RD AUTO SPRAYER MANUAL

INDEX
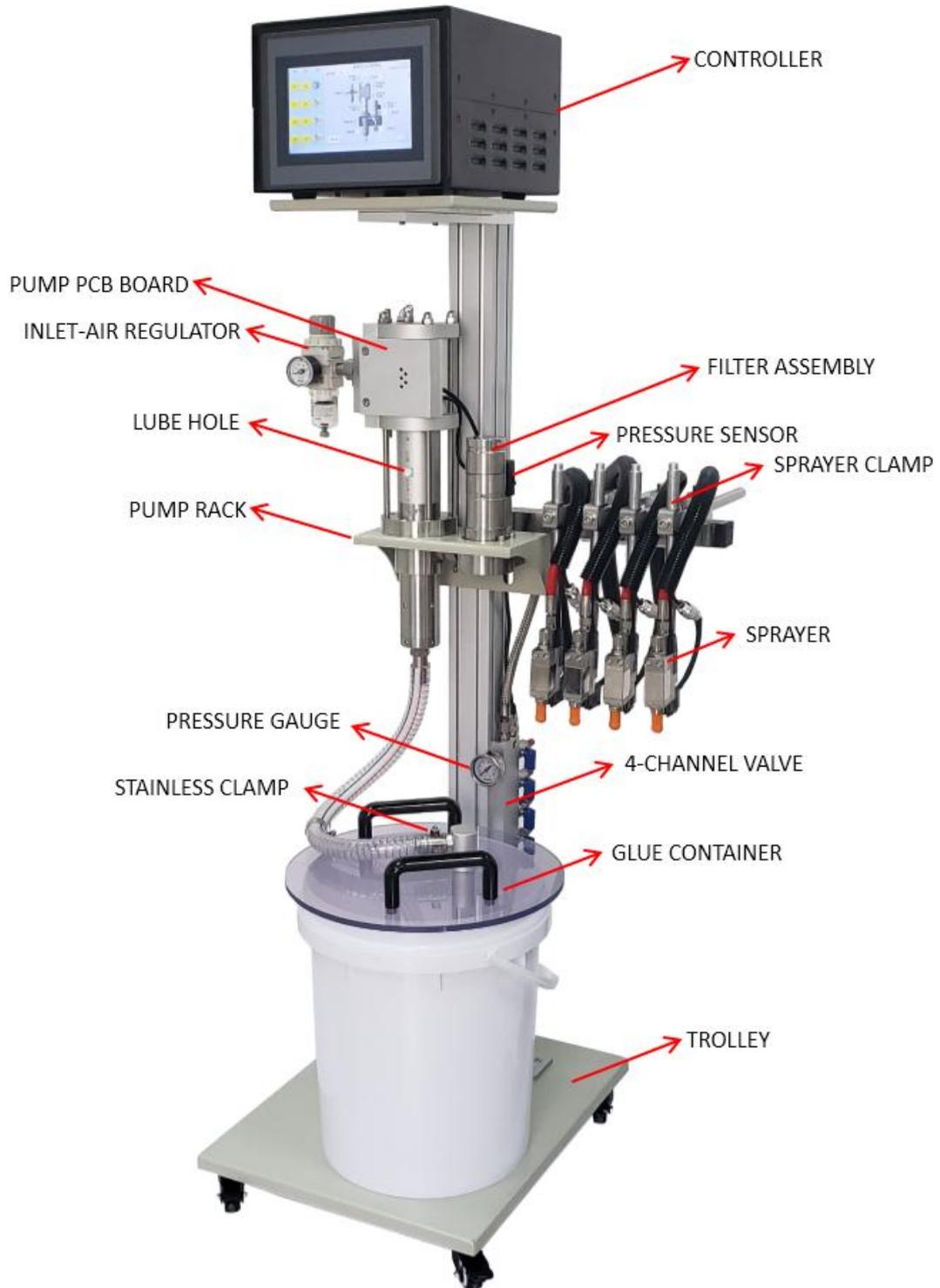
1　EQUPMENT DESCRIPTION

1.1　USAGE

1.1.1 This machine is made by Advanced Algorithm Intelligent Electronic Pty Ltd. It is used for glue spraying on assembly line. It drives cold glue and hot glue by thread, dot or mix mode. It also drives double side taping machines. It has four main parts: controller, pump, spraying gun and encoder.
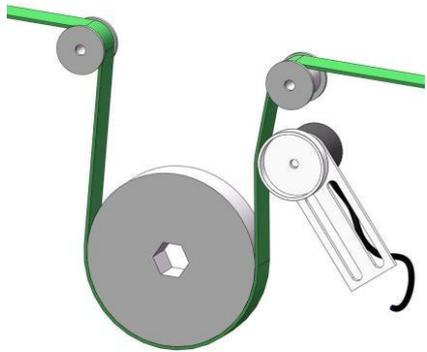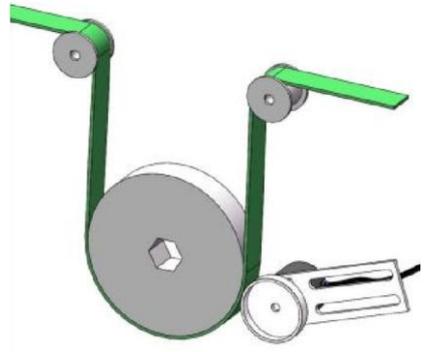
1.2　PARAMETERS

