



PRODUCT CATALOGUE

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Single-phase & Three-phase
Turns Ratio Testers



Single-phase & Three-phase
Winding Resistance Testers



Three-phase Transformer
Analysers



Circuit Breaker Analysers &
Timing Testers



Contact Resistance Testers/
Micro-ohmmeters



Vacuum Interrupter
Testers



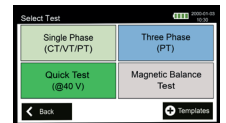
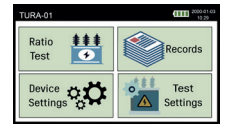
Multifunctional Substation
Testers



Hightest Technology Ltd. stands as a leading manufacturing company located in the United Kingdom, dedicated to the production of cutting-edge, high precision test equipment. Our primary objective revolves around the advancement, production, and promotion of substation test and measurement equipment, specifically catered to meet the demands of the industry. Within our extensive product portfolio, we proudly offer a range of exceptional devices including Turns ratio testers, Winding resistance testers, Circuit breaker analyzers, Circuit breaker timers, Contact resistance testers, Vacuum bottle testers, and an array of versatile multi-function test devices. With an extensive tenure in the field, we boast a rich history of designing and manufacturing top-of-the-line test equipment. Our commitment to excellence is reflected in our ability to cater to clients worldwide, including Transformer manufacturers, Electrical utilities, general contractors, and service companies.

At Hightest Technology Ltd., we hold ourselves to the highest standards, aligning our equipment with globally recognized international standards. This ensures that our customers receive products of impeccable quality, reliability, and accuracy. To complement our exceptional products, we have assembled a team of experienced professionals who are dedicated to providing exceptional after-sales support and technical assistance. Our unwavering commitment to customer satisfaction underpins our service philosophy, as we strive to exceed expectations at every turn. As an industry leader, Hightest Technology Ltd. combines innovation, precision, and expertise to deliver unparalleled test equipment solutions. We invite you to explore our range of products and experience the excellence that has made us a trusted partner in the field of substation testing.

TURA-01 SERIES 100V TURNS RATIO TESTER



TURA-01 is designed to accurately measure the turns ratio of single-phase and three-phase transformers.

TURA-01 performs fast and accurate turns ratio measurements on current, voltage and power transformers using its user-friendly interface.

With market-leading accuracy, the TURA-01 has a very wide ratio measurement capability with an accuracy of 0.08 %. Other features available on TURA-01 include the measure of core excitation current, phase angle, polarity, and ratio error.

TURA-01 instrument has a single-phase cable configuration, although users may still perform three-phase transformer tests by connecting cables for each phases one by one.

The instrument also contains a helpful list of connection diagrams for the various transformer configurations. The operator simply selects the one they need to be displayed. Therefore, there is no need for an additional manual or diagrams to understand the cable connections for each vector groups. Selecting the right vector group is enough and device shows how to connect the cables to the transformer.

The TURA-01 instrument has a wide operating range for use on equipment such as high excitation current transformers to high power potential transformers in substations. The instrument can generate 1V, 4V, 10V, 40 V and 100 V AC test voltages.

The 4.3-inch colour touch screen is large enough to display all parameters requiring entry. It is also large enough to display all measurement results on a single screen.

USB, Bluetooth (Option), and Flash Memory feature allow TURA-01 to control, record and store up to 100 test records.

With the HighTest Data Management Platform or a.k.a. (DMP Software), users may control the TURA-01 instrument and analyse the measured results on a PC.

If an immediate hard copy of the results is required the TURA-01 also allows for this via an embedded 2.25-inch printer.

Multi-language capability and user-friendly operation menu make it easy to control TURA-01, even by less trained staff.

TURA-01 is a light, compact and rugged device with an IP protection class of IP67, (case closed).



DEVICE HIGHLIGHTS



Single-phase & three-phase ratio measurement

With TURA-01's single-phase cable configuration, users can measure turns ratio of single-phase transformers as well as three-phase transformers.



