

Intelligent batch control instrument

一、 Introduction

Universal intelligent control meter (hereinafter referred to as the main characteristics of control instrument):

It is suitable for various liquid medium flow display, integrating, control function;

- to input a variety of flow sensor signal (such as vortex, turbine, electromagnetic, roots, elliptic gear, double rotor, orifice, V cone, Annubar, mass flow and other flow meter);

- flow input channel: can receive frequency signal and a variety of analog current signal;

- temperature input channel: can receive a variety of analog current signal;

二、 The main technical index instrument

1. Incoming signal

The analog quantity:

- resistance: standard thermal resistance -- Pt100;
- current: $0 \sim 10\text{mA}$, $4 \sim 20\text{mA} \leq 250 \Omega$ -- input impedance;

Pulse volume:

Bo: a rectangular shape, sine wave and triangular wave;

- amplitude: more than 4V;
- frequency: $0 \sim 10\text{KHz}$ (or according to user requirements).

2. Output signal

Analog output:

- DC $0 \sim 10\text{mA}$ (Load resistance $\leq 750 \Omega$);
- DC $4 \sim 20\text{mA}$ (Load resistance $\leq 500 \Omega$);

3. The switch output

- Relay output -- back to the poor, AC220V/3A; DC24V/6A.

4. Communication output

- Interface mode——RS—232C, RS—485, Ethernet;
- Baud rate——600, 1200, 2400, 4800, 9600Kbps。

5. Feed output

- DC24V, load $\leq 100\text{mA}$;
- DC12V, load $\leq 200\text{mA}$

6. Characteristics

Measuring accuracy: $\pm 0.2\%FS \pm 1$ words or $\pm 0.5\%FS \pm 1$ words

Frequency conversion accuracy: ± 1 pulse (LMS) is generally better than 0.2%

Measuring range: -999999 ~ 999999 words (instantaneous, compensation value)

In 0 ~ 99999999.9999 words (value)

Resolution: ± 1 words

7. Display mode

- 1• backlit screen 128 x 64 dot matrix liquid crystal graphic display;
- 2• historical cumulative flow, instantaneous flow, medium temperature, medium density, flow (differential current, frequency), clock, alarm status;
- 3• 0 ~ 999999 instantaneous flow value
- 4• 0 ~ 99999999.9999 cumulative value
- 5• -9999 ~ 9999 temperature compensation
- 6• -9999 ~ 999999 flow (pressure, frequency) value

8. Control / alarm

- select relay upper limit, lower limit control (or alarm) output, LCD and LED output indicator;
- control (or alarm) for back to the poor (users can freely set)
- select alarm mode: the maximum flow rate, flow rate, temperature upper limit, lower limit temperature;

9. Print

Serial thermal printer directly with Chinese characters, can realize the real-time or timing print;

10. Protection mode

- power accumulated value time more than 20 years;
- Automatic reset, power supply under pressure;
- abnormal automatic reset (Watch Dog);
- resettable fuse, short circuit protection.

11. The use of the environment

Environment temperature: $-20\text{ }^{\circ}\text{C} \sim 60\text{ }^{\circ}\text{C}$

Relative humidity: $\leq 85\%RH$, avoid the corrosive gas

12. The power supply voltage

Conventional type: AC 220V% ($50\text{Hz} \pm 2\text{Hz}$);

Special type: AC 80 ~ 265V switching power supply;

DC 24V $\pm 1\text{V}$ switching power supply;

Backup power: +12V, 20AH, can be maintained for 72 hours.

13. Power consumption

$\leq 10\text{W}$ (AC220V)

14. Instrument the size of holes:

152mm $\times$ 76mm

三、Method of operation

3.1 Key and LED

3.1.1 Key

The instrument panel to the right, there are 6 buttons. The upper and lower, left, right, back and confirmation.



Up arrow: Make the value increase or change the parameter option; quickly enter the common value quantitative control interface; input the value represents the number 2.



Down arrow: Reduce the value or change the parameter options; quickly enter the common value quantitative control interface; when the input value represents the number 8.



Left arrow: In the setting interface, move the cursor to the left; move to select the modified bit; enter the value to represent the number 4.



Right arrow: In the setting interface, move the cursor to the right; move to select the modified bit; enter the value to represent the number 6.



MENU and Confirm key: Use this key to enter the menu, performs the selected operation. In the display measurement interface, you press the key, to enter the main menu; In the parameter settings, press the button to switch the next parameter.



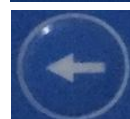
Cancel key: Return to the main interface when setting parameters; cancel the quantitative control when issuing materials.



Unit switch: Enter a quantitative value, the unit is switched.



Start and pause key: For quantitative control, start or pause control; quickly enter the material delivery interface;



backspace key: Enter a quantitative value, can delete one value before the cursor each time you press it.

The instrument also has 0-9 numeric keys and decimal point keys.

3.1.2 LED

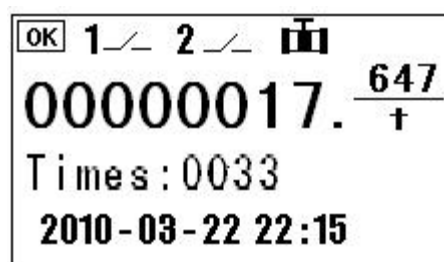


3.2 Display interface

3.2.1 Display

The display contents include:

- 1) The presenting bank;
- 2) historical amount and units;
- 3) Issue number;
- 4) date, time;



3.2.2 The presenting bank

OK Instruments work normally;

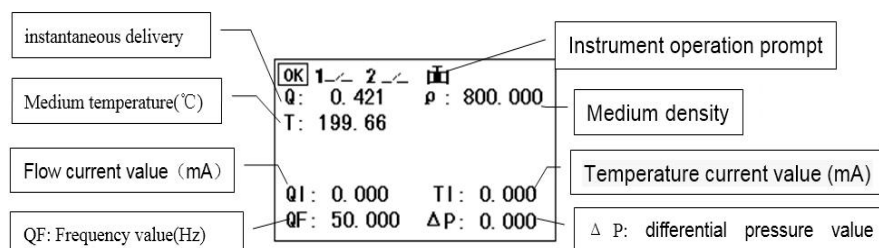
Err The instrument works;

1 Relay status

2 Relay status

Icon The pump switch state

3.2.3 Debugging interface

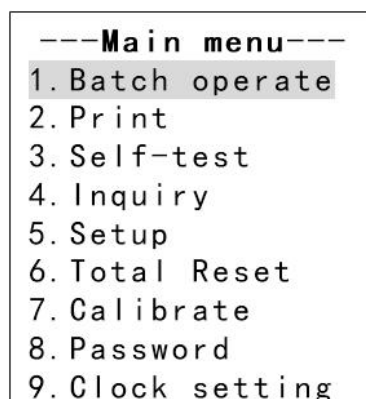


Right click on the main interface to enter the test interface, as shown in the left figure:

3.4 Main menu

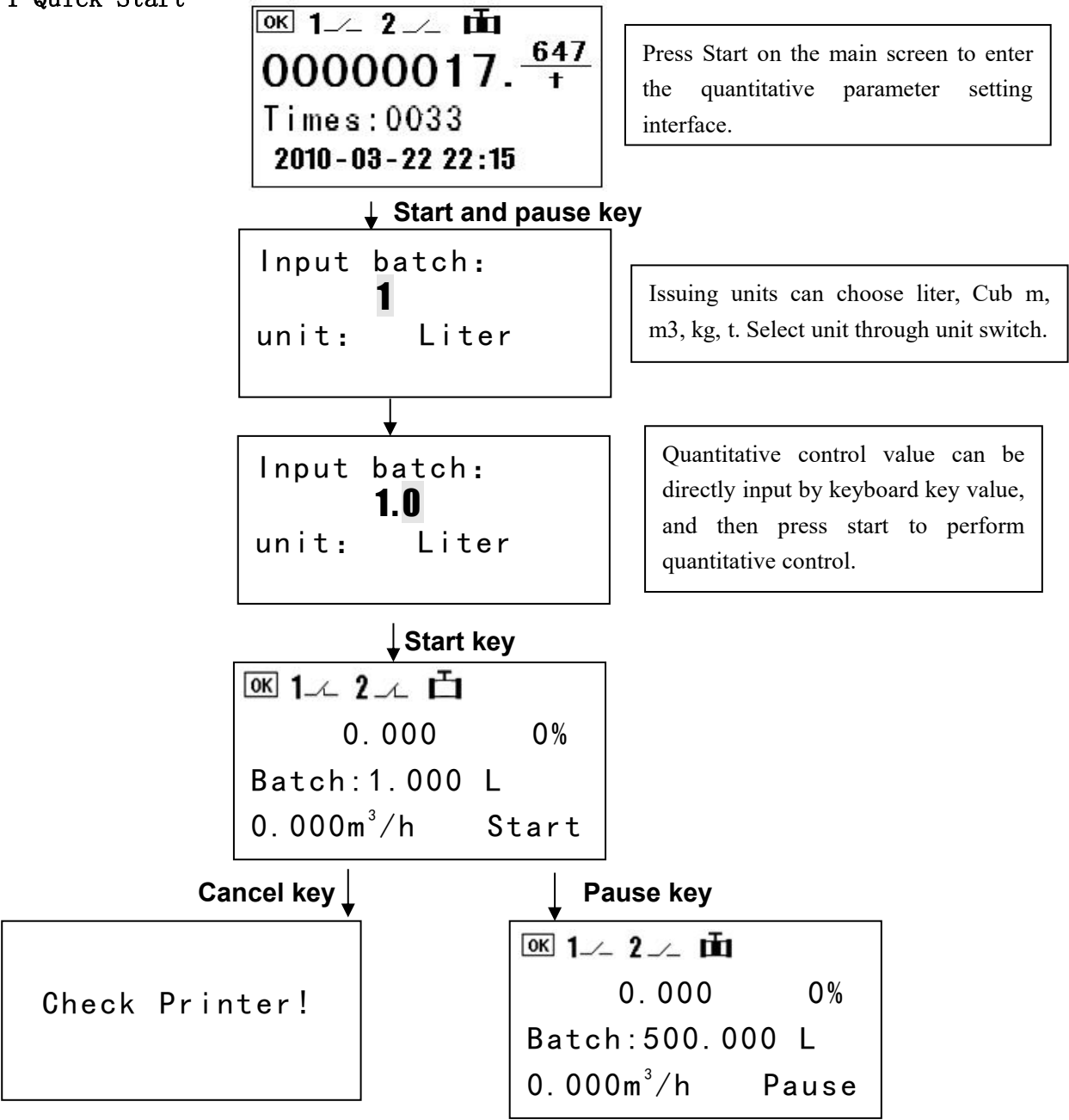


MENU key

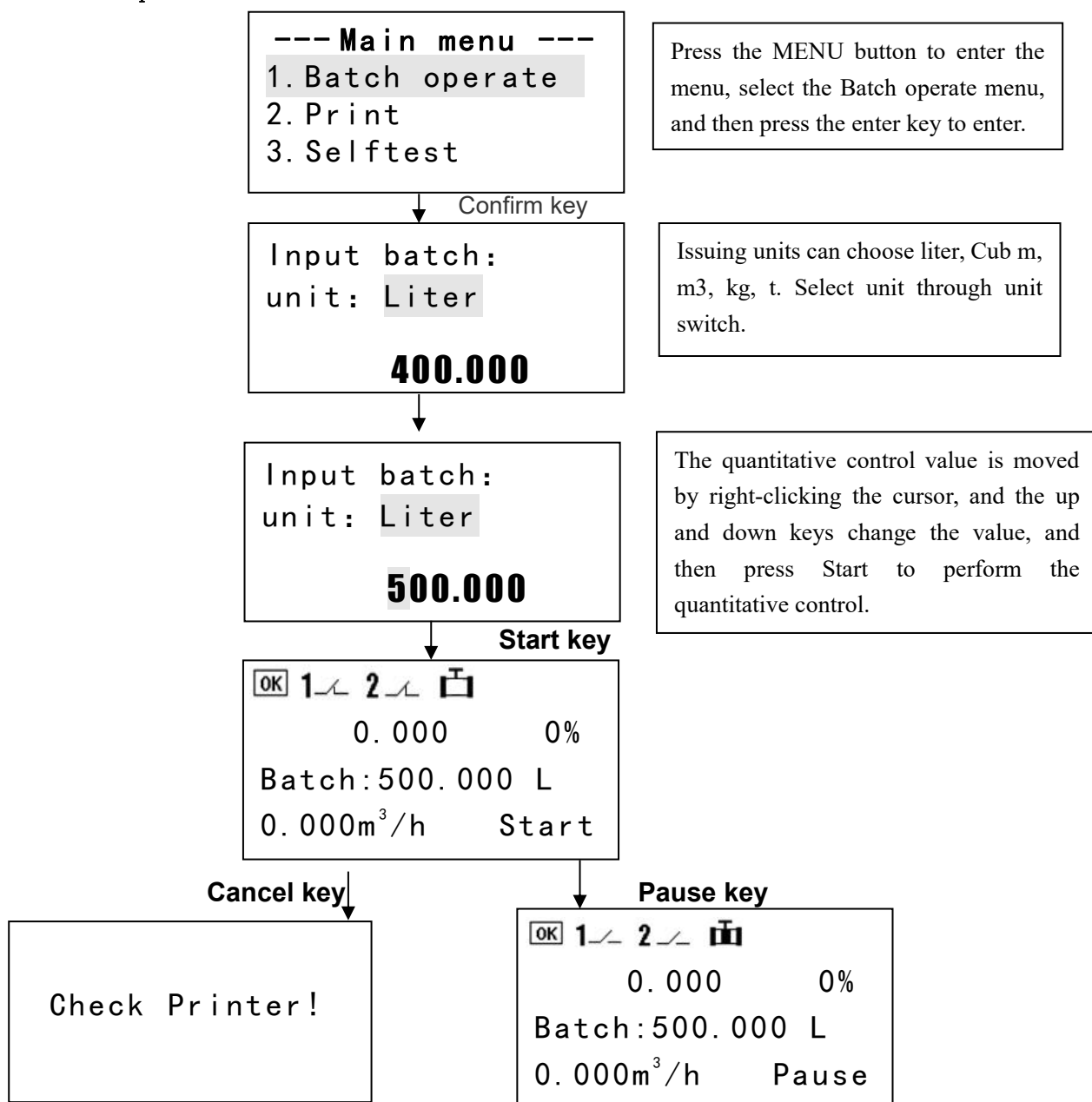


3.5 Quantitative feeding

3.5.1 Quick Start



3.5.2 Batch operate



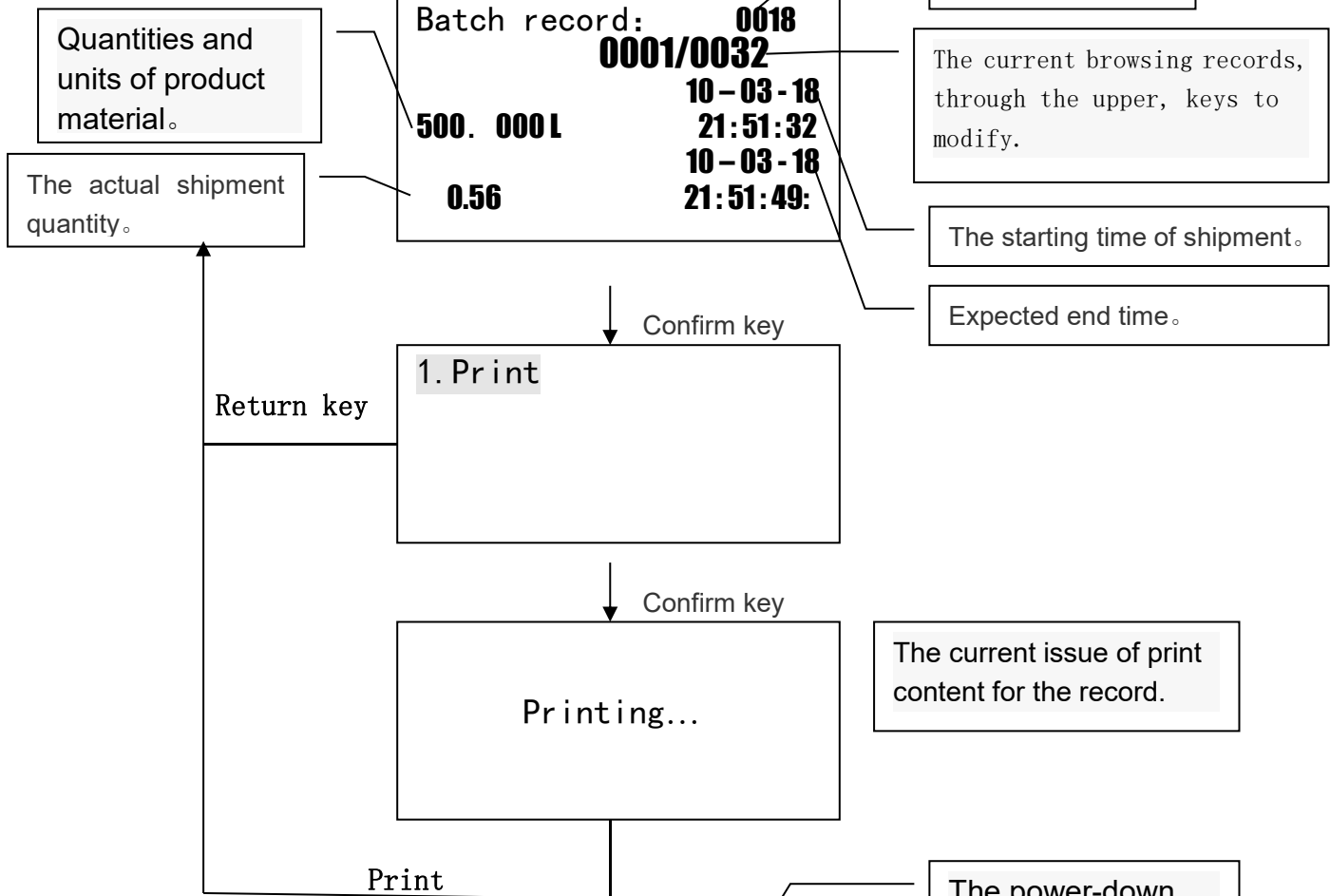
3.5.3 Common volume control

When each issue amount is a different value, and the issue amount is a few sets of conventional values, the meter can set 8 groups of commonly used quantities. In the setup parameter menu, press the key to switch 8 groups of common quantities, and input several groups of common quantities into the meter. When each issue amount is a different value, and the issue amount is a few sets of conventional values, the meter can set 8 groups of commonly used quantities. In the setup