CONTROLLER	MODEL No.	RD-KZQ-4~64
	INPUT POWER	220VAC(±20%) 50-60Hz
	POWER RATE	500W
	ACCURACY	±0.1mm
	Dot Max Speed	180m/min
	Thread Max Speed	300m/min
	Product Max Length	No limit
	Samples storable	1000
	Guns controllable	4 ~64
	Sections programmable	11
PUMP	Model No.	RD-ZDB-2
	Stroke displacement	200cm^3
	Max glue viscosity	4000mPas
	Compression rate	5:1
	Inlet air requirments	2-8 bar
SPRAYER GUN	Model No.	RD-QA-02
	Nnozzle hole diameter	0.4mm/0.45mm
	Piston material	Silicon Oxide
	Operation mode	Magnetic injectjion
	Ooperating cycle	0.02 ms
	Injection adjustable	10 levels
	Glue adjusting knob	Yes
	Piston lifespan	5,000,000,000cycles
	Coating	Powder coating
	Detector	Panasonic infrared detector
	Fixture	protector
	Detector protection	stainless steel case
ENCODER	Manufacturer	OMRONG
	Wheel diameter	66.72mm
	wires	6

2 Knowledge the machine

CONTROLLER

PUMP PCB BOARD

INLET-AIR REGULATOR

FILTER ASSEMBLY

LUBE HOLE

PRESSURE SENSOR

SPRAYER CLAMP

PUMP RACK

SPRAYER

PRESSURE GAUGE

STAINLESS CLAMP

4-CHANNEL VALVE

GLUE CONTAINER

TROLLEY

3   Installation

1)   Install encoder

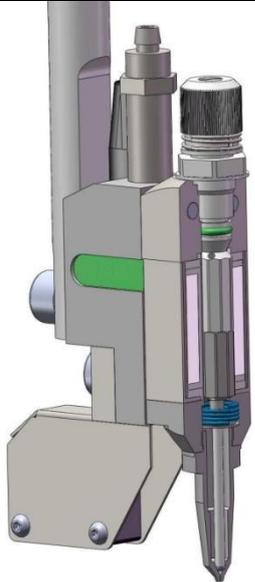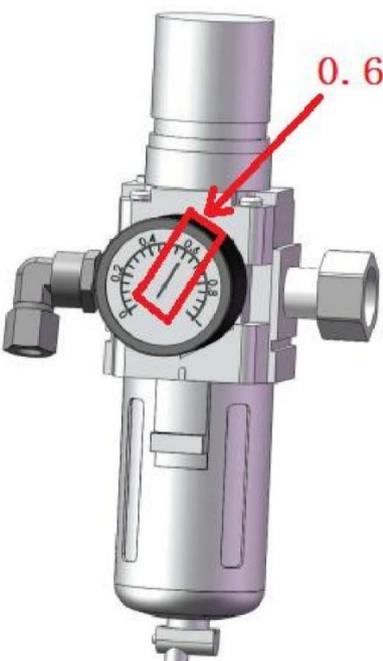| Correct Way	Wrong way
Install encoder to the belt which is used to run the product. The wheel touches the belt and bend the belt gently.	Do not place encoder wheel to belt wheel, otherwise gluing positioning will be affected, and encoder's lifespan could be reduced.

2)   Adjusting knob

High end	Low end

Clockwise turning knob to lower the knob; Anti-clockwise turning knob to lift the knob. Take the following steps to adjust spraying gun:

1.   Clockwise turn the knob to the lower end;

2.   Anti-clockwise turn the knob by 2 scales

3.   Start manual spraying mode and see if spraying smoothly. If not switch off manual mode and anti-clockwise turn the knob by another 1 scale. Repeat above procedure until spraying smoothly. (please note: the maximum spraying is not the high end but in the middle point)

4.   if need to adjust the size of spraying point, change "clean gun" to "test gun" on the touch screen's setting menu.

| Spray glue to your product and see if result is satisfied. If not repeat step 1,2,3 to adjust. |
|---|

3) Sprayer nozzle

Nozzle assembly order	Nozzle cut way view
Please note: before remove the nozzle assembly, anti-clockwise the adjusting knob to the high end. When placing the nozzle back, do not use spanner. If feeling hard to turn the nozzle back, please double check if adjusting knob is on the high-end position.	

4) Pump

Glue pressure adjustment	Pump Front view
Red light stays on. Blue lights located above and below the red light, toggles each other. Another top right corner blue	

light flicks every 1s. Normally, adjust the inlet air pressure to 6kg/cm³.

5) Product feed-in direction, gap between nozzle and product
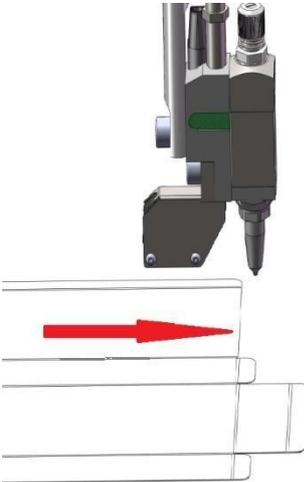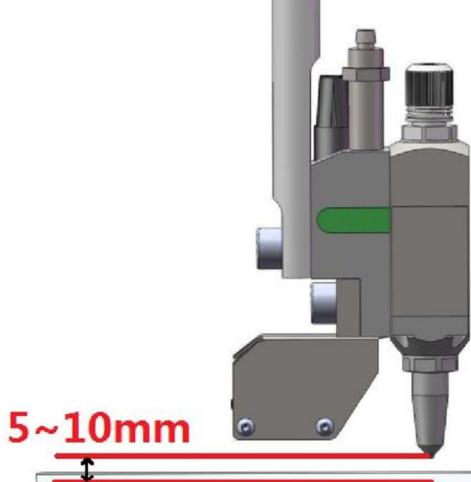
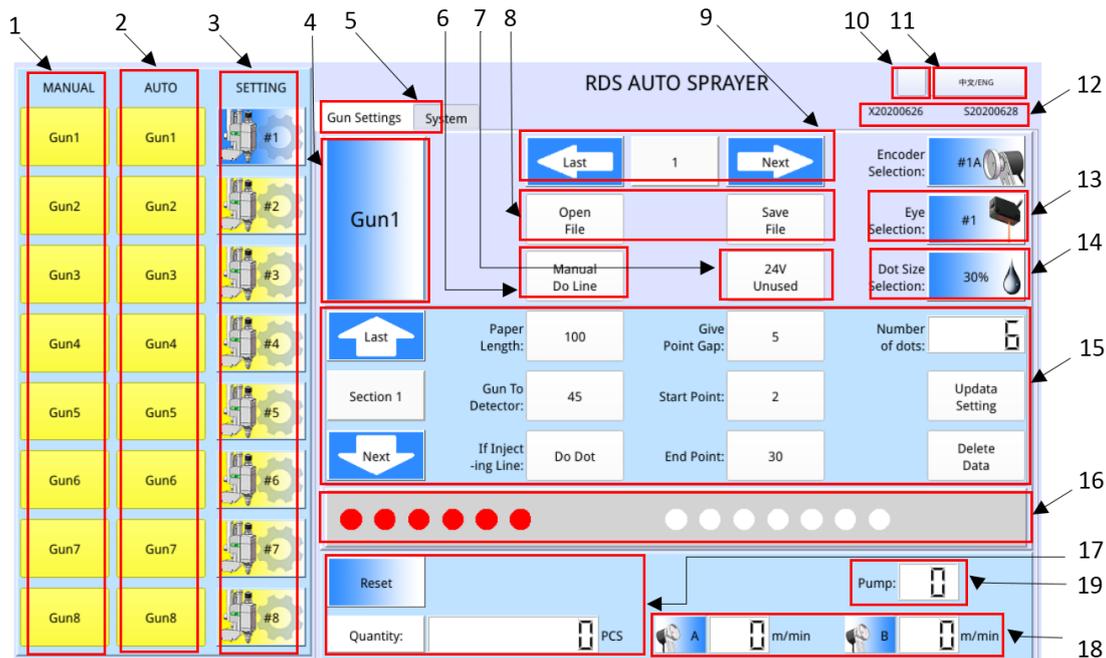| Product feed in direction	Gap between nozzle and product
Above picture shows that products visit detector before meet spraying nozzle. The gap between nozzle and products recommends 5-10mm.	