Built-in Rechargeable Li-Ion Smart Battery

TURA-01 comes with a 14.4V Li-Ion smart battery which enables you to make tests while on field. TURA-01 works on both main power and consuming battery power.



4.3-inch TFT Colour Touch Screen

TURA-01 is built-in with a 4.3-inch TFT Colour Touch Screen which is visible under both bright sunlight and dim lit environment.



2.25-inch Built-in Thermal printer

TURA-01's built-in thermal printer let you print the results immediately during field test.

FEATURES

- Turns Ratio Measurement (Single-phase and three-phase measurement)
- Ranges from 0.8 to 33,000 Ratio Measurement
- High Accuracy (0.08 %)
- 1V, 4V, 10V, 40 V and 100 V AC Test Voltages
- Ratio Error Measurement
- Excitation current, phase angle, polarity measurement
- Built-in Battery & Printer
- Internal memory, USB Flash Drive
- PC control via USB cable
- Optional Bluetooth control and communication
- 4.3-inch colour touch display





TECHNICAL SPECIFICATIONS

Measurement Parameters	Turns Ratio Measurement, Excitation Current, Phase Angle, Polarity, Ratio Error (%)		
Ratio Measurement Modes	CT Mode, PT Mode, Power Transformer (Single-Phase and Three-Phase)		
Test Voltages	CT Mode: 1 V and 4 V ; PT Mode: 1, 4, 10, 40 & 100 V		
Ratio Range	0.8 – 33,000		
Accuracy	Mode	Ratio	Accuracy
	CT Mode (1V -4 V)	0.8-399 400-4000	0.08 % 0.1 %
	PT Mode(10 V- 100 V)	0.8-5000 5001-12000 12001-33000	0.08 % 0.15 % 0.5 %
Phase Angle Measurement	0-360 degrees, ± 0.2 degrees (± 1 digit)		
Excitation Current	2 A, 2 % of reading (± 1 mA)		
Power Supply	100-240V AC, 47/63 Hz		
Built-in Battery	Yes, 14.4 V 3.45 Ah		
Memory	Up to 100 records (includes up to 25 tap results)		
Printer	2.25-inch built-in printer		
Communication	USB 2.0/1.1 Standard-A, USB 2.0/1.1 Standard-B, Bluetooth (Model: TURA-01 BLUE)		
PC Software	DMP Software		
Display	4.3-inch colour touch display		
Dimensions	12.5" x 10.1" x 6.0" (318 mm x 257 mm x 152 mm)		
Weight	3.8 kg		
Temperature	Working: -10 °C to +60 °C ; Storage: -30 °C to +70 °C		
Humidity	95% RH Non-condensing		
Protection Class	IP67 (case closed)		
Included in the package	Power Cable, Ground Cable, 5 m Test Cable Set, USB Cable, Printer Paper (x2), USB flash drive, Instruction Manual (Soft Copy), DMP Software, Soft Carrying Case		
Options	Hard Carry Case, Bluetooth (factory install option)		

Specifications are valid at/under 25 °C temperature. *Content subject to change without notice.

ORDERING INFORMATION

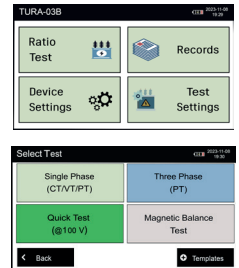
TURA-01  

100V Transformer Turns Ratio Tester with Built-in Printer & Battery

TURA-01 BLUE   

100V Transformer Turns Ratio Tester with Built-in Printer, Battery & Bluetooth

TURA-03 SERIES 250V 3 ϕ TURNS RATIO TESTER



TURA-03 is designed to accurately measure the turns ratio of single-phase and three-phase transformers.

TURA-03 performs fast and accurate turns ratio measurements on current, potential and power transformers via its user-friendly interface.

With market-leading accuracy, the TURA-03 has a very wide ratio measurement capability with a precision of 0.08 %.