parameter menu, press the key to switch 8 groups of common quantities, and input several groups of common quantities into the meter. The meter has 3 external buttons: start, pause and reset, you can switch the set amount of material by using the stop and end buttons, and then press the start button to start the button. Press the up and down keys on the main screen to enter the common volume selection, and then press Start Control.

3.6 Inquiry record:

Inquiry record:
Batch record
Power down record

3.7 Batch record



3.8 Power down record

Power : 013 / 0013
PW Down: 2013-05-09
13:22:02
PW Down: 2013-05-09
13:22:25

The power-down current browsing records.

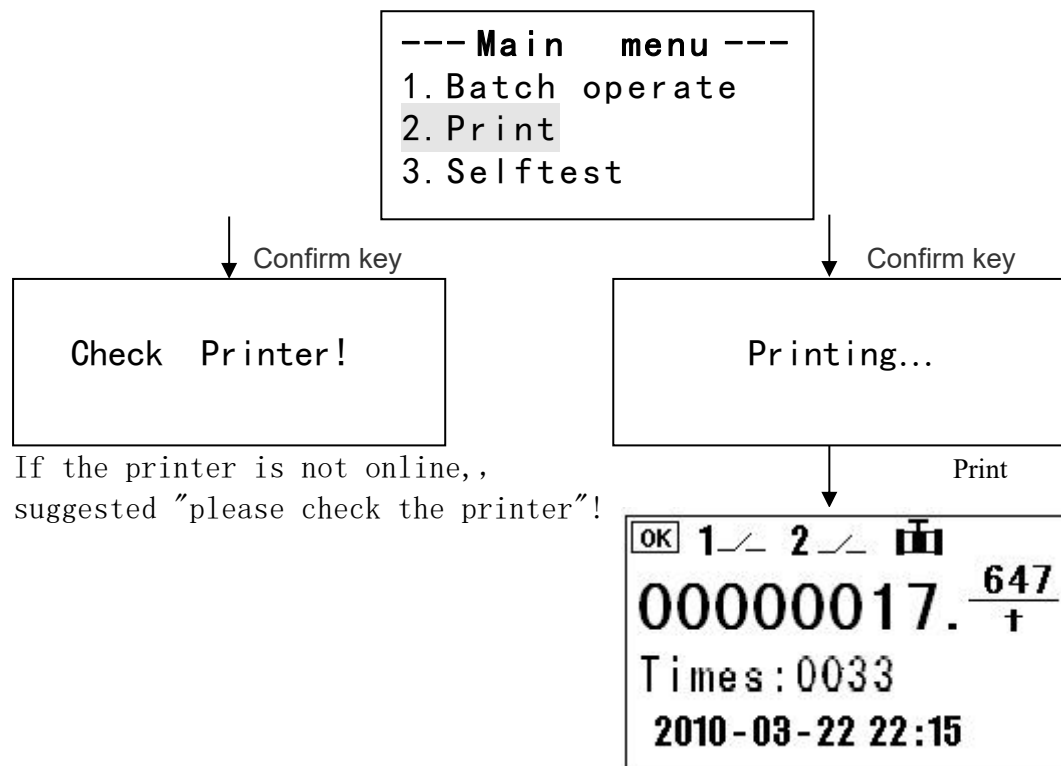
The total number of electric.

