

# LB01 User Manual









## LB01 User Manual

LB01 multifunction process calibrator is the updated version of Z001,function added,covers the PLC, DCS, ESD, field instrumentation, valves and other maintenance required functions, performance greatly improved.Security fully in place and clear display with backlight and shell with a new ABS material, copper connector contact resistance is minimal. Compact and portable, Panel layout, simple operation.Compact and portable, Panel layout, simple operation.






### Instructions:





 : 测量标识 measure symbol     : 输出标识 output symbol

、、、 those 4 buttons have the measure and output function, On the premise of no range change







(for example, switch from  to ) ,press any one of those 4 buttons for once, will switch between the measure and output of each gear. Note: when switch from one gear to another gear,Will back to the state that this gear left (state keep) .

#### 一、measure function instruction:







**1、voltage measure:** start default state is voltage measure,Top right of the screen will display ,bottom will display “ V ” symbol. The method of switch from other gear to voltage measure state: whichever gear you at,press ; if Top right of the screen display ,press again ,wait Top right of the screen display ,bottom display “ V ” symbol,then can enter voltage measure.

**2、 Current measure:** whichever gear you at,press ,if Top right of the screen display ,press again ,wait Top right of the screen display ,bottom display “ mA ” symbol,then can enter current measure.


### **3、 mV measure and Thermocouple temperature measure:**



**3.1、 mV measure:** whichever gear you at,press ,if Top right of the screen display ,press again ,wait Top right of the screen display ,bottom display “ mV 、 E、 K、 B、 S、 R、 J、 T、 n ” any one of the symbol,under this state,if don't display the “mV ” symbol,press  or  to up/down page,wait bottom display “ mV “symbol,then can enter mV measure.


#### **3.2、 E type Thermocouple temperature measure:**

whichever gear you at,press ,if Top right of the screen display ,press again ,wait Top right of the screen display ,bottom display “ mV 、 E、 K、 B、 S、 R、 J、 T、 n ” any one of the symbol,under this state,if don't display the “ E ” symbol,press  or  to up/down page,wait bottom display “ E “symbol,then can enter E type Thermocouple temperature measure.

At this moment, display the temperature value that Thermocouple temperature measuring. Note: Thermocouple temperature measure involves cold end compensation issue, So, when do the Thermocouple temperature measure, Lower left of the screen will display the Cold end temperature indication, how many number shows, cold degree compensation will be the numbers. When doing the Thermocouple temperature measure, make sure set the correct Cold end temperature value. If wrong set, will lead to big error. The method of setting Cold end temperature: press

, will see There's one number at both right and left

side, left side number indicate it's the manually input Cold end temperature value, when the number flashing, press   to







increase/reduce; right side number is the measured value by the inner temperature measurement element of meter, cannot change, cycle press , will change the flash turn of these 2 numbers, whichever those number flash, indicate which comes into effect.





### 3.3、 other types Thermocouple temperature measure:





This meter designed for 8 kinds of regular Thermocouple temperature measure function (E、 K、 B、 S、 R、 J、 T、 N ), the detail use instruction is the same as E type Thermocouple temperature measure.

## 4、 resistance measure and Pt100、 Cu50 temperature measure:

### 4.1、 resistance measure:













whichever gear you at, press , if Top right of the screen display , press again , wait Top right of the screen display , bottom display “ Ω、 Pt100、 Cu50” any one of the symbol, under this state, if don't display the “Ω” symbol, press  or  to up/down page, wait bottom display “Ω “ symbol, then can enter resistance measure.

**4.2、 Pt100 temperature measure:** whichever gear you at, press , if Top right of the screen display , press again , wait Top right of the screen display , bottom display “ Ω、 Pt100、 Cu50” any one of the symbol, under this state, if don't





display the “Pt100” symbol,press  or  to up/down page,wait bottom display “Pt100 “ symbol,then can enter Pt100 temperature measure. Because this meter use two-wire system measure method,if Pt100 measure element far from this meter,will bring additional error,in order to compensate this error,there’s compensation option setting. The method as below: first use the resistance measure function, to measure the resistance value sent by three-wire system pt100,choose the min resistance (normally, only few ohm) ,write down. Cycle press “set” button,when the bottom indicate “Ω” symbol,use   **to set the resistance value that measured just now. Then back to** Pt100 temperature measure function,measure those 2 wires that with bigger resistance of three-wire system,so can get the correct temperature value.