TURA-03 is able to measure the core excitation current, phase angle, polarity, ratio error and magnetic balance. TURA-03 can detect vector groups automatically. The instrument also contains a helpful list of connection diagrams for the various transformer configurations. The operator simply selects the one they need to be displayed. Therefore, there is no need for an additional manual or diagrams to understand the cable connections for each vector groups. Selecting the right vector group is enough and device shows how to connect the cables to the transformer.

The instrument has a wide operating range for use on equipment such as high excitation value current transformers and high voltage power transformers in substations.

The instrument can generate 1V, 4V, 10V, 40V, 100V and 250V AC test voltages.

A 7-inch TFT touch display allows TURA-03 to show all measurement results on a single screen. USB, Bluetooth (Option), and Flash Memory features allow TURA-03 to control, record and store measurement results, (up to 100 Test Records).

Using the HighTest Data Management Platform or a.k.a. (DMP Software), users can control TURA-03 and analyse measured results and records. If an immediate hard copy of the results is required the TURA-03 also allows for this via an embedded 2.28-inch printer.

Multi-language capability and user-friendly menus make it easy to control the TURA-03 instrument, even by less trained staff. TURA-03 can also control the tap changer, (i.e. raise and lower) via its tap changer outputs.

TURA-03 is a light, compact and rugged device with an IP protection class of IP67, (case closed).

In addition to ratio tests, TURA-03 can also be used to perform Magnetic Balance Test.



DEVICE HIGHLIGHTS



Single-phase & three-phase ratio measurement

With TURA-03's three-phase cable configuration, users can measure turns ratio of both three-phase and single-phase transformers.



Optional Rechargeable Li-Ion Smart Battery

TURA-03 comes with a 14.4V Li-Ion smart battery which enables you to make tests while on field. TURA-03 works on both main power and consuming battery power.



7-inch TFT Colour Touch Screen

TURA-03 is built-in with a 7-inch TFT Colour Touch Screen which is visible under both bright sunlight and dim lit environment.



2.28-inch Built-in Thermal printer

TURA-03's built-in thermal printer let you print the results immediately during field test.

FEATURES

- Turns Ratio Measurement (Single-phase and three-phase measurement)
- Ranges from 0.8 to 50,000 ratio measurement
- High Accuracy (0.08 %)
- 1V, 4V, 10V, 40V, 100V and 250V AC test voltages
- Ratio Error Measurement, Excitation Current, Phase Angle, Polarity Measurement, Magnetic Balance
- Built-in Printer
- Automatic vector group detection
- Internal memory, USB Flash Drive
- PC control via USB cable
- Optional Bluetooth control and communication
- 7-inch colour touch display



TECHNICAL SPECIFICATIONS

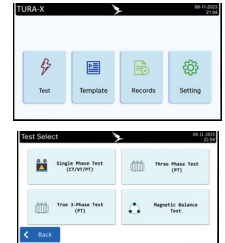
Measurement Parameters	Turns Ratio Measurement, Excitation Current, Phase Angle, Polarity, Ratio Error (%), Magnetic Balance, Vector group detection
Ratio Measurement Modes	CT Mode, PT Mode, Power Transformer (Single-Phase and Three-Phase)
Measurement Method	ANSI/IEEE C57.12
Test Voltages	CT Mode: 1 V and 4 V ; PT Mode: 1, 4, 10, 40, 100 & 250 V
Ratio Range	0.8 - 50,000
Phase Angle Measurement	0-360 degrees, ± 0.2 degrees
Excitation Current	0 to 2 A
Excitation Current Accuracy	± 0.1 mA
Power Supply	100-240 V, 47/63 Hz,
Battery	Yes, 14.4 V / 3.45 Ah Optional on Models: TURA-03B, TURA-03B BLUE.
Memory	Up to 102 records (include up to 25 tap results) Unlimited Storage using an external USB
Printer	2.28-inch Built-in Printer
Communication	USB 2.0/1.1 Standard-A, USB 2.0/1.1 Standard-B, Bluetooth (Models: TURA-03 BLUE & TURA-03B BLUE)
PC Software	DMP Software
Display	7-inch colour touch display
Dimensions	16.7" x 13.4" x 6.8" (424 mm x 340 mm x 173 mm)
Weight	7.1 kg (models with battery)
Working Temperature	-10 °C to +60 °C
Storage Temperature	-30 °C to +70 °C
Humidity	95% RH Non-condensing
Protection Class	IP67 (case closed)
Included in the package	Power Cable, Ground Cable, 5m Standard Test Cable Set, 10m Extension Cable Set, Tap Changer Cable Set, USB Cable, Printer Paper (x2), USB flash drive, Instruction Manual (Soft Copy), DMP Software, Cable Bag
Options	Hard Carry Case, Bluetooth (factory install option), Battery (factory install option)

