GENERAL MEASURE

Automatic Weigh Filler

User's Manual

Model no.:AF-50K-103A

Contents

1. Information

The Weigh Filler AF-50K-103A is the perfect all-round weighing machine to fill sensitive granules from 5kgs to 50kgs, such as rice, bean, maize, seed etc. It is very flexible and applicable for very different products and it reaches a filling speed of 18 fillings per minute with just one weighing head. Underfeeding is impossible with the self-controlled weighing machine. This guarantees both satisfied customers and minimum product loss.

1.1. Characteristics

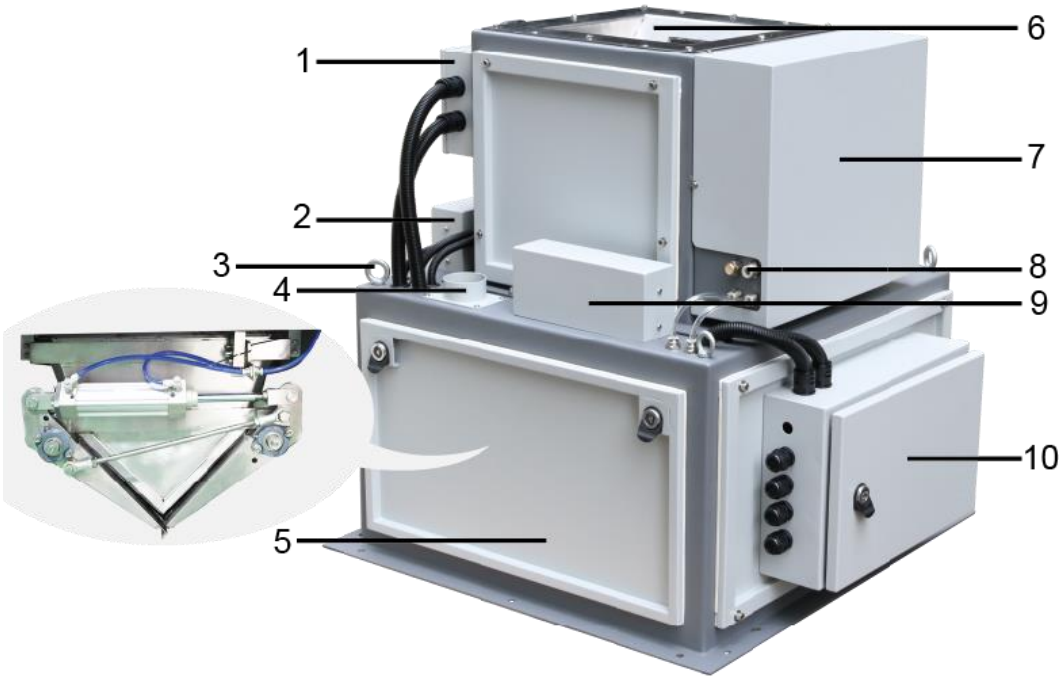
- Weighing capacity from 5kgs to 50kgs
- High visibility 4.3inch TFT screen with graphic user interface
- Weigh products precisely without inputting various setting
- Automatic weighing compensation and zero tracking
- 50,000pcs weight value for production statistics
- Data storage and data printout ready
- Access protection by password

1.2. Specification

Model no.	AF-50K-103A
Weighing Range：	5~50kgs
Accuracy：	±10g
Weighing Hopper Volume：	30L
Operation Air Pressure：	0.4~0.6Mpa, 1.2m³/h
Power Supply：	AC110~260V，50~60Hz
Dimensions(L x W x H)：	815mm x 730mm x 790mm
Operating Temperature	-10℃～40℃
Relative Humidity	90% R.H. Without dew

1.3. Structure

The Weigh Filler AF-50K-103A are specially designed for sensitive granules, which are easy to integrate in packaging equipment.

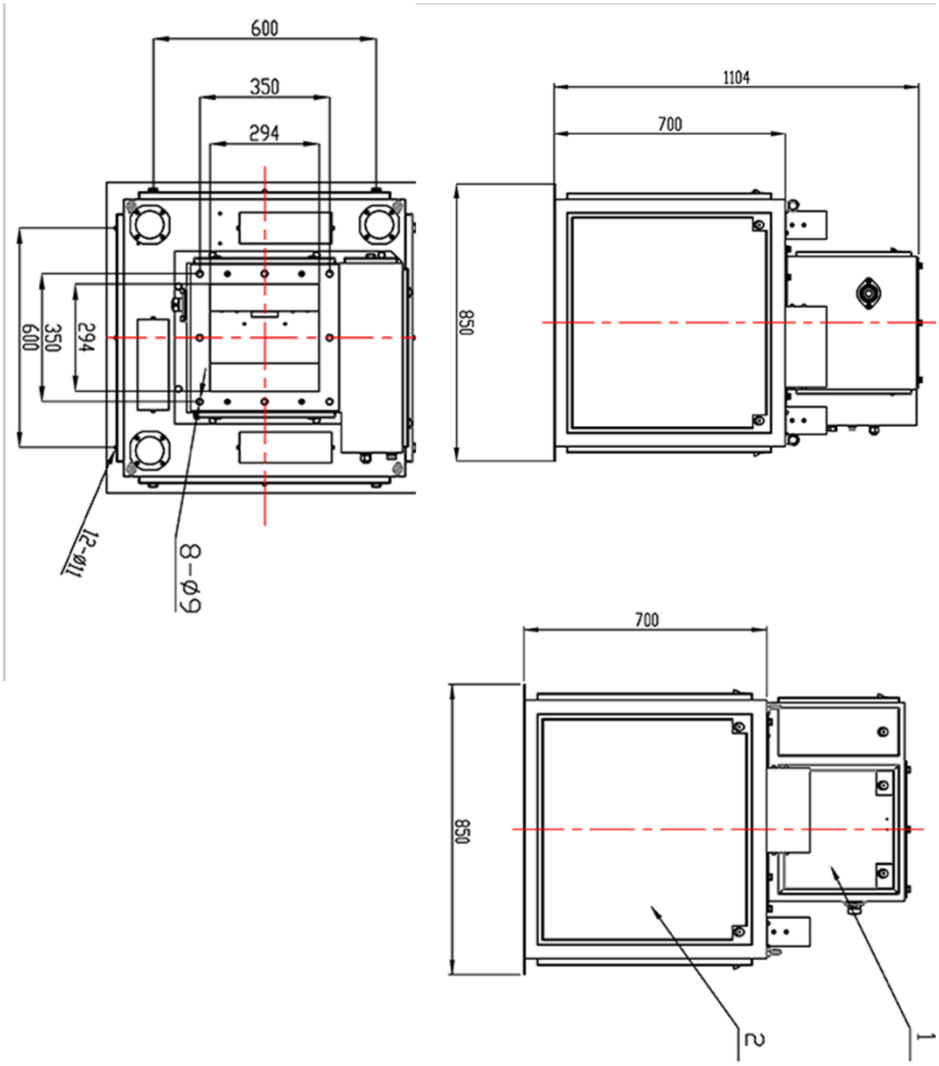


1. Junction box
2. Load cell
3. Lifting eyebolt
4. Dust removing flange
5. Weighing hopper
6. Filling hopper
7. Cylinder control box
8. Air vent
9. Load cell
10. Electronic Control box

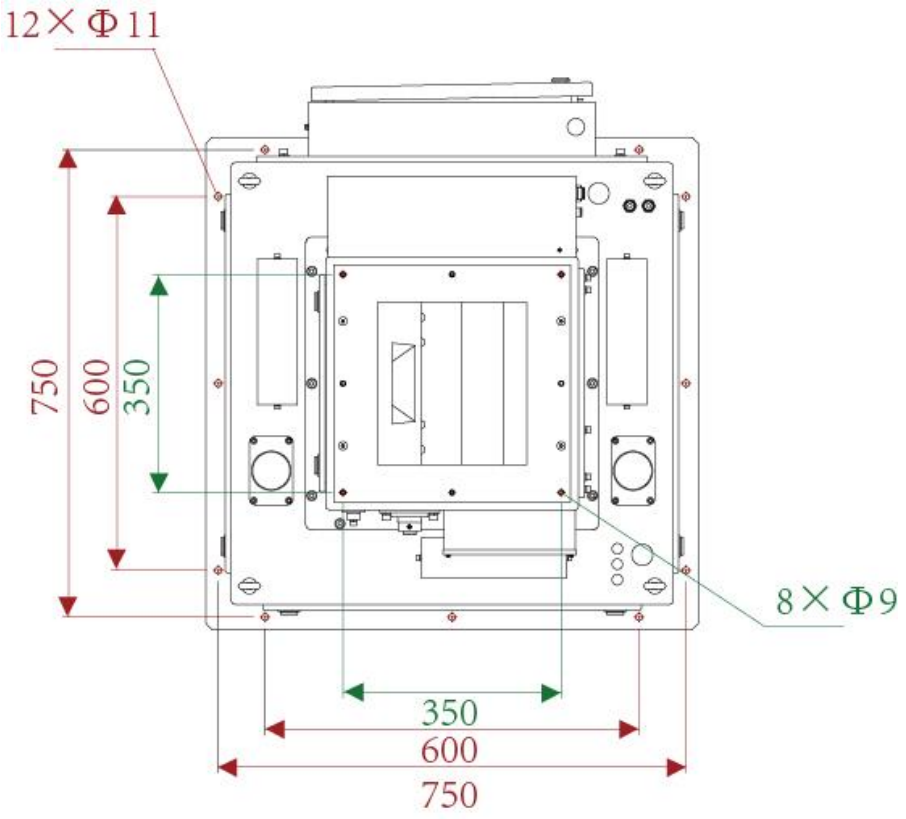
Note: The user need take off the cover of dust removing flange first, then connect with the tube to remove inside dust.

