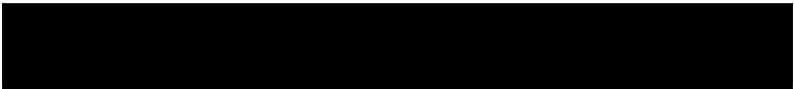




AMC401-U

single channel packing controller instruction manual



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Company web site: <http://www.szamp.com.cn/>

This product carries out the standard:

GB/T 7724-2008 National standard of <electronic weighing instrument>

JJF1624-2017 Type evaluation outline of <digital weighing indicator (weighing indicator) >

JJG649-2016 Verification regulation of digital weighing indicator (weighing indicator)



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I. essential information

1.1. Features and specifications

The AMC401-U is a packaging controller designed for industrial weighing. The controller has a small size, stable performance and rich interfaces. Can be widely used in industrial field packaging linear scale and other equipment.

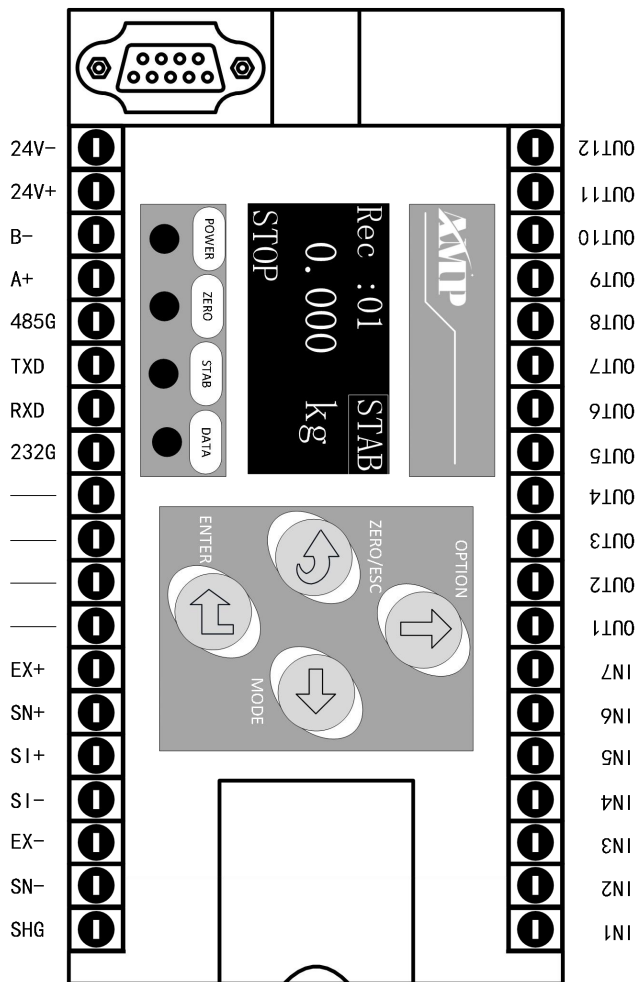
The AMC401-U has the following basic features:

- Operating voltage: DC24V
- Weighing channel: a single channel
- Sensor: DC5V / 6 line compatible strain bridge weighing sensor
- Switch quantity: 7 input / 12 output
- Communication interface: serial port RS485, serial port RS232, support Modbus-RTU protocol.
- Analog output: 1 channel analog output (optional voltage or current) output interface, can control the vibration feeder.
- Installation method: guide rail (or screw fastening)
- Volume: 120*80*61 (length, width, mm, excluding protrusion)

Detailed technique, and the specifications are as follows:

Sensor incentive	DC5V $\pm$ 10% / 120 mA drive current / 8350 Ω size sensors
Adaptive sensor sensitivity	2 mV / V or 3 mV / V
Enter the signal range	0~15mV
input sensitivity	0.5uV/d
Nonlinear	0.02%FS (at 3 mV / V)
zero drift	<0.5 μ V/°C
gain drift	<10PPM/°C
AD slew rate	And 960 beats / second
Highest display resolution	1/100000
Product accuracy level	Ⓐ
working voltage	DC24V (18V ~30V compatible)
Product power consumption	<5W
working temperature	-10°C~45°C
storage temperature	-20°C~60°C
humidity	Within 90% RH (no condensation)

1.2. front panel



The front panel consists of LCD, 4 indicators and 4 buttons.

The instructions are as follows:

pilot lamp	
DATA	When the serial port receives the

	instruction and responds, the indicator light is on once
STAB	The controller has a stable weight and a bright duration
ZERO	The controller weight is long and bright at zero point
POWER	Electricity flashing
key	
 Zero / ESC	1. The menu interface key to exit to the previous menu once. 2. In standby state, press the key to perform zero clearing operation once. 3. Standby state long press the calibration zero operation. 4. Value input interface, long press to clear the input data. 5. The alarm can be cleared when it exists.
 OPTION	1. Menu and selection interface, move the cursor up. 2. Value input interface to make the flashing number plus 1. 3. When the "8.1.2 or 8.2.2" protocol selects ⑥ [Manual printing], the main interface button performs the printing operation at one time.
 MODE	1. Menu and selection interface, move the cursor down. 2. Value input interface, move the flashing cursor to the right.

 EXTER	1. Menu and selection interface to confirm the current options. 2. Numerical input and options interface to confirm the preservation of the current data.
--	--

1.3. Terminal port

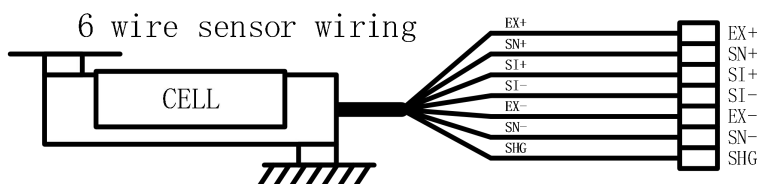
The wiring ports are described as follows:

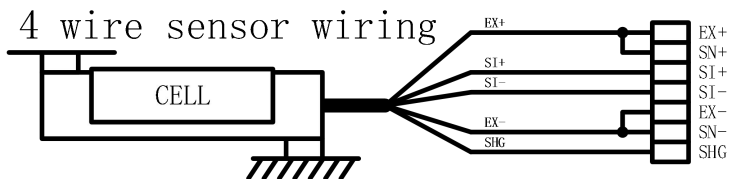
class	joggle	explain
POWER	24V	DC24V Positive power supply
	24G	The DC24V power supply is negative
sensor interface	EX+	Sensor, and the excitation is positive
	EX-	Sensor excitation negative
	SI+	Sensor signal positive
	SI-	Sensor signal negative
	SN+	Sensor induction is positive
	SN -	Sensor induction negative
	S HG	Sensor, the shielding wire
analog quantity (Optional Voltage or current)	U1+/I1+	The positive pole of the analog output 1 U 1 + for switching voltage I1 +
	U1-/I1-	Negative electrode of analog output 1 (GND of analog) U 1- Switch optional current when I1-
	pay attention to: Use the optional voltage as an example to	

	describe and explain the parameters below.		
serial port (RS485)	A+	RS 485 A+	
	B-	RS 485 B-	
	485G	RS485 GND	
serial port (RS232)	TXD	RS232 TXD	
	RXD	RS232 RXD	
	232G	RS232 GND	
IO output	OUT1	Switch output 1	Q1. Running
	OUT2	Switch volume output of 2	Q2. Stop
	OUT3	Switch volume output 3	Q3. Fast
	OUT4	Switch volume output 4	Q4. Med
	OUT5	Switch volume output of 5	Q5. Slow
	OUT6	Switch volume output 6	Q6. Fixed value
	OUT7	Switch volume output 7	Q7. Over/under
	OUT8	Switch volume output of 8	Q8. warning
	OUT9	Switch volume output 9	Q9. Clamp bag
	OUT10	Switch volume output of 10	Q10. flap / push
	OUT11	Switch volume output 11	Q11. Discharge
	OUT12	Switch volume output of 12	Q12. Zero area

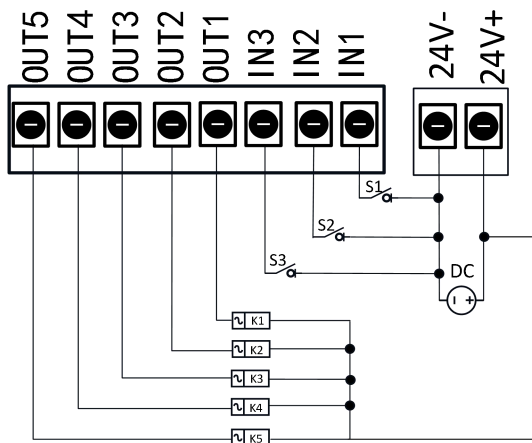
I0 Input	IN1	Switch quantity input 1	I1. Start
	IN2	Switch quantity input 2	I4. Stop
	IN3	Switch quantity input 3	I5. Zero
	IN4	Switch quantity input 4	I6. Clr alarm
	IN5	Switch quantity input 5	I3. Slow stop
	IN6	Switch quantity input 6	I7. Clamp/unclamp
	IN7	Switch quantity input 8	I12. Manual Disc

1.3.1.Sensor wiring method





1.3.2.Switching quantity wiring method



The external circuit driven by the following two points:

1. The external circuit should share with the controller;
2. When the external circuit is input at a low level, the input is valid, otherwise, the input is invalid.

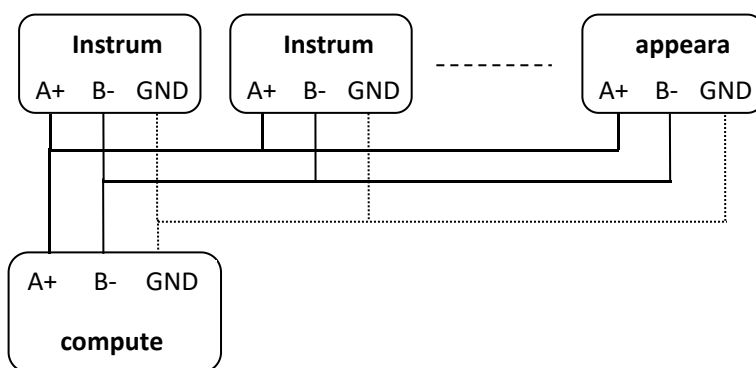
The external circuit driven by the output switching quantity should meet the following two main points:

1. The external circuit should share with the controller;
2. The switching output is low.

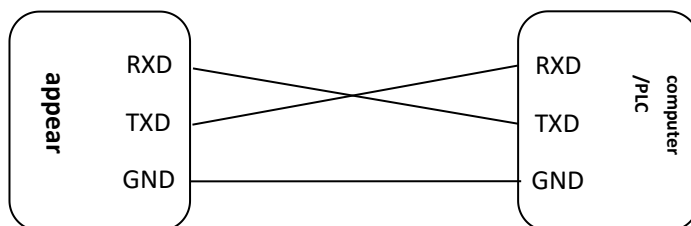
Note: The maximum driving capacity of each switching output port is 500 mA. Please pay attention to the power of the load when connecting the load. Over the driving capacity of the output port may cause damage to the switching output port.

1.3.3. Serial connection method

RS 485 Wiring signal:



RS 232 Wiring signal:

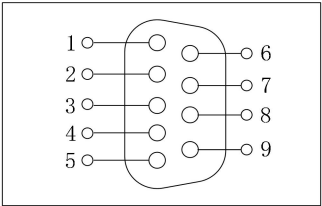


1.3.4. Simulation volume extension

The controller can choose analog volume function (the switching

volume extension cannot be selected), the interface form is DB9 plug, optional with analog volume, optional voltage or current can be selected through dialing switch, see Section 2.9 for related functions.

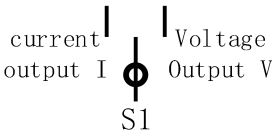
The interface is defined as follows:



DB9 pin	interface specification
No.1 pin	empty
No.2 pin	empty
No.3 pin	U 1+ /I1+
No.4 pin	empty
No.5 pin	empty
No.6 pin	empty
No.7 pin	empty
No.8 pin	U 1- /I1-
No.9 pin	empty

pay attention to:

Dial switch on the power board, change the output needs to dismantle the instrument, can be selected voltage or current output at the factory.



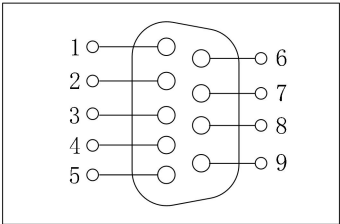
DIP switch Sketch

Analog expansion and switching expansion cannot be selected simultaneously.

1.3.5. Switch volume expansion

The controller can choose the switching volume expansion board (analog volume expansion cannot be selected at this time), and the interface form is DB9 plug, which can provide 3 in and 2 out switching volume interface. The controller can automatically identify the expansion board. When the switching volume expansion board is connected, the switching volume related function interface will automatically display the increased switching volume function definition.

The interface is defined as follows:

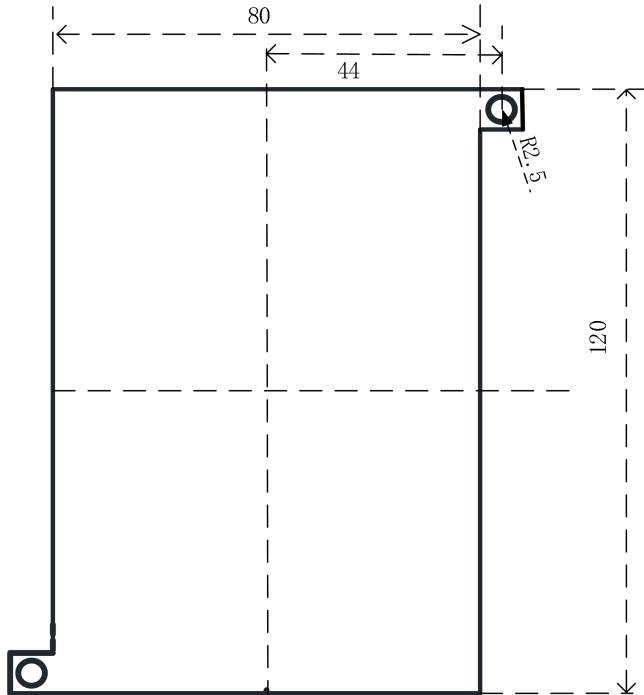


DB9 pin	interface specification
No.1 pin	empty
No.2 pin	empty
No.3 pin	IN8
No.4 pin	IN9
No.5 pin	IN10
No.6 pin	OUT13
No.7 pin	empty
No.8 pin	OUT14
No.9 pin	empty

pay attention to:

Switch volume expansion and analog volume expansion cannot be selected simultaneously.

1.4.installation size



The figure above is the bottom view of the product,
with data given in mm

II. Function menu



Under the standby interface to enter the function menu selection interface, and set and view the various function configuration of the controller. The main menu is shown in the table:

order	project	explain
1	calibration	Weight calibration for related operation.
2	weighing para	Weight acquisition and processing of the basic parameters.
3	scale para	Functional process controls the relevant parameters.
4	Recipe setting	And 20 sets of product formulation parameters.
5	AI packing	AI machine learning intelligent packaging function setting.
6	I/O	Switch volume function definition and port test.
7	ACC data	Cumulative data and preset batch viewing and setting.
8	Comm setting	Set the related parameters of the communication serial port.
9	analog	analog output range and calibration.
10	logic	Logical programming-related parameters.
13	system	Parameter reset and system language selection and version view.

