B60 Batch Weighing and Mixing Machine Operator's Manual

Contents

1. Safety precautions

This manual uses two different symbols to indicate "danger" and "attention" respectively in order to maintain your safety when using the controller. Please read through the safety regulations listed in this manual before using the controller.

Danger: Improper use may cause personal injury or mechanical failure.

1. Wiring operations must be performed after power is disconnected to ensure safety.
2. The grounding terminal must be implemented with third-party grounding.
3. Please confirm that the power supply voltage meets the input rated voltage of the controller.

Attention: Improper use may cause abnormal mechanical operation or inability to operate.

1. Before installation, please check whether there is any damage caused by careless handling on the appearance of the machine; if there is any damage, do not connect it to a power source.
2. Please install it on non-combustible materials and avoid installing it near flammable materials to prevent fires.
3. TFT human-machine interface should be touched by hand, and other tools should not be used to avoid damage.

1.1. precautions before operation

(1)Confirm that the controller, sensor, etc. have been installed correctly.

(2)Check whether the wiring is correct. Incorrect power connection may cause major faults.

(3)Are the parameters set within a reasonable range?

2. Features

1. This product is suitable for processes such as plastic injection, extrusion, blow molding or hollow molding that require precise mixing of multiple materials according to weight ratios.
2. The controller of this product uses a high-level operation CPU and adopts advanced batching algorithms, making it easy to operate and learn.
3. This series of products uses high-precision weight sensors to control the batch ratio error within ±0.1%~±0.3% (depending on the set ratio).
4. Automatic repeated calibration function, which will automatically perform calibration after each weighing.
5. The additive valve can choose a micro-discharge port to accurately control the discharge ratio.
6. It has a function of recording alarm history

7. Equipped with an Ethernet communication interface, which enables centralized monitoring and networking with the molding machine.
8. Optional data acquisition function is available, which can retrieve the actual proportion of each batch of raw materials A and B, pigment C, and additive D, as well as the production output, cumulative usage of various raw materials and production rate.

【Note】1. Automatic suction machine must be purchased separately
2.This product is not suitable for mixing powder and flakes.

3. Coding Rules

B 6 0 – 6 0 0 – 4

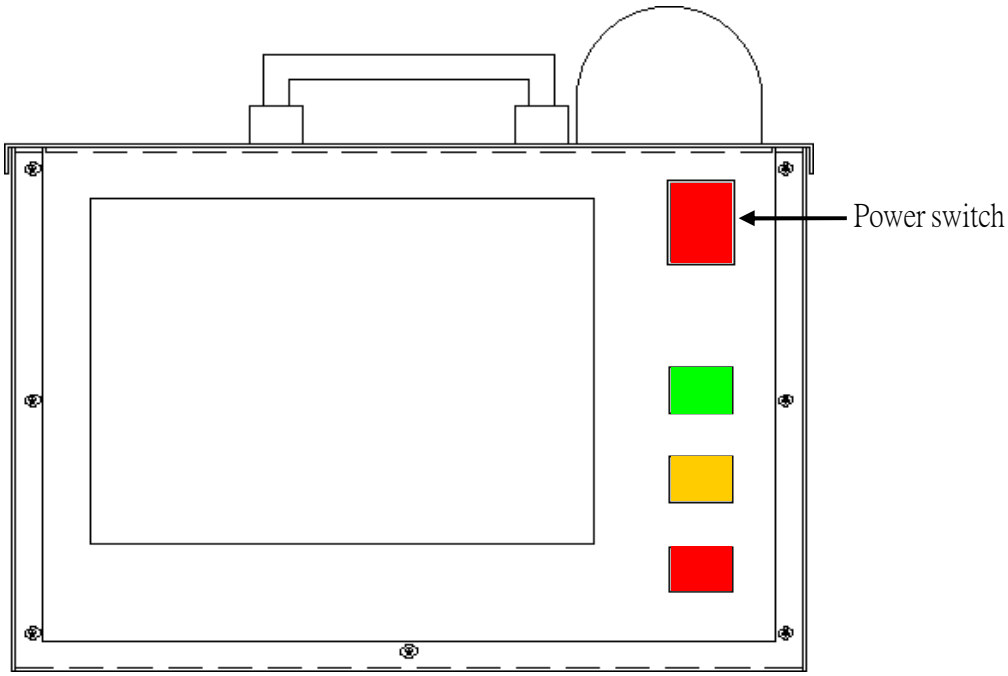
- 4 — Number of barrels：1～4
- 600 — Maximum flow rate：(Kg/hr)
- 60 — Batch weighing and mixing machine

4. Product Description

4.1. Basic Description

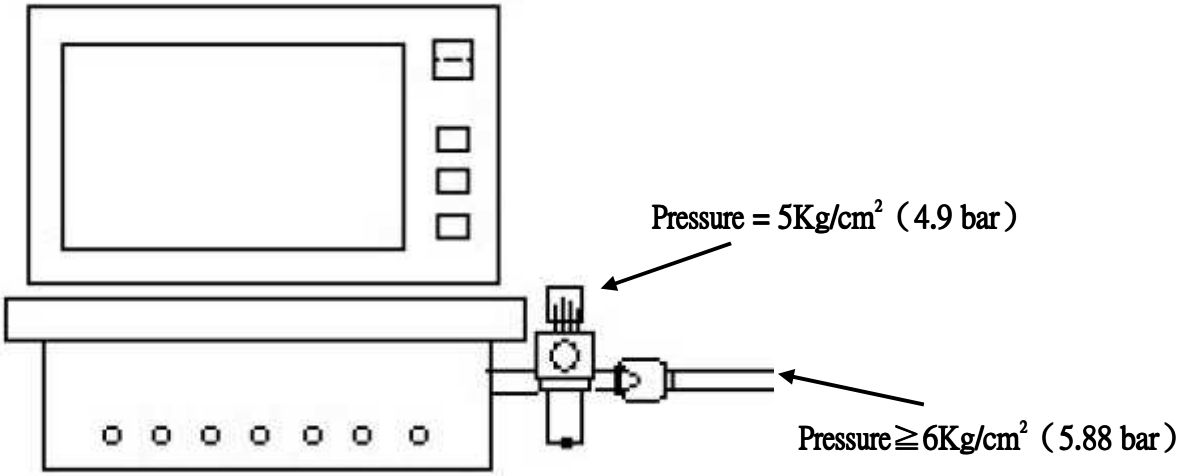
4.1.1. Installation Instructions

① Make sure the power switch on the operation panel is OFF, and turn it to OFF if it is notin the OFF position



② Connect the power cable of the control box to the input power connector of the control box ,and the other end to AC220V power; The external control element is connected to the corresponding connector on the control box. (See 5.4 Right View of Controller)

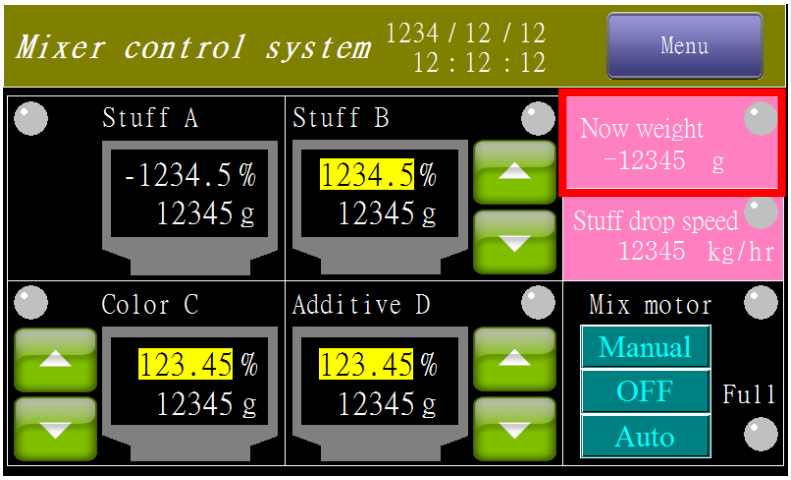
③ Connect the operating air pressure connection port to the compressed air source, the air pressure should be≧**6Kg/cm2（5.88 bar）**，and adjust the operating air pressure regulator valve so that the supply operating pressure is **5Kg/cm2（4.9 bar）**。



④ Inspect whether there are any foreign objects in the hoppers of each raw material. ? Check for foreign objects in the weighing bucket and mixing area.If any foreign objects are found in these areas, they must be thoroughly cleaned.

⑤ Check whether the side door of the mixer is properly closed. ? Are the fasteners securely Fastened ?

⑥ Turn the power switch on the operation panel ON and check if the HMI is activated and enters the main screen ? Verify if the weight displayed on the screen is within the range of -50g to 50g. If everything is normal, it indicates that the installation is complete. Otherwise, please contact technical support for assistance.



4.1.2. Input/output signal monitoring

Switch the screen to the main menu, press the function key to select "Query" to enter the operation screen, select "Input Terminal" or "Output Terminal" to switch to the monitoring screen. (See 6.4.1 Query)

