PSYN

Batch Controller

C2001 - Batch Controller

Dual channel series

General

PSYN Batch Controller (Model C2001,hereafter we call C2001) is a new kind of intelligent controlling instrument. It adopts the latest single-chip microcomputer and PLC technology, and high definition LCD with backlight. It has the features of simple structure, high durability, static grounding detection, overflows input detection, temperature compensation, pressure compensation and so on. It is used with the flowmeter to automatically control filling amount in mass or volume through controlling the pump and valve. In addition, it can work with upper computer to realize remote auto loading/unloading control and financial management. It's a new-generation intelligent ex-proof flow control instrument.
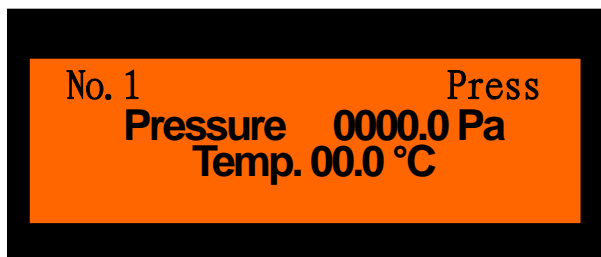
1. Main Technical Datum:

1) Flow Signal Input：Voltage Pulse Signal: V_{p-p} >10V(VH>12V, VL <4V)

2) Current pulse signal:I_{p-p} >3mA(IH>4mA, IL <1mA)

3) Temperature Signal Input: Two-wire System DC24V, 4~20mA , (the temperature upper and lower limits can be adjusted)

4) Static overflow clamp input: Switch signal

5) Output Signal: 24V Contact Signal, Passive Dry Contact Signal ,4~20mA Current Signal

6) Maximum accumulative number: 9999999.

7) Batch Amount Setting Range: 1-999999; Ahead Amount Setting Range: 0~9999.

8) Pulse Equivalent Setting range: 0.0001~99.9999

9) Density Setting Range: 0.0001～99.9999

10) Accumulated Error: ±1 Pulse

11) Batches：1~99 times; Interval Time：1~99 seconds
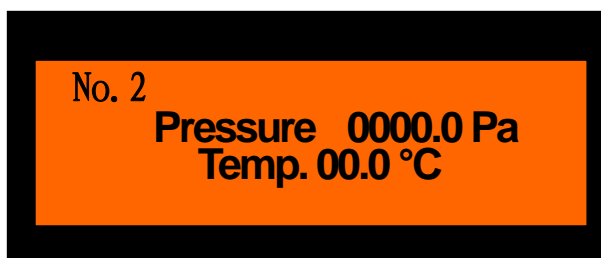
12) Working Ambient Temperature: -20℃~+50℃

13) Power supply: AC220V ±10%   50Hz (or designed as DC24V if required)

14) Outline Dimension of the whole instrument:

   300mm(Length)*450mm(Width)*140mm(Thickness)

15) Total Weight: 16kg

16) Data automatic protection when Power is off

17) External Structure: Cabinet type or Wall-hanging type.

2. Standby Display Instruction

After starting the system, the LCD display will show the following information Fig.1

```
No. 1                    Press
   Pressure    0000.0 Pa
   Temp. 00.0 °C
```

CHANNEL   1

Fig.1. Dual display LCD.

```
No. 2
   Pressure    0000.0 Pa
   Temp. 00.0 °C
```

CHANNEL   2

If no further operation, it will stay showing the above information, **date and time** will display alternately.

Attention!!

1) "Press" means Key pad works for current channel and LCD display, If "Press" shows on the No.1, you can operate on the channel 1 by Key pad. Following is detailes for instruction. Under system standby state, Press any key to enter the main menu (see Fig.3).

2))we only take channel 1 as an example to illustrate for the setting procedure is the same for channel 2.