2. Dimension

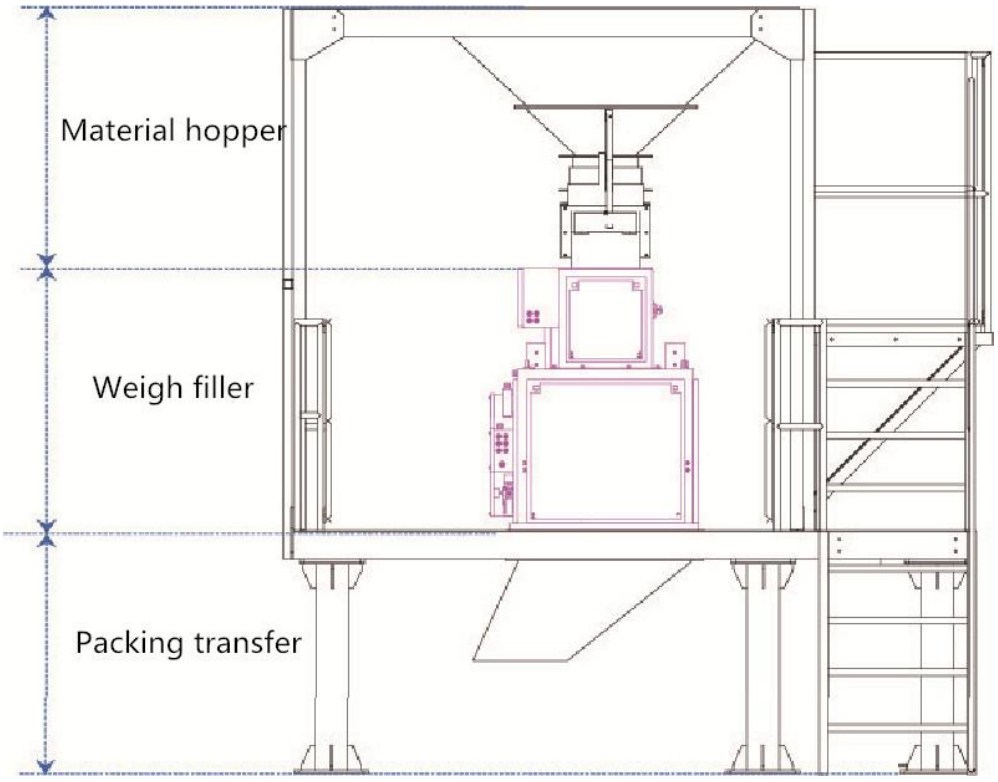
2.1. Outward appearance



2.2. Flange size



2.3. Installation diagrammatic sketch



3. Installation

3.1. Warranty

We do not accept any liability for damages resulting from:

1) Non-compliance with our operating conditions and user's manual.

2) Unauthorized installation.

3) Defective electrical installation by the customer.

4) Structural changes to our equipment.

5) Incorrect operation.

6) Natural wear and tear.

3.2. Warning notice

The main switch must be off in the following situations:

1) Before carrying out work in the control cabinet, cut off power and disconnect the power connector.

2) When cleaning and maintenance work is being carried out on the outside of the control cabinet.

3) Risk to life from an electrical charge in the control cabinet.

The device must be operated by people who have been instructed in the operating procedure.

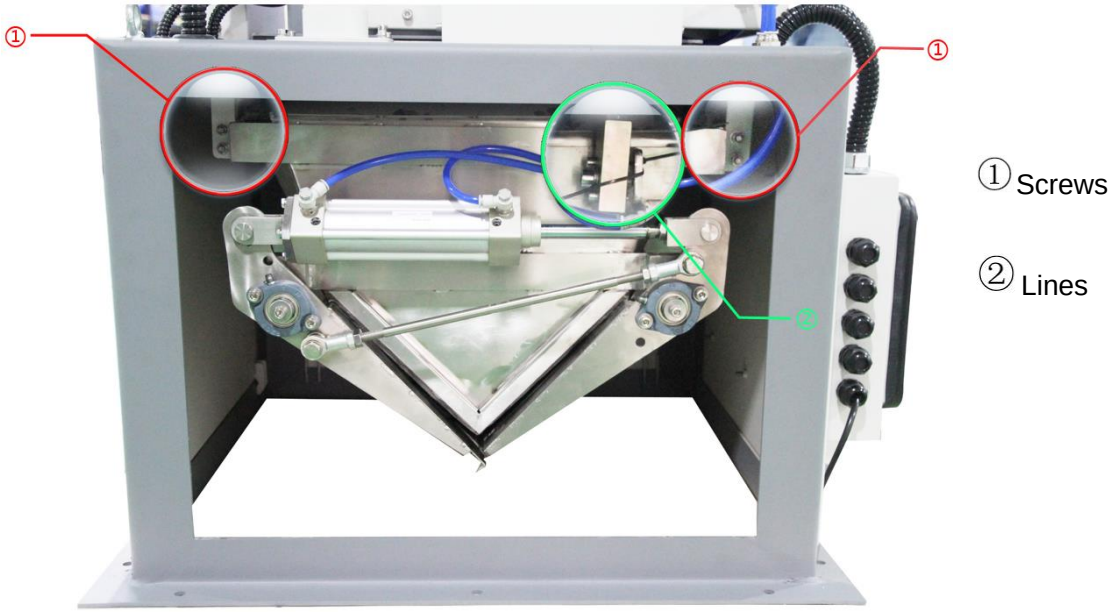
The operator must understand the safety instructions in this manual.

Even though the device is equipped with all the required safety installations, injuries to the operating personnel or damage to property is possible if the safety instructions are not heeded.

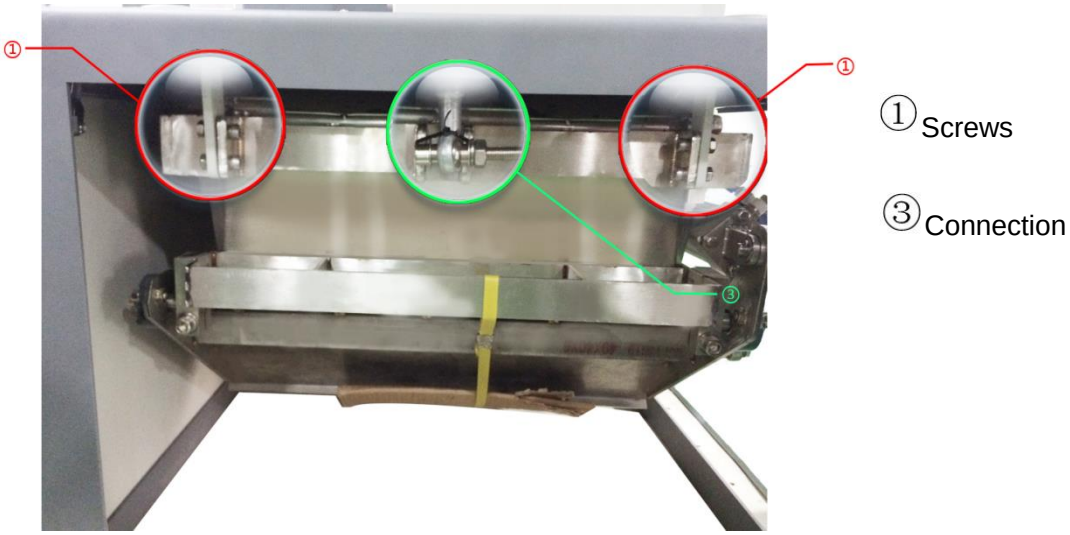
3.3. Connection

3.3.1 Load cell

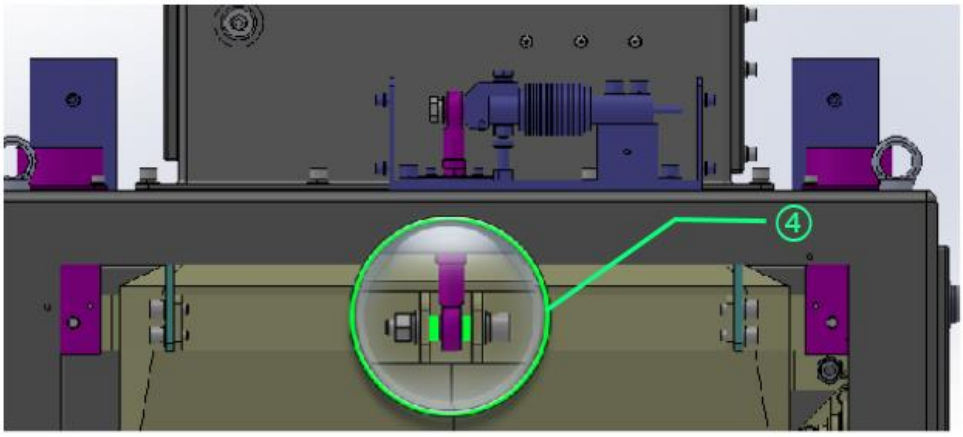
Please take off the screws on the protection boards which protect load cells to avoid damage in delivery



