

**LOW VOLTAGE
TRANSFORMATION RATIO TESTER**



USER'S MANUAL

Precaution For Use

Thanks for your purchase of **this Low Voltage Current Transducer Transformation Ratio Tester** of our company. In order to make better use of this product, please make sure to:

—**Read this user manual in detail, the operators must fully understand the manual instructions and be able to operate the instrument skillfully, and then can field testing.**

—**Strictly comply with the safety rules and precautions listed in this manual.**

- ◆ Under any circumstance, shall pay special attention on safety in using this meter. Especially when measuring voltage circuit over AC100V and above.
- ◆ It is strictly forbidden to use this meter to test bare wires or busbar with voltage over 35kV
- ◆ If the tested line voltage over 600V, it must be used insulation rod to connection.
- ◆ Because the high voltage circuit is very dangerous, the operator must be strictly trained and obtain the national high voltage operation certification before using the meter for field test.
- ◆ Pay attention to the text labeled on the panel and backplane of the Meter.
- ◆ Do not place and store the meter in high temperature and humidity or dewy places and under direct sunlight for a long time.
- ◆ Replace the battery, please pay attention to the battery polarity. If you not use the leaker for a long time, please take out batteries.
- ◆ Disassembly, calibration, and repair of this tester must be performed by authorized personnel.
- ◆ If meter's clamp and components are damaged, please stop to use.
- ◆ It should avoid impingement on the clamp head, and maintain the instrument regularly, do not clean with corrosive or coarse material, should use soft cloth (such as eyewear cloth), and stained with anti-rust and dehumidification kind of lubricant (such as wd-40), gently wipe the instrument clamp head.
- ◆ Due to the reason of this instrument, if it is dangerous to continue using, should stopped, and sealed immediately, and handled by an authorized institution.
- ◆ The meter manual with the danger mark "  ", users must follow instructions to operate safely.
- ◆ The meter manual with the extremely dangerous mark "  ", users must in strict follow instructions to operate safely.
- ◆ It is recommended that the meter should make insulation strength test at least once a year (AC 60kV/rms telescopic insulation rod is fully opened between the two ends).

1. Introduction

This series **Low Voltage Current Transducer Transformation Ratio Tester** can be widely used in the power system of 380/220V, can be convenient and fast realize online field test for current transformer of the metering device, and the measurement of current and leakage current value of the 380/220V power system, realize the transformer ratio, angle error, phase and polarity can be accurately tested without power cut. It provides a safe, accurate, and convenient new design electric power instrument for the electric power inspector. Its application will certainly bring significant economic and social benefits to power enterprises in electricity management.

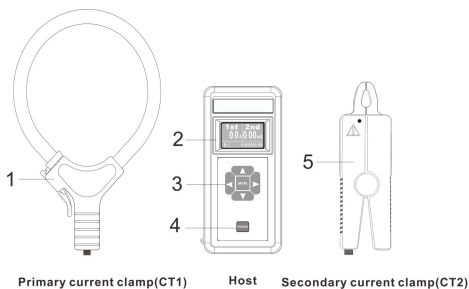
Among this **Low Voltage Wireless Current Transducer Transformation Ratio Tester**, primary current clamp adopt wireless transmit type, the transmission distance 100 meters, more convenient for usage.

2. Model difference

Model	Primary Current Clamp	Secondary Current Clamp	Transformation Ratio	Angle Error	Communication
9100A	0. 0A~3000A	0. 00mA~5A	1~500	0~360°	Wired
9100B	0. 0A~3000A	0. 00mA~5A	1~500	--	Wireless

3. Meter Structure

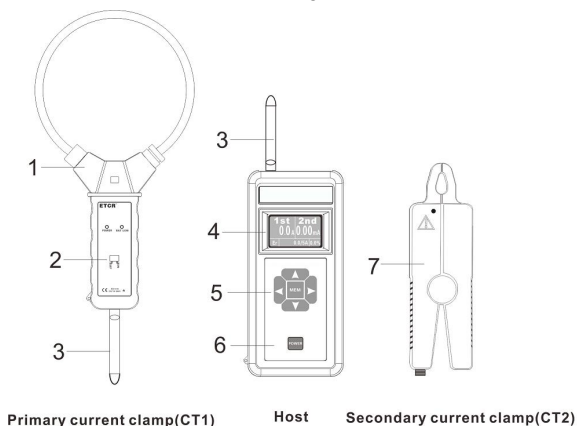
3.1. 9100A consists of host, primary flexible current clamp CT1 and secondary current clamp CT2.



