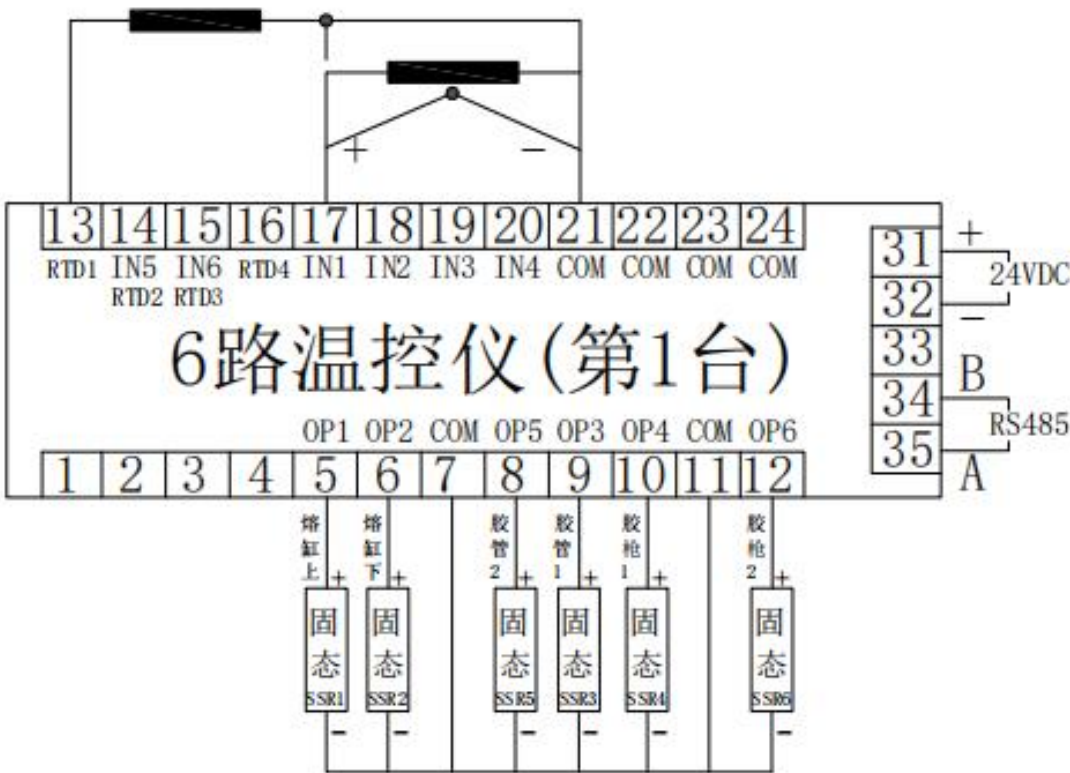
6.4.3 H9 Intelligent Hot Melt Machine Control System Wiring Diagram



控制回路

传感器输入端子标签:

17: 熔缸上	13:	21: COM
18: 熔缸下	14: 胶管2	22: COM
19: 胶管1	15: 胶枪2	23: COM
20: 胶枪1	16:	24: COM

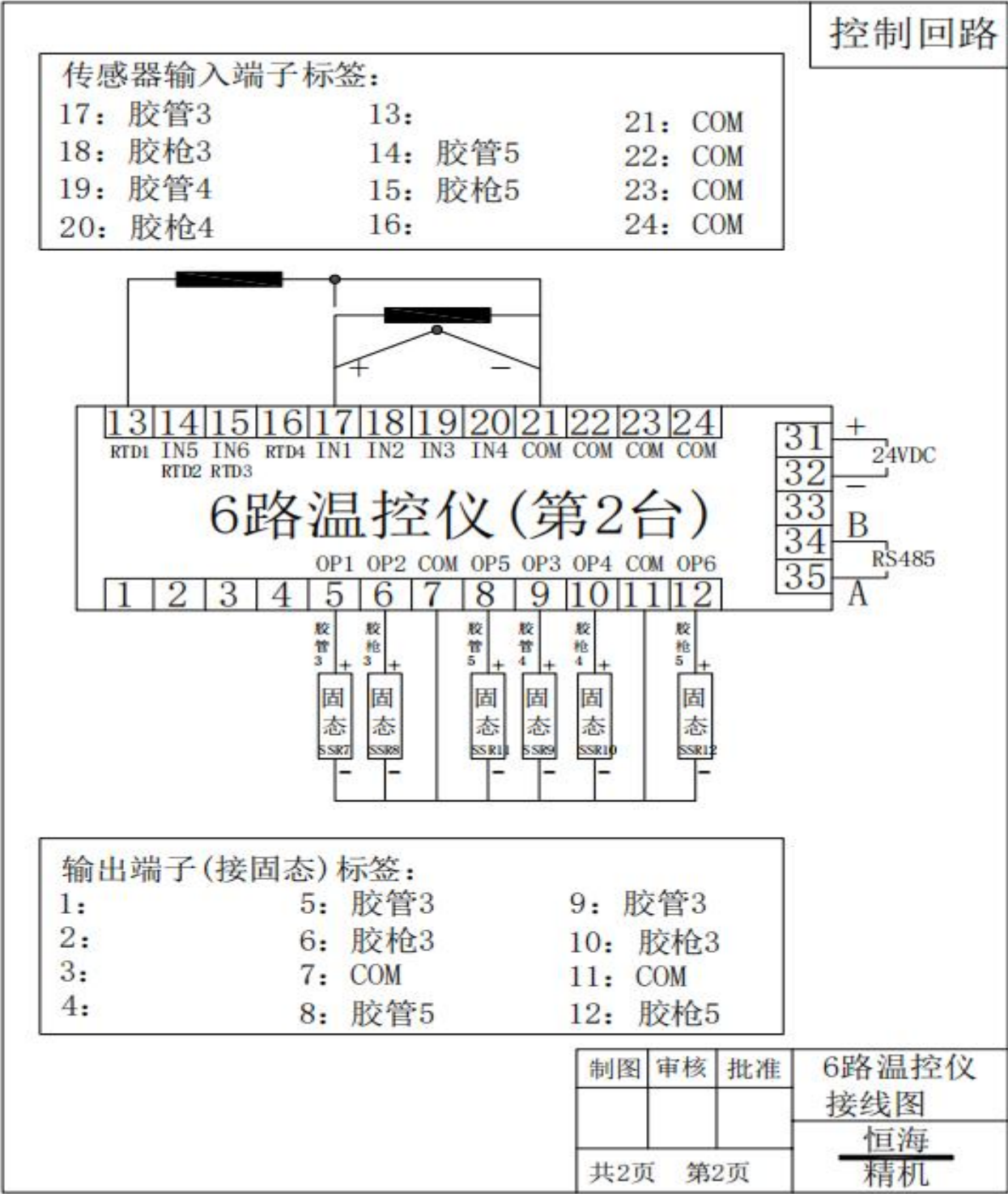


输出端子（接固态）标签:

1:	5: 熔缸上	9: 胶管1
2:	6: 熔缸下	10: 胶枪1
3:	7: COM	11: COM
4:	8: 胶管2	12: 胶枪2

制图	审核	批准
共2页 第1页		

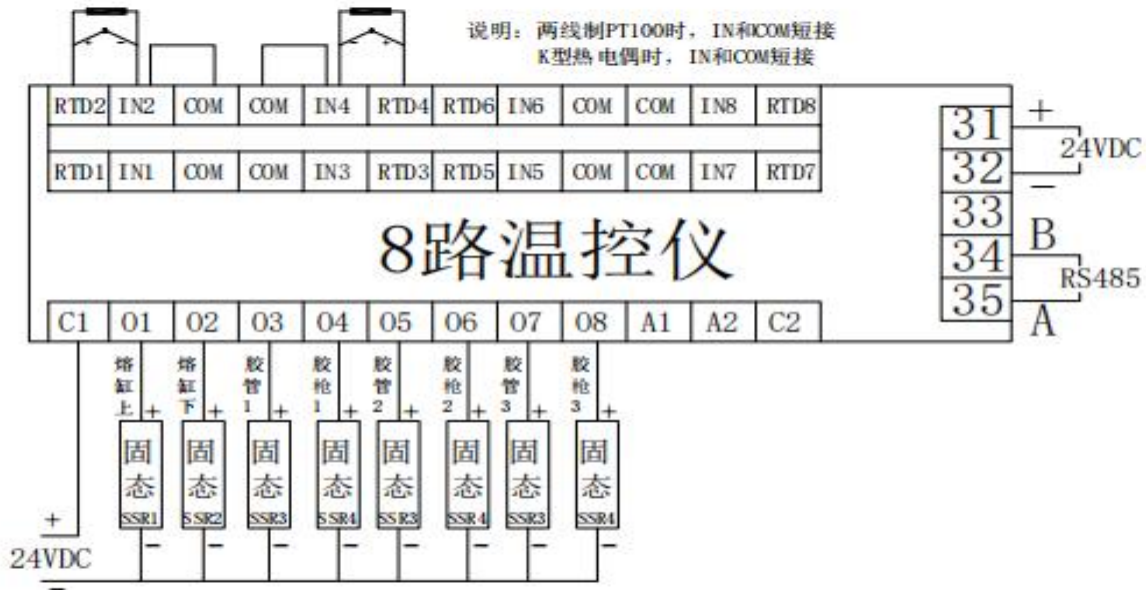
6路温控仪 接线图 <u>恒海</u> 精机



控制回路

输入端子标签:

RTD1: 熔缸上 RTD5: 胶管2
 RTD2: 熔缸下 RTD6: 胶枪2
 RTD3: 胶管1 RTD7: 胶管3
 RTD4: 胶枪1 RTD8: 胶枪3