Each project has a password function, you can choose whether to open the project into the password.

All passwords are factory default "000000".

2.1. Wt Calib

The related operation of weight calibration in the project, the first installation of the product or the scale structure, such as the sensor or weighing platform, a weight calibration operation should be carried out to ensure the accurate weight display.

order number	parameter	explain	starter
1.1	unit	①g/②kg/③t/④lb; Select the unit for the system weight display.	②kg
1.2	point	①0/②0.0/③0.00/④0.000/⑤0.0000 Select the decimal number for the system weight.	③0.00
1.3	Min-Div	①1d = 1/②1d = 2/③1d = 5/④1d = 10/⑤1d = 20/⑥1d = 50 Select the minimum separation value displayed by the system weight.	①1d = 1
1.4	Max range	Set the maximum weighing range. If the weight exceeds the set maximum range, the weight overflows "OFL"	100.00
1.5	Loadcell Vol	Displays the voltage signal size of the current sensor input. ADOFL Or ADOFL means that the current sensor signal is abnormal.	
1.6	Zero clb	 Empty the scale table zero according to confirmation.	
1.7	Gain clb	Place objects with known weight on the weighing platform for gain calibration.	

		 Enter the exact weight of the put object after confirmation.	
1.8	PSW Set		
1.8		Password modification needs to enter the same password twice to modify successfully.	

2.1.1. Weight calibration process

1. Set the weight decimal point, unit, minimum scale, maximum range and other parameters used by the system.
2. Zero point calibration.

Enter the [1.6 point] interface, as shown in the figure below:



The main display of the voltage size of the current sensor, empty the scale table, wait for the displayed sensor voltage value to stabilize, press the confirmation key to complete the zero calibration, and set the current sensor voltage signal size to

zero calibration. 

3. Gain calibration.

Enter the [1.7 Gain calibration] interface, as shown in the figure below:



For the voltage of the current sensor relative to the zero point, put the weight on the weighing table and wait for the displayed voltage value to stabilize, press the confirmation key. 

Input Wt
000.000 kg
SV:002.203

 After inputting the weight in the outgoing interface, press the confirmation button to complete the gain calibration, and automatically perform the gain calibration of the relative zero voltage and the input weight.

2.1.2. Quick calibration zero point

 In the stop state, press the controller key for about 3s, release the buzzer sound, and quickly set the current state to zero.

Note: The quick weight needs to be stable at zero point.

2.1.3. Calibrate matters needing attention

1. For zero calibration and gain calibration, if the sensor voltage shows A DOFL, the signal of the current sensor is abnormal. Check whether the line connection and installation of the sensor are normal and whether the sensor is damaged.
2. When zero calibration and gain calibration, the displayed sensor voltage is stable, check whether the sensor line connection and installation is normal, and whether the sensor is damaged.
3. Zero point calibration and gain calibration support manual input

of the sensor voltage value for calibration, just need to prompt the button according to the calibration interface. 

2.2. Weighing parameters

The project sets the parameters of weight signal acquisition and processing functions.

order number	parameter	explain		starter
2.1	Weighing			
2.1.1	Zero Track	0~9d, If only in the stop state, the weight value is automatically reset within the positive and negative range of this set value d (minimum dividing value).		0
2.1.2	Zero range	0~99%, When the reset operation is performed, the weight should be less than or equal to the "maximum measuring range zero range".		10%
2.1.3	Stab range	1~9d	These two parameters work together to determine whether the weight is stable. Taking all the weight values in the "stability time", the difference between the maximum value and the minimum value is less than or equal to the "stability range", the weight value is considered to be stable.	2d
2.1.4	Stab time	0.01~9.9s		0.8

2.1.5	Filter	0~9; The strength level of the software digital filtering, and set the appropriate filter level parameter value according to the actual debugging effect of the equipment. 0: the weakest filter, fast weight response, poor anti-vibration effect; 9: The strongest filter, slow weight response, good anti-vibration effect.	5
2.1.6	Disc filter	0~9; Software digital filtering strength rating at unloading status.	2
2.1.7	Power zero	① OFF/② ON After opening, the controller will automatically perform a zero-clearing operation each time it is turned on.	① OFF
2.2	Password		
2.2.1	switch	① OFF/② ON Select the password switch for the item.	① OFF
2.2.2	modify	Password modification needs to enter the same password twice to modify successfully.	

2.3. Scale parameters

All parameters related to the device process control function are set in the project.

2.3.1. Work Mode

The functional parameters of the packing scale can be set.

order	parameter	explain	starter
3.1	Work mode		
3.1.1	work mode	① [Non-Hopper]	② [Hopper]

		② [Hopper] ③ [valve] ④ [VSP] ⑤ [Bottom filling] ⑥ [NON-Hopper Exh] See Chapter III for workflow description of different working modes.	
3.1.2	Feed mode	① [Independent]: Fast: the projection signal output is effective. Medium speed: the CIC signal output is effective. Slow speed: the slow shot signal output is effective. ② [Combination]: Fast: fast ,med and slow projection signal output is effective. Med: med and slow projection signal output is effective. Slow: the slow signal output is effective.	② [Combination]
3.1.3	Scale Num	0~7, For the priority setting in multi-scale composite packaging.	0
3.1.4	Zero Intvl	0~99; After each packing process, clear zero before packing starts. Note: The first scale is not cleared after starting.	0
3.1.5	Stop Clamp	Set the pocket mechanism processing mode after turning these devices to a stop state: ① [Ignore]: Do not control the action of	① [Ignore]

		the clamp bag mechanism after stopping, and keep the state before stopping. ②[Unclamp]: keep the bag mechanism in pine bag state after stopping. ③[Clamp]: keep the pocket mechanism in the pocket state after stopping. Note: valve scale mode, this function does not work.	
3.1.6	Pack Mode	This function is effective in no relevant working mode. ① [Gross]: do not peel before adding. ② [Net]: Put on the tare before feeding.	② [Net]
3.1.7	Ctr Unclamp	This function is effective in no scale, super fine powder and Exh mode. ① [Manual]: After the packaging is completed, the "I7 clamp / loose bag" signal should be manually entered before releasing the loose bag. ② [Auto]: Automatic pine bag after packaging.	② [Auto]
3.1.8	All Unclamp	Set whether loose bags are allowed at runtime. ① [Off]: respond to loose bag signal. ② [On]: When running, the input loose bag signal controller will perform the loose bag action and return to the waiting pocket state. Note: This function only works in Non-Hopper.	①[off]

3.1.9	Tare Max	Tare detection function. Set to the net heavy packing, after running the bag in Non-Hopper, the controller will detect the "current weight of the current weight" is considered normal tare weight; otherwise it will prompt "abnormal tare weight" for manual treatment.	0
3.1.10	Tare Min	Close the tare weight detection function when all the epithelial weight and subcutaneous weight are set to 0. Note: This function only works in Non-Hopper.	0
3.1.11	Tare Reme	No tare and heavy memory function. 3.1.6 choose Net mode, during the operation process, the peeling and memory tare will be stopped. If the device does not loose the bag, the above secondary peeling and weight memory value will be peeled again. Note: This function only works in Non-Hopper.	① [off]

2.3.2.Sew/Cut

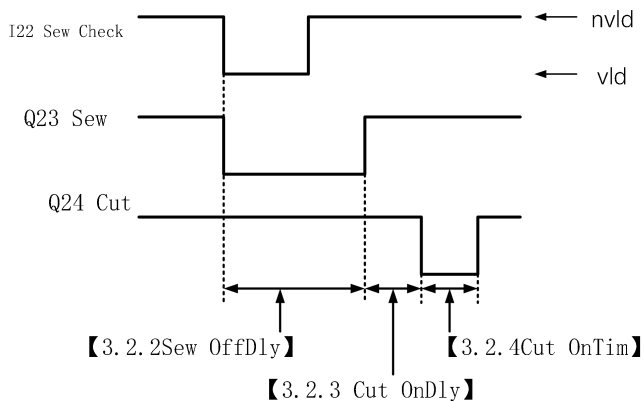
The controller has the function of sewing and tangent control, and can control the sewing and tangent action of the sewing plane. The relevant function parameters are as follows:

number	parameter	explain	starter
3.2	Sew/Cut		
3.2.1	Sew Mode	① [Timing Sew On]: When the "I22 Sew Check " signal input is valid,	② [Timing

		output the "Q23 seam packet output" signal and start the [3.2.2 Sew OffDly], and close the "Q23 Sew " signal after the delay time reaches. ② [Timing Sew Off]: start the "I22 Sew Check " signal output when the "I22 Sew Check " signal input is valid, detect the "I22 Sew Check " signal input is invalid [3.2.2 Sew OffDly], and close the "Q23 Sew " signal after the delay time. See Section 2 for detailed procedures2.3.2.1	Sew Off]
3.2.2	Sew OffDly	0~99.9s;Invalid seam packet signal output after this delay has ended.	4.0
3.2.3	Cut OnDly	0~99.9s;Start this delay after the sewing package, and output the "Q24 tangent output" signal after the delay.	0.2
3.2.4	Cut OnTime	Output time of the "Q24 tangent output" signal. If there is a defined "I21 tangent" signal, the "I21 tangent" signal is valid at the tangent output.	1.5

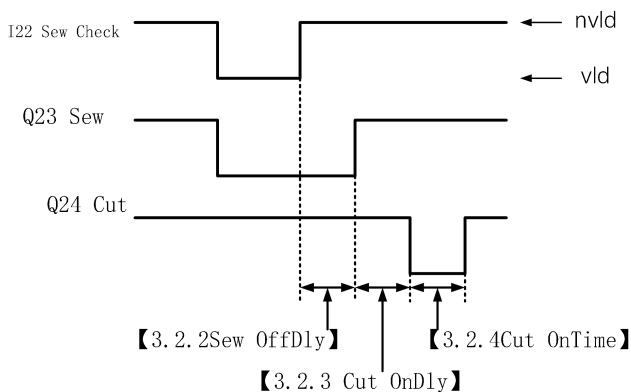
2.3.2.1. Details of the sew and cut function

- 3.2.1[Sew mode] is set to ① [start time], and the signal timing diagram of the packet tangent function is as follows:



【3.2.1Sew Mod】①tim-start

2. [3.2.1 Timing mode] set to ② [End timing], the signal timing diagram of packet tangent function is as follows:



【3.2.1Sew Mod】①tim-stop

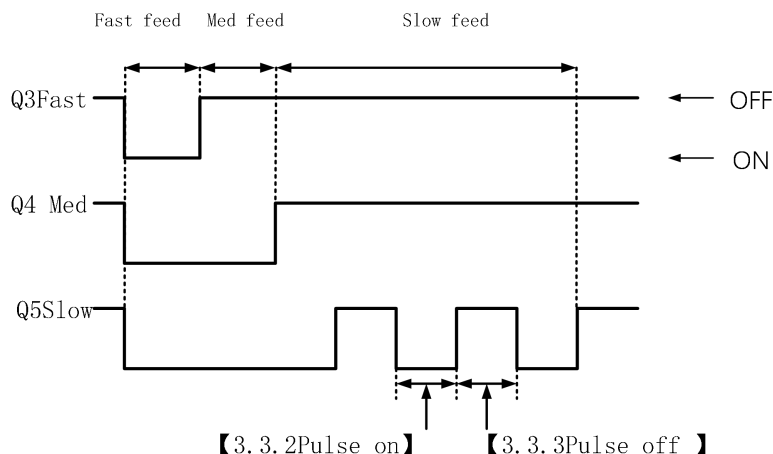
2.3.3. Slow plus

The slow dot movement function can control the slow dot output signal in the form of pulse dot movement to control the feeding.

number	parameter	explain	starter
3.3	Slow Pulse		
3.3.1	Pulse Func	① Off: "Q5 slow" signal will be output in normal level. ② ON: the "Q5 slow" signal will be output in the form of pulse dot movement. Note: The slow movement function only works during slow feeding (only the slow drop signal output).	① OFF
3.3.2	Pulse On	0~99.9s;Effective time of slow output pulse dot.	0.5
3.3.3	Pulse Off	0~99.9s;Invalid time of the slow projection output pulse dot movement.	0.5

2.3.3.1. Detailed drop movement function

The slow drop movement function only works in the slow feeding process. The following figure shows the output sequence of the feeding signal when the parameter [3.1.2 feed output] is set to ② [combined feed].



2.3.4. Disc shake

Disc vibration, function in the bucket, scale mode.

When there is a bucket scale packaging liquidity is not very good or has a certain sticky material, there may be viscose when unloading, resulting in some materials can't be normally released from the weighing bucket.

The discharge vibration function can detect when the discharge timeout occurs, the corresponding vibration signal to control the vibrator or air hammer, and the symmetrical heavy bucket for vibration, so as to achieve the purpose of the material attached to the weighing bucket.

Setting [3.4.5 Shake Out] to ① [discharge] can also realize the function of material vibration attached to the weighing bucket by directly controlling the opening and closing of the discharge door.

The relevant parameters of the discharge vibration function are set as follows:

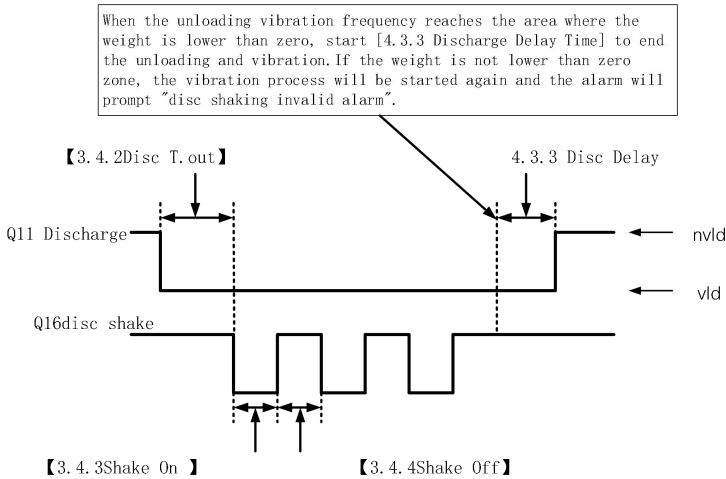
order	parameter	explain	starter
-------	-----------	---------	---------

3.4	Disc Shake		
3.4.1	Shake Num	0~99; Number of output of discharge vibration signal. After the number of unloading vibration, if the current weight is lower than 4.2.5Disc zero], end the vibration, and the unloading will end after starting [4.3.3 unloading delay]. After the number of discharge vibration, if the current weight is not lower than [4.2.5Disc zero], then alarm "discharge vibration invalid alarm", and continue to open the next round of vibration cycle process. When the unloading vibration function is closed when the discharge vibration number is set to 0.	0
3.4.2	Disc T.out	0~99.9s;This time is started at the beginning of unloading. If the unloading is still not completed after this time (the weight is not lower than [4.2.5 Disc zero]), the unloading is considered overtime and the unloading vibration output is started.	0.5
3.4.3	Shake On	0~99.9s; Shake vibration signal output effective time.	0.5
3.4.4	Shake Off	0~99.9s; Shake vibration signal output invalid time.	0.5

3.4.5	Shake Out	① [Discharge]: directly control the "Q11 Discharge " signal, by controlling the unloading door switch to vibration the material. ②[Disc Shake]: output "Q16 discharge vibration" signal when unloading vibration, through the control vibrator or air hammer and other devices to vibration the material.	② [Disc Shake]
-------	-----------	---	----------------

2.3.4.1. Discharge vibration function details

The timing diagram of the discharge vibration function signal is as follows:



2.3.5. Belt / coding

Belt function: can control the start and stop of the conveyor belt in the equipment and use for transporting the material bag after the package is completed.

