

Batch Controller Instrument

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1. Introduction

Universal batch controller meter (here in after 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;
- Can provide +24V DC transmitter, power supply +12V DC, with short circuit protection function, simplify the system, saving investment;
- Fault-tolerant function: temperature / density compensation measuring signal is abnormal, carry out compensation operation manually set the corresponding value;
- Flow and transmission function, the output current signal flow, update cycle 1 second, meet the need of automatic control;
- Meter clock and timing automatic meter reading function, print function, provides the convenience for measurement management;
- Rich self-test and self diagnosis function of the instrument is easy to use and maintenance;
- Three password prevents unauthorized personnel changes to the data set;
- The instrument without any potentiometer, code switch adjustable device, so as to improve the instrument seismic resistance, stability and reliability;
- Communication function: can carry out data communication through a variety of means of communication with the host computer, energy metering network system:
RS-485; RS-232; In GPRS, CDMA; In broadband network.

2. The main technical index instrument

2.1 Incoming signal

The analog quantity:

- resistance: standard thermal resistance -- Pt100;
- current: 0 ~ 10mA, 4 ~ 20mA \leq 250 Ω -- input impedance;

Pulse volume:

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

- amplitude: more than 4V;
- frequency: 0 ~ 10KHz (or according to user requirements).

2.2 Output signal

Analog output:

- DC 0~10mA (Load resistance \leq 750 Ω);
- DC 4~20mA (Load resistance \leq 500 Ω);

2.3 The switch output

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

2.4 Communication output

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

2.5 Feed output

- DC24V, load \leq 100mA
- DC12V, load \leq 200mA

2.6 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

2.7 Display mode

- backlit screen 128 x 64 dot matrix liquid crystal graphic display;
- historical cumulative flow, instantaneous flow, medium temperature, medium density, flow (differential current, frequency), clock, alarm status;
- 0 ~ 999999 instantaneous flow value
- 0 ~ 99999999.9999 cumulative value
- -9999 ~ 9999 temperature compensation
- -99999 ~ 999999 flow (pressure, frequency) value

2.8 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;

2.9 Print

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

2.10 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.

2.11 The use of the environment

Environment temperature: -20 °C ~ 60 °C

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

2.13 The power supply voltage

Conventional type: AC 220V% (50Hz \pm 2Hz);

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

DC 24V \pm 1V switching power supply;

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

2.14 Power consumption

$\leq 10W$ (AC220V)

2.15 Instrument the size of holes:

152mm \times 76mm

3. Method of operation

3.1 Key

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

Up arrow



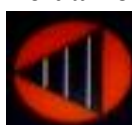
Use this key to move the cursor in the menu; add modify settings in the settings.

Down arrow



Using the keys to move the cursor down the menu; reduce to modify the settings in the settings.

Left arrow



Use this key to move the cursor to the left menu in the settings to the left; move the selection modified bit.

Right arrow



Use this key to move the cursor on the menu to the right; set moves to the right of choice of modified bit.

Return key



Use this key to return to the previous menu

Confirm key



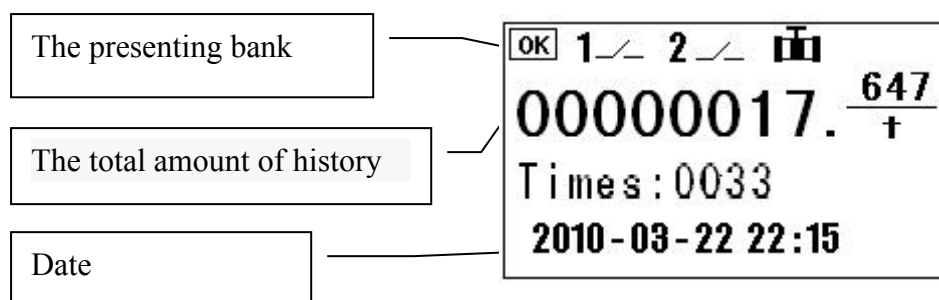
Use this key to enter the menu, performs the selected operation.

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.

In the issue, you press the key, switch to start / pause state;

3.2 Display



4. Operation Interface

4.1 LED

Running state indicating lamp	AH1 ● Pause	●AL2 Function
Foaming process indicator	AH2 ● Unfinished	●AL2 Has been completed
Communication indicator	TXD ● Send data indication	●RXD Receive data indicator

4.2 Display interface

4.2.1 Display

The display contents include:


- Prompt line:

OK Instrument work normally

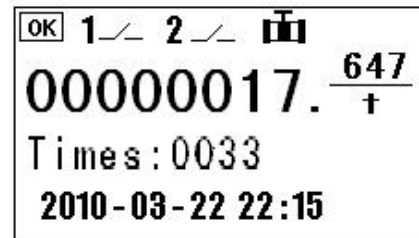
Err The instrument works

1 — Relay status

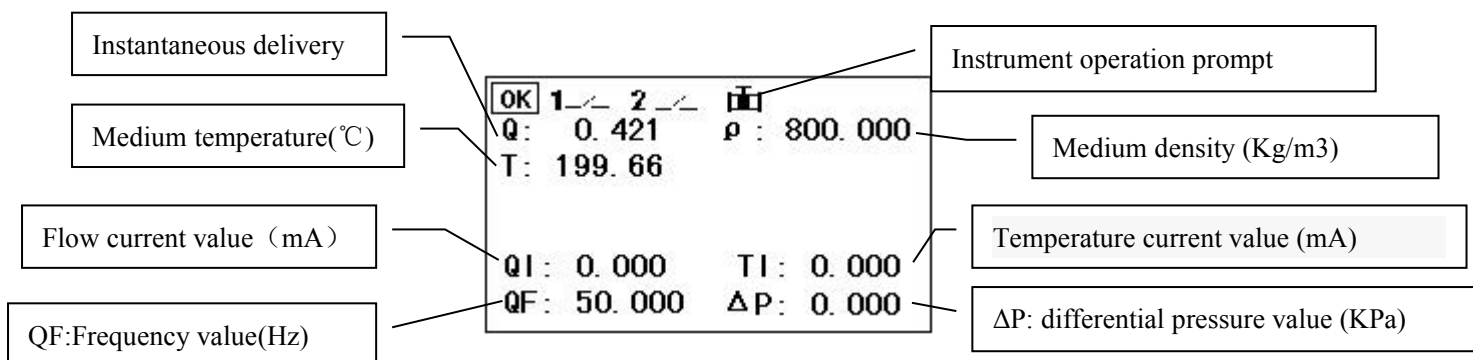
2 — Relay status

 The pump switch state

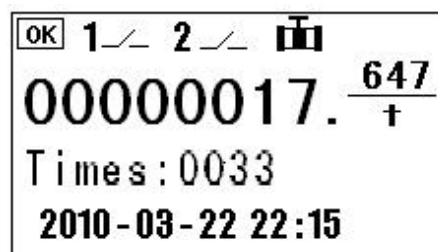
- Historical amount and units
- Batch number
- Date