6) FILTER MAINTENANCE

| PUMP FILTER	GLUE CONTAINER FILTER
Clean once per month with teeth brush and flush with clean tap water. Not cleaning properly might cause the nozzle blockage.	

7) Connect air source and adjust the inlet air pressure to 6kg/cm³, then set up speed pressure curve.

8) Install sprayer gun, position the sprayer nozzle to where need to glue, and keep the gap between nozzle and product surface within 5-10mm.

9) When install encoder, make sure the wheel touches the belt closely. No specific direction required.

10) Connect joiner of spray gun, detector, pump and encoder.

11) Plug in 220v power cords.

12) Program the gluing.

13) Test.

14) Adjust and test.

15) Manufacturing

16) Please place nozzle sleeves with water back to nozzle after finish work. To void blockage we recommend throughout flush clean if not using the machine over 7 days.

17) Switch off power and air source.

4 Program gluing

    4.1   Main menu

No.	Descriptioin
1	Manual switch, red means on, yellow means off
2	Auto switch, red means on, yellow means off
3	Channel setting button, blue indicates the channel we are setting.
4	Current channel no.
5	Setting Tab handler
6	Switch to toggle between manual dotting and threadlike
7	24 voltage switch
8	Open and save file
9	Channel group switch
10	Reserve button
11	Language Selection
12	Code version
13	Eye selection
14	Point size selection
15	Glue programing button groups, please note: 1. Distance from nozzle to eye, minimum is 10, maximum is 5 times of total product length. 2. The distance from nozzle to eye, can be used to move the whole gluing forward or backward
16	Gluing display, red is current editing section
17	Finished work piece, system will keep the total manufacturing quantity (refresh rate: once per second).
18	Encoder speed(refresh rate: once per second).
19	Pump pressure display for current group(refresh rate: once per second).

4.2   System setting menu
a)   Basic information display
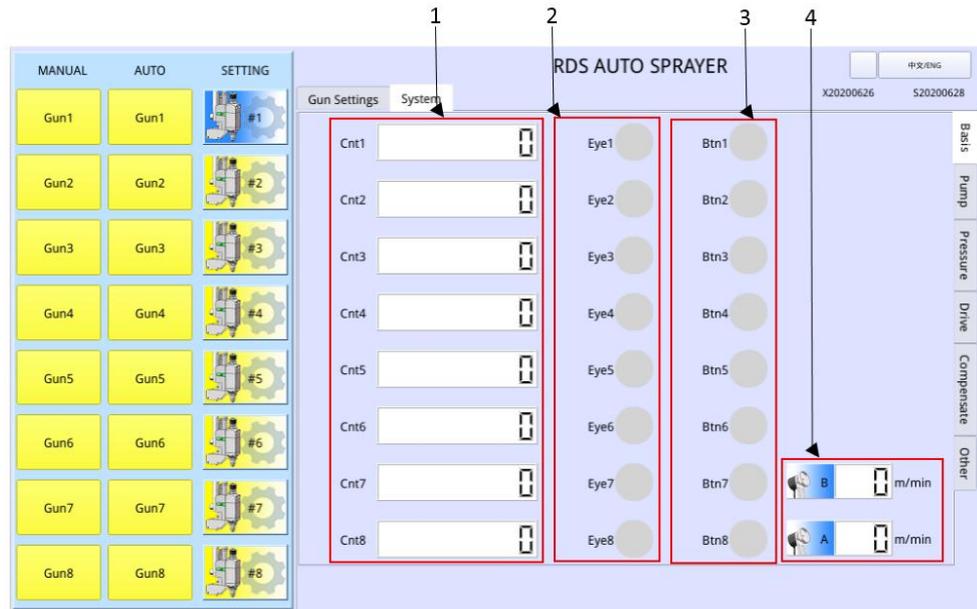
| No.	Description(refresh rate: once per second)
1	Display quantity of finished work piece for every channel, it will be reset after switched off
2	Indicate detector signal: grey is undetected, red is detected
3	Indicate manual signal: grey is 0, red is 1.
4	Encoder speed display

