ZXTX-2025&ZXTX-1825
Process Calibrator
Users Manual

Wuhan GDZX Power Equipment Co., Ltd.

Contents

1 Basic Introduction

1.1 Function

- A split-screen display. The upper display allows you to measure volts, current (with loop power), resistance and continuity test. The lower display allows you to measure and source volts, current, resistance temperature detectors (RTD), thermocouples (TC), frequency, and ohms.
- Calibrates a transmitter using the split-screen.
- The measure of thermocouple provides automatic reference junction
- Automatic and manual cold end temperature compensation for TC.
- Manual stepping and automatic stepping and ramping.
- Super-strong protection： The waterproof grade is IP67. Automatic protection against the signal terminals connect to the 220V.
- Support for PC communication

1.2 Summary of Source and Measure Functions

Function	Measure	Source
DC V	0～50V (the upper display ± 30V)	0～10V
DC mA	0～24mA (the upper display ± 24mA)	0～24mA
Frequency	1.000Hz ～ 100.00kHz	0.00Hz～20.000kHz
Resistance	0～3200Ω	0～3200Ω
DC mV	0～100mV (the upper display ± 200mV)	0～100mV
RTD	Pt100, Pt1000, Cu50, Cu100	Pt100, Pt1000, Cu50, Cu100
TC	E, J, K, T, B, R, S, N	E, J, K, T, B, R, S, N
Others	Loop supply, Step, Ramp, Dual display	

1.3 Terminal Description

Figure 1.3-1

No.	Name	Description
①	Communication and Charging connector	Connect the power adaptor to charge batteries or connect the calibrator to the computer.
② ③	Measure V, mV, mA, Loop, Ω and continuity test terminals	Input terminals for measuring voltage, current, resistance, and supplying loop power.The two terminals electrical isolate from the other terminals.
④ ⑤	Measure and Source V, mV, Hz, Ω, TC and RTD terminals	Terminals for sourcing or measuring voltage, resistance, frequency, RTD and TC. ⑤ is the common Terminal.
⑤ ⑥	Measure and Source mA , and 3W for Ω terminals	Terminals for sourcing or measuring current ,and the terminal ⑥ is also used for the measure of 3W resistance.
⑥ ⑦	Source mA and Measure 4W Ω terminals	Terminals for sourcing current, or for measuring resistance of 4W.

1.4 Keys description

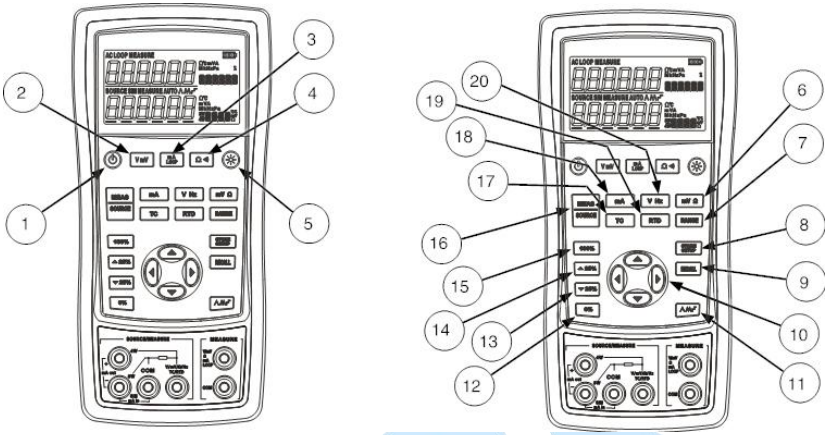

Figure 1-3

No.	Key	Description
1	⏻	Turns the power on or off
2	V mV	Selects DC V or DC mV measurement function in the upper display
3	mA LOOP	Selects DC mA or Loop Power measurement function in the upper display
4	Ω •))	Selects resistance measurement or continuity test function in the upper display
5	☼	Turns backlight on or off. Turns Contrast Adjust mode on when powering up.
6	mV Ω	Selects DC mV or resistance measurement function in the lower display
7	RANGE	Selects the range of source function in the lower display
8	STORE SETUP	Saves the calibrator setup. Saves Contrast Adjust setup
9	RECALL	Retrieves a previous calibrator setup from a memory location
10	▼ ▲ ◀ ▶	Increases or decreases the source level
11	ΛMꟳ	Cycles through: Λ Slow repeating 0 % - 100 % - 0 % ramp M Fast repeating 0 % - 100 % - 0 % ramp ꟳ Repeating 0 % - 100 % - 0 % ramp in 25 % steps

12	0%	Set output by 0% of span. Press and hold to store the source value as the 0 % value.
13	▼ 25%	Decrements output by 25 % of span.
14	▲ 25%	Increments output by 25 % of span.
15	100%	Sets output by 100% of span. Press and hold to store the source value as the 100 % value.
16	MEAS / SOURCE	Cycles the calibrator through MEASURE and SOURCE modes in the lower display.
17	TC	Selects TC (thermocouple) measurement and sourcing function in the lower display. Repeated pushes cycle through the thermocouple types.
18	mA	Selects current or transducer (SIM) function.
19	RTD	Selects RTD (resistance temperature detector) measurement and sourcing function in lower display. Repeated pushes cycle through the RTD types.
20	V Hz	Selects voltage or frequency function

2 Basic Operation

2.1 Measure and Source

This section acquaints you with some basic operations of ZXTX-2025/ ZXTX-1825.