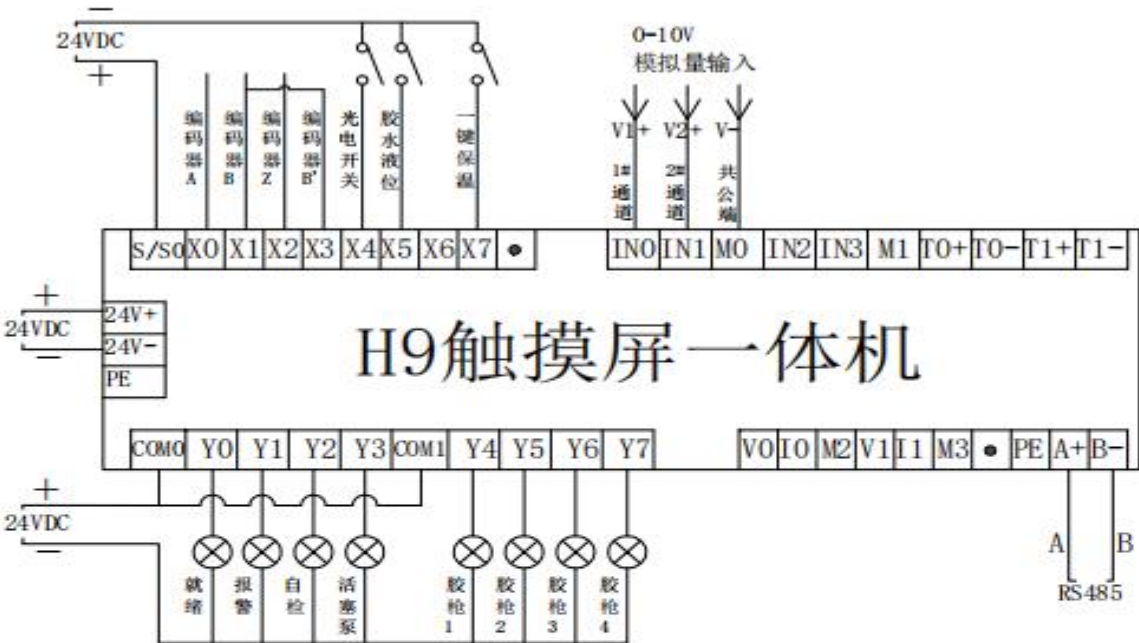


输出端子标签:

C1: 24VDC+ 04: 胶枪1 08: 胶枪3
 01: 熔缸上 05: 胶管2
 02: 熔缸下 06: 胶枪2
 03: 胶管1 07: 胶管3

制图	审核	批准	8路温控仪 接线图 恒海 精机
共1页 第1页			

控制回路



制图	审核	批准	7寸一体机
			触摸屏接线图
共1页 第1页			恒海 精机

6.5 System Configuration

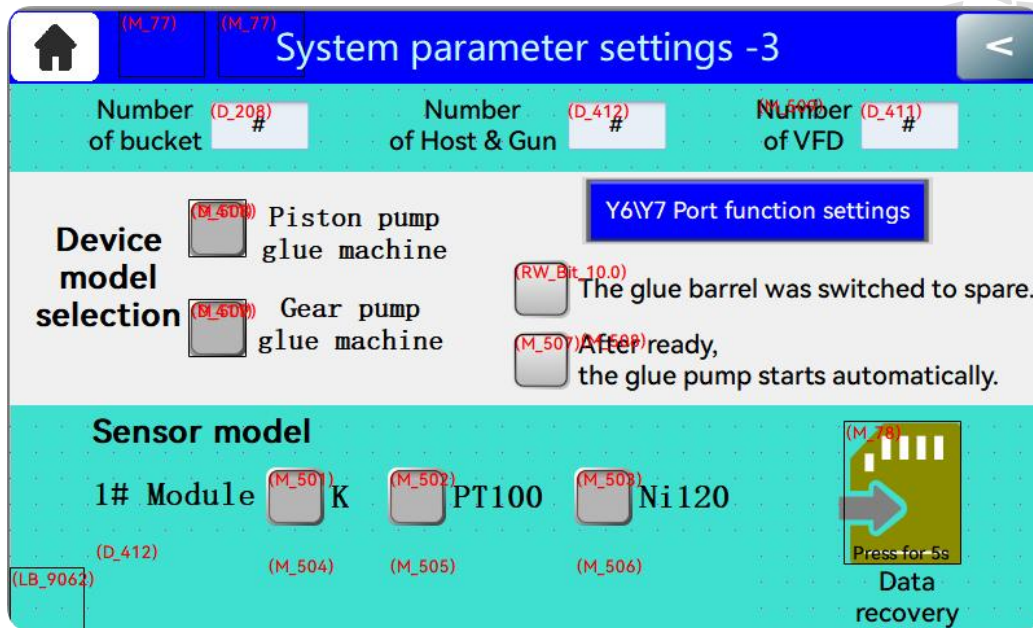
6.5.1 Model Selection

The H9 intelligent hot melt machine integrated unit supports online switching between gear pump and air pump control modes.

The model must be confirmed before use.

Procedure:

Home > Parameter Settings > Enter password 9870 > Parameter Settings 1 > Parameter Settings 2 > Press and hold page-forward button ">" for 5 seconds > Parameter Settings 3
On the Parameter Settings 3 screen, tap System Configuration, select the appropriate model, and restart.



6.5.2 Home Screen Logo Switching

Enter the home screen, tap the lower-left area of the display, enter the highest-level password (obtain from the manufacturer), and choose between manufacturer logo or generic logo display.



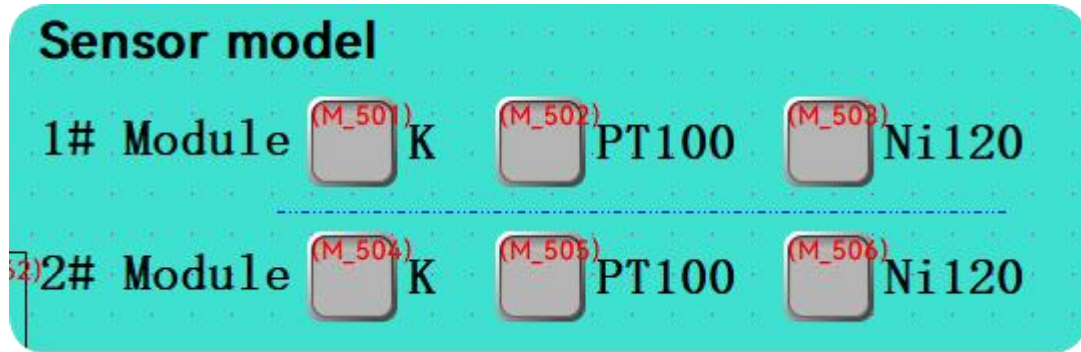
6.5.3 Sampling Filter Coefficient

To filter interference, a sampling filter coefficient is provided on the configuration page. The default is 0; do not modify unless necessary.

6.5.4 Selecting the Temperature Sensor Type

Selecting the correct sensor type is essential for normal controller operation. Confirm before use.

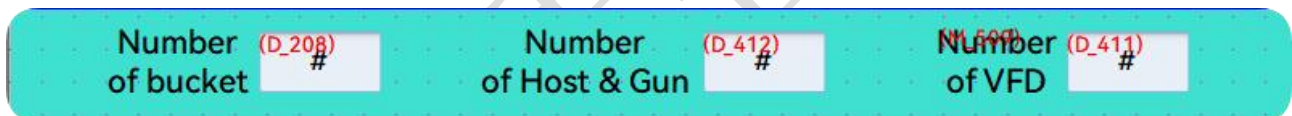
Enter the Parameter Settings 3 screen and select according to actual situation;
The input module Pt100/Ni120/K can be switched.



6.5.5 Selecting the Number of Connected Inverters (skip this section for air pump models)

This controller allows connecting multiple inverter models for coordinated operation. Currently up to 2 inverters are supported.

Enter the Parameter Settings 3 screen to modify the number of connected inverters.



Tap to select the appropriate inverter model and quantity based on actual conditions.