Side view-1



Side view-2



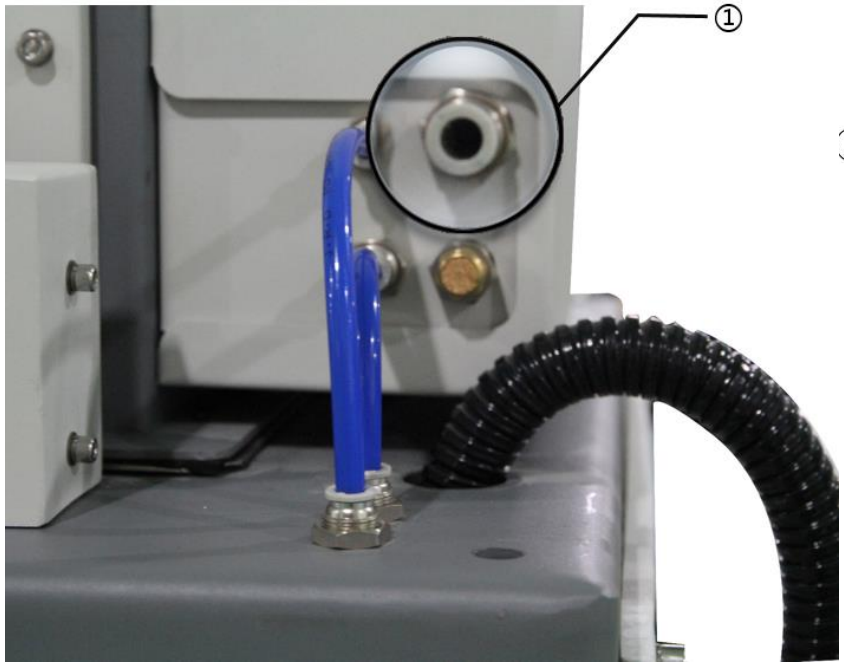
④ Screws

Sketch

Note: 1. Please install load cells after the weigh filler has been fixed on equipment.

2. Please fasten the screws when load cell connection and weighing device are in nature.

3.3.2 Air vent

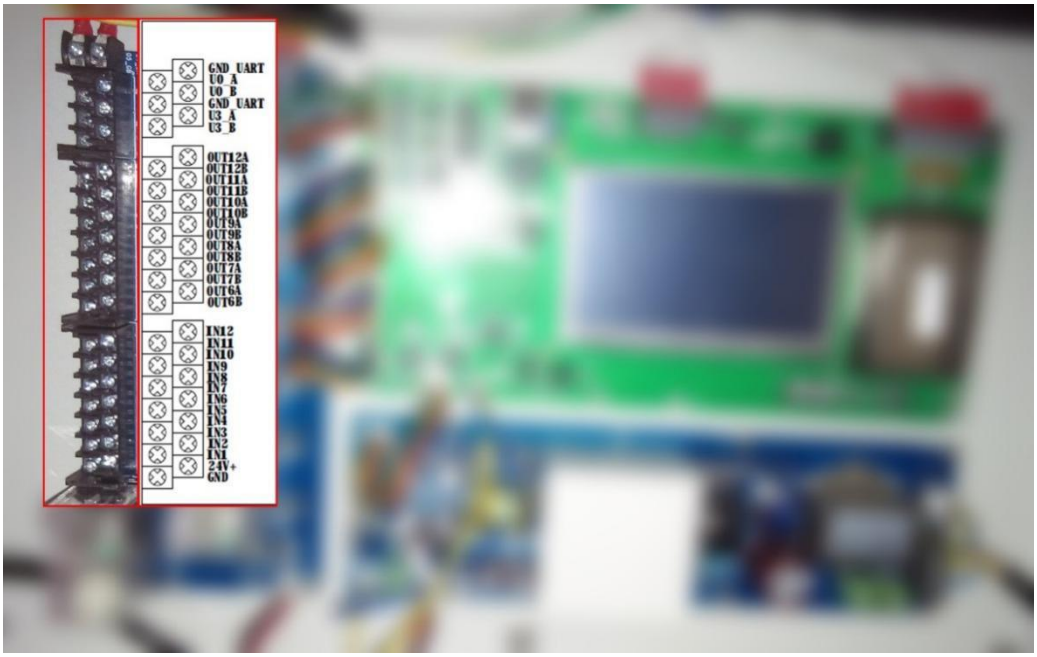


① Air vent

Operation air pressure：0.4~0.5Mpa, 1.2m³/h

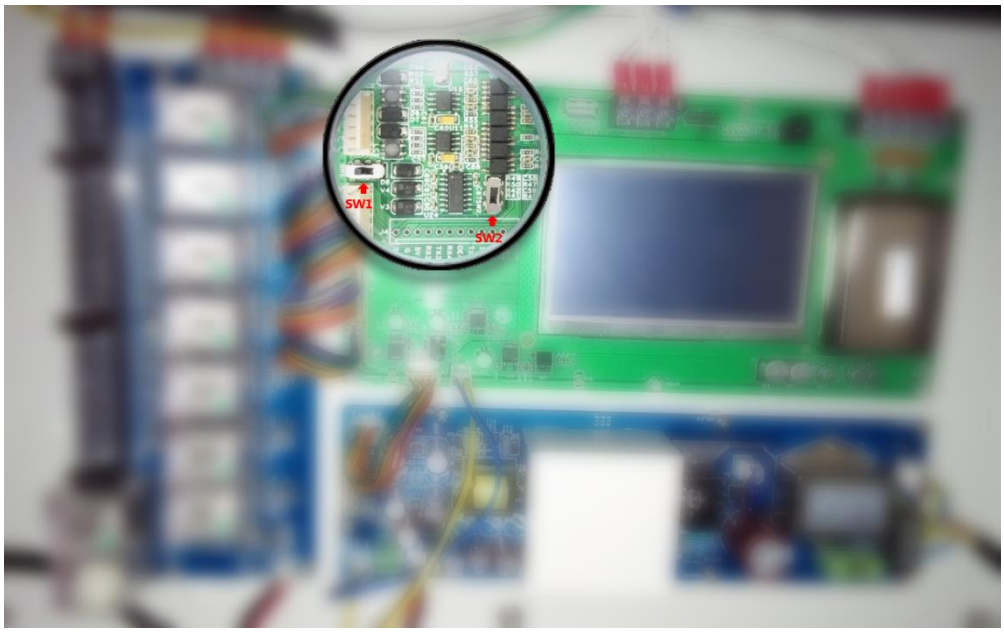
3.3.3 Serial port

IO terminals：

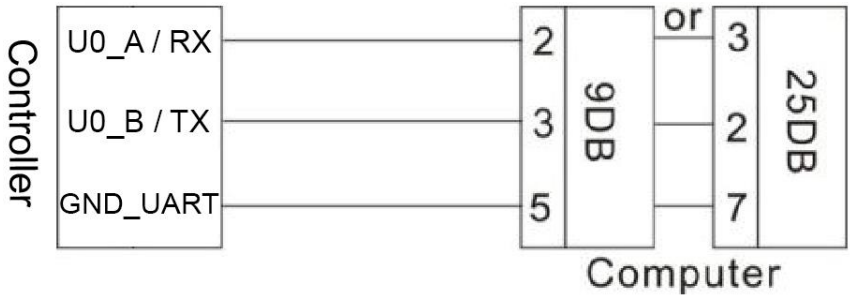


1). Serial port 1（GND_UART、U0_A、U0_B）connection：

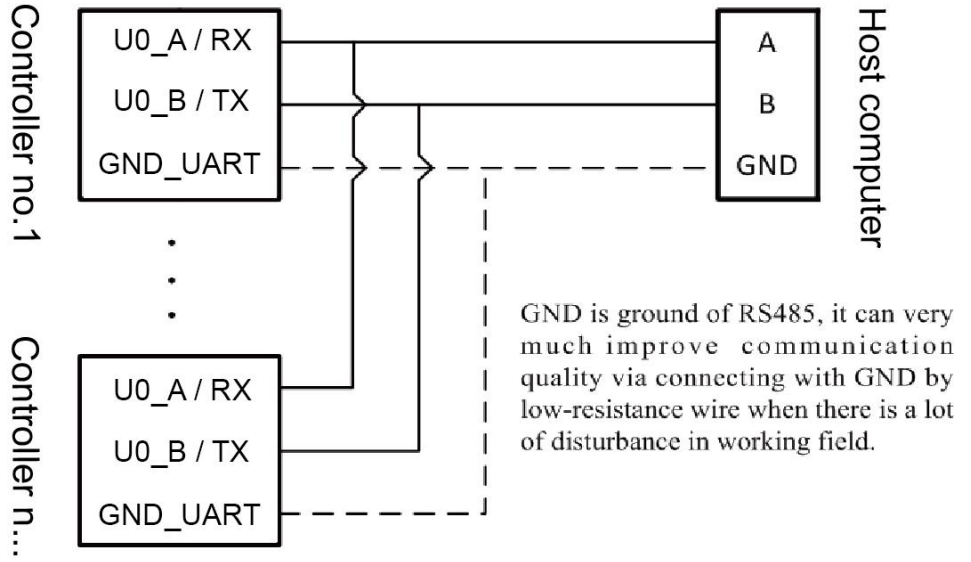
RS485/RS232 optional by SW1 and SW2 on main board: SW1 to left and SW2 up for RS485 communication, and SW1 to right and SW2 down for RS232 communication.