Specifications are valid at/under 25 °C temperature. *Content subject to change without notice.

ORDERING INFORMATION

TURA-03		250V Transformer Turns Ratio Tester with Built-in Printer
TURA-03 BLUE		250V Transformer Turns Ratio Tester with Built-in Printer & Bluetooth
TURA-03B		250V Transformer Turns Ratio Tester with Built-in Printer & Battery
TURA-03B BLUE		250V Transformer Turns Ratio Tester with Built-in Printer, Battery & Bluetooth

TURA-X SERIES TRUE-3 ϕ TURNS RATIO TESTER



TURA-X is designed to accurately measure the turns ratio of single-phase and three-phase transformers.

TURA-X performs fast and accurate turns ratio measurements on current, potential and power transformers via its user-friendly interface. TURA-X can apply voltage to all three-phases at a time and make three-phase measurements.

With market-leading accuracy, the TURA-X has a very wide ratio measurement capability with a precision of 0.08 %.

Other features available on TURA-X include the measure of core excitation current, phase angle, polarity, ratio error and magnetic balance.

TURA-X can detect vector groups automatically. The instrument has a wide operating range for use on equipment such as high excitation value current transformers and high power potential transformers in substations.

The instrument can generate 1V, 4V, 10V, 40V, 100V, and 250V AC test voltages.

A 7-inch colour touch display allows TURA-X to show all measurement results on a single screen. USB, Bluetooth (Option), and Flash Memory features allow TURA-X to control, record and store measurement results, (up to 100 Test Records).

Using the HighTest Data Management Platform or a.k.a. (DMP Software), users can control TURA-X and analyse measured results and records. If an immediate hard copy of the results is required the TURA-X also allows for this via an embedded 2.28-inch printer.

Multi-language capability and user-friendly menus make it easy to control the TURA-X instrument, even by less trained staff. TURA-X can also control the tap changer, (i.e. raise and lower) via its tap changer outputs.

TURA-X is a light, compact and rugged device with an IP protection class of IP67, (case closed). In addition to ratio tests, TURA-X can also be used to perform Magnetic Balance Test.



DEVICE HIGHLIGHTS



Single-phase, three-phase & True three-phase ratio measurement

With its three-phase cable configuration, users can measure turns ratio of both three-phase and single-phase transformers. Capable of testing phase shifting transformers



Optional Rechargeable Li-Ion Smart Battery

TURA-X comes with a 14.4V Li-Ion smart battery option which enables you to make tests while on field. TURA-X works on both main power and consuming battery power.



7-inch TFT Colour Touch Screen

TURA-X is built-in with a 7-inch TFT Colour Touch Screen which is visible under both bright sunlight and dim lit environment.



2.28-inch Built-in Thermal printer

TURA-X's built-in thermal printer let you print the results immediately during field test.

FEATURES

- Turns Ratio Measurement (Single-phase, Three-Phase and True Three-phase measurement)
- Ranges from 0.8 to 50,000 ratio measurement
- 1V, 4V, 10V, 40V, 100V, & 250V AC test voltages
- Ratio Error Measurement, Excitation Current, Phase Angle, Polarity Measurement, Magnetic Balance
- High Accuracy (0.08 %)
- Automatic vector group detection
- Built-in Printer
- Internal memory, USB Flash Drive
- PC Software
- Bluetooth & Battery options
- 7-inch colour touch display