- 3.1.1. Primary current clamp (CT1)
- 3.1.2. LCD display of the host
- 3.1.3. Host
- 3.1.4. MEM arrow key(5pcs)
- 3.1.5. Secondary current clamp (CT2)

3.2. 9100B consists of host, primary flexible current clamp CT1 and secondary current clamp

CT2. The primary current clamp adopts wireless transmit the test data, transmission distance is 100 meters, more convenient for usage.

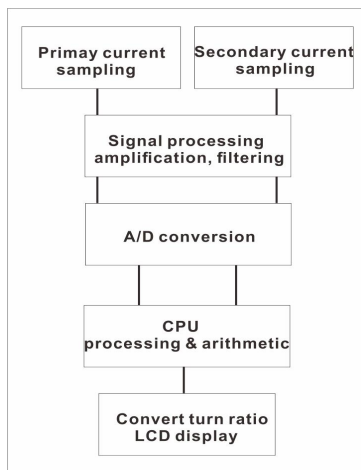


- 3.2.1. Primary current clamp (CT1)
- 3.2.2. Primary current clamp switch key
- 3.2.3. Antenna
- 3.2.4. Display screen
- 3.2.5. MEM arrow key(5pcs)
- 3.2.6. Host
- 3.2.7. Secondary current clamp (CT2)

4. Working Principle

In 380/220V system and under the condition of without power cutting, via primary current sampling clamp CT1 and secondary current sampling clamp CT2, respectively to make the sampling from primary and secondary loop of the current transducer, the sampling signal via processing, amplifying, filtering and A/D conversion, and then input the host CPU, analyzes and process the two way A/D signal by the central processor, and displayed with the transformation ratio and ratio difference converted by the secondary current which is 5A, so as to realize safe and fast online detect the transformation ratio and angle error etc. of the current transducer in the operation.

The principal block diagram is shown below:



5. Base Conditions

Influence Quantity		Base Condition	Working Conditions	Remark
Environment Temperature		23°C±5°C	-15°C~50°C	
Environment Humidity		40%~60%	< 70%	
Sine Wave Distortion		≤1%	≤3%	
Signal Frequency		50HZ±5HZ	45HZ~65HZ	
Angle Error Test	Primary high voltage current clamp	300A±30A	0.0A±3000A	only for 9100A
	Secondary Current Clamp	1A±0.2A	10mA~5A	Only for 9100A
	9100B without the function of angle error test			
External Electric Magnetic Field		To be avoided		
The Tested Wire Position		Measured wire at approximately the geometric center of the clamp		

6. Technical Specification

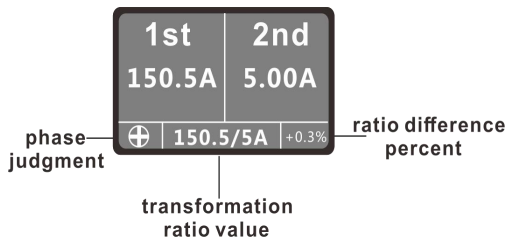
Function	Current, transformation ratio and angle error test of the low voltage current transducer primary and secondary circuit, polarity, and phase judgment.
Primary High voltage Current Test Accuracy	Range:0.0A~3000A; Resolution: 0.1; Accuracy: ±1%FS
Secondary Current	Range: 0.00mA~5A; Resolution: 0.01mA; Accuracy: ±0.5%FS

Test Accuracy	
Transformation Ratio Measurement Range	1~500
Transformation Ratio Resolution	0.1
*Angle Error Test Accuracy	Range: 0~360°; Resolution: 1°; Accuracy: ±3°(only 9100A)
Primary Current Clamp Size	CT Size: φ200mm Out Shape Size: 200mm×245mm×13mm (9100A) 200mm×370mm×40mm (9100B)
Secondary Current Clamp Size	Jaw Size: φ8mm Out Shape Size: 137mm×40mm×19.5mm
Meter Weight	800g
Battery	1.5V x 4PCS AAA battery
Data Storage	3000 groups
Sampling Rate	3 times/second
Overflow Display	Exceed measure range overflow function: "OL" symbol display
Battery Voltage	When battery voltage is lower than 5.2V±0.3V, low battery voltage symbol will display and remind to replace battery.
Auto Shut Down	15 minutes after boot up, the meter shuts down automatically without any operation
Primary Current Clamp Transmission Distance	Wireless transmission distance 100M (only to 9100B)
Current Clamp Connection Cable Length	2M
Working Temperature	-10℃~50℃; below 70%rh
Store Temperature	-10℃~60℃; below 70%rh
Insulation Strength	AC3700V/rms(between the shell and clamp core)

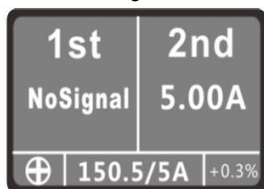
7. Application

7.1 Start up and shut down

Press the **POWER** key to start up, the LCD displays main interface, and press again **POWER** key to shut down.