b)   Pump control
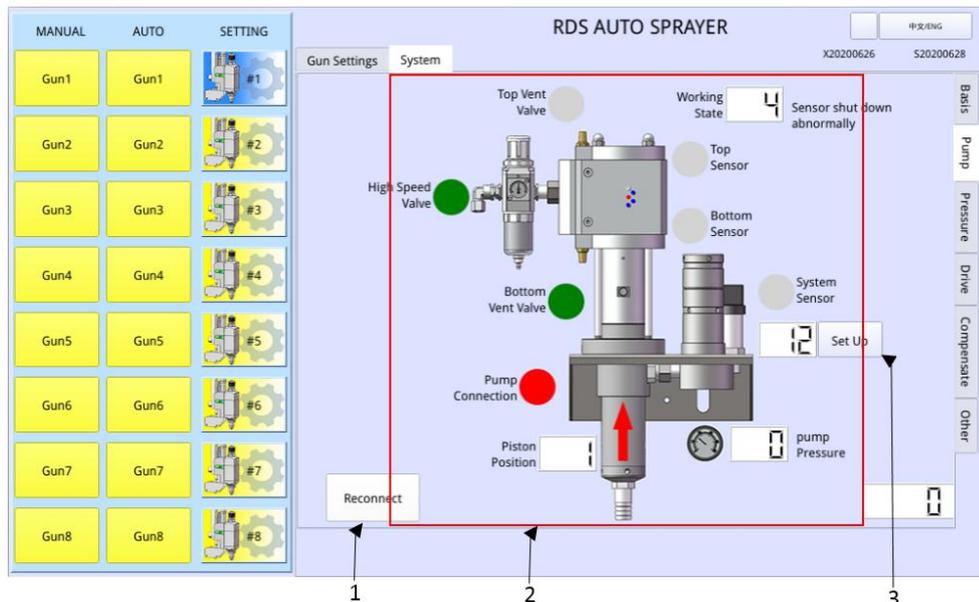
No.	Description(refresh rate: five times per second)
1	Reconnect button is to reboot the pump and refresh the pump information
2	Pump status display

3	Temporary pressure setting: it is designed for testing. this setting is only valid when the speed is constant.

c) Pump pressure speed follower

Advanced settings: click System tab and input code:123456 to enter advance setting menu. System board use these parameters to adjust pump pressure according to encoder speed change. This helps sprayer output position-stable and quantity-stable gluing.
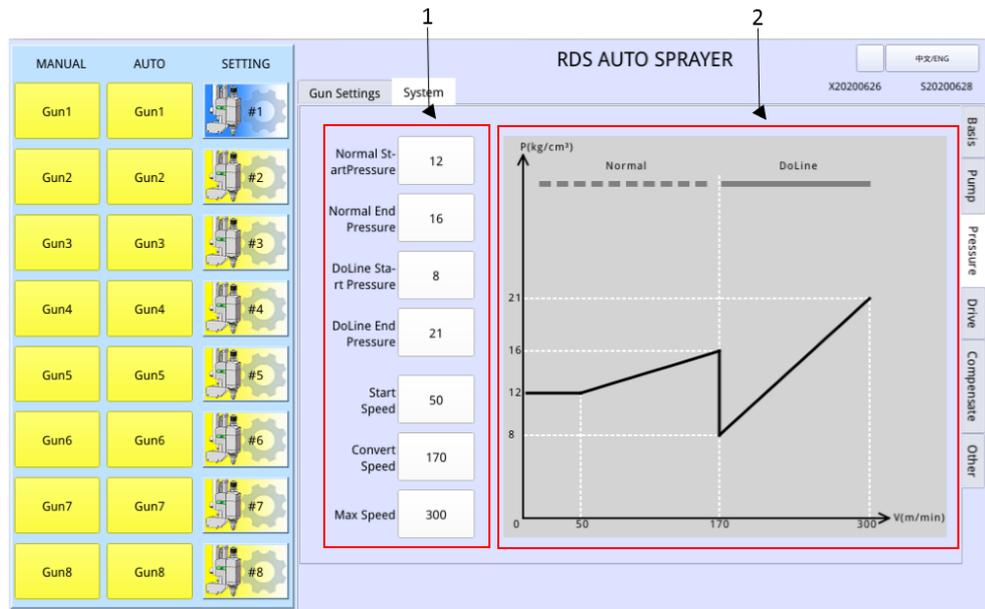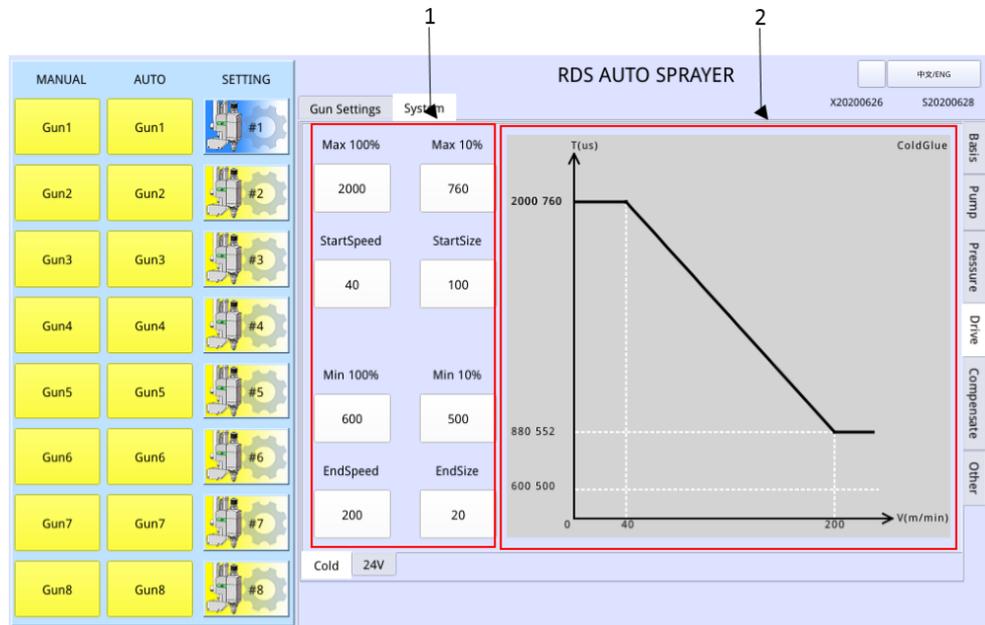