TECHNICAL SPECIFICATIONS

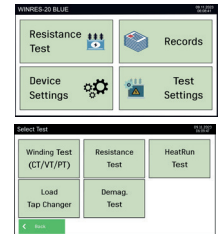
Measurement Parameters	Turns Ratio Measurement, Excitation Current, Phase Angle, Polarity, Ratio Error (%), Vector group detection, Magnetic Balance		
Ratio Measurement Modes	CT Mode, PT Mode, Power Transformer (Single-Phase, Three-Phase and TRUE Three-Phase)		
Measurement Method	ANSI/IEEE C57.12		
Test Voltages	CT Mode Single-Phase : 1 V and 4 V PT Mode; Three-Phase: 1, 4, 10, 40, 100 & 250 V		
Ratio Range	0.8 – 50,000		
Accuracy	Mode	Ratio	Accuracy
	CT Mode (1V - 4 V)	0.8000 - 399.99 400.00 - 4000.0	0.08 % 0.1 %
	PT Mode(10 V- 250 V)	0.8000 - 5000.0 5000.1 - 12000 12001 - 50000	0.08 % 0.15 % 0.5 %
Phase Angle Measurement	0-360 Degree, ±0.2 degree		
Excitation Current	Up to 2 A		
Power Supply	100-240V AC, 47/63 Hz		
Battery	Yes, 14.4 V / 3.45 Ah : Optional on Models: TURA-XB, TURA-XB BLUE.		
Memory	Up to 102 records (include up to 25 tap results)		
Printer	2.28-inch Built-in Printer		
Communication	USB 2.0/1.1 Standard-A, USB 2.0/1.1 Standard-B, Bluetooth (Models: TURA-X BLUE & TURA-XB BLUE)		
PC Software	DMP Software		
Display	7-inch colour touch display		
Dimensions	16.7" x 13.4" x 6.8" (424 mm x 340 mm x 173 mm)		
Weight	7.1 kg (models with battery)		
Temperature	Working: -10 °C to + 60 °C ; Storage: -30 °C to + 70 °C		
Protection Class	IP67 (case closed)		
Included in the package	Power Cable, Ground Cable, 5m Standard Test Cable Set, 10m Extension Cable Set, Tap Changer Cable Set, USB Cable, Printer Paper (x2), USB flash drive, Instruction Manual (Soft Copy), DMP Software, Cable Bag		

Specifications are valid at/under 25 °C temperature. *Content subject to change without notice.

ORDERING INFORMATION

TURA-X		250V True-3Ø Transformer Turns Ratio Tester with Built-in Printer
TURA-X BLUE	 	250V True-3Ø Transformer Turns Ratio Tester with Built-in Printer & Bluetooth
TURA-XB	 	250V True-3Ø Transformer Turns Ratio Tester with Built-in Printer & Battery
TURA-XB BLUE	  	250V True-3Ø Transformer Turns Ratio Tester with Built-in Printer, Battery & Bluetooth

WINRES-20 SERIES 20A WINDING RESISTANCE TESTER



WINRES-20 has been designed to measure the resistance of current, voltage and power transformer windings as well as shunt resistors. It is able to apply up to 20 Amps of direct current allowing the instrument to measure the resistance of a transformer winding quickly and accurately.

The instrument also has two measurement channels allowing simultaneous resistance measurement of two windings in any configuration such as, two primary or two secondary or one primary and one secondary winding, the choice will depend on the configuration of transformer/s. Starting from 0.1 $\mu\Omega$, the WINRES-20 instrument series can measure up to 100,000 Ω of resistance. To avoid residual core magnetization or remanence of a transformer the WINRES-20 series of instruments will de-magnetise the transformer after each test. The instrument also has a separate temperature sense input which allows the operator to automatically correct for temperature variation. An optional sensor is available for this input.

The instrument tests resistance based on Intelligent Decision Criteria (IDC) where the device analyse the results for a period of time and if the measurement is stable under a specified value, the device decides to STOP the test and produce results. As a result, the operator doesn't need to inspect the measurement values continuously on the display or stop the test manually (manual operation is also available). In the case of a failure in the current circuit, the WINRES-20's intelligent software control's the flow of current to mitigate damage and provide added safety for users. Device discharges through its voltage channels in case High Voltage is present in the transformer under test.