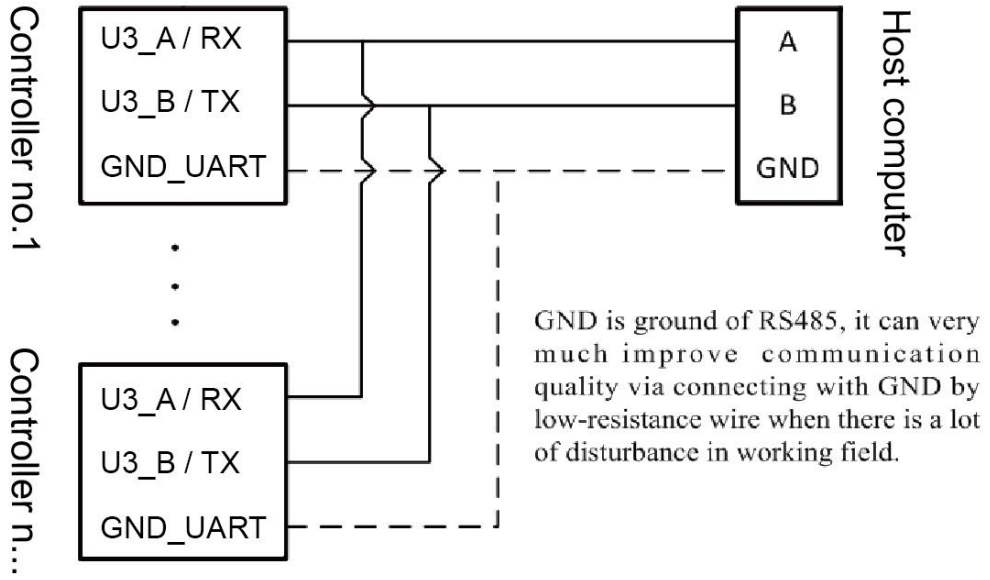
RS232 connection：



RS485 connection：



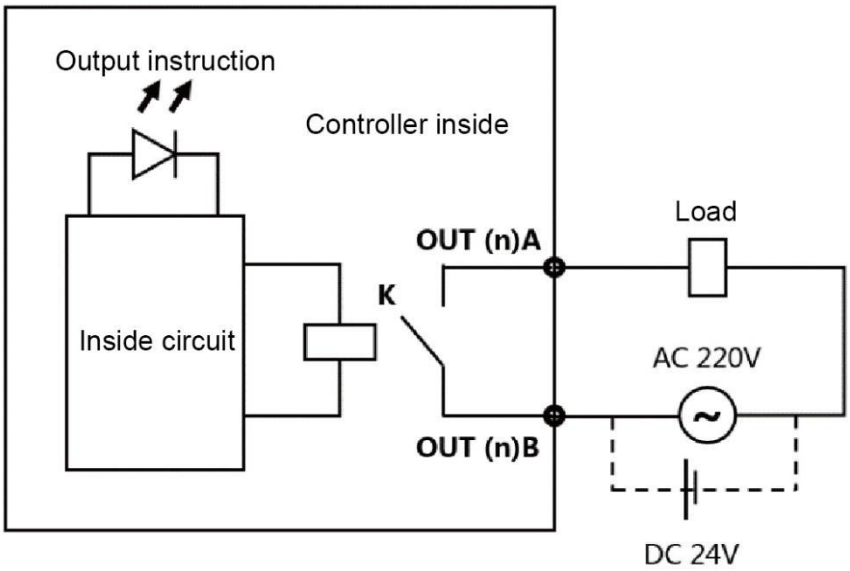
2). Serial port2（GND_UART、U3_A、U3_B）： Only RS485 connection



3).（OUT6A、OUT6B）–（OUT12A、OUT12B）

The user can refer parameter chapter to self-define 7pcs outputs.

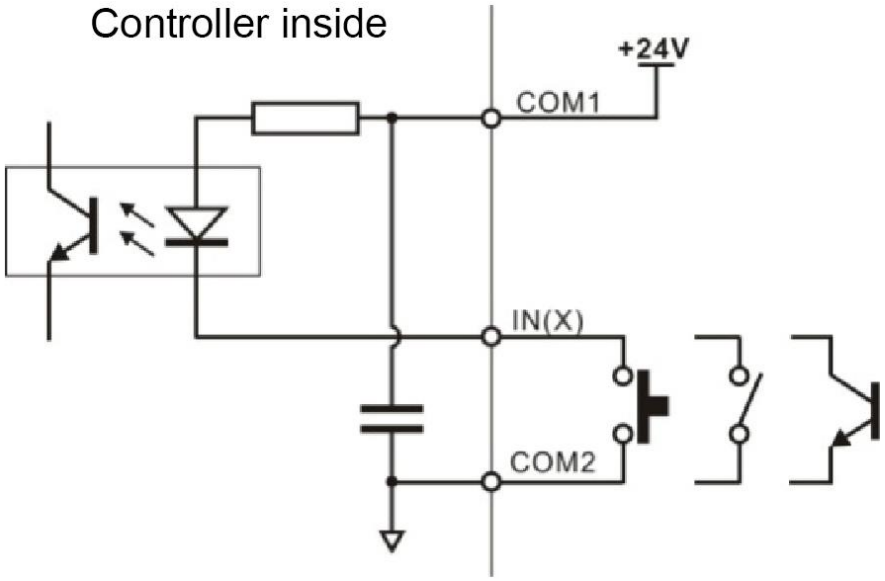
Controller output schematic as follows. **OUT1~OUT5** are set by manufactory, so the user don't need to connect and define.



4). IN1–IN12：

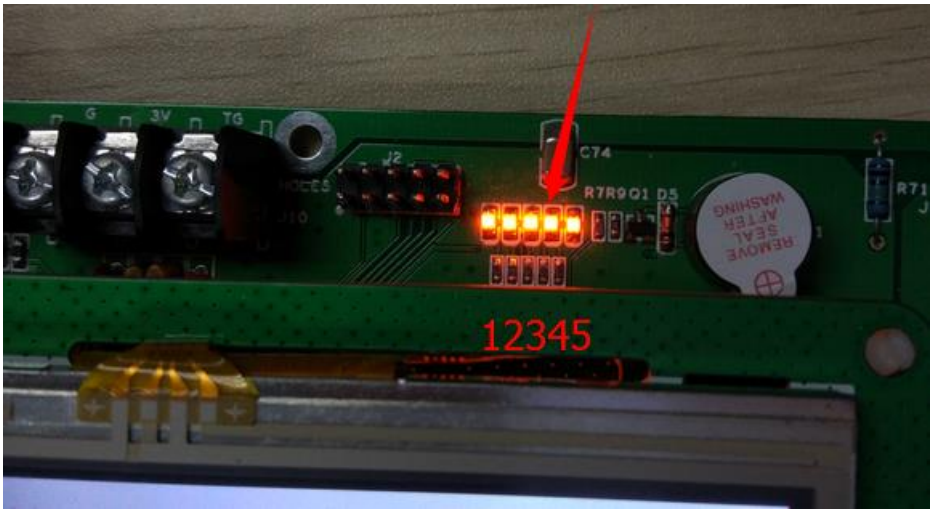
The user can refer parameter chapter to self-define 12pcs Inputs at active low.

Controller input schematic as follows.



5)**. 24V+、GND：**The terminal supply one DC24V power, which positive connect with indicator 24V+，negative electrode with indicator GND.

3.4. LED instruction



There are five LED lights named LED1~5 from the left to the right.

All of LED1~5 bright means the controller is updating within 4 seconds.

LED state instruction：

LED1：Sparkle interval time is one second. If not, the controller will have problems.

LED2：Bright for running. If not, the controller will stop.

LED3：Bright for error in A/D convert module. If it is dark, the A/D convert module is OK.

LED4：Bright for serial port no. 1 to send data.

LED5：Bright for serial port no. 2 to send data.

4. Operation

4.1. Menu

Instruction:

① Load information：User level.

② System time and date：Current time and date.

③ Weight display：Show weight value and unit.

④ Stable sign：Green sign for stable and white sign for unstable.

⑤ Zero sign：Green sign for zero and white sign for not zero.

⑥ Procedure：Run/Stop, Coarse, Fine, Stable load, Discharge, Over and Under, Clip bag.

⑦ Data：The left side is current recipe data which can be revised by users. The right side show statistics and last packing data.

⑧Function：5pcs keys for system function.

Key function:

：Enter main menu

：Set current weight to zero

：Start the packing process.