Proceed as follows to perform a voltage-to-voltage test:

1. Connect the calibrator's the voltage output to its voltage input as shown in Figure 2.1-1.

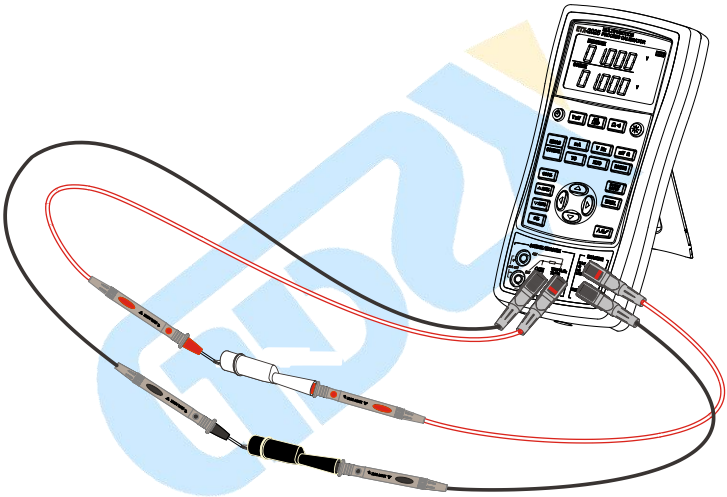

Figure 2.1-1

2. Press ⏻ more than 2 seconds to turn on the calibrator. The screen will display all the contents for 1 second as shown in Figure 2.1-2.

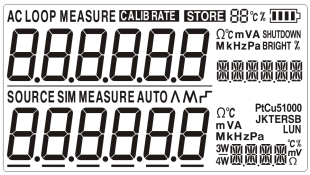

Figure 2.1-2

3. Then the type of product and automatic shutdown time will be displayed for 2 seconds as shown in Figure 2.1-3.

Figure 2.1-3

4. Then the default interface of boot will be displayed as shown in Figure 2.1-4:

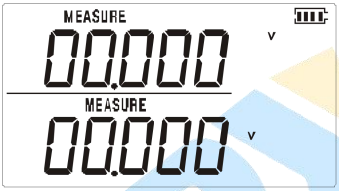

Figure 2.1-4

Attention: The upper and lower default modes are both based on DC voltage during turn on.

5. Press MEAS SOURCE for SOURCE mode (lower screen). The screen will display as shown in Figure 2.1-5.

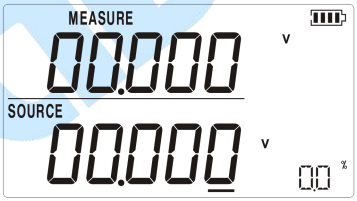

Figure 2.1-5

6. Press ▲ or ▼ to increase or decrease 1 of the number that locates at the line (the number automatic carry but the position of the line have no change). Press ◀ or ▶ to select a digit to change.
7. Press ▲▼◀▶ to select 1 V for the output value, and then press and hold 0% until the buzzer work to enter 1V as the 0% value.
8. Press ▲ to select 5 V for the output value, and then press and hold 100% until the buzzer work to enter 5V as the 100% value.
9. Press ▲25% and ▼25% to step between 0 and 100% in 25% step increments.

The screen will display as shown in Figure 2.1-6

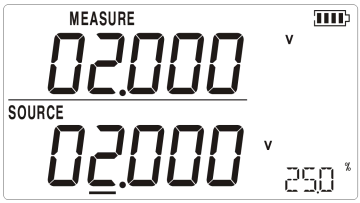

Figure 2.1-6

2.2 Shut Down Mode

The calibrator comes with the Shut Down mode enabled for a time duration set to 30 minutes (displayed for about 2 seconds when the calibrator is initially turned on). When the Shut Down mode is enabled, the calibrator will automatically shut down after the time duration has elapsed from the time the last key was pressed. To disable the Shut Down mode, press ⏻ and ◀ simultaneously. To enable the mode, press ⏻ and ▶ simultaneously. To adjust the time duration, press ⏻ and ▶ simultaneously, the screen will display as shown in Figure 2.2-1,then press ▲ and/or ▼ to adjust the time between 1 and 30 minutes and press STORE SETUP to store the new duration time (Without pressing any key for 5 seconds, the calibrator will exit automatically).

Figure 2.2-1

2.3 Backlight brightness Adjustment

To adjust the brightness of backlight, proceed as follows:

1. Press ⏻ and ☼ simultaneously until “BRIGHT” is displayed as shown in Figure 2.3-1.

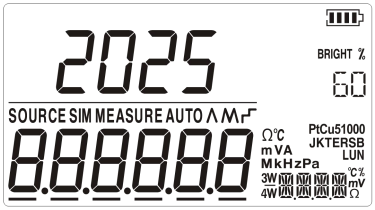

Figure 2.3-1

2. Press ▲ and ▼ to adjust the brightness of backlight.
3. Press STORE SETUP to save brightness level, STORE will appear and then the calibrator will enter into the work mode (Without pressing any key for 5 seconds, the calibrator will exit automatically).

3 Functions of Upper Display

3.1 DC V and DC mV Measurement

The default function of the upper screen is DC V measurement after turn on. Press V mV to select DC V or DC mV and the connection is shown in Figure 3.1-1.

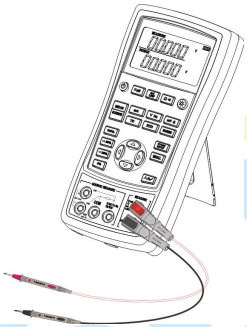

Figure 3.1-1

3.2 DC mA Measurement

Press mA LOOP to select DC mA(unit:m A),the LOOP sign should not be displayed and connection is same to that of DC V measurement.

3.3 Current Measurement with Loop Power

The loop power function activates a 24 V supply in series with the current measuring circuit, allowing you to test a transmitter when it is disconnected from plant wiring. To measure current with loop power, proceed as follows:

1. Connect the calibrator to the transmitter current loop terminals as shown in Figure 3.3-1.
2. Press mA LOOP until LOOP and m A appear simultaneously.