Power off time

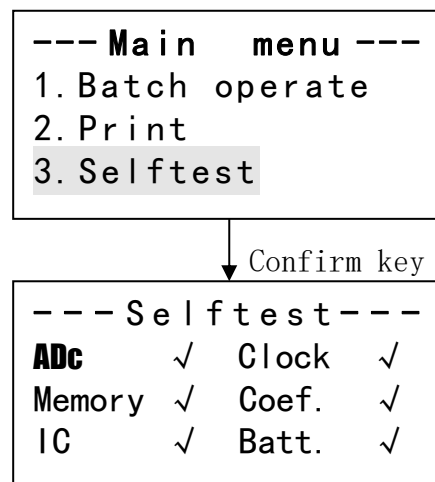
Call time

3.9 Print

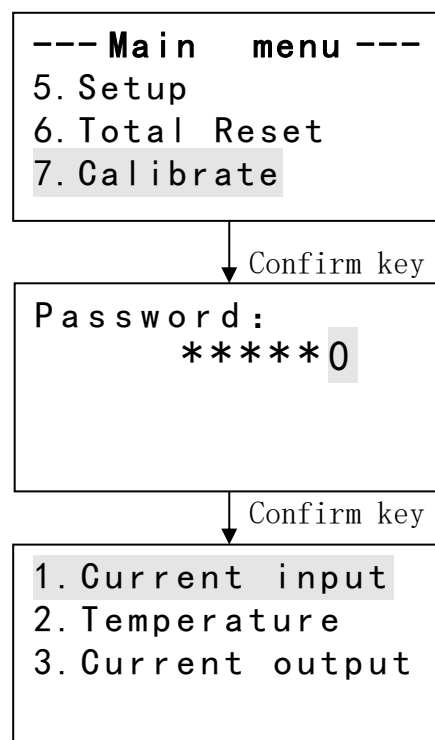
Print the last release results.



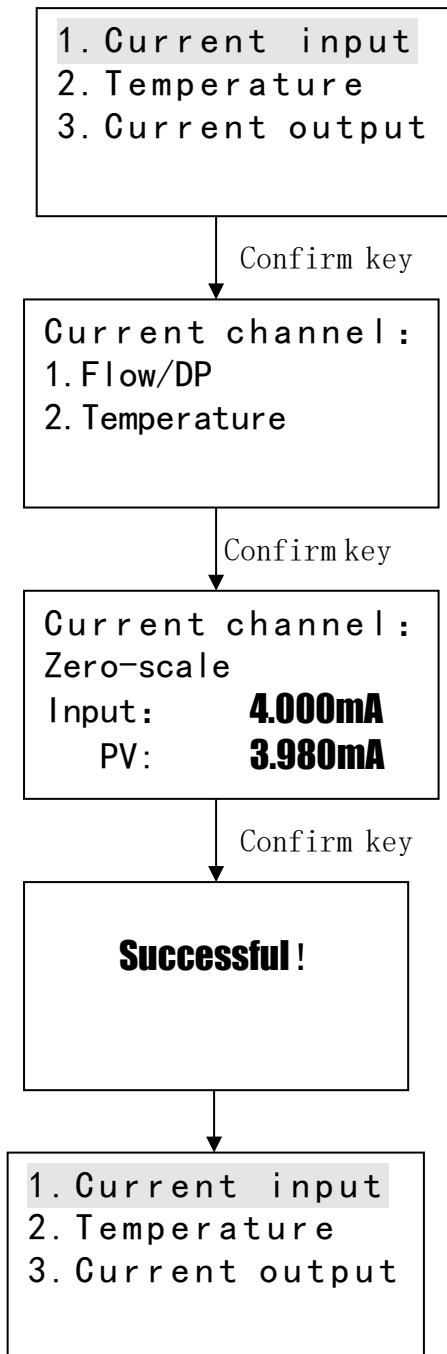
3.10 Selftest



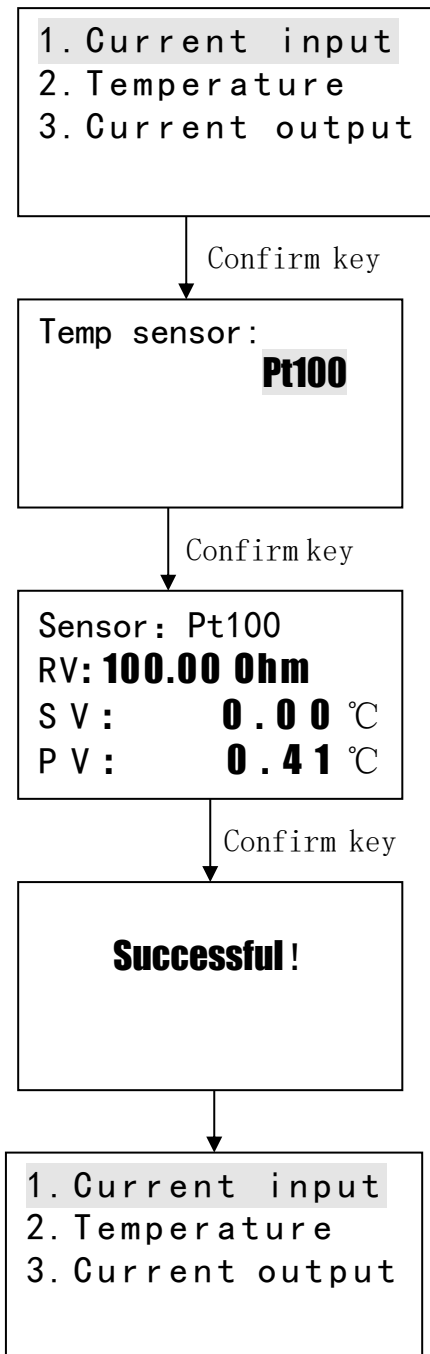
3.11 Calibrate



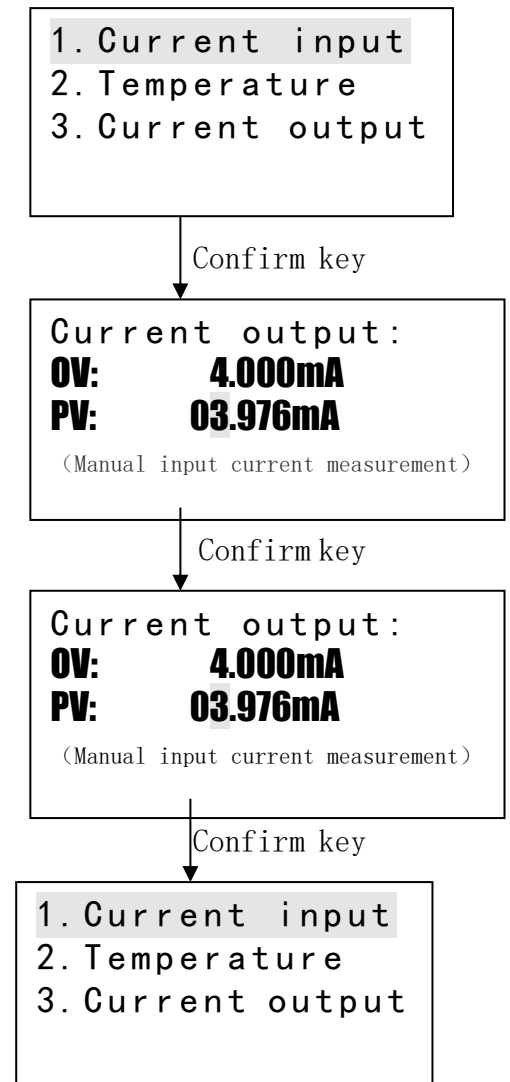
3.11.1 Current input



3.11.2 Temperature



3.11.3 Current output



3.12 Setup

```
--- Main menu ---  
3. Selftest  
4. Inquiry  
5. Setup
```

↓ Confirm key

```
Password:  
*****0
```

Calibration code. Factory default password is 000000.