**4.3、Cu50 temperature measure method is the same as Pt100 temperature measure.**

## 二、 Output function instruction:

1、 **voltage output:** whichever gear you at,press ,if Top right of the screen display ,press again ,wait Top right of the screen display ,bottom display “ V ” symbol,then can enter voltage output.Output voltage setted by    . These 2 buttons control increase/reduce by little  ,work with “STEP” button,can change step,can increase/reduce 0.1V once or 0.01V, the default step is 0.1V.These 2 buttons control   increase/reduce by big,step is 1V.

## 2、 Current output:

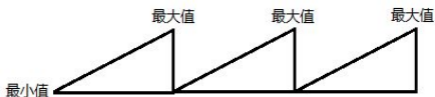
**2.1、 source current output:** whichever gear you at,press ,if Top right of the screen display ,press again ,wait Top right of the screen display ,check whether top of the screen will display “有源 source” symbol,bottom only display “ mA ” symbol,but don’t display “Prog 1” 、 “Prog 2” 、

“Prog 3” . If don't display “有源 source” symbol ,press  or  to up/down page,until display “有源 source” 、 “ mA ” ,then can enter source current output state. Output current setted by     . These 2 buttons   control increase/reduce by little,work with “STEP” button,can change step,can increase/reduce 0.1 mA or 0.01 mA once ,the default step is 0.1 mA.These 2 buttons control   increase/reduce by big,step is 4 mA.

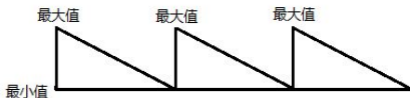
## 2.2、 Source current program output:

最小值--Min 最大值--Max

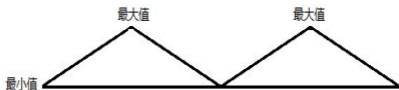
“Prog 1” state: Curve of current change:



“Prog 2” state: Curve of current change:



















“Prog 3” state: Curve of current change:

















There're 3 methods of programming for source current program output,detail output time as above curves. The method as below:

“Prog 1” program output method: whichever gear you

at,press ,if Top right of the screen display ,press again ,wait Top right of the screen display ,check whether top of the screen will display “有源 source” symbol,bottom only display “Prog 1” and “ mA ” symbol. If don't display “有源 source” symbol ,press  or  to up/down the page,until display “有源 source” 、 “Prog 1” 、 “ mA ” ,then can enter source program current output state. Under this state, the current step is 1mA,but the step range and change speed can be setted manually. The method of setting the max and min as below: press “set” ,will display 2 numbers ,left number indicates the min current,right number indicates the max current ,use     those 4 buttons can revise the min, the max. These 2 buttons   can revise the range of the min、 These 2 buttons   can revise the range of the max. Note: the min can't less than 0,the max can't bigger than 24,the min can't bigger than the max . Press again “set” ,enter the speed change setting option,use   these 2 buttons to revise range of speed change,the setting range can be 0.5~5s . “Prog 2” 、 “Prog 3” program output method refer “Prog 1” .















### 2.3、 sink current program output: whichever gear you

at,press ,if Top right of the screen display ,press again ,wait Top right of the screen display ,check whether top of the screen will display “无源 sink” symbol,bottom only display “ mA ” symbol,but don't display “Prog 1” 、 “Prog 2” 、 “Prog 3” ,If don't display “无源 sink” symbol,press  or  to up/down page,until display “无源 sink” 、 “ mA ” ,then can enter sink current output state. The output current setted by those 4 buttons     . These 2 buttons   control increase/reduce by little,work with “STEP” ,can change step,increase/reduce 0.1 mA or 0.01 mA once ,the default step is 0.1 mA. These 2 buttons control   ,increase/reduce by big,step is 4 mA.

















Note: Under All current output state, if the test pen **如果表笔开路**.The setting number on the screen will flash.





### 3、 mV output and Thermocouple temperature output:

**3.1、 mV output:** whichever gear you at,press ,if Top right of the screen display ,press again ,wait Top right of the screen display ,bottom will display “ mV 、 E、 K、 B、 S、 R、 J、 T、 n” any one of the symbol,under this state,if don't display “mV ” symbol,press  or  to up/down page,wait bottom of the screen display “ mV “symbol,then can enter mV output. The output setting by these 4 buttons . These 2 buttons ,control increase/reduce by little,work with “STEP” ,can change step,increase/reduce 1 mV or 0.1 mV once, the default step is 1 mV.These 2 buttons control increase/reduce by big,step is 10 mV.

