LB02A   LB06   User Manual

LB06 process calibrator

Source ⬆️

12.000 mA

1 ↗	2 ↘	3 ⌐	⌐⌐
V (4)	mA (5)	24V (6)	Hz · Del
← (7)	mV/TC (8)	Ω/RTD (9)	→ · Enter
⏻	Hart	Mod bus	F-Fn

Cautions :

1. This instrument uses multiple internal self-recovery fuse and a quick one-time fuse blows, but no protective measures can not guarantee 100% complete and reliable instrument and just do our best to protect the safety of users possible . Any position of the instrument, can withstand 30V DC or AC voltage is below 20V 5 seconds when an error operation. Any stalls can not access to 220V mains. If the violation of security requirements above may result in personal injury, damage to the instrument

2. When the meter is working, internally generated some heat, which to some extent affect the measurement accuracy of the temperature measurement devices inside. The size of this error and the level of ambient temperature, The current size of the active output, the size of the load resistance, temperature of the operator's hand have a relationship . Any internal integrated temperature measurement instruments can not avoid such errors . To overcome this error, we recommend using an external Pt100 temperature moudle.

3. Resistance output, which has a certain relationship with the external resistor output excitation source, if the current is too small, the output resistance will have a certain degree of error, therefore, ordinary

multimeter to check the output resistance may be a little error.

Features:

LB01A、LB02A、LB06 multifunction process calibrator covers the PLC, DCS, ESD, field instrumentation , valves and other maintenance required functions, performance greatly improved. Security fully in place and shell with a new ABS material, copper connector contact resistance is minimal. Compact and portable, Panel layout , simple operation. V, mV, mA, resistance、Hz signal input and output has a corresponding button directly transferred out, the operation is extremely simple. LB06 have modbus master、slave mode and Hart function.

Operation Instruction:

⬅: Measure mode   ➡: Output mode

When at a certain function, press function key of the corresponding function repeatedly to alternate between the measure mode and output mode (for example, press key 🔽 , and the corresponding function is voltage input, press key 🔽 again, and it will alternate into voltage output) (under the condition both of input and output).

The basic function means voltage、current、millivolt、resistance、frequency and the other basic electrical units, subfunction means use these basic electrical

units as engineering signals of measure or output. For
instance: various types of thermoelement (TC) is the
subfunction of mV. Various types of thermal resistance
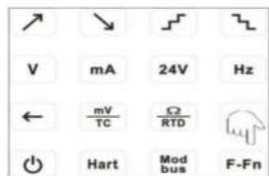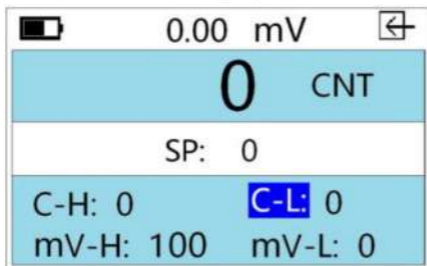(RTD) is the subfunction of resistance.
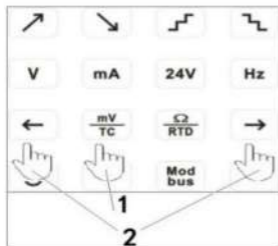
mV measurement figure :
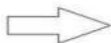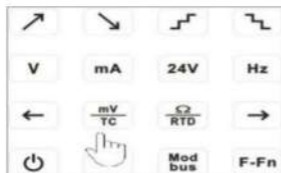
Conventional mode display :

mV Method of measure full-function mode:

Full-function mode display:

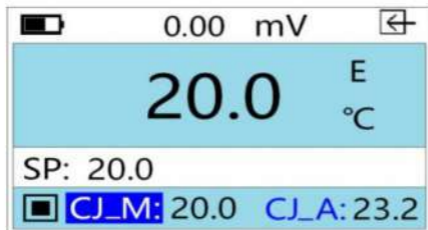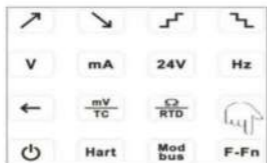| ▭	0.00 mV	⏎
	0	CNT
	SP: 0	
C-H: 0	C-L: 0	
mV-H: 100	mV-L: 0	

mV Subfunction measurement:

Conventional mode display:

▭		⏎
	0.0	E °C

Method of starting full-function mode of E type TC :

■	0.00 mV	↵

20.0 E °C

SP: 20.0

■ CJ_M: 20.0 CJ_A:23.2
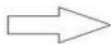
Operation of all the other functions is similar to it,
and no more details.

Meanings on various of subfunction shorthand characters
in full-function mode:

SP: set value.

Sqrt: whether the signal is Square root or not, on is
Square root, off is not Square root.

CNT: short for Count, can be interpreted as the counting
unit of range conversion.

C-H: short for Count-H, upper limit of range conversion.

C-L: short for Count-L, lower limit of range
conversion.

V-H: voltage to upper limit of range conversion.

V-L: voltage to lower limit of range conversion.

mA-H: current to upper limit of range conversion.

mA-L: current to lower limit of range conversion.

C-T: time of a complete cycle when current program output.

W-T: waiting time of up to upper limit and lower limit when current program output.

mV-H: mV value to upper limit of range conversion.

mV-L: mV value to lower limit of range conversion.

CJ_M: manual set value to cold junction temperature when Thermocouple measure or output

CJ_A: automatic set value to cold junction temperature when Thermocouple measure or output.

R-H: resistance value to upper limit of range conversion

R-L: resistance value to lower limit of range conversion

WR-M: manual set value to wire resistance when thermal resistance measure.

WR-A: automatic set value to wire resistance when thermal resistance measure .