↓ 确认键 | key

```
Batch1: Enable  
100.000 Liter
```

The instrument has 8 groups of common playing material choice, press the button to switch settings.

↓ Confirm key

```
Meter : veloc./PD  
Options: 01/04  
Signals type:  
Pulse
```

Flow chart: veloc./PD; Mass Flow; DP Scale; Orifice DP; V cone DP; Annubar DP;

3.12.1 veloc./PD

The output of the type of flowmeter is volume (volume) signal, includes the speed meter and volumetric flowmeter. .

The main types of velocity type flowmeter:

The main types of velocity type flowmeter :

- 1、Vortex flowmeter;
- 2、Turbine flowmeter;
- 3、Vortex precession flowmeter;
- 4、Electromagnetic flowmeter;
- 5、Ultrasonic flowmeter.

The main types of volumetric flowmeter:

The main types of volumetric flowmeter:

- 1、Elliptical gear flowmeter
- 2、Scraper flowmeter
- 3、Double rotor flowmeter
- 4、Waist wheel flowmeter (roots)
- 5、Rotary piston flowmeter
- 6、Reciprocating piston meter
- 7、Disc flowmeter
- 8、Liquid seal rotary flowmeter

3.12.1.2 Signal type for related options volume pulse setting method:

```
Meter : veloc./PD  
Options: 01/04  
Signals type:  
Pulse
```

Flow chart: speed / volume or other speed meter, including the output signal for the volume flow, mainly including: vortex flowmeter, vortex precession flowmeter;

↓

Meter : veloc./PD
Options: 01/04
Signals type:
Pulse

Speed / volume, volume pulse options:
The 1 signal types; 2 excision frequency coefficient is 4; 3 section; flow coefficient; the 5 section frequency 01; 6 partition coefficient of 01;... The 23 section frequency 10; 24 partition coefficient of 10.

↓

Meter : veloc./PD
Options: 01/04
Signals type:
Pulse

Volumetric flowmeter signal type speed /:
1, the volume pulse; 2, 4-20mA, 3, 0-10mA,
volume of volume;

↓ Up / down button, modify relevant contents

Meter : veloc./PD
Options: 01/04
Signals type:
4-20mA

↓

Meter : veloc./PD
Options: 01/04
Signals type:
0-10mA

↓

Meter : veloc./PD
Options: 01/04
Signals type:
Pulse

Input signal types used,
keys to modify the speed /
volume flowmeter

↓

Meter : veloc./PD
Options: 01/04
Signals type:
Pulse

The current related items / total number of related items, 01/04 said: the current options for "01 signal types", several options related to volume pulse is 4.

↓

Meter : veloc./PD
Options: 02/04
Cut-off freq:
0000 Hz

Lower excision frequency, unit: Hz, valid range: 0-9999.

Meter : veloc./PD
Options: 03/04
Coef. linearize:
OFF

Flow coefficients are piecewise. If the don't fragment, calculation of flow discharge coefficient fourth; if the input frequency segment, segment corresponding and block coefficient, calculated using piecewise coefficients corresponding to.

Meter : veloc./PD
Options: 04/04
Flow coefficient:
00009.400 1/L

The flow coefficient, no time units: 1/L, valid range: 0-9999.9999.

3. 12. 1. 2 Signal type for related options current setting method

Meter : veloc./PD
Options: 01/04
Signals type:
4-20mA

If the signal type is "4-20mA," volume "or 0-10mA, volume", related options: 1, signal type, 2, range units, 3, flow span, 4, removal of current.

Meter : veloc./PD
Options: 02/04
Flow F.S unit:
m³/h

Range units: cubic meters / hour (m³/h), L / h (l/h)

Meter : veloc./PD
Options: 03/04
Flow full scale:
0000100.000 m³/h

Flow range, range: 0-99999999.999. The unit by the relevant item 2.

Meter : veloc./PD
Options: 04/04
Cut-off current:
4.000 mA

Resection of lower limit value, the current unit: mA, valid range: 0-9.999 mA,.

3. 12. 2 Mass flow

The mass flow and speed / volume calculation method is different, the same method

3. 12. 3 DP scale

Meter : DP scale
Options: 01/05
Signals type:
4-20mA, no $\sqrt{}$



Meter : DP scale
Options: 01/05
Signals type:
4-20mA, no $\sqrt{}$



Meter : DP scale
Options: 01/05
Signals type:
4-20mA, no $\sqrt{}$

Meter : DP scale
Options: 02/05
Scaled flow unit:
t/h

Meter : DP scale
Options: 03/05
Scaled range:
0000010.000 t/h

Meter : DP scale
Options: 04/05
Design density:
0004.0000 kg/m³

Meter : DP scale
Options: 05/05
Cut-off current:
4.000 mA

Flow chart: plate /V cone / Annubar / Venturi / elbow arithmetic type flowmeter, the output signal for scale mass flow;

The options:
1, the signal type; 2, scale unit; 3, scale flow; 4, density 5, removal of current design;

Signal type:

- 1, 4-20mA, without prescribing;
- 2, 0-10mA, without prescribing;
- 3, 4-20mA, have been prescribing;
- 4, 0-10mA, have been prescribing.

The calibration unit:

- 1, tons / hour (t/h); 2, kg / h (Kg/h)

Scale flow:

Range: 0-9999999.999.

Design density:

Range: 0-9999.999, unit: kg/m³.

Current limit resection:

The effective range: 0-9.999mA.

3. 12. 4 Orifice DP

Meter : Orifice DP
Options: 01/09
Signals type:
4-20mA, no $\sqrt{\quad}$

Relevant options:

- 1、 Signals type;
- 2、 Pipe diameter D, unit: mm;
- 3、 Hole diameter d, unit: mm;
- 4、 Expensibility ϵ ;
- 5、 Discharge coe.C;
- 6、 DP unit: MPa/KPa/Pa
- 7、 DP low scale;
- 8、 DP high scale;
- 9、 Cut-off current

Meter : Orifice DP
Options: 01/09
Signals type:
4-20mA, no $\sqrt{\quad}$

Orifice plate differential pressure signal:

- 1, 4-20mA, without prescribing;
- 2, 0-10mA, without prescribing;
- 3, 4-20mA, have been prescribing;
- 4, 0-10mA, have been prescribing.