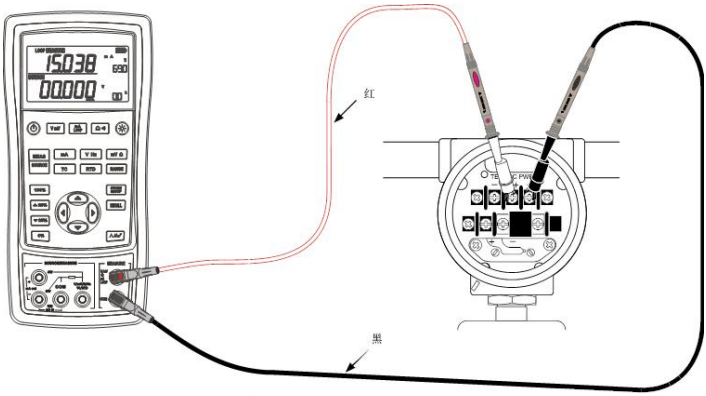

Figure 3.3-1

3.4 Resistance measure and continuity test

Press [Ω •))] to select resistance measurement or continuity test function circularly with the unit of Ω and the connection is the same as DC V measurement. In the continuity test function, the buzzer works when the measured value less than 50Ω.

4 Functions of Lower Display

The state of the upper display remains unchanged during the operation of the lower display.

4.1 Measure and Source of DC V and DC mV

The lower display default function is DC V measurement after trun on. If necessary, press V Hz or mV Ω to select DC V or DC mV function and press MEAS SOURCE to switch measure and source mode. The connection is shown in Figure 4.1-1.

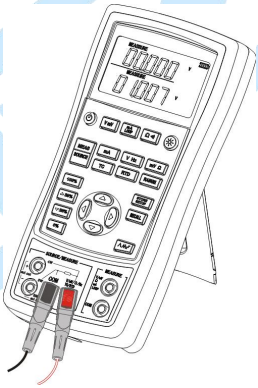

Figure 4.1-1

4. 2 DC mA Measurement

Press MEAS SOURCE to select MEASURE mode, press mA to select DC mA measuring function with the unit of m A. The connection is shown in Figure 4.2-1.

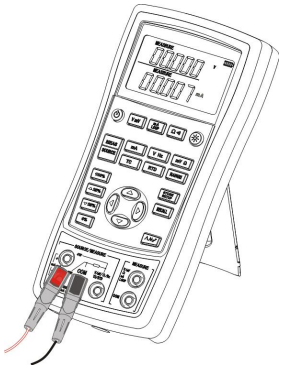

Figure 4.2-1

4.3 DC mA Source（active）

Press MEAS/SOURCE to select SOURCE mode. If necessary, press mA to select DC mA source with the unit of **m A** and then the calibrator can implement current output. The connection is shown in Figure 4.3-1.

Figure 4.3-1

When the output load is too heavy, LOAD sign will appear in the display as shown in Figure 4.3-2. and, at the same time, the main value of lower display will flash, which means that the actual output current cannot reach the set value, so you should

check connection and load accordingly.

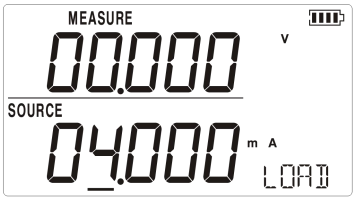

Figure 4.3-2

4.4 Simulating a 4- to 20-mA Transmitter

Simulate is a special mode of operation in which the calibrator is connected into a loop in place of a transmitter and supplies a known, settable test current.

Proceed as follows:

1. Connect the 24 V loop power source as shown in Figure 4.4-1.
2. If necessary, press MEAS SOURCE to select **SOURCE** mode.
3. Press mA until **m A** and **SIM** (simulation) are displayed in the screen.

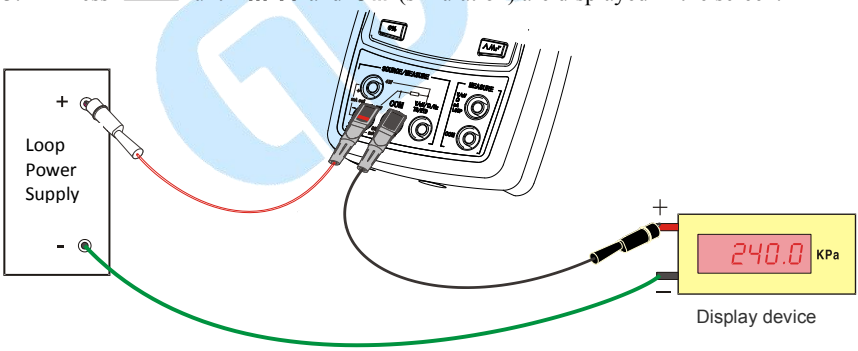

Figure 4.4-1

4.5 Measure and Source of Resistane

Measure

Press MEAS SOURCE to select **MEASURE** mode. If necessary, press mV Ω to select resistance function with the unit of Ω. The interface is shown in Figure 4.5-1:

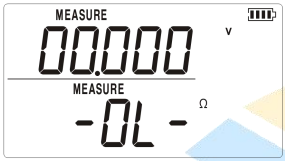

Figure 4.5-1

Attention: Over range indicate when the connection open.

Resistance measurement supports the connection types of two-wire, three-wire and four-wire. The calibrator can be switched to three-wire or four-wire according to actual connecting type. The respective connecting types are shown in Figure 4.5-2:

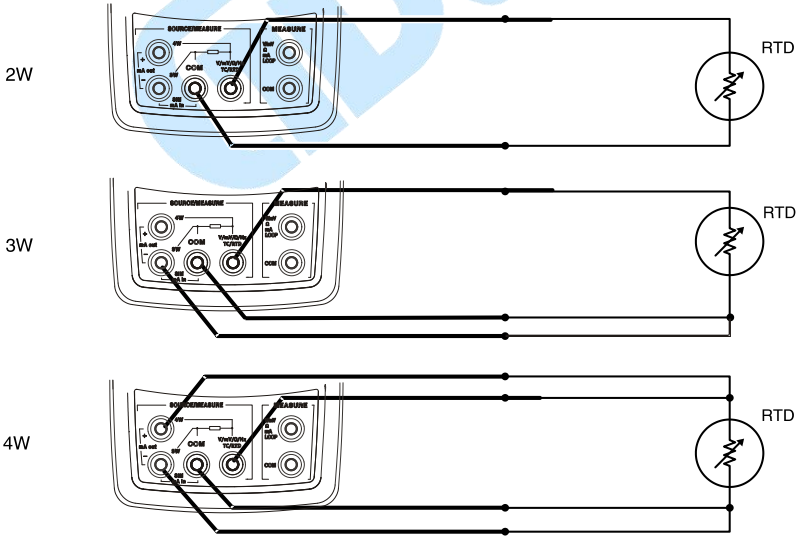

Figure 4.5-2

Press ▲ or ▼ to select a 2-, 3-, or 4- wire connection and then the calibrator will

not detect the connecting type automatically unless you quit the mode of resistance measurement and reenter.