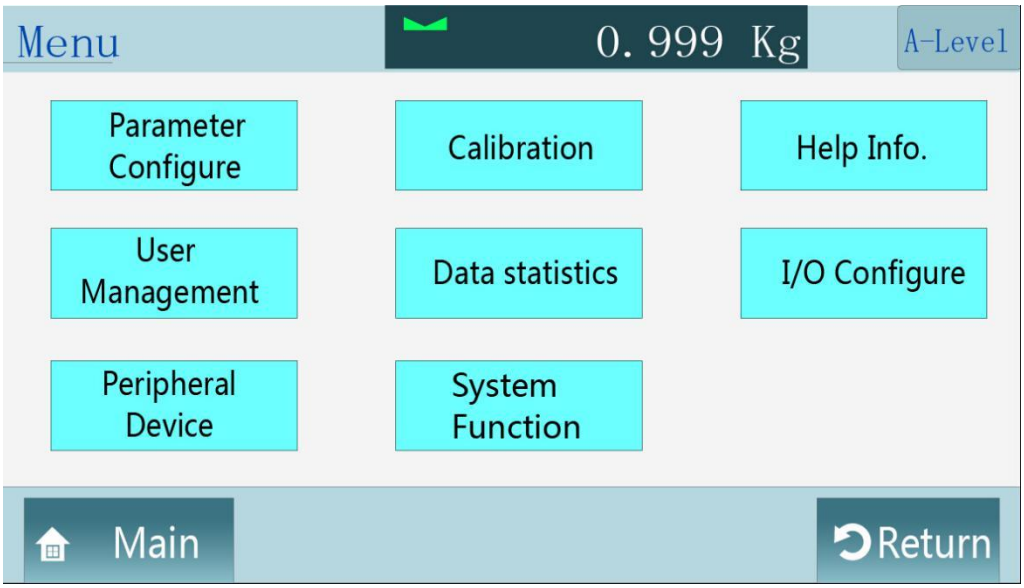
：Stop packing process in running

：Set parameters

4.2. Main menu

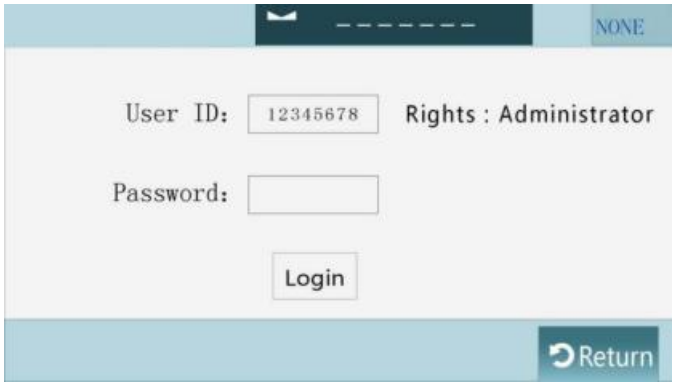
Press 

to enter main menu to select operation.



4.3. Login

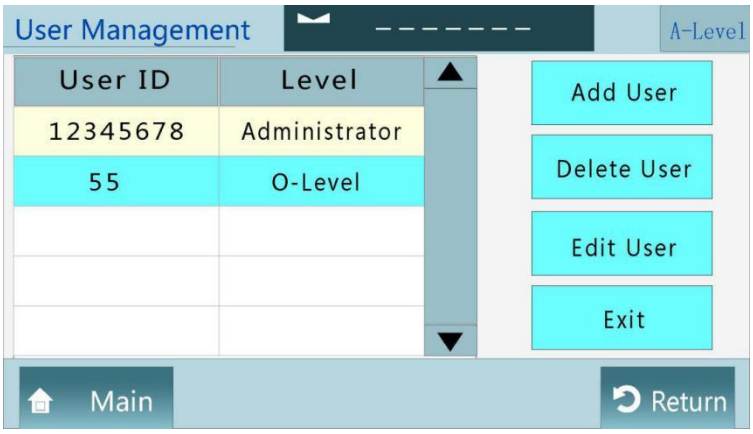
The default administrator ID is 12345678 and password is 000000. Please change the password to use for first time. For other users, please refer“User management”



4.4. User management

Press 

to register authorization levels: Manufactory, System administrator, Administrator, Technician, Operator.



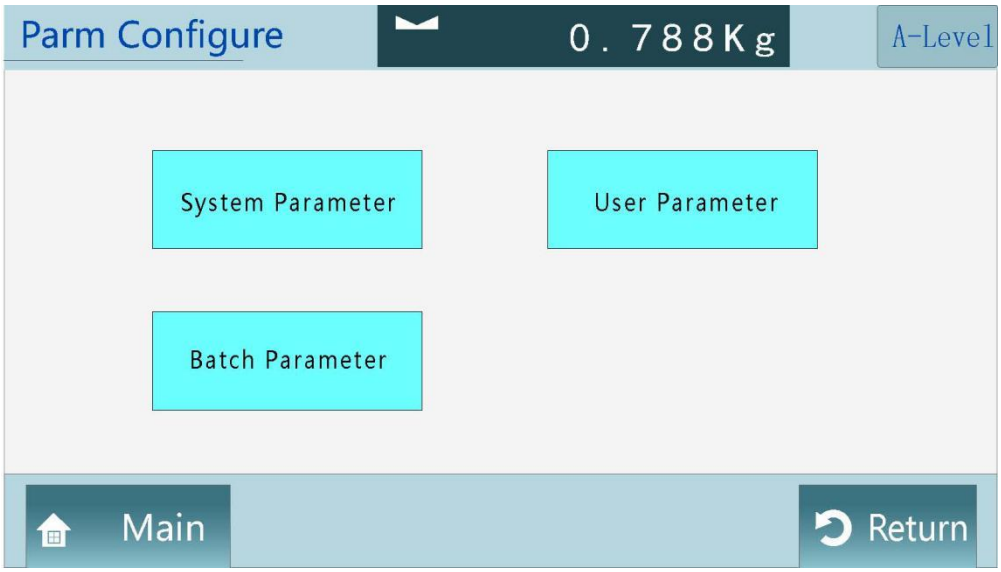
Level explanation：

User / Menu	Manufactory	System administrator	Administrator	Technician	Operator
Parameter Configure	√	√	√	√	√

Calibration	√	√	√	√	√
Help	√	√	√	√	√
User management	√	√	√	√	√
Data Statistics	√	√	√	√	×
I/O Configure	√	√	√	√	×
Peripheral Device	√	√	√	√	×
System Function	√	√	√	×	×
Manufactory	√	×	×	×	×

4.5. Parameter Configure

Press Parameter Configure to set System Parameter, User Parameter and Batch Parameter.



4.5.1 System parameter

No.	Parameter	Range	Initial	Instruction
1	Unit	g Kg t lb	Kg	System unit
2	Decimal point	0 0.0 0.00 0.000 0.0000	0.000	System decimal point
3	Mini division	1 / 2 / 5 / 10 / 20 / 50	1	Mini division

4	Max. capacity	xxxxxx	100.000	Max. capacity
5	Work mode	Single	Single	Single scale
6	Automatic zeroing interval	0~999999	80	Zeroing after some packing times. Not to zero If 0. Note: Not to zero for first packing.
7	Zeroing range	1%~99%	10%	1%~99% of max. capacity.
8	Stable range	0~99	5	0~99d optional. Stable state will be continue if 0.
9	Stable time	0.001~	0.3 s	Stable weight within stable time, otherwise unstable.
10	Zero tracking range	0~9	3	0~9d optional Not to track zero if 0.
11	Zero tracking time	0.001~9.999	2 s	
12	Running AD filter grade	0～9	2	The bigger the stronger
13	Stop AD filter grade	0～9	9	The bigger the stronger
14	Automatic zeroing switch	ON/OFF	OFF	Zeroing or not when power supply is on.
15	Manual discharging switch	ON/OFF	OFF	Account to total or not for manual discharging.
16	Fix weight display switch	ON/OFF	OFF	After meeting target weight, the value will be displayed continuously till discharging.
17	Automatically adjust filling door switch	ON/OFF	ON	Adjustable
18	Screen bright time	Bright / 10 minute / 5 minutes / 1 minute	5 minutes	
19	Language	Chinese / English	Chinese	Operation language

Self-adjustable parameter:

No.	Parameter	Initial	Instruction
1	ON/OFF	ON	Self-adjustable coarse filling and fine filling switch
2	0~10	0	Packing speed grade. 0 is normal. The bigger the slower, but higher precision.
3	ON/OFF	OFF	Positive deviation function switch ON： The weighing result will be positive deviation compared with target value in filling. OFF：The weighing result will be positive or minus around 0 in filling.

Date and time

Press 

to check date & time or change setting, then confirm if changed.

Communication parameters for serial port 1 and 2：

No.	Parameter	Initial	Instruction
1	1~99	**1**	ID code
2	Modbus-RTU / Modbus-ASCII/Printer	Modbus-RTU	Communication parameters
3	9600、19200、38400、57600、115200、256000	38400	Baud rate
4	1-8-NONE-2、1-8-EVEN-1、1-8-ODD-1、	1-8-EVEN-1	Data format

	1-8-NONE-1		
5	High-low / Low-high	High-low	Register data

Ethernet parameters：

No.	Parameter	Initial	Instruction
1	Modbus-TCP	Modbus-TCP	Communication protocol
2	High-low / Low-high	High-low	Register data
3	0~65535	**502**	ID
4	**xxx.xxx.xxx.xxx**	**0.0.0.0**	IP address
5			MAC address

4.5.2 User parameter

The user can set 20 set recipes parameters as follows：

No.	Parameter	Initial	Instruction
1	1~20	1	Recipe no.
2	xxxxxx	**0**	Target value
3	xxxxxx	**0**	Leading quantity of coarse feeding. When present weight **≥** Target value-Leading quantity of coarse feeding, and then shut off coarse feeding.
4	xxxxxx	**0**	Free fall value. When present weight ≥ target value-free fall value，and then shut off the fine feeding.
5	0～99.999 s	**0.3 s**	Discharge time Output discharging signal within effective time.
6	ON/OFF	**OFF**	Over / under tolerance switch
7	xxxxxx	**0**	Over tolerance Present weight ≥ target value + over value.
8	xxxxxx	**0**	Under tolerance Present weight ≤ target value - under value.
9	0～99.999 s	**2 s**	Alarm time for over/under tolerance

10	ON/OFF	**OFF**	Pause switch for over/under tolerance **ON**：Stop. The user can press “Clear alarm” to go on or press “E-Stop” to stop running. **OFF**：Just output alarm signal, not stop.
11	0～99	**1**	Single weighing times Weigh once to discharge for packing. If 0, it will directly discharge with bag or not.
12	0～99.999 s	**0 s**	Delay time before filling Begin to fill material after delay time **t1.**
13	0～99.999 s	**0.9 s**	Fix weight time. Output discharging signal after this time when filling has finished.