3. Operation Instruction:
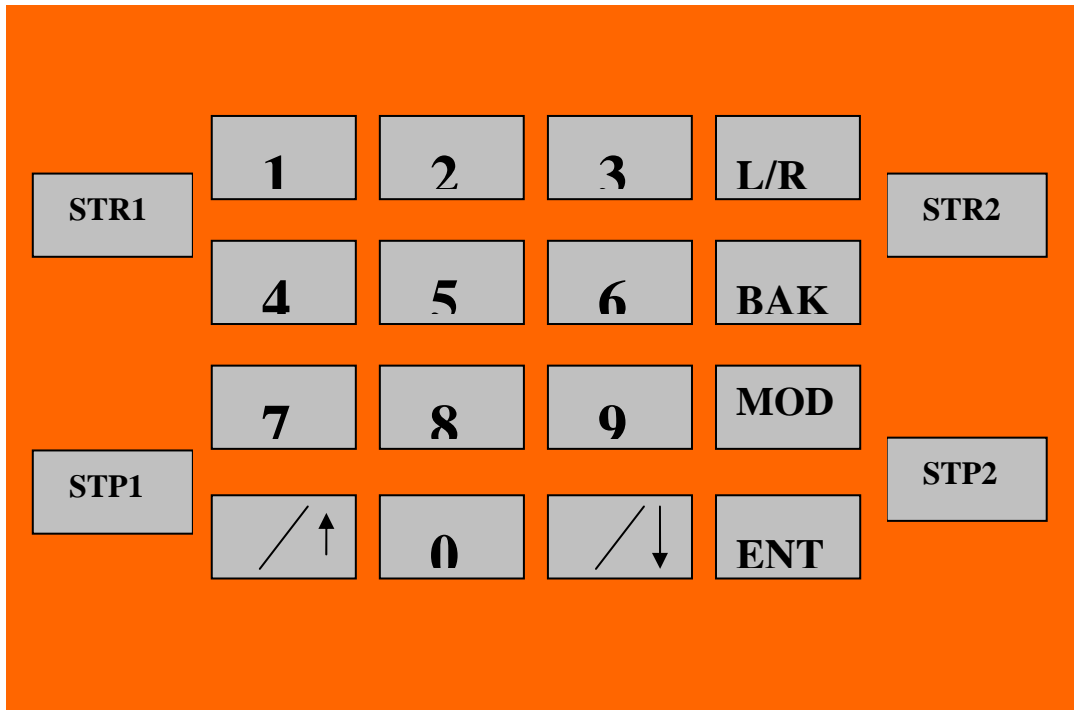
The operation keyboard is shown in Fig.2:

Fig.2

Key Functions:

0-9: Number button for number input.

『*/↑』: Up key; decimal point key while input data

『-/↓』: Down key; minus key while input data

『**L/R**』: shift the "Press" between two LCD menu. When "Press" shows in channel 1, the Key pad will work for Channel 1; when "Press" shows in channel 2, the Key Pas will work for Channel 2, you can shift the "Press" between two LCD menu any time

『**BAK**』: back to main menu

『**MOD**』: a) If you press the 『**MOD**』 button when modifying the parameters, you can set the parameters. b) When input mistake occurs and need to input again, press 『**MOD**』, then you could retype.

『**ENT**』: Confirm the operation.

『**STR1**』: Channel 1 Start to dispense, press again, the dispensing would be suspended.

『STP1』: Channel 1 Stop to dispense,(stop the dispensing immediately).

『**STR2**』: Channel 2 Start to dispense, press again, the dispensing would be suspended.

『STP2』: Channel 2 Stop to dispense,(stop the dispensing immediately).

we take Channel 1 menu as an example!!

When pressing any button in the standby state, it goes to the main menu as follows (Fig.3):

```
No.1                                    Press
1. Manual Dispensing 3. Bill Dispensing
2. IC Card Dispensing 4.Other Settings
```

CHANNEL   1

Fig.3

Press 【1~4】 buttons to enter its corresponding menu.

1. Manual Dispensing

Press 『1』enter the interface as Fig.4.

```
No.1                          Press
     PLS Enter Operator No.

                ___
```

Fig.4

Each device owns four Operator Numbers corresponding to 1, 2, 3 and 4. If the Operator No. is correct, then display the information as Fig.5.
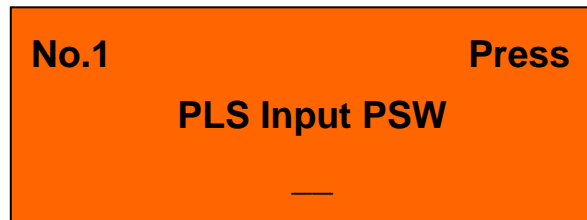
```
No.1                          Press
            PLS Input PSW

                  __
```

Fig.5

Input the correct password, and next interface (Fig.6) shows.

```
No.1                          Press
PLS Input Required Amount

            2 0 0 0. 0 0
```