No.	Description		
1	Set parameters		
	Function	Function description	
	Normal pressure	normal pressure given speed 0 to adjusting-edge speed	
	Dotty spray max pressure	Maximum pressure point, above picture shows how pressure proportionally change according to speed.	
	Critical pressure point	The value that system change from dotty spray mode int threadlike spray mode compulsorily	
	Max pressure at threadlike mode	Max pressure at threadlike spray mode	
	Start changing speed	The value is speed after which pump starts change pressure	
	Critical speed point	This is the speed after which system use threadlike mode compulsorily	
	Max adjusting speed	Pump does not increase pressure after this speed	
2	Display area		
		Description	
	X-axis	Encoder speed, unit: m/min	
	Y-axis	Glue pressure, unit: kg/cm³	

	At top	The area under dotted line is normal speed mode at which sprayer can do point and threadlike spraying simultaneously; The area under solid line is high speed mode at which sprayer only do threadlike spraying.
	Middle area	Pressure follower curve

d)　Point spraying drive settings

This is an advance settings: Click Drive tab and enter code(this functions is for expert only, if you want to access this function, please ask our service engineer). This function set spray-point size, driving scaling as per speed change and intelligent control parameters.

No.	Description	
1	Data setting area	
	Function	Description
	Max 100%	The parameter with which system use to drive 100% glue point size at maximum output. Amplitude is 100.
	Max 10%	The parameter with which system use to drive 10% glue point size at maximum output. Amplitude is 100.
	Min 100%	The parameter with which system use to drive 100% glue point size at minimum output. Amplitude is 1.
	Min 10%	The parameter with which system use to drive 10% glue point size at minimum output. Amplitude is 1.
	Start speed	If the encoder speed is high than this, system uses speed as parameter to tune the spray drive.
	Start size	The amplitude at the beginning of adjustment.
	Top speed	Quicker than the speed, the amplitude keeps the same.
	Top Size	The top limit of amplituide
	The formula to calculate amplitude: $A = As - (V - Vs)/((Ve - Vs)/(As - Ae))$	
	The formula to calculate the 100% point size :	

	S100=(Max100-Min100)*A/100+Min100 The formula to calculate the 10% point size : S10=(Max10-Min10)*A/100+Min10 The formula to calculate other point size : S=(S100-S10)*(Ds-1)/9+S10 **Symbols:**	

Symbols:			
A	Current amplitude	S	Point size
As	Starting amplitude	S100	100% point size
Ae	Top amplitude	S10	10% point size
V	Current speed		
Vs	Starting speed		
Ve	Top speed		
Ds	Current ratio*10		

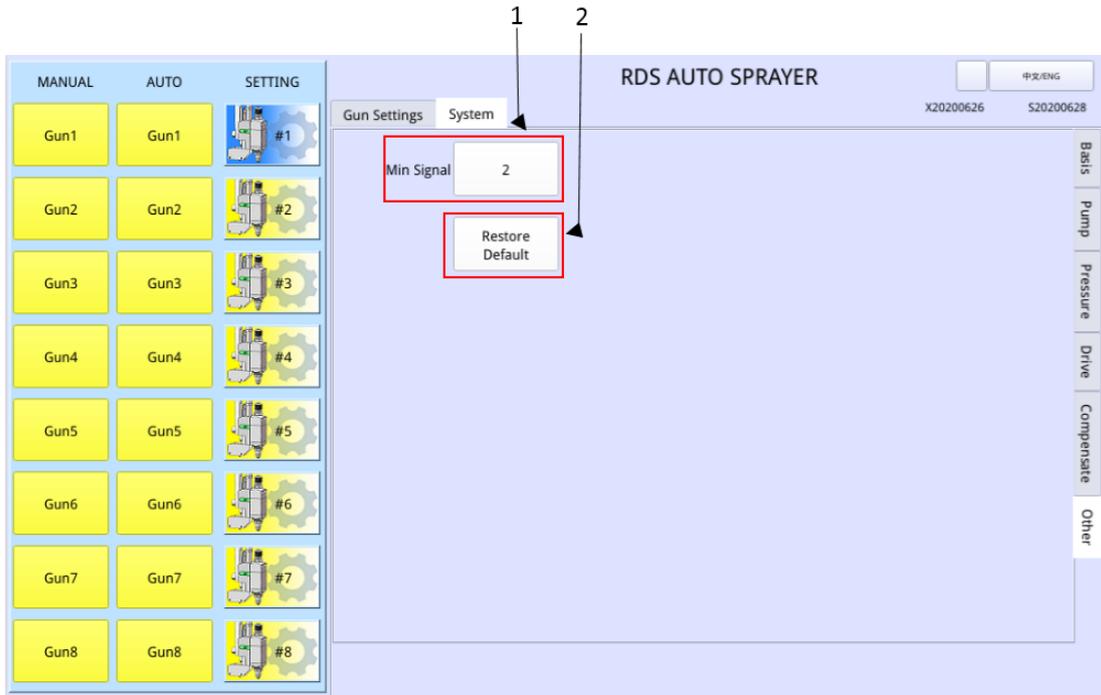| 2	Display area	
		Description
	X-AXIS	Encoder speed, unit: m/min
	Y-AXIS	Spray drive amplitude
	MIDDLE AREA	Spraying drive curve
3	24-volts drive use the same way as cold gluing	

e) Glue starting point compensate

This is an advance settings: Click System tab and enter code(this functions is for expert only, if you want to access this function, please ask our service engineer). This function set spray-point point size at the first few points larger than rest point at some scale.