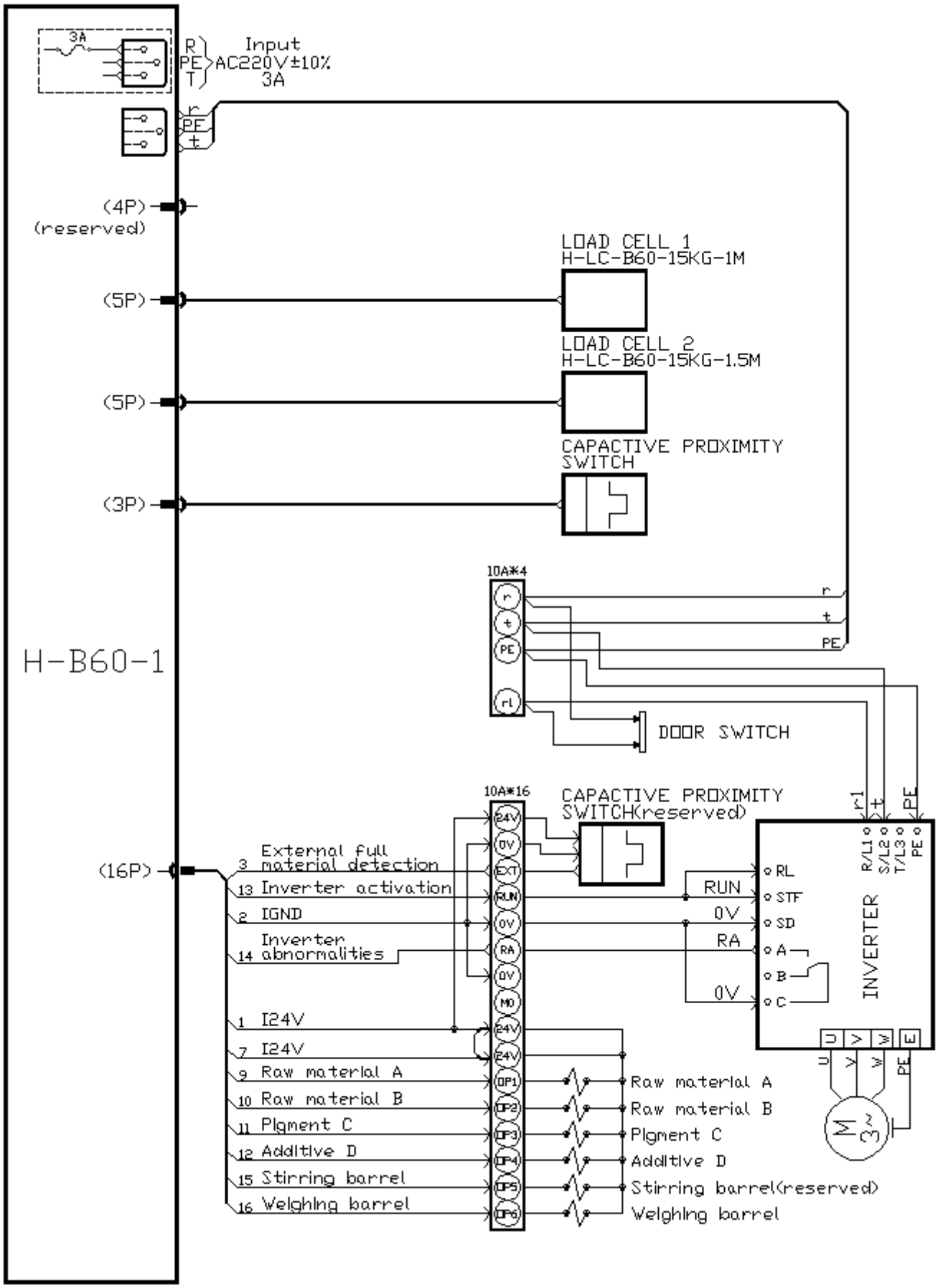
4.1.3. Output Test

① Switch the screen to the main menu, press the function key to select 'Query' and enter the operating screen. Choose 'Output Test' to switch to the testing interface.

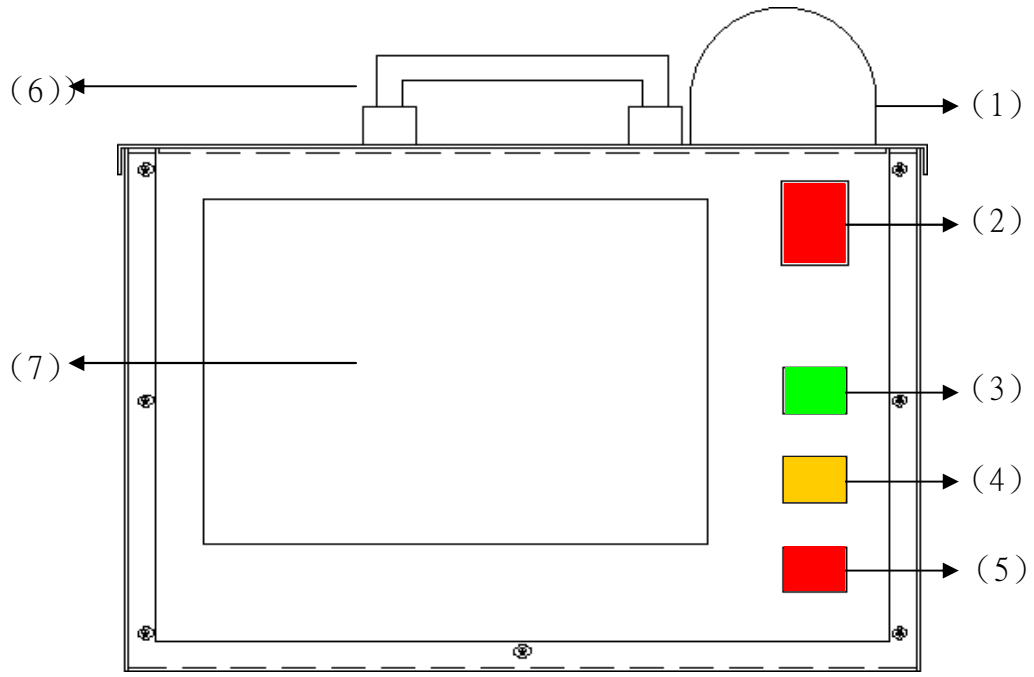
② Before the test, all output states are inactive. Next, press the solenoid valves in various parts of the screen, and their actions will correspond to their names and actual positions: for example, pressing 'Solenoid Valve A' will activate the pneumatic cylinder of raw material A. Pressing it again will cancel the action. If the pneumatic cylinder has abnormal movements, check whether the operating air pressure source pressure of the machine is normal.

5. Wiring and Connections

5.1. External wiring diagram



5.2. Front view of controller



(1) Warning light：If there is any abnormality, the alarm will emit a continuous short beep and the warning light will start flashing. The alarm sound and warning light will remain active until the 'Alarm Clear' switch is pressed, which will turn off the alarm sound and warning light.

(2) Power switch：

Switch ON：A. Turn on the power, the indicator light is ON.

B. About 5 seconds, the alarm will beep once, the system will be turned on, the TFT. HMI will show the screen, you can start to set up the mixer when you enter the main screen.

Switch OFF：Turn off the power and the indicator is off.

(3) Operation switch ON/OFF(green)：

Switch ON：A. Start operation

B. Indicator light blinks：Open the weighing bucket and discharge the materials into the mixing tank.

C. Indicator light ON：Start discharging the materials from each bucket in sequence.

Switch OFF：The indicator light flashes rapidly; after this feeding process is finished, the indicator light turns off & stops operation

(4) Pause switch (yellow)：

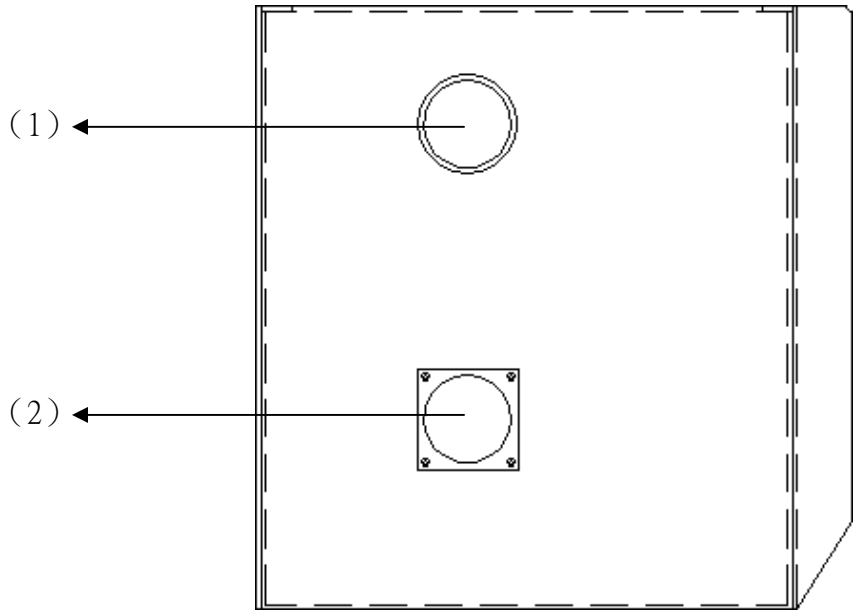
When the switch is pressed during operation, the indicator light will start flashing and stop feeding. Press the switch to turn off the light and continue to feed the material when it is running & stopped.

(5) Alarm Clear Switch (red)：If there is an abnormality, the switch indicator light will start flashing, and the alarm will emit a continuous short beep. Press the 'Alarm Clear' switch once to turn off the alarm sound and switch off the warning light.

(6) Handlebar

(7) TFT Human Machine Interface

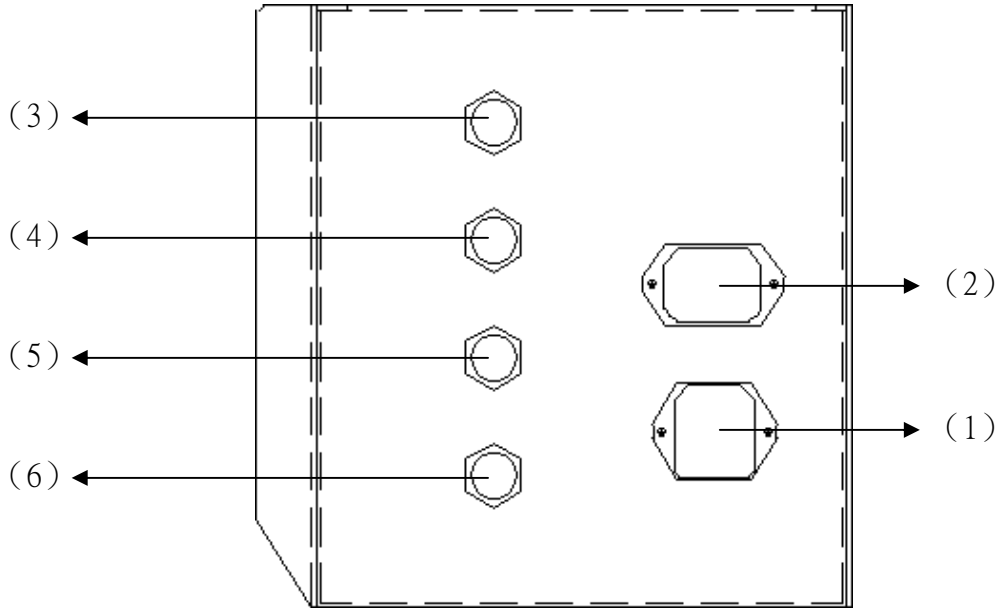
5.3. Left view of controller



(1) Alarm：When the power switch is turned on for the first time, the alarm emits a short beep to indicate that the system is booting up. If there is an abnormality, the alarm will emit a continuous short beep.

(2) Input/output control signal connector [see 5.5.3].

5.4. Controller right view



(1) Input power connector (with fuse 3A/250V) [see 5.5.1].

(2) Output power connector [see 5.5.2].

(3) Abnormal output contact connector (reserved) [see 5.5.4]

(4) Load cell 1 connector [see 5.5.5].

(5) Load cell 2 connector [see 5.5.5].

(6) The full material is checked and connected [see 5.5.6].