Meter : Orifice DP
Options: 02/09
Pipe diameter D:
0400.0000 mm

Pipe diameter D:

Range: 0-9999.9999 mm;

Meter : Orifice DP
Options: 03/09
Hole diameter d:
0350.0000 mm

Hole orifice diameter:

Range: 0-9999.9999 mm;

Meter : Orifice DP
Options: 04/09
Expensibility ϵ :
1.0000

Expandable coefficient:

Range: 0-9.99999

Meter : Orifice DP
Options: 05/09
Discharge coe.C:
0.800000

The discharge coefficient of orifice plate: Range: 0-0.999999.

Meter : Orifice DP
Options: 06/09
DP unit:
KPa

Differential pressure unit:

- 1、 Pa;
- 2、 kPa;
- 3、 MPa.

Meter : Orifice DP
Options: 07/09
DP low scale:
+000.000 KPa

DP low scale:
The effective range: $0-\pm 999.999\text{KPa}$.

Meter : Orifice DP
Options: 08/09
DP high scale;
+100.000 KPa

DP high scale:
The effective range: $0-\pm 999.999\text{KPa}$.

Meter : Orifice DP
Options: 09/09
Cut-off current:
4.000 mA

Current limit resection:
The effective range: $0-9.999\text{mA}$.

3. 12. 5 V cone DP

Meter : V cone DP
Options: 01/09
Signals type:
4-20mA, no $\sqrt{\quad}$

Relevant options:
1、Signals type;
2、Pipe diameter D, unit: mm;
3、Cone diameter d, unit: mm;
4、Expensibility ε ;
5、Discharge coe.C;
6、DP unit: MPa/KPa/Pa
7、DP low scale;
8、DP high scale;
9、Cut-off current

Meter : V cone DP
Options: 01/09
Signals type:
4-20mA, no $\sqrt{\quad}$

Orifice plate differential pressure signal:
1, 4-20mA, without prescribing;
2, 0-10mA, without prescribing;
3, 4-20mA, have been prescribing;
4, 0-10mA, have been prescribing.

Meter : V cone DP
Options: 02/09
Pipe diameter D:
0400.0000 mm

Pipe diameter D:
Range: $0-9999.9999\text{ mm}$;

Meter : Orifice DP
Options: 03/09
Cone diameter d:
0350.0000 mm

Cone diameter d:
Range: $0-9999.9999\text{ mm}$;

Meter : V cone DP
Options: 04/09
Expensibility ε :
1.0000

Expandable coefficient:
Range: $0-9.99999$.

Meter : V cone DP
Options: 05/09
Discharge coe. C:
0.800000

The discharge coefficient of orifice plate. The effective range: 0-0.999999。

Meter : V cone DP
Options: 06/09
DP unit:
KPa

DP unit:
4、 Pa;
5、 kPa;
6、 MPa。

Meter : V cone DP
Options: 07/09
DP low scale:
+000.000 KPa

DP low scale:
The effective range: 0-±999.999KPa。

Meter : V cone DP
Options: 08/09
DP high scale;
+100.000 KPa

DP high scale:
The effective range: 0-±999.999KPa。

Meter : V cone DP
Options: 09/09
Cut-off current:
4.000 mA

Current limit resection:
The effective range: 0-9.999mA。

3. 12. 6 Annubar

Parameters of Annubar and orifice plate differential pressure setting method for the same.

Option 3 is "drag coefficient ζ "

Meter : Annubar DP
Options: 03/09
Drag coe. ζ :
000.00000

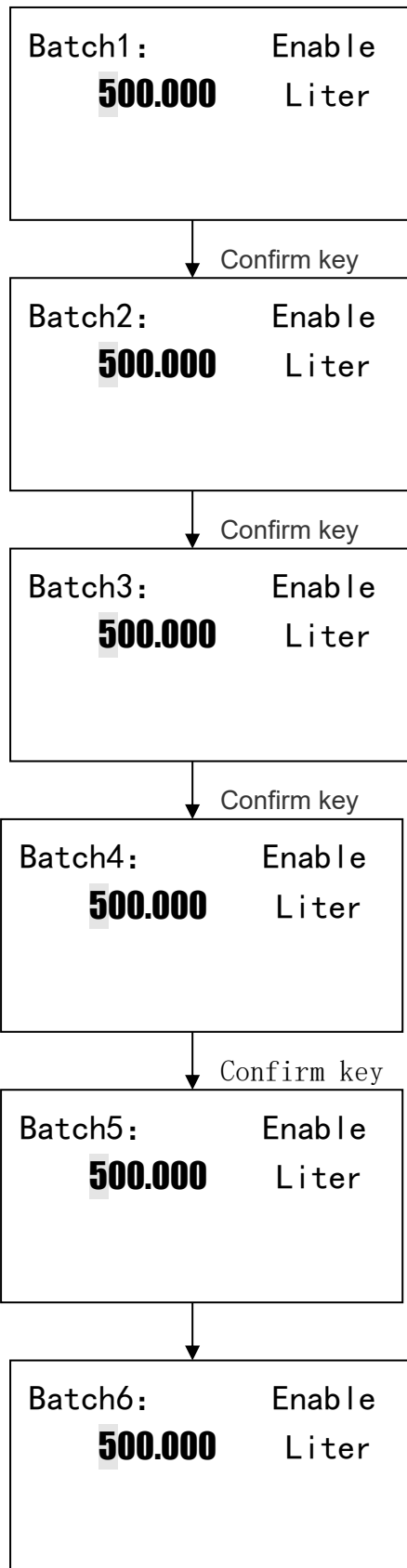
Drag coe. ζ :
The effective range: 0-999.99999。

Option 5 "flow coefficient K"

Meter : Annubar DP
Options: 05/09
Flow coe.:
0.000000

Annubar flow coefficient k:
The effective range: 0-0.999999。

3.12.7 Setup



8 groups of quantities and units:

You can switch the amount used by the "pause" and "the reset button", press the "start" button to select the group after the usual dose distribution. If you only use a set of commonly used quantity, other disabled, press the start button automatically by the use of the usual dose distribution.

Batch7: Enable
500.000 Liter

↓ Confirm key

Batch8: Enable
500.000 Liter

↓ Confirm key

Meter : veloc./PD
Options: 01/04
Signals type:
 Pulse

↓ Confirm key

Density (20°C):
0800.0000 kg/m3
V-expansion coe:
0.000000

↓ Confirm key

Low flow alarm:
Flow: 00.00 t/h

↓ Confirm key

Empty alarm:
Flow: 00.00 t/h

↓ Confirm key

Damping time:
005 S

Medium density:
1, 20 °C density ρ 20 (kg/m3)
2, liquid volume expansion coefficient

When the instantaneous flow below this value, the alarm.

When the instantaneous flow below this value, the alarm.

Damping time: effective range: 000 ~ 30 seconds

Confirm key

Com type: **RS-485**
Device ID: **0001**
Baud rate: **9600**

Communication: RS-485/RS-232/ broadband / no;
effective range: 001 ~ 254, the baud rate:
600/1200/2400/4800/9600.

Confirm key

T sensor: **Pt100**
Constant: **+180.00**

Temperature input mode:
Pt100/4-20mA/0-10mA/setup.