Heat run test/Temperature Rise Test

Heat run test or temperature rise test reproduces conditions of continuous rated load and the temperature rise occurring during the load. WINRES-20 is capable of measuring the winding resistance of transformers and the full load resistance R_o during heat run test by applying up to 20A DC.

A 7-inch colour touch display allows WINRES-20 to show all measurement results on a single screen. Field test results may be stored and recorded in the WINRES-20's internal memory, (up to 100 Test Records) or many more on an external USB flash.

Alternatively the operator may choose to employ the Data Management Platform (DMP Software) which allows PC based control of WINRES-20 via a USB cable or the optional Bluetooth interface. This software platform allows the operators to analyze, edit and store measured results on a PC or laptop. If an immediate hard copy of the results is required the WINRES-20 also allows for this via an embedded 2.28-inch printer. An internal battery option is also offered for operators who feel that they may be in situations where a mains supply source isn't always available .

With its single-phase cable configuration, users can measure winding resistance of single-phase transformers as well as three-phase transformers. For three-phase transformers, each phase needed to be measured separately as WINRES has a single-phase cable configuration.



DEVICE HIGHLIGHTS



Single-phase & three-phase measurement

With WINRES-20's single-phase cable configuration, users can measure winding resistance of both single-phase and three-phase transformers.



Optional Rechargeable Li-Ion Smart Battery

WINRES-20 comes with a 14.4V Li-Ion smart battery option which enables you to make tests while on field. WINRES works on both main power and consuming battery power.



Heat run test/ Temperature Rise Test

WINRES-20 is capable of measuring the full load resistance ' R_o ' during heat run test by applying up to 20A DC.



2.28-inch Built-in Thermal printer

WINRES's built-in thermal printer let you print the results immediately during field test.

FEATURES

- 2-channel resistance measurement
- Measurements from 0.1 $\mu\Omega$ to 100,000 Ω
- 0.001 A to 20 A DC adjustable current output
- High accuracy (0.1%)
- Test Voltage 50 V
- Demagnetisation feature
- On-Load Tap Changer (OLTC) Control
- Heat-Run Test
- 7-inch TFT touch display
- Built-in printer (2.28-inch)
- Battery & Bluetooth Options
- PC control / analysis via USB cable & DMP Software











TECHNICAL SPECIFICATIONS

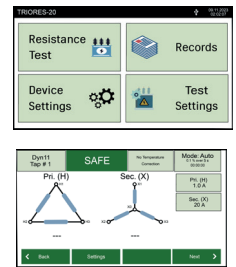
Measurement Parameters	2-channel resistance (Single-phase and Three-Phase Resistance Measurement with single-phase cable configuration)			
Test Voltage	50 V			
Current output	From 0.001 A to 20 A DC (User-selectable)			
Resistance Measurement	From 0.1 $\mu\Omega$ to 100,000 Ω			
Accuracy	Current Value	Resistance Value	Accuracy	Resolution
	1 mA - 10 mA	Up to 100 k Ω	0.1% rdg 0.1% of Fs	100 $\mu\Omega$
	10 mA - 100 mA	Up to 5 k Ω	0.1% rdg 0.1% of Fs	10 $\mu\Omega$
	100 mA - 1 A	Up to 500 Ω	0.1% rdg 0.1% of Fs	10 $\mu\Omega$
	1 A	Up to 50 Ω	0.1% rdg 0.1% of Fs	1 $\mu\Omega$
20 A	Up to 2.5 Ω	0.1% rdg 0.1% of Fs	0.1 $\mu\Omega$	
Demagnetisation	Yes			
Power Supply	100-240V AC, 47/63 Hz			
Built-in Battery	Optional as Models: WINRES-20B, WINRES-20B BLUE. Type 14.4 V / 6.9Ah			
Memory	Up to 100 records (include up to 25 tap results), Unlimited Storage using a USB			
Printer	2.28-inch built-in printer			
Communication	USB 2.0/1.1 Standard-A, USB 2.0/1.1 Standard-B, Bluetooth (Models: WINRES-20 BLUE & WINRES-20B BLUE)			
PC Software	DMP Software			
Display	7-inch Colour touch display			
Dimensions	16.7" x 13.4" x 6.8" (424 mm x 340 mm x 173 mm)			
Weight	7 kg (models with battery)			
Temperature	Working: -10 $^{\circ}\text{C}$ to + 60 $^{\circ}\text{C}$; Storage: -30 $^{\circ}\text{C}$ to + 70 $^{\circ}\text{C}$			
Humidity	95% RH Non-condensing			
Protection Class	IP67 (case closed)			
Included in the package	Power Cable, Ground Cable , 1x 5m Current Cable Set, 2 x 5m Voltage Cable Set, USB Cable, Tap Changer Cable Set, Jumper Cable, Printer Paper (x2), USB flash drive, Instruction Manual (Soft Copy), DMP Software, Cable Bag			
Options	Hard carry case, Battery, Bluetooth (factory install), Temperature Sensor, 10m Long Cable Sets for Current and Voltage channels			