6.6 Basic System Functions

6.6.1 Main Screen Overview



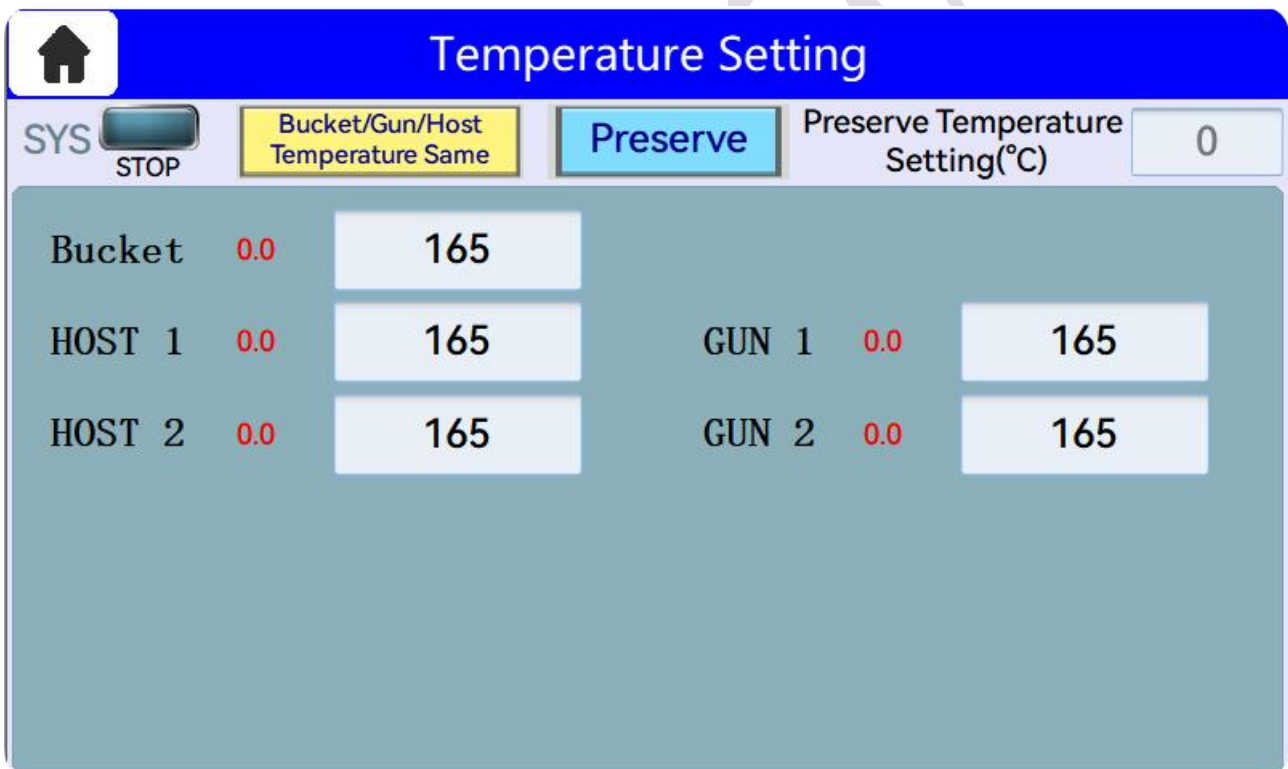
6.6.2 Machine Status Display

The machine has 4 operating statuses: "Not Ready," "Ready," "Standby," and "Heating," displayed in the upper left/right corner of the temperature screen and other relevant screens.



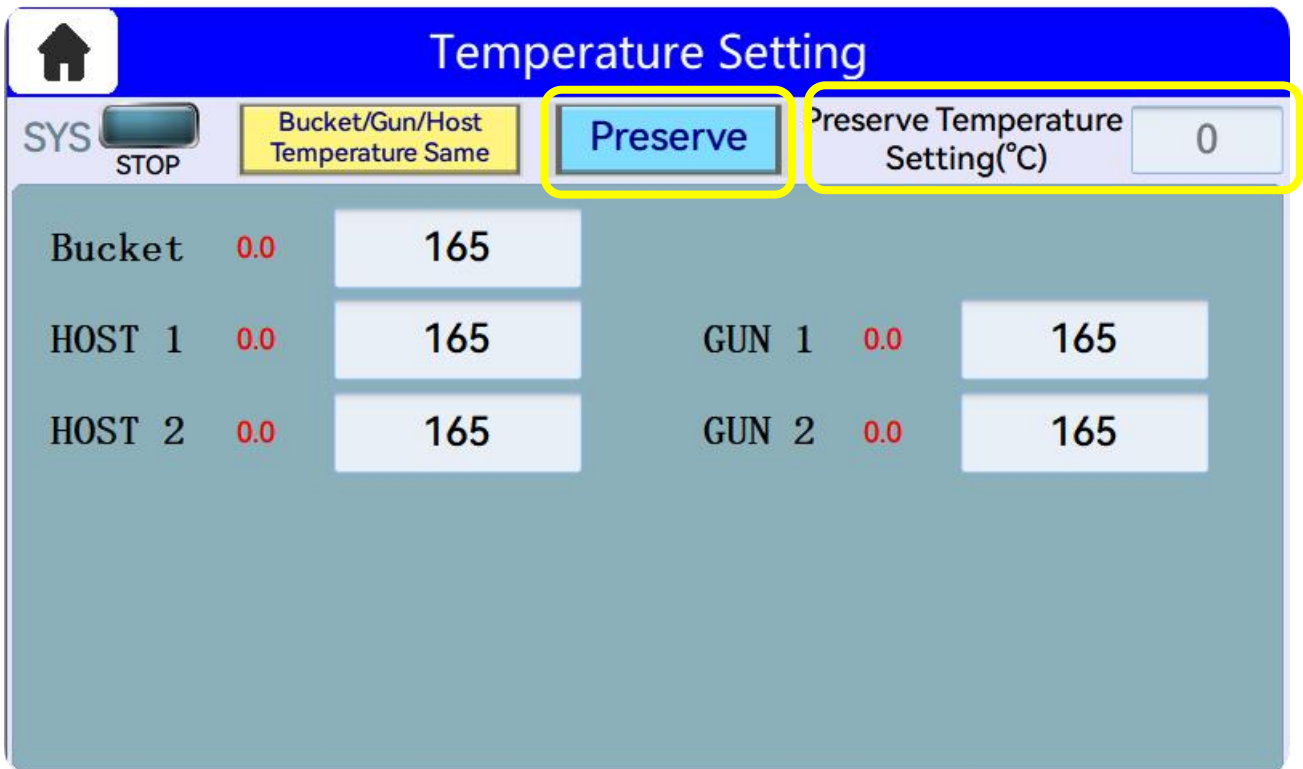
6.6.3 Temperature Setting and Control Enable

Tap the set temperature to enter the temperature setting page for the corresponding channel. Set the temperature and control enable as needed.



6.6.4 Standby Function

Tap the set temperature to enter the temperature parameter setting screen.



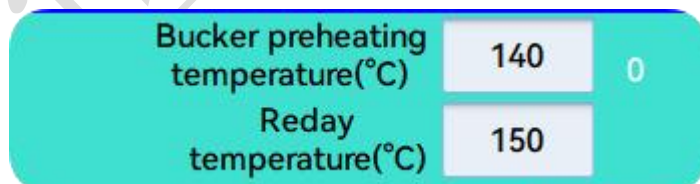
Use the one-touch standby button to toggle between standby/heating;
In standby mode, each channel heats and controls to the standby temperature.

6.6.5 Ready Determination

Temperature readiness is a prerequisite for inverter (or air pump) operation. Readiness requires 2 conditions:

- A、Lower tank temperature reaches preheat temperature (typically preheat temperature is set about 10 degrees below the tank set temperature);
- B、Excluding channels with heating disabled and channels with no sensor connected, all channels reach the system ready temperature or above (typically set about 10 degrees below the tank set temperature).

Preheat temperature and ready deviation can be set by tapping the "Parameter Settings" button to enter the Parameter Settings 1 screen:



6.6.6 Over-temperature Protection

The controller provides over-temperature protection in two stages:

- A. When any channel reaches the over-temperature alarm value, an alarm is triggered.
- B. When any channel reaches the over-temperature shutoff value, an alarm is triggered

and heating power to all channels is cut off until the fault is cleared. Over-temperature protection can be set by tapping the "Parameter Settings" button to enter the Parameter Settings 1 screen:

All overheating alarm deviation temperature(°C)	15	All overheating deviation shutdown power supply temperature(°C)	15
The temperature of the over-temperature deviation alarm on the upper part of the melt barrel(°C)	30	The temperature of the power supply is turned off due to the over-temperature deviation of the upper part of the melt barrel.(°C)	60

6.6.7 Heating Abnormality Alarm

The controller provides a heating abnormality alarm. Related parameters can be set on System Parameters Page 1. When conditions are met, the system will alarm.

2	minutes after the system is powered on, The temperature has not risen by	2	degrees.
Judged to be abnormally heated by the system.			

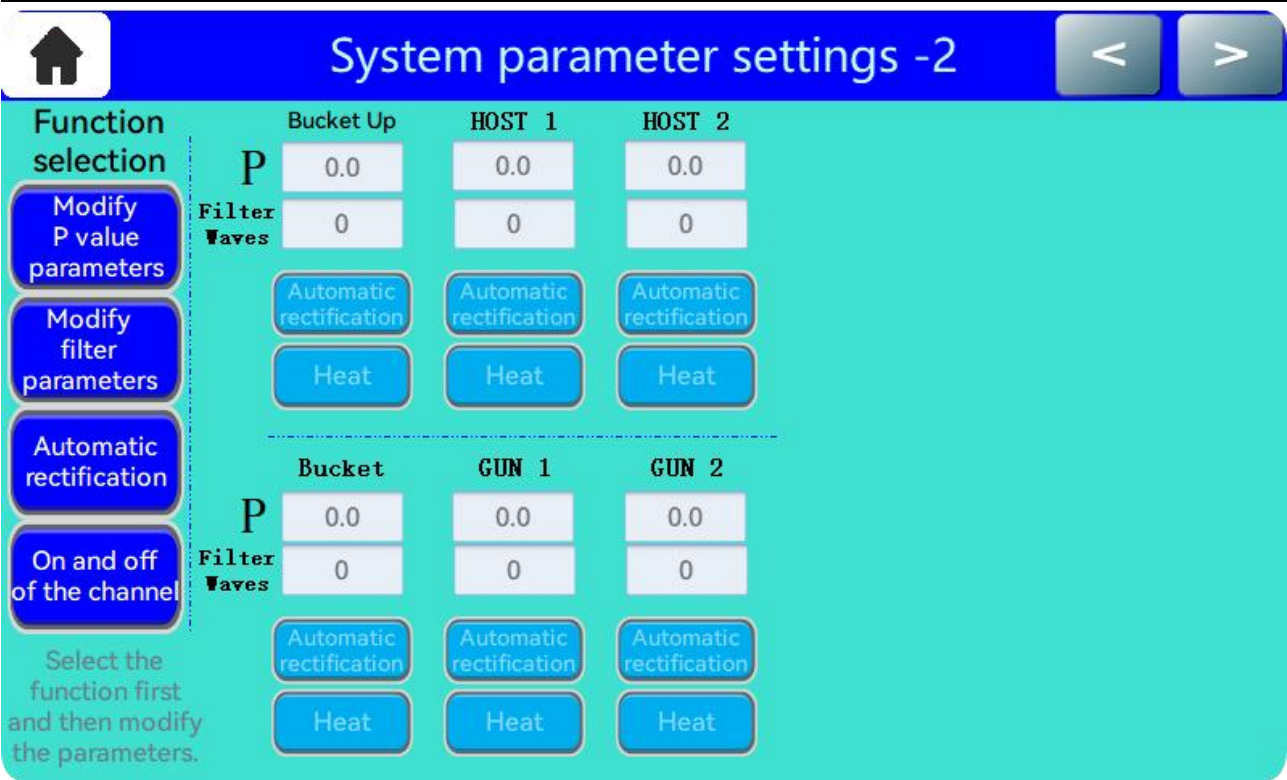
6.6.8 PID Parameter Adjustment

PID parameters affect temperature control stability. Incorrect settings may cause loss of control or over-temperature. Please complete setup under the guidance of a qualified engineer.