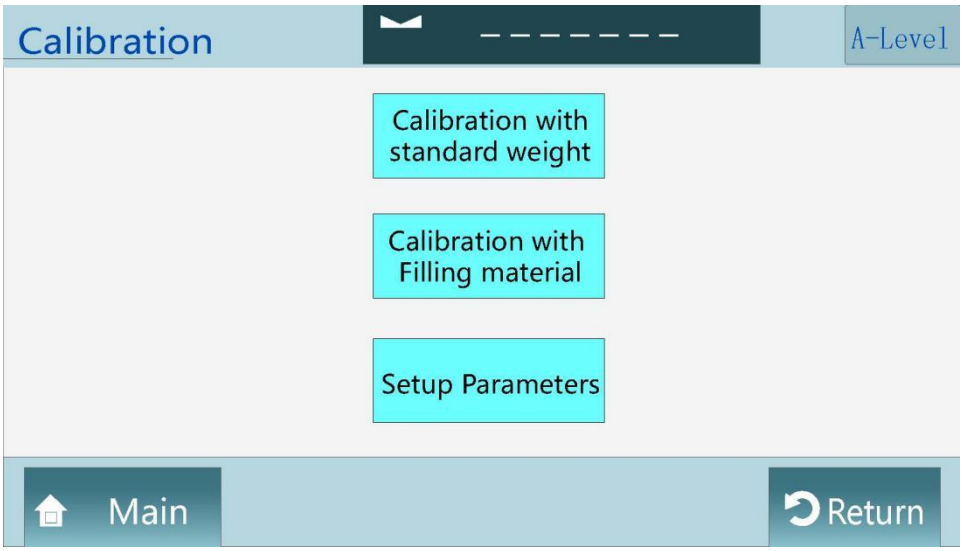
4.5.3 Batch parameter

The user can press Batch Parameter to set batching times. The device will pause to output alarm signal after finished, then the user can clear alarm by pressing “Clear alarm” , “ Stop” or “ E-Stop” .

4.6. Calibration

The user need calibrate AF-50K-103A to use for first time or any change or weighing error.

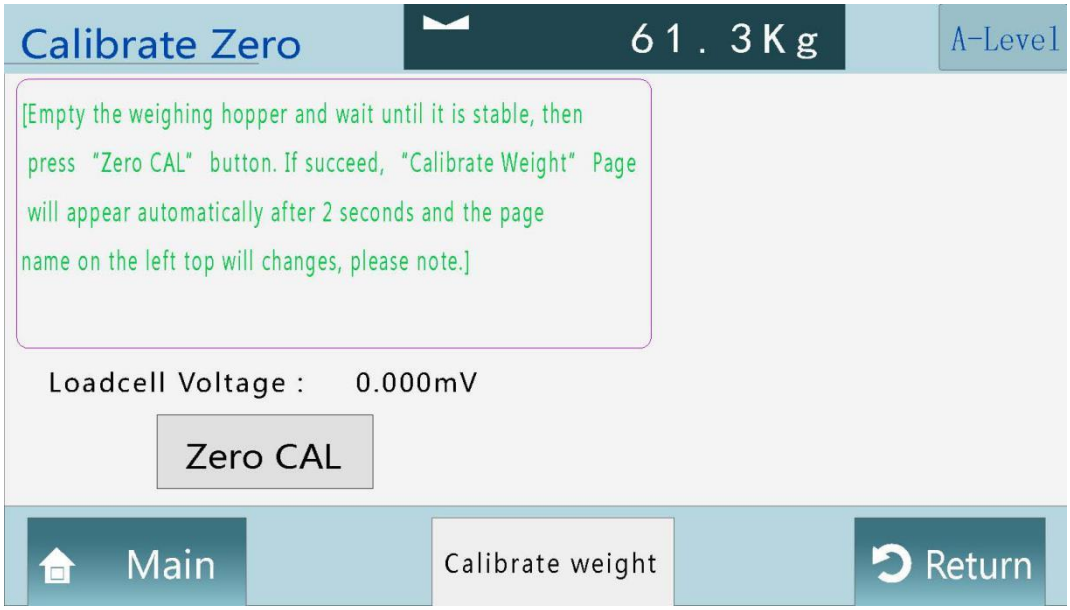
Please press Menu to enter Calibration as follows:



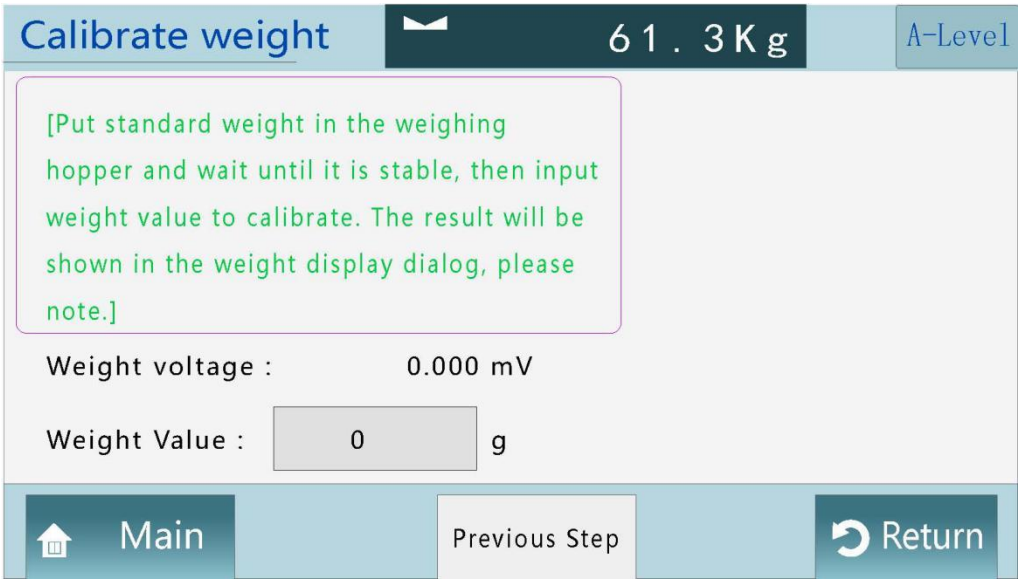
Note: The user can calibrate by standard weight or filling material.

4.6.1 Calibration with standard weight

1) Zero calibration: Empty hopper and press “Zero calibration” to display zero on screen. Then device will enter gain calibration automatically after zero calibration has been finished 2 seconds later.



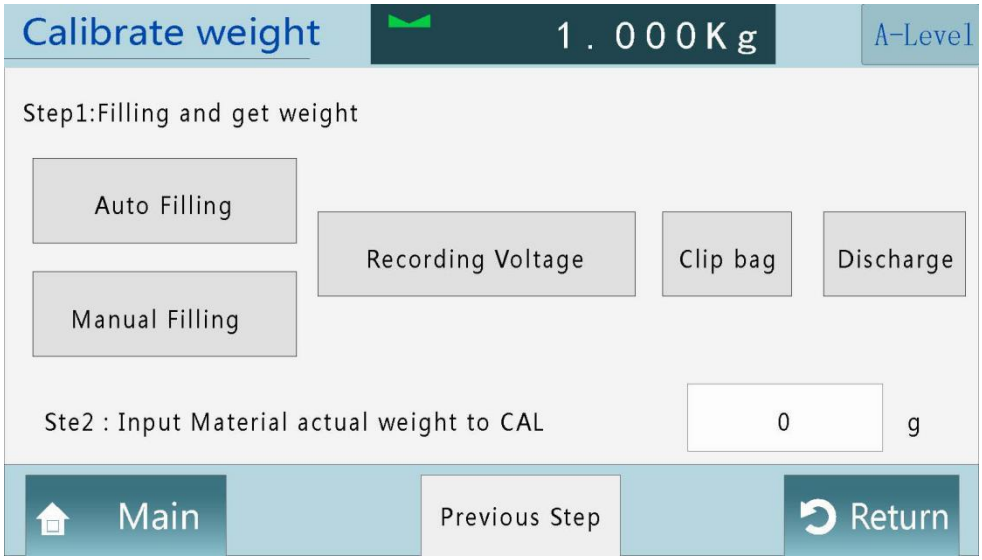
2) Gain calibration: Put standard weight on weighing device and input the weight value in dialogue window, which value should be same as the weight display on screen.



4.6.2 Calibration with filling material

1) Zero calibration: Empty hopper and press “Zero calibration” to display zero on screen. Then device will enter gain calibration automatically after zero calibration has been finished 2 seconds later.