No.	Description			
1	Data set area			
	Name	Description		
	Max compensation	Starting points Max compensation, amplitude is 100		
	Min compensation	Starting points min compensation, amplitude is 10		
	Start speed	The speed at which compensation function start to intervene		
	Start amplitude	The amplitude at start speed		
	Turning point speed	The speed at which slope changes		
	Turning point amplitude	The amplitude at turning point speed		
	Top speed	The top speed compensation function would work for		
	Top amplitude	The amplitude at the top speed		
	Dot Num	The point number you want to compensate		
	Max Amp	The fixed amplitude after top speed		
	To calculate the amplitude at given speed: $A=(V-Vl)/((Vn-Vl)/(An-Al))$ The real compensation: $R=(Rmax-Rmin)*A/100+Rmin$			
	Symbols			
	A	The current compensation amplitude	R	Real compensation value
	Al	The last amplitude	Rmax	Max compensation
	An	The next amplitude	Rmin	Min compensation
	V	The current speed		
	Vl	The last setting speed	Vn	The next setting speed
2	Display area			
		Description		
	X-axis	Encoder speed, unit: m/min		
	Y-axis	Compensation amplitude		
	Middle area	Compensation curve		
3	24 volts setting use the same way as above			

f) Other settings:

This is an advance settings: Click System tab and enter code(123456).


NO.	Description
1	Minimum detected length, unit: mm. This value is used to reduce the interference. Signal is not valid until the detected length is longer than this value. This value is not valid if it is bigger than the distance from nozzle to detector.
2	Restore to factory default settings

		Functions	If restore
	1	Sprayer auto & manual switch	Yes
	2	Manual spray status	Yes
	3	24 volts mode	Yes
	4	Encoder Selection	Yes
	5	Eye Selection	Yes
	6	Glue point size	Yes
	7	Glue programming	Yes
	8	Pressure follower	Yes
	9	Dot spray drive	Yes
	10	Start point compensation mode	Yes
	11	Minimum detected distance	Yes
	12	Number of worked piece	No
	13	Saved file	No

4.3   Dotty threadlike mixed programing

The button named If Injecting Line is used to toggle between dot
and threadlike. Every section can be configured.

Dotty spray programming
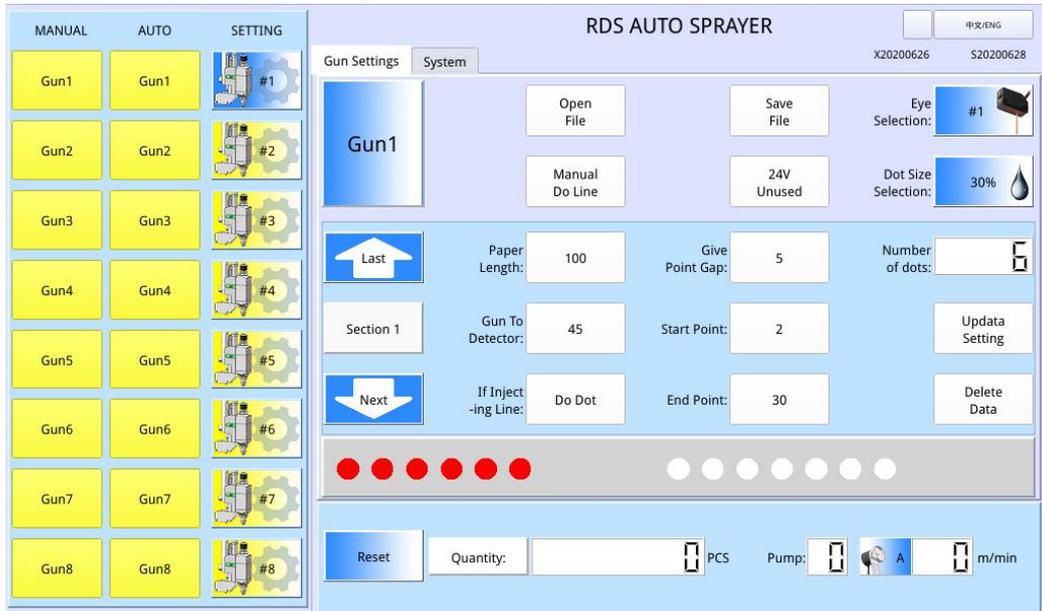
Threadlike spray programming
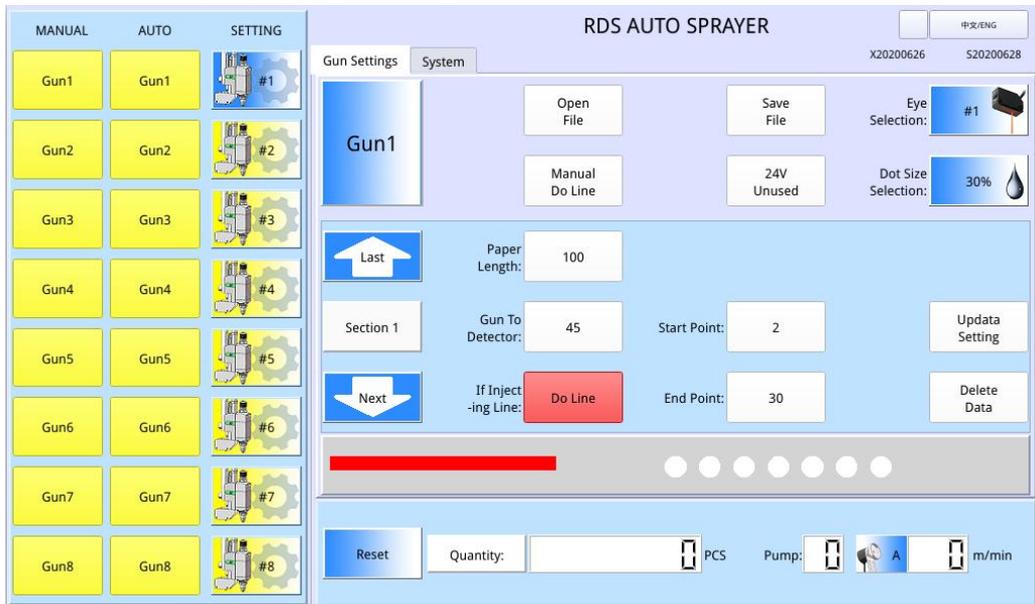
4.4　24 Volts control mode