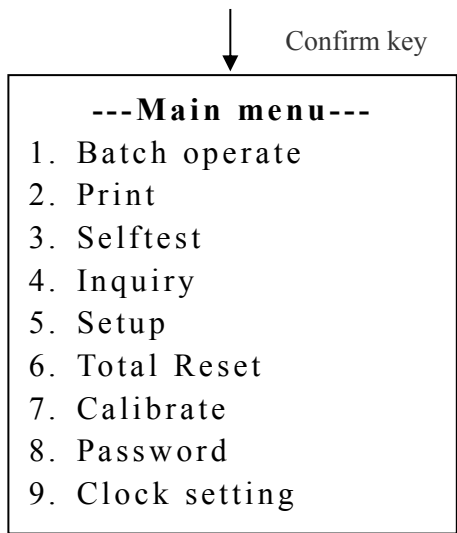


4.2.3 Debugging interface

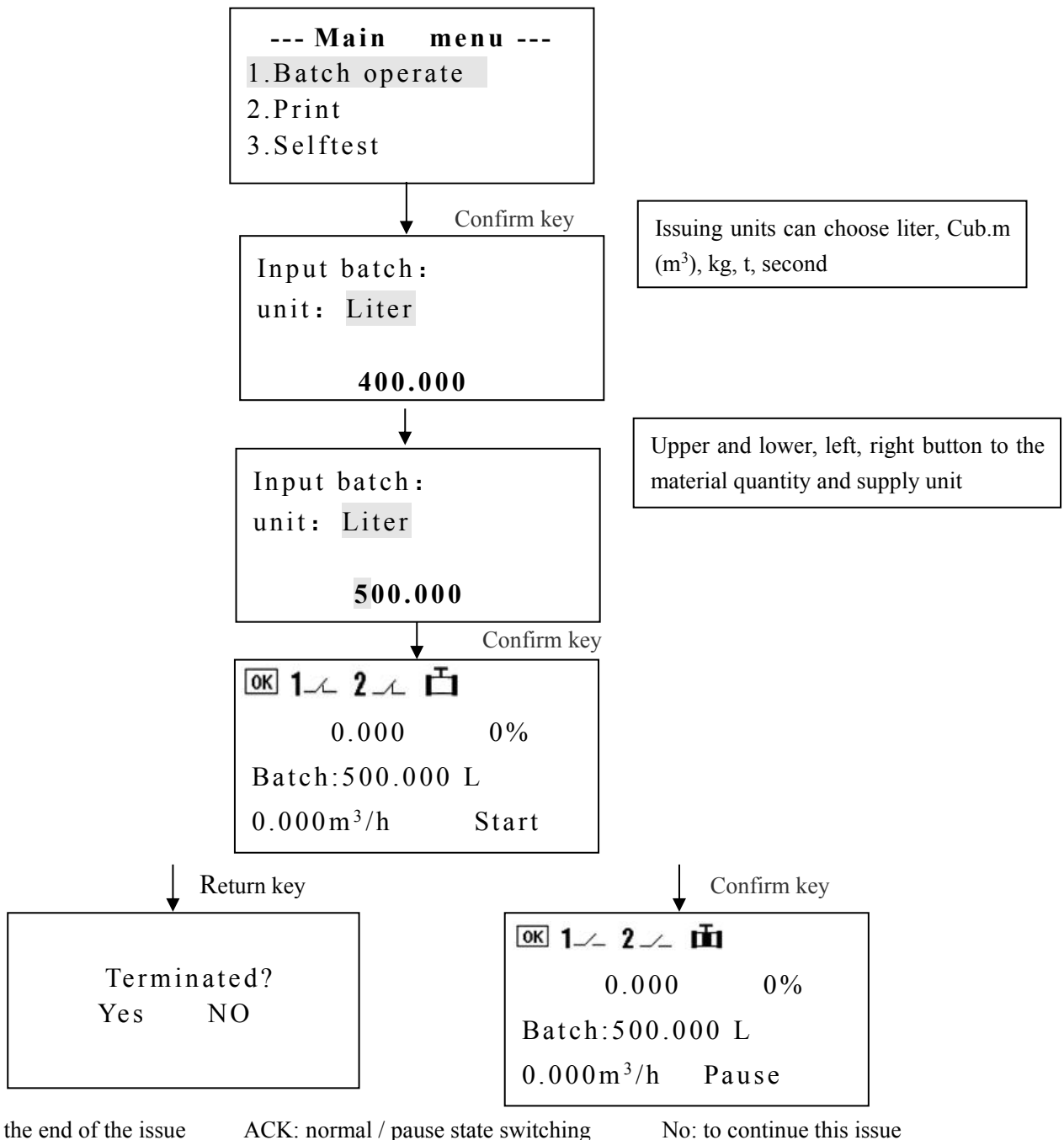


4.3 Main menu





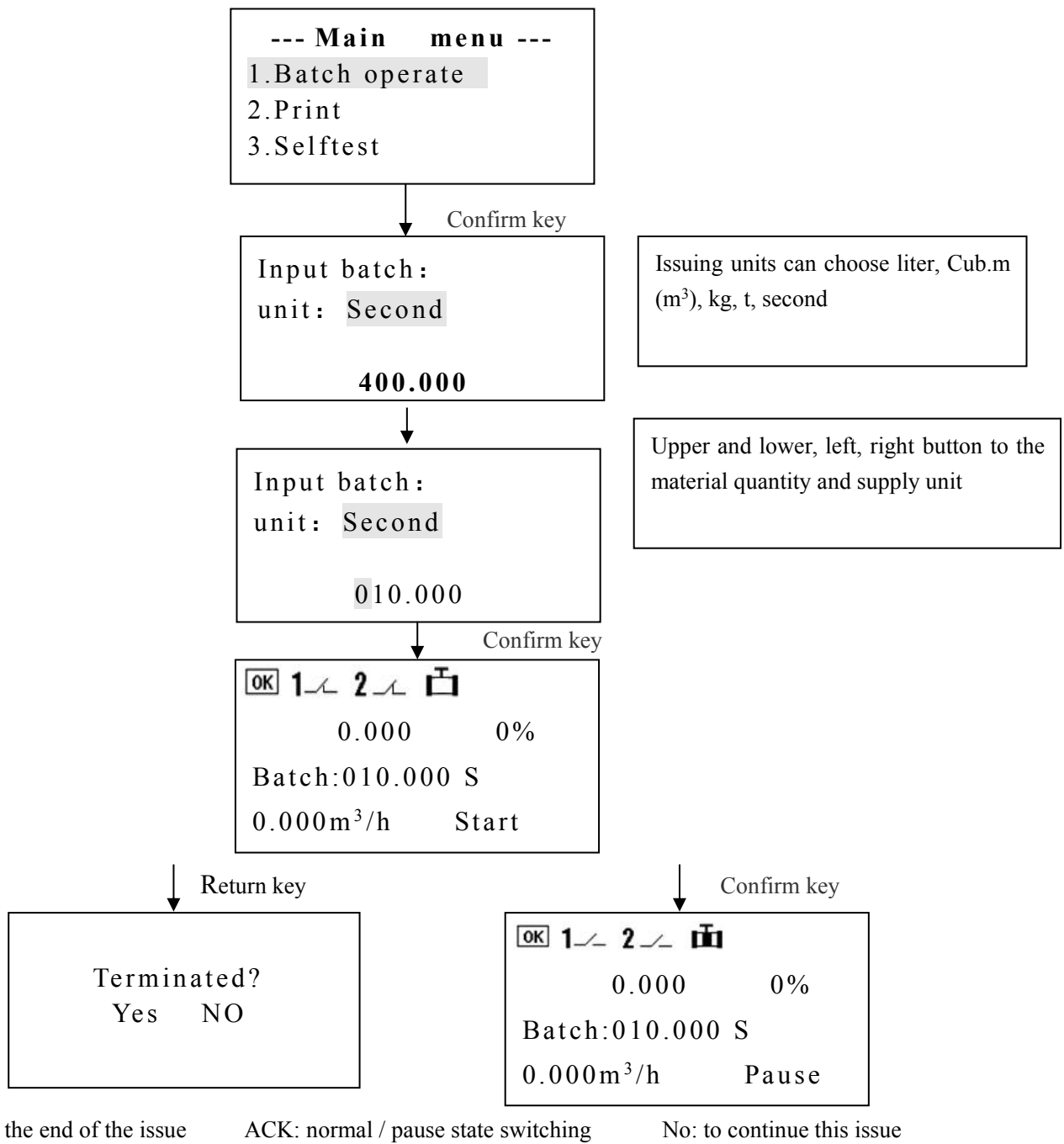
4.3.1 Batch operation



