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Chapter 4 AKS35L Series Hot Melt Adhesive Machine

4.1 Introduction to AKS35L-B Touch-Screen Hot Melt Adhesive Machine System

The AKS35L-B touch-screen hot melt adhesive machine adopts a human-machine dialogue interface, making the control system simpler and more intuitive. The whole machine uses a 7-inch touch screen together with an independent temperature control module to control the temperature of each zone, achieving more precise temperature control.



Main technical parameters of the AKS35L-B touch-screen hot melt adhesive machine:

Temperature control range: 0-200℃ Working temperature: 165℃ Rated power: 3500W+1200W

Max. power at full load: 17000W (with four sets of 400MM guns connected) Rated voltage: 380VAC Rated current: 15.9A+5.5A Net weight: 75.8kg Overall dimensions: 950x510x1150 (L x W x H)

4.2 Technical Parameters of AKS35L-B Touch-Screen Hot Melt Adhesive Machine

Working Environment

Storage/transport temperature: -30℃ to 50℃

Ambient working temperature: -15℃ to 50℃

Ambient noise: <30 dB (at 1 m, excluding solenoid valve noise)

Performance Parameters

Dimensions: 950x510x1150 (L x W x H)

Available outputs: 1-4 guns / hot melt hoses

Tank heating zones: 2 (additional heating fins optional)

Pump quantity: 1-2 (single/double layer optional)

Gear pump ratio: 1.5cc/rev, 3.2cc/rev or 4.5cc/rev

External protection: waterproof, dustproof, high-temperature-resistant composite material

Electrical connection: standard military aviation connectors

Tank capacity: AKS35L = 32L (effective capacity)

Tank type: built-in heater, infiltrated Teflon coating

Filter type: bottom primary filter, output filter

Weight (empty): AKS35L = 76kg

Adhesive shape: any shape accepted

Power Supply Requirements

Supply voltage: 220/380VAC, determined by the system

Total system power: AKS35L = 5700W

Tank power: AKS35L = 4700W

Tank heating type: tubular built-in heater (main tank)

External heating with attached heating plate (equipped on AKS35 series and above)

Temperature control mode: PID control

Sensor: K / PT100 thermocouple

Electrical connection: aviation locking connector

Drive motor: 200W three-phase AC gear motor

Motor control mode: variable frequency control

Fuse current for hoses and guns: tank 25A; hose 15A; gun 25A

Max. load per hose and gun: 4000W

Air Supply:

Air pressure: >=0.7MPa dry compressed air

Max. pump speed: 96 rpm (gear pump)

Max. air consumption: 90 L/min

Equipment Parameters:

Temperature control range, standard mode: 10℃~220℃

Temperature control accuracy: ±0.5℃

Standby cooling temperature (optional): default 80℃ (adjustable)

Backup temperature control system range: 10℃~220℃ (optional)

Tank over-temperature cutoff: 218℃ (self-recovering thermostat)

Gun over-temperature cutoff: micro contactor; main power cuts off automatically at 15 ℃ over-temperature (adjustable)

Hose over-temperature: audible and visual alarm (over-temperature range adjustable)

Low-temperature pump protection: 140℃ (preset, adjustable)

Applicable adhesive viscosity: 500 to 5000 cP

Max. viscosity for dispensing: 3000 cP

Preheat time, tank full of adhesive: approx. 0.5 h

Max. open-circuit adhesive output: 0.91 kg/min (single 4.5cc gear pump)

Melting rate (depending on adhesive type): 10.5-32 kg/h

System adhesive pressure: max. 100MPa (closed circuit)

Control Mode

Temperature control system: 10 independent temperature control channels

Backup temperature control points: 1 channel (standard on touch-screen version)

Control system: external fully automatic high-speed compensation system or other external analog output

Display type: LCD touch screen / digital panel

Solid-state board: 10-channel solid-state relay output

Output power: tank: 4000W (max.)

Per hose/gun: 700~4000W

Max. output for four hoses/guns: 20000W

Machine inverter control signal: 0-10VDC linear analog

Gun solenoid valve control signal: 24VDC/220VAC

Fuse specification: tank 10×38mm AC500V 25A

Gun 10×38mm AC500V 25A

Hose 10×38mm AC500V 15A

Others

Operation panel: simplified icons and numeric keys / temperature controller

Over-temperature response: cut off power to that zone automatically / audible and visual alarm

Sequential heating protection: yes

Program start function: yes (optional)

Sensor open-circuit alarm: built into the system

4.3 Introduction to AKS35L-B Touch-Screen Hot Melt Adhesive Machine System

The H9 intelligent adhesive machine control system is an intelligent controller developed by our company on the basis of years of experience in designing and manufacturing "intelligent" hot melt adhesive machine control systems. Paired with an intelligent temperature control module, this integrated unit integrates various circuits on a proven and stable circuit scheme, offering intelligence, stability and high cost-performance.

The H9 integrated unit is equipped with a 7-inch screen and supports three sensor types: K, PT100 and Ni120, switchable as needed. Built-in control programs for conventional gear-pump and air-pump models can be switched online through soft parameters; encoder tracking and gun control programs are also built in, enabling the machine to adapt to different working conditions.

Main Technical Parameters of H9 Intelligent Adhesive Machine Control System

Model	H9-AKS
Screen size	7-inch
Temperature signal type	K, Pt100, Ni120
Number of temperature signal channels	6/8/12
Temperature input range	K:-100.0 ~ 1300.0℃ Pt100:-200.0 ~ 850.0℃ Ni120:-70.0 ~ 300.0℃
Temperature measurement accuracy	Class 0.3
Temperature control output	NPN (withstand 30VDC), PID control
Logic control output	3~4 channels, NPN type
Encoder / photoelectric input	Supports 2 encoders + 2 photoelectric inputs
Dispensing control function	4-point dispensing output
Liquid level detection	Supported
Communication interface	1 independent RS485 channel

4.3.1 Wiring Rules for Temperature Section

Wiring order of 1# temperature control module (6-channel controller):

Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6
Upper tank (standby)	Lower tank	Hose 1	Gun 1	Hose 2	Gun 2

Note: For double-layer tanks, channel 1 is used for the upper tank layer.

Wiring order of 2# temperature control module (6-channel controller):

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

Wiring order of temperature control module (8-channel controller):

Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7	Channel 8
Upper tank (standby)	Lower tank	Hose 1	Gun 1	Hose 2	Gun 2	Hose 3	Gun 3

4.3.2 Communication Parameters to Set Before Using the Inverter

- Inverter parameters must be set in advance before connecting to the touch screen;
- Communication control of up to 2 inverters is supported by default;
- These parameters are required for communication control; set other inverter parameters according to system requirements;
- The inverter must be restarted after parameters are set before they take effect;
- The table below only gives the S310 setting example; for other inverters, please consult our technical department.

TECO S310 Inverter Parameter Setting Table

Function Code	Function Description	Setting Value	Remarks
08-00	Inverter station number	3~4	Set to 3 for one inverter; Set to 3 and 4 respectively for two inverters;
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	Communication fault detection time (S)	5.0	
08-07	Communication fault handling	2	Continue running after communication interruption and prompt COT
08-08	Err6 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	Depending on the system; the smaller the better;
00-10	Deceleration time (S)	1.0	
04-09	Direct start on power-on	0	Start directly after valid external command power-on;

Yudian 6-Channel Temperature Control Module Parameter Setting Table

Function	Function Description	Setting	Remarks

Code		Value	
Addr	Module station number	1~2	Set to 1 for one module; Set to 1 and 2 respectively for two modules;
bAud	Baud rate	19.20	19200
AFC	Communication protocol	0	Standard Modbus protocol

Yudian 8-Channel Temperature Control Module Parameter Setting Table

Function Code	Function Description	Setting Value	Remarks
Addr	Module station number	1	Set to 1 for one module;
bAud	Baud rate	19.20	19200
AFC	Communication protocol	0	Standard Modbus protocol