Code function: used to control the coding machine, the output coding control signal will print the coding on the bag.

The relevant parameters are as follows:

order number	parameter	explain	starter
3.5	Belt / coding		
3.5.1	Belt OnDly	0~99.9s;Start the delay time of belt conveying, start this time after the loose bag, and output the "Q18 belt" signal to control the rotation of the conveyor belt.	0.5
3.5.2	Belt On	0~99.9s; Duration after the Q18 Belt " signal is output. Note: When the time is set to 0, the "Q18 belt" signal will always output effectively after the instrument runs, making the belt rotate all the time.	0
3.5.3	Code Func	Code the function switch. ① OFF/② ON	② ON
3.5.4	Code OnDly	0.0~99.9s;When moving the bag this delay, the delay time to the output "Q35 coding function" signal control code coding.	0.5
3.5.5	Code On	0.0~99.9s;Duration of the "Q35 coding function" signal output.	1.0

2.3.5.1. Detailed description of the belt function

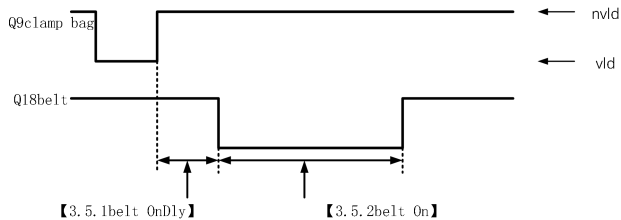
The belt control function can be divided into two modes according to

the parameter setting of [3.5.2 Belt On]:

1. Single delivery mode ([3.5.2 Belt On] set not 0)

When operating in this mode, when the loose bag starts [3.5.1 Belt OnDly], after the delay time, output the "Q18 belt" signal to control the "Q18 belt" signal output after the [3.5.2 Belt On].

The signal timing is as follows:

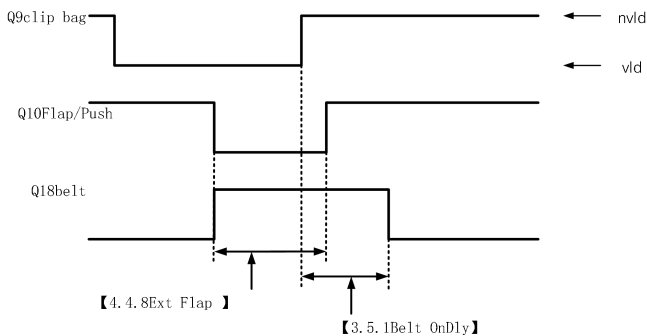


2. Continuous operation mode ([2.5.2Belt On] is set to 0)

When operating in this mode, the Q18 Belt signal is always valid. Only when the "Q10 Pack / push the bag "function is opened, the " Q10 Pack / push the bag "signal is output and the [4.4.8 extra bag] is executed, the " Q18 bag "signal is closed. When the loose bag, the [3.5.1 Belt OnDly] is started, and after the delay time, the " Q18 belt " signal is output to control the rotation of the conveyor belt.

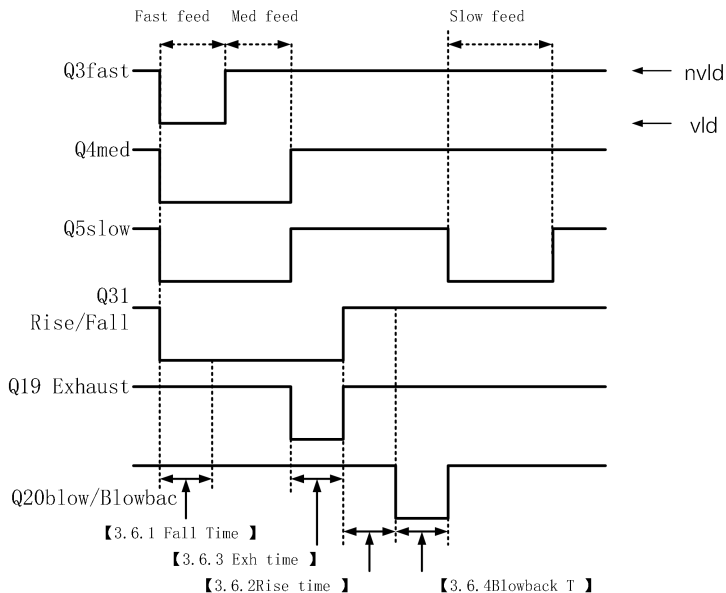
The signal timing is as follows:

When the suction rod cylinder falls.



2.3.5.2. The code-typing function is a detailed description

The coding function is started each time, and the "Q35 coding function" signal control coding machine is output. The signal timing diagram of the coding function is as follows:



2.3.6. VSP Exhaust

[3.1.1 Working mode] This function works when set to ④ [Powder] or ⑥ [bucket Exh]. Often used in the packaging equipment of ultra-fine powder materials, can control the lifting of the suction rod cylinder, pumping and back and other actions.

The relevant parameters are as follows:

order number	parameter	explain	starter
3.6	VSP Exhaust		
3.6.1	Fall Time	0.0~99.9s	1.0
3.6.2	Rise Time	0.0~99.9 s;When the suction rod cylinder rises.	0.8
3.6.3	Exh Time	0.0~99.9 s;Duration of the pumping action.	0.5
3.6.4	Blowback T	0.0~99.9s;Duration of the backaction.	0.5
3.6.5	Rise Bef	00~99.9s;Delay time before the pump cylinder.	0
3.6.6	Blow Bef	0~99.9s;The delay time before the backward blowing action.	0.8
3.6.7	Cylinder D	① [Feeding start]: The cylinder falls when the feed begins. ② [Air Pump Start]: The cylinder starts to fall before the pumping starts	①[Feeding start]
3.6.8	Exh East	End the pumping switch After opening, after the end of the investment, execute the pumping action process.	off
3.6.9	Exh Mid	The CIC ends the pumping switch After opening, after the end of the CIC, perform the pumping action process.	off
3.6.10	After Fee	End the pumping switch After opening, after the end of	off

		the fixed value, perform the pumping action process.	
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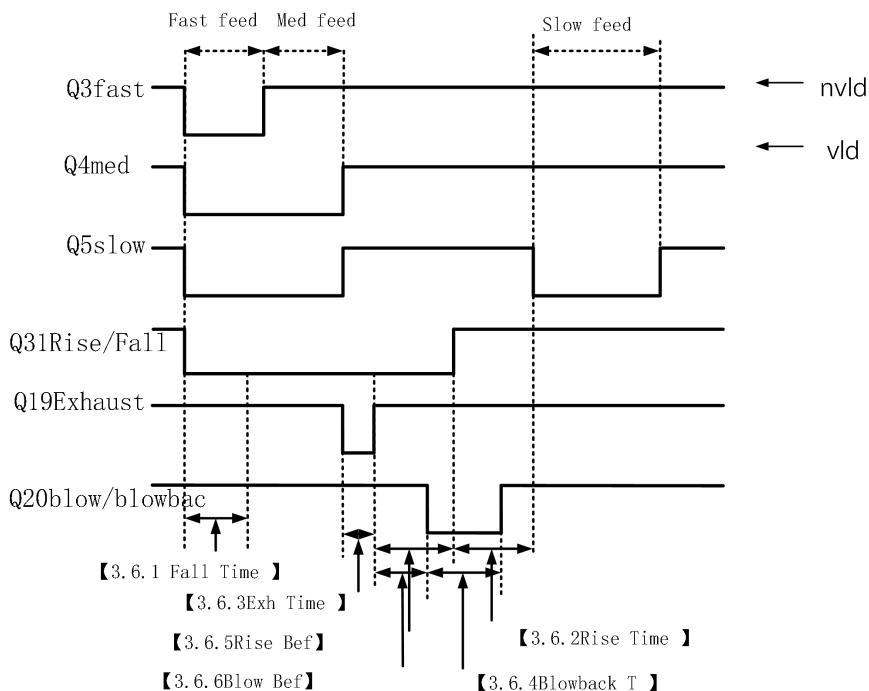
2.3.6.1. Ultra-fine powder, pumping function in feeding, explained in detail

In the working mode of super fine powder, close [3.6.8 major investment end pumping], open [3.6.9 Exh Mid] and [3.6.7 Cylinder D] select ① [feeding start] as an example, explain the pumping action process in detail

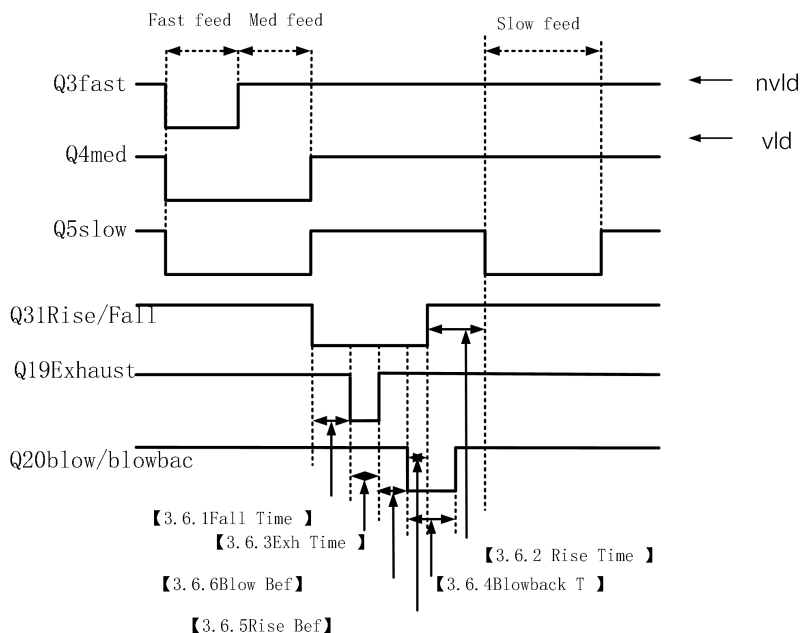
1. .6.1 After operation, when the fast feeding starts (large, medium and slow projection output is effective), start [3 drop cylinder time] timing, and output the "Q31 Rise/Fall " signal at the same time to control the descent of the suction rod cylinder, and extend the suction rod into the packaging bag.[3.6.1 Fall Time] to the cylinder drop is complete.
2. After the end of the middle speed feeding (the end of the med), stop the feeding, start [3.6.3 pumping time] time, and output the "Q19 pumping" signal at the same time, control the pumping rod, [3.6.3 pumping time], then close the "Q19 pumping" signal, end the pumping action.
3. At this time, start [3.6.5 Rise Bef] and [3.6.6 Blow Bef], [3.6.5 Rise Bef] and open [3.6.2 Rise Time] at the same time, and close the "Q31 Rise/Fall " signal at the same time to control the rise of the pumping rod cylinder. [3.6.6 Blow Bef] to open [3.6.4 reverse time] time, and output the "Q20 Blow / blowback " signal at the same time, control the suction rod back, [3.6. 4 reverse time] to close the "Q20 Blow / blowback " signal, and end the reverse action. [3.6.2 Rise Time] The cylinder rise is considered to be complete.

4. After the cylinder rises, start the slow feeding (the slow output is effective) and continue to finish the material.

The timing diagram of the extraction function in superfine powder feeding is as follows:



When the working mode of ultra fine powder, close [3.6.8 Exh East], open [3.6.9 Exh Mid] and [3.6.7 Cylinder D] select ② [pumping start], at this time, the timing diagram of pumping function in the ultra fine powder feeding is as follows:



If opening [3.6.8 Exh East], please refer to the opening [3.6.9 Exh Mid] process.

2.3.6.2. Holding in VSP, pumping function in detail

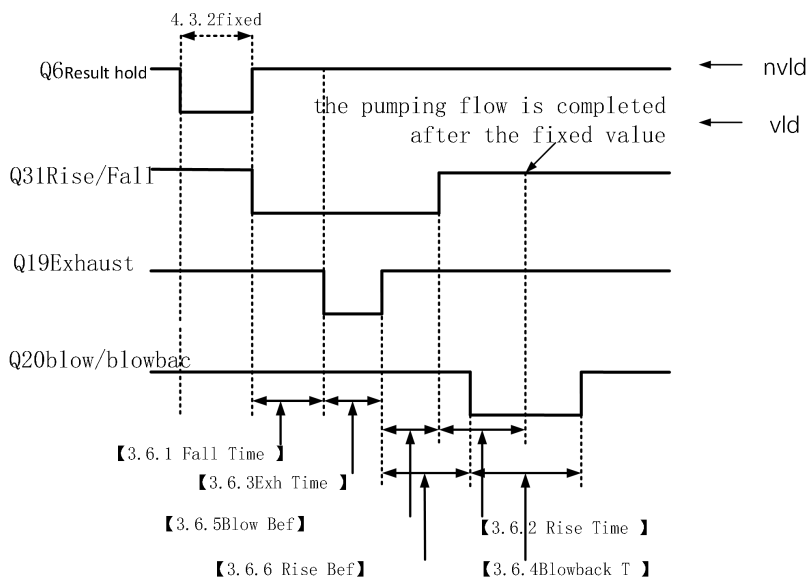
The following takes the working mode of VSP, opens [3.6.10 After Fee] as an example to explain the pumping action process in detail:

1. After the fixed value, start [3.6.1 Fall Time] time, and output the "Q31 Rise/Fall " signal at the same time to control the pumping rod cylinder drop and extend the pumping rod into the packaging bag.[3.6.1 Fall Time] to the cylinder drop is complete.
2. After the cylinder drops, start [3.6.3 pumping time], and output

the "Q19 pumping" signal at the same time to control the pumping rod, [3.6.3 pumping time] and then close the "Q19 pumping" signal to end the pumping action.

3. At this time, start [3.6.5 Rise Bef] and [3.6.6 backward blowing front delay], [3.6.5 Rise Bef] and open [3.6.2 Rise Time] at the same time, and close the "Q31 Rise/Fall " signal at the same time to control the rise of the pumping rod cylinder.[3.6.6 reverse before delay] to open [3.6.4 reverse time] time, and output the "Q20 Blow / blowback " signal at the same time, control the suction rod back, [3.6.4 reverse time] to close the "Q20 Blow / blowback " signal, and end the reverse action.[3.6.2 Rise Time] The cylinder rise is considered to be complete.
4. After the cylinder rises, the pumping function is completed after the fixed value, and the follow-up process such as patting bag and loose bag is started.