Issuing units can choose liter, Cub.m (m³), kg, t, second

Upper and lower, left, right button to the material quantity and supply unit

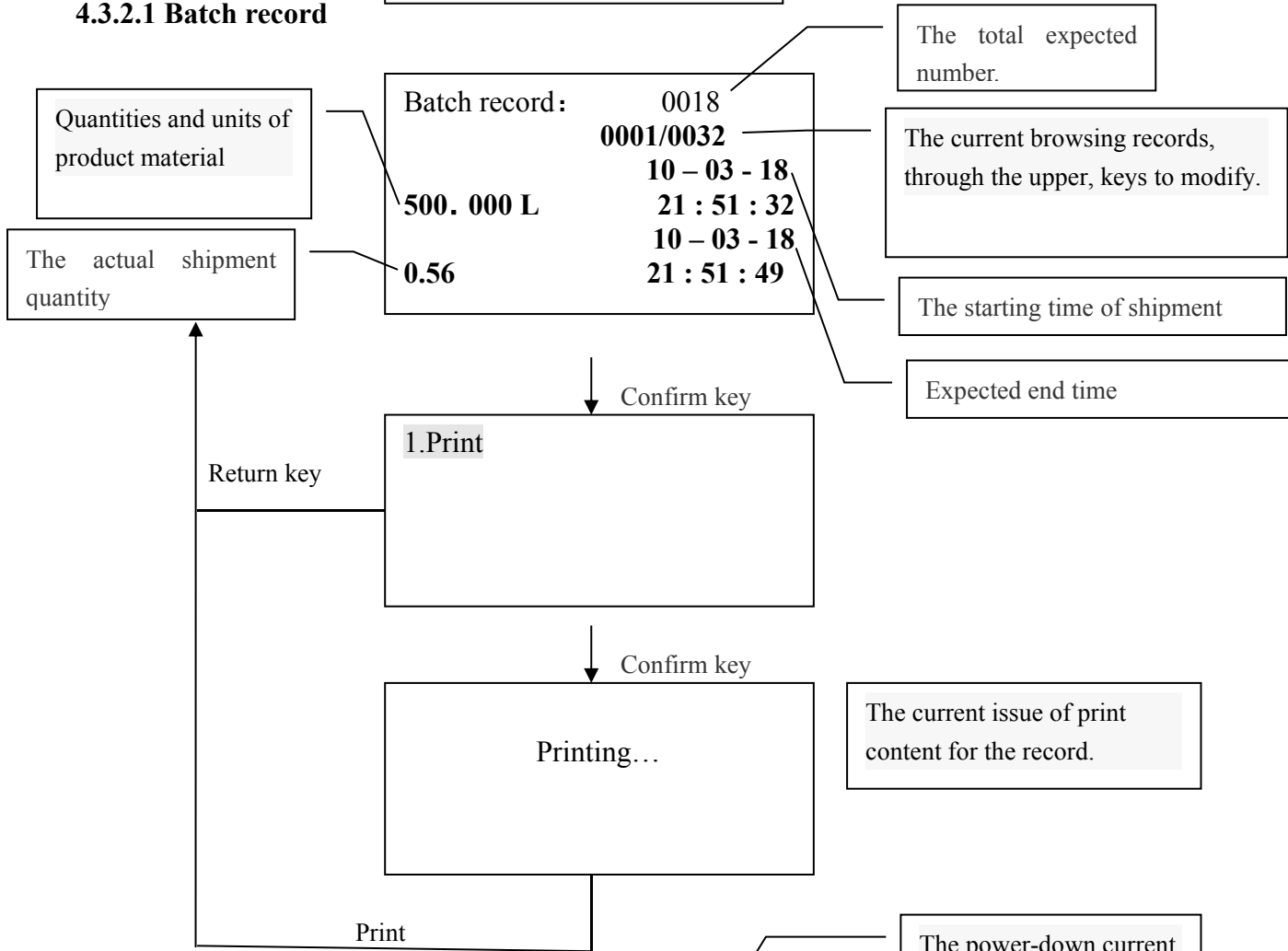
4.3.1.1 Batch operate(Quantitative control by time)