### 3.2、 E type Thermocouple temperature output:

whichever gear you at,press ,if Top right of the screen display ,press again ,wait Top right of the screen display ,bottom will display “ mV 、 E、 K、 B、 S、 R、 J、 T、 n” any one of the symbol,under this state,if don't display “ E ” symbol,press  or  to up/down page,wait bottom of the screen display “ E “symbol,then can enter E type Thermocouple temperature output. At this moment, will show the value of Thermocouple temperature output. The output set by these 4 buttons . These 2 buttons control increase/reduce by little,work with “STEP” ,can change step,increase/reduce 10 °C or 1 °C once, the default step is 10 °C . These 2 buttons control increase/reduce by big,step is 10 0 °C . Note: Thermocouple temperature output comes to cold end temperature compensation issues. when Thermocouple temperature output, there's cold end temperature indication at the Lower left of

the screen, How much it displays, then how much cold end temperature compensates . when Thermocouple temperature output, make sure set the correct cold end temperature value, If set wrong, then will bring big error. The setting method of cold end

temperature: press , will see there's 1 number at left side and right side, the left number is cold end temperature value that input by manually, When the number flashing, can use these 2 buttons   to increase or reduce; The right number is the value that measured by Internal temperature element Of the meter , the number can't be changed, Cycle press , will change the Flashing sequence of the left and right number. Which of these 2 number flashing, which comes to be effective.

### **3.3、 Other types of Thermocouple temperature output**

This meter designed for 8 kinds of commonly used Thermocouple















(E、K、B、S、R、J、T、N) temperature output function, the use















method is the same as E type Thermocouple temperature output. To

set a value that lower than cold end temperature output is nonsense.

### **4、 Resistance output and Pt100、 Cu50 temperature**


**output:**

**4.1、 Resistance output :** whichever gear you at, press , if Top right of the screen display , press again , wait Top right of the screen display , bottom will display “ Ω、 Pt100、 Cu50” any one of the symbol, under this state, if don't display “ Ω ” symbol, press  or  to up/down page, wait bottom of the screen display “ Ω ” symbol, then can enter Resistance output. The output set by these 4 buttons    . These 2 buttons   control increase/reduce by little, work with “STEP”, can change step, increase/reduce 10Ω or 1Ω once. the default step is 10 Ω. These 2 buttons control   increase/reduce by big, step is 100Ω.

**4.2、 Pt100 temperature output:** whichever gear you at, press , if Top right of the screen display , press again , wait Top right of the screen display , bottom will display “ Ω、 Pt100、 Cu50” any one of the symbol, under this state, if don't display “Pt100” symbol, press  or  to up/down page, wait bottom of the screen display “Pt100” symbol, then can enter Pt100 temperature output. The output set by these 4 buttons    . These 2 buttons   control increase/reduce by little, work with “STEP”, can change step, increase/reduce 10 °C or 1 °C ONCE, the default step is 10 °C. These 2 buttons control   increase/reduce by big, step is 100°C. The setting method of Cu50 temperature output is the same as Pt100 temperature output.

Note: Resistance output starts from 50 Ω ; Pt100、 Cu50 temperature output starts from 0 °C. When external exciting current doesn't

exist or connect is reversed, the setting value will flash.

**5. 24V output with current measurement:** whichever gear you at, press , enter 24V output with current measurement state.

This state indicates the external equipment provide the **24V power supply, output current can't less than 24mA** (this is

**determined by equivalent internal resistance of the external equipment)**

**When output 24V voltage, meanwhile measure the current that flows through the 24V power supply, the current will display on the screen.**

### **三、 Other functions introduction:**

#### **1. automatic shutdown:**

By pressing the switch, if long time no use the meter( around 30 minutes), it will automatic shutdown. Instead of toggle switch

**2. Can charging, meantime, working**

**3. Charging status indicator**

#### **四、 Note of use**

1、 whichever gear of this meter, can't connect the voltage that bigger than DC30V or AC20V. If don't obey the note, then will cause personal injury, meter damage.

2、 when the meter is working, the Interior will produce some heat, the heat will affect Internal temperature element measurement accuracy at a certain extent .The size of this error has relationship with the High and low of the environment temperature , with the Current Size of source current output, with the size of load resistance, with the hand" s temperature of the operator. This error is common in all Internal temperature measurements. If you want overcome this error,

use external Pt100 Temperature probe is recommended.

3、 When resistance output, the Resistance output accuracy has relationship with the current size of external source. If current too small, will cause resistance output error. So, Use ordinary multimeter to detect the Resistance output accuracy can't to be a Reference.

This meter is Calibrated in exciting current 1 mA, very near the exciting current of temperature measure parts of PLC、 DCS. So, measure on these equipment, can has accurate output.