The timing diagram of the pumping function of ultra-fine powder after fixed value is as follows:



2.3.7. Lift Tab

3.1.1[Working mode] When set to ⑤ [no bucket charge], this function works. It is often used in the equipment that needs to be inserted into the bottom of the bag for feeding. Before the feeding starts, raise the pocket bracket, the feeding port is inserted into the bottom of the bag, and the pocket holder bracket slowly drops during the process of feeding.

The relevant parameters are as follows:

number	parameter	explain	starter
3.7	Lift Tab		
3.7.1	Lift Ctrl	① [Air]/② [two Motor Limit]/ ③[two air limit] See Section 2 for detailed functional	② [two Motor Limit]

		description..3.7.1	
3.7.2	rise time	0~99.9s; [3.7.1 lift Ctrl] works when set to ① [Pneumatic-infinite]. After this time.	5.0
3.7.3	Fall time	0~99.9s;[3.7.1 lift Ctrl] works when set to ① [Pneumatic-infinite]. When the stent drops, the decrease is considered complete after this time.	5.0
3.7.4	Rising time	0~99.9s; [3.7.1 lift Ctrl] is set to function when ② [Two Motor Limit] or ③ [two air limit]. If the "I30 Rise Limit" is not valid after the stent rises after this time, the alarm "stent rises timeout". When the timeout is set to 0, the timeout detection and alarm function is turned off.	0
3.7.5	Fall T.out	0~99.9s; [3.7.1 Lift Ctrl] is set to function when ② [Two Motor Limit] or ③ [two air limit]. If the "I31 Fall Limit " is not valid after this time, the alarm "stent Fall timeout". When the timeout is set to 0, the timeout detection and alarm function is turned off.	0
3.7.6	Lift Auto	① [OFF]: After the clamp bag is completed, the signal of "I29 L / drop bracket" needs to rise manually, and the signal of "I29 L / drop bracket"	② [Automatic rise and automatic

		starts to drop manually. ② [Auto rise and fall]: After the clamp bag is completed, the bracket rises automatically, and the bracket automatically drops after feeding. ③ [Auto rise man fall]: After the clamp bag is completed, the bracket will automatically rise, and the signal of "I29 1 / drop bracket" will start to drop manually. ④ [Man Ris Aut Fa]: After the clamp bag is completed, it is necessary to manually give the bracket rising signal, and the bracket will automatically drop after starting feeding.	fall]
3.7.7	Auto Rise	0~99.9s;Delay time before the stent automatically rises.	0.5
3.7.8	Auto Fall	0~99.9s;Time-lapse time before the automatic descent of the stent.	0.5
3.7.9	Fill Wt	Set the parameter to the added weight per second to determine whether the material is adding. If the bracket is set to drop drop and this parameter is not set to 0, the meter will determine if the second weight increase is greater than this parameter. If this parameter is greater, the stent is considered fed and begins to drop automatically; if less, the feeding is considered absent (possibly material shortage), the stent is suspended	0

		until the stent starts to drop again after a normal weight increase is detected. When set to 0, the feeding judgment function is turned off.	
3.7.10	Stop Lift	① [Ignore]: Do not control the support mechanism after stopping and maintain the state before stopping. ② [Fall]: Put the stent in the down state after stopping. ③ [Rise]: Keep the stent in the ascending state after stopping. ④ [Pause]: pause the stent action after stopping.	④[Pause]

2.3.7.1. Details of the bracket lift function

According to the setting of [3.7.1 Lift Ctrl], the process of bracket lifting is mainly the following three kinds:

① [Air]: The bracket lifting is controlled by pneumatic signal.

The signal output of "Q31" Rise/Fall is effective, and the bracket rise is controlled. After [3.7.2 rise time], the bracket rise is considered to be finished.

During the drop, the signal output of "Q31 Rise/Fall " is invalid, and the control bracket is reduced. After [3.7.3 Fall time], the bracket drop is considered to be completed.

② [Two Motor Limit]: The bracket lift is controlled by electric signal, and the upper and lower two limit signals need to be input to the instrument to judge whether the bracket is rising and falling in place.

When rising, the "Q33 Rise(Motor)" signal output is

effective, the bracket rise is controlled, the "I30 Rise Limit" signal is effectively detected, and the "Q33 Rise(Motor)" signal output is closed.

During the drop, the signal output of "Q34 Fall(Motor)" is effective, and the bracket drop is controlled, and the "I31 Fall Limit " signal is detected and the drop is complete, and the signal output of " Q34 Fall(Motor)" is closed.

③ [Two air limit]: the bracket lifting is controlled by pneumatic signal. And the upper and lower two limit signals need to be input to the instrument to judge whether the bracket is rising and falling down in place.

When the signal output of "Q31 Rise/Fall " is effective, the control bracket is used to rise, and the detection of "I30 Rise Limit" signal is valid, and the rise is completed.

During the drop, the signal output of "Q31 Rise/Fall " is invalid, and the control bracket is down, and the "I31 Fall Limit " signal is effectively detected.

2.3.8. Material level

Set the functional parameters related to level signal input and feed output.

order number	parameter	explain	starter
3.8	Material Level		
3.8.1	Supply Mode	①[None]: no material position. ②[Only]: There is 1 material level (cutting level). ③[Up & lower]: there are 2 material positions (feeding level, feeding level).	① [None]

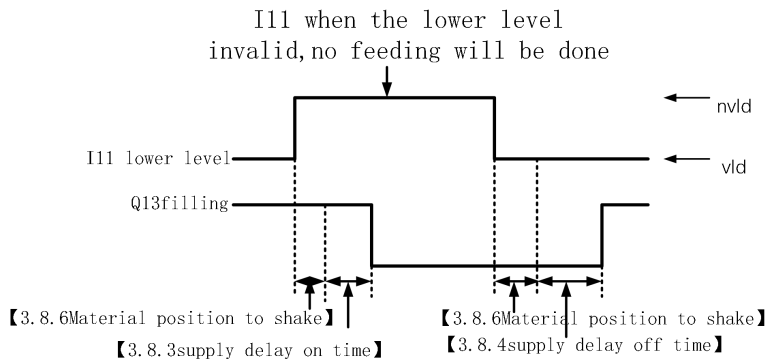
		④ [Only Upper]: There is 1 material level (feeding level). Note: If the mode including the feeding level is selected, the feeding will not start when the feeding level signal input is invalid.	
3.8.2	Supply Tri	① [Off]: Turn off the feed supply and output function. ② [lower trigger]: The feeding function is triggered when the signal input of "I11 Lower level" is invalid. ③[upper trigger]: I9 Upper level when the input is invalid. Note: When the feed level mode is [upper and lower feed level], the feed output continues until the feed level signal is valid.	①[Off]
3.8.3	Supply On	After the feed function is triggered, output the "Q13 Supply Fill" signal after delaying this time.	0
3.8.4	Supply Off	After the feeding, close the "Q13 Supply Fill" signal output after delaying this time.	3.0
3.8.5	Supply time	①[run & stop]/②[Only run].	① [run & stop]
3.8.6	In Debounc	0~9.99s;The shaking time of the signal input of " I9 Upper level " and "I11. lower level". The signal is considered valid after the continuous duration of this time;	0.50

		The continuous invalid signal is considered invalid after this time. Prevent interference from occasional instantaneous signal interruption or conduction.	
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2.3.8.1. Detailed specification of the feed supply function

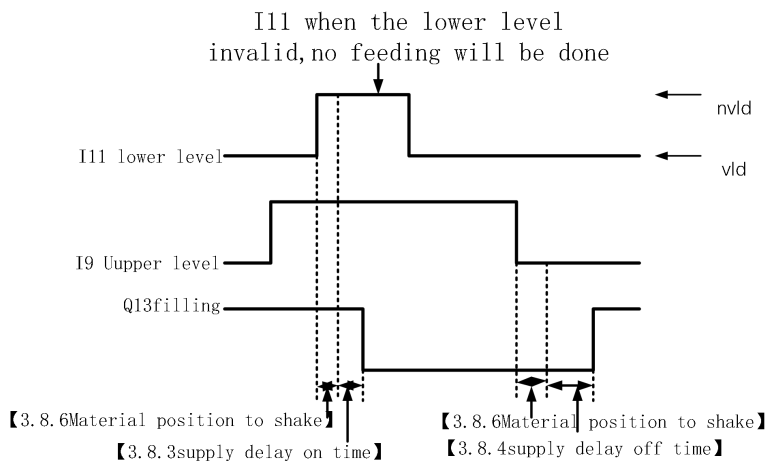
1. Material level mode: single feed level; feed trigger: feed level trigger.

The timing diagram is as follows:



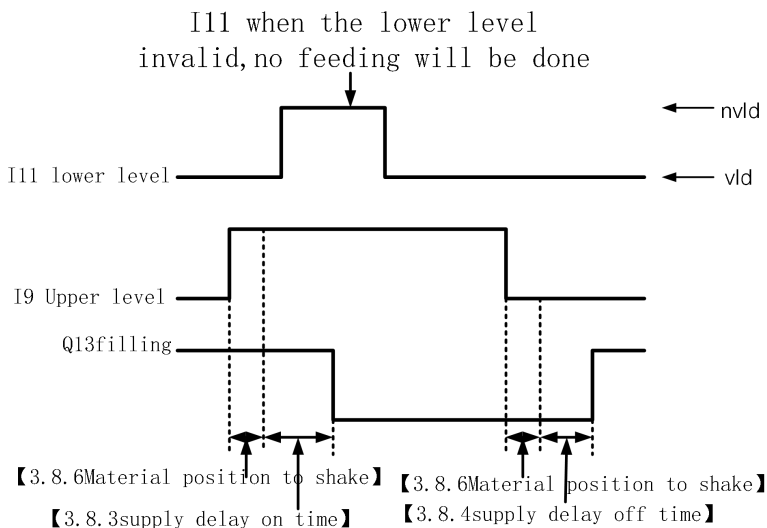
2. Material level mode: upper and lower material level; feeding trigger: lower feeding level trigger.

The timing diagram is as follows:



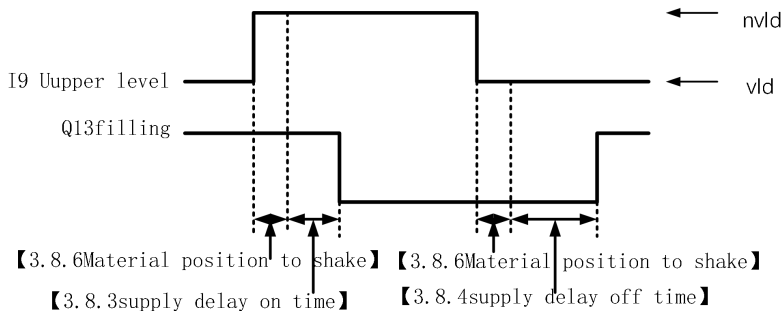
3. Material level mode: upper and lower material level; feed trigger: feeding level trigger.

The timing diagram is as follows:



4. Material level mode: single loading level; feed trigger: loading level trigger.

The timing diagram is as follows:



2.3.9. Parameter password

Set the password switch and password for the entry control parameters.

order	parameter	explain	starter
3.9	password		
3.9.1	switch	① Off/② On Select the password switch for the item.	① off
3.9.2	modify	Password modification needs to enter the same password twice to modify successfully.	

2.4. Recipe setting

The controller has 20 sets of formula parameters to be set. Users can set the commonly used formula parameters in advance and switch to the corresponding formula number when using them.

2.4.1. Recipe

Sets the currently selected formula number.

order	parameter	explain	starter
4.1	Recipe		

4.1.1	Rec Num	Set the recipe number currently used.	1
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2.4.2.target value

This interface sets the formula parameters, such as the target value of the formula number.

order	parameter	explain	starter
4.2	target		
4.2.1	target	Set the target weight for the package.	0
4.2.2	Fast feed	When the value $\geq$ target value-Fast feed, close the fast output; When set to 0 indicates that the output process is not started.	0
4.2.3	Med feed	When the value $\geq$ target value- Med feed ;close the med output When set to 0, the med process is not started.	0
4.2.4	Slow feed	When the value $\geq$ target value-slow feed value, close the slow drop;	0
4.2.5	Disc zero	[3.1.1 Working mode] function when set to ② [Hopper]. When the bucket scale is unloaded, when detecting the zero area value of the current weight unloading, it considers that the unloading has been completed and prepares to close the unloading door.	0
4.2.6	Scale Cmb	[3.1.1 Working mode] function when set to ② [Hopper].	1

		Set a number of times to unload, that is, discharge several times to loose a bag. When set to 0, it does not judge whether the clamp bag is directly unloaded after the filling is completed.	
4.2.7	Fast DLY	0~99.9s; During the vibration elimination time at the beginning of the overshoot, during which fast signal is always effective and not affected by the weight. Only after the end of the time to determine whether the weight reaches the fast amount to end the overshoot.	0.5
4.2.8	Med DLY	0~99.9s; The vibration elimination time at the beginning of the Med feed, during which the Med is valid and not affected by the weight, starts at the end of the time to end the CIC.	0.5
4.2.9	Slow DLY	0~99.9s; During the vibration elimination time at the beginning of the slow, the signal of the slow is not affected by the weight. After the end of the time, whether the weight reaches the slow feed to end the slow.	1.4
4.2.10	Feed speed	① [fast/slow]: fast and slow casting to achieve two material speed feeding.	③ [Three-speed]

		② [med/slow]: med and slow to achieve two material investment speed feeding. ③ [Three speed]: fast, med and slow investment to achieve three material speed feeding.	
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2.4.3. Time setting

Set the relevant time parameters during the feeding process.

order	parameter	explain	starter
4.3	Time set		
4.3.1	Feed Delay	0~99.9s; Delay time before the start of the feeding.	0.5
4.3.2	stabilisation	0~99.9s; Wait time after the current weight record.	1.0
4.3.3	Disc Delay	0~99.9s;. [3.1.1 Working mode] function when set to ② [Hopper]. When the bucket scale is unloaded, when the current weight [4.2.5Disc zero] is detected, the unloading has been completed, the discharge delay is started, and the unloading door is closed after the time reaches.	0.5
4.3.4	Clamp DLY	0~99.9s; [Q9 clamp bag] After the signal output is effective, the clamp bag action is completed after the delay of this time, and the subsequent process can be started, such as adding (Non-Hopper) or	0.5

		unloading (Hopper), etc.	
4.3.5	Unclamp DLY	0~99.9s;Delay time before the automatic loose bag.	0.5
4.3.6	End delay	0~99.9s;After the loose bag action is completed, start the delay, and do not respond to the [I7 clamp / Unclamp] input signal during the delay time.	0.5