Confirm key

Confirmation:
None

Issue confirmation: no / password / IC card;
Select issue confirmation way. Material not to need to
confirm, please select "no".

Confirm key

Current output:
Options: **1/4**
Output type:
4-20mA

The current output channel options:
current output type / output variables
/ the lower limit of the range / range
limit.

Confirm key

Printing copies:
0

After the number of copies printed
material, material results. A maximum of
2 linked. If 0, then do not print.

Confirm key

Printing tag:
B9A4CEBBA3BA3030
3100000000000000
0000000000000000

Identify and distinguish for printing
results.

Valve-off volume
BIG: **00.2000m³**
Small: **00.0500m³**

In the valve closed

↓

Pump-on delay :
00 S
Pump-off volume :
00.0000 L

Confirm key

IC system : **OFF**
Code: **0001**

Confirm key

Controller:
Buttons only

Open pump delay: starting material, first open the valve, the valve is fully open after the pump is started, the parameters for the pump start-up time delay.

Close the pump advance: residual material in off pump.

IC card prepayment system switch.

Control instrument selection: Buttons only/Com only/
Buttons and Com

3.13 Total Reset

--- Main menu ---
4. Inquiry
5. Setup
6. Total Reset

Confirm key

Password:
*****0

Confirm key

Total reset:
1. Total flow
2. Total times

3.13.1 Total flow:

Total reset:
1. Total flow
2. Total times

Confirm key
↓
Total flow:
00000012.4458

3.13.2 Total times:

Total reset:
1. Total flow
2. Total times

Confirm key
↓
Powerdown: **0005**
Batch: **0001**

3.14 Password

--- Main menu ---
6. Total Reset
7. Calibrate
8. Password

Confirm key
↓
Password Change:
1. Setup
2. Calibrate
3. Total reset

3.14.1 Setup

Password Change:
1. Setup
2. Calibrate
3. Total reset

Confirm key
↓
Setup:
OLD: **XXXXXX**
NEW: **000001**

Enter the old password and
the new password, modify
password.

Confirm key
↓
Setup:
OLD: XXXXXX
NEW: 000001
Successful!

Set the password updated successfully. The new password is 000001.

3.14.2 Calibrate

Password Change:
1. Setup
2. Calibrate
3. Total reset

Confirm key
↓
Setup:
OLD: XXXXXX
NEW: 000002

Enter the old password and the new password, modify password.

Confirm key
↓
Setup:
OLD: XXXXXX
NEW: 000002
Successful!

Set the password updated successfully. The new password is 000002.

3.14.3 Total reset

Password Change:
1. Setup
2. Calibrate
3. Total reset

Confirm key
↓
Setup:
OLD: XXXXXX
NEW: 000003

Enter the old password and the new password, modify password.

Confirm key
↓
Setup:
OLD: XXXXXX
NEW: 000003
Successful!