Normal mode is like this:
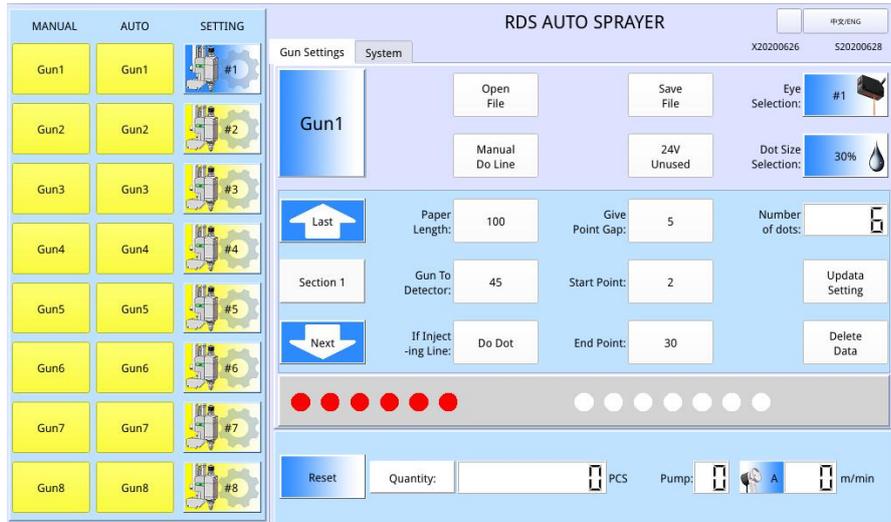
Click the button named 24v unused, you will see the following window:
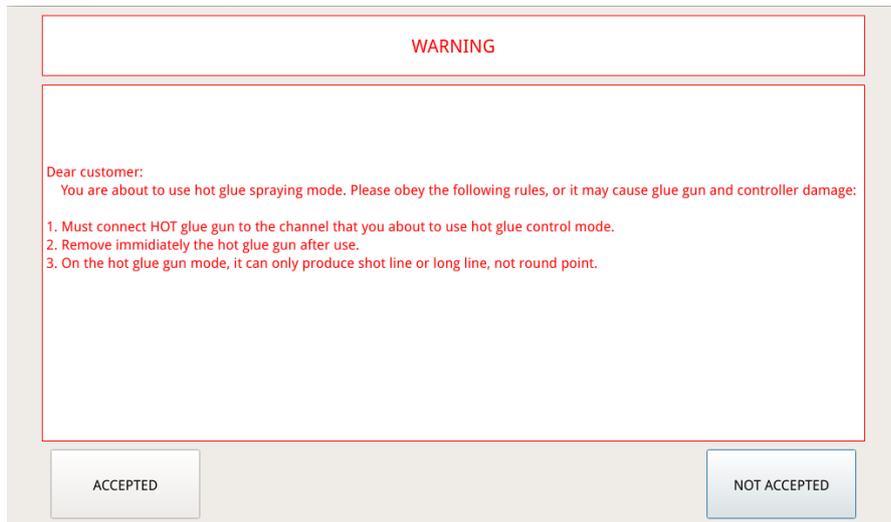
Please read carefully, then click I accept, system enter 24v mode:
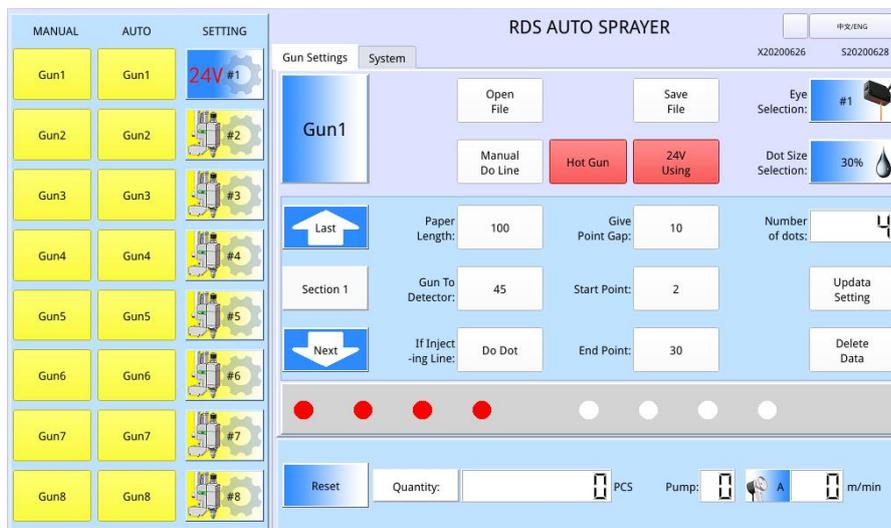
As above picture, the button name has changed into "24v used". And new button named "hot glue mode" shows up. Click hot glue mode button, you can select sub-24v working mode.
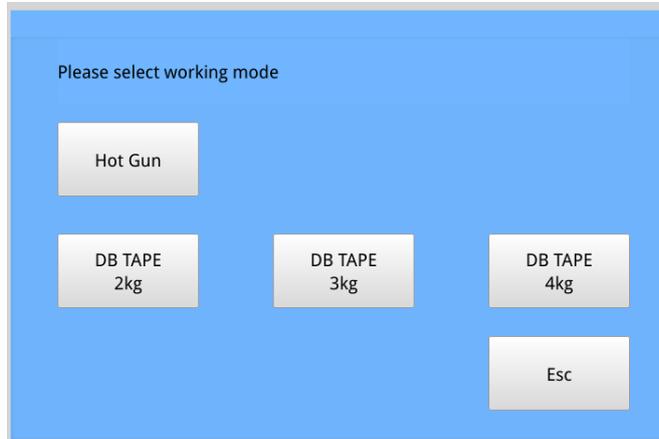
Please note although 24v mode can drive hot glue gun, double-side taper etc, we cannot connect the cold glue spray gun by using 24v mode.