If a channel heats too slowly or overshoots excessively, adjust the PID parameters for that channel

to improve performance. Please consult our technical department before setting.

Tap the "Parameter Settings" button to enter the Parameter Settings 2 screen, then tap "Modify P Value" on the left to adjust:



For slow heating, decrease the parameter; for excessive overshoot, increase the parameter.

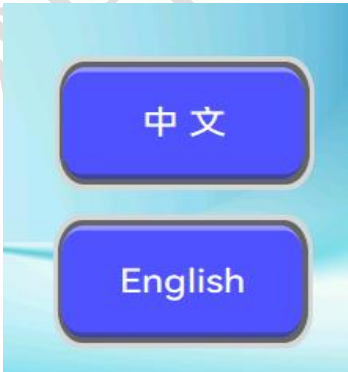
Modify Filter Value: Filters the input signal to remove jitter noise for smoother output response. Typically set to 0.

Switch Auto-tuning: The meter automatically calculates PID values internally and stops auto-tuning after a period of operation.

Channel Switch: Manually turn channel output on or off.

6.6.9 Language Switching (Chinese/English)

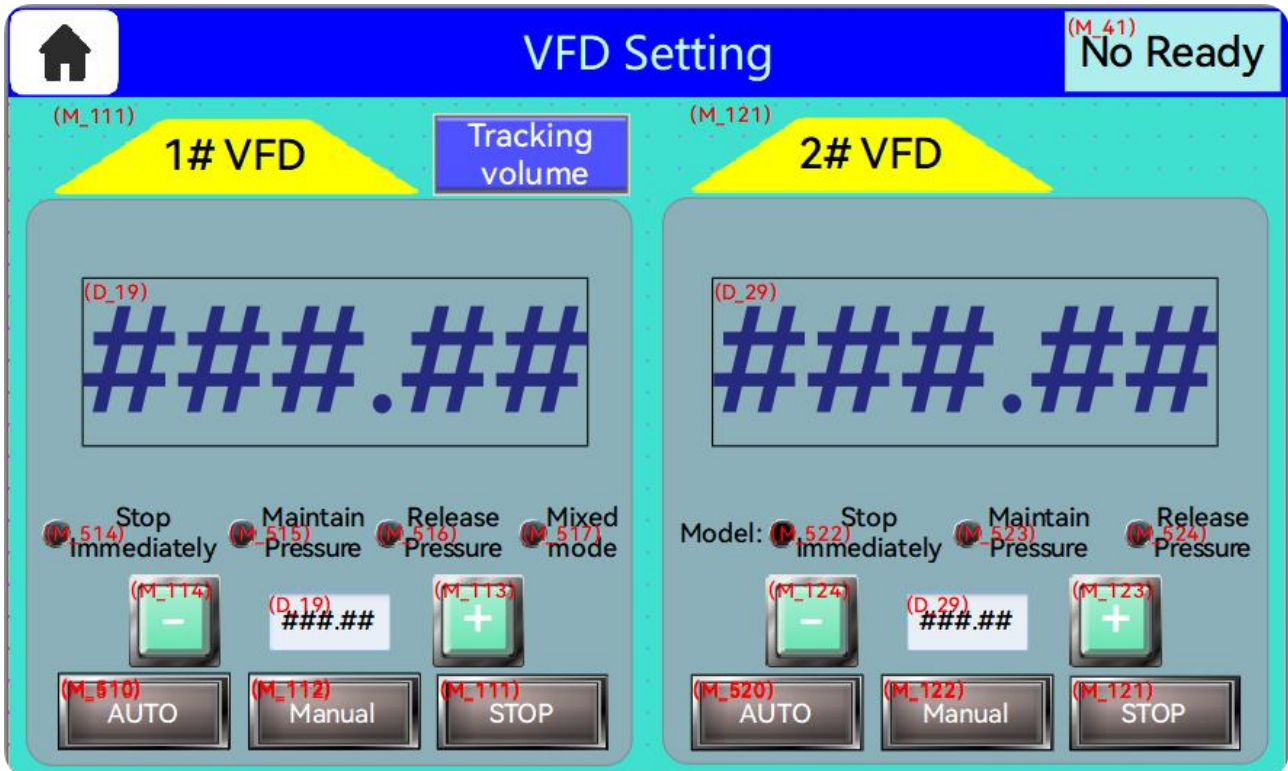
On the contact information display page, tap Chinese/English to switch languages.



6.6.10 Gear Pump Model Inverter Speed Control

Inverter speed control takes effect after temperature readiness. Tap the inverter speed

button to enter the speed setting screen.



Three operating modes:

- A. Stop Mode: Inverter is prohibited from driving the motor.
- B. Manual Mode: After temperature readiness, the inverter runs at the set manual value.
Speed can be set via manual speed setting. When temperature is not ready, this button is inactive.
- C. Automatic Mode: After temperature readiness, the inverter determines start/stop and speed based on external voltage input (0~10V, connected to external terminal block 0V-10V) or encoder signal.

Select the signal type on Parameter Settings Page 1.

First tap the Stop button, then tap the 1# inverter tab to enter the speed control page:

Parameter	Mode
Manual initial frequency (D_424) ###.## Hz	(M_514) Start and stop at any time
Upper limit of frequency (D_270) ###.## Hz	(M_515) AUTO Maintain Pressure When the Maintain pressure ON time is set to 99, the system continues to maintain the pressure.
Lower limit of frequency (D_272) ###.## Hz	Maintain Pressure ON(S) (D_266) #### Frequency (Hz) (D_268) ### Maintain Pressure OFF(S) (D_264) ####
Tracking volume (%) (D_274) ###	(M_516) AUTO Release Pressure Release Pressure ON(S) (D_267) #### Frequency (Hz) (D_269) ### Release Pressure (D_269) ###
Supercharged section speed selection	(M_517) Mixed mode Pressurized time (D_438) #### Pressurized magnification (D_440) ###

Parameters: Upper Limit: Inverter frequency upper limit.

Lower Limit: Inverter frequency lower limit.

Tracking Gain: Calculated output frequency * tracking gain = final inverter output frequency

This function is used when the hot melt machine is equipped with two inverters that require

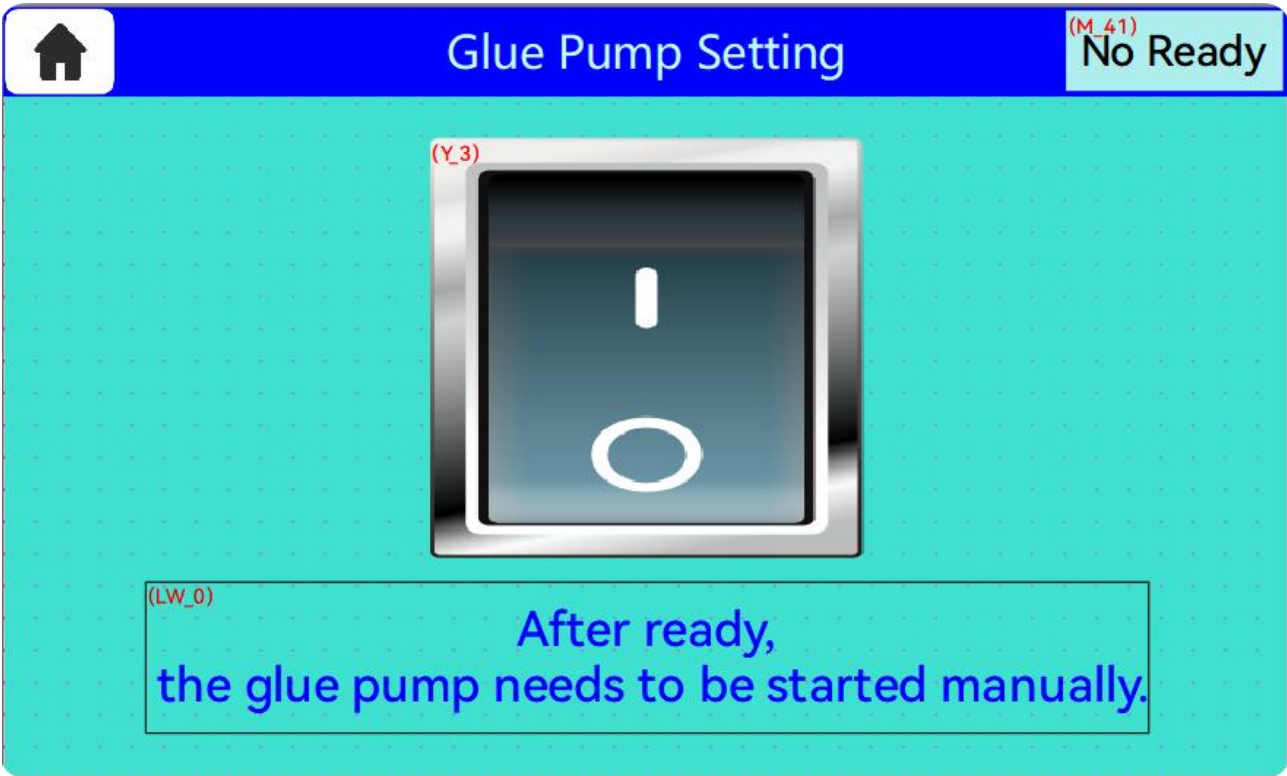
different output frequencies. Typically set to 100.