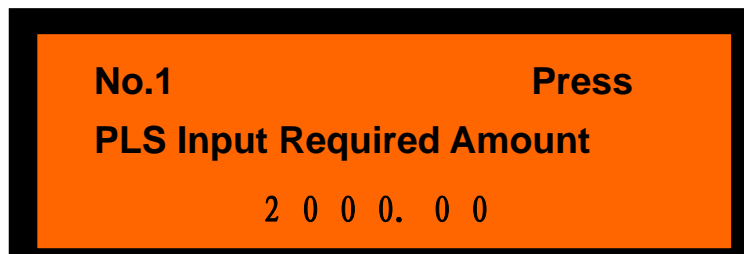**Fig.6**

If modification is needed, press 『MOD』, input the required amount, then pressent to switch to the dispensing process screen(Fig.7).

```
No.1                          Press
Dispensed Amount   0 0 0 0 5 0 4.0        99.999KPA  ———— Pressure
Required amount: 002000.00 L              51℃        ———— Temperature
Inst. Flow: 01.2000   m3/h                RUN ———— Dispensing State
                                                    Unit
```
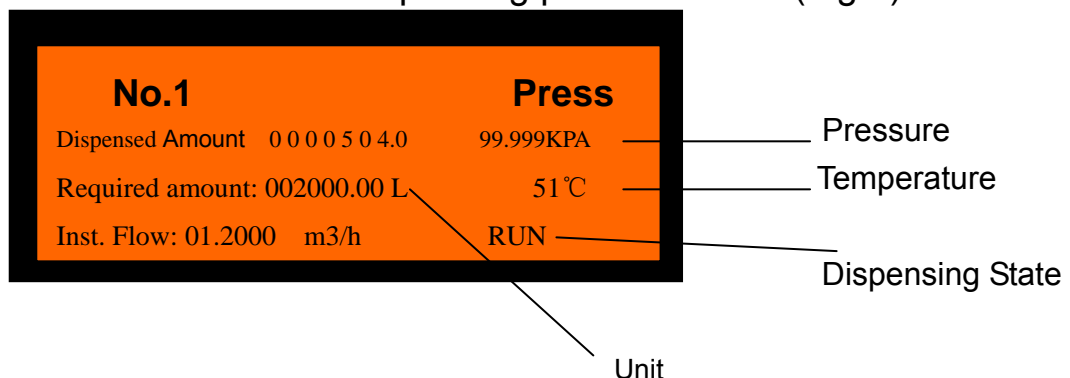
Fig. 7

Note:

1. There are 2 measuring unit: L and Kg which could be chosen through the "Unit Selection" parameter.

2. The dispensing has 3 states: RUN, PAUSE, and STOP.
   When it is dispensing, the dispensing state shows RUN. You can press the "『STR1』" button to pause the dispensing, and the dispensing state change to PAUSE. If you press " 『STR1』 " button again, the dispensing will be

continued and the dispensing state would be displayed as RUN. If STP1 is pressed, it ends the dispensing and shows the dispensing state as STOP.

The C2001 could accept electrostatic clamp, overflow clamp signal, if the electrostatic clip is not grounded in the process of dispensing, it will display electrostatic alarm screen as Fig.8.

```
No.1                    Press
      Electrostatic Alarm
```

Fig. 8

If it reaches overflow alarm position, Overflow Alarm would be shown in the display (Fig. 9).

```
No.1                    Press
         Overflow Alarm
```

Fig. 9

If electrostatic alarm occurs, then pause the dispensing and ensure the electrostatic clamp is well connected; if overflow alarm occurs, pause the dispensing, take the overflow clamp away, then it will turn back to dispensing menu (Fig.7).

If both the electrostatic clamp and overflow clamp are used, please short-circuit the two signal receiving terminals to the instrument grounding terminal.

2. **IC card dispending (For special model only)**

3. **Bill Dispensing**

Press number key 『3』 to select "3. Bill Dispensing" in the main menu (Fig.3) to enter "Bill Dispensing" Menu.

The process of long distance dispensing:

Upper computer (PC computer) randomly generates a B/L No., and relates the required dispensing parameter value with this B/L No.. The dispensing operator

input the B/L No. into the lower computer. If the B/L No. is confirmed from the upper computer, the upper computer will send the dispensing parameter value to the lower computer. And the upper computer can also send Start/Stop command to the lower computer to implement the control.