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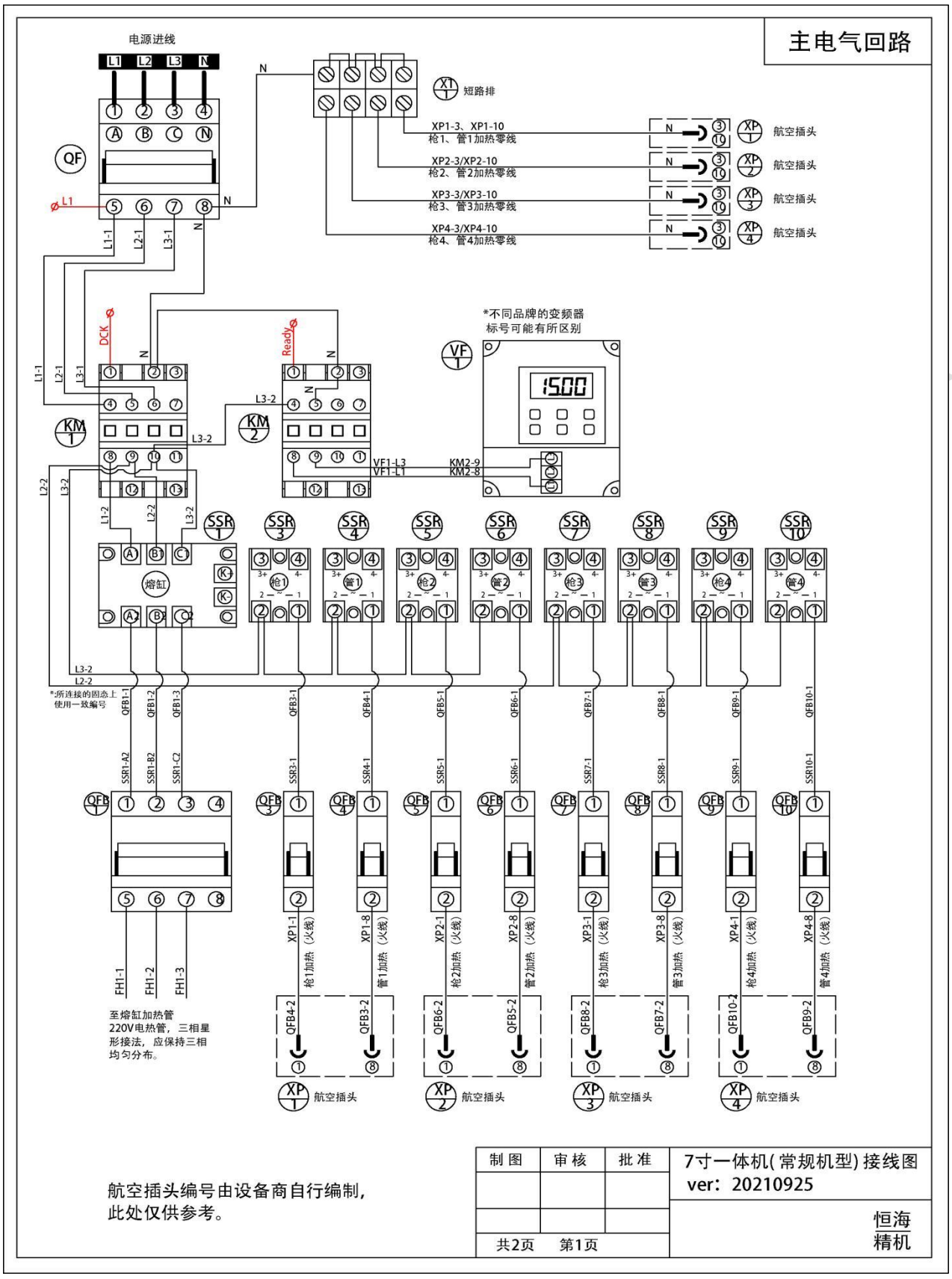
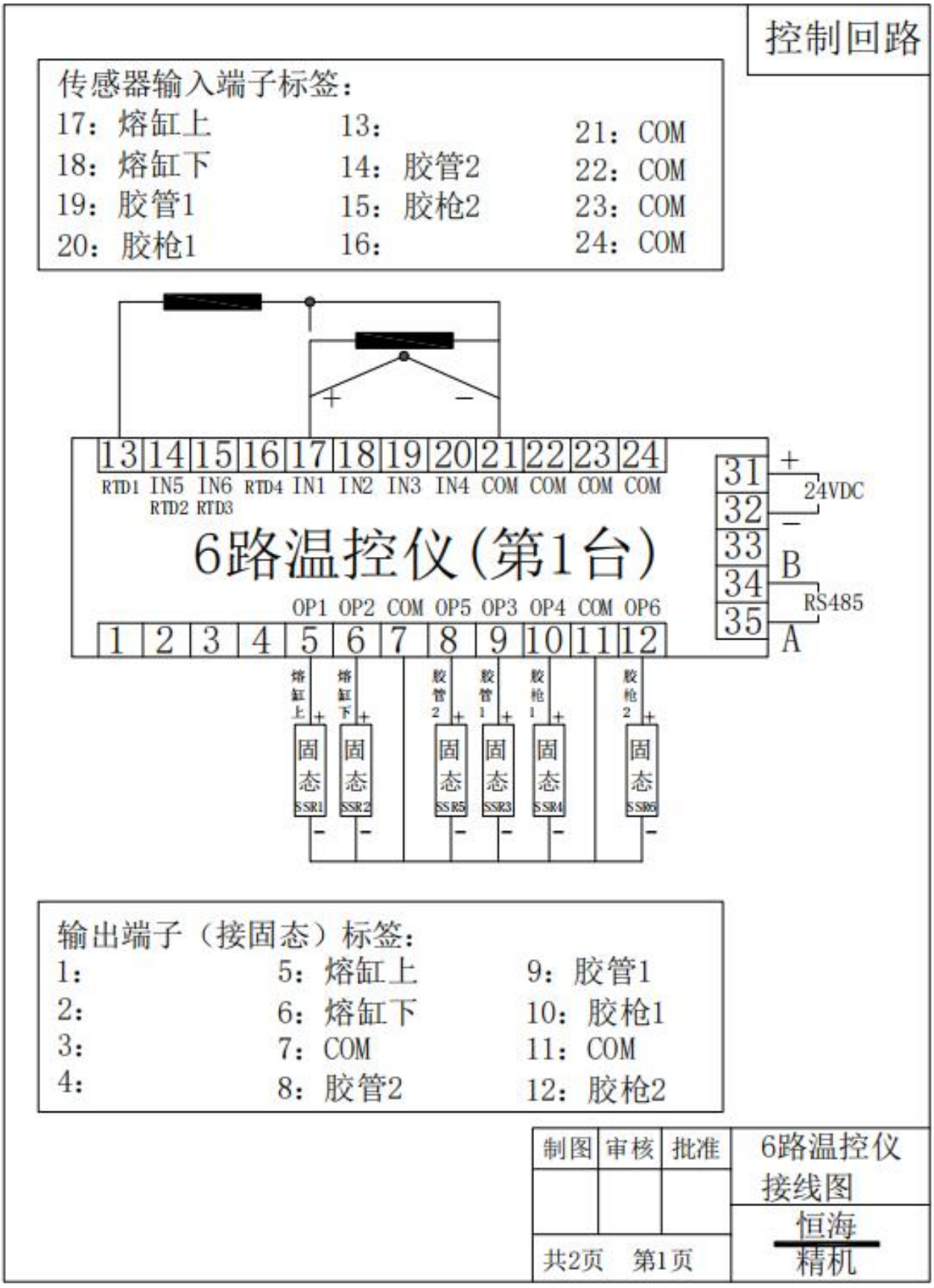
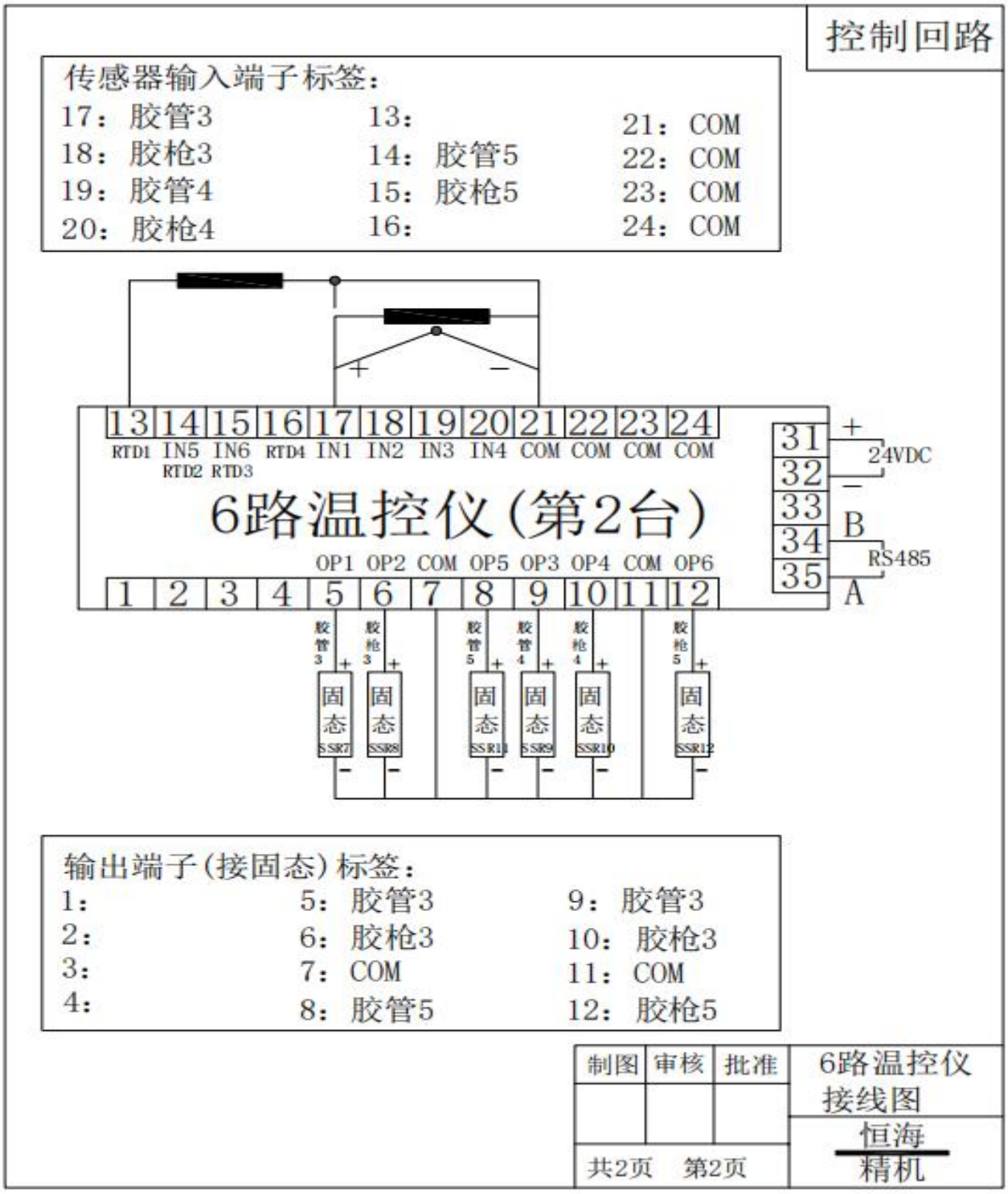
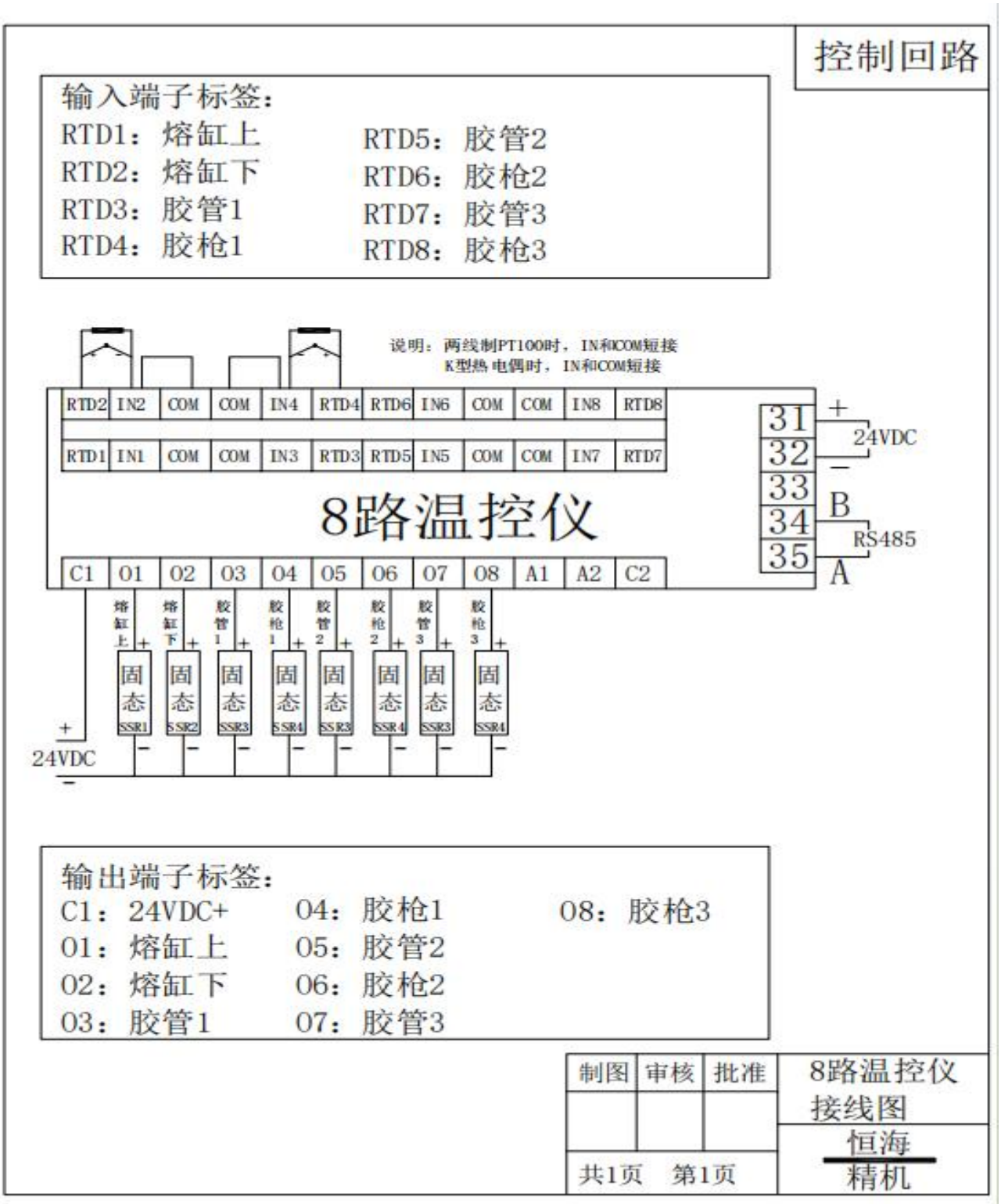
4.3.3 Wiring Diagram of H9 Intelligent Adhesive Machine Control System