Specifications are valid at/under 25 $^{\circ}\text{C}$ temperature. *Content subject to change without notice.

ORDERING INFORMATION

- WINRES-20**  20A Transformer Winding Resistance Tester with Built-in Printer
WINRES-20 BLUE   20A Transformer Winding Resistance Tester with Built-in Printer & Bluetooth
WINRES-20B   20A Transformer Winding Resistance Tester with Built-in Printer & Battery
WINRES-20B BLUE    20A Transformer Winding Resistance Tester with Built-in Printer, Battery & Bluetooth

TRIORES-20 SERIES 20A 3 ϕ WINDING RESISTANCE TESTER



TRIORES-20 Series of instruments are designed to measure current transformers, voltage transformers and power transformer windings. Applying up to 20 Amps of direct current allows TRIORES-20 Series to measure the resistance of the transformer windings quickly and accurately.

The TRIORES-20 instruments allow the operator to measure the resistance of both three-phase and single-phase transformer windings. It allows winding measurements to be performed without the need to disconnect and / or reconnect the cables from the transformer. Operators simply need to make the connection once to measure all three phases of a transformer.

Starting at 0.1 $\mu\Omega$, the TRIORES-20 series can measure up to 100,000 Ω of resistance. It can control OLTC. The instrument tests resistance based on Intelligent Decision Criteria (IDC) where the device analyse the results for a period of time and if the measurement is stable under a specified value, the device decides to STOP the test and produce results. Manual operation is also available on TRIORES-20 where the operator can choose when to STOP the test depending on their preference.

The TRIORES-20 series can demagnetise the transformer to mitigate the build up of remanence or residual magnetism due to the testing. The instrument also has a temperature measurement input which when connected to an optional temp sensor allows the TRIORES-20 series to perform temperature correction or adjustments to its measurements. In the case of a failure in the current circuit the TRIORES-20's intelligent software controls the flow of current to

mitigate damage and provide added safety for users. Device discharges through its voltage channels in case High Voltage is present in the transformer under test.

Heat run test/Temperature Rise Test

Heat run test or temperature rise test reproduces conditions of continuous rated load and the temperature rise occurring during the load. TRIORES-20 is capable of measuring the winding resistance of transformers and the full load resistance R_o during heat run test by applying up to 20A DC.

A 7-inch colour touch display allows TRIORES-20 series to show all measurement results on a single screen. Field test results may be stored and recorded in the TRIORES-20's internal memory, (up to 100 Test Records) or many more on an external USB flash. Alternatively the operator may choose to employ the Data Management Platform (DMP Software) which allows PC based control of TRIORES-20 via a USB cable or the optional Bluetooth interface. This software platform allows the operators to analyze, edit and store measured results on a PC or laptop.

If an immediate hard copy of the results is required the TRIORES-20 also allows for this via an embedded 2.28-inch printer. An internal battery option is also offered for operators who feel that they may be in situations where a mains supply source isn't always available. Multi-language capability and a user-friendly operating menu make it easy to control.