4. **Other Settings**

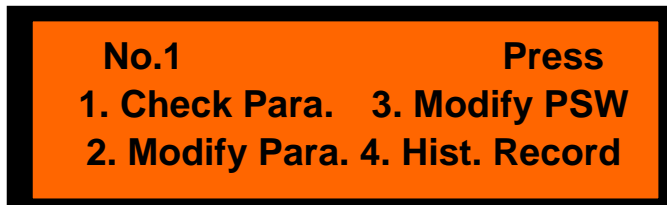   Select 〖4〗 in the main menu (Fig.3) to enter the following menu(Fig 10).

<div align="center">

```
No.1                      Press
1. Check Para.   3. Modify PSW
2. Modify Para. 4. Hist. Record
```

Fig. 10

</div>

① Check parameters

   Press number key 〖1〗 to enter "Check Para." Menu (Fig. 11),

<div align="center">

```
No.1                      Press
     Dispensed Amount
            0. 0000
```
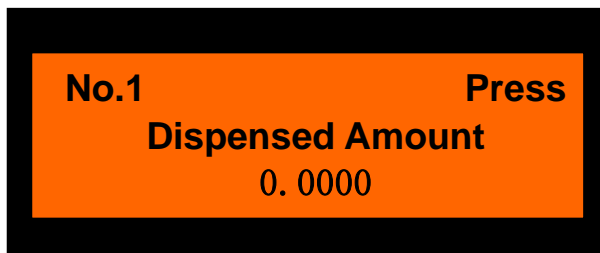
Fig.11

</div>

Fig.11 show the parameters of the dispensed amount.

This menu contains 22 parameters, press 〖↑〗, 〖↓〗 button to display them cyclically. The parameter display order shows in **Fig. 12:**

Required Amount →Ahead Amount →Overshoot Correction →Meter Para. →Material Dens. →Temp. Para. →Upper Temp. Limit →Lower Temp. Limit→ Pressure Para. →Std. Pressure → Upper Pressure Limit→ Lower Pressure Limit→ Location Set→ Commu. Addr.→Valve Control Time →Valve Control Lower Limit →Valve Control Upper Limit →Valve Option →Meter Unit Option →Clear Total Flow→ Time set →Date set→ Required Amount

---

<div align="center">

Fig. 12

</div>

For example：If you want to check parameter in "Meter Para.", press 〖↑〗, or 〖↓〗 button to show the picture as **Fig.13**

```
No.1                    Press
        Meter Para.
          0.0001
```

Fig.13

If you want to return to the main menu from the parameters interface, press 『BAK』 button.

If you want to check the other parameters, perform the same operation.

② Modify parameters

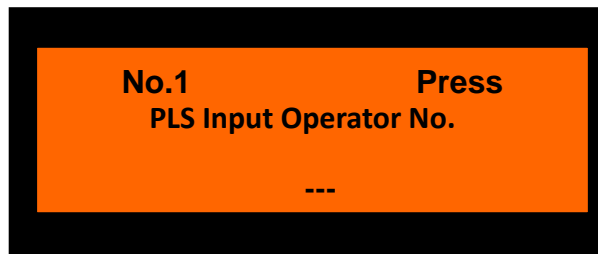Press button 『2』 to enter "Modify Para." Menu shown in **Fig.14.**

```
No.1                    Press
      PLS Input Operator No.

              ---
```

Fig.14

After the operator No. is correctly input, we could enter next menu (Fig.15) to do the parameter modification,

```
No.1                    Press
        Required Amount
          1000.0000
```
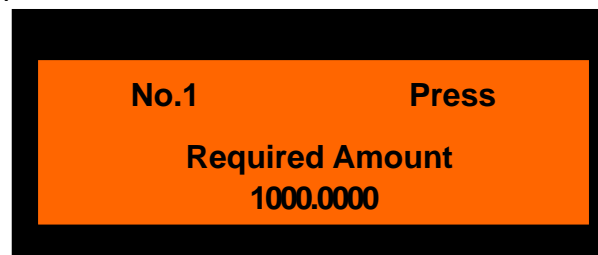
Fig.15

Press 『↑』or『↓』 button to switch the menu from one to another. The cyclical order of parameter menus is show in Fig.16.