控制回路
传感器输入端子标签：
17：熔缸上
18：熔缸下
19：胶管1
20：胶枪1
13：
14：胶管2
15：胶枪2
16：
21：COM
22：COM
23：COM
24：COM
13 14 15 16 17 18 19 20 21 22 23 24
RTD1 IN5 IN6 RTD4 IN1 IN2 IN3 IN4 COM COM COM COM
RTD2 RTD3
6路温控仪(第1台)
OP1 OP2 COM OP5 OP3 OP4 COM OP6
1 2 3 4 5 6 7 8 9 10 11 12
31 32 33 34 35
+
24VDC
−
B
RS485
A
熔缸上
熔缸下
胶管2
胶管1
胶枪1
胶枪2
固态 SSR1
固态 SSR2
固态 SSR5
固态 SSR3
固态 SSR4
固态 SSR6
输出端子（接固态）标签：
1：
2：
3：
4：
5：熔缸上
6：熔缸下
7：COM
8：胶管2
9：胶管1
10：胶枪1
11：COM
12：胶枪2
制图
审核
批准
6路温控仪接线图
共2页 第1页
恒海精机


控制回路
传感器输入端子标签：
17：胶管3
18：胶枪3
19：胶管4
20：胶枪4
13：
14：胶管5
15：胶枪5
16：
21：COM
22：COM
23：COM
24：COM
13 14 15 16 17 18 19 20 21 22 23 24
RTD1 IN5 IN6 RTD4 IN1 IN2 IN3 IN4 COM COM COM COM
RTD2 RTD3
6路温控仪(第2台)
OP1 OP2 COM OP5 OP3 OP4 COM OP6
1 2 3 4 5 6 7 8 9 10 11 12
31 +
32 24VDC
33 −
34 B
35 RS485
A
胶管3 胶枪3 胶管5 胶管4 胶枪4 胶枪5
固态 SSR7
固态 SSR8
固态 SSR11
固态 SSR9
固态 SSR10
固态 SSR12
输出端子(接固态)标签：
1：
2：
3：
4：
5：胶管3
6：胶枪3
7：COM
8：胶管5
9：胶管3
10：胶枪3
11：COM
12：胶枪5
制图
审核
批准
6路温控仪接线图
共2页 第2页
恒海精机