5.5. Connector Pin Function

5.5.1. Input power connector

1ΦAC220V±10% , 3A , 50/60HZ

5.5.2. Output power connector

1ΦAC220V±10% , 2A , 50/60HZ

5.5.3. Input/output control signal connector (16P)

Signal name		Connector pin number	function
Name	Code		
I24V	24V	1	Provides external power supply DC24V
IGND	0V	2	
External full material detection	IN02 (EXT)	3	Signal of external full material detection
NC	X	4	Undefined [Reserved]
NC	X	5	Undefined [Reserved]
NC	X	6	Undefined [Reserved]
I24V	24V	7	Provides external power supply DC24V
NC	X	8	Undefined [Reserved]
Raw material A	OP01	9	Raw material A solenoid control signal
Raw material B	OP02	10	Raw material B Solenoid control signal
pigment C	OP03	11	pigment C Solenoid control signal
Additive D	OP04	12	Additive D Solenoid ControlSignal
Inverter activation	OP10 (RUN)	13	Inverter start signal
Inverter (safety door) abnormalities	IN01 (RA)	14	Inverter (safety door) abnormal signal
Stirring barrel	OP05	15	Stirring barrel solenoid valvecontrol signal
Weighing barrel	OP06	16	Weighing barrel solenoidcontrol signal

5.5.4. Abnormal output contact connector (reserved)(4P)

Signal name	Connector pin	Function
R1A	1	The controller provides internal relay contacts for use
R1C	2	
NC	3	Undefined [Reserved]
NC	4	Undefined [Reserved]

5.5.5. Load cell 1 & 2 connectors (5P)

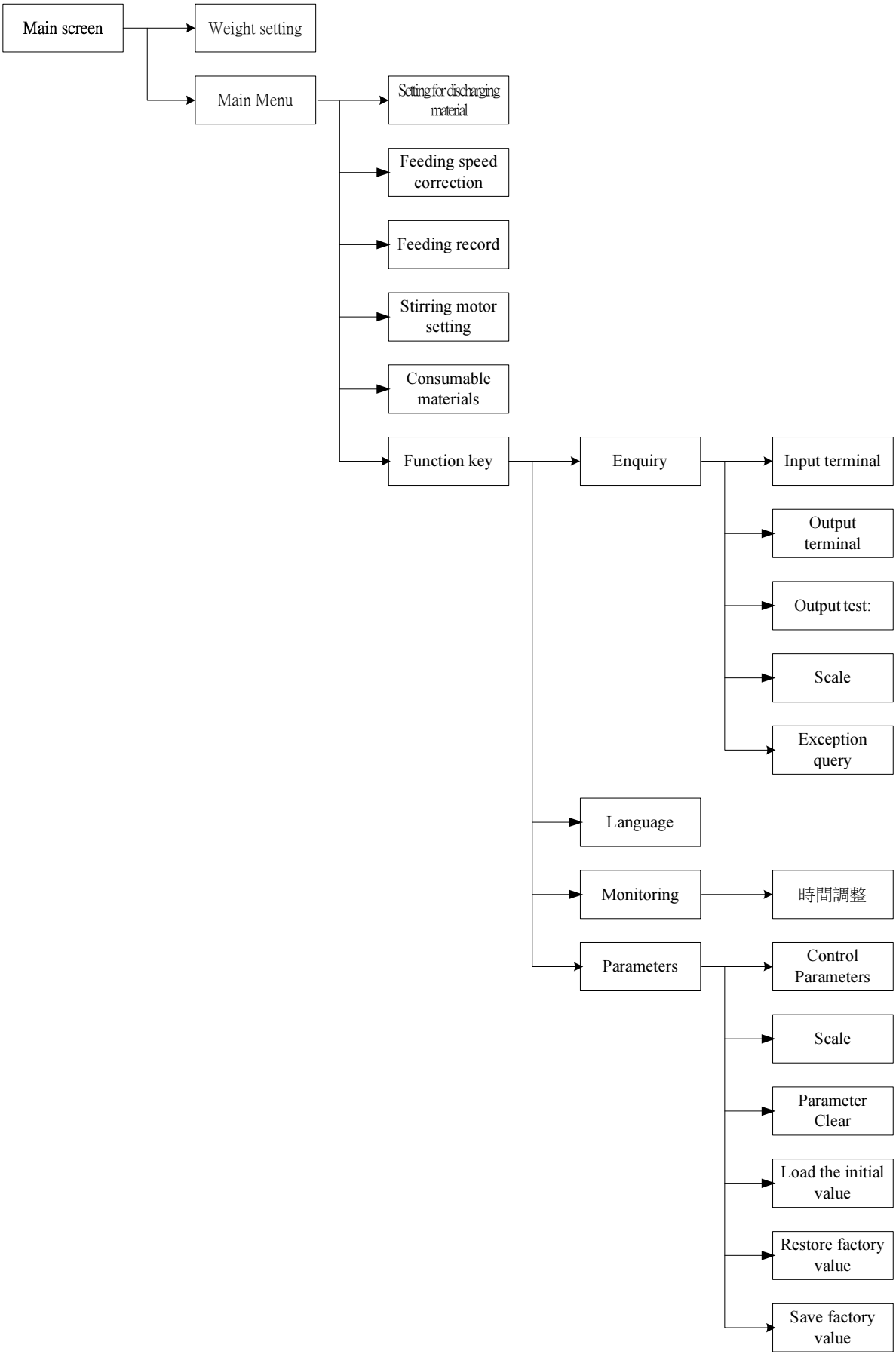
Signal name	Connector pin	Function
12V	1	Provides external power supply DC12V
GND	2	
PE	3	ground
LC+	4	Load cell sensing signal(+)
LC-	5	Load cell sensing signal (-)

5.5.6. Full material check connector (3P)

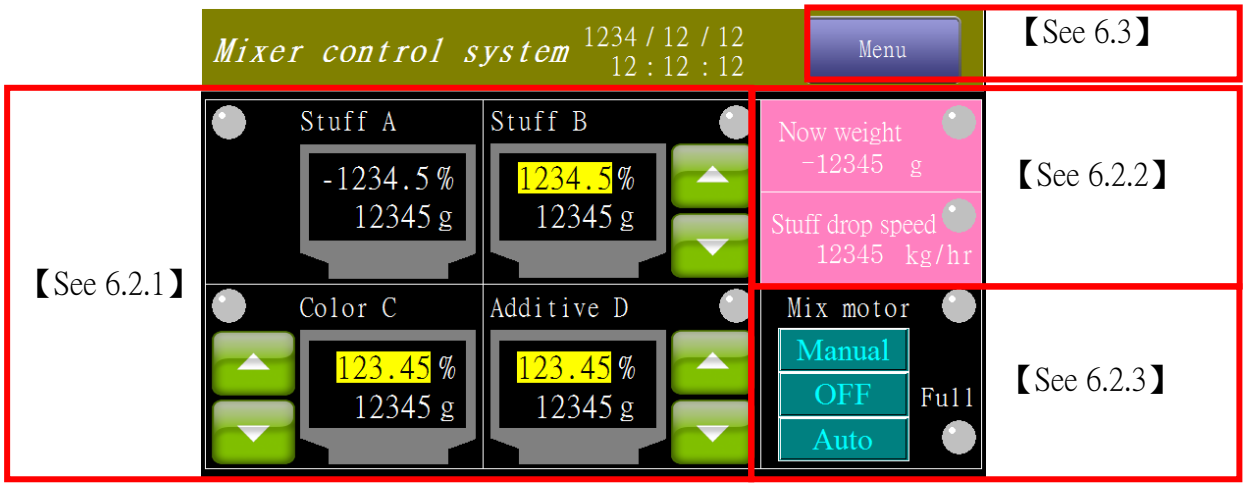
Signal name	Connector pin	Function
I24V	1	Provides external power supply DC12V
IGND	2	
Full material detection	3	The signal of full material detection of mixing barrel

6. Screen Operation Instructions

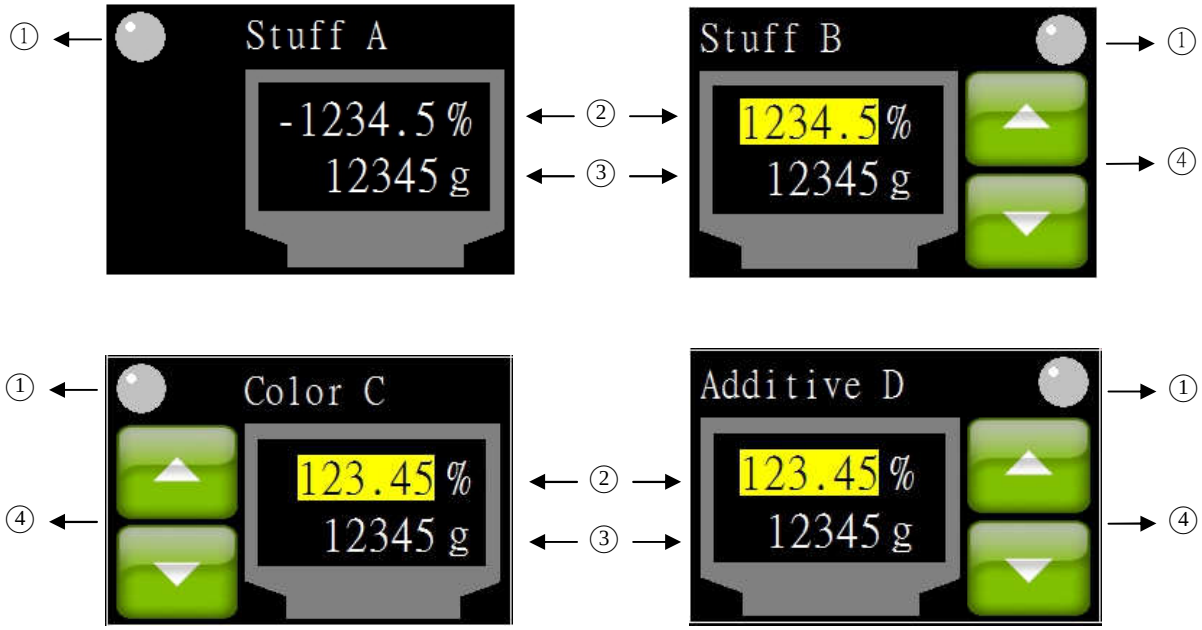
6.1. Screen operation flow chart



6.2. Main screen instruction



6.2.1. Material barrel instruction



① Barrel Feeding Action Indicator: "Green " is displayed when the barrel is opened for feeding.

② The percentage setting：The mixing ratio is used as the total weight percentage method, you need to calculate the weight percentage of each material and input it.
Batch weight = Weight of raw material A + Weight of raw material B + Weight of pigment C + Weight of additive D Raw material
Raw material A: calculated from the program，Raw material A % = 100 % - Raw material B % -pigment r C % - Additive D %
Raw material B：0.00～100.0%
Pigment C：0.00～100.0%
Additive D：0.00～100.0%

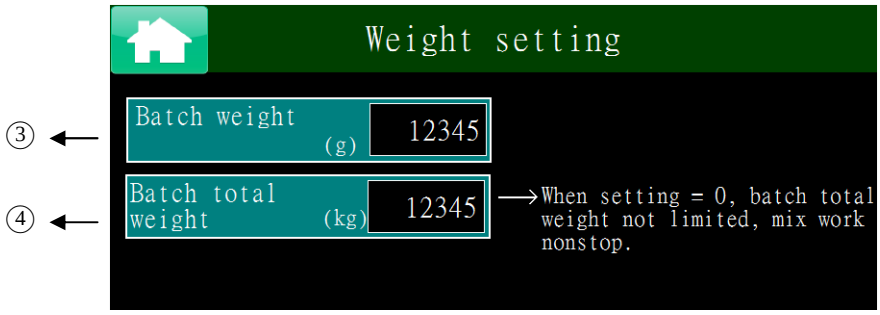
③ Weight display：After the percentage is set, the program will calculate the required weight of each drum

④ Fine tuning the feeding percentage

6.2.2. Weight setting

When you press (Fig. 1) on the main screen, the following screen is displayed (Fig. 2).