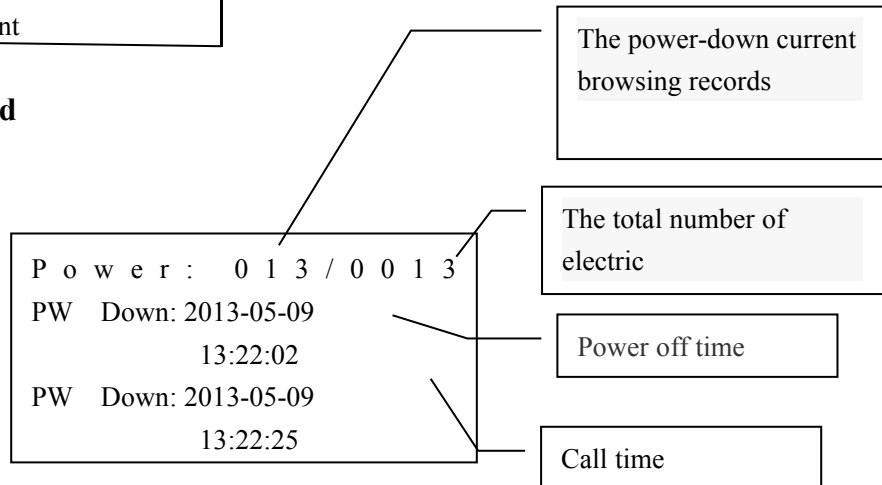
4.3.2 Inquiry record:

Inquiry record:
 Batch record
 Powerdown record

4.3.2.1 Batch record



4.3.2.2 Powerdown record

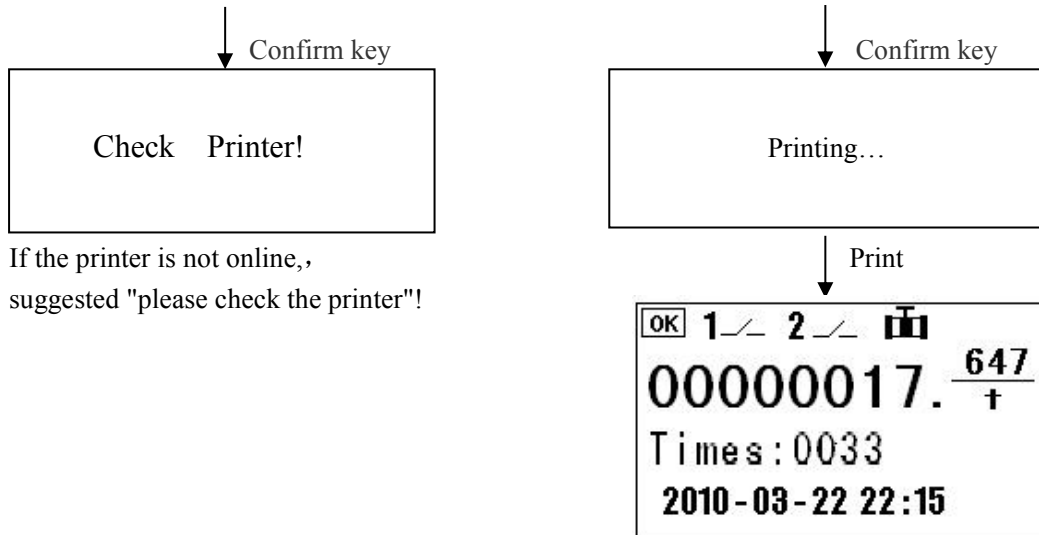


4.3.3 Print

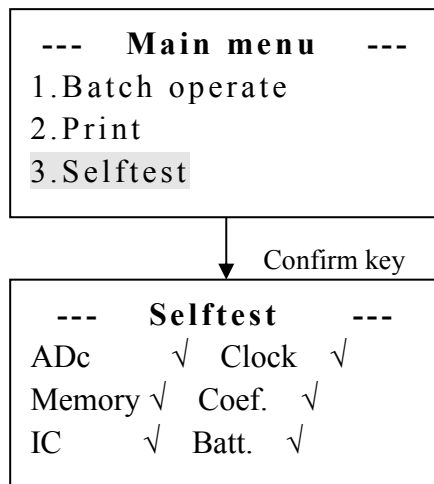
Print the last release results

```

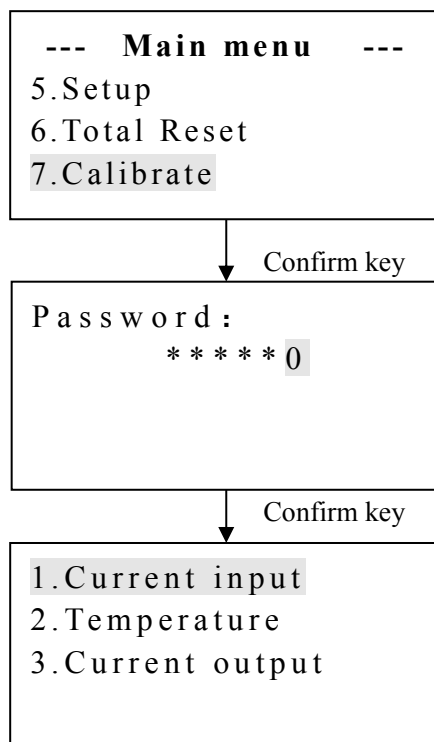
--- Main menu ---
1.Batch operate
2.Print
3.Selftest
    
```



4.3.4 Selftest



4.3.5 Calibrate



4.3.5.1 Current input

1. Current input
2. Temperature
3. Current output

Confirm key

Current channel:
1. Flow/DP
2. Temperature

Confirm key

Current channel:
Zero-scale
Input : 4.000mA
PV: 3.980mA

Confirm key

Successful!