Source

Press MEAS SOURCE to select **SOURCE** mode. If necessary, press mV Ω to select resistance function with the unit of Ω. The connecting type is the same as DC V measurement. Press RANGE to switch resistance output range.(Resistance source includes 400 Ω range and 3200 Ω range, as shown in Figure 4.5-3 and Figure 4.5-4)

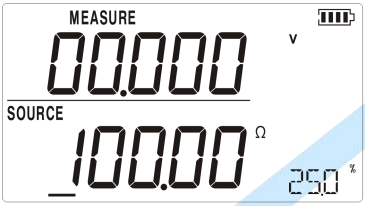

Figure 4.5-3

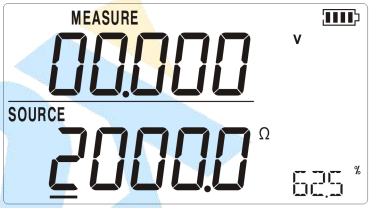

Figure 4.5-4

Attention: The Figure 4.5-3 is 400 Ω range and the Figure 4.5-4 is 3200 Ω range.

4.6 Measure and Source of Frequency

Measure

Press MEAS SOURCE to select **MEASURE** mode, press V Hz to select frequency, its unit is **Hz**. The connection is same to DC V measurement. The screen will display as shown in Figure 4.6-1

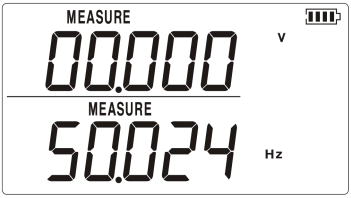

Figure 4.6-1

Source

Press MEAS SOURCE to select **SOURCE** mode. If necessary, press V Hz to select frequency, its unit is **Hz**. The connection is same to DC V measurement. Press RANGE to select source range. The screen will display as shown in Figure 4.6-2.

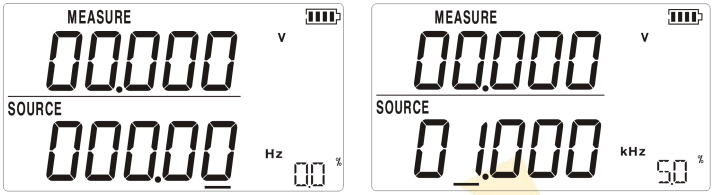

Figure 4.6-2

Attention: The left is of 200.00Hz range and the right is of 20.000kHz range.

5 Temperature Measurement

5.1 Using Thermocouples (TC)

The calibrator supports ten standard thermocouples, including type E, N, J, K, T, B, R, S, L, or U. Lower table summarizes the ranges and characteristics of the supported thermocouples.

Type	Positive Lead Material	Negative Lead Material	Specified Range（℃）
E	Chromel	Constantan	-200～950
N	Ni-Cr-Si	Ni-Si-Mg	-200～1300
J	Iron	Constantan	-200～1200
K	Chromel	Alumel	-200～1370
T	Copper	Constantan	-200～400
B	Platinum (30% rhodium)	Platinum (6% rhodium)	600～1800
R	Platinum (13% rhodium)	Platinum	-20～1750
S	Platinum (10% rhodium)	Platinum	-20～1750
L	Iron	Constantan	-200～900
U	Copper	Constantan	-200～400

To measure temperature using a thermocouple, proceedas follows:

1. Connect the thermocouple to the calibrator as shown in Figure 5.1-1:

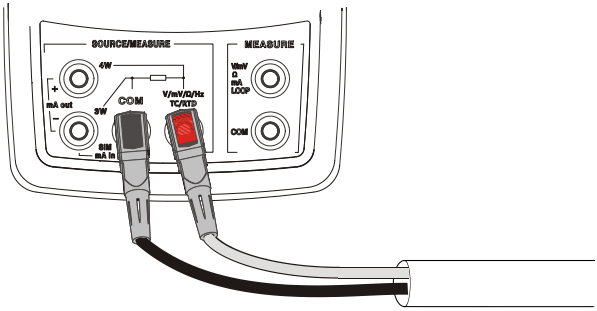

Figure 5.1-1

Attention : If the calibrator and the thermocouple plug are at different temperatures, wait one minute or more for the connector temperature to stabilize after you plug the miniplug into the TC input/output.

2. Press MEAS/SOURCE to select **MEASURE** mode.
3. Press TC for the TC display. If desired, continue pressing this key to select the desired thermocouple type as shown in Figure 5.1-2.

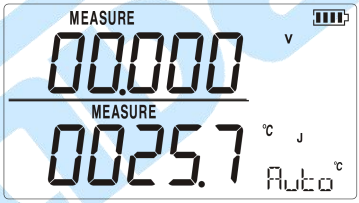

Figure 5.1-2

4. Press RANGE to display the DC mV value reading as shown in Figure 5.1-3. The DC mV value continue to display for 3s and then automatically return to the original display.

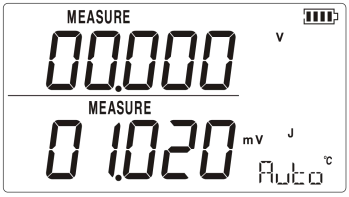

Figure 5.1-3

There are two kinds of cold end temperature compensation for thermocouple

measurement, automatic compensation directly using machine internal cold end temperature compensation and manual compensation through the key to set the cold end temperature compensation by the user.