(Fig. 1)



(Fig. 2)

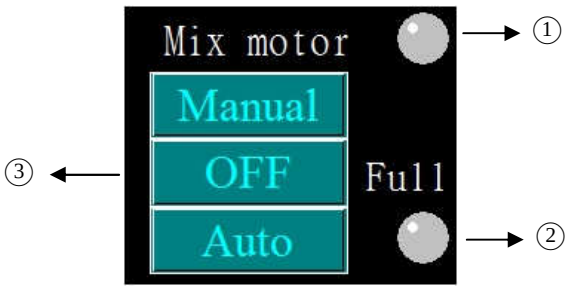
① Indicator light for weighing hopper door action: When the material bin is opened for discharge, the light will display "green".

② Mixing drum door operation indicator light: It will display "green" when the bin is open for feeding.

③ Batch weight: 1000~4000 g
Batch weight = Weight of raw material A + Weight of raw material B + Weight of pigment C + Weight of additive D Raw material

④ Total batch weight: 0～60000 Kg, when the total batch weight is reached, it will alarm and stop feeding.

6.2.3. Stirring motor switch



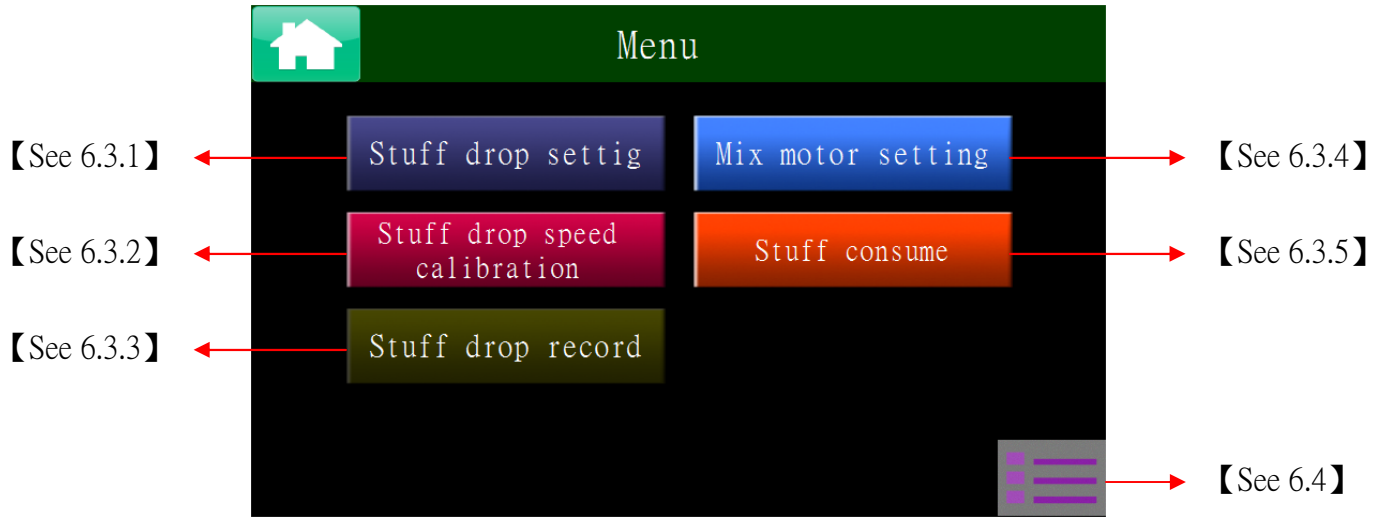
① When the stirring motor is running, it will show "Green ".

② Full load indicator light: When the mixing drum is full, it will display "red". When the weighing bucket is opened after the discharge is completed, the feeding will be paused until the full load indicator light is turned off, and then the feeding will continue.

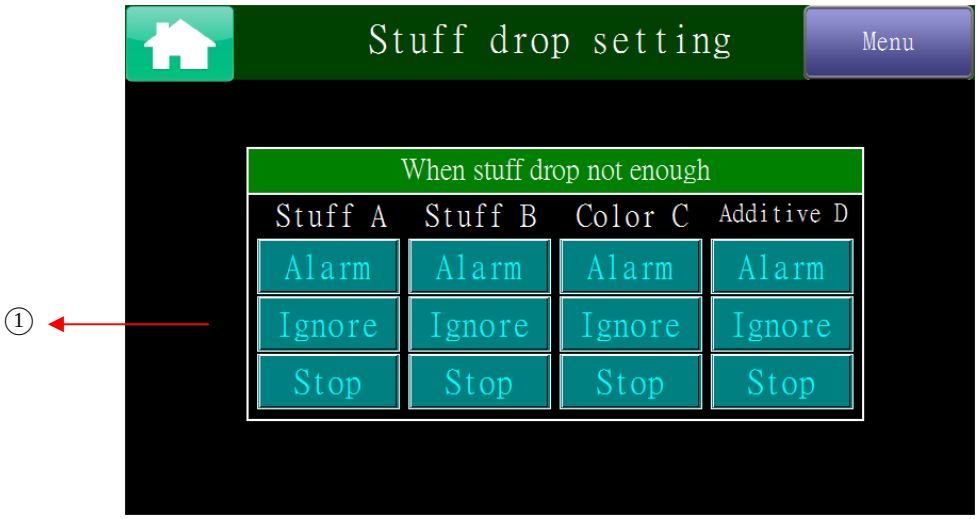
③ Switching: Manual/OFF/Auto
Manual：The stirring motor is not controlled by the program and runs continuously.
OFF：The mixing motor stops running
Automatic：The stirring motor running and stopping timing is controlled by the program process.

6.3. Main Menu Instruction

When you press "Main Menu" on the Home screen, the following screen is displayed.



6.3.1. Setting for discharging material



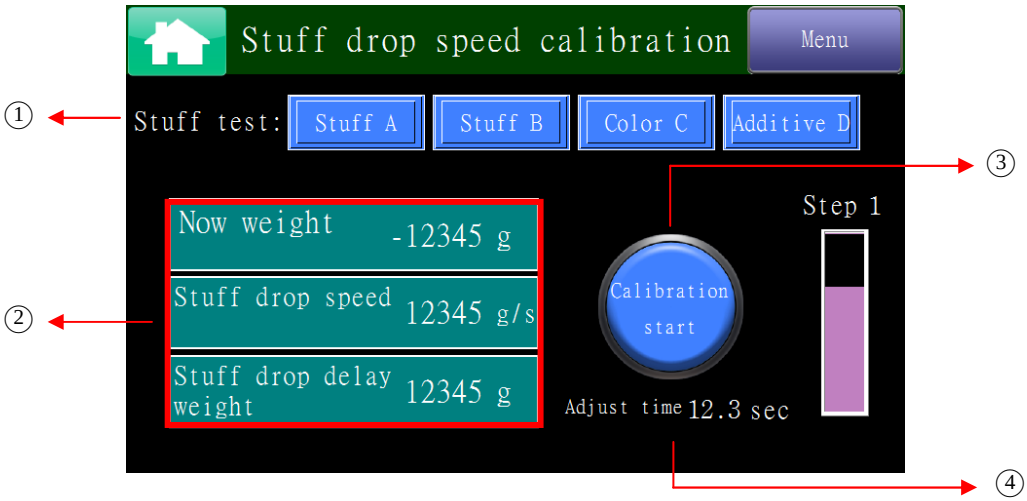
Mode selection when underfeeding: alarm, ignore, alarm stop.

Alarm：When the material is not enough, only an alarm will be sounded and the machine will continue to feed.

Ignore：When there is not enough material, no response is made and the machine continues to feed.

Aarm stop：When the material is not enough, an alarm will sound and the machine will stop feeding.

6.3.2. Feeding speed correction



① Testing raw materials: choose raw materials A, Raw materials B, pigment C, Additives D.

② When the calibration time is reached, the program calculates the correlation coefficients for each drum according to the actual weight of the material to be discharged to obtain a positive.

③ Start calibration: After the switch is pressed, open the barrel to start the speed calibration.

④ Correction time: Determined by the parameter. (See 6.4.5 Control Parameters)

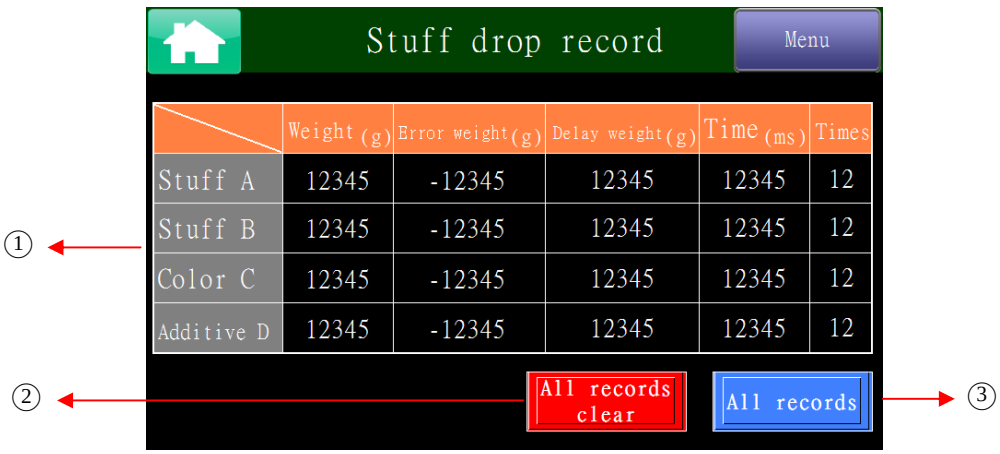
【Note】 When you want to mix the weight of raw materials more accurately, you should execute the feeding speed correction. This is because the feeding speed correction can make the amount of each raw material in the feeding more accurate and less error.

When there is a change in the raw material to be mixed, the speed correction should be performed again so that the weight error during mixing will not be bigger due to the change in the raw material, as follows:

A. After the scale calibration is completed, enter the calibration screen for the first time, select the test material to be calibrated, execute "Start Calibration", wait for the calibration to be completed, then proceed to the next test material.Perform calibration until the 4 ingredients are tested and the mixing process can begin.

B. If the material is changed, just correct the material, the rest does not need to be corrected.

6.3.3. Feeding record

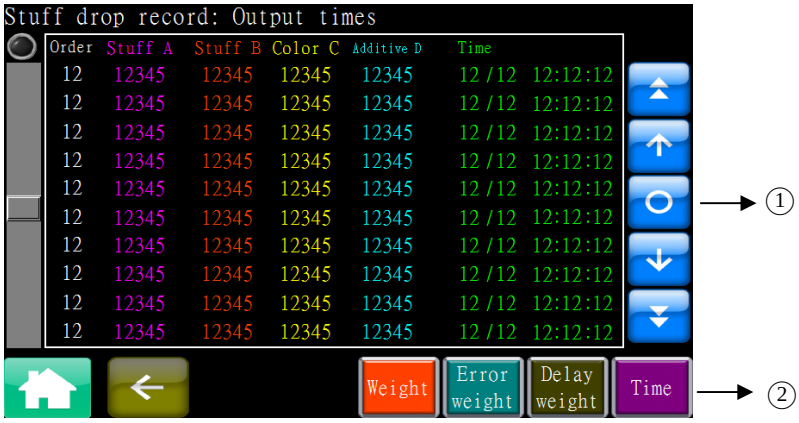


① Display the previous feeding information of each bin, including weight, deviation, delay weight, time, count, and the program will adjust the next feeding weight of each bin based on the relevant information.