Required Amount →Ahead Amount →Overshoot Correction →Meter Para. →Material Dens. →Temp. Para. →Upper Temp. Limit →Lower Temp. Limit→ Pressure Para. →Std. Pressure → Upper Pressure Limit→ Lower Pressure Limit→ Location Set→ Commu. Addr.→Valve control time →Valve Control Lower Limit →Valve Control Upper Limit →Valve Option →Meter Unit Option →Clear Total

Flow→ Time set →Date set→ Required Amount

Fig.16

Parameter Instruction and Settings

● **Required Amount**

Set the required dispensing amount.

If the dispensed amount reaches this set amount, the batch controller will automatically output signals stop the pump and close the valve.

Required Amount Setting Procedure is as follows:

If there is no need to change the amount, then press「**BAK**」 to return. If the modification is needed, first press 「**MOD**」, then input required amount, press 「**ENT**」 to save the value.

This Setting Procedure is the same for other parameters.

Initial value: 1000

● **Ahead amount** :

The parameter is to balance the inertia of the pump and valve when dispensing.

For example: Ahead amount is 200, required amount is 1000, when the dispensed amount reach 1000-200=800, the dispensing flowrate is reduced. The reduced flowrate value depends on the setting of the menu "Valve Control Lower Limit".

Initial value: 200

● **Overshoot Correction:**

The parameter is to balance overshoot, it equal to the overshoot value of last time.

Initial value: 20

● **Meter Para.**

Here "Meter Para." is to set Pulse Equivalent. It should be set the same as the pulse equivalent of the flowmeter.

Initial value: 01

● **Material Dens.**

When dispensing in mass quantities, It is set as the material density under the standard condition(20℃).

When dispensing in volume quantities, then this value is not used while calculating the flowrate.

Initial value: 1

● **Temp. Para.**

This value is not used while dispensing in volume.

When dispensing in mass, its value equals to the material density changing value when the temperature changes $1℃$.

Initial value: 0

- **Upper Temp. Limit**

  The highest temperature which the batch controller could measure should be the same as the upper temperature limit of the temperature sensor.

Initial value: 80

- **Lower Temp. Limit**

  The lowest temperature which the batch controller could measure should be the same as the lower temperature limit of the temperature sensor.

  Initial value: -20

- **Pressure Para.**

  Not used in this device.

- **Std. Pressure**

  If the pressure sensor measures the absolute pressure, then it is set to zero.

  If the pressure sensor measures the gauge pressure, then it is set to the local atmospheric pressure.

Initial value: 0

- **Upper Pressure Limit**

  The highest pressure which the batch controller could measure should be the same as the upper pressure limit of the pressure sensor.

Initial value: 2500

- **Upper Pressure Limit**

  The lowest pressure which the batch controller could measure should be the same as the lower pressure limit of the pressure sensor.

Initial value: 0

- **Location Set**

  This is to set the material type dispensed from the device. (Different』 storage tank at different location may load different material for dispensing.) Setting SN Range: 0~99. This is used with upper computer and IC card. Only when the No. in the card is the same as the material SN in the batch controller can the device dispense material correctly.

Initial value: 0

- **Commu. Addr.**

  This address is used to communicate with other devices. The address ranges from 0 to 100.

Initial value: 1

- **Valve Control Time**

  This is to set the time of closing valve when it is about to end the dispensing. 10ms is used as basic unit. If it is set as 50, that means the valve closing cycle is 500ms. Hence, changing this parameter value could change the speed of valve closing.

  It is invalid for current『 regulating valve.

Initial value: 50

- **Valve Control Lower Limit**

  This parameter is to set the valve opening degree when ahead amount is reached. If it is set as 50, the opening of the valve is 50% (corresponding to current 12mA) when the ahead amount is reached.

  It is invalid for electrohydraulic valve.

Initial value: 20

- **Valve Control Upper Limit**

  The parameters setting should match with the maximum flow rate of on-site pipeline. For example, the maximum flow when the on-site valves are fully open is 100t/h or 100m3/h, the parameters should be set from 90 to 100.

  It is invalid for current regulating Valve.

Initial value: 80

- **Valve Option**

  Control valve options:

  1. Electrohydraulic Valve   2. Regulating Valve   3. Two-stage Valve

Initial value: 1

- **Unit option**

  If the number is 0, it counts as volume. If the number is 1, counts as mass. It has temperature compensation when measuring in mass.