2.4.4. Pack setting

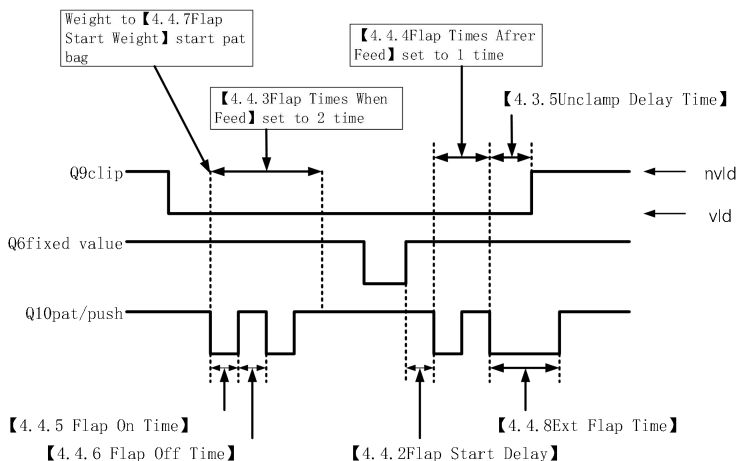
Set up the racket bag action-related functions.

order	parameter	explain	starter
4.4	Flap		
4.4.1	Check Func	① [Off]: Close the pat bag function. ② [Feeding]: only beat the bag in the feeding. ③ [After feeding]: only beat the bag after the fixed value. ④ [All]: beat the bag after adding the ingredients and determining the value.	① [off]
4.4.2	Flap start	0~99.9s;The delay time before the start of the beat bag function after the fixed value.	0.5
4.4.3	Flap feed	0~99;Number of pulses of the beat bag signal output by the beat bag function in the feeding.	0
4.4.4	Flap after	0~99;The number of pulses of the bag signal that is output of the bag	4

		function after fixed value.	
4.4.5	Flap On	0~99.9s;Effective time of the beat bag to output the pulse signal.	0.5
4.4.6	Flap OFF	0~99.9s;Invalid time of the beat bag to output the pulse signal.	0.5
4.4.7	Start WT	In the process of feeding, after the starting weight of the current weight, start the function.	0
4.4.8	EXT Flap	0~99.9s; After the completion of the bag times, the output of the bag signal time, this time and the [4.3.5loose bag before delay] at the same time, often used in the pier bag function, the time setting is longer than the [4.3.5 loose bag before delay] to achieve the bag down, first loose bag and then lift the bag.	0

2.4.4.1. Pack bag function, detailed description

Taking the no-scale mode as an example, the signal timing diagram of all the bags after feeding and fixed value is as follows:



2.4.5. Over/under detection

Excessive difference is a combination of excess or poor. In the packaging process, when the packaging result is above a certain range of the target value, it is considered poor, while below a certain range is considered poor. This range is set according to the production demand.

order number	parameter	explain	starter
4.5	Over /under		
4.5.1	Check Func	① [off]/② [On]: After the end of each feeding, the feeding results will be detected.	① [OFF]
4.5.2	Check DLY	0~99.9s;After the delay of the feeding, the excess difference will be detected for the current weight to stabilize.	0.5
4.5.3	Over TOL	When the excess difference is detected, if the weighing result is>	0

		target value + Over TOL, it is judged as super difference;	
4.5.4	Under TOL	When the excess underbalance is detected, if the weighing value is <target value- Under TOL, it is judged as underbalance.	0
4.5.5	Pause	①[off]/②[On]: When it occurs, the controller will alarm and wait for the user to process. At this time, after clearing the alarm and continue to run, it can also give the "I4 stop" signal and return to the stop state for processing.	①[OFF]
4.5.6	Interval	0~9999;How many packages per interval for a excessive under detection. When set to 0, each package is under detection.	0

2.4.6. push bag of Valve scale

[3.1.1 Working mode] This function is valid when set to ③ [valve scale]. Set the push bag, bag and blowing material.

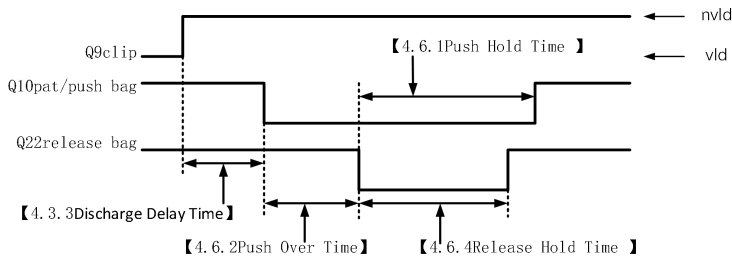
order number	parameter	explain	starter
4.6	Valve mouth scale push bag		
4.6.1	Push Hold	0~99.9s;Hold time after the push bag action is in place.	1.0
4.6.2	Push Over	0~99.9s;"Q10 Pack / push the bag " signal output, after this time that the push bag action has been in	1.5

		place. If the switching output defines "I18 push bag in place", the "I18 push bag in place" will immediately think that the push bag action has been in place.	
4.6.3	REL delay	0~99.9s;When the switch input defines "I9 Upper Level", and after the "I9 Upper Level" push bag is in place, the "signal is valid, so the material is blocked under the unloading mechanism, and the" Q22 Release Bag " signal is not output. When the "I9 Upper Level" signal is invalid, the "Q22 Release Bag " signal is output for bag removal.	1.0
4.6.4	REL Hold	0~99.9s;Duration time after " Q22 Release Bag " signal output.	1.5
4.6.5	Blow On	0~99.9s;When feeding the valve port scale, control the "Q20 Blow/Blowback" for pulse moving output according to the effective and invalid time of the set blowing point.	0.5
4.6.6	Blow off	0~99s.9;How many packages per interval for a excessive under detection. When set to 0, each package is under detection.	0.5
4.6.7	Valve zero	This parameter is not set for 0. After the "Q22 Release Bag " signal is output, check the weight is lower	0

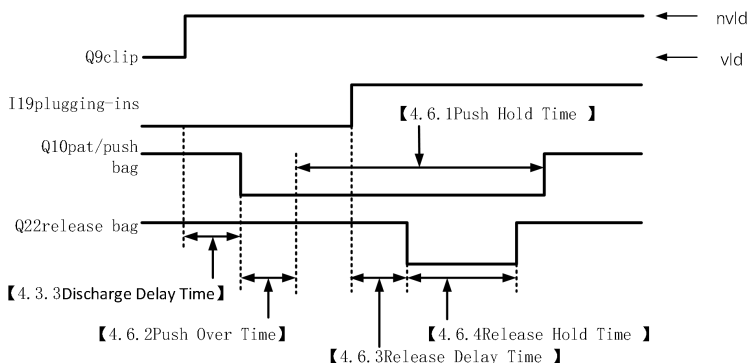
		than this parameter setting value. [4.6.4 REL Hold], and close the "Q22 bag unloading" signal after the time reaches. The weight value is not detected when this parameter is set to 0.	
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2.4.6.1. Push/blow bag

In the valve port scale mode, after the packaging is unpacked, start [4.3.3 Disc delay], and start the process of pushing the bag and unloading the bag after the time ends. The timing diagram of the push bag unloading signal is as follows: ([4.6.7 valve zero] is set to 0)



When the "I9 plugging detection" signal is defined and the "I9 plugging detection" input signal is valid during bag unloading, the signal timing diagram is as follows:



2.4.7. analog of feed

The analog output function should the analog output expansion.

When the controller is equipped with analog expansion, analog output can be used to control the feeding, large, medium and slow projection can correspond to three analog sizes, to realize the analog control of inverter frequency or vibration feeder output voltage, and feeding at different material speeds.

order	parameter	explain	starter
4.7	Feed analog		
4.7.1	Fast analog	0~100.000%; The size of the analog output.	0
4.7.2	Med analog	0~100.000% The size of the analog output in CIC.	0
4.7.3	Slow analog	0~100.000% The size of the analog output on slow shots.	0

2.4.8. Parameter password

Set the password switch and password to enter the recipe setting.

order number	parameter	explain	starter
4.8	Parameter password		
4.8.1	switch	① Off/② On Select the password switch for the item.	① off
4.8.2	modify	Password modification needs to enter the same password twice to modify successfully.	

Note: The percent of analog output set here is related to the [9.1.1Output Range] setting, such as:

[9.1.1 Output range] is set to 0~5V

[4.7.1 fast analog] was set to 80.000%

[4.7.2 med analog] was set to 40.000%

[4.7.3 Slow analog] was set to 10.000%

The simulated output is 4V when large feeding, 2V when feeding, 0.5V when slow feeding, and 0V when feeding is stopped.

2.5. AI packaging

The controller measurement and control research the AI intelligent packaging algorithm for the packaging process, which can collect the characteristic parameters of each feeding process, calculate the collected data through the machine learning AI algorithm, automatically adjust the parameters, so that the packaging scale can run fast and accurate.

2.5.1. Function Settings

AI intelligent packaging basic function Settings.

order	parameter	explain	starter
5.1	function set		
5.1.1	AI Pack	The AI intelligent packaging function of the master switch ① OFF/② ON When the function is turned on, the controller will automatically adjust the following parameters: [4.2.2 Fast feed] [4.2.3 Med feed] [4.2.4 Slow feed] [4.2.8 Med DLY] [4.2.9 Slow DLY]	① OFF
5.1.2	Sampled Data	0~100; The AI intelligent packaging function will save the weighing data of the latest 100 times, carry out machine learning AI intelligent packaging algorithm calculation, and get the feeding related parameters suitable for the current state.  This project can view the number of saved sampling data, press the confirmation key to clear the sampling data, and start statistical sampling.	0
5.1.3	Mat type	①[Granule] ②[powder] Select the material type of packaging, and the AI intelligent	Granule

		packaging algorithm can be optimized for different types of materials to get the relevant parameters more suitable for the characteristics of this material.	
--	--	--	--

2.5.2.speed control

AI intelligent packaging function is related to packaging speed control parameters. The packaging speed can be set by automatic calculation and control by AI intelligent packaging algorithm, or the packaging speed to be controlled by customers manually, and the AI intelligent packaging algorithm can adjust the parameters to reach the set speed.

Note: If the manual packaging speed is too fast to exceed the speed achieved by the equipment, the packaging accuracy may be inaccurate.

order	parameter	explain	starter
5.2	speed control		
5.2.1	Control Mod	① [Auto]: The controller automatically controls the packaging speed ② [Manual]: The packing speed is determined by the set parameters [5.2.3 slow Min] and [5.2.4 slow Error].	①Auto
5.2.2	Speed Grad	0~4 [5.2.1 Control mode] When it is set as auto, the slower the number is, the faster the speed is.	1
5.2.3	Slow Min	200~9999ms 、100~9999ms	800
5.2.4	Slow	[5.2.1 Control mode] When set to manual,	500

	Error	use these two time parameters to determine the standard time of slow shots. $\text{Slow DLY} + \text{Slow Min} \leq \text{standard time of slow}$ $\leq \text{Slow DLY} + \text{Slow Min} + \text{slow error time.}$ The intelligent packaging function controls the slow casting time always within the standard time.	
5.2.5	Med Min	200~9999ms 、100~9999ms	500
5.2.6	Med Error	These two time parameters to determine the standard time of Med. $\text{Med DLY} + \text{Med Min time} \leq \text{standard time of Med}$ $\leq \text{Med DLY} + \text{Med Min time} + \text{Med Error time.}$ The intelligent packaging function controls the Med time through the adjustment of the advance parameters and always falls within the standard time.	500

2.5.3. Modify the switch

The correction switch of large investment, CIC and slow investment can be separately controlled, and the AI intelligent packaging algorithm will no longer adjust the corresponding advance amount after turning off.

order	parameter	explain	starter
5.3	Modify the switch		
5.3.1	Fast AI	① [OFF]: Do not correct the [4.2.2 large] parameter ② [ON]	② [ON]

5.3.2	Med AI	① [OFF]: Do not correct the [4.2.3 Med Feed] parameter ②[ON]	②[ON]
5.3.3	Slow AI	① [OFF]: Do not correct the [4.2.4 slow feed] parameter ②[ON]	②[ON]

2.5.4. Parameter password

Set the password switch and password to enter the AI smart package.

order	parameter	explain	starter
5.4	Parameter password		
5.4.1	switch	① Off/② On Select the password switch for the item.	① off
5.4.2	modify	Password modification needs to enter the same password twice to modify successfully.	

2.6.switching value

The functions corresponding to the switching volume input and output port can be defined, and the switching volume test function can be used to test whether the external switching volume circuit works normally.

2.6.1. Input

Define the function corresponding to the switching volume input port IN 1 to IN 7. Select the switch port to set and select the features to define in the option box list.

order	parameter	explain	starter
6.1	Input the amount of switch		

6.1.1	IN1	Functional definition of the switch volume input port. The list of options is detailed in 2.6.1.1.	I1. Start
6.1.2	IN2		I4. Stop
6.1.3	IN3		I5. Zero
6.1.4	IN4		I6. Clr alarm
6.1.5	IN5		I3. Slow stop
6.1.6	IN6		I7. Clamp / Unclamp
6.1.7	IN7		I12. Manual Disc

2.6.1.1. List of switch quantity input functions

Function	Function name	description
I0	NONE	No functional definition.
I1	Start	Start running.
I2	Start (level)	Valid start, and invalid stop.
I3	Slow stop	Enter the stop process, that is, after the completion of the packaging automatically stop running.
I4	Stop	bring to rest.
I5	Zero	Conduct a zero-clearing operation.
I6	Clr alarm	Clear the alarm status.
I7	Clamp / Unclamp	Clamp / Unclamp handling input signal.
I8	Clamp OK	The clamp bag mechanism is effectively considered to be in place.
I9	Upper Level	Detection of input signal of hopper loading level. The material is considered to have reached the loading level when effective. Detailed functions are available in Section

		2.3.8.1.
I10	NONE	No functional definition.
I11	Lower level	Detection of input signal of storage level. The material is considered to have reached the loading level. Detailed functions are available in Section 2.3.8.1.
I12	Manual Disc	Used to manually remove the material in the metering bucket. This input effectively opens the unloading door once, and effectively closes the unloading door again.
I13	Disc (level)	Used to manually remove the material in the metering bucket. Open the unloading door when the input is valid, and close the unloading door if the input is invalid.
I14	Disc Close	Discharge closed in place to detect signal.
I15	Interlocked in	Cooperate with the "Q21 Interlock ok " to realize the multi-channel packaging system. See Section 3 for a detailed introduction..7
I16	Safe ON-OFF	In the stop state, when the valid input enters the running state and holds the pocket; when in the running state, the input effectively stops directly and releases the bag.
I17	Clamp Select	When the input is valid, the bucket scale mode runs at high speed and is unloaded once; when the input is invalid, the bucket mode runs in combination mode.