Set the password updated successfully. The new password is 000003.。

3.15 Clock

--- Main menu ---
7. Calibrate
8. Password
8. Clock setting

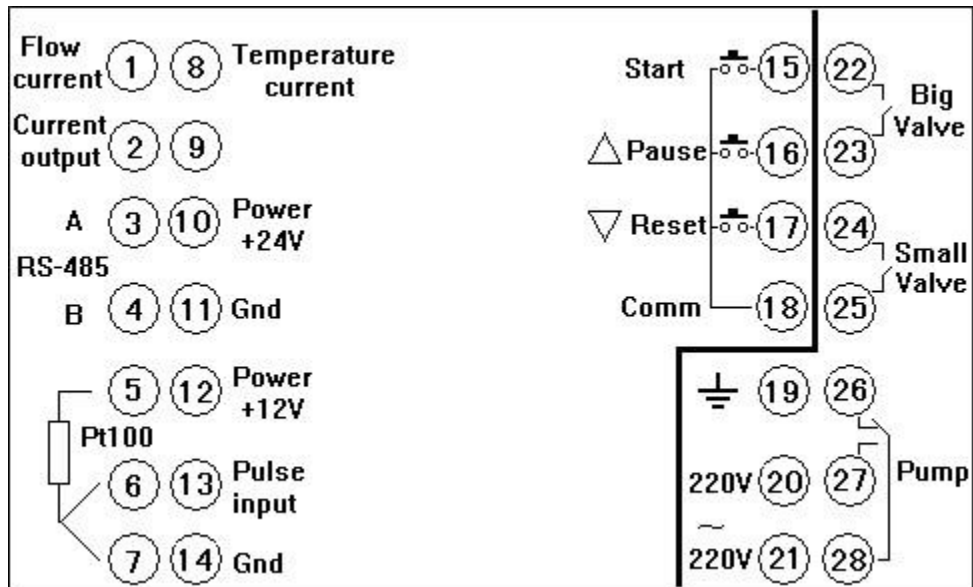
↓ Confirm key

Real-time clock:
Date: **2013-03-01**
Time: **17:08:39**

Clock。

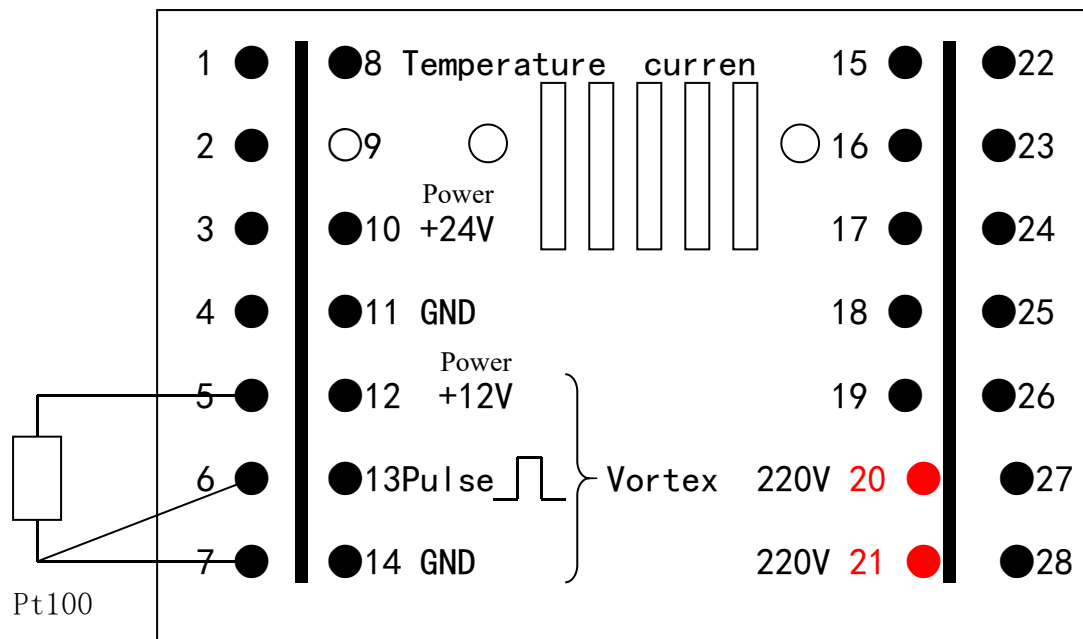
四、Wiring

1、 Terminal definitions

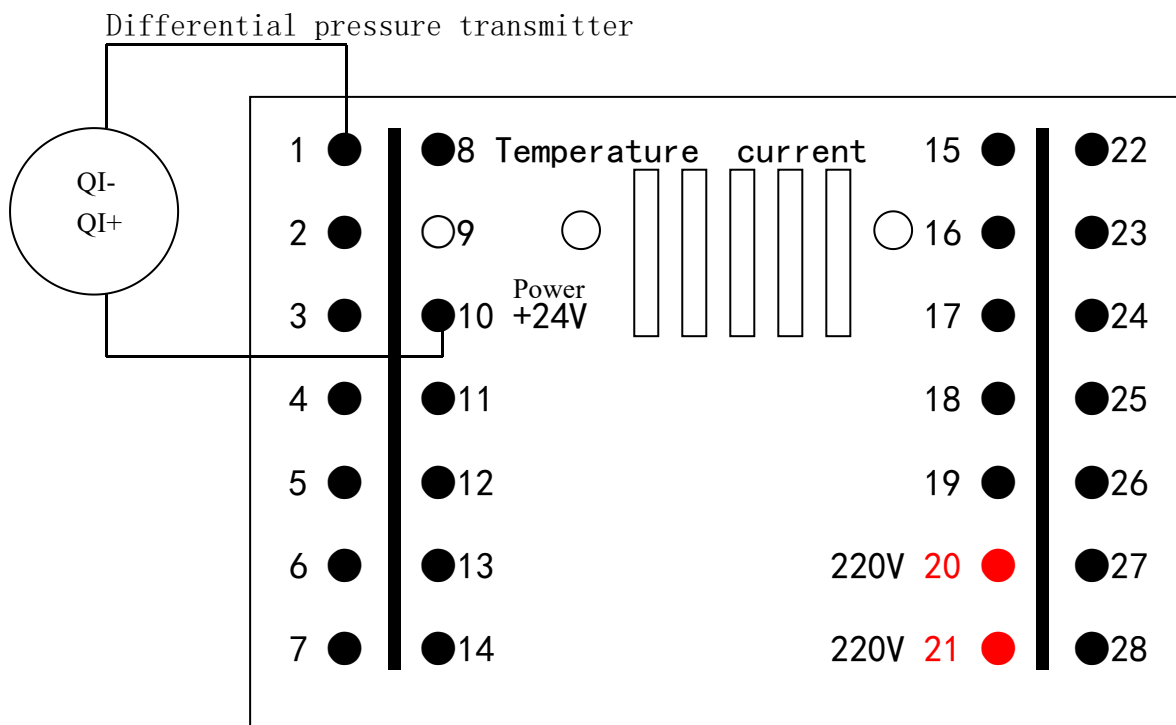


- | | |
|----------------------------|---|
| 1. Flow current; | 8. Temperature current; |
| 2. current output; | 9. hollow; |
| 3. RS-485,A; | 10. +24V (Power); |
| 4. RS-485,B; | 11. GND; |
| 5. Pt100, A; | 12. +12V; |
| 6. Pt100, B; | 13. Pulse input; |
| 7. Pt100, B; | 14. GND; |
| 15. Start; | 22. Big Valve1; |
| 16. Pause; | 23. Big Valve2; |
| 17. Reset; | 24. Small Valve1; |
| 18. COMM; | 25. Small Valve 2; |
| 19. Grounded; | 26. Pump normally closed contact |
| 20. 220V; | 27. Pump normally open contact |
| 21. 220V; | 28. Pump public contacts |

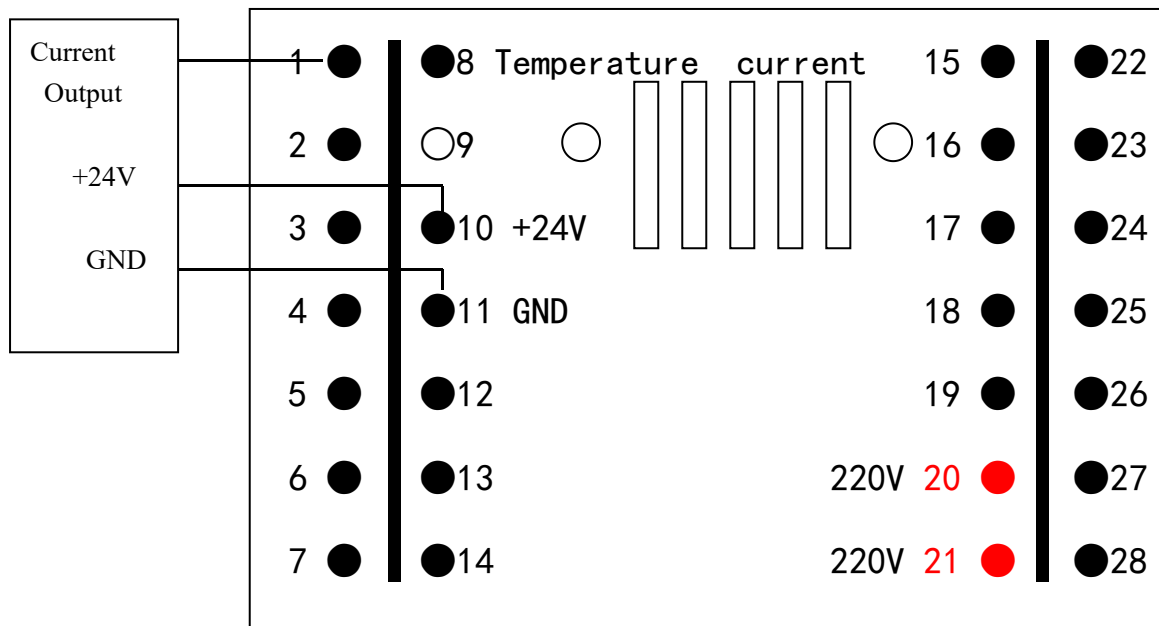
- 2、 Flow (pulse), temperature (Pt100) and the power supply wiring method.



- 3、 Wiring method for flow transmitter or differential pressure transmitter two line.



4、Wiring method for flow transmitter or differential pressure transmitter three line.



五、 Programming examples

Example: using vortex flow sensor to measure the quality of hot water, mean flow coefficient of 9.2187 pulses / L. With Pt100 temperature compensation. Each time you start the 10 tons of water. Issue without passwords or credit card to confirm.

Parameter setting:

1、 Flow meter selection: veloc./PD;

The options:

Signals type: Pulse;

Cut-off freq: 0000Hz;

Coef.linearize: OFF

Flow coefficient: 0009.2187 1/升

2、 Medium:

The options:

✧ 20°C Density: 0998.0000 kg/m³;

✧ V-expansion coe.: 0.000251 ;

3、 Shipment quantity: 10.000 t

4、 Temperature input mode: Pt100

5、 Confirmation: None;

6、 Damping time: 001 秒;

T sensor: **Pt100**
Constant: **+080.00**

Damping time:
001 S

Meter : veloc./PD
Options: 01/04
Signals type:
Pulse

Meter : veloc./PD
Options: 03/04
Coef.linearize:
OFF

Meter : veloc./PD
Options: 04/04
Flow coefficient:
00009.2187 1/L

Density (20°C):
0998.0000 kg/m3
V-expansion coe.:
0.000251

Batch1: Enable
010.000 t

七、 Factory password

Set password: **000000**;

Calibration password: **000000**;

Reset password: **000000**。