控制回路
输入端子标签：
RTD1：熔缸上
RTD2：熔缸下
RTD3：胶管1
RTD4：胶枪1
RTD5：胶管2
RTD6：胶枪2
RTD7：胶管3
RTD8：胶枪3
说明：两线制PT100时，IN和COM短接
K型热电偶时，IN和COM短接
RTD2 IN2 COM COM IN4 RTD4 RTD6 IN6 COM COM IN8 RTD8
RTD1 IN1 COM COM IN3 RTD3 RTD5 IN5 COM COM IN7 RTD7
8路温控仪
C1 O1 O2 O3 O4 O5 O6 O7 O8 A1 A2 C2
31 +
32 −
24VDC
33
34 B
35 A
RS485
熔缸上
熔缸下
胶管1
胶枪1
胶管2
胶枪2
胶管3
胶枪3
固态 SSR1
固态 SSR2
固态 SSR3
固态 SSR4
固态 SSR3
固态 SSR4
固态 SSR3
固态 SSR4
+
24VDC
−
输出端子标签：
C1：24VDC+
O1：熔缸上
O2：熔缸下
O3：胶管1
O4：胶枪1
O5：胶管2
O6：胶枪2
O7：胶管3
O8：胶枪3
制图
审核
批准
8路温控仪
接线图
共1页 第1页
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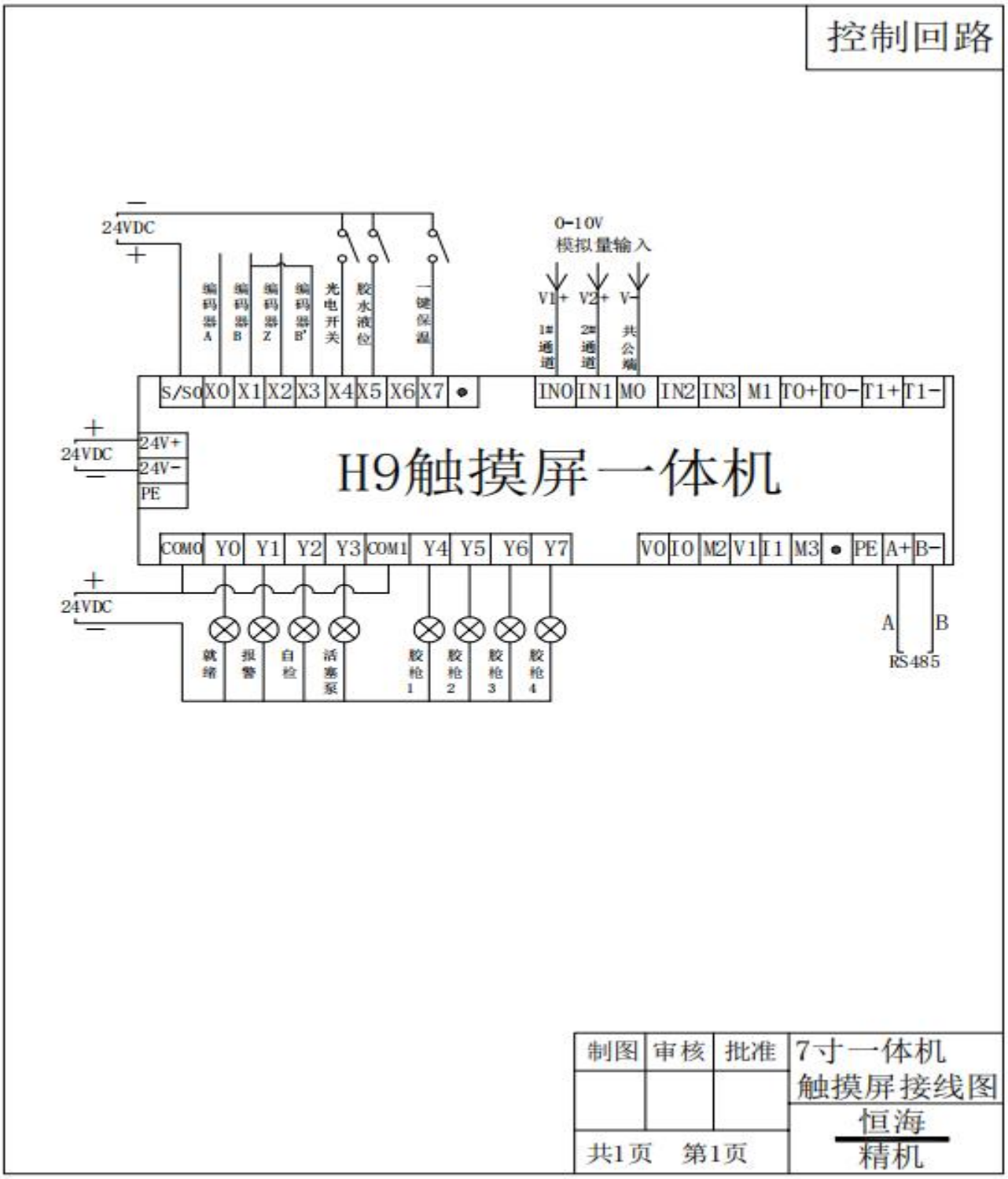
精机


控制回路
24VDC
编码器A
编码器B
编码器Z
编码器B'
光电开关
胶水液位
一键保温
0-10V
模拟量输入
V1+
1#通道
V2+
2#通道
V-
共公端
S/S0 X0 X1 X2 X3 X4 X5 X6 X7
IN0 IN1 M0 IN2 IN3 M1 T0+ T0- T1+ T1-
24VDC
24V+
24V-
PE
H9触摸屏一体机
COM0 Y0 Y1 Y2 Y3 COM1 Y4 Y5 Y6 Y7
V0 I0 M2 V1 I1 M3 PE A+ B-
24VDC
就绪
报警
自检
活塞泵
胶枪1
胶枪2
胶枪3
胶枪4
A
B
RS485
制图
审核
批准
7寸一体机
触摸屏接线图
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4.4 System Configuration

4.4.1 Model Selection

The H9 integrated hot melt adhesive machine unit supports online switching between gear-pump and air-pump models; the model must be confirmed before use.

Operation steps:

Home → Parameter Settings → enter password 9870 → Parameter Settings 1 → Parameter Settings 2 → press and hold the next-page button ">" for 5 seconds → Parameter Settings 3

On the Parameter Settings 3 screen, tap to enter system configuration, select the corresponding model on the configuration page, and restart.



4.4.2 Home Logo Switching

On the home page, tap the lower-left area of the screen and enter the highest-level password (obtained from the manufacturer) to switch between the factory-customized logo and the standard logo.



4.4.3 Sampling Filter Coefficient

To filter out interference, a sampling filter coefficient is provided on the configuration page; the default value is 0. Do not modify it unless necessary.

4.4.4 Selecting the Sensor Type

Selecting the correct sensor type is a prerequisite for normal controller operation; confirm it before use.

Enter the Parameter Settings 3 screen and select according to actual conditions;

The input sensor of the 6-channel module can be switched among Pt100/Ni120/K; the whole machine must use the same sensor type.

The setting method for the 6-channel module input sensor is shown below:

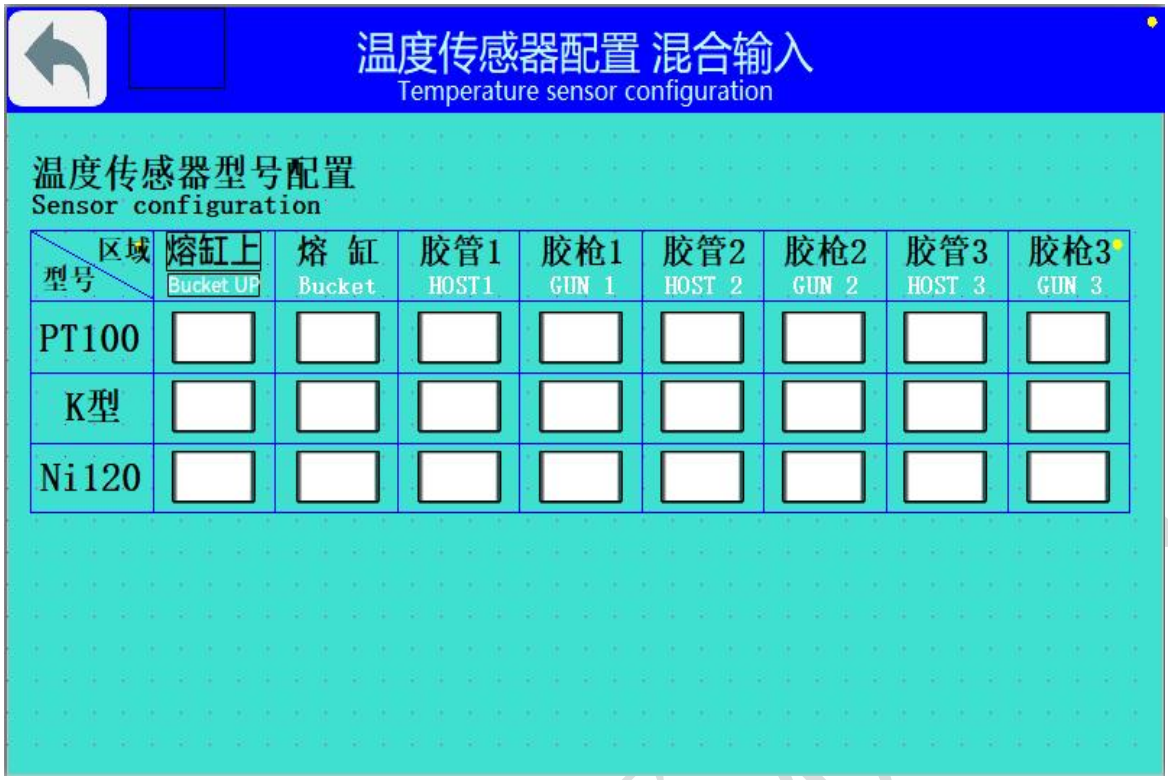


The input sensor of the 8-channel module can be switched among Pt100/Ni120/K; the whole machine may use the same sensor type, or different sensor types for different zones.