I18	Push OK	The detection signal of the push bag in place is considered to be in place when the push bag is effective.
I19	Block Check	The plugging detection signal of valve port scale mode, conduct plugging detection before unloading. Detailed description is available for Section 2.4.6.1
I20	Pres Check	It is used to detect the pressure. When the signal is valid, the pressure is insufficient, alarm prompt and suspend feeding.
I21	Cut OK	Detection input with the tangent action in place.
I22	Sew Check	Detection input signal initiated by the suture function. Detailed functions are available for the sections2.3.2.1
I23	NONE	No functional definition.
I24	NONE	No functional definition.
I25	NONE	No functional definition.
I26	NONE	No functional definition.
I27	NONE	No functional definition.
I28	NONE	No functional definition.
I29	Rise/Fall	It works in the bucket less charging mode and is used to control the rise and fall of the pocket holder.
I30	Rise Limit	At the upper limit of the pocket bracket, the input signal is detected.
I31	Fall Limit	In the no-bucket charging mode, the lower limit of the pocket bracket detects the

		input signal.
I32	All unclamp	If this signal is defined, in no bucket mode, the fixed value needs to wait for the free bag allowed signal to be valid before performing the relevant process.
I33	AI Pack Disc	When this input is valid, the AI intelligent packaging function is prohibited.
I34	Touch Dis	If this input signal is defined, the touch screen is prohibited, and the touch screen and the communication is invalid.
I35	Choose Rec	Enter a valid formula once and switch to the next formula where the target value is not 0.

2.6.2. Output

Define the functions corresponding to the switching volume output port OUT1 to OUT12. Select the switch port to set and select the features to define in the option box list.

order	parameter	explain	starter
6.2	Output switch amount		
6.2.1	OUT1	Functional definition of the switch volume output port. The list of options is detailed in 2.6.2.1	Q1. Running
6.2.2	OUT2		Q2. Stop
6.2.3	OUT3		Q3. Fast
6.2.4	OUT4		Q4. Med
6.2.5	OUT5		Q5. Slow
6.2.6	OUT6		Q6. Result Hold
6.2.7	OUT7		Q7. Over/under
6.2.8	OUT8		Q8. warning

6.2.9	OUT9		Q9. Clamp bag
6.2.10	OUT10		Q10. Flap/push
6.2.11	OUT11		Q11. Discharge
6.2.12	OUT12		Q12. Zero area

2.6.2.1. List of switch-volume output functions

Function number	Function name	description
Q0	No definition	No functional definition.
Q1	Start	The output is valid when running the status.
Q2	Stop	The output is valid when stopped in the state.
Q3	Fast	Fast feeding control signal.
Q4	Med	Medium-speed feeding control signal.
Q5	Slow	Slow feeding control signal.
Q6	Result hold	The output is valid when the feeding is completed, indicating that the feeding has been completed. The duration can be set with parameters [4.3.2stabilisation]. After the fixed value holding time ends, the current weight is recorded as the packaging result.
Q7	Over/under	The excess default function is turned on, and the output is effective when the excess default alarm occurs in the feeding result.
Q8	warning	The output is valid when the controller has an alarm.
Q9	Clamp bag	Bag ouch mechanism control signal, effective bag, invalid loose bag.

Q10	Pack / push the bag	Slap bag function control signal. Detailed functions are available for the sections.2.4.4.1 Push bag function control signal for valve port scale mode. Detailed functions are available for the sections.2.4.6.1
Q11	Discharge	There is a unloading door to control the weighing bucket.
Q12	Zero area	The output is valid when the current weight is lower than [4.2.5 Disc Zero].
Q13	Supply fill	Supply material control output signal. When the signal is valid, start the feeding device to feed into the storage hopper. Detailed functions are available in Section 2.3.8.1.
Q14	Batch comp	The signal output is valid after completing the cumulative set batch.
Q15	starving	staving state output signal. The "I11 lower level" signal input is invalid in the missing state.
Q16	Disc shake	Disc shake output control signal. Detailed functions are available in Section 2.3.4.1.
Q17	Sever Mat	The output is effective when feeding.
Q18	belt	Belt function to output the control signal. Detailed functions are available for the sections 2.3.5.1
Q19	Exhaust	The valve port scale mode is the discharge function, and the output is effective when

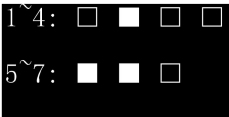
		feeding. In ultra-fine powder mode. Detailed functions are available in Section 2.3.6.1.
Q20	Blow / blowback	The valve port scale mode is the blowing function, and the pulse output is performed according to the set blowing time. VSP mode for the blowback function. Detailed functions are available in Section 2.3.6.1.
Q21	Interlock ok	Cooperate with the interlocked input to realize the multi-channel packaging system. See Section for a detailed introduction3.7
Q22	Release bag	Discharge function control signal in valve port scale mode. Detailed functions are available for the sections.2.4.6.1
Q23	Sew	Sack output control signal. Detailed functions are available for the sections. 2.3.2.1
Q24	Cut	Tangent output control signal. Detailed functions are available for the sections.2.3.2.1
Q25	Logic 1	Logic programming 1 function output signal.
Q26	Logic 2	Logic programming 2 function output signal.
Q27	Logic 3	Logic programming 3 function output signal.
Q28	Logic 4	Logic programming 4 function output signal.
Q29	Logic 5	Logic programming 5 function output signal.
Q30	Logic 6	Logic programming 6 function output signal.
Q31	Rise/Fall	Output control signal of cylinder lifting

		function without bucket bottom charging working mode. Detailed functions are available for the sections.2.3.7.1
Q32	Tare Err	If the tare weight does not meet the set tare weight range value when the tare goes down without scale mode.
Q33	Rise(Motor)	The output control signal of the bracket lifting electric control function without the bucket charging working mode. Detailed functions are available for the sections.2.3.7.1
Q34	Fall(Motor)	Control the A scale coding mechanism action.
Q35	Coding	The output control signal of the typing function. Detailed functions are available for the sections.2.3.5.2

2.6.3.Input test

order	parameter	explain	starter
6.3	Enter the test		

Input test is used to test the function of input switch quantity. The interface is shown in the figure below:



The upper and lower rows of 1 to 4 are the input port 1 to 4 test, and each block from left to right is the input status of IN 1 to 4 and IN 5 to 7.



The white squares are valid.

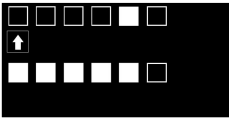


Black squares indicate an invalid value.

2.6.4. Output test

order	parameter	explain	starter
6.4	Output test		

Output test is used to test whether the output switch quantity works properly. The interface is shown in the following figure:



The upper and lower rows 1 to 12 are the output port 1 to 12 test, and from left to right are the output status of 12 output switch ports from OUT1 to 6 and IN 7 to 12.  
The key moves the cursor and it can switch the output valid / invalid status.



The white squares are valid.



Black squares indicate an invalid value.

2.6.5. Parameter password

Set the password switch and password for the entry switch quantity.

order	parameter	explain	starter
6.5	Parameter password		

6.5.1	switch	① Off/② On Select the password switch for the item.	① off
6.5.2	modify	Password modification needs to enter the same password twice to modify successfully.	

2.7. Cumulative data

View the batches and recipes for the controller.

2.7.1.Batch and cumulative

View the cumulative value of the control to set the number of batches run. The interface is shown in the following figure:

order	parameter	explain	starter
7.1	Bat & Acc.		
7.1.1	Batch set	Set the quantity of packaging, when the number of runs reaches the set number of batches, the packaging process will stop, and alarm reminder. Turn it off when it is set to 0.	0
7.1.2	completed	If the number of batches is set, it displays the number of batches that are currently completed.  Press confirm to clear the accumulated data and start it again.	0
7.1.3	Manual Disc	Set whether the weight of the manual	① is not

		unloading is included in the cumulative data. ① is not included in ② reckon in	included in
7.1.4	Acc. Num	View the accumulated data, press the confirmation key to clear the accumulated data, and start the cumulative again. 	
7.1.5	Acc. Wt		

2.7.2. Recipe cumulative

You can view the accumulated data of each formula and clear the accumulated data.

order	parameter	explain	starter
7.2	Recipe Acc		
7.2.1	Rec 1 Acc	View the cumulative data for each recipe.  Press the key to clear its accumulation.	
7.2.2	Rec 2 Acc		
7.2.3	Rec 3 Acc		
7.2.4	Rec 4 Acc		
7.2.5	Rec 5 Acc		
76.2.	Rec 6 Acc		
77.2.	Rec 7 Acc		
78.2.	Rec 8 Acc		
79.2.	Rec 9 Acc		
.2.710	Rec 10 Acc		
.2.711	Rec 11 Acc		
.2.712	Rec 12 Acc		
.2.713	Rec 13 Acc		

.2.714	Rec 14 Acc		
.2.715	Rec 15 Acc		
.2.716	Rec 16 Acc		
.2.717	Rec 17 Acc		
.2.718	Rec 18 Acc		
.2.719	Rec 19 Acc		
.2.720	Rec 20 Acc		

2.7.3. Parameter password

Set the password switch and password to enter the accumulated data.

order	parameter	explain	starter
7.3	Parameter password		
7.3.1	switch	① Off/② On Select the password switch for the item.	① off
7.3.2	modify	Password modification needs to enter the same password twice to modify successfully.	

2.8. Com

2.8.1. The RS232 setup

The RS232 is the RS232 communication serial port of the controller, and the relevant parameters are as follows:

order number	parameter	explain	starter
8.1	RS 232 Settings		
8.1.1	Slave ID	1~99 Set the communication address of the	1

		device (slave station number).	
8.1.2	protocol	① [Modbus-RTU-H]: Modbus-RTU communication protocol (two-word data high word first). ② [Modbus-RTU-L]: Modbus-RTU communication protocol (two-word data low word first). ③ [ExModbus-H]: Modbus main station (dual word data high word in front) ④ [ExModbus-L]: Modbus main station (two-word data low word first) ⑤ [Auto print]: Automatic printing of packaging result data. ⑥ [Manual print]: manually print the accumulated data, and execute the printing operation with the main interface button. ⬆ ⑦ [Continuous]: The instrument sends the current working state.	①MODBUS-RTU-H
8.1.1	Baud rate	①4800 ②9600 ③19200 ④38400 ⑤57600	②9600
8.1.4	Data	①7-E-1	③8-N-1

	format	②7-O-1 ③8-N-1 ④8-E-1 ⑤8-O-1	
--	--------	--------------------------------------	--

2.8.1.1. print format

⬆ When [8.1.2 Protocol] is set to ⑥ [Manual print], the main interface button will output the cumulative data through the serial port, including cumulative times, cumulative weight and current time. The format is as follows:

Cumulative times: 3

Cumulative weight: 1,819 kg

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When [8.1.2 protocol] is set to ⑤ [auto print], the accumulated data will be automatically printed through the serial port after each package completion.

Note: The touch screen should be used at the current time.

2.8.1.2. continuous mode

When [8.1.2 Communication Protocol] is set to ⑦ [Continuous mode], the instrument will continuously send the current working mode.

Data frame are resolved as follows:

STX	Scale number	C	S	state 1	state 2	G/N	+/-	show value	CRC	CR	LF
-----	-----------------	---	---	------------	------------	-----	-----	---------------	-----	----	----

among:

STX —— data frame start: 02H.

Scale number —— two digits, ten in the front, one in the back.

CS —— capital characters: 43H, 53H.

Status 1 —— 0: stop, 1: before adding, 2: fast add, 3: middle add, 4: slowly add, 5: fixed value (end of adding), 6: unloading (bucket), pat bag (no bucket), 7: loose bag (no bucket) 8: batch times completed.

State 2 —— M: Unstable 4 DH, S: stable 53H, O: overflow 4 FH.

G / N —— G: gross weight 47H, N: net weight 4 EH.

+/- —— Symbol bit, 2 BH for positive + and 2 DH for negative.

Display value —— 7 bits with decimal points, leading zero is space.

CRC —— checksum, in which all the previous values are added and converted to decimal, and then the last two digits are taken and converted to ASCII code.(Ten of them are in the first and one is in the second).

CR —— return key 0 DH.

LF —— line key 0 AH.

For example, the instrument sends out the following data (in the hexadecimal form):

02 30 31 43 53 30 53 47 2B 20 20 30 2E 31 30 30 39 37 0D 0A

This means that the current state of the 1 # scale is: stop state, stable, gross weight, and the main display value is + 0.100.

2.8.2. RS 485 Settings

Set method method refer to 2.8.1RS232 settings.

2.8.3. ExModbus

When the protocol is set to ExModbus, the controller can read the external equipment address as the main station, which is often used to read the frequency of the frequency converter for controlling the motor

speed.

This feature supports up to two slave devices (channels A and B) and up to two read and write addresses (start 1 and 2).

order number	parameter	explain	starter
8.3	ExModbus		
8.3.1	A slave ID	0~99 Set the slave station number for channel A.	0
8.3.2	A Addr 1	0~65535 Set the read and write address 1 for channel A.	0
8.3.3	A speed 1	1~9999999 Set the rotational speed 1 value of channel A.	0
8.3.4	A cof 1	0~9999999 The value of the rotational speed 1 coefficient 1 is written into the corresponding starting address 1.	0
8.3.5	A Addr 2	0~65535 Set the read and write address 2 for channel A.	0
8.3.6	A speed 2	1~9999999 Set the rotational speed 2 value of channel A.	0
8.3.7	A cof 2	0~9999999 The value of the rotational speed 2 coefficient 2 is written into	0

		the corresponding starting address 2.	
8.3.8.8.3.14 Channel B is set in the same way as channel A.			

2.8.4. Parameter password

Set the password switch and password to enter the communication interface.

order	parameter	explain	starter
8.4	Parameter password		
8.4.1	switch	① Off/② On Select the password switch for the item.	① off
8.4.2	modify	Password modification needs to enter the same password twice to modify successfully.	

2.9.analog quantity

The analog output function should the analog output expansion.

Analog interface:

U1 + / I1 +: Positive electrode of the voltage / current type analog output.

U1- / I1-: Negative electrode of analog output of voltage / current type.

Voltage type output analog connection U 1 + and U1-.

Current type output analog connection I1 + and I1-.

Select the output voltage / current type analog quantity through the dial switch.

2.9.1. Output Settings

Set the relevant parameters of the analog quantity output function.

order number	parameter	explain	starter
9.1	Output Set		
9.1.1	out range	①[0-5V] ②[0-10V] ③[4-20mA] ④[0-20mA] ⑤[0-24mA] ⑥ [User Set U] ⑦ [User Set I]	①[0-5V]
9.1.2	Out mean	① feeding: it can be respectively output fast, med and slow projection corresponding analog size, to control the feeding device for feeding. Detailed functions are available in Section 2.4.7.	① feeding
9.1.3	Out max	[9.1.1 Out range] When set to ⑥ [User Set U] or ⑦ [User Set I], the output voltage or current output range can be customized through these two parameters.	0
9.1.4	Out min		0

2.9.2. Simulation calibration

The calibration operation of the simulated quantity, and the output value of the simulated quantity can be used to correct the output of the simulated quantity.