Hz-H: frequency value to upper limit of range conversion

Hz-L: frequency value to lower limit of range conversion

Hz-V: threshold value when frequency measure or output, for input state， it will not start counting until the signal of input greater than the set value. For

output state, the frequency is the peak of output waveform.

Hz-DC: PWM Duty cycle set when frequency output

Range conversion, take current for an example, formula of the other signal types is the same.

$$CNT= \frac{mA\_in * (C\_H - C\_L)}{mA\_H - mA\_L}$$

Instruction of compensation for wire resistance when thermal resistance measure:

When WR-M is selected , it's available to execute manual set of wire resistance compensation, range of compensation is 0~50Ω. When WR-A is selected, it's available to execute automatic set of wire resistance compensation, and the process : it will not set the value as wire resistance compensation automatically until the resistance measure value is 0~10Ω, and no needs to set manually.

Regardless of whatever function it is, once the full-function mode stimulated, some parts of the screen will be light teal background.

Conventional mode: the range of add-subtract key is fixed and stable, and it will be effective at once when pressing the key to output, no needs to confirm, and it's good to Convenient setting output value. If it's

necessary to adjust range of output in accuracy, start full-function mode and use digital keyboard to input.

↗ ↘ : small range of add-subtract key

ᒻ ᒻ : big range of add-subtract key

When full-function mode , digital keyboard and special function keyboard simulated, no details of digital keyboard instruction of special function keyboard as follows:

ᒻ : Chosen parameter key, press the key and it will cycle in chosen parameters.

Hz : Digital delete key, press the key and it will delete the digits from back to front one by one.

→ : Confirm key, press the key and it will confirm to the parameters input.

F-Fn : Full-function enter、exit key.

Modbus mode :

LB06 support Modbus master、slave function.

Master	Slave
SlaveAdd: 1	BaudRate:9600
DataBit:8	StopBits:1
Parity:0	0:NO; 1:Even;2:Odd
ReadCoil	ReadInput
ReadHoldReg	ReadInputReg
WriteCoil	WriteHoldReg

Note: When the select box is in the white background area , it's available to alternate to other function , such as voltage measure、current output and so on. When the select box is in the light teal background area, it's not available to alternate to other function, it's available to alter、confirm or alternate to other selects.

Master、slave setting

Master Slave

Communication parameter setting, correct setting to guarantee normal communication.

SlaveAdd: 1	BaudRate:9600
DataBit:8	StopBits:1
Parity:0	0:NO; 1:Even;2:Odd

Modbus function select

ReadCoil	ReadInput
ReadHoldReg	ReadInputReg
WriteCoil	WriteHoldReg

according to the function required, press key 🔩 to select. Whatever mode it is, master or slave, the order of the meter will be in accordance with the order of other equipment. For instance, the other is order of read input register, and no needs to alternate to order of write input register for the meter, but still use order of read input register to avoid mistaking when artificial transforming.

Hart mode :

Hart mode supports 3 connecting method:

1、In the conventional mode, Hart is in the high resistance state, can be connected directly to the circuit in parallel without disturbing. But it's not available to execute current calibration.

2、24V mode, in 24V mode, it's available to use the meter to drive two-wire transmitter directly and support all the functions of meter.

3、250Ω mode , the mode is connected in the circuit, and applies to the circuit the resistance of circuit is lower than 250Ω.

The connecting method in detail, refer to the figure in the mode select of meter.

Primary_Variable: master variable measurement value.

Loop_Current: circuit current, the current is the digital signal read by LB06 Hart module from the transmitter, not measured by LB06 Hart module.

Percent_of_Range: percentage of master variable value to range.

top_of_range: upper limit of user range.

bottom_of_range: lower limit of user range.

top_of_sensor: upper limit of sensor range.

bottom_of_sensor:1 ower limit of sensor range.

damping_time: damping time, means filtering time .

External_Current: external current, the current value is the value of driving transmitter by LB06 in the state of 24V basic to Hart hand operator mode, please note the distinction between this and loop_current.

4mA_calibrate:0 point calibration of transmitter, press Start, then LB06 will send calibration order relatively, and the transmitter will output 4 mA compulsorily, then the displayed current value of external current is 4 mA output by transmitter compulsorily. If it's not 4mA, input the value into 4mA_calibrate calibration digit box, press key Enter and wait until External Current equals to or close to 4 mA.

20mA_calibrate: Full calibration of transmitter, press Start, LB06 send order of full calibration, and the transmitter will output 20 mA, the displayed current value of External_Current is 20mA output compulsorily, if it's not 20 mA, input the value into the 20mA calibrate digit box, press key Enter and wait until External_Current equals to or close to 20 mA, the calibration is completed.

Set_to_Pv_L_Range: set the measurement value as lower limit to user range.

Set_to_Pv_H_Range: set the measurement value as upper limit to user range.

Set_to_Pv_Zero: set the measurement value as 0 point of user range, and do not operate during the using process of transmitter, due to once set successfully, it will not recover until cut and remove the transmitter from the device and take the order again. The operation is used after the new transmitter equipped well and before putting in service.

Set_Square_Root: whether the signal is prescribed or not.

Other functions introduction:

1. Cancel toggle switch, through the key switch, do not operate for a long time (about 30 minutes), automatic shutdown. In the state of charge, auto-off function

is disabled. While charging the instrument will not automatically shut down, the production line for continuous use.

2. Charging and status indication. battery can be charged in with calibrator on or off state. the charging process will takes 5-6 hours. This machine uses the lithium polymer battery. Do not try to run out of power. Place a long time needs to be fully charged battery.

3. Replace fuse. This instrument uses 5 * 20mm 500mA (216 series) littelfuse quick fuse, for replacement, try to use the littelfuse brands, it must be replaced as 250V/500mA fuse.

4、function and parameter please refer to Chinese Manual.