Stop Mode: A. Jog-stop: In automatic mode, motor start/stop tracking follows external tracker/encoder signals.

B. Automatic Pressure Relief: When the motor transitions from running to stopped, the motor reverses at relief frequency for the relief ON time to release pressure.

C. Automatic Pressure Holding: In automatic mode, after the external start condition is removed, the motor maintains pressure at the holding frequency for the holding ON time, then stops for the holding OFF time, repeating until the external start condition is met. This keeps pressure stable and is typically used for long hose runs.

6.6.11 Air Pump Model Glue Pump Control



The glue pump control button can manually start or stop the pump after the system is ready.
Note: When the system is not ready, the pump defaults to OFF and cannot be manually started.

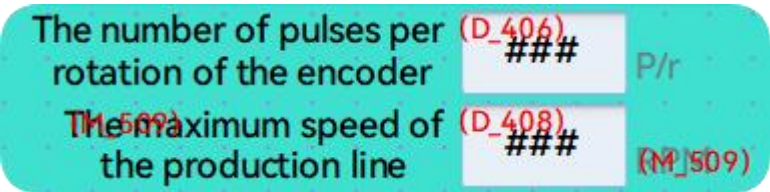
6.6.12 Abnormal Alarm

Alarms are divided into general alarms and critical alarms. Both types trigger external audible/visual alarms and display on screen.
Only critical alarms cut off heating power to protect the equipment, such as when over-temperature occurs.



6.7 Beat (Glue Break) Settings
6.7.1 Beat Basic Parameter Settings

Enter the gun control page and set the following parameters when using an encoder:



Encoder PPR	120~600, based on actual encoder input; 360 PPR encoder recommended.
-------------	--

	Set according to actual use, otherwise speed measurement accuracy will be affected.
Max Line Speed	Speed at normal equipment operation. This value can be queried on the gun control page. Typically max speed is about 10% above normal operating speed.

Select the appropriate operating mode based on actual conditions:



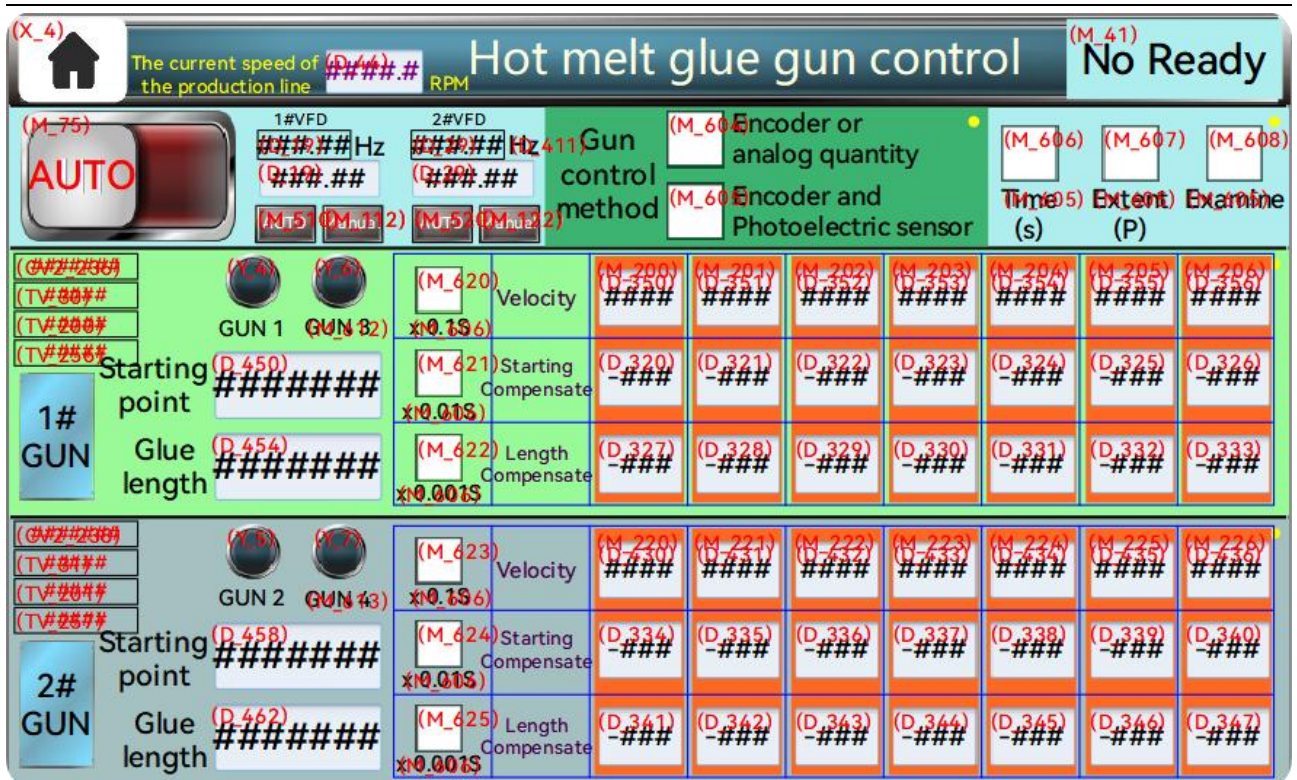
Gun Control Method: Guns have two control modes: continuous spray and beat.

1. When Encoder/Analog is selected, the gun operates in continuous spray mode: the gun port outputs immediately when the system receives an encoder rotation signal or when the analog voltage exceeds the threshold voltage set in Parameter Settings 1.
2. When Encoder + Photoelectric Switch is selected, the gun operates in beat mode, requiring one of three methods: spray time / spray length / photoelectric detection.

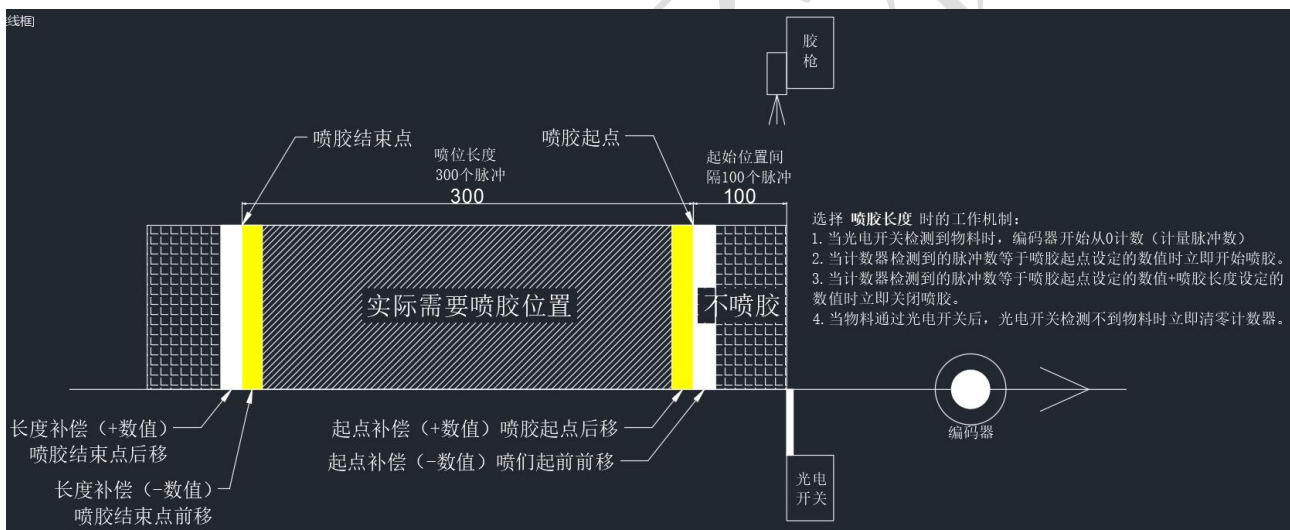
Definitions are shown in the table below:

Spray Time	Uses encoder for speed measurement. When photoelectric switch detects material, timer starts and spraying begins immediately. When set time elapses, gun turns off automatically. Waits for next material detection.
Spray Length	Uses encoder for speed measurement. When photoelectric switch detects material, counter starts (pulse count) and spraying begins immediately. When set pulse count is reached, gun turns off automatically. Waits for next material detection.
Photoelectric Detection	Uses encoder for speed measurement. Spraying starts immediately when photoelectric switch detects material; gun turns off automatically when material is no longer detected.