Simulation quantity calibration method:

- (1) Enter the [9.2 analog cal] interface and dial the code switch to the voltage analog output.
- (2) Enter the [9.2.1 [0V]] option interface, measure the voltage size of the analog output with a multimeter (normal should be around 0V), and input the measured value into the interface to confirm.
- (3) Enter the [9.2.2 [2.5V]] interface, measure the voltage size of the analog output with a multimeter (normal should be around 2.5V), and input the measured value into the interface to confirm.
- (4) Enter the [9.2.3 [5V]] option interface, measure the voltage size of the analog output with a multimeter (normal should be around 5V), and input the measured value into the interface to confirm.
- (5) Enter the [9.2.4 [7.5V]] option interface, measure the voltage output of analog U 1 (normal should be around 7.5V), and input the measured value into the interface to confirm.
- (6) Enter the [9.2.5 [10V]] option interface, measure the voltage size of the analog output with a multimeter (normal should be around 10V), and input the measured value into the interface to confirm.
- (7) After the above operation can complete the simulation amount of calibration operation.

Tip: When measuring the output voltage, please confirm that the multimeter is in DC voltage, the positive pen connects to the output port of the controller analog terminal (pin 3 of DB 9 terminal), and the negative pen connects to the output port of the controller analog terminal (pin 8 of DB 9 terminal).

Current calibration operation is similar to voltage calibration

operation. When calibration the current, the dial switch should be dialed to the current analog output, and the calibration parameter is selected [9.2.6 [0 mA]] - [9.2.10 [24 mA]].

order number	parameter	explain	starter
9.2	Simulation calibration		
9.2.1	[0V]	.0000~12.000V The analog quantity output is 0V calibration points.	0.000
9.2.2	[2.5V]	0.000~12.000V Analog output of 2.5V calibration points.	2.500
9.2.3	[5V]	0.000~12.000V The analog quantity output is 5V calibration points.	5.000
9.2.4	[7.5V]	0.000~12.000V Analog output of 7.5V calibration points.	7.500
9.2.5	[10V]	0.000~12.000V The analog quantity output is 10V calibration points.	10.000
9.2.6	[0mA]	0.000~26.000mA Analog output 0mA calibration points.	0.000
9.2.7	[4mA]	0.000~26.000mA Analog output of 4mA of calibration points.	4.000
9.2.8	[12mA]	0.000~26.000mA Simog output 12mA calibration points.	12.000
9.2.9	[20mA]	0.000~26.000mA Analog output is 20mA of calibration	20.000

		points.	
9.2.10	[24mA]	0.000~26.000mA The analog output is 24mA of calibration points.	24.000

Note: When reset all parameters, the analog output setting and calibration data are not reset. The analog parameters should be selected separately [13.1.10 analog] for the reset operation of the analog parameters.

2.9.3. Parameter password

Set the password switch and password to enter the analog volume interface.

order number	parameter	explain	starter
9.3	Parameter password		
9.3.1	switch	① Off/② On Select the password switch for the item.	① off
9.3.2	modify	Password modification needs to enter the same password twice to modify successfully.	

2.10. programming in logic

The controller supports the 6-way logic programming function. When the existing functions of the controller cannot meet the control requirements of the device, it can try to use the logic programming function to define auxiliary logic output signals outside the operation process of the controller to control the action of the device.

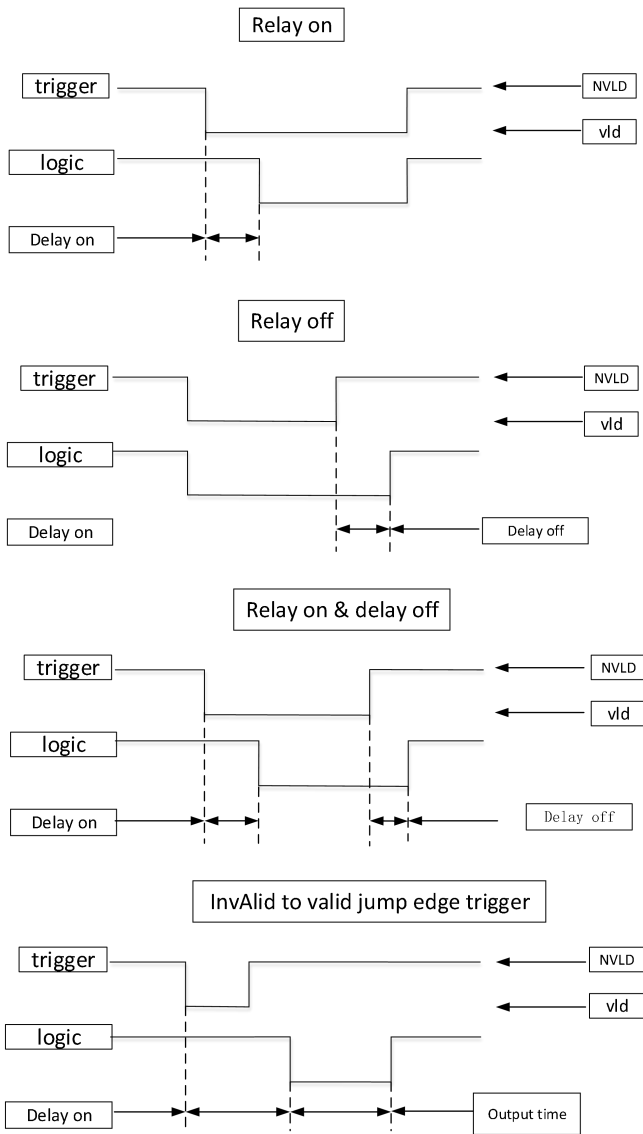
Logical programming 1 is used below as an example to explain the role of each parameter.

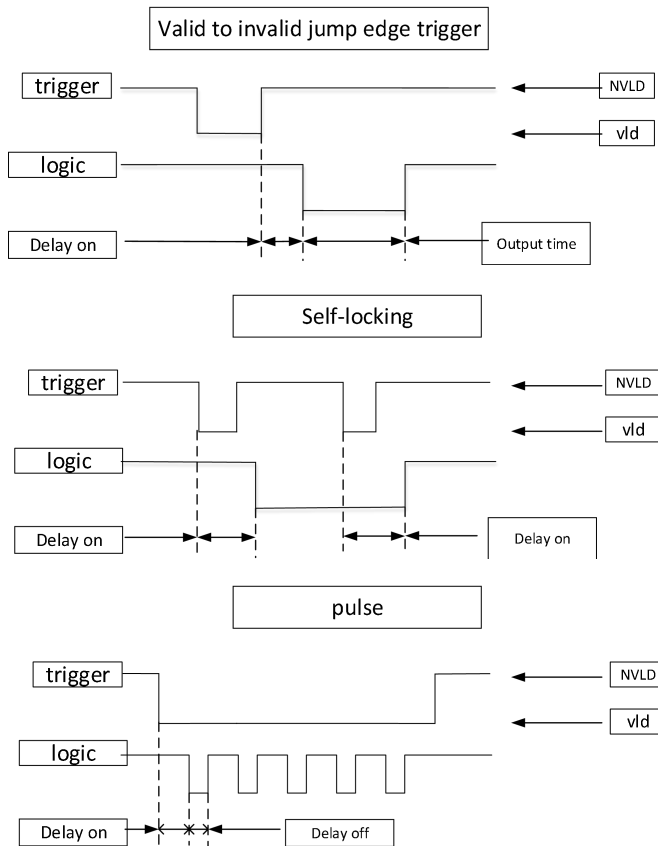
order number	parameter	explain	starter
10.1	Logical programming of the 1		
10.1.1	Logic type	Select the type of the logic programming. ① [close]: Turn off the logical output function. ② [Delay on] ③ [Delay off] ④ [delay on and off] ⑤ [OFF-ON edge] ⑥ [ON-OFF edge] ⑦[Self Hold] ⑧[pulse] See Section 2.1.0.1:	① close
10.1.2	Trig type	① [Signal trigger]: The logical output is triggered by a certain signal. ② [Conditional trigger]: a logic output is triggered by reaching a certain condition. ③ [Comm trigger]: The logical output is triggered by the communication command.	① [Signal trigger]
10.1.3	Sig output	Select the logical output signal to define to an output port.	None
10.1.4	On Time	Time when the logical output signal is switched on.	0
10.1.5	Off time	The time of the logical output signal delay disconnection.	0

10.1.6	Signal 1	Select the signal 1 used to trigger the logic output.	NONE
10.1.7	Sig logic	Select the logical relationship between the trigger signal 1 and the trigger signal 2 used to trigger the logic output. 1. [or]: trigger signal 1 and trigger signal 2 either signal can trigger the logical output. 2. [and]: Trigger signals 1 and trigger signal 2 need to be fully valid to trigger the logic output. 3. [XOR]: the trigger signal is between the trigger signal 1 and the trigger signal 2.	1. [or]
10.1.8	output time	[10.1.1 Logic Type] This parameter is set when set to item 5 / 6. The effective time of output after the logical signal is triggered, and the logical output after the time to end. When this time is set to 0, the logical output signal will only end by the reset signal.	0
10.1.9	Init signal	[10.1.1 Logic Type] This parameter is set when set to item 5 / 6. After the logical output is valid, the reset signal can reset the logical output to make the logical output signal invalid and end the logical	NONE

		output process.	
10.1.10	Init type	1. [ON Init]: When the reset signal is effective, the reset logic output. 2. [OFF Init]: When the reset signal is invalid, the reset logic output.	1. [ON Init]
10.1.11	conditions	Select the conditions that trigger the logical output. 1. [More set Value] 2. [less set Value] 3. [Inside range] 4. [Outside Range]	1. [More set Value]
10.1.12	value 1	Used to set the weight value for the corresponding trigger condition.	0
10.1.13	value 2		0
10.1.14	Need station	1. [Off]: After the weight meets the trigger condition and requires stability to trigger the logical output. 2. [ON]: The logical output can be triggered after the weight meets the trigger condition, without stability.	1. [OFF]
10.1.15	Signal 2	Select the signal 2 used to trigger the logical output.	not have

2.10.1. Logic output timing diagram





2.10.2. illustrate

The coding function is realized through logical programming: after the output signal of the bag is effective, the delay is 1s, and then the output OUT12 lasts for 2s, which is used to control the coding machine to print the code on the bag after the bag is completed.

The setting is as follows:

[10.1.1 Logic type]: Invalid-valid jump edge trigger

[10.1.4 Delayed connection]: 1s
[10.1.8 Output time]: 2s
[10.1.2 Trigger type]: Signal trigger
[10.1.6 Signal 1 setting]: pouch
[10.1.3 Signal output port]: OUT12

Through the coordination between different trigger signals, trigger conditions and logical programming signals, very flexible logical signals can be combined.

For example, the following logic should be implemented: the real-time detection weight is higher than 100kg, namely, the output OUT10 for alarm indication. And the alarm delay is 2s, and the output OUT11 for 3s is used to control the unloading mechanism to unload the material.

The setting is as follows:

Logical programming 1: realize the detection weight above 100kg, the output OUT10.

[10.1.1 Logic type]: delay connection
[10.1.4 Delayed connection]: 0s
[10.1.2 Trigger type]: conditional trigger
[10.1.11 Trigger condition]: Weight is greater than the set point
[10.1.12 Set value 1]: 100kg
[10.1.3 Signal output port]: OUT10

Logical programming 2: delay 2s after OUT10 is effective, and output OUT11 for 3s.

[10.2.1 Logic type]: Invalid-valid jump edge trigger
[10.2.4 Delay connection]: 2s
[10.2.8 Output time]: 3s
[10.2.2 Trigger type]: Signal trigger

[10.2.6 Signal 1 Settings]: Logic output 1

[10.2.3 Signal output port]: OUT11

2.13. system

System language setting and system version information view.

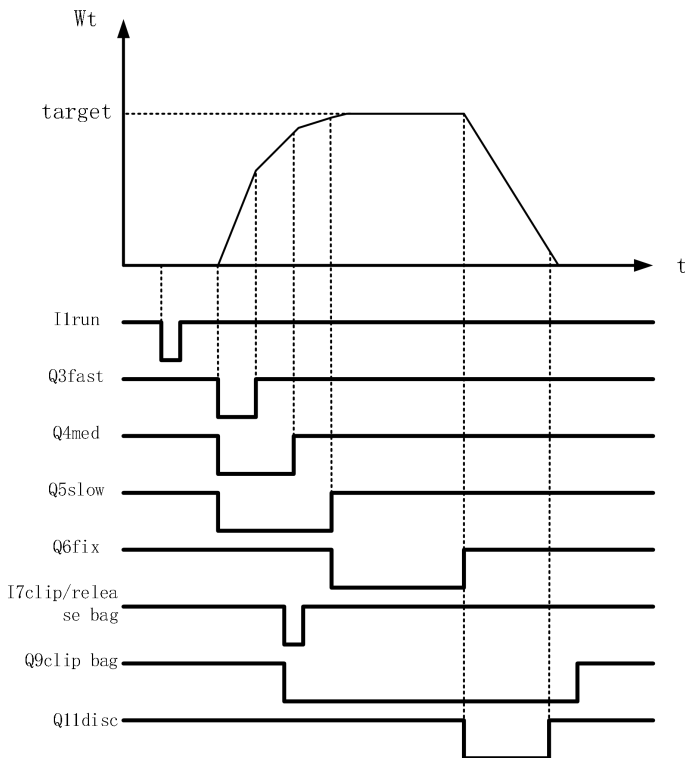
order	parameter	explain	starter
13.1	Parameter reset		
13.1.1	All para	 Push the key to reset the selected parameter items.	
13.1.2	Cal Para		
13.1.3	Wt Para		
13.1.4	Scale Para		
13.1.5	Recipe		
13.1.6	AI pck		
13.1.7	I/O		
13.1.8	Acc data		
13.1.9	Comm port		
13.1.10	analog		
13.1.11	logic		
13.2	Language	①简体中文 ②English	① 简体 中文
13.3	about	Model number and version number of the controller to view.	
13..4	Bott Screen	① OFF ② ON Select the switch displayed on the boot screen.	② ON
13.5	Parameter password		

13.5.1	switch	① Off/② On Select the password switch for the item.	① off
13.5.2	modify	Password modification needs to enter the same password twice to modify successfully.	

Note: When reset all parameters, the analog output setting and calibration data are not reset. The analog parameters should be selected separately [13.1.10 analog] for the reset operation of the analog parameters.