5.1.1 Automatic compensation

First entered the thermocouple measurement mode, the default of the cold end temperature compensation is automatic compensation reading as shown in Figure 5.1.1-1.The Auto sign represents that the current cold end temperature compensation is automatic compensation. If you need further view current automatic cold end temperature compensation value,you have to operation RECALL key. Reading as shown in Figure 5.1.1-1,after press RECALL key, the Auto sign is replaced for current automatic cold end temperature compensation value as 20.3. The value 20.3 continue to display for 2s and then automatically return to the Auto sign.

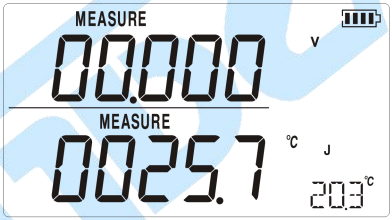

Figure 5.1.1-1

5.1.2 Manual compensation

Manual compensation through the key to set the cold end temperature compensation by the user, the following steps shall be followed:

1. Press STORE SETUP key to enter the set mode, reading as shown in Figure 5.1.2-1, the appear of STORE sign shows that entering the setup mode, the assistant value 23.0 means the value of manual compensation.

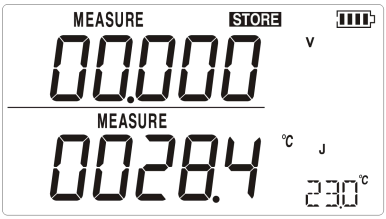

Figure 5.1.2-1

2. If you need to adjust the manual compensation value, press keys to adjust.
3. Press STORE SETUP key to save the value of manual compensation and exit from the setup mode at the same time, reading as shown in Figure 5.1.2-2.

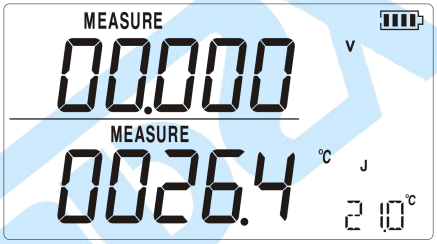

Figure 5.1.2-2

4. If necessary, press RECALL key return to automatic compensation.

5.2 Using Resistance Thermometer Detector (RTD)

The calibrator accepts RTD types of Pt100, Pt1000, Cu50 and Cu100.The calibrator accepts RTD measurement inputs in two-, three-, or four-wire connections, with the three-wire connection the most common. A four-wire configuration provides the highest measurement precision, and two-wire provides the lowest measurement precision.

To measure temperature using an RTD input, proceed as follows:

1. Press MEAS SOURCE to select **MEASURE** mode.
2. Press RTD for the RTD display. If desired, continue pressing this key to select the desired RTD type.
3. The calibrator can detect the connecting type automatically,and you can Press ⌃ or ⌄ to select a 2-, 3-, or 4- wire manually.

6 Simulation of temperature sensor

6.1 Simulating Thermocouples

Connect calibrator input/output terminal to the instrument to be tested using the thermocouple. The connecting diagram is shown in Figure 6.1-1. Proceed as follows to simulate a thermocouple:

1. Connect the thermocouple to the TC input/output plughole of the calibrator.
2. If necessary, press MEAS SOURCE to select SOURCE mode.
3. Press TC for the TC display. If desired, continue pressing this key to select the desired thermocouple type.
4. Enter the temperature you want by pressing ▲ and ▼ keys. Press ◀ or ▶ keys to select a different digit to edit.

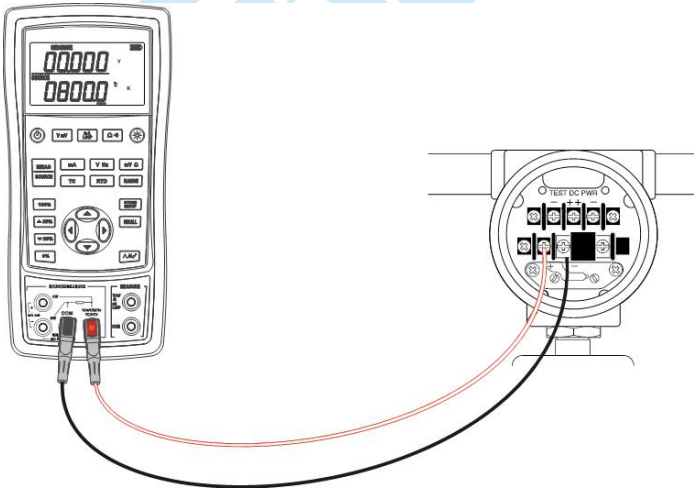

Figure 6.1-1

5. Press RANGE to display the DC mV value. The DC mV value continue to display for 3s and then automatically return to the original display.

6.2 Simulating RTD

Connect the calibrator and the instrument to be tested according to the Figure 6.2-1. Proceed as follows to simulate RTD:

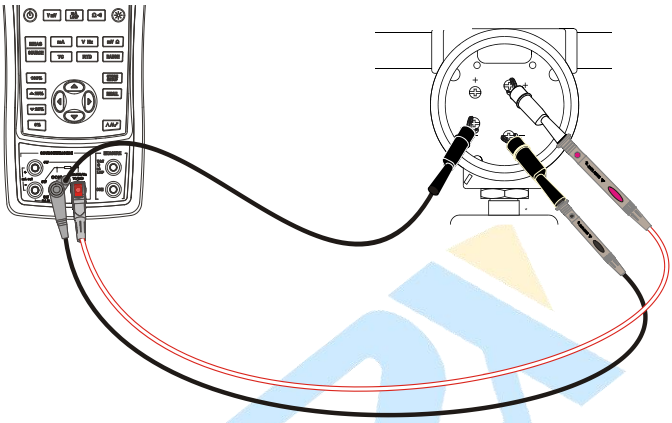

Figure 6.2-1

Attention:
Third-wire (3 W) and Fourth-wire (4 W) terminals are just for measurement, not simulation. The calibrator can simulate a two-wire RTD source in the front panel. To be connected to a third-wire or Fourth -wire transducer, folding cable can be sued to used as extra wiring.