1. Current input
2. Temperature
3. Current output

4.3.5.2 Temperature

1. Current input
2. Temperature
3. Current output

Confirm key

Temp sensor:
Pt100

Confirm key

Sensor: Pt100
RV: 100.00 Ohm
S V : 0 . 0 0 °C
P V : 0 . 4 1 °C

Confirm key

Successful!

1. Current input
2. Temperature
3. Current output

4.3.5.3 Current output

1. Current output
2. Temperature
3. Current output

Confirm key

Current output:
OV: 4.000mA
PV: 03.976mA
(Manual input current measurement)

Confirm key

Current output:
OV: 4.000mA
PV: 03.976mA
(Manual input current measurement)

Confirm key

1. Current input
2. Temperature
3. Current output

4.3.6 Setup

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

↓ Confirm key

Password :
 * * * * * 0

Calibration code. Factory default password is 000000.

↓ Confirm 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

4.3.6.1 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

4.3.6.1.1 Signal type for related options volume pulse setting method:

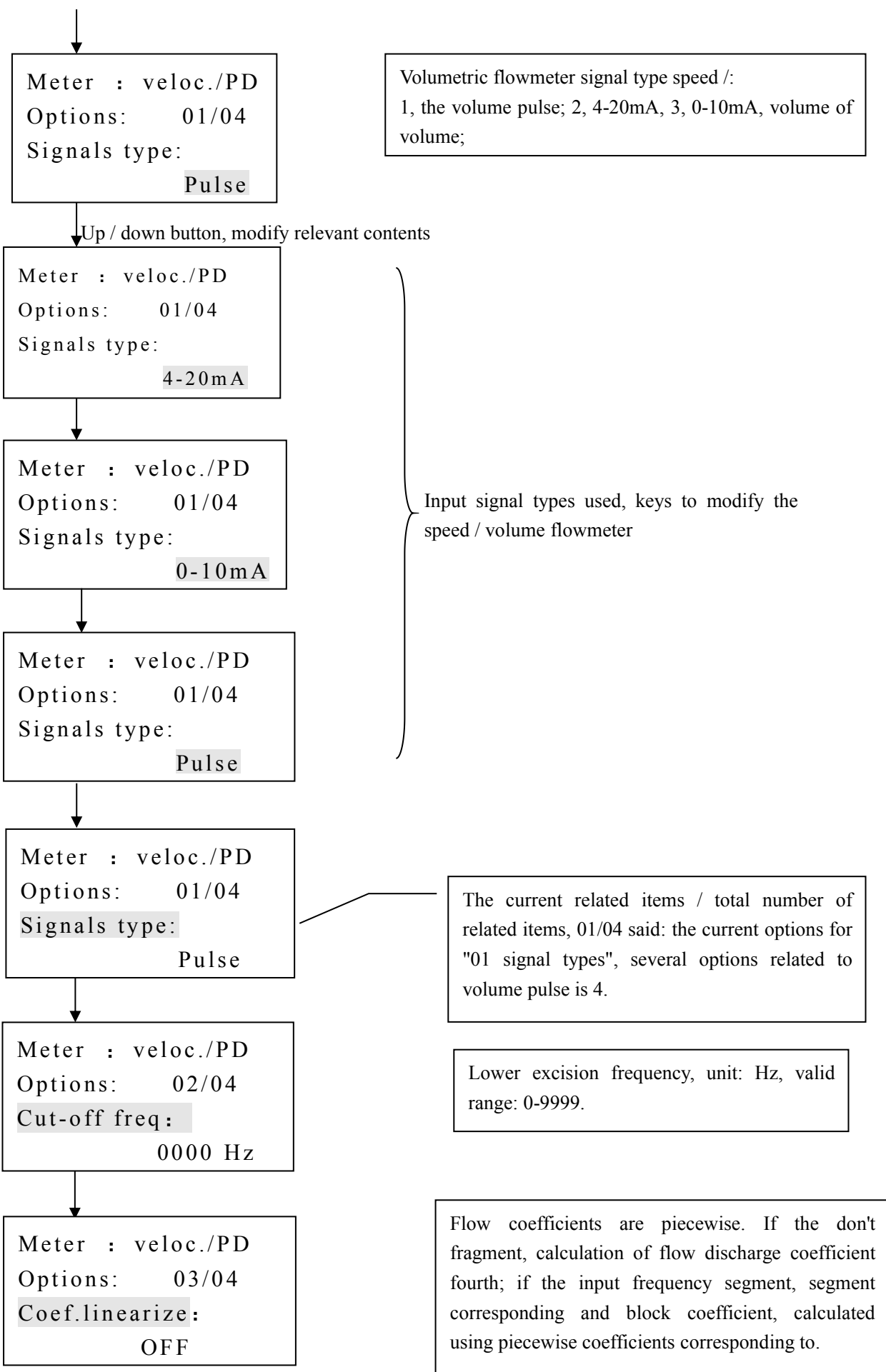
Meter : veloc./PD
 Options: 01/04
 Signals type:
 Pulse

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: 04/04
 Flow coefficient:
 00009.400 1/L

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

4.3.6.1.2 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 /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: 0-9999999.999. 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.

4.3.6.2 Mass flow

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

4.3.6.3 DP scale

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

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

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

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

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

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

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

The calibration unit:
1: tons / hour (t/h); 2: kg / h (Kg/h)

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

Scale flow:
Range: 0-9999999.999.

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

Design density:
Range: 0-9999.999, unit: kg/m³.

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

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

4.3.6.4 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:
Pa; kPa; MPa

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

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

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

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

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

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

4.3.6.5 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 mm;

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

Cone diameter d:
Range: 0-9999.9999 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:
Pa; kPa; 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.