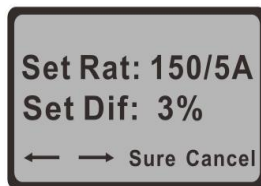
9100B in the state of wireless reception, the primary side current clamp meter is in the state of shutdown, or the wireless signal connection with the host is failed due to signal interference, the primary side current shows the "no signal" indication



About 15 minutes after the host starts up, the LCD will continue flashing, prompt that will automatically shut down, the LCD after continue flashing about 30 seconds will automatic shutdown, to reduce the battery consumption. If the LCD continues to flashing, press the **POWER** key to continue working.

7.2 Transformation ratio, ratio difference setting

After start up, press up arrow key to enter transformation ratio and error setting. Press the up and down key to change the number size (long press the up and down key to achieve ± 10 number changes), press the left and right keys to move the cursor, press the **MEM** key to return.



For example, the tested current transformer ratio is set as 150/5A, and the ratio difference (error) is 3%.The setting of the transformer ratio shall be consistent with the name plate of the transformer.

If the ratio difference of actual test exceeds the setting error, an OL symbol is displayed at the bottom right of the LCD.

7.3 Transformation Ratio test

Refer to the field wiring diagram

After starting up, CT1 and CT2 are respectively used to clamp on the primary and secondary circuits of the current transformer. The host shows the magnitude of current, phase, and polarity of the primary and secondary loop circuit, conversion ratio and ratio difference of the primary and secondary circuits based on the current.

For example, If the variable ratio is set to 150/5A, and test the same phase positive polarity line, the primary current is 150.5A and the secondary current is 5.00A, then the converted variable ratio is 150.5/5A and the ratio difference is 0.3%.

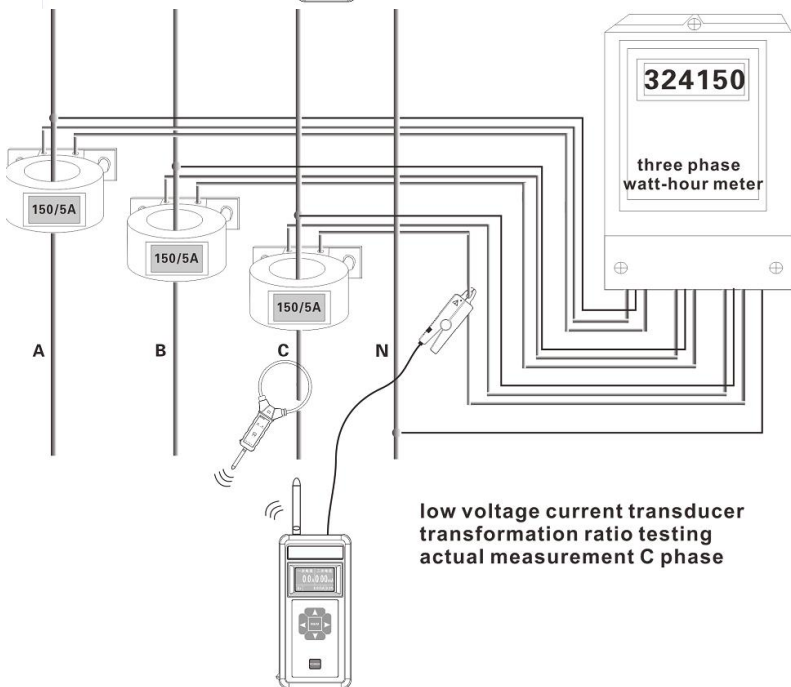
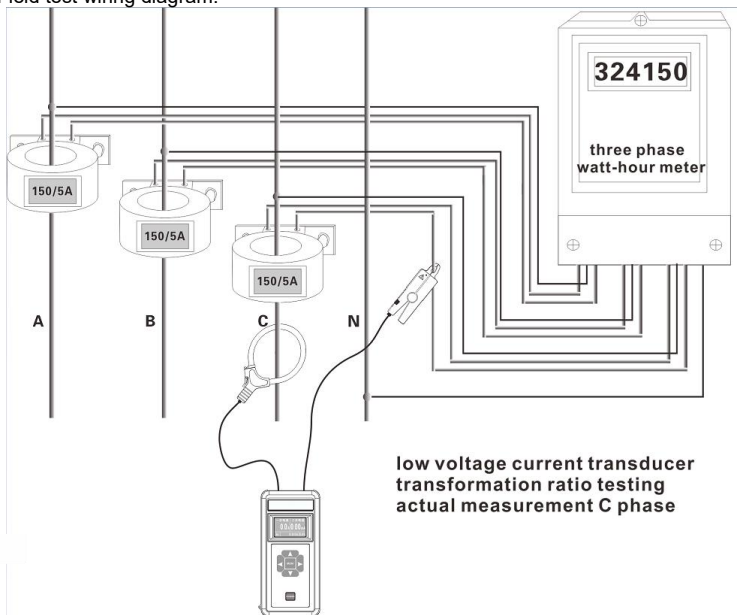
Because: $(150.5-150) / 150 * 100\% = 0.3\%$