  Initial value: 0

- **Clear Total Flow**

  The cumulative dispensed amount can only be cleared through administrator password.

  Initial value: 0

- **Time Set**

  This is for setting actual time. Take 12:12':12'' as an example, you can input 12.1212, and the system can recognize this time.

  Initial value: actual date

- **Date Set**

  This is for setting actual date. Take Jan 1st, 2007 as an example, you can input

07.0101 and the system can recognize this date.
● **Modify Password**
Press button『3』, enter "Modify Password" menu, as Fig.17. As per the cursor, inputs the operator No.. It has 4 Operator No. to choose from: 【1】, 【2】, 【3】, 【4】

```
No.1                 Press
  PLS Operator No.


```

Fig.17

After input the Operator No., press 『ENT』, go to the password modification menu as shown in Fig.18.
If any input mistake, press 『MOD』button, clears the input number, re-enter and press 『ENT』to go to next menu,

```
No.1                 Press


  PLS  Input  PSW

```

Fig.18

Each operator No. has its initial password:
【1】: 1 1 1 1 1 1;   【2】: 2 2 2 2 2 2;
【3】 3 3 3 3 3 3;   【4】: 4 4 4 4 4 4;
Input the correct code, press 『ENT』, show the interface below (Fig.19):

```
No.1                 Press
  PLS  Input  New  PSW

        _
```

Fig.19

After inputting the new password, press 『 **ENT** 』 to show the menu as Fig.20,

```
No.1                    Press
PLS Reinput New PSW

                         _
```
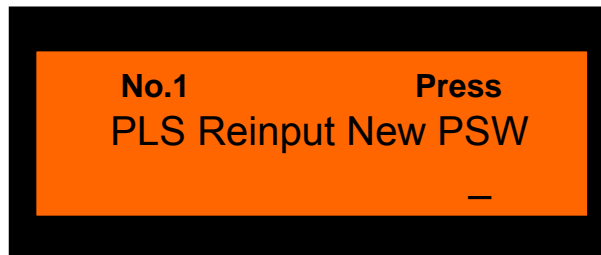
Fig.20

Input the new password again, and press 『**ENT**』. If the twice password inputs are the same, then the information in Fig.21 will show.
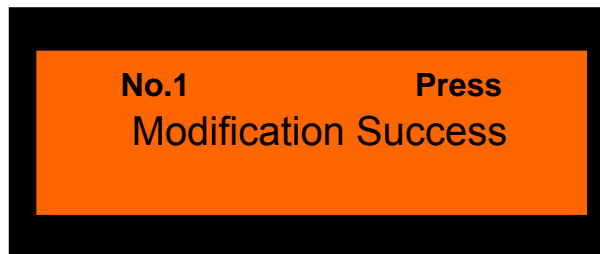
```
No.1                    Press
    Modification Success
```

Fig.21

Press 『**ENT**』 to return to the main menu.

If the twice password inputs are different, then the information in Fig.22 will show.

```
No.1                    Press
Passwords do not match
```
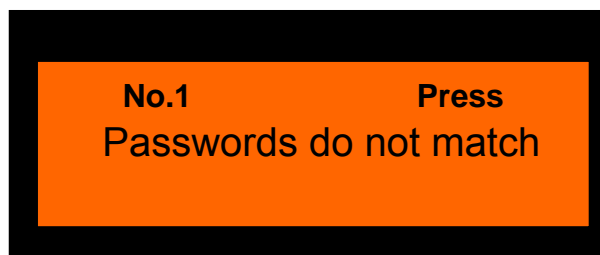
Fig.22

Press 『 **BAK** 』 button to go back to the menu shown in Fig.10, then you modify the password again.

③ **History record**

Press button 『4』 to enter "Hist. Record" menu(Fig.23).

```
No.1           Record 00      Press
Dispensed Amount: 002500.23
Time: 051105123523
Operator No.: 01
```
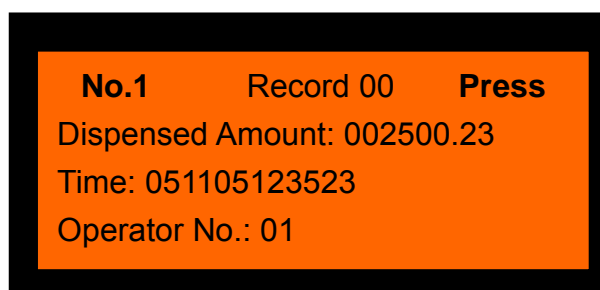
Fig.23

Record 01 is the previous dispensing record.