1. If necessary, press MEAS SOURCE to select **SOURCE** mode.
2. Press RTD for the RTD display. If desired, continue pressing this key to select the desired RTD type..
3. Enter the temperature you want by pressing ▲ and ▼ keys. Press ◀ or ▶ keys to select a different digit to edit.
4. In case that the calibrator displays XIHI or XILo, the exciting current of calibrator has exceeded the limit. The screen will display as shown in Figure 6.2-2.

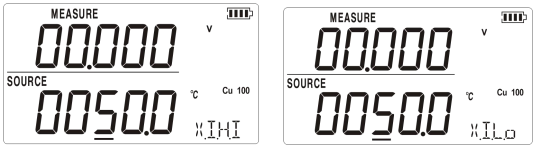

Figure 6.2-2

7 Advanced Application

7.1 Setting 0 % and 100 % Output Parameters

As for stepping operation and percentage display, 0% and 100% should be set before using. The default values have been set when delivered from the factory and set values are listed below:

Source function	0% value	100% value
DC V	0.000 V	10.000 V
DC mV	0.00 mV	100.00 mV
DC mA	4.000 mA	20.000 mA
Resistance 400Ω	0.00 Ω	400.00 Ω
Resistance 3200Ω	0.0 Ω	3200.0 Ω
Frequency 200Hz	0.00 Hz	200.00 Hz
Frequency 2,000Hz	0.0 Hz	2000.0 Hz
Frequency 20 kHz	0.000 kHz	20.000 kHz
TC - J model	0.0 ℃	1000.0 ℃
TC - K model	0.0 ℃	1000.0 ℃
TC - T model	0.0 ℃	400.0 ℃
TC - E model	0.0 ℃	800.0 ℃
TC - R model	0 ℃	1500 ℃
TC - S model	0 ℃	1500 ℃
TC - B model	600 ℃	1800 ℃
TC - N model	0.0 ℃	1000.0 ℃
Pt100	0.0 ℃	500.0 ℃
Pt1000	0.0 ℃	400.0 ℃
Cu50	0.0 ℃	150.0 ℃
Cu100	0.0 ℃	150.0 ℃

The default set values may not meet your requirements, so you can reset them. Press and hold 0% or 100% to reset 0% and 100% value until the buzzer works. The reset value will be stored in the storage space of the calibrator automatically and remains effective after restart. Now you can start operation with the reset value:

- Manually stepping an output with 25 % increments.
- Jump between the 0 and 100 % span points by momentarily pushing 0% or 100%.

7.2 Auto Ramping the Output

Auto ramping gives you the ability to continuously apply a varying stimulus from the calibrator to a transmitter, while your hands remain free to test the response of the transmitter. When you press [ΛΜ⌐], the calibrator produces a continuously repeating 0 % - 100 % - 0 % ramp in your choice of three ramp waveforms :

- Λ 0%-100%-0% 40-second smooth ramp
- Λ 0%-100%-0% 15-second smooth ramp
- ⌐ 0%-100%-0% Stair-step ramp in 25 % steps, pausing 5 seconds at each step.

Press any key to quit ramp output function.

7.3 Factory Reset

Factory reset consists of the following items:

- The upper and lower working modes recover to DC V measurement function.
- Automatic shutdown time is reset to be 30 min and becomes effective.
- LCD backlight brightness is reset to be 60%.
- Output range is recovered to be factory default.

Press ⏻ and [RECALL] simultaneously until the buzzer work and the factory reset is executed .

7.4 Calibrating a Transmitter

Use the measurement (upper display) and source (lower display) modes to calibrate a transmitter. This section applies to all but pressure transmitters. The following example shows how to calibrate a temperature transmitter.

Connect the calibrator to the instrument under test as shown in Figure 7.4-1. Proceed as follows to calibrate a transmitter:

1. Press [mA LOOP] to select loop current (upper display) .
2. Press [TC] (lower display). If desired, continue pressing this key to select the

desired thermocouple type.

3. If necessary, press [MEAS / SOURCE] to select source mode.
4. Set your zero and span parameters by pressing ▲ and ▼ keys. Enter these parameters by pressing and holding [0%] and [100%]. For more information on
5. setting parameters, see “Setting 0 % and 100 %” earlier in this manual
6. Perform test checks at 0-25-50-75-100 % points by pressing [▲25%] or [▼25%]. Adjust the transmitter as necessary.

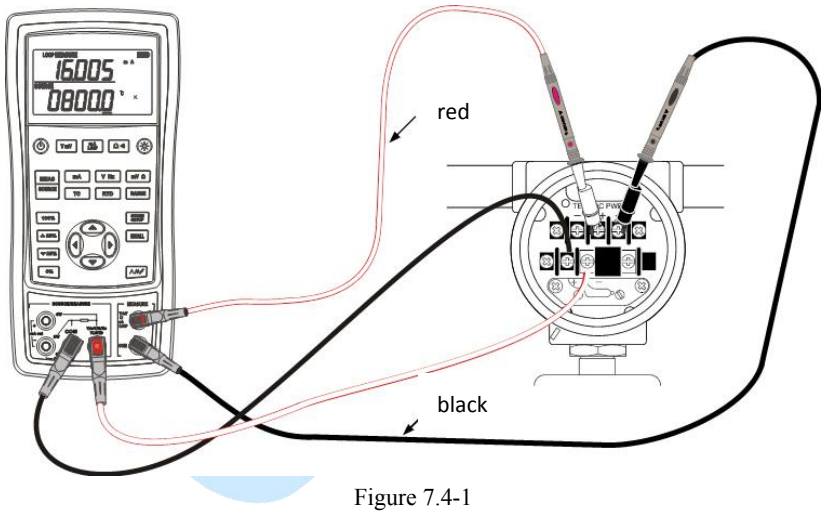

Figure 7.4-1

8 Power

The calibrator needs 6 disposable LR03 model (size 7) alkaline batteries or 6 R03 model (size 7) nickel-metal hydride batteries (or nickel-cadmium batteries). The longest service life of alkaline batteries can reach 50 hours.