Due to mechanical inertia, the actual spray position may shift with line speed changes. This system introduces dynamic tracking of gun action. Settings are as follows:



Gun action function is shown in the diagram below:



When Spray Length is selected, the operating sequence is:

1. When the photoelectric switch detects material, the encoder starts counting from 0 (pulse count)
2. When the counter reaches the set spray start value, spraying begins immediately.
3. When the counter reaches the spray start value + spray length value, spraying stops immediately.
4. After material passes the photoelectric switch (no material detected), the counter resets to zero immediately.

When Spray Time is selected, the mechanism is the same except the counter is replaced by a timer. The spray-time function only applies to constant-speed line operation.

6.7.2 Encoder, Photoelectric Switch, and Expansion Board Wiring

For wiring ports, refer to the wiring diagram. Important note: when the encoder and photoelectric signals share power with the touchscreen, wire separately from the switching power supply; do not connect directly to the touchscreen power terminals. Solenoid valve power must also be wired separately and not mixed.

6.7.3 Liquid Level Input

The H9 intelligent hot melt machine control system can use X6 for liquid level input.

6.7.4 External One-touch Standby

The H9 intelligent hot melt machine control system can use X7 as an external one-touch standby button input.

6.7.5 Multi-speed Tracking

The H9 intelligent hot melt machine control system features multi-speed tracking with up to 7 freely configurable tracking curves.

Configure freely on the gun control page according to production needs.

多段速胶量跟踪设置
Multi-segment speed spray glue quantity tracking setting

生产线当前速度 (D.44) #####.# RPM 最高生产速度 (D.408) ##### RPM 最低启动频率 (D.386) ##.## Hz

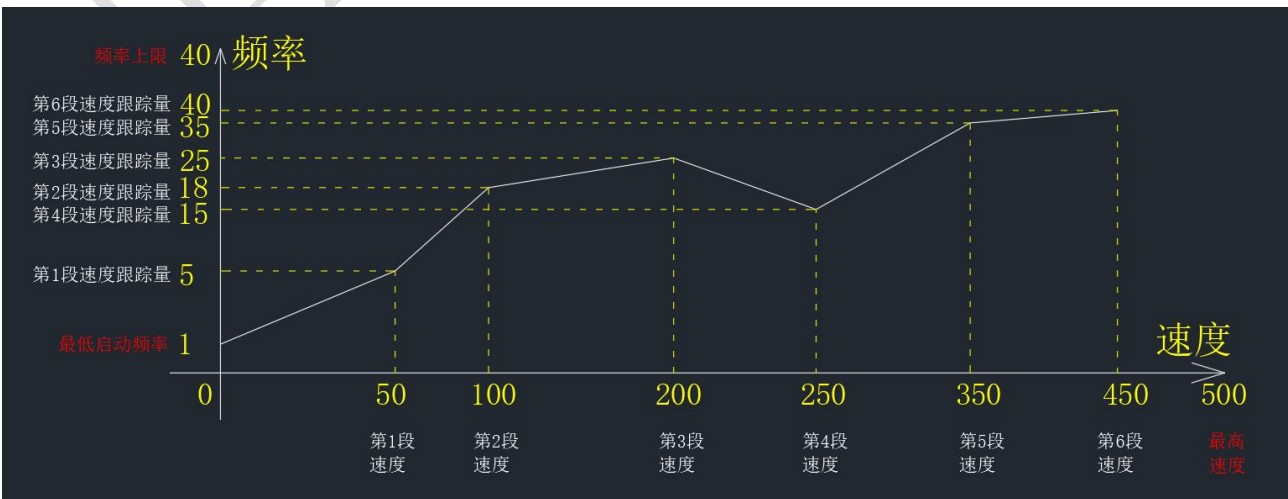
多段速胶量跟踪 当前输入模拟量电压(V) (D.24) ###.##
Multi-segment speed spray glue quantity tracking Current input analog voltage

速度 Velocity	(D.388) #####	(D.387) #####	(D.382) #####	(D.383) #####	(D.386) #####	(D.385) #####	(D.389) #####
频率 Frequency	(D.220) ###.##	(D.224) ###.##	(D.228) ###.##	(D.232) ###.##	(D.236) ###.##	(D.240) ###.##	(D.244) ###.##

Minimum Starting Frequency: The minimum frequency the inverter outputs when start conditions are met.

Multi-speed glue tracking meaning:

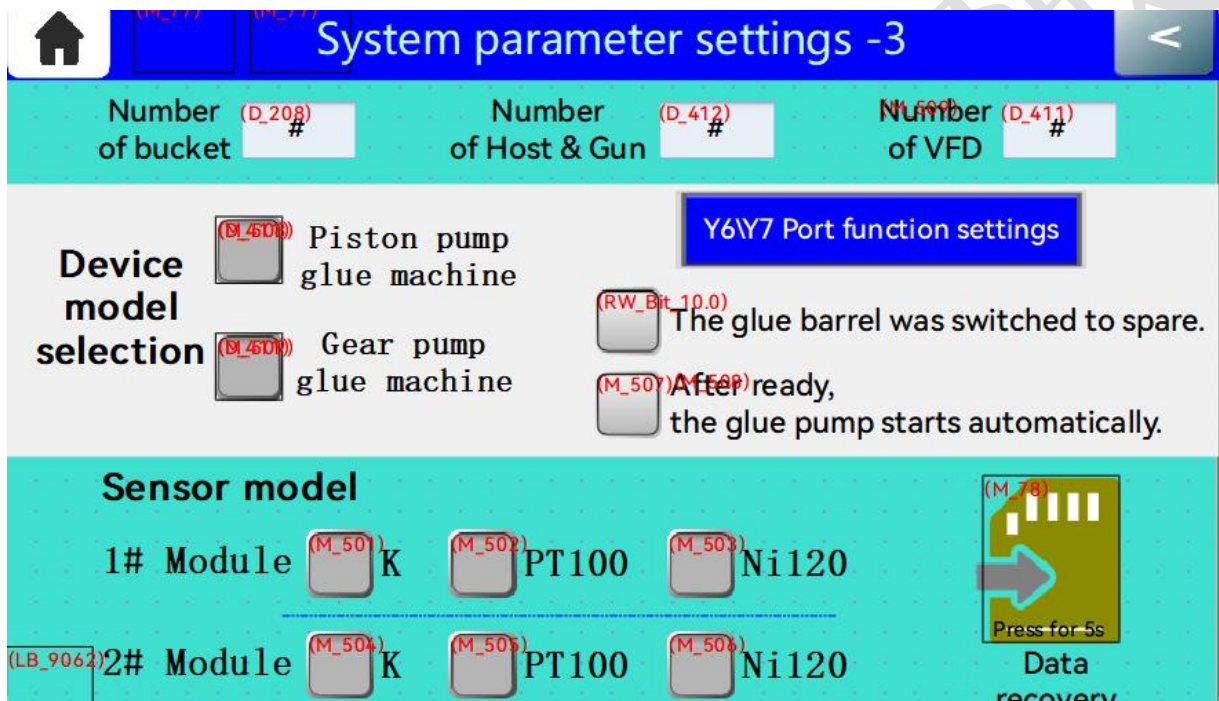
1. If only one linear tracking segment is needed, set only the speed and tracking value for Group 1. Set all other groups to 0 (the speed value must not exceed the maximum line speed; the tracking value is the inverter output frequency at the actual maximum equipment speed).
2. In practice, 2 or more linear tracking segments may be needed. Set Groups 2, 3, etc. as required. The system automatically calculates the inverter output frequency corresponding to real-time speed. Set unused groups to 0.



6.7.6 Output Port Configuration

Due to interlock requirements, this system reserves Y6/Y7 two output ports that users can freely configure.

Enter the Parameter Settings 3 page, as shown below:



Tap the Y6\Y7 Port Function Setting button to configure port functions in the pop-up dialog according to production needs.

As shown below:



6.8 AKS 5L/10L Series Hot Melt Adhesive Machine Installation, Operation, and Storage

6.8.1 Installation and First Use

1) Machine Handling:

The main unit can be moved by one person. Hold the machine steady and push gently. If using ropes or hooks, ensure they are securely fastened. Do not stand on the machine.

2) Machine Securing:

Place the machine on a flat surface. After moving it to position, press the caster lock pedals with your foot to secure the casters. Main power and control communication cables can pass through the bottom.

3) Machine Installation:

After securing the machine, install according to the following steps:

1. Ensure both the supply switch and the machine main power switch are OFF.
2. Open the electrical box cover. Connect the correct power cable to the earth-leakage circuit breaker and connect the ground wire.
3. Connect the hot melt hose to the machine's glue outlet. Connect the hose aviation plug to ports 1-4 on the main unit. The bend radius must be at least 20cm. Do not crush or use metal strapping on hoses. There are 4 glue outlets and aviation connectors; 4 outlets accept 4 hoses and an optional glue pressure gauge. The 4 outlets are arranged side by side for convenient hose installation. Please note the matching order: e.g., Outlet 1 connects to Hose/Gun 1 using Aviation Connector 1, etc.

6.8.2 Adding Hot Melt Adhesive:

Maintain the adhesive level in the tank between 30 and 50mm below the lid. When dispensing heavily, add adhesive frequently.

When the tank runs empty, adding a large quantity of adhesive at once will drop the tank temperature below the ready temperature.

6.8.3 Changing Adhesive:

When switching between different adhesive types or incompatible adhesives, the system must be thoroughly cleaned.

6.8.4 Startup

1. Fill the tank with clean hot melt adhesive and immediately close the lid to prevent contamination.

2. Turn on the main power switch on the control panel. The control screen displays and the machine begins heating.

3. Wait for warm-up (approx. 20–30 minutes) until adhesive is melted and all zone temperatures are stable.

4. After temperature is reached, open the air valve on the side of the machine and press the Start button on the panel. The piston pump starts automatically and runs until glue pressure is maintained.