The setting method for the 8-channel module input sensor is shown below:



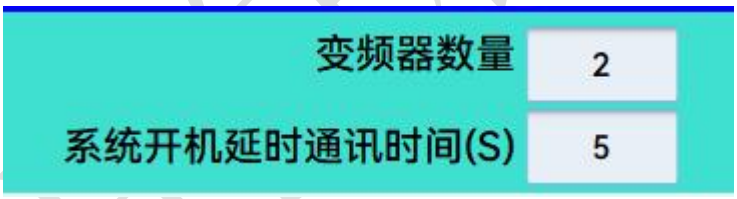
Tap the Temperature Sensor Configuration button to set the sensor type for each zone independently on the new page, as shown below:



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

This controller supports linkage with multiple inverter models; up to 2 inverters can be connected at present.

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



Select the corresponding inverter model and quantity according to actual conditions.

4.4.6 System Data Recovery

If the user operates by mistake or sets inappropriate parameters, the factory parameters can be restored with the data recovery button.

On the Parameter Settings 3 screen, press and hold the button for more than the specified seconds; when the system beeps, all data will be restored to factory

values. Then modify the relevant parameters as needed.



4.5 Basic System Functions

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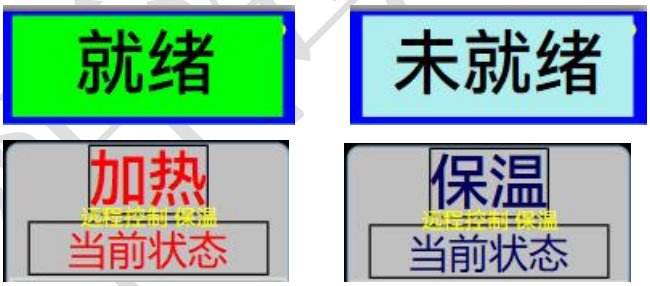
4.5.1 Main Screen Overview



4.5.2 Machine Status Display

The machine has four working statuses: "Not Ready", "Ready", "Standby" and "Heating", shown at the upper-left/upper-right corner of the temperature screen and other screens.



4.5.3 Temperature Setting and Heating Enable

Tap the set temperature to enter the temperature setting page of the corresponding channel, and set the temperature and heating enable as needed.



4.5.4 Standby Function

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



Switch between standby and heating with the one-key standby button;

In standby, each channel heats and controls according to the standby temperature.

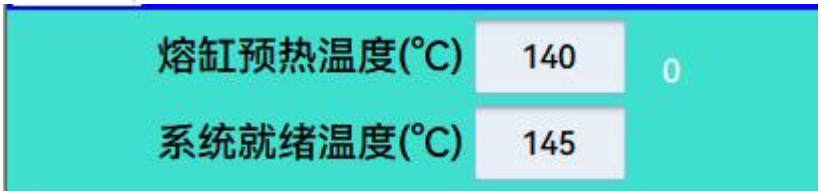
4.5.5 Ready Condition

Temperature ready is a prerequisite for the inverter (or air pump) to run. There are two main conditions for temperature ready:

A. The lower tank temperature reaches the preheat temperature (generally the preheat temperature should be set about 10℃ lower than the tank set temperature);

B. Except for channels with heating disabled and channels without a sensor connected, each channel temperature reaches or exceeds the system ready temperature (generally the system ready temperature should be set about 10℃ lower than the tank set temperature).

The preheat temperature and ready deviation can be set on the Parameter Settings 1 screen by tapping the "Parameter Settings" button:



4.5.6 Over-Temperature Protection

The controller provides over-temperature protection in two stages:

A. An alarm is triggered when any channel reaches the over-temperature protection value.

B. When any channel reaches the over-temperature cutoff 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 on the Parameter Settings 1 screen by tapping the "Parameter Settings" button:



4.5.7 Heating Abnormality Alarm

The controller provides a heating abnormality alarm; relevant parameters can be set on system parameter page 1, and the system alarms when the conditions are met.



4.5.8 PID Parameter Adjustment

PID parameters affect temperature control stability; random settings may cause loss of control or over-temperature. Please adjust under the guidance of a professional engineer.

If a channel heats too slowly or overshoots too much, adjust its PID parameters to improve the situation. 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:



If heating is too slow, decrease this parameter; if overshoot is too much, increase it.

Filter value: filters the input signal to remove jitter and noise for a smoother output response; generally set to 0.

Auto-tuning: the instrument calculates the PID values internally and turns off auto-tuning automatically after running for a period.

Channel switch: manually turn the channel output on or off.

4.5.9 Chinese/English Switching

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



4.5.10 Inverter Speed Control for Gear-Pump Models

Inverter speed control takes effect after temperature is ready; tap the inverter speed button to enter the speed control interface.



There are three working modes:

A. Stop mode: the inverter is prohibited from driving the motor.

B. Manual mode: after temperature is ready, the inverter runs at the set manual value; the speed can be set manually. This button is invalid when temperature is not ready.

C. Auto mode: after temperature is ready, the inverter determines start/stop and speed according to the external voltage input (0~10V, connected to external terminals 0V-10V) or encoder signal.

★ Select the signal type on the Parameter Settings 1 page.

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



Parameters: Upper limit: inverter frequency upper limit.

Lower limit: inverter frequency lower limit.

Tracking gain: system-computed output frequency × tracking gain = final inverter output frequency.

This function is used when the machine is equipped with two inverters that need to output asynchronous frequencies; generally set to 100.

Stop modes: A. Start-stop tracking: in auto mode, the motor starts and stops tracking according to the external tracker/encoder signal.

B. Auto pressure relief: when the motor changes from running to stopping, it reverses at the relief frequency for the relief ON time to release a certain pressure.

C. Auto pressure holding: in auto mode, after the external start condition is removed, the motor keeps running at the holding frequency for the holding ON time, then stops for the holding OFF time, repeating until the external start condition is met, to maintain a certain pressure; generally used for long hoses.

D. Mixed mode: when the motor changes from running to stopping, it reverses at

the relief frequency for the relief ON time to release the higher pressure maintained at high speed; then it runs at the holding frequency for the holding ON time and stops for the holding OFF time, repeating until the external start condition is met, to maintain the minimum pressure required for startup; generally used for glue coating and bead glue applications with long hoses.

When the motor changes from stopped to running, it first runs at the actual frequency = boost ratio × current segment speed for the boost time (S), then returns to the current segment speed to continue running. This allows the machine to build high adhesive pressure quickly when accelerating from zero/low speed, keeping the glue output stable during gun dispensing.

Note: In mixed mode, enable the boost segment and select the required boost segment speeds.

Tap the button and select the speed segments to boost in the pop-up box. 



The selected segments run in boost mode.

4.5.11 Abnormal Alarm

Alarms are divided into general alarms and fatal alarms. Both connect to an external audible and visual alarm and are shown on the screen, but only fatal alarms cut off heating power to protect the equipment, for example when over-temperature occurs.



Tap to mute the audible and visual alarm manually; the system exits the alarm state automatically when the alarm is cleared. 

4.6 Glue Cut-Off Settings

4.6.1 Basic Glue Cut-Off Parameters

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



Encoder pulses	120~600, entered according to the actual encoder; a 360-pulse encoder is recommended. Set according to the actual encoder; otherwise subsequent speed measurement accuracy will be affected.
Max. production line speed	Speed at normal machine operation. This value can be checked on the gun control page. The max. speed is usually about 10% higher than the normal running speed.

Select the corresponding working mode according to actual conditions:



Gun control modes: long dispensing and glue cut-off.

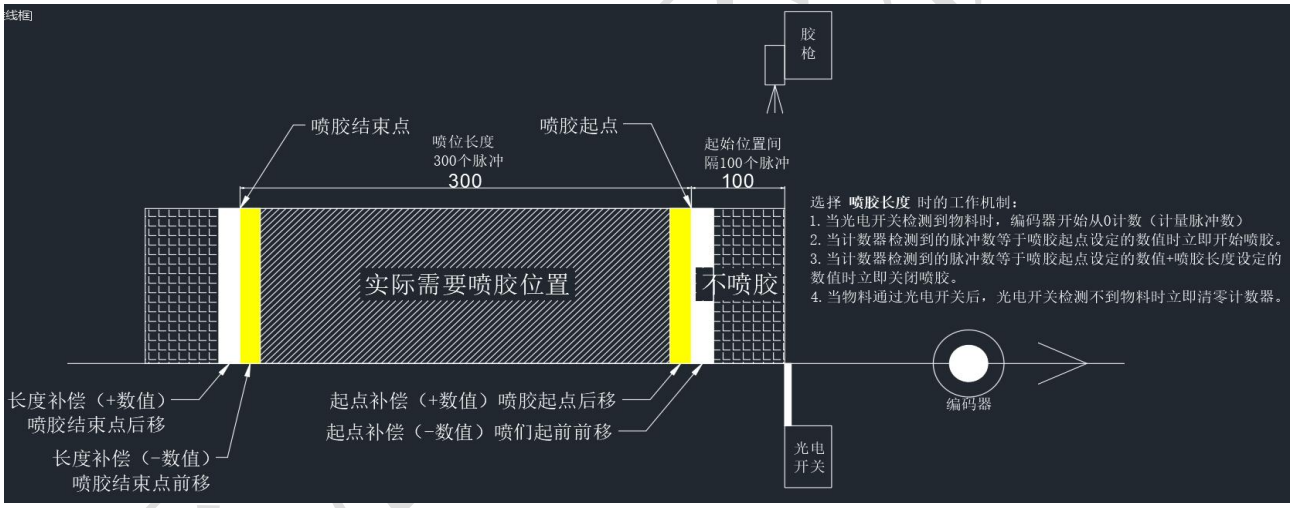
1. When encoder/analog is selected, the gun is in continuous dispensing mode: the gun outputs immediately upon receiving the encoder rotation signal or when the analog voltage exceeds the threshold voltage set in Parameter Settings 1.
2. When encoder + photoelectric switch is selected, the gun is in cut-off mode, controlled by one of: dispensing time / dispensing length / photoelectric detection. Definitions are given in the table below:

Dispensing time	Using the encoder for speed measurement: when the photoelectric switch detects the material, timing starts and dispensing begins; the gun closes automatically when the set time elapses, then waits for the next material detection.
Dispensing length	Using the encoder for speed measurement: when the photoelectric switch detects the material, counting (pulses) starts and dispensing begins; the gun closes automatically when the set pulse count is reached, then waits for the next material detection.
Photoelectric detection	Using the encoder for speed measurement: dispensing starts immediately when the photoelectric switch detects the material, and stops automatically when no material is detected.

Due to mechanical inertia, the actual dispensing start point and length may shift as machine speed changes. This system introduces dynamic tracking of gun actions; settings are as follows:



Gun action function is shown below:



Working mechanism when Dispensing Length is selected:

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

The mechanism for Dispensing Time is the same, except the counter is replaced by a timer; time-based dispensing applies only to machines running at constant speed.

4.6.2 Encoder, Photoelectric Switch and Expansion Board Wiring

Refer to the wiring diagram for the related ports. Note in particular: when the encoder and photoelectric signals share a power supply with the touch screen, wire separately from the switching power supply; do not connect directly to the touch screen power terminals. Solenoid valve power should also be wired separately, not mixed.

4.6.3 Liquid Level Input

In the H9 intelligent hot melt adhesive machine control system, X6 can be used as the liquid level input.

4.6.4 External One-Key Standby

In the H9 intelligent hot melt adhesive machine control system, X7 can be used as the external one-key standby button input.

4.6.5 Multi-Segment Speed Tracking

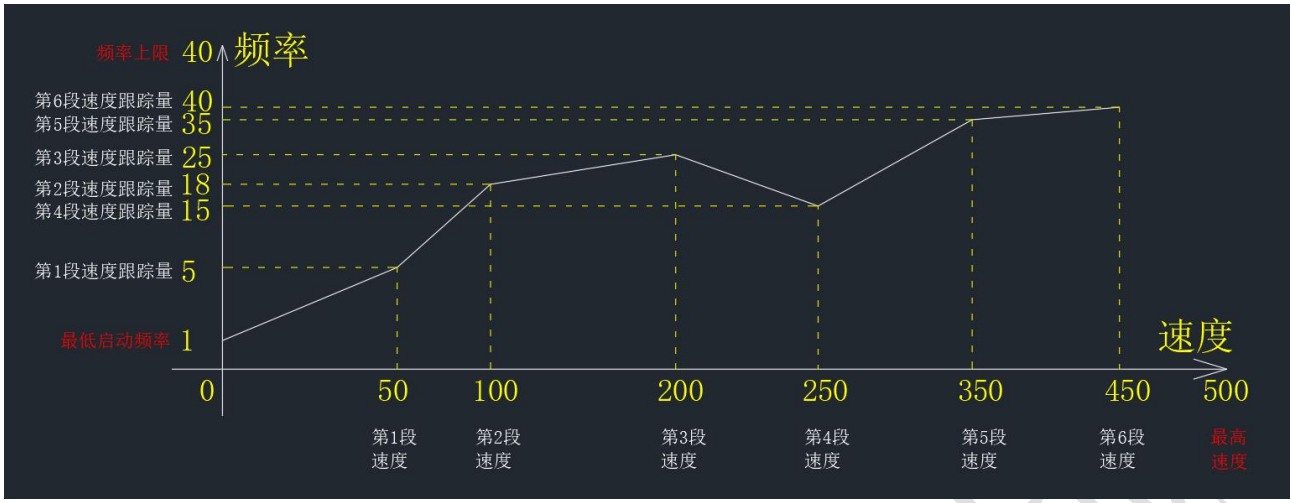
The H9 control system provides multi-segment speed tracking, with up to 7 tracking curves freely configurable. Configure freely on the gun control page according to actual production needs.



Minimum starting frequency: the minimum frequency output by the inverter when start conditions are met.

Meaning of multi-segment glue output tracking:

1. If only one linear tracking ratio is needed, set only the parameters of the first speed and tracking ratio group; set other groups to 0 (the speed value must not exceed the max. production line speed; the tracking ratio is the inverter output frequency when the speed reaches the actual max. running speed).
2. In practice, two or more linear tracking ratios may be needed. Set groups 2, 3, ... as required; the system automatically calculates the inverter output frequency corresponding to the real-time speed. Set unused groups to 0.



4.6.6 Output Port Configuration

Due to the interlock mechanism, this system reserves two multifunctional output ports Y6/Y7, freely configurable by the user.

Enter the Parameter Settings 3 page, as shown below:



Tap the Y6/Y7 port function setting button to configure the port functions in the pop-up dialog according to actual production needs.

As shown below:



4.7 Installation, Use and Storage of the AKS35L Series Hot Melt Adhesive Machine

4.7.1 Installation and First Use

1) Moving the machine:

The main unit can be moved by one person; hold the machine steady and push it gently. If ropes or hooks are used, ensure they are fastened securely; do not stand on the machine.

2) Fixing the machine:

Place the machine on a flat floor; after moving it to the proper position, press the brake pedal on the casters with your foot to lock them. The main power and other control communication lines can be routed from the bottom.

3) Installation:

After fixing the machine, install it following these steps:

1. Make sure both the supply switch and the machine main power switch are off.

2. Remove the electrical box cover, connect the correct power cable to the leakage protection switch, and connect the ground wire.

3. Connect the hot melt hose to the machine outlet; plug the hose aviation connector into main aviation socket No. 1-4. The hose bending radius must not be less than 20cm; do not press heavily on the hose or bind it with metal. There are four outlets arranged side by side for four hoses and an optional pressure gauge; note the hose/gun order: outlet 1 connects to hose/gun 1 and main aviation socket No. 1, etc.

4.7.2 Adding Hot Melt Adhesive:

The adhesive level in the tank should be kept 30-50 mm below the top cover. Add adhesive frequently when output is high; adding a large amount at once when the tank runs dry will drop the tank temperature below the ready temperature.

4.7.3 Changing Adhesive:

When changing to a different type of adhesive or adhesives that interact, clean the system thoroughly.

4.7.4 Startup

1. Add clean hot melt adhesive to the tank and close the lid immediately to prevent dirt from entering.
2. Close the main power switch on the control panel; the display lights up and the machine starts heating.
3. Wait for the preheat period (about 20-30 minutes) until the adhesive melts.
4. Work can begin after each zone reaches the set temperature.

4.7.5 Temporary Storage Method

1. Flush the system with cleaning fluid; see maintenance section for details.
2. Release pressure and turn off all power.
3. Clean or replace the filter; see maintenance section for details.
4. Release residual air pressure.
5. Remove residual adhesive and clean the parts.
6. Remove all air lines and power cables.
7. Pack the machine.
8. Store in a safe location.

4.7.6 Equipment Disposal

1. Shut off all air and power supplies.
2. Release residual adhesive pressure.
3. Remove all remaining adhesive.
4. Remove adhesive remaining on hoses and other accessories.
5. Dismantle all accessories and sort parts into mechanical and electronic parts.
6. Recycle all parts for reuse.