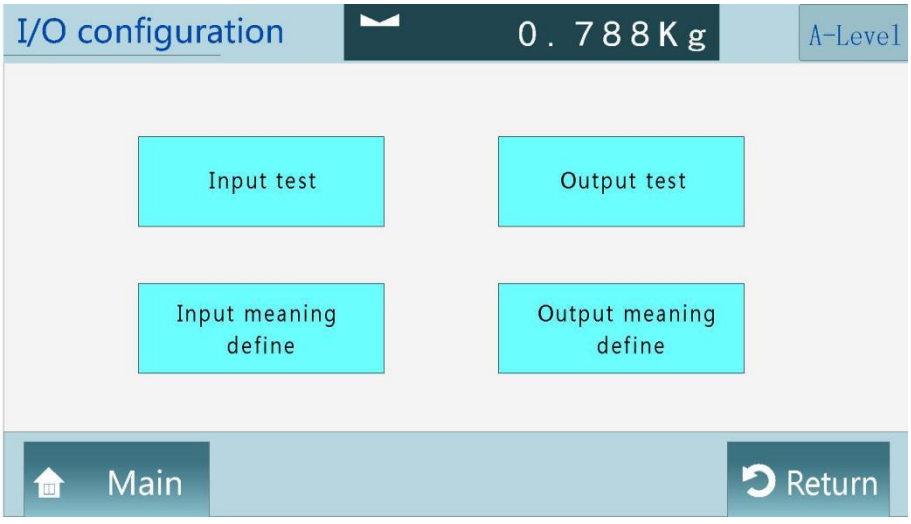
2) Gain calibration: After finish filling, press “record current weight” till “OK”, then press discharge to weigh the material again. Input the weight value in “weight again” dialogue window for gain calibration.



4.7. I/O configure

Press 

to test and define I/O: 12pcs input and 7pcs output



4.7.1 Input meaning define：

No.	Define	Meaning
IN1	1 Run	0：None 1：Run 2：E-Stop 3：Stop 4：Zeroing
IN2	2 E-Stop	
IN3	3 Stop	

IN4	4 Zeroing	5：Clear alarm 6：Select recipe 7：Clip/release bag 8：Manual discharging 9：Manual fine filling 10：Manual coarse filling 11：Print grand total 12：Upper level 13：Lower level 14：Run/Stop (level signal) 15：Run/E-stop (level signal) 16：Manual discharging (level signal) 17：Manual fine filling (level signal) 18：Manual coarse filling (level signal) 19：Push rod to open material gate 20：Push rod to close material gate
IN5	5 Clear alarm	
IN6	6 Select recipe	
IN7	7 Clip/release bag	
IN8	8 Manual discharging	
IN9	9 Manual fine filling	
IN10	10 Manual coarse filling	
IN11	0 None	
IN12	0 None	

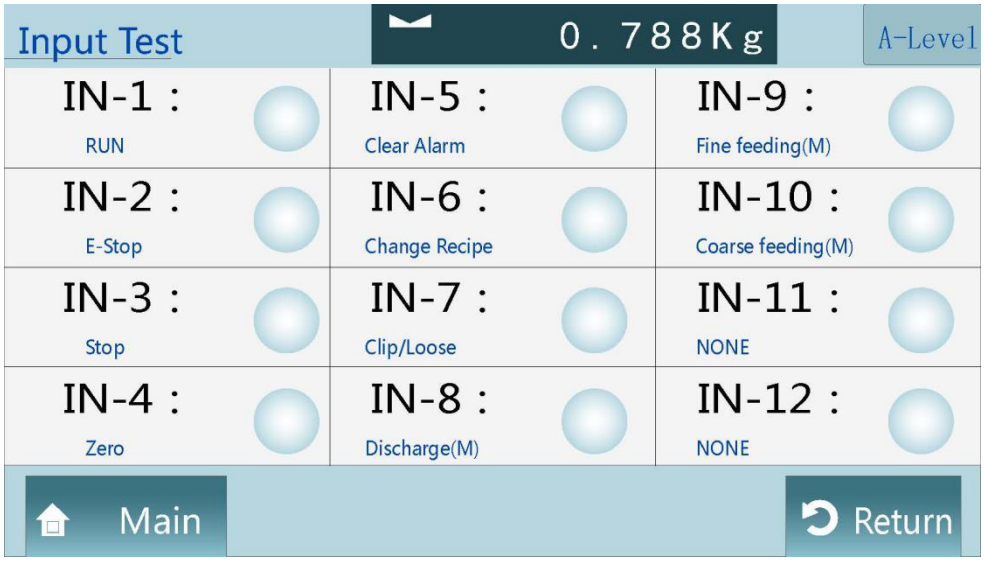
4.7.2 Output meaning define：

No.	Define	Meaning
OUT1 (Manufactory)	3 Coarse filling	0：None 1：Run 2：Stop 3：Coarse filling 4：Fine filling 5：Discharge 6：Fix weight/finish filling/target 7：Over/under tolerance 8：Alarm 9：Clip bag 10：Printing code 11：Feeding 12：Lack material 13：Batch done 14：Push rod to open material gate 15：Push rod to close material gate 16：Finish packing once (Output finishing signal after discharging 2 second later)
OUT2 (Manufactory)	4 Fine filling	
OUT3 (Manufactory)	5 Discharge	
OUT4 (Manufactory)	14 Push rod to open material gate	
OUT5 (Manufactory)	15 Push rod to close material gate	
OUT6	9 Clip bag	
OUT7	1 Run	
OUT8	8 Alarm	
OUT9	10 Printing code	
OUT10	13 Batch done	
OUT11	7 Over/under tolerance	
OUT12	16 Finish packing once	

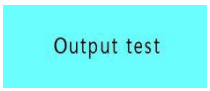
4.7.3 Input test

Press 

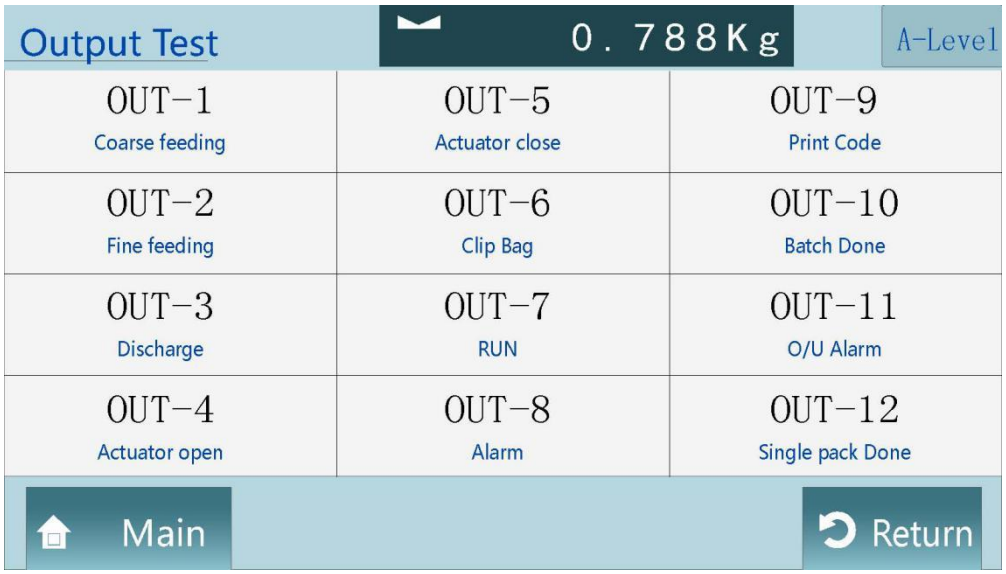
to test connection, which green light instructs ok, but gray not.



4.7.4 Output test

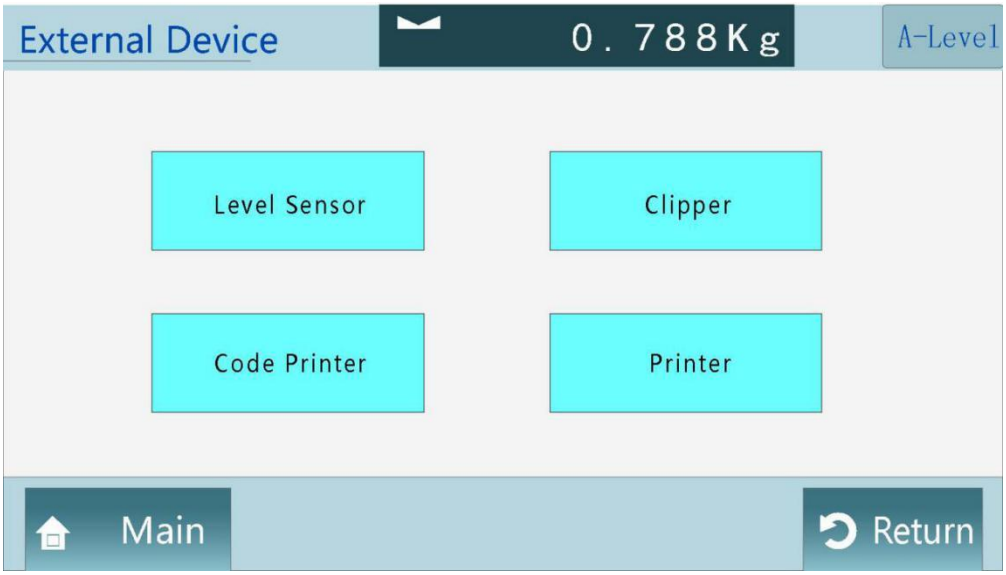
Press 

to test connection, which green instruct ok, but gray not. The user can press again to check if reset.