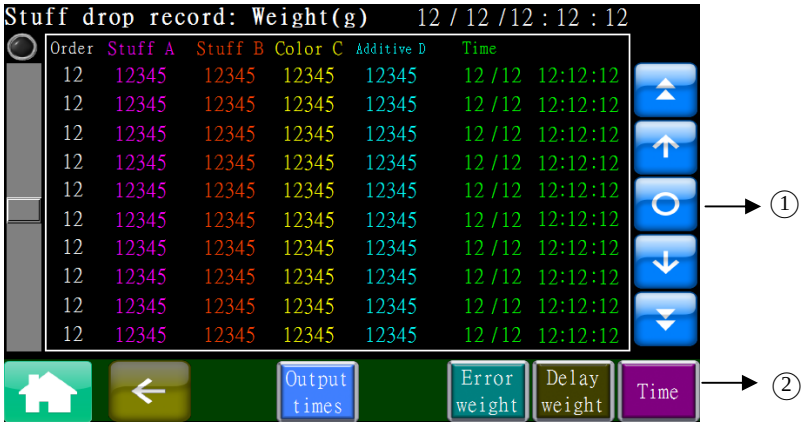
② When "Clear All Records" is pressed, the following screen is displayed: Press OK to clear the list of all records and record again.

③ All records: Each time the material is feeded, the list is automatically saved and can be used for record analysis; in the discharging record, the following screen is displayed when "All Records" is pressed on the recording screen.

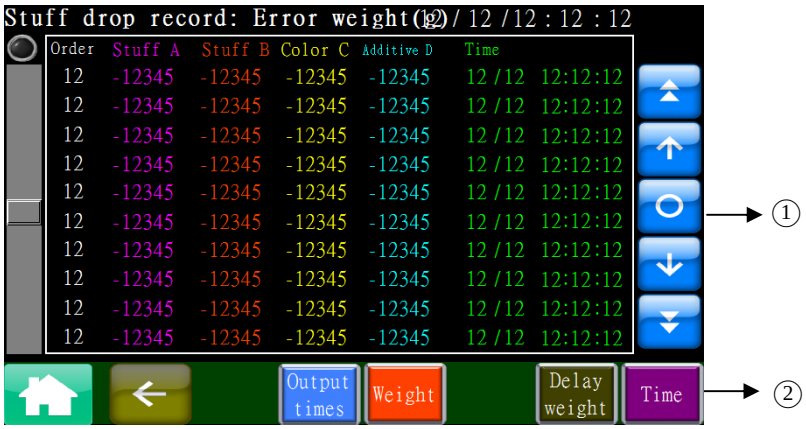
＊ Output count screen



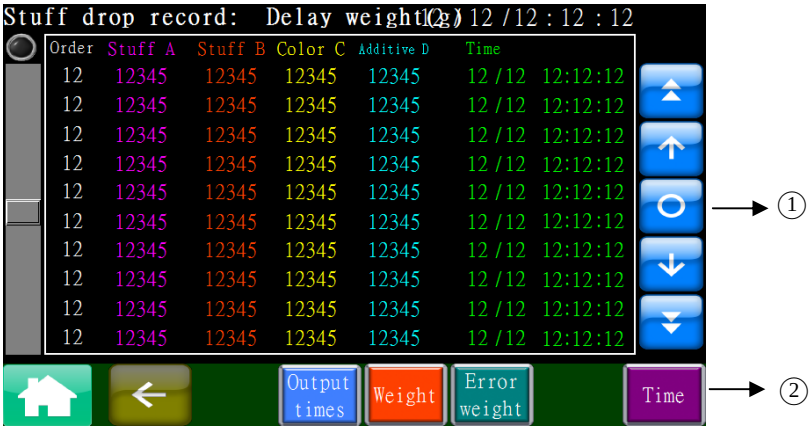
＊Weight screen



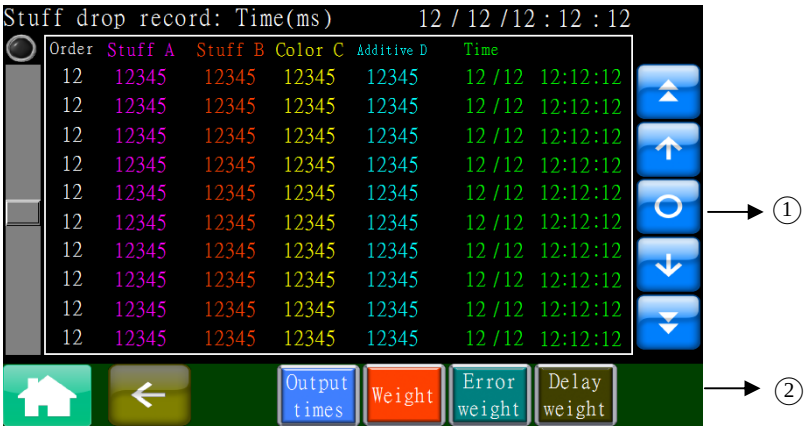
＊Weight error screen



＊Delayed weight screen



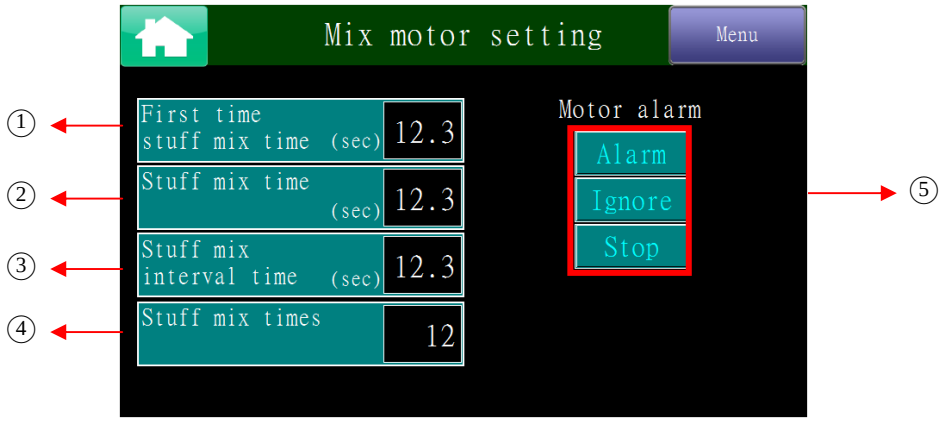
＊Time screen



① The record list lookup switch

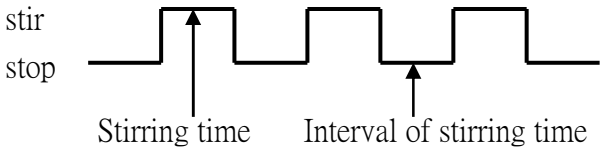
② Record screen switching：output count, weight, error weight,delay weight, time.

6.3.4. Stirring motor setting

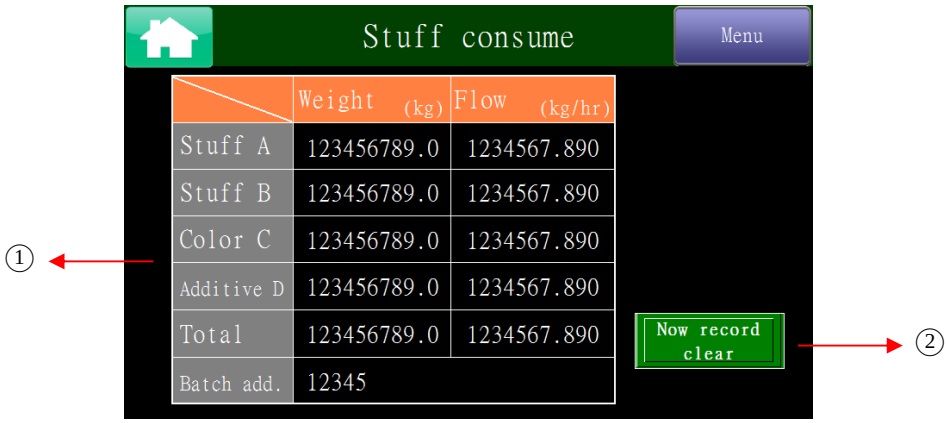


① First stirring time：0.0～60.0 sec，First start-up, the time stirring motor runs.
② Stirring time：0.1～10.0 sec, each stirring time, the time stirring motor runs.
③ Stirring interval time：0.0～60.0 sec, After stirring complete, the time stirring motor stops.
④ Stirring times：1～99 times, in auto process, the stirring motor willstop running after the. stirring times are finished.
⑤ The mode when the mixing motor is abnormal: alarm, ignore, alarmstop.
Alarm：when stirring motor is abnormal, only alarm will be sounded and the motor keep feeding
Ignorance：when stirring motor is abnormal, no response, machine keeps feeding.
Alarm stop：when stirring motor is abnormal, alarm will sound and machine stops feeding.

【Note】：stirring motor action description

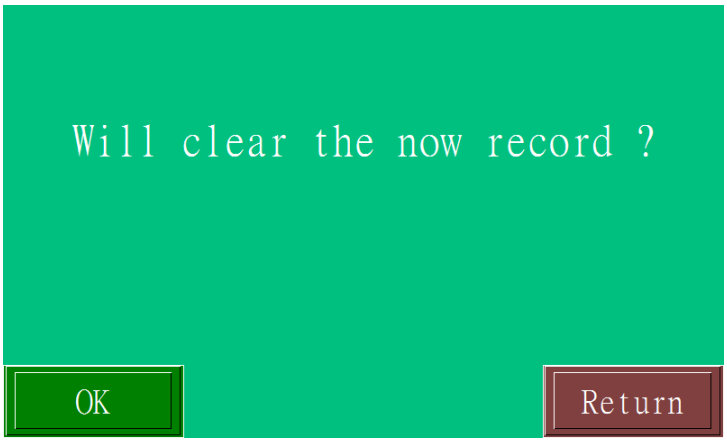


6.3.5. Consumable materials



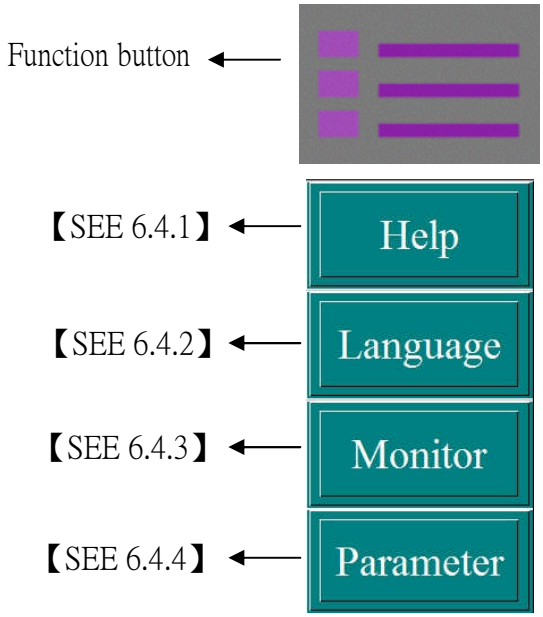
① Record the current cumulative "weight" and "flow" of each barrel,as well as "total material" and "cumulative batch".