4.8 Maintenance of the AKS35L Series Hot Melt Adhesive Machine

4.8.1 General Cleaning

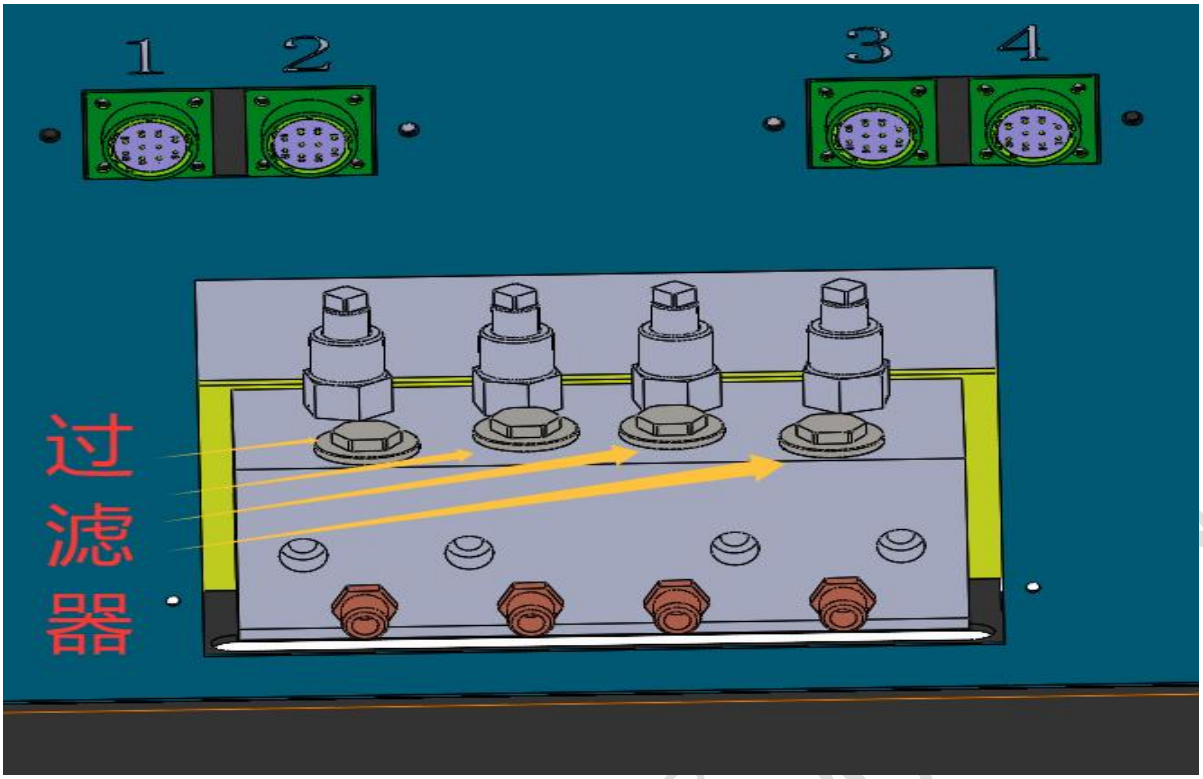
The machine has a high-strength exterior coating and can be cleaned by common methods. To prevent peeling or damage to the coating, do not use strongly corrosive solvents; wipe the cover and panel with industrial alcohol or a dedicated hot melt adhesive cleaner.

4.8.2 Maintenance

The machine requires little maintenance. A built-in primary filter prevents large debris from entering the system and usually needs infrequent cleaning. Maintain other parts according to the following procedures.

4.8.2.1 Output Filter

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



Replace the output filter screen following these steps:

1. Bring the system to operating temperature;
2. Release the adhesive pressure in the manifold base;
3. Unscrew the filter cover;
4. Pull the filter screen out of the manifold base with a hook tool;
5. Inspect the screen for carbon deposits and debris; replace it if necessary;
6. When replacing the screen, also replace the seal O-ring; apply silicone grease to the O-ring;
7. Apply silicone grease to the filter cover threads, install the cover onto the manifold base and tighten.

4.8.2.2 Hot Melt Hose Fittings

Check all fittings every three months for tightness.

4.8.2.3 Primary Filter Cleaning

1. Pump out the adhesive from the tank;
2. Lower the tank temperature to the adhesive softening point;
3. Remove the machine side cover, but keep the ground wire connected;
4. Wear protective gloves, unscrew the filter mounting bolts, and remove the primary filter;
5. Soak the filter in cleaning fluid for a while, then take it out and clean debris off with a hot air gun and cloth;
6. Apply silicone grease to the filter threads and reinstall it;
7. When installing the filter, make sure the opening faces the pump;
8. Reinstall the side cover.

4.8.3 General Maintenance Rules

4.8.3.1 Monthly Maintenance

1. Check the output filter screen and replace if necessary;
2. Check for adhesive leakage at the base; replace the seal if it is damaged or ineffective.

4.8.3.2 Quarterly Maintenance

1. Check that hose connectors are tight;

2. Check that bolts are tight;

3. Check the primary filter screen; clean or replace it.

4.8.4 Releasing Adhesive Pressure

For safety, adhesive pressure must be released before replacing filters or disconnecting hoses/guns. Follow these steps: bring the machine to operating temperature, stop the pump, and close the air supply.

1. Locate the pressure relief valve;

2. Slowly loosen the relief valve with a tool (do not unscrew fully) until adhesive flows out from the outlet into a container placed in advance;

3. Retighten the relief valve after pressure is released.

4.8.5 Flushing the System

If dirt has entered the adhesive or the adhesive brand needs changing, flush the machine; at least 6 liters of cleaning fluid are required.

1. Drain the adhesive as much as possible;

2. Reduce adhesive pressure to zero;

3. Disconnect the hose and gun adhesive fittings, and place one end of the hose in a container;

4. Pour cleaning fluid into the tank and hold for 15 minutes; mix it thoroughly with the remaining adhesive;

5. Start the pump slowly and pump half of the cleaning fluid through the hose;

6. Reduce adhesive pressure to zero;

7. Replace the filter screen and seal ring;

8. Add new adhesive and bring to operating temperature;

9. Connect the hose and gun and discharge the remaining cleaning fluid (after the new adhesive stabilizes);

10. Fill the tank with new adhesive; the system is ready.

4.8.6 Installation Requirements:

1. Before installing the hose, confirm the machine power is off.

2. The hose connects to the main unit with an 8-core electrical connector and to the gun with a 4-core connector.

4.8.7 Removal Requirements:

Note: Before disconnecting the hose, confirm the adhesive pressure in the hose has been released; stop the piston pump first and open the gun to release system pressure.

4.8.8 Sensor Check:

If the sensor resistance changes, calibrate against the resistance table; PT100 RTD is used by default.

4.9 Troubleshooting of the AKS35L Series Hot Melt Adhesive Machine

4.9.1 Notes

Technicians should be proficient in the instruments and tools used for troubleshooting, such as multimeters, thermometers and soldering irons. Electrical faults in hoses and guns can be checked simply by unscrewing the aviation plug to inspect wiring and internal resistance.

4.9.1.1 Preparation Before Detailed Inspection

A. Whether the machine is running.

B. Whether the main power cord is loose or whether there is power.

C. Whether compressed air is supplied to the machine.

D. Whether air and electrical components are connected correctly.

E. Whether there is adhesive in the tank.

4.9.1.2 Quick Diagnosis of Hose or Gun Faults

Hose or gun damage usually presents as poor electrical contact, so operators can test first: turn off the machine, unplug the aviation plug of the faulty hose or gun, and plug it into a working socket;

Check whether it works. If yes, the hose/gun circuit is fine; otherwise the hose/gun is faulty and needs repair.

4.9.1.3 Resetting Motor Speed Control

4.9.1.4 Over-Temperature Protection Settings (see 4.5.6 Over-Temperature Protection)

4.9.1.5 Pump Startup Protection Setting

The pump protection switch opens at low temperature to prevent the gear pump from rotating before the adhesive melts. This protection switch circuit is mounted on the gear pump and factory-set to 130℃. [Gear pump startup protection is set on Parameter Settings page A]

4.9.1.6 Removal and Replacement of Electrical Components

A. The control system and electrical components are sensitive to static electricity; turn off the main power before servicing.

B. Follow procedures strictly when approaching or touching these components to prevent static discharge from damaging electronic parts.

C. Wear an anti-static wrist strap when removing internal circuit boards; if unavailable, frequently touch an exposed metal part of the machine.

4.9.2 Troubleshooting Table

4.9.2.1 Common Faults and Checks for the Machine Main Unit

Fault Symptom	Possible Cause	Inspection / Remedy
Machine does not power on	1. External power supply not switched on 2. Internal leakage protector tripped or damaged 3. Main power button damaged 4. Main contactor damaged	1. Check whether external power is applied correctly. 2. Open the side cover and check whether the leakage protector has tripped. If tripped, first press the blue button on the protector, then switch on again. If it still trips, unplug all aviation plugs connected to the machine before powering on to determine whether the leakage is in the machine or the hoses/guns. Do not power on again before the leakage point is located, to avoid electric shock. 3. Check whether the power button indicator is on; if not, the button is damaged and must be replaced. 4. Measure whether the contactor coil voltage is normal 220VAC; if normal, the contactor is damaged and must be replaced.