6.8.5 Shutdown

1. Close the air supply.

2. Turn off the main power switch on the control panel.

3. Clean dust from the machine surface.

6.8.6 Output Glue Pressure Adjustment

The AKS 5L/10L uses an automatic reversing piston pump that outputs high-pressure hot melt adhesive. Output glue pressure is adjusted by input air pressure. Locate the air pressure regulator knob on the panel, pull it outward gently and rotate to adjust input air pressure. Observe the air pressure gauge on top of the machine; typically set to 0.3 MPa. Push the knob inward after adjustment to complete.

6.8.7 Return Valve Adjustment

The AKS 5L/10L has a built-in return valve that ensures stable output glue pressure. The return valve is inside the melting tank; open the tank lid to access it. Use an Allen wrench to turn the adjustment bolt clockwise to increase glue pressure, or counterclockwise to decrease. Factory calibrated to 50 kg pressure; adjust as needed for site conditions.

6.8.8 Temporary Storage

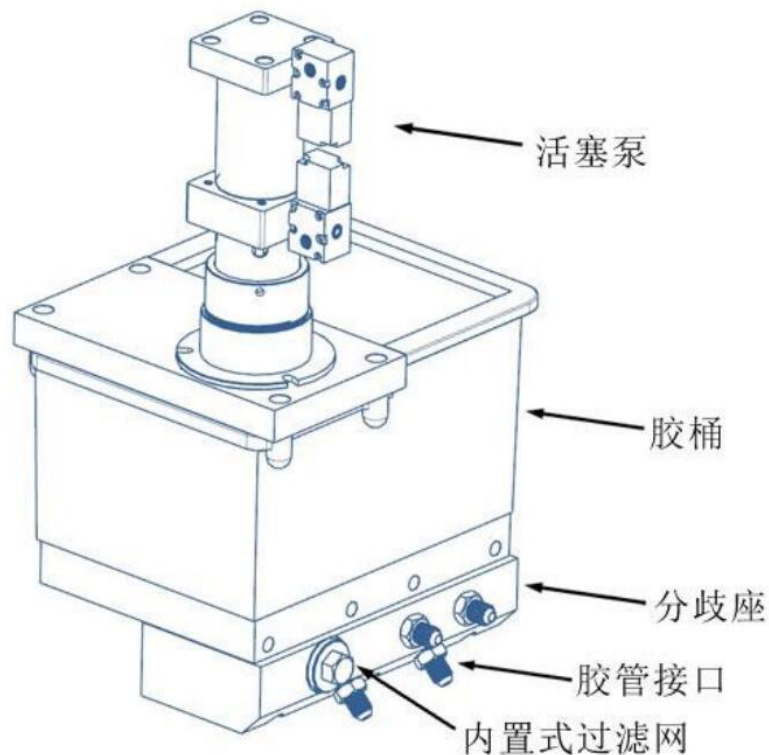
1. Flush the system with cleaning fluid (see Maintenance).
2. Release pressure and turn off all power.
3. Clean or replace filter elements (see Maintenance).
4. Release residual air pressure.
5. Purge residual adhesive and clean components.
6. Disconnect all air and power lines.
7. Package the machine.
8. Store in a safe location.

6.8.9 Equipment Disposal

1. Turn off all air and power supplies.
2. Release remaining glue pressure.

3. Remove all residual adhesive.
4. Remove residual adhesive from hoses and accessories.
5. Dismantle all accessories and sort into mechanical and electronic parts.
6. Arrange all parts for recycling.

6.9 AKS 5L/10L Series Hot Melt Adhesive Machine Tank Structure Diagram



6.10 AKS 5L/10L Series Hot Melt Adhesive Machine Maintenance

6.10.1 General Cleaning

The machine has a high-strength outer coating. Common cleaning methods may be used, but avoid strong corrosive solvents to prevent coating damage. The lid and panel can be wiped with industrial alcohol or dedicated hot melt cleaner.

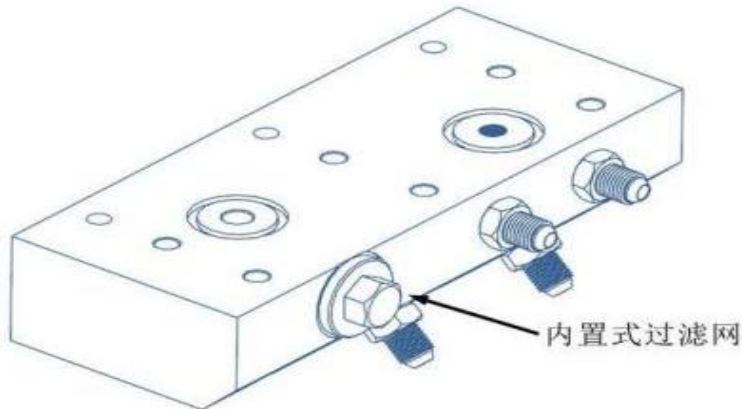
6.10.2 Maintenance

The machine requires minimal maintenance. The built-in primary filter prevents large particles from entering the system.

It generally does not need frequent cleaning. Follow the procedures below for other maintenance items.

6.10.2.1 Output Filter

Replace the output filter monthly during the first few months. After gaining experience, set your own cleaning/replacement schedule. The output filter is in the manifold (connected to hoses); see figure.



Follow these steps to replace the output filter screen:

1. Bring the system up to operating temperature;
2. Release glue pressure in the manifold;
3. Unscrew the filter cover;
4. Use a hook-shaped tool to pull the filter screen out of the manifold;
5. Inspect the screen for carbonized residue and debris; replace if necessary;
6. When replacing the screen, also replace the O-ring and apply silicone grease to it;
7. Apply silicone grease to the filter cover threads, reinstall the manifold, and tighten.

6.10.2.2 Hot Melt Hose Fittings: All fittings must be checked for tightness every three months.

6.10.2.3 Primary Filter Cleaning

1. Pump out adhesive from the tank;
2. Lower the tank temperature to the adhesive softening point;
3. Remove the machine side cover, but do not disconnect the ground wire;
4. Wear protective gloves, unscrew the filter mounting bolts, and remove the primary filter;
5. Soak the filter in cleaning fluid for a period, then remove and clean debris using a hot air gun and cloth;
6. Apply silicone grease to the filter threads and reinstall;
7. When installing the filter, ensure the opening faces the pump;
8. Reinstall the side cover;

6.10.3 General Repair Rules

6.10.3.1 Monthly Maintenance

1. Check the output filter screen; replace if necessary;
2. Check for glue leaks on the base; replace seals if damaged.

6.10.3.2 Quarterly Maintenance

1. Check that hose connectors are tight;
2. Check that bolts are tight;
3. Check the primary filter screen; clean or replace.

6.10.4 Releasing Glue Pressure

For safety, always release glue pressure before replacing filters or disconnecting hoses/guns. Follow these steps: bring the machine to operating temperature, pump stopped, air supply off.

1. Locate the pressure relief valve
2. Slowly loosen the relief valve with a tool (do not fully unscrew) until adhesive drains. Adhesive flows from the outlet into a pre-placed container.
3. After releasing pressure, retighten the relief valve.

6.10.5 System Flushing

Flush the machine if debris has contaminated the adhesive or when changing adhesive brands. Use at least 6 liters of cleaning fluid.

1. Pump out as much adhesive as possible;
2. Reduce glue pressure to zero;
3. Disconnect the hose-gun glue line connection and place the hose end into a container;
4. Pour cleaning fluid into the tank and hold at temperature for 15 minutes; thoroughly mix the cleaning fluid with remaining adhesive;
5. Slowly start the pump to flush half the cleaning fluid through the hose;
6. Reduce glue pressure to zero;
7. Replace filter screen and seals;
8. Add new adhesive and heat to operating temperature;
9. Reconnect hoses and guns and flush out remaining cleaning fluid (wait until new adhesive stabilizes before flushing);
10. Fill the tank with new adhesive; system is ready.

6.10.6 Installation Requirements:

1. Before installing hoses, ensure the machine power is OFF.
2. Hoses connect to the main unit via an 8-pin electrical connector; hoses connect to guns via a 4-pin connector.

6.10.7 Removal Requirements:

Note: Before disconnecting hoses, ensure glue pressure has been released. First stop the piston pump, then open the gun to release system pressure.

6.10.8 Sensor Inspection:

If sensor resistance changes, calibrate according to the resistance chart. PT100 RTD is the default.

6.11 AKS 5L/10L Series Hot Melt Adhesive Machine Troubleshooting

6.11.1 Precautions

Use instruments and tools such as multimeters, temperature meters, and soldering irons; maintenance personnel should be proficient in their use. Hose and gun electrical faults can be checked by simply unplugging the aviation connector and inspecting wiring and internal resistance.

6.11.1.1 Preparation Before Detailed Inspection

- A. Is the hot melt machine in a started state?
- B. Is the main power cable loose or is there power?
- C. Is compressed air supplied to the machine?
- D. Are air and electrical components properly connected?
- E. Is there adhesive in the tank?

6.11.1.2 Quick Diagnosis of Hose or Gun Failure

Hose/gun failures typically involve poor electrical contact. Operators can first self-test: turn off machine power,
unplug the problem hose/gun aviation connector and plug it into a known-good port;
observe normal operation. If normal, the hose/gun circuit is fine; otherwise the hose/gun is defective and requires repair.