4.8. Peripheral device

Peripheral device: Level Sensor, Clipper, Code Printer and Printer.



4.8.1 Level sensor

Dual level sensor

The device can control feeding function: When both upper and under levels input ineffective, the feeding output effective; When the upper level input effective, the feeding output ineffective. At same time, the device will check if the under level input effective before each filling, if not, the device will output lack material signal and waiting till the under level input effective. But in the whole of filling, the device will not check whether the under level input effective or not.

Single level sensor

The device won’t control to feed material, only check under level before filling. if not, the device will output lack material signal and waiting till the under level input effective. The filling won’t start till the under level input effective before each feeding. But in the whole of filling, the device will not check whether the under level input effective or not.

No level

The indicator doesn’t control to feed materials and doesn’t check whether the under level input effective or not.

4.8.2 Clipper

No.	Parameter	Initial	Instruction
1	0.000 ~ 99.999 second	**0.5 s**	Delay time after clip bag Finish clip bag after this time
2	0.000 ~ 99.999 second	**0.5 s**	Delay time before release bag Once discharge, then release bag after this time

4.8.3 Code printer

1) When the device output clip bag signal and start delay time for printing code at same time, then the device output signal to print code after delay time, the signal will be ineffective after that.
2) Printing code is effective in running or stop status.
3) Release bag is available in printing code.
4) Finish to print code when E-stop signal input.

No.	Parameter	Initial	Instruction
1	ON/OFF	**OFF**	Code printer switch
2	0.000 ~ 99.999 second	**0 s**	Delay time before printing code
3	0.000 ~ 99.999 second	**2.0 s**	Code printer output effective time
4	ON/OFF	**OFF**	Inhibit to discharge in printing code

4.8.4 Printer

Please set baud rate and communication format same as printer when serial port 1 or 2 communication protocol is “ Serial port printer ”.

No.	Parameter	Initial	Instruction
1	16 row / 32 row	**32 row**	Printing format of 16 rows or 32 rows.
2	Chinese / English	**Chinese**	Printing language
3	0~9	**3**	Printing lines after one set of data
4	ON/OFF	**OFF**	Automatic printing switch

Automatic printing

The device will print packing details automatically every time if the switch is “**ON**”.

32 row printing format as follows：

```
            Packing Detail
ID:     1
Run Time:2000/01/01 80:00
Unit:kg
Total Times Rec    Target     Result
--------------------------------
2       1       1.000       0.995
3       1       1.000       1.016
4       1       1.000       1.093
5       1       1.000       1.009
```

Print total report

Press “PRINT” for total report in stop status.

32 row printing format as follows：

```
              Total Report
ID:     1
Time: 2000/01/01 80:00
--------------------------------
Total Times:                    0
Total Value:                0.000kg
--------------------------------
```

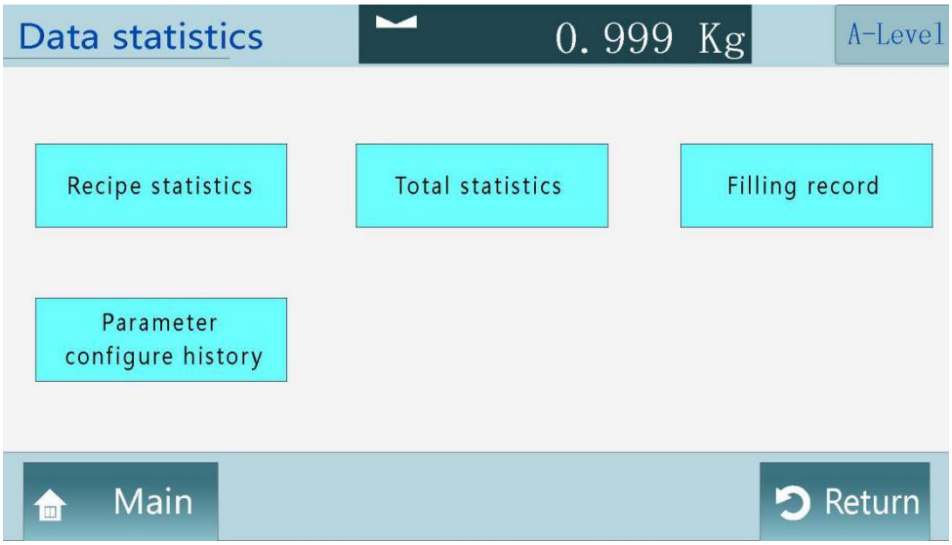
Print recipe report

Press “PRINT” for recipe report in stop status.

32 row printing format as follows：

```
               Rec. Report
ID:     1
Time: 2000/01/01 80:00
--------------------------------
Rec.:                           5
Target:                     0.000
Rec. Times:                     0
Rec. Value:                 0.000kg
________________________________
```

4.9. Data statistics



Recipe statistics : Store all of recipes, which can be zeroing.

Total statistics : Store all of total reports, which can be zeroing or printing.

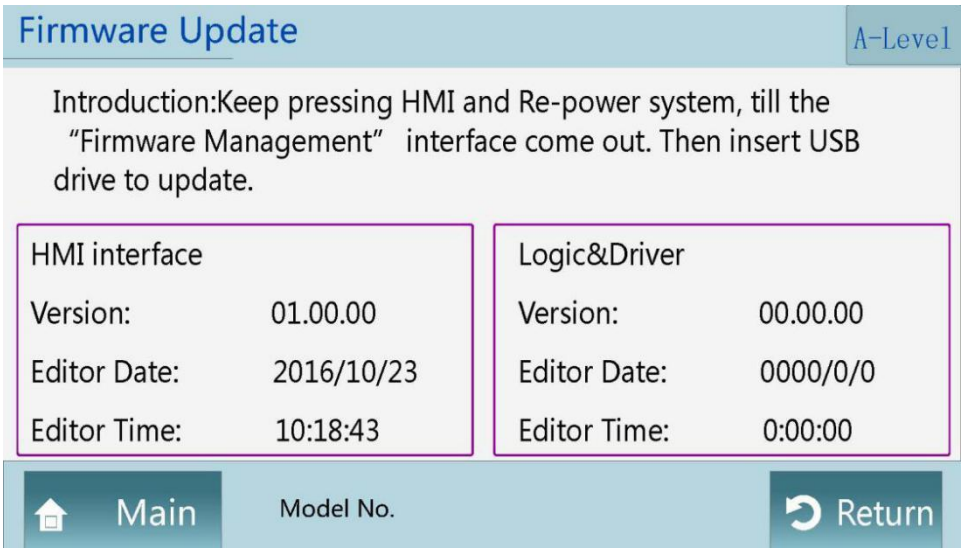
Filling record : Store 50,000pcs records at most, which can be output **to** U disk.

Parameter configure history : Store revised parameters, such as date, time, data etc.

4.10. System function

4.10.1 Firmware update

The user can view software version, date and time as follows:



Update tool: U disk

Update file route : Update program must be saved in up_gm file at the root of U disk.

Update file name: HMI interface program must be named DispUp.gm

Logic&Driver program must be named CtrlUp.gm

Note: The power supply do not break in updating.

4.10.2 Backup and reset

Initialize all of parameters : Reset all of parameters to initialization

Initialize basic parameters : Reset basic parameters to initialization

Initialize calibration parameters : Reset calibration parameters to initialization

Initialize recipe parameters : Reset recipe parameters to initialization

Initialize peripheral device parameters : Reset peripheral parameters to initialization

Initialize self-adaptive parameters : Reset self-adaptive parameters to initialization

Initialize communication parameters : Reset communication parameters to initialization

Initialize I/O configuration : Reset I/O configuration to initialization

Initialize self-adaptive statistics : Reset self-adaptive statistics and renew statistics

4.10.3 Output to USB

The user can output parameter values and statistics to file folder data_gm in the root of U disk by CSV format as follows:

ParameterCalib.csv : Calibration parameters

ParameterBasic.csv : Basic parameters

ParameterUser.csv : User parameters

ParameterIODef.csv : IO define

ParameterComm.csv : Communication parameters

ParameterPeri.csv : Peripheral parameters

ParameterAdapt.csv : Adaptive parameters

ParameterPushrod.csv : Push-rod parameters

ParameterHide.csv : High degree parameters

StatisticAcc.csv : Accumulative statistics

StatisticPacking.csv : Packing statistics

StatisticPara.csv : Parameter revised statistics

4.10.3 USB input

The user can input parameter file from folder data_gm in the root of U disk, which file name is same as above.

5. Procedure

5.1. Procedure

The whole procedure as follows:

1. Check target value and material gate before running.
2. Delay time before filling.
3. If the self-adaptive function is ON, the user need learn how to set parameters about the leading quantity and free fall on first packaging. And the controller will automatically adapt coarse filling and free fall base on the first packaging.
4. Fix weight time after filling finished
5. Record the fixed weight as the packing report.
6. Dealing with over/under tolerance if need.
7. Discharge if clip bag signal is effective.
8. Release bag when discharging time is over.

5.2. Self-adaptive function

If the self-adaptive function is ON, the controller will automatically set the leading quantity of coarse filling and free fall.

There are two courses on self-adaptive function：self-learn and self-adjust

Self-learn：There is only target weight in a recipe, but no leading quantity of coarse filling and free fall setting, then the controller will self-learn to set these values automatically.

Self-adjust：The controller has got the leading quantity of coarse filling and free fall values, but need adjust the values base on packing procedure in one period, thus to ensure weighing precision in consideration of packing speed.