III. Workflow and functional description

3.1. Hopper workflow



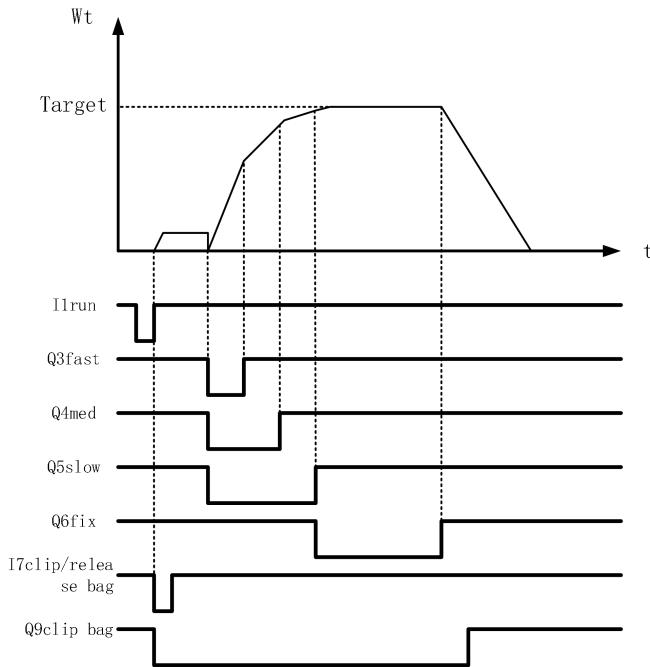
Explain the basic packaging process with the figure above:

1. Start running.
2. [4.3.1 Delay before feeding] time.

3. Open the big feed, when the weight value [4.2.1 target value] - [4.2.2fast feed], close the big shot, and enter the med .
4. When the weight value [4.2.1 target value] - [4.2.3 med feed], close the med and enter the slow .
5. When the weight value [4.2.1 target value] - [4.2.4 slow feed], close the slow drop and end the feeding.
6. [4.3.2stabilisation].
7. Start the unloading after judging that the clamp bag is finished.
8. After the weight is lower than [4.2.5 Disc zero], start [4.3.3 Disc delay], and close the unloading after the time reaches.
9. Start [4.3.5 unclamp DLY], time to back loose bag.
10. Complete the packaging process and go back to step 1 to start a new packaging process.

Note: The process does not include special functions such as excess difference detection, unloading vibration and material level, etc. To understand a certain function, please check the chapter description of the corresponding function.

3.2.Non-Hopper workflow



Explain the basic packaging process of the bucket scale combined with the figure above:

1. Start the operation and wait for the pocket.
2. Clamp bag.
3. [4.3.1feed delay] time.
4. If [3.1.6pack mode] is set to ① [gross], then start adding directly without peeling.
If [3.1.6pack mode] is set to ② [Net], then stabilize the peel and start adding.
5. Open the big feed, when the weight value [4.2.1.target value] - [4.2.2fast feed], close the

- big shot, and enter Med output.
6. When the weight value [4.2.1target value] - [4.2.3Med feed], close the Med and enter the slow shot.
 7. When the weight value [4.2.1 target value] - [4.2.3 slow feed], close the slow drop and end the feeding.
 8. [4.3.2Fixed value hold].
 9. Start [4.3.5loose bag front delay], time to back loose bag.
 10. Complete the packaging process and go back to step 1 to start a new packaging process.

Note: The process does not include special functions such as excess deficit detection, patting bag and material level. To know a certain function, please check the chapter description of the corresponding function.

3.3. Bottom filling workflow

No bucket filling work, the process is the same standard, Non-Hopper process, the difference is no bucket filling control support lifting, and the loose bag needs to manually input the loose bag signal to loose the bag.

Main workflow of matchless bottom filling type:

1. The instrument starts into operation and waits for the pocket.
2. After the completion of the bag, stable peeling and other related treatments were determined according to the parameter setting.
3. According to the [3.7 lift Tab] related parameters setting, the bracket starts to rise automatically or manually.

4. After the bracket rise ends, start the feeding, and control the bracket to drop automatically or manually drop according to the relevant parameters of [3.7 lift Tab].
5. During the descent process, the support will be added. After the filling, if the stent has not finished, wait for the descent of the stent and enter the fixed value.
6. After the fixed value ends, wait and manually input the loose bag signal for the loose bag.
7. After the loose bag is completed, the first process is over, and we will wait for the next process cycle.

3.4. Valve workflow

The working process of the valve orifice scale is basically the same as that of the bucket scale, but the operation control of push bag and unloading bag after the loose bag, as described in section 2.4.6 for details.

3.5. VSP workflow

The working process of non-bucket ultra-fine powder is basically the same as that of no-bucket scale, but the pumping function is selected. It can be selected to control the falling cylinder, pumping and blowing during or after feeding. See section 2.3.6 for details.

3.6. NON-Hopper Exh

The workflow of NON-Hopper Exh is basically the same as that of Non-Hopper. The difference is that if there is a loose bag signal in the feeding process, it will directly stop running and loose the bag. In addition, after the fixed value is maintained, the action control different from the super fine powder is implemented, and the subsequent patting bag, loose

bag and other processes are started.

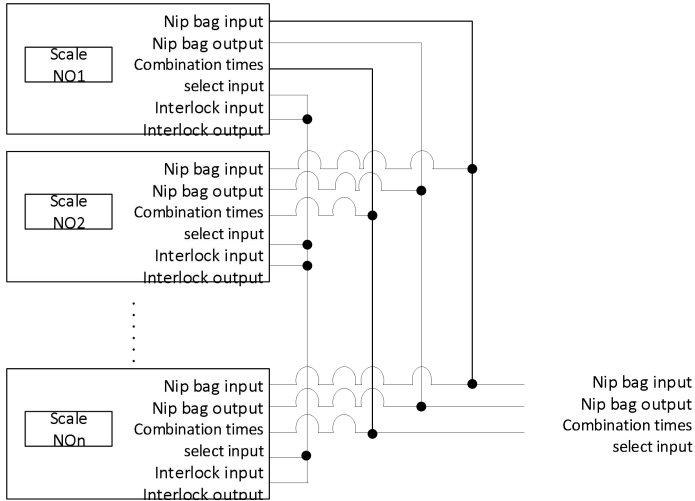
pay attention to:

1. When [4.6.4REL Hold] is set to 0, the pat bag function completes the extra pat bag, the bag is not automatically loose, and the loose bag is controlled manually.
2. When [4.6.4REL Hold] is set not 0, after the extra bag function and the bag is in place, the bag will automatically release the bag.
3. Pumping function process: after the fixed value is maintained, start [3.6.1 Fall Time] time, and output the "Q31 Rise/Fall" signal at the same time to control the pumping rod cylinder drop and extend the pumping rod into the packaging bag.[3.6.1 Fall Time] After thinking that the cylinder descent is completed; Then start [3.6.3 pumping time] time, And simultaneously output the "Q19 extraction" signal, Control bar, [3.6.3 Pump time] Turn off the "Q19 pump" signal later, End of the pumping action; Then start [3.6.1 Rise Time], And also close the "Q31 Rise/Fall " signal, Control the rise of the suction rod cylinder; [3.6.1 Rise Time] to think that the suction rod rise in place, Then open the [3.6. 4 blowback time] time, And also output the "Q20 Blow / blowback " signal, Control suction bar back, [3.6.4 Back time] To close the "Q20 Blow / blowback " signal, To end the blowback action, This is when the end of the pumping process, Then start the subsequent pine bags and other processes.

3.7.Multiscale combination and interlocking

Multiple A MC501-U controllers can form a multi-channel

packaging system (usually in bucket scale mode), with "I15 interlocking input (level)" and "Q21 Interlock ok " that need to be defined for multiple meters. Connect the "I15 interlocking input (level)" and "Q21 Interlock ok " lines of multiple modules as shown in the figure below:



1. Set the [3.1.3 scale num] of each controller, and the scale number of each controller cannot be the same. The scale number is related to unloading priority, no. 0 has the highest priority and No.7 has the lowest priority. When the simultaneous packaging is completed, the high priority is unloaded first, and the low priority is unloaded later.
2. When the input switch quantity of "I17 Clamp Select " is valid, the bucket scale mode runs at high speed, releasing the bag once for every discharge; when the input is invalid, the bucket mode is set by [4.2.6 Scale Cmb].
3. Multi-scale combination mode and batch times. When multi-scale combination, the number of combinations is determined by [4.2.6 Scale Cmb], and the number of single scale

combinations of all instruments must be set to the same value to work normally. Each instrument can also set the number of batches, and when the number of batches arrives, the packaging will end. Although all instruments must be set to the same value, they can have different batch times. For example, the number of instrument 1 can be set to 100 and the number of instrument 2 can be set to 200. The batch arrival instrument will end the run and will not affect the operation of other instruments. In multi-scale combination, if you want to use the automatic shutdown function of batch number, the setting of batch number and "single scale combination number" should meet the following conditions:

$$N = (1 \text{ batch of instrument } 1 + 2 \text{ batches of instrument } 2 + \dots + N \text{ batches of instruments}) / \text{single scale combination}$$

The N must be an integer.

For example, assuming $n=2$:

Number of instrument 1:4

Number of instrument in 2 batches: 6

So in total, the number of batches is 10. At this time, if the number of single scale combination is 2, it means that the bag is loosened once after unloading 2 times, and after the bag is loosened 5 times, just 10 times of unloading, and the two scales just reach the number of batch.

IV. warning message

When the controller has an alarm, it will prompt the bottom line, as shown in the following below:

Rec. :01 STAB
0.000 kg
⚠️Target error

⏮️ Press the key or enter "I6 clear alarm" to clear the alarm.

Detailed description of the specific alarm is shown in the following table:

order	content	explain
1	⚠️ Batch finish	Set [7.1.1 batch set], and has run completed the set batch times, alarm prompt.
2	⚠️ O/U pause	The controller opens the [4.5.1Check Func] function and [4.5.5 pause] function, and the feeding connection result occurs, and waits for the user processing.
3	⚠️ Disc shake inv	After unloading the vibration, the weight value is not lower than the zero area, and the unloading vibration is invalid.
4	⚠️ Self learning ERR	Self-learning error.
5	⚠️ Support rise timeout	[3.7.1 Lift Ctrl] non- ① Air and [3.7.4 rise T.out] is not 0, the bracket rises after [3 rise timeout] has not reached the upper limit of the bracket, the bracket rise timeOUTalarm..7.4
6	⚠️ Support Fall	[3.7.1 lift ctrl] non- ① Air and [3.7.5

	timeout	Fall T.out] is not 0, the stent drops after [3.7.5 Fall T.out], the stent Fall timeout alarm.
7	 The unloading door is not closed	[3.1.1 Working mode] When the ② has a bucket scale, the unloading door is opened during the non-unloading process, and the alarm is prompted.
8	 Wt over Range	During the clearing operation, the weight exceeds the clearance range and cannot be cleared. Adjustable parameter setting of [2.1.2 reset range].
9	 Wt is not stab	During the zero-clearing operation, the weight is unstable and cannot be cleared. Check the cause of unstable weight beating and whether it is caused by mechanical vibration. It can also adjust the [2.1.3 stability range] and [2.1 stability time] to adjust the judgment of stability conditions..4
10	 OFL at zero	Cannot be cleared when weight overflow.
11	 zero CLR is not stab	During the zero calibration operation, the weight needs to be stable for successful calibration, otherwise the alarm indicates.
12	 OFL at the zero-point calibration	Cannot be set on weight overflow.
13	 Gain> maximum range	For gain calibration, the gain weight is greater than [1 maximum range] error..4
14	 High-gain-based calibration accuracy	In the gain calibration, 1 score is less than 2 AD codes, and the accuracy is not enough.
15	 Target value set	Formulation parameter [4.2.1 target value] is not

	error	set to start. The target value needs to be set to start.
16	 Add the unloading door open	[3.1.1 Working mode] When ② has a bucket scale, the unloading door is opened during the feeding process, and the error is indicated.
17	 Wrong loose bag during unloading	Wrong loose bag during unloading.
18	 Cannot start in an OFL	Cannot start with weight overflow.
19	 Stop the signal effectively	When start, the "I4 stop" signal is detected in a valid state, cannot start, alarm prompt.

V. Common fault screening

When the controller is running, the bottom row of the display will prompt the functions and processes being performed by the current controller in real time. Through this prompt, you can judge the operation process of the current controller and help to troubleshoot. The controller shown in the figure below is in the projection process:



Rec. :01 STAB
0.202 kg
Fast

Some possible faults and troubleshooting methods of the controller are found in the following table:

order number	content	explain
1	A DOFL / - ADOFL	Sensor signal is abnormal. 1. The sensor line is misconnected and has poor contact.(Note the four-wire system and six-wire connection method) 2. Sensor damage. 3. Overload range of the sensor.
2	OFL / -OFL	Weight overflow, and OFL is indicated when the hopper weight exceeds the [1.4 maximum range] set value. If the empty scale shows the OFL, please check: 1. [1.4 Max. range] Is it set correctly. 2. Calibration is abnormal, re-calibrate. 3. Whether the sensor is damaged.
3	The static state weight	1. Whether the sensor line connection is correct and reliable, and whether the line is rusty and

	of the device is abnormal and unstable	oxidized. 2. Whether the weighing mechanism is affected by external force or vibration. 3. Whether the sensor is damaged. 4. The sensor or controller is disturbed by the electrical equipment around the site, such as the motor, frequency converter, etc. 5. [2.1.5 Filter] Whether the setting is appropriate.
4	Unable to start	1. Whether the input line such as the external start button is normally connected to the controller (it can be viewed through the switching volume test). 2. Whether the input port of starting signal access is correctly defined as startup.
5	The result of feeding is not allowed	1. The results displayed by the controller after the feeding are inaccurate: (1) Adjust the setting of large and medium investment advance amount of formula parameters. Ensure that the slow casting process has a long enough time to ensure the accuracy. (2) Whether the feeding mechanism is normal, whether the following material outlet is blocked, and whether the material flow is smooth. 2. The results displayed by the controller are accurate, but the actual reweighing results are inaccurate. (1) Display has a deviation from the actual weight and needs to be calibrated.

		(2) It is best to use weights or materials of the same weight as the target value for calibration, and pay attention to the uniform force of the scale table, and do not bias the load.
6	Accumulation is not allowed	When recording the cumulative value, the controller records the cumulative value at the end of the fixed value process, so check whether the time setting of [4.3.2 Fixed value holding] is sufficient. At the end of the fixed value holding time, the controller shows that the weight has stabilized and no longer beats significantly, so as to record the accurate cumulative result of the feeding.

appendix

update log

time	content
2021-8-19	the front page.
2021-12-17	Switch volume input definition added "I35. Switching formula".
2022-3-2	The action in correction parameter [3.1.7 Ctr Unclamp].
2022-3-18	Correction 2.5.2 Some descriptions in the parameter list of speed control section.
2022-7-15	Add parameters [3.1.11 tare heavy memory] and its description. Modify Section 2.9.2 Description of analog calibration.
2022-9-5	Correct 1.3 Wiring port section Some errors in sensor wiring port description and RS 232 wiring mode.
2022-10-12	Parameter [8.1.2 communication protocol] Add the ⑦ [continuous mode] option and its description. Add section 2.8.1.1 Print format description.
2022-11-4	Add parameters [3.6.5 Rise Bef], [3.6.7 Cylinder D], [3.6.6blow Bef] and its description. Modify chapter 2.3.6.1 Gas extraction function in superfine powder feeding, detailed description, 3.5 Description of the superfine powder workflow and 3.6 Exh workflow. Add section 2.3.6.2 Fixed function of ultrafine powder.

2022-11-11	Add parameters [3.8.6 material to shake] and its description. Modified section 2.3.8.1 Details of feed supply function.
2022-12-29	Add section 1.3.4 Details of switching volume extension.
2023-8-9	Add the parameter [3.6.8 Exh East] and its description.
2023-8-21	Modified parameter [3.6.8 Exh East] is [3.6.7 Cylinder D]. Remove [3.6.7 Cylinder D]. Add the functions of [3.6.8 Exh East], [3.6.9 Exh Mid] and [3.6.10 After Fee].