1st	2nd
150.5A	5.00A
⊕	150.5/5A +0.3%

Under normal start up test interface, Press **MEN** key for about 2 seconds to enter the display interface of angle error parameters: current value of primary and secondary loop; only when the phase difference is about $0^\circ \sim 30^\circ$ or $330^\circ \sim 360^\circ$, can be considered as the same phase polarity. The phase difference is about $150^\circ \sim 210^\circ$ as out of phase, indicate that the primary and secondary current clamp are not clamping on the same current line. Press the **MEN** key for about 2 seconds to exit the display mode of angle error parameters display mode and return to the test mode.

I :	150.5A/5.00A
Rat:	150.5/5.00A
Dif :	0.3%
AEr:	0°

Field test wiring diagram:



	<p>【 Same Phase 】: The phase difference is about $0^{\circ} \sim 30^{\circ}$ or $330^{\circ} \sim 360^{\circ}$, which is the same phase polarity.</p>
	<p>【 Out Phase 】 : The phase difference is about $150^{\circ} \sim 210^{\circ}$, the primary or second current clamp is not the same current line</p>
	<p>【Er】 : Cannot be recognized normally, the current amplitude may be too small, or the signal may be interfered with the same frequency etc.</p>

7.4 Data lock, store and unlock

During the test, press left key can lock the display data of LCD, "HOLD" symbol indicates, and automatic numbering stores the locked data at the same time. Press left arrow key again to relieve the data lock, and return to test mode, "HOLD" symbol disappears. The instrument can store up to 3000 groups of data.

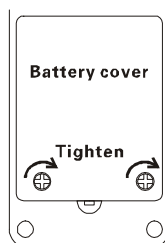
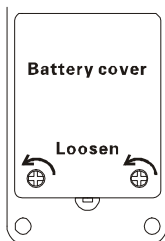
7.5 Data access, delete

After start up, press the right arrow key to access the data and automatically display the 0001 group of stored data. Currently, press the left and right keys to move the cursor, press the MEM key to confirm. This instrument can set to "+1, -1, +10, -10" quick access and stored data function, press the MEM key once, according to the increasing (decreasing) quantity query, the cursor on "+10, -10" position, has been holding down the MEM key, can 100 increasing (decreasing) query.

Move the cursor to the "return" position, press the MEM key to exit data access mode and return to test mode.

7.6 Replace Batteries

When the battery voltage of the high voltage detector lower than $5.2V \pm 0.3V$, the host will continue to flashing and display "E+" symbol; when the battery voltage of the host lower than 4.8V, the host will continues displaying the low battery voltage symbol, indicate that low battery. Please replace batteries in time.



8. Attention

8.1. Do not place and store the meter in high temperature and humidity or dewy places and

under direct sunlight for a long time

8.2. If you not use the instrument for a long time, please take out batteries.

8.3. During the test, the clamp must be kept clean, free from dust and dirt, and close well.

8.4. It should avoid impingement on the clamp head, and maintain the instrument regularly, do not clean with corrosive or coarse material, should use soft cloth (such as eyewear cloth), and stained with anti-rust and dehumidification kind of lubricant (such as wd-40), gently wipe the instrument clamp head.

8.5. During the testing, should avoid the electromagnetic field interference around the clamp.

Current sampling clamp CT1 and CT2 cannot be inserted inversely with the host.

9. Accessories

Host	1PCS
Primary High Voltage Current Clamp	1PCS
Secondary Low Voltage Current Clamp	1PCS
Tool Bag	1PCS
Manual/ Maintenance Card/ Certificate	1SET

The company is not responsible for other losses caused by use.

The contents of this user manual cannot be used as a reason to use the product for special purposes.

The company reserves the right to modify the contents of the user manual. If there are any changes, no further notice will be given.