4.3.6.6 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

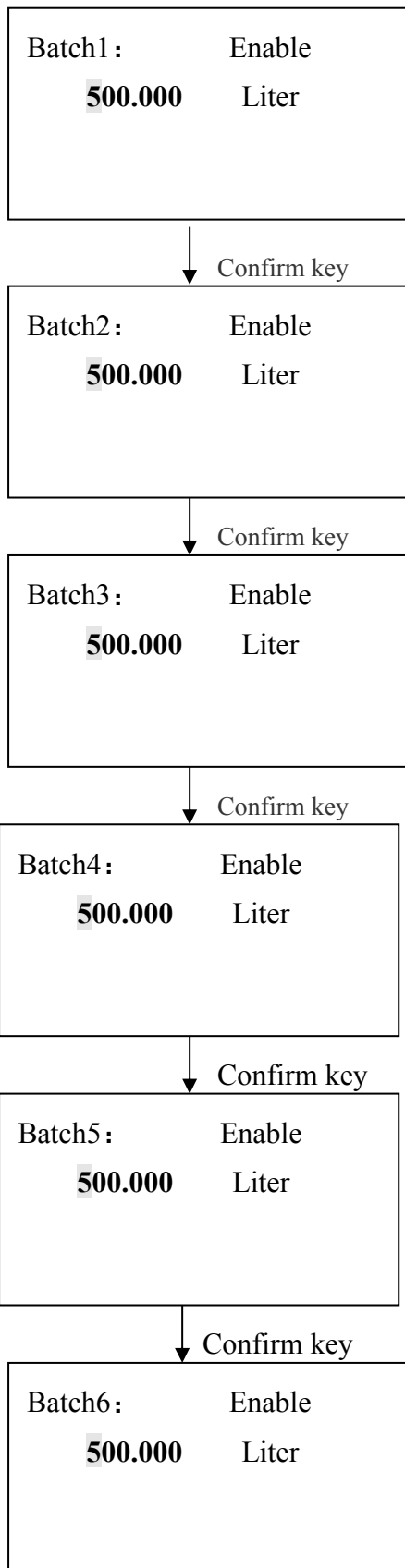
Drag coe. ζ :
The effective range: 0-999.99999.

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.

4.3.6.7 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

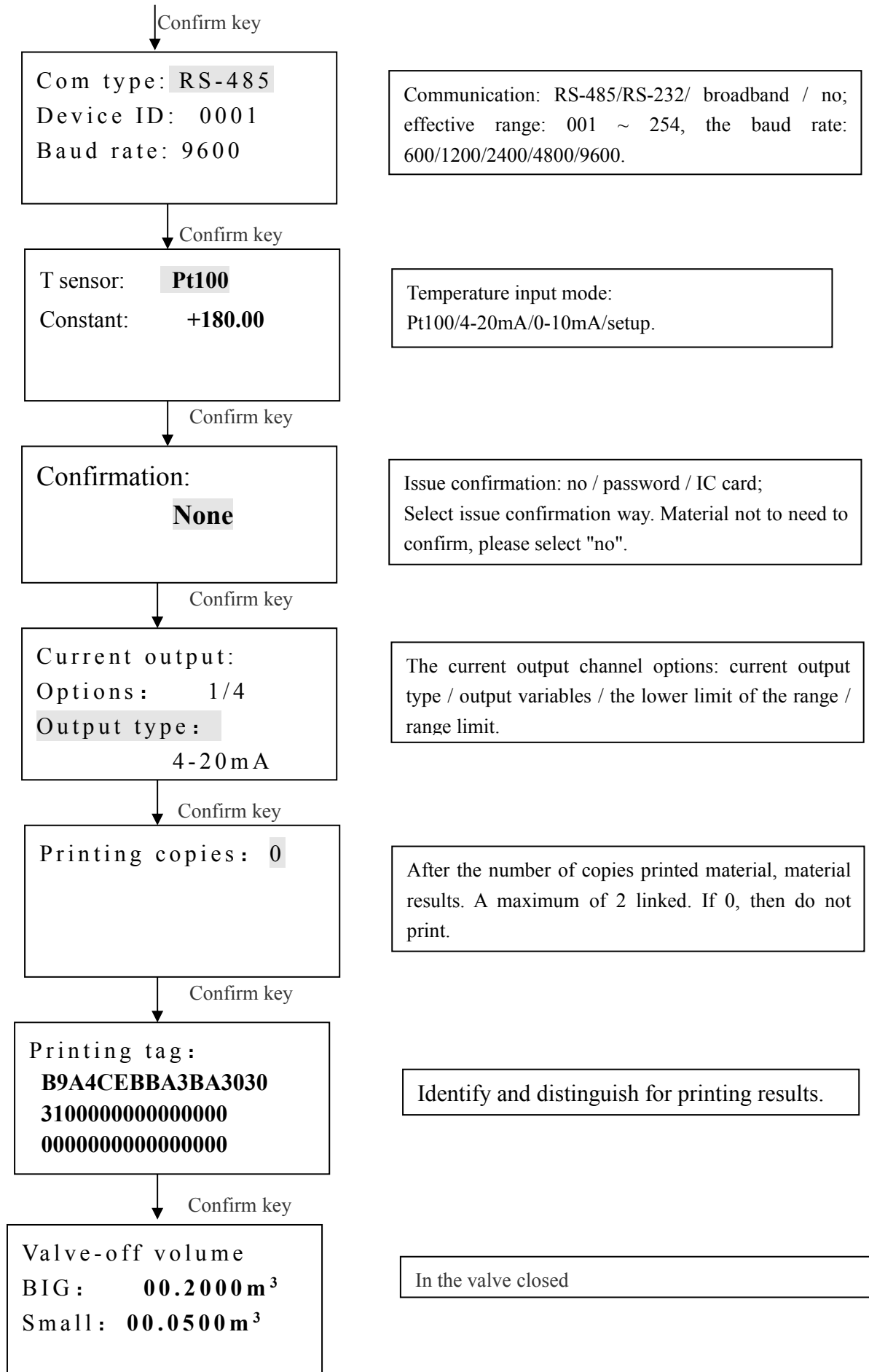
Damping time:
 005 S

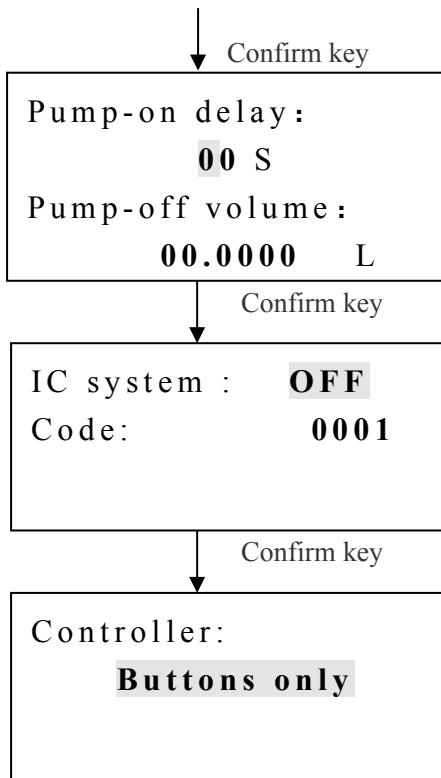
Medium density:
1, 20 °C density ρ 20 (kg/m3)
2, liquid volume expansion coefficient