② When "Clear Current Record" is pressed, the following screen will be displayed: Press OK to reset all values to zero, and re-accumulate.

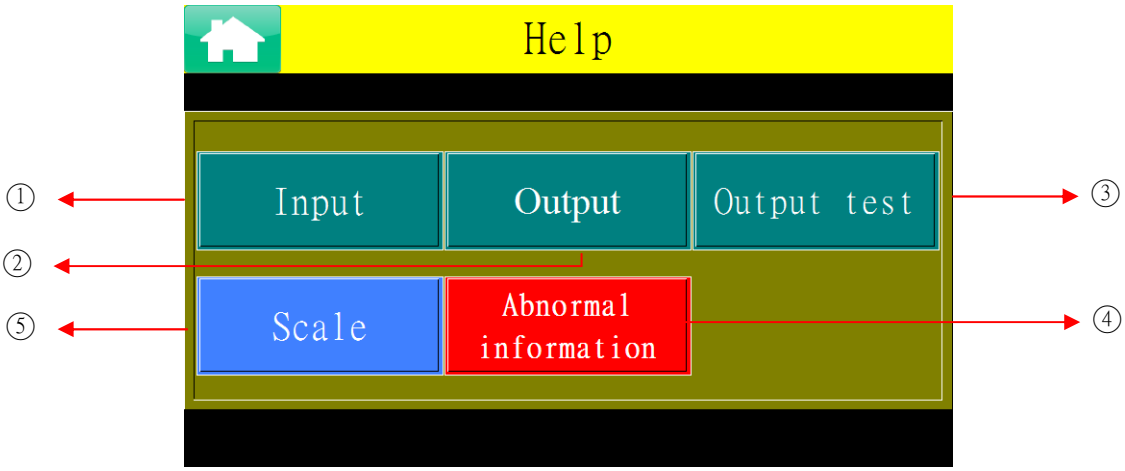


6.4. Function key description

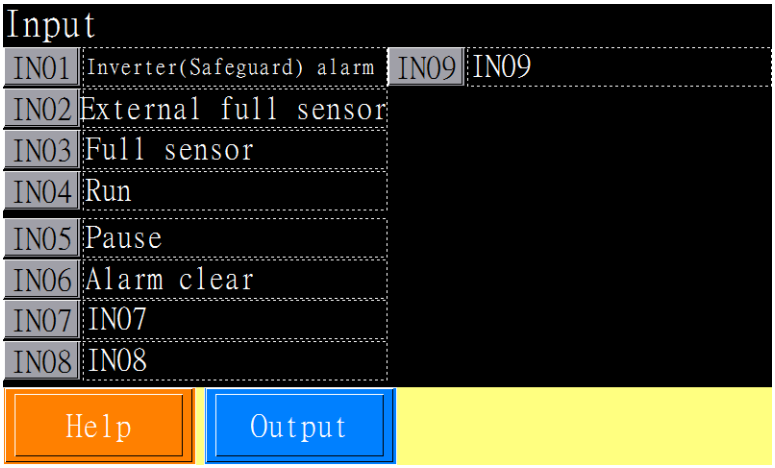
On the main screen, when you press the "Function button" at the bottom right corner, the following screen is displayed.



6.4.1. Enquiry



① Input terminal



IN01：Negative logic, stirring inverter, ON_driver is normal, OFF_driver is abnormal

IN02：Positive logic, close connection, ON_external full material.

IN03：Positive logic, proximity, ON_full material.

IN04：Positive logic, push button switch, ON_run, OFF_stop.

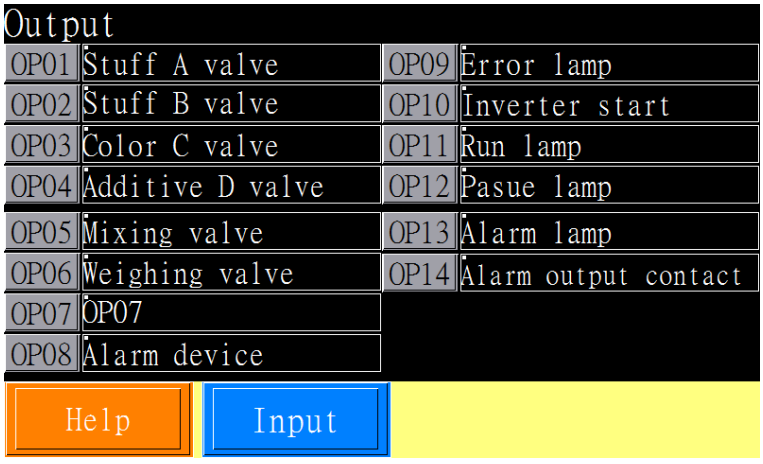
IN05：Positive logic, push button switch, ON_pause.

IN06：Positive logic, push button switch, ON_alarm clear. IN07, 08, 09: undefined, spare terminal.

IN07、08、09：undefined, spare terminal.

Operate the pushbutton switch or use your hand to get close to it to see if the signal of the corresponding function changes. If there is a change, the signal is normal; if there is no change, the circuit or component has a problem that needs to be repaired.

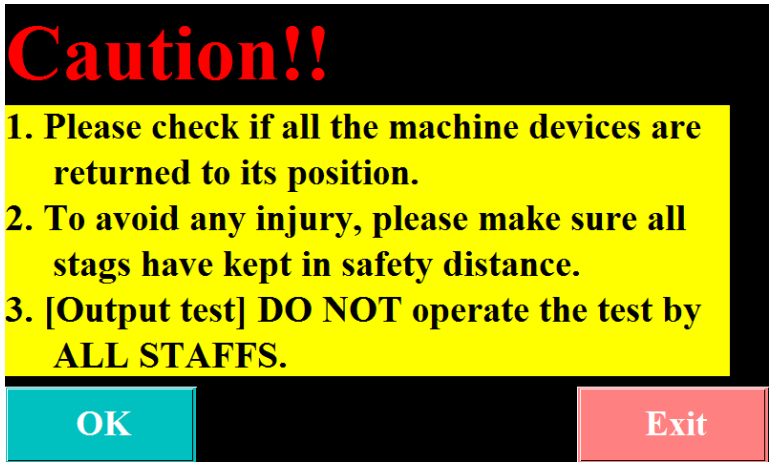
② Output terminal

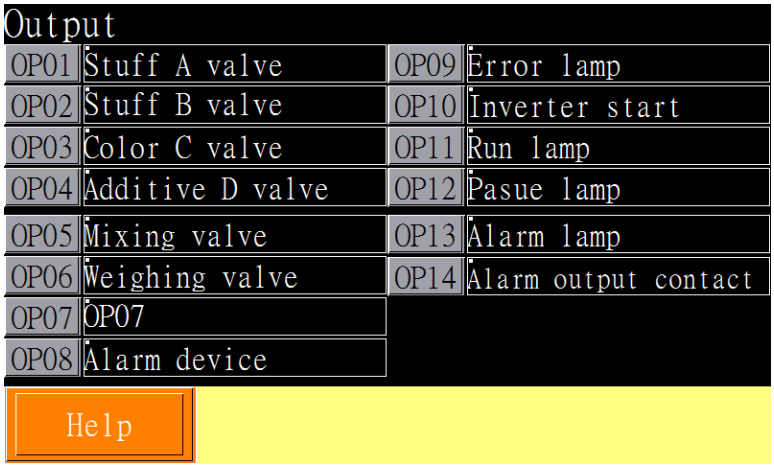


When the machine is in operation, the output signal of the corresponding function can bemonitored to see if it changes correctly.

If the change does not match the actual output, please go to "Output Test" to check if theline or component is normal.

③ Output test: A warning message will appear after selection, press "OK" to display the same output terminal screen.





OP01：Press "Material A solenoid valve" to turn "Material A pneumatic cylinder ON"; press again to turn "Material A pneumatic cylinder OFF".

OP02："Material B solenoid valve" is the same as OP01.

OP03："Pigment C solenoid valve" is the same as OP01.

OP04："Additive D solenoid valve" is the same as OP01.

OP05："Mixing Drum Solenoid" is the same as OP01.

OP06："Weighing Drum Solenoid" is the same as OP01.

OP07：Undefined, spare terminal.

OP08：Press the "Alarm", then "Alarm sound ON"; press again to "Alarm sound OFF" (see 5.2 Front view of controller)

OP09：Press "Abnormal warning lamp", then "Abnormal indicator lamp ON (orange)"; Press again, then "Abnormal warning light OFF" (warning light: position see 5.2 Controller front view)

OP10：Press "Inverter start", then "motor rotate(stirring blade rotate)"; press again, then" motor stop(stirring blade stop)".

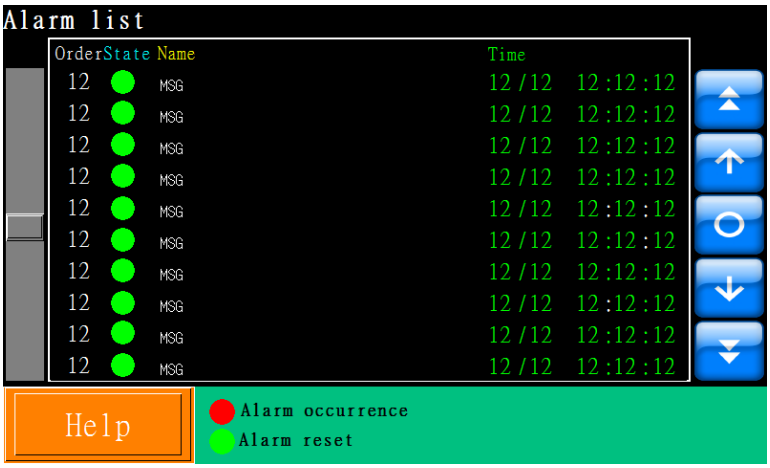
OP11：Press "Run Indicator", then "Run Indicator ON (Green)";press again to turn the "operation. indicator off"(operation switch: see 5.2 Front view of controller)

OP12：Press "Pause Indicator", then "Pause Indicator ON (yellow)";
Press again to turn the pause indicator off (pause switch: see 5.2 Front view of controller)

OP13：Press the "Alarm Clear Indicator", then "Alarm Clear Indicator ON (Red)";press again, then "Alarm Clear Indicator OFF"(Alarm Clear Switch: See 5.2 Front View of Controller for location)

OP14：Press "abnormal output contact" to close the relay contact.(Relay contact: see 5.5.4 Abnormal output contact connector for location)

④ Exception query: When an exception occurs, record the exception name, occurrence time, and clearance time.