6.11.1.3 Motor Speed Control Reset

6.11.1.4 Over-temperature Protection Settings (see 6.6.6 Over-temperature Protection)

6.11.1.5 Pump Start Protection Setting

The pump protection switch opens at low temperature to prevent rotating the gear pump before adhesive melts. This protection circuit is mounted on the gear pump; factory set to 130C. [Pump start protection is set on Parameter Settings Page A]

6.11.1.6 Electrical Component Removal and Replacement

A. The control system and electrical components are sensitive to static. Turn off main power before servicing.

B. When approaching or touching these components, follow strict procedures to prevent electrostatic discharge from damaging electronic components.

C. When removing internal circuit boards, wear an anti-static wrist strap. If unavailable, frequently touch exposed metal

parts of the machine.

6.11.2 Troubleshooting Table

6.11.2.1 Common Hot Melt Machine Faults and Remedies

Fault	Cause	Inspection & Remedy
Machine will not power on	1. External power not connected / Internal ELC tripped or damaged / Main power button damaged / Main contactor damaged 2. 3. 4.	1. Check external power supply / Open the side cover and check the ELC. If tripped, press the blue reset button on the ELC and try closing again. If it trips again, unplug all aviation connectors and power on to determine whether the leak is in the machine or hoses/guns. Do not power on again until the leak is located, to prevent electric shock. / Check if the power button indicator is lit; if not, replace the button. / Measure voltage across contactor coil; should be 220VAC. If normal, replace the contactor. 2. 3. 4.

6.11.2.2 Common Melting Tank Faults and Remedies

Fault	Cause	Inspection & Remedy
Main tank over-temperature	1. High/low temp alarm range too narrow / Temperature sensor damaged / SSR damaged /	1. Reset high/low alarm range; recommend +/-10C / Measure sensor resistance (see P51 resistance chart); replace sensor if incorrect /

	Temperature control module damaged 2. 3. 4.	With SSR indicator OFF, measure voltage between SSR output L1 and T1; if no 220V, replace SSR / Use temperature gun to measure actual tank temp; if exceeds setpoint, replace temperature module 2. 3. 4.
Main tank not heating	1. Heating fuse blown / SSR damaged / Over-temp thermostat tripped / Heating contactor damaged / Temperature module damaged / Heating element burned out 2. 3. 4. 5. 6.	1. If fuse holder indicator is lit, replace fuse; measure fuse resistance (should not be open circuit) / With SSR indicator ON, measure voltage between L1 and T1; if 220V present, SSR is faulty - replace / Measure tank over-temp thermostat resistance; if open circuit, replace / Check if tank contactor pulls in; if not, replace contactor / Measure module output 12-24VDC; if absent, replace module / Measure tank heater resistance (approx. 15 ohm); if open circuit, all elements are burned out and must be replaced entirely (if significantly above 15 ohm, some are damaged) 2. 3. 4. 5. 6.
Main tank temperature display abnormal or flickering	1. Sensor damaged or open / Temperature module damaged 2.	1. Check sensor resistance; replace sensor or repair broken wiring / Replace temperature module 2.
Main tank glue leak	1. Pump seal aging, shaft seal worn	1. Replace pump seals or replace pump

6.11.2.3 Common Hose and Gun Faults and Remedies

Fault	Cause	Inspection & Remedy
Hose not heating	1. Heating fuse blown / SSR damaged / Temperature module damaged / Aviation plug damaged / Hose heating element damaged 2. 3. 4.	1. If fuse holder indicator is lit, replace fuse; measure fuse resistance / With SSR indicator ON, measure voltage between L1 and T1; if 220V present, replace SSR / Measure module output 12-24VDC; if absent, replace module / Inspect aviation plug for burn marks or discoloration; replace if damaged /

	5.	Plug the hose into another numbered port to test. If still not heating, replace the hose. 2. 3. 4. 5.
Hose over-temperature	1. High/low temp alarm range too narrow / Sensor damaged / SSR damaged / Temperature module damaged 2. 3. 4.	1. Reset high/low alarm range; recommend +/-10C / 2. Measure sensor resistance (see P51 chart); replace if incorrect / 3. With SSR indicator OFF, measure L1-T1 voltage; if no 220V, replace SSR / 4. Plug into another port to test temperature control. If controlled normally, replace the temperature module.
Gun not heating	1. Heating fuse blown / 2. SSR damaged / 3. Temperature module damaged / 4. Aviation plug damaged / 5. Gun heating element damaged	1. If fuse indicator is lit, replace fuse; measure fuse resistance / 2. With SSR indicator ON, measure L1-T1 voltage; if 220V present, replace SSR / 3. Measure module output 12-24VDC; if absent, replace module / 4. Inspect aviation plug for burns or discoloration; replace if damaged / 5. Plug gun into another port to test. If still not heating, replace gun heating element.
Gun over-temperature	1. High/low temp alarm range too narrow / 2. Sensor damaged / 3. SSR damaged / 4. Temperature module damaged	1. Reset high/low alarm range; recommend +/-10C / 2. Measure sensor resistance (see P51 chart); replace if incorrect / 3. With SSR indicator OFF, measure L1-T1 voltage; if no 220V, replace SSR / 4. Plug into another port to test temperature control. If controlled normally, replace the temperature module.

6.11.2.4 Common Gun Abnormal Spray Faults and Remedies

Gun dispenses no adhesive	1. Tank adhesive depleted / Pump not started / Gun solenoid not energized / Gun needle valve not open / Pump upper/lower limit switch detached or damaged / Pump damaged 2. 3. 4. 5. 6.	1. Check tank adhesive level; add adhesive to at least cover the tank base / Check machine air supply switch and pump control switch / Check gun solenoid wiring, switches, and coil / Check compressed air pressure is >0.6MPa; check needle valve for debris or rust; clean if needed / Check upper/lower limit switch position; replace if loose or damaged / Check pump for damage or seizure; repair or replace 2. 3. 4. 5. 6.
Gun nozzle dripping	1. Atomizing solenoid not open / Atomizing air flow too low / Excess moisture in compressed air / Gun temperature too low / Nozzle clogged / Seal ring aging 2. 3. 4. 5. 6.	1. Check atomizing solenoid wiring, switches, and coil / Adjust throttling valve on atomizing air line to increase flow / Drain water from air reservoir; disconnect gun air line to purge moisture / Raise gun temperature / Remove nozzle and clean debris / Check seal rings; replace aged ones 2. 3. 4. 5. 6.
Insufficient spray volume	1. Tank adhesive depleted / Pump output too low / Needle valve gap set too small / Filter screen clogged / Return valve pressure too low 2. 3. 4. 5.	1. Check tank adhesive level; add adhesive to cover tank base / Increase pump input air pressure / Turn needle valve adjustment bolt counterclockwise slightly (only for individual nozzle groups with low output) / Clean gun filter screen / Adjust return valve clockwise to increase output pressure 2. 3. 4. 5.

Excessive spray volume	1. Pump output too high / Needle valve gap set too large 2.	1. Decrease pump input air pressure / Turn needle valve adjustment bolt clockwise slightly (only for individual nozzle groups with high output) 2.
------------------------	--	---

6.12 Equipment Disassembly Steps

6.12.1 Removing Motor/Electrical Box

1. Loosen the four fixing screws (bottom edge of motor/electrical box, one on each side)
2. Open the box cover; note: disconnect the ground wire

6.12.2 Removing Melting Tank Cover

1. Loosen the four fixing screws (two on the side cover and two on the tank cover bottom)
2. Lift the tank cover upward

6.12.3 Removing Melting Tank Lid

Remove the four flat-head screws and take off the tank lid. See figure for O-ring location.

6.12.4 Removing Over-temperature Switch and Motor Protection Switch

1. Loosen the two screws at the bottom of the side cover (note: disconnect ground wire).
 - a. Over-temperature switch replacement: Remove the two screws securing the switch to the tank, disconnect the two wires from the switch, and replace the switch.
 - b. Motor protection switch replacement: Disconnect the two wires from the protection switch and replace it.

6.12.5 Sensor Inspection

1. Remove the motor/electrical box cover.
 - a. Tank sensor: Located between the heater terminals, secured with bolts and quick-connect wiring.
 - b. Heating nozzle sensor: If heating nozzles are installed, a second sensor is mounted on the nozzle, similarly secured with bolts and quick-connect wiring.

6.12.6 Electrical Component Inspection

1. First confirm main power is OFF.
2. Open the motor/electrical box cover, loosen the display panel fixing screws, and slide the panel forward to its maximum position.
 - a. Main power switch replacement: The main switch is on the display panel and can be removed from the back.
 - b. Fuse replacement: The circuit board fuse holder has an indicator light. If the fuse blows, the light turns on; replace the fuse.
 - c. Contactor replacement: There is only one contactor in the system, mounted on the terminal block.
 - d. Circuit board replacement: Remove the main electrical box cover to access boards including CPU board, control computer board, power control board, auxiliary control board, signal control board, and motor speed control board.

6.12.7 Pump or Motor Removal.

Remove the motor/electrical box cover and open the side and front panels.

- a. Piston pump removal: Disconnect the air lines and electrical wiring of the solenoid valve on the four-way valve. Remove the four bolts securing the pump to the manifold and take out the pump and four-way valve. Installation: reinstall the piston pump; bolt torque is 21Nm at room temperature. Maximum tightening torque is 49Nm at a tank temperature of 177C.

- b. Gear pump and motor removal: Disconnect the motor electrical connections, loosen the set screw on the fixing pin, and remove the shaft pin.
- c. Gear pump motor brush replacement: The motor brushes are on the panel side; remove the brush cap to replace.
- d. Pump seal replacement: Remove the pump from the machine, take out the seal ring, and install a new one.

恒海精密机械