4.9.2.2 Common Faults and Checks for the Tank Section

Fault Symptom	Possible Cause	Inspection / Remedy
Main tank over-temperature	1. High/low temperature alarm range too narrow 2. Temperature sensor damaged 3. Solid state relay damaged 4. Temperature control module damaged	1. Reset the high/low alarm range; an alarm range of ±10℃ is recommended. 2. Measure the sensor resistance (see resistance table on P51); replace the sensor with the same type if abnormal. 3. With the SSR indicator off, measure whether there is 220V between SSR output terminals L1 and T1; if not, the SSR is damaged; replace with the same type. 4. Use a temperature gun to check whether the actual tank temperature exceeds the set temperature; if so, the control module is damaged; replace with the same type.
Main tank not heating	1. Heating fuse blown 2. Solid state relay damaged 3. Anti-over-temperature thermostat tripped 4. Heating contactor damaged 5. Temperature control module damaged 6. Heating element damaged	1. If the indicator on the fuse holder is lit, replace the fuse; measure the fuse resistance; replace if it is open circuit (infinite resistance). 2. With the SSR indicator on, measure whether there is 220V between SSR output terminals L1 and T1; if yes, the SSR is damaged; replace with the same type. 3. Measure the resistance of the tank anti-over-temperature thermostat; replace it if the resistance is infinite. 4. Check whether the tank heating contactor pulls in; if not, replace the contactor. 5. Measure whether the control module output is 12-24VDC; if not, replace the module. 6. Measure the tank heating element resistance (about 15Ω); if infinite, all elements are damaged and must be replaced; if well above 15Ω, some elements are damaged.
Main tank temperature display abnormal or flashing	1. Temperature sensor damaged or open circuit 2. Control module damaged	1. Check the sensor resistance; replace the sensor or restore the broken circuit. 2. Replace the control module
Main tank adhesive leakage	1. Gear pump seal ring aged; shaft seal worn	1. Replace the gear pump seal ring, or replace the gear pump.

4.9.2.3 Common Faults and Checks for Hoses and Guns

Fault Symptom	Possible Cause	Inspection / Remedy
Hose not heating	1. Heating fuse blown 2. Solid state relay damaged 3. Temperature control module damaged	1. If the indicator on the fuse holder is lit, replace the fuse; measure the fuse resistance; replace if it is open circuit (infinite resistance). 2. With the SSR indicator on, measure whether

	4. Aviation plug damaged 5. Hose heating wire damaged	there is 220V between SSR output terminals L1 and T1; if yes, the SSR is damaged; replace with the same type. 3. Measure whether the control module output is 12-24VDC; if not, replace the module. 4. Check the plug pins for burning or blackening; replace the aviation plug if present. 5. Plug the aviation connector into another numbered socket to check whether heating is normal; if it still does not heat, replace the hose.
Hose over-temperature	1. High/low temperature alarm range too narrow 2. Temperature sensor damaged 3. Solid state relay damaged 4. Temperature control module damaged	1. Reset the high/low alarm range; an alarm range of ±10℃ is recommended. 2. Measure the sensor resistance (see resistance table on P51); replace the sensor with the same type if abnormal. 3. With the SSR indicator off, measure whether there is 220V between SSR output terminals L1 and T1; if not, the SSR is damaged; replace with the same type. 4. Plug the aviation connector into another socket to check whether temperature is controlled within the normal range; if so, replace the control module.
Gun not heating	1. Heating fuse blown 2. Solid state relay damaged 3. Temperature control module damaged 4. Aviation plug damaged 5. Gun heating element damaged	1. If the fuse holder indicator is lit, replace the fuse; measure the fuse resistance; replace if open circuit (infinite resistance). 2. With the SSR indicator on, measure whether there is 220V between SSR output terminals L1 and T1; if yes, the SSR is damaged; replace with the same type. 3. Measure whether the control module output is 12-24VDC; if not, replace the module. 4. Check the plug pins for burning or blackening; replace the aviation plug if present. 5. Plug the aviation connector into another socket to check whether heating is normal; if it still does not heat, replace the gun heating element.
Gun over-temperature	1. High/low temperature alarm range too narrow 2. Temperature sensor damaged 3. Solid state relay damaged 4. Temperature control module damaged	1. Reset the high/low alarm range; an alarm range of ±10℃ is recommended. 2. Measure the sensor resistance (see resistance table on P51); replace the sensor with the same type if abnormal. 3. With the SSR indicator off, measure whether there is 220V between SSR output terminals L1 and T1; if not, the SSR is damaged; replace with the same type. 4. Plug the aviation connector into another socket

		to check whether temperature is controlled within the normal range; if so, replace the control module.

4.9.2.4 Common Faults and Checks for Abnormal Gun Dispensing

Fault Symptom	Possible Cause	Inspection / Remedy
Gun does not dispense adhesive	1. Tank adhesive used up 2. Machine motor not started 3. Gun solenoid valve not energized 4. Gun needle valve not open 5. Gear pump coupling to motor detached or damaged 6. Gear pump damaged	1. Check the adhesive level in the tank; add adhesive until it covers the tank base. 2. Check whether the inverter in the machine is running (the inverter panel should show a number without flashing). 3. Check whether the gun solenoid valve wiring is disconnected, whether the line switch is on, and whether the solenoid coil is damaged. 4. Check whether compressed air pressure is above 6MPa; check the needle valve for foreign matter or rust; clean the needle valve promptly. 5. Check whether the coupling needs replacement. 6. Check whether the gear pump is damaged or seized; repair or replace it.
Gun nozzle dripping	1. Atomizing solenoid valve not open 2. Atomizing air flow too small 3. Excessive moisture in compressed air 4. Gun temperature too low 5. Nozzle clogged 6. Seal ring aged	1. Check whether the atomizing solenoid valve wiring is disconnected, whether the line switch is on, and whether the solenoid coil is damaged. 2. Adjust the throttle valve on the atomizing air line to increase air flow. 3. Drain the water from the air reservoir; disconnect the gun air tube to drain moisture from the tube. 4. Raise the gun temperature appropriately. 5. Remove the nozzle and clean impurities. 6. Check whether the seal ring is aged; replace the aged seal ring.
Dispensing output too small	1. Tank adhesive used up 2. Pump output too small 3. Needle valve clearance adjusted too small 4. Filter screen clogged 5. Return valve pressure too low	1. Check the adhesive level in the tank; add adhesive until it covers the tank base. 2. Increase the controller tracking ratio, or raise the inverter frequency upper limit. 3. Turn the needle valve glue adjustment bolt slightly counterclockwise (applies when one nozzle group of a multi-needle gun dispenses too little). 4. Clean the gun filter screen. 5. Turn the return valve clockwise to increase adhesive output pressure.

Dispensing output too large	1. Pump output too large 2. Needle valve clearance adjusted too large	1. Decrease the controller tracking ratio, or lower the inverter frequency upper limit. 2. Turn the needle valve glue adjustment bolt slightly clockwise (applies when one nozzle group of a multi-needle gun dispenses too much).

4.10 Equipment Disassembly Steps

4.10.1 Removing Motor / Electrical Box

1. Loosen the four fastening screws (one on each side at the bottom edge of the box)
2. Open the box cover; remember to disconnect the ground wire.

4.10.2 Removing the Tank Box Cover

1. Loosen the four fastening screws (two on the side cover and two at the bottom of the tank cover)
2. Lift out the tank box cover.

4.10.3 Removing the Tank Lid

Remove the four flat-head screws and take off the tank lid; the lid seal ring position is shown in the figure.

4.10.4 Removing the Over-Temperature Protection Switch and Motor Protection Switch

1. Loosen the two screws at the bottom of the side cover (remember to disconnect the ground wire).

a. Replacing the over-temperature protection switch: remove the two screws fixing the switch to the tank body, disconnect the two wires on the switch, and replace it.

b. Replacing the motor protection switch: disconnect the two wires and replace the switch.

4.10.5 Checking the Sensor

1. Remove the motor/electrical box cover.

a. Tank sensor: located between the two heater terminals, fixed with bolts and quick-connect wiring.

b. Booster nozzle sensor: if a booster nozzle is optional, a second sensor is mounted on it, likewise fixed with bolts and quick-connect wiring.

4.10.6 Checking Electrical Components

1. Confirm carefully that the main power is off.

2. Open the motor/electrical box cover, loosen the panel fixing screws, and slide the panel forward to the maximum position.

a. Main power switch replacement: the main switch is on the display panel and can be removed from the back of the panel.

b. Fuse replacement: there is an indicator on the circuit board fuse holder; if the fuse blows, the indicator lights and the fuse must be replaced.

c. Relay replacement: there is only one relay in the whole machine, mounted on the terminal block.

d. Circuit board replacement: remove the main electrical box cover to see the boards: CPU board, control computer board, power control board, auxiliary control board, signal control board and motor speed control board.

4.10.7 Pump or Motor Removal

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

a. Piston pump removal: disconnect the air line and electrical wiring of the solenoid valve on the four-way valve, remove the four bolts fixing the pump to the body, and take off the pump and four-way valve. Installation: return the piston pump to its original position; bolt torque 21Nm (room temperature); at a tank temperature of 177℃, max. tightening torque is 49Nm.

b. Gear pump and motor removal: disconnect the motor electrical connection, loosen the fixing pin locking screw, and remove the shaft fixing pin.

c. Gear pump motor brush replacement: brushes are on the panel side of the motor; remove the brush cover to replace.

d. Pump seal replacement: remove the pump from the machine, take off the seal ring, and install a new one.

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