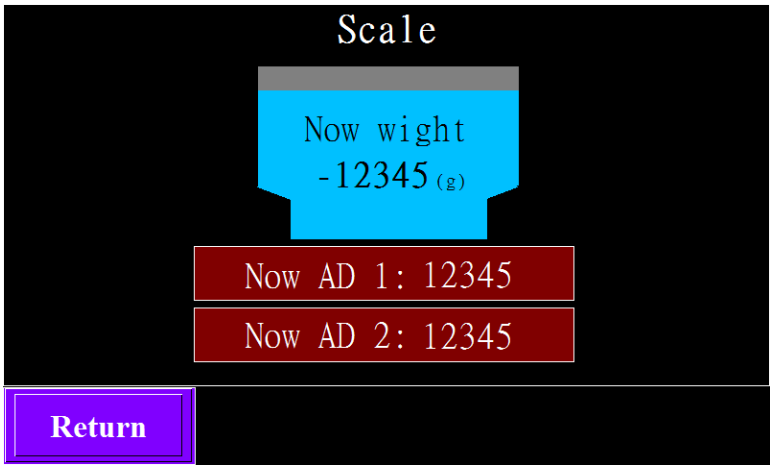
⑤ Scale

You can verify that the scale is currently working properly.

Please remove all the ingredients from the weighing barrel first.

The current weight shows -50g ~ 50g

The current AD 1 and AD 2 error i < 1000

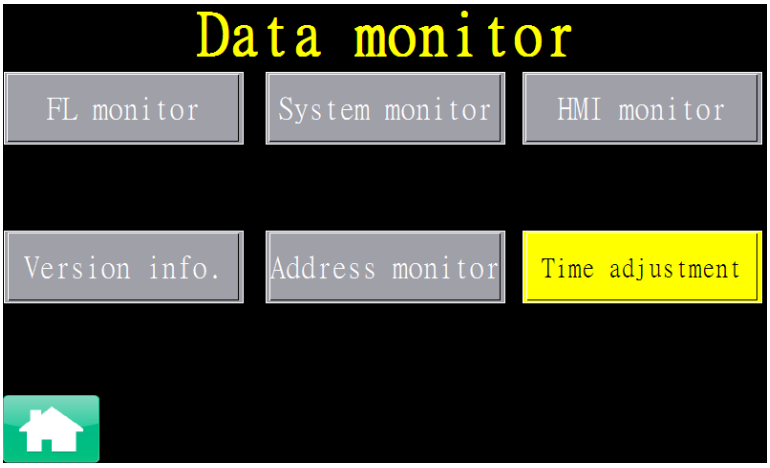


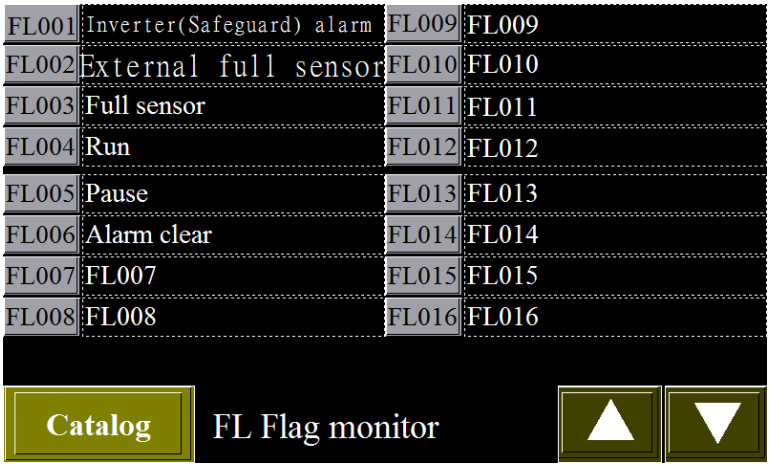
6.4.2. Language

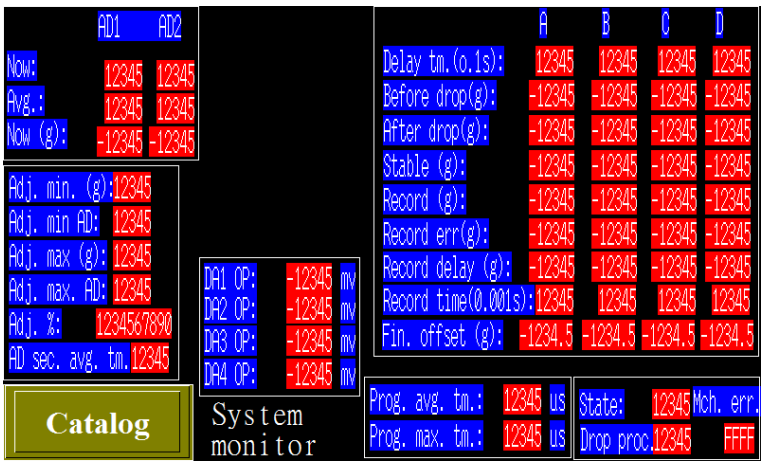
You can switch between Chinese and English.

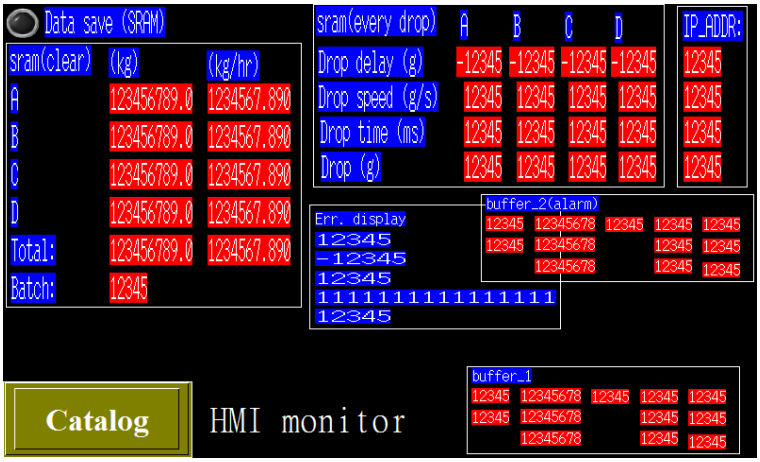
6.4.3. Monitoring

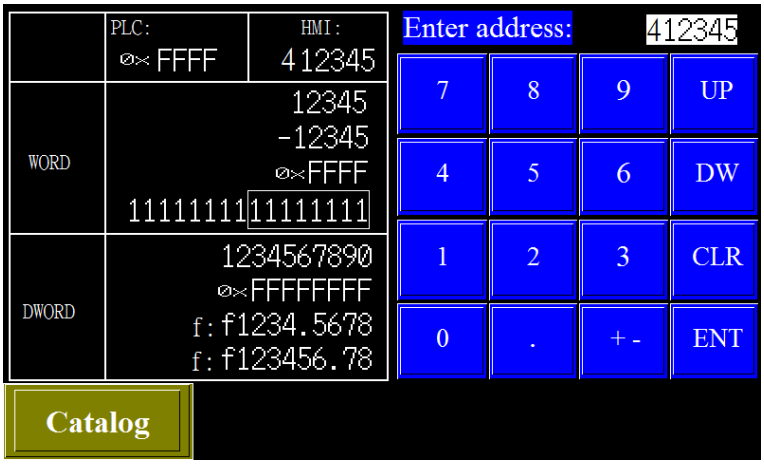
System-related information [for original technician monitoring].

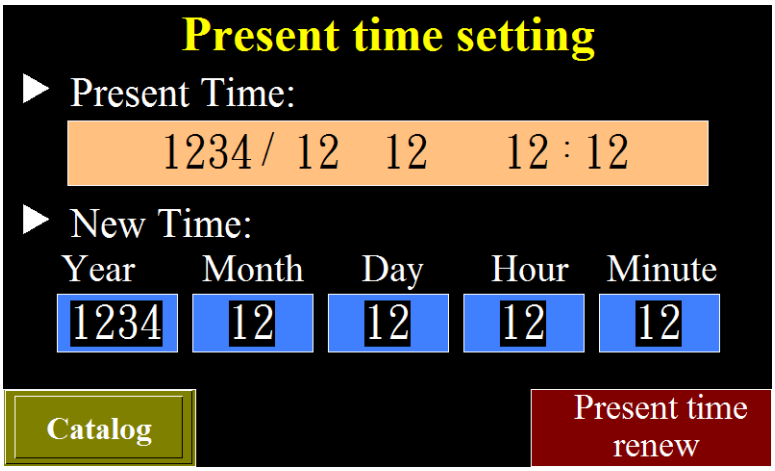


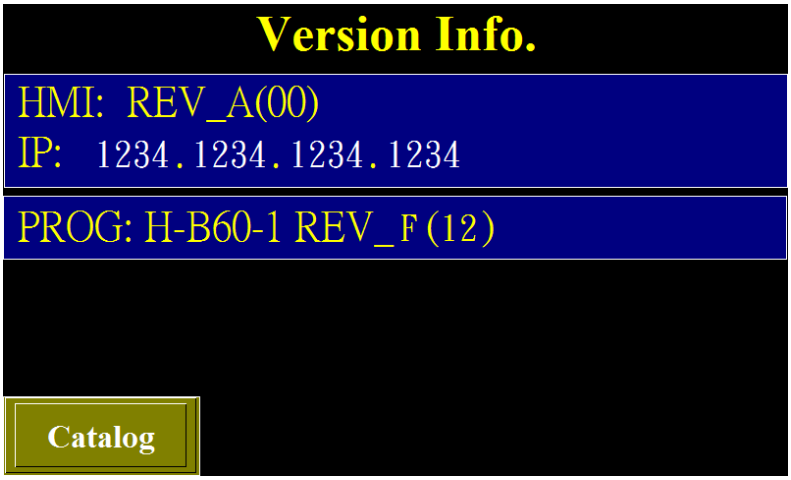




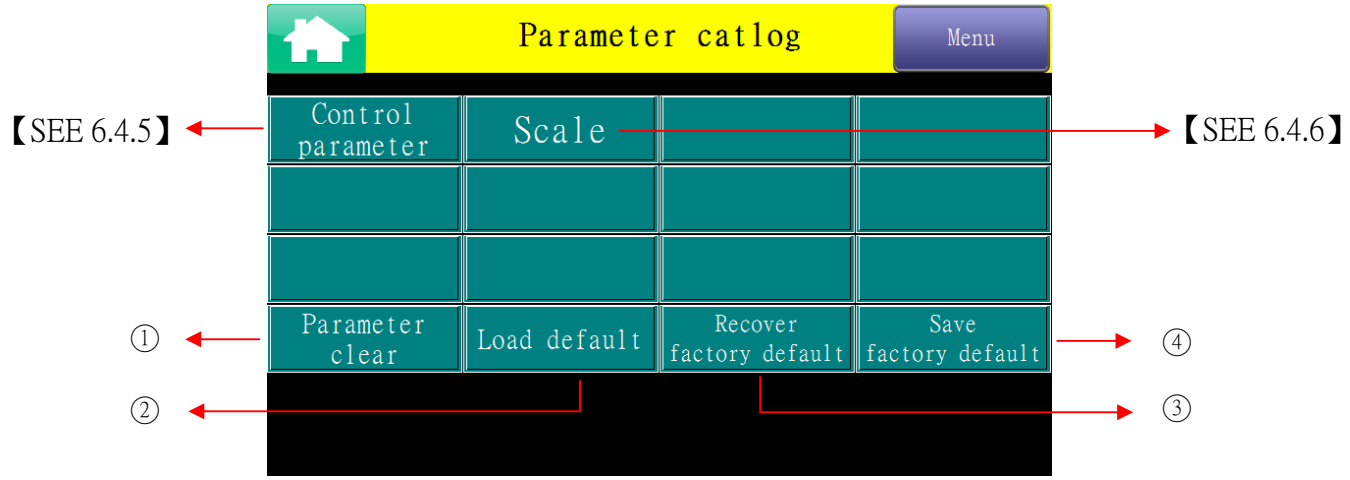

Data save (SRAM)
sram(clear)
(kg)
(kg/hr)
A
B
C
D
Total:
Batch:
123456789.0
1234567.890
12345
sram(every drop)
A
B
C
D
Drop delay (g)
Drop speed (g/s)
Drop time (ms)
Drop (g)
-12345
12345
IP_ADDR:
Err. display
12345
-12345
1111111111111111
buffer_2(alarm)
12345678
buffer_1
Catalog
HMI monitor