Record 99 is the 99th record counted backwards from last record.

Dispensed amount is actual amount of the N_{th} time dispensing.

Time is the finish time of the Nth time dispensing. The format is year, month, day, hour, minute, second.

According this format, the time Fig.23 shows is 12:35'23'' NOV 5th, 2005.

Operator No.: This shows the operator No. of the dispensing of this batch.

Manual Dispensing Process

Manual Dispensing Process is shown in **Fig. 24.**

> **Power on→Input Operator PSW→Input Required Amount**
>
> **→Check electrostatic overflow clamp→Dispense oil**

Fig. 24

◆ Attention:

1) Under manual dispensing mode, the operator can dispense unlimitedly. So the operator must keep their own operator password.

After the dispensing is over, press 「BAK」 to go back to the main menu.

2) The Setting Procedure is the same for channel 2

Troubleshooting

1. The control valve can't be opened.
    1) Check if the wire is well connected, if not, please reconnect it carefully again.
    2) Use the multimeter to test if the valve control terminal has the voltage (Current) output; if not, please contact the manufacturer.
    3) Check the electrohydraulic valve, if broken, contact the manufacturer.
2. No current signal
    1) Check if the wire for flow signal is well connected, if not, please reconnect it carefully again.
    2) Use the oscilloscope (OSC) to observe if there is any pulse signal on the signal input terminal, if not, please use the multimeter to test if the signal source power exists. If so, contact manufacturer to fix the signal sender. If not,

contact manufacturer to repair the batch controller.

3. Wrong temperature display

   1) Check if the wire for temperature signal is well connected, if not, please reconnect it carefully again.

   2) Check if the upper temperature limit and lower temperature limit set in the batch controller are the same as the value in the temperature sensor. If not, please change the values to make them the same on both.

   3) Check if the power of temperature sensor exists. If not, contact manufacturer to repair the batch controller.

   4) Check if temperature transmitter can send back the current signal, if not, contact manufacturer to repair the temperature sensor.

4. Wrong pressure display

   1) Check if the pressure signal wire is well contacted, if not, please reconnect it carefully again.

   2) Check if the upper pressure limit and lower pressure limit set in the device are the same as the value in the pressure sensor. If not, please change the values to make them the same on both.

   3) Check if the power of pressure sensor exists. If not, contact manufacturer to repair the batch controller.

   4) Check if pressure transmitter can send back the current signal, if not, contact manufacturer to repair the pressure sensor.

5. Error Measurement, error control, etc.

   Please first read the user manual carefully and check each parameter to ensure all the parameters are set correctly. If the batch controller can't be used normally for the first time, mostly the problem lies in the error of the parameter setting. You can also contact us for the problem and we'll provide the solution.

Use and Maintenance

1. After opening the package of the batch controller, you should check if all the accessories are in the package, and if all the socket connectors and wires are well connected. Please ensure the result of all the above checks are OK before using. Instrument must be well grounded.

2. Please keep the batch controller clean when it is working. It must be checked every six months. If there is something abnormal happening while working, the immediate maintenance should be done.

Unpacking and Storage

1. Don't contact the instrument with large force. Prevent hard metal stuff from contacting the device during the process of unpacking.
2. If the unpacking needs to be done in intense heat or cold conditions, then the batch controller must first be placed in air for at least 4 hours before unpacking.
3. Check the instrument and accessories according to the packing list after unpacking. There should be one user manual and one certification inside the package box.
4. The instrument should be stored under the temperature of -30~+60℃ and the relative humidity of 85%, without any corrosive gas in the air.

Ordering Instruction

1. Please detail the instrument type, name, power supply, and the supporting flowmeter type, signal output type while ordering.
2. After the delivery of the instrument, our company would provide twelve-month quality warranty time from the delivery date. The quality warranty does not cover the damage caused by transportation, improper storage etc. human factor.
3. Our company could do the installation and maintenance and supply instrument accessories. If the user requests the above, then they must noted this requirement while placing the order.

Statement: Our Company reserves the right of further changes to this manual.
GPE Inc.
Website: www.gpeus.com