4.5   Example programing
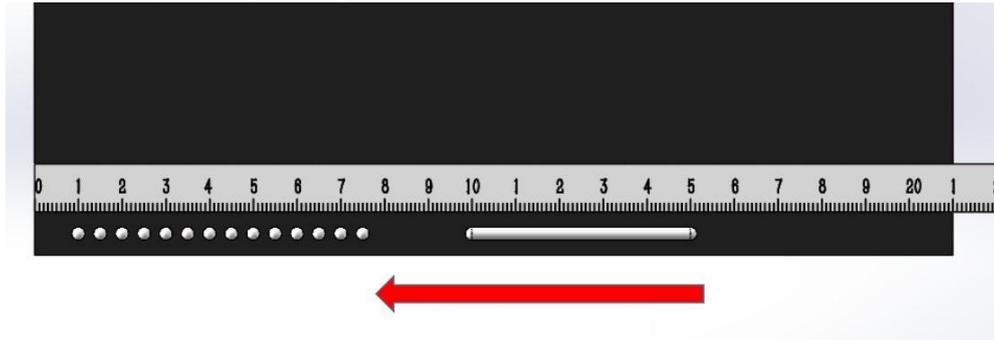
Total product length: 210mm; the first section start point:10mm; points gap is 5mm, end point is 75, dotty spray; the second section use threadlike spray; starts from 100mm, end at 150mm. Now we begin to edit program:

1   Do the measurements: along with product moving direction, measure from the edge of product to the end edge of product.

2   Enter into the glue pattern editing menu.

3   Click to delete all of the current data.

4   Check if current section is "section 1", if not click to change to "section 1"

5   Click and input the total paper length:210.

6   Input the gap between spray gun and detector, here we use default value: 45mm.

7   Click the button "if do lin" to turn it into grey color, button text should show "Do dot".

8   Input glue gap as 5mm.

9   Input start point as 10mm.

10 Input end point as 75mm.

11 Number of points shows:14

12 Click button "next part" and change to "part 2"

13 Click "if do line" button and button color goes to red(point gap, number of points will be hidden.

14 Input start point:100

15 Input end point:150

16 Gluing programing finished. Now you can save the program or go back to settings menu.

17 Go back to main menu and click run auto to test spraying result

5 FAQ

5.1 Sprayer gun cannot spray manually

Reason 1: sprayer gun connector is not plugged in properly.

Solution: unplug and plug

Reason 2: 4 channel valve is not open.

Solution: turn on the valve

Reason 3: auto-run is switched on.

Solution: switch off auto-run.

Reason 4: blockage

Solution: flush clean the nozzle or even the pump and pipe; if still happening, change the glue.

Reason 5: nozzle, piston and spring is not well positioned.

Solution: reassemble them properly.

Reason 6: spray gun malfunction.

Solution: call us and get it repaired or replaced.

5.2 the gun work on manual spray but not on auto mode

Reason 1: no speed is detected.

Solution: if encoder wheel is not touching the belt, adjust it; if still the same problem, change the encoder.

Reason 2: detector is not working properly.

Solution: if indicator of detector is not on, plug the detector to another channel, if still the same problem, send it back manufacturer. If green indictor is on, and yellow indicator is not on while paper goes under it, use flat screw driver to turn the knob to far direction. If green indicator is on and yellow one is also on all the time, we need reposition the detector.

Reason 3: auto-run is not switched on or programing has some error.

Solution: make sure auto-run is on and reprogram the gluing.

5.3 Pump is not pumping glue

Reason 1: no air source connected or inlet air pressure is under the limit.

Solution: connect the air source or correct air supply pressure properly.

Reason 2: inlet air pressure control valve is not adjust properly.

Solution: turn the valve knob and adjust the inlet pressure to 6kg/cm³.

5.4 pump is pumping but not pump out the glue

Reason 1: container has no glue left.

Solution: add glue.

Reason 2: there is air in the glue channel.

Solution: switch off 4 channel valves, remove one of spray gun pipe from the valve, then gently switch on the valve to "squeeze" out the air.

Reason 3: the one-way ceramic ball is stuck.

Solution: remove glue pipe from container, and use long flat screw driver to push the ceramic ball to make it moving. Install the glue pipe back.

5.5 Touchscreen is not working properly

Reason 1: electro-interference affect the system communication

Solution: use wire connect controller case to ground wire

Reason 2: controller malfunction.

Solution: call us to get it repaired

6 Maintenance
6.1 Daily maintence

i   No other spare part or device placed on the equipment.

ii Keep the equipment clean and make sure no glue is visible on equipment surface.

iii Check pressure gauge because over pressure will cause gauge or other parts damage.

iv Check the water level of inlet air pressure control valve water container. If level is over 1/3, please release the water.

v   Put nozzle protection sleeves back to nozzle if not using the sprayer gun.

vi Clean the nozzle before using.

vii Avoid step on the pipe and wire of the equipment.

viii Clean the glue container if long-time no usage.

ix Flush clean the glue channel if over 7 days no using the equipment.

x   Flush clean the glue channel before using different brand or model of glue. **Do not mix up 2 different type of glue together.**

xi Switch off the 4 channel valves before cleaning the nozzle. **The O-ring on the nozzle need to be check before placing the nozzle back. Defected O-ring might cause serious glue leaking.**

xii Check the encoder wheel and see if it touches belt.

6.2 Periodic maintenance

Add 100ml lubricant every 6 month. You can use motor oil.

Pump filter need to be clean every 3 months. We recommend you use special tool supplied with machine as accessary to open up the filter container. Flush clean the spray gun every 3 months. Filter under the container need to be clean every 3 months.