PLC:
HMI:
FFFF
412345
WORD
12345
-12345
FFFF
11111111 11111111
DWORD
1234567890
FFFFFFFF
f:f1234.5678
f:f123456.78
Enter address:
412345
7
8
9
UP
4
5
6
DW
1
2
3
CLR
0
.
+-
ENT
Catalog


Present time setting
Present Time:
1234/ 12 12 12:12
New Time:
Year
Month
Day
Hour
Minute
1234
12
12
12
12
Catalog
Present time renew



6.4.4. Parameters



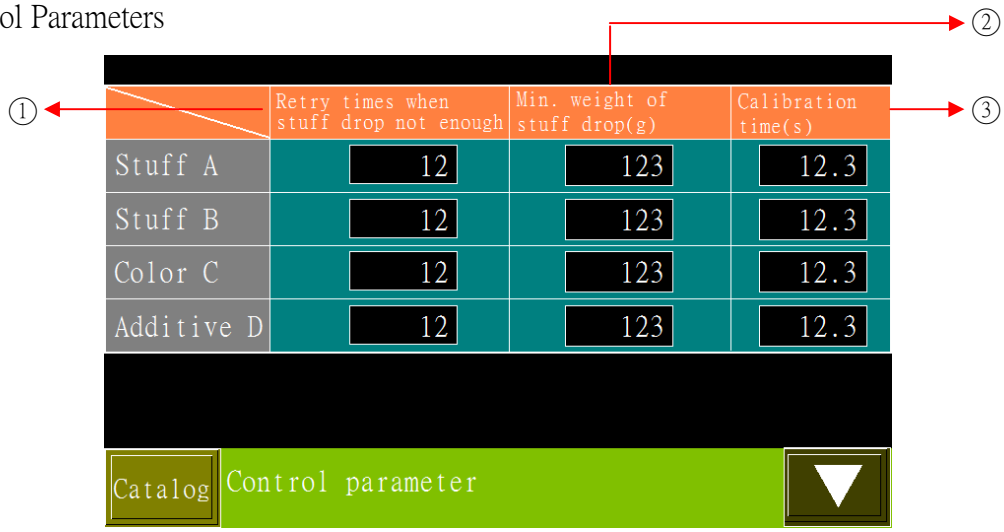
① Parameter Clear：Clears all internal parameters to 0.

② Load the initial value：Load the basic parameters during the first test. (For factory test)

③ Restore factory value：Restore the parameters of stored backup to the machine.

④ Save factory value：Save the backup of the parameters after the test machine is completed.

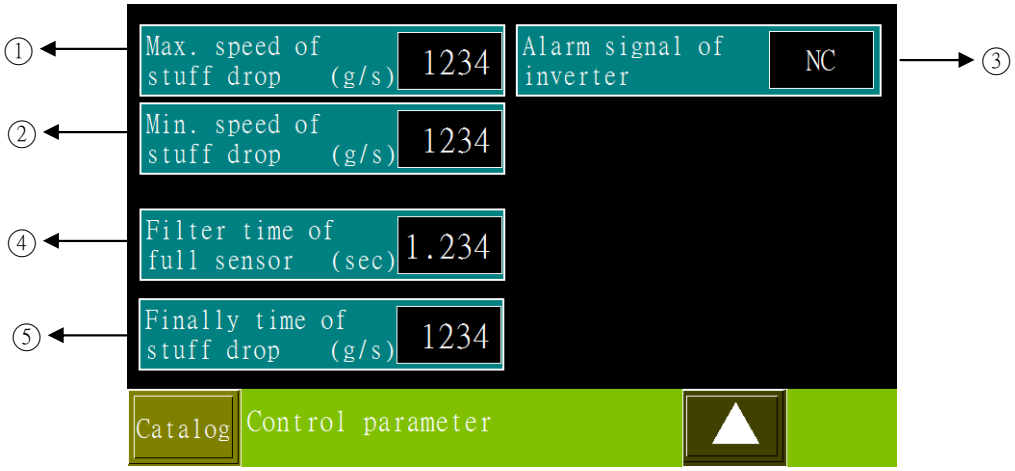
6.4.5. Control Parameters



① Underfeed retries: 1 to 99 times, when the weight of the barrel < the set weight (calculated by %).If the barrel is not used, then the barrel will be feeded again until the feeding weight is reached or the number of retries is reached. Only then is the barrel feeding process completed.

② Minimum weight of feeding: 0～500 g. When the set weight (calculated by %) < minimum weight of feeding, the weight is displayed. Show anomalies.

③ Correction time: 1.0 to 10.0 sec, determine the "feeding speed correction"time.



① The fastest speed of feeding: 0～500 g/s, when the speed of feeding is corrected under the speed of discharging > the fastest speed of discharging.
The "Discharge speed test abnormal" is displayed.

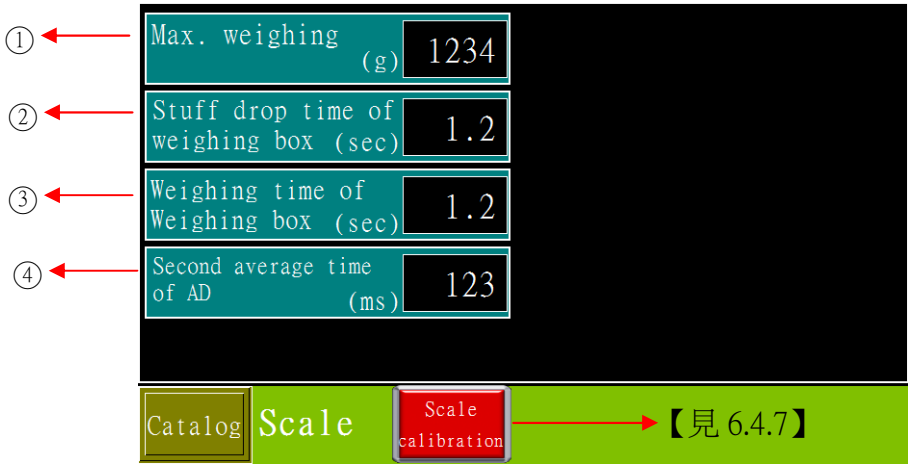
② The slowest speed of discharging: 0～500 g/s, when the speed of discharging is corrected to < the slowest speed of discharging. The "Discharge speed test abnormal" is displayed.

③ Inverter error signal: NO/NC, determine the external error signal as positive logic/negative logic.

④ Full material filtering time: 0~9.999 sec, avoid "full material abnormal" misoperation, when full material is near induction.
If the time > full material filter time, "full material abnormal" is displayed.

⑤ Last feeding time: 0~300 ms, when the feeding time is insufficient and the retry time is the last time. Wait until the "last feeding time" is reached before recording the information.

6.4.6. Scale



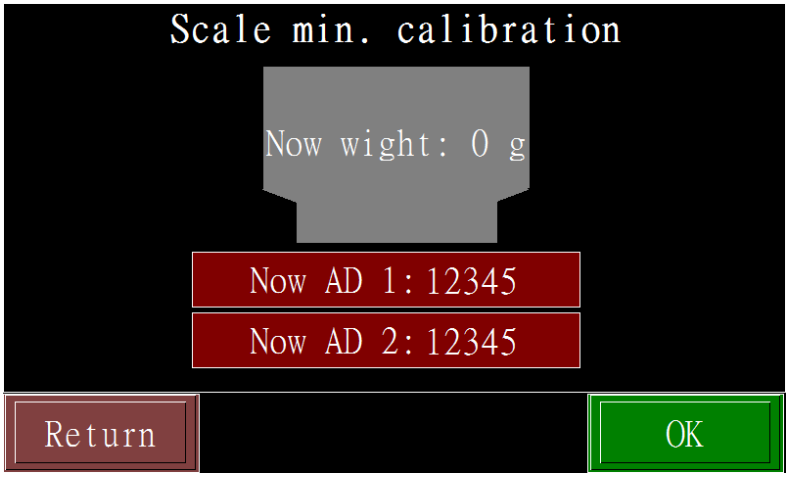
① Max weighting weight：0～6000 g, the max weight of the machine can be mixed, when the weight of the material is greater than the maximum weighting weight, the scale abnormalities are displayed.

② Unloading time：0.0～3.0 sec, the time to unload all the materials after mixing and opening the scale box.

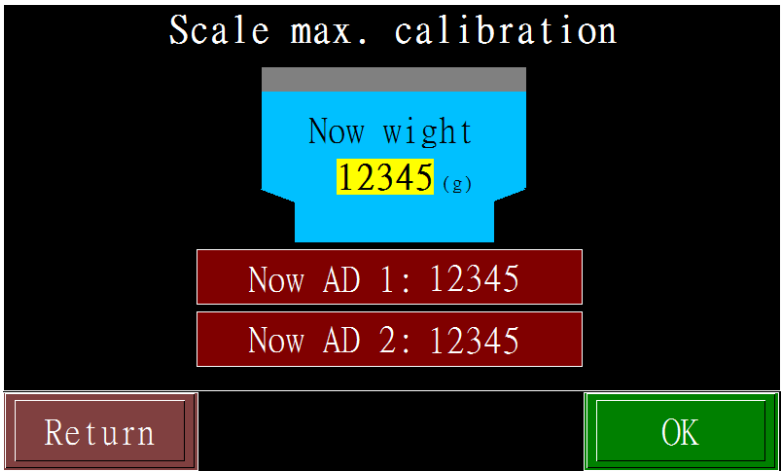
③ Scale box weighing time：0.0～3.0 sec, after the material has been loaded, wait for the weighing time to stabilize.

④ AD Second homogenization time：0～500 ms

6.4.7. Scale Calibration



Minimum Calibration: Empty the scale box, when the box is empty, it will be 0 grams; press "OK" to complete the "Minimum Calibration".



To calibrate the scale to the maximum: Place the maximum available weight in the scale box and enter the corresponding weight in "Current Weight"; press "OK" to complete the "Scale Maximum Calibration".

※Take an object of known weight as a reference for calibration (weight recommended 3000g~4000g), and proceed as follows:

① Go to the scale calibration screen, the current weight in the scale minimum calibration is "0g"; and the current AD1 and current AD2 will have a numerical value which is the weight of the weighing barrel reading, and the minimum calibration is recorded when it is confirmed.

② The scale will enter the maximum calibration screen, enter the calibration weight in the current weight and put the corresponding weight of the object in the scale bucket, when placing the object should be careful to place the object evenly in the scale bucket, press to confirm that the scale calibration is complete.

7. Mechanism dimensions

unit：mm