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



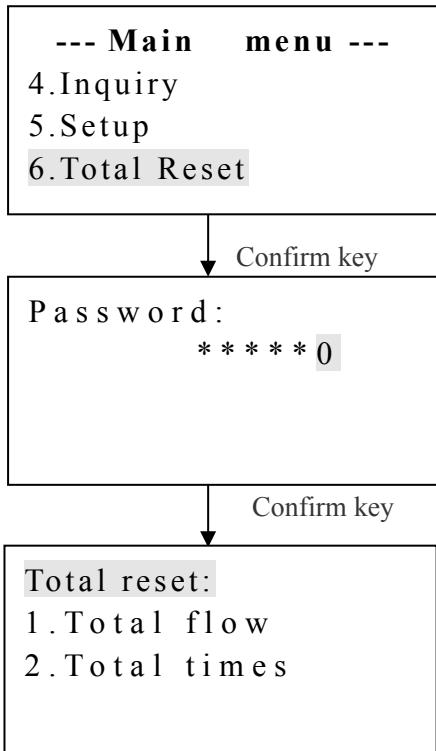


Open pump delay: starting material, first open the valve, the valve is fully open after the pump is started, the parameters for the pump start-up time delay.
Close the pump advance: residual material in off pump.

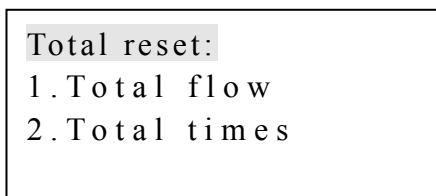
IC card prepayment system switch.

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

4.3.7 Total Reset



4.3.7.1 Total flow:



↓ Confirm key

Total flow :
00000012.4458

4.3.7.2 Total times:

Total reset:
1.Total flow
2.Total times

↓ Confirm key

Powerdown: 0005
Batch: 0001

4.3.8 Password

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

↓ Confirm key

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

4.3.8.1 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.

↓
Setup:
OLD: XXXXXX
NEW: 000001
 Successful!

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

4.3.8.2 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. 8. 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.

4.3.9 Time

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

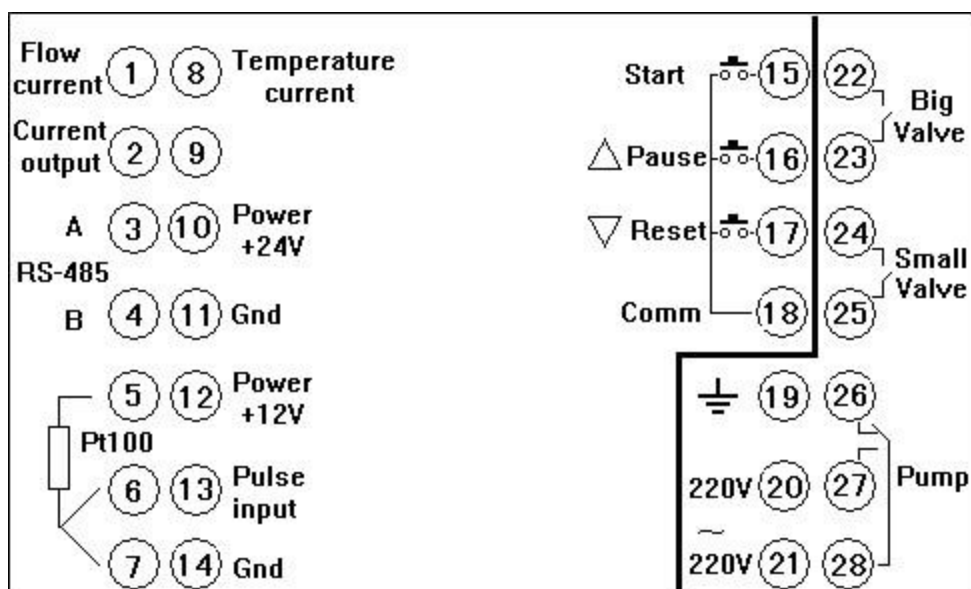
↓ Confirm key

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

Clock.