A 12V/1A power adaptor is used for charging and providing working power for the calibrator.

8.1 Charge

When the battery indicator is pointed at , the remaining electric quantity is less than 20%. Charge is necessary for normal operation of the calibrator. The LCD backlight will start operation and the will display on the screen when the power adaptor is used. If the battery indicator flashes, the calibrator will be in the charging process, after which the battery indicator will stop flashing.

The calibrator will stop charge automatically in case of the following circumstances:

- Disposable batteries are used.
- Electric quantity is enough.

Figure 8.1-1

Interface of Charging indicator in the standby mode

9 Specifications

Specifications are based on a one year calibration cycle and apply from +18 C to +28 C unless stated otherwise. All specifications assume a 10 minute warmup period.

9.1 DC Voltage Measurement

Range	Maximum measurement range	Resolution	Accuracy (% of reading + counts)	
			ZXTX-1825	ZXTX-2025
28V (upper display)	-33V～33V	0.001V	0.05+2	0.025+2
200mV (upper display)	-80mV～80mV	0.001mV	0.05+20	0.025+20
	-200mV～200mV	0.01mV	0.05+2	0.025+2
50V (lower display)	-1V～60V	0.001V	0.05+2	0.02+2
100mV (lower display)	-15mV～80mV	0.001mV	0.05+20	0.02+20
	80mV～125mV	0.01mV	0.05+2	0.02+2
-10℃～18℃，+28℃～55℃ temperature coefficient,±0.005%FS/℃. *Input resistance: ＞1MΩ.*				

9.2 DC Voltage Source

Range	Maximum output range	Resolution	Accuracy (% of reading + counts)	
			ZXTX-1825	ZXTX-2025
100mV	-15mV～99.999mV	0.001mV	0.05+20	0.02+20
	100mV～125mV	0.01mV	0.05+2	0.02+2
10V	0～11V	0.001V	0.05+2	0.02+2
-10℃～18℃，+28℃～55℃ temperature coefficient,±0.005%FS/℃. *Maximum load: 1mA or 1kΩ （It should be based on the lower load.）*				

9.3 DC mA measurement

Range	Maximum measurement range	Resolution	Accuracy (% of reading + counts)	
			ZXTX-1825	ZXTX-2025
20mA (upper display)	-24mA～24mA	0.001mA	0.05+2	0.025+2
20mA (loop of upper display)	0～24mA	0.001mA	0.05+2	0.025+2
20mA (lower display)	0～24mA	0.001mA	0.05+2	0.02+2
-10℃～18℃，+28℃～55℃ temperature coefficient,±0.005%FS/℃.. *Input resistance: ＜100Ω.*				

9.4 DC mA source

Range	Maximum output range	Resolution	Accuracy (% of reading + counts)	
			ZXTX-1825	ZXTX-2025
20mA	0～24mA	0.001mA	0.05+2	0.02+2
20mA (Transducer simulation)	0～24mA	0.001mA	0.05+2	0.02+2
-10℃～18℃，+28℃～55℃ temperature coefficient,±0.005%FS/℃. *Maximum load voltage: 20V, equivalent to voltage of 20mA on 1000Ω load resistance.*				

9.5 Resistance Measurement (upper display)

Range	Maximum output range	Resolution	Accuracy (% of reading + counts)	
			ZXTX-1825	ZXTX-2025
400Ω	0～440Ω	0.1Ω	0.05+2	
3200Ω	420Ω～3300Ω	1Ω		

On-off test	0～200Ω	1Ω	0.05+1
-10℃～18℃，+28℃～55℃ temperature coefficient,±0.005%FS/℃. *Maximum load voltage: 20V, equivalent to voltage of 20mA on 1000Ω load resistance.*			

9.6 Resistance measurement (lower display)

Range	Maximum measurement range	Resolution	Accuracy（Ω）			
			ZXTX-1825		ZXTX-2025	
			Two-wire, three-wire	Four-wire	Two-wire, three-wire	Four-wire
400Ω	0～440Ω	0.01Ω	0.25	0.15	0.15	0.10
3200Ω	420Ω～3600Ω	0.1Ω	1.5	1.0	1.0	0.5
-10℃～18℃，+28℃～55℃ temperature coefficient,±0.005%FS/℃. *Exciting current during measurement:* *400Ω：0.4mA±10%；* *3200Ω：0.2mA±10%。* *Two-wire:* Does not include lead resistance. *Three-wire:* Assumes matched leads with a total resistance not exceeding *25Ω.*						

9.7 Resistance source

Range	Maximum output range	Resolution	External exciting current	Accuracy (Ω)	
				ZXTX-1825	ZXTX-2025
400Ω	0～440Ω	0.01Ω	0.40mA～3.30mA	0.25	0.15
3200Ω	400～3600Ω	0.1Ω	0.1mA～0.6mA	1.0	0.50
-10℃～18℃，+28℃～55℃ temperature coefficient,±0.005%FS/℃.					

9.8 Frequency measurement

Range	Maximum measurement range	Resolution	Accuracy (% of reading + counts)	
			ZXTX-1825	ZXTX-2025
100Hz	1~99.999Hz	0.001Hz	0.02+1	0.01+1
1000Hz	100~999.99Hz	0.01Hz		
10kHz	1k~9.9999kHz	0.1Hz		
100kHz	10k~99.999kHz	1Hz		
Sensitivity: 10Hz～10kHz，Vp-p≥1V; rest:Vp-p≥2V. *Wave form: Square wave. 5 counting points should be added to errors of other wave forms.* *Commercial frequency can be measured directly.*				

9.9 Frequency source

Range	Maximum output range	Resolution	Accuracy (% of reading + counts)	
			ZXTX-1825	ZXTX-2025
200Hz	0~200Hz	0.01Hz	0.02+1	0.01+1
2000Hz	0~2000Hz	0.1Hz		
20kHz	0~20kHz	1Hz		
Output amplitude: ≥4.5Vp-p； *Wave form: Square wave*				

9.10 Temperature, thermocouples

Graduation	Range	Resolution	Accuracy (℃)	
			ZXTX-1825	ZXTX-2025
J	-200℃～0℃ 0℃～1200℃	0.1℃	1.5℃ 1.0℃	1.0℃ 0.7℃
K	-200℃～0℃ 0℃～1370℃	0.1℃	1.8℃ 1.2℃	1.2℃ 0.8℃

T	-200℃～0℃ 0℃～400℃	0.1℃	1.8℃ 1.2℃	1.2℃ 0.8℃
E	-200℃～0℃ 0℃～950℃	0.1℃	1.5℃ 1.0℃	0.9℃ 0.7℃
R	-20℃～0℃ 0℃～500℃ 500℃～1750℃	0.1℃	4℃ 2.5℃ 2℃	2.5℃ 1.8℃ 1.4℃
S	-20℃～0℃ 0℃～500℃ 500℃～1750℃	0.1℃	4℃ 2.5℃ 2℃	2.5℃ 1.8℃ 1.5℃
B	600℃～800℃ 800℃～1000℃ 1000℃～1800℃	0.1℃	3.5℃ 2.5℃ 2℃	2.2℃ 1.8℃ 1.4℃
N	-200℃～0℃ 0℃～1300℃	0.1℃	2.0℃ 1.2℃	1.5℃ 0.9℃
Errors of cold-junction compensation are not included in the table. *Accuracy of cold-junction compensation: 1.5 ℃*				

9.11 Temperature, RTD

Graduation	Range	Resolution	Accuracy (℃)					
			ZXTX-1825			ZXTX-2025		
			2-wire 3-wire	4-wire	Output	2-wire 3-wire	4-wire	Output
Pt100	-200℃～ 850℃	0.1℃	0.7	0.4	0.7	0.4	0.3	0.3
Pt1000	-200℃～ 650℃		0.4	0.3	0.3	0.3	0.15	0.15
Cu50	-50℃～150℃		1.2	0.8	0.8	0.8	0.5	0.5
Cu100	-50℃～150℃		0.7	0.4	0.4	0.4	0.25	0.25

As for exciting current during measurement, please refer to resistance measurement function.
As for allowable external exciting current during output, please refer to resistance output function.
2-wire: Does not include lead resistance.
3-wire: Assumes matched leads with a total resistance not exceeding 25Ω.

10 Product Accessories

10.1 Standard Accessories

ZXTX-2025/ZXTX-1825 multifunction process calibrator also includes the following:

- hard spot test leads (two sets)
- alligator clips (two sets)
- One 12V/1A power adaptor
- ZXTX-2025/ZXTX-1825 Users Manual

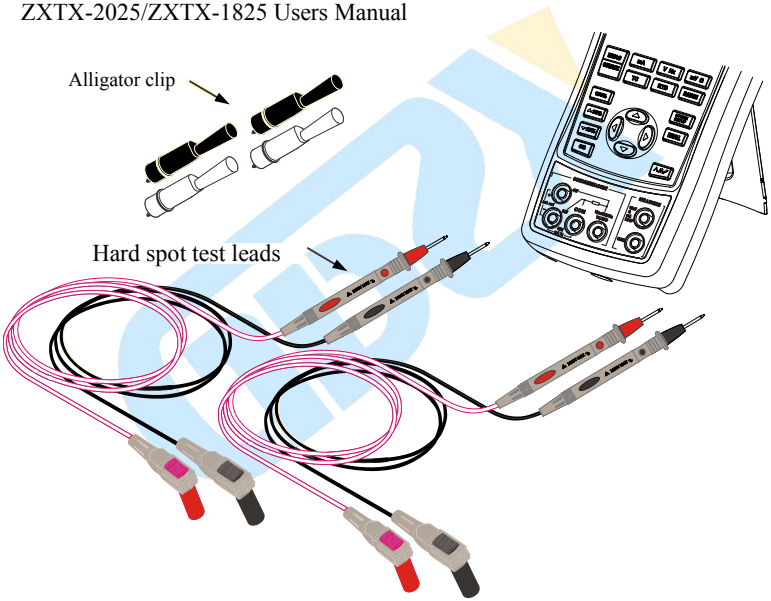

Figure 10.1-1

10.2 Optional Accessories

- 6 R03-model rechargeable batteries
- 1 Metal Box
- Communication line

11 Warning

To avoid possible electric shock or personal injury:

- Test a given voltage to confirm its normal operation before using. Mutual authentication of the upper and lower display data, for instance.
- Please follow all the safety operation procedures.
- Select the proper function and range gear according to measurement requirements.
- Confirm that the battery door has been closed before application.
- Remove the test line of the calibrator before opening the battery door.
- Check whether damaged or exposed metal exists in test line and whether the test line has been conducted. Replace the damaged test line before using.
- Do not touch the metal contact when the detector is used.
- Connect the common line and then electric test line. As for wire removal, electric test line should be removed first.
- Don't use the calibrator under any abnormal conditions. Calibrator should be repaired because it may have been damaged.
- Don’t use the calibrator near explosive gases.
- Remove test line before changing measurement or output function.
- 6 LR03-model (size 7) alkaline batteries or R03-model nickel-metal hydride batteries (or nickel-cadmium batteries) should be used in the calibrator and the battery should be placed inside the meter housing.
- To avoid reading error and possible electric shock or personal injury when the screen displays the battery under-voltage, please replace or charge the battery.