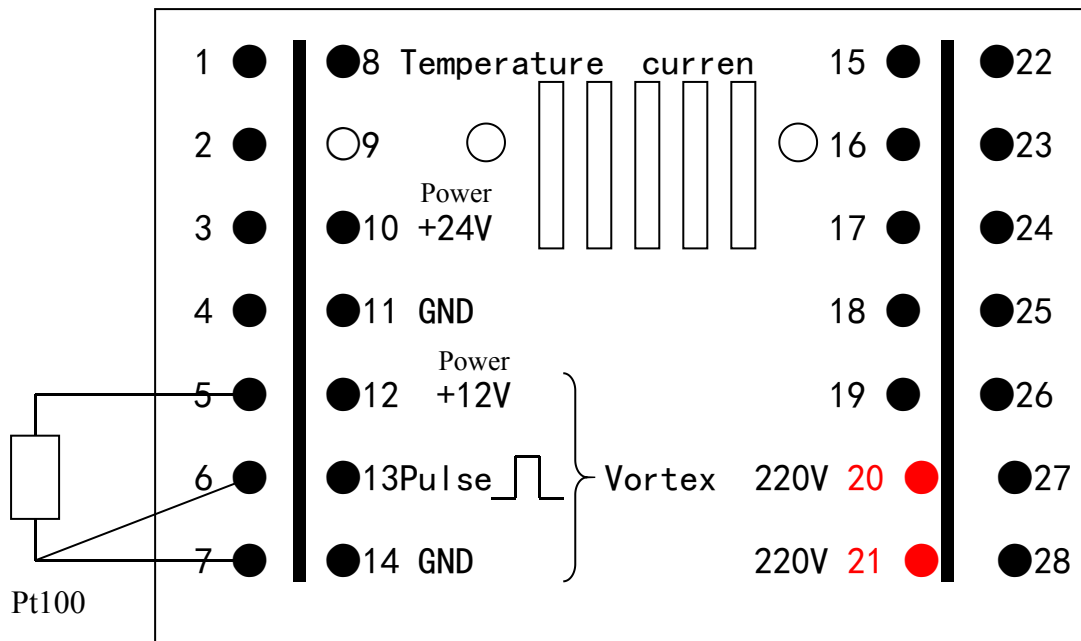
5. Wiring

5.1 Terminal definitions



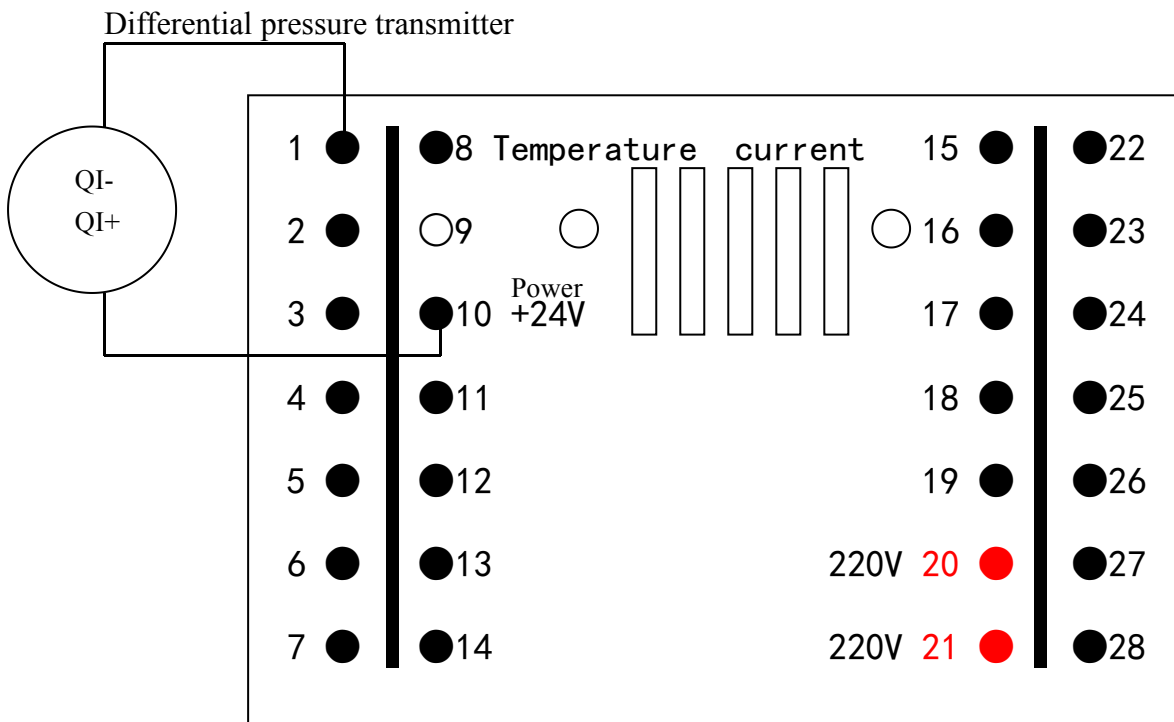
- | | |
|--------------------|----------------------------------|
| 1. Flow current; | 8. Temperature current; |
| 2. current output; | 9. Hollow; |
| 3. RS-485,A; | 10. +24V(Power); |
| 4. RS-485,B; | 11. GND; |
| 5. Pt100,A; | 12. +12V; |
| 6. Pt100,B; | 13. Pulse input; |
| 7. Pt100,B; | 14. GND; |
| 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 |

5.2 Flow (pulse), temperature (Pt100) and the power supply wiring method.

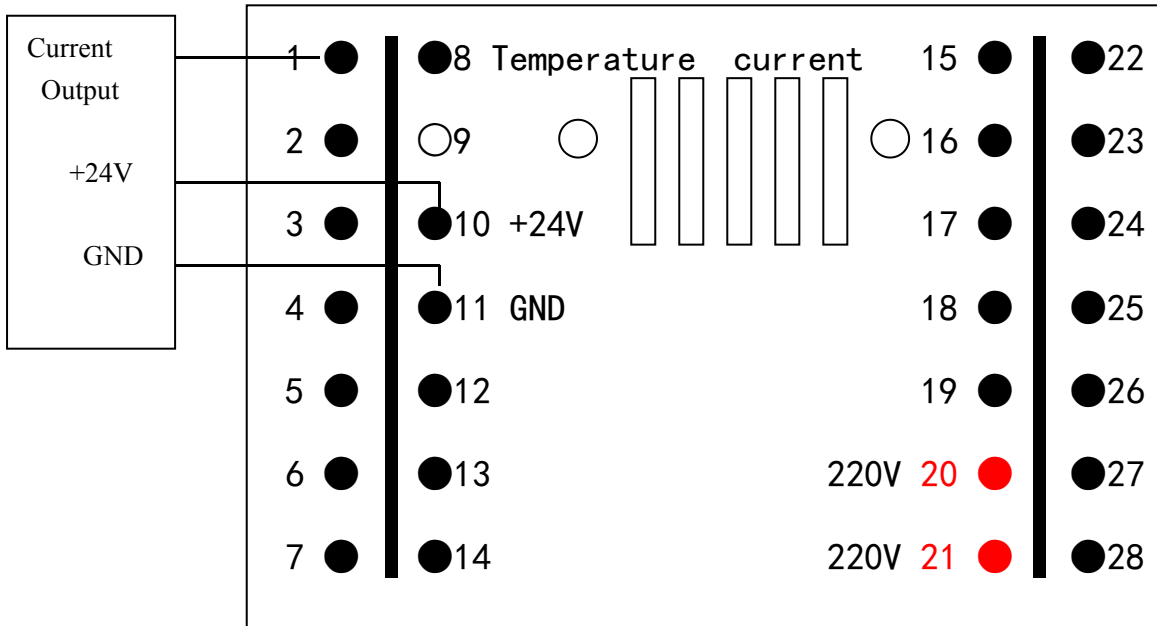


5.3 Wiring method

For flow transmitter or differential pressure transmitter two line.



5.4 Wiring method for flow transmitter or differential pressure transmitter three line.



6. 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/L

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: 001S;

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

7. Factory password

Set password: 000000

Calibration password: 000000

Reset password: 000000