DEVICE HIGHLIGHTS



Single-phase & three-phase measurement

With TRIORES's three-phase cable configuration, users can measure winding resistance of three-phase transformers as well as single-phase transformers.



Optional Rechargeable Li-Ion Smart Battery

TRIORES comes with a 14.4V Li-Ion smart battery option which enables you to make tests while on field. WINRES works on both main power and consuming battery power.



Heat run test/ Temperature Rise Test

TRIORES-20 is capable of measuring the full load resistance R_o during heat run test by applying up to 20A DC.



2.28-inch Built-in Thermal printer

TRIORES's built-in thermal printer let you print the results immediately during field test.

FEATURES

- Fully Automatic Three-phase and single-phase resistance measurement with three-phase cable configuration
- Measurement range, 0.1 $\mu\Omega$ to 100,000 Ω
- 0.001 A to 20 A DC adjustable current output
- High accuracy (0.1%)
- Test Voltage 50 V
- Demagnetisation feature
- On Load Tap Changer (OLTC) Control
- Heat-run test
- 7-inch TFT touch display
- Built-in printer (2.28-inch)
- Battery & Bluetooth Options
- PC control / analysis via USB cable & DMP Software











TECHNICAL SPECIFICATIONS

Measurement Parameters	Three-phase and single-phase winding resistance measurement
Test Voltage	50 V
Current output	From 0.001 A to 20 A DC (User-selectable)
Resistance Measurement	From 0.1 $\mu\Omega$ to 100,000 Ω
Accuracy	0.1%
Resolution	5 digits
Demagnetisation	Yes
Power Supply	100-240 V 47/63 Hz
Battery	14.4 V 6.9 Ah battery (Optional) (Models: TRIORES-20B, TRIORES-20B BLUE)
Memory	Up to 100 records (include up to 25 tap results) Unlimited Storage using an external USB
Printer	2.28-inch built-in printer
Communication	USB 2.0/1.1 Standard-A, USB 2.0/1.1 Standard-B, Optional Bluetooth (Models: TRIORES-20 BLUE, TRIORES-20B BLUE)
PC Software	DMP Software
Display	7-inch colour touch display
Dimensions	(16.9 × 12.9 × 9.3)" (429 × 328 × 236) mm
Weight	9 kg (models with battery)
Working Temperature	-10 °C to + 60 °C
Storage Temperature	-30 °C to + 70 °C
Humidity	95% RH Non-condensing
Protection Class	IP67 (case closed)
Included in the package	Power Cable, Ground Cable , 2x 5m H&X Measurement Cable Set, 2x 10m H&X Extension Cable Set, 5m Tap Changer Cable Set, USB Cable, Jumper Cable, Printer Paper (x2), USB flash drive, Instruction Manual (Soft Copy), DMP Software, Cable Bag
Options	Hard carry case, Battery, Bluetooth (factory install), Temperature Sensor

Specifications are valid at/under 25 °C temperature. *Contents subject to change without notice.

ORDERING INFORMATION

TRIORES-20 	20A 3Ø Transformer Winding Resistance Tester with Built-in Printer
TRIORES-20 BLUE  	20A 3Ø Transformer Winding Resistance Tester with Built-in Printer & Bluetooth
TRIORES-20B  	20A 3Ø Transformer Winding Resistance Tester with Built-in Printer & Battery
TRIORES-20B BLUE   	20A 3Ø Transformer Winding Resistance Tester with Built-in Printer, Battery & Bluetooth

TRAN-203 SERIES 20A, 250V 3-PHASE TRANSFORMER ANALYSER



The TRAN-203 series of instruments are designed to measure the turns ratio and winding resistance of three-phase and single-phase transformers. Via its user friendly interface the TRAN instrument/s provide a fast and accurate assessment of key transformer parameters.

TURNS RATIO MEASUREMENT

The TRAN-203 employs elements of performance tests specified in the ANSI/IEEE C57.12.90 standard. With market leading accuracy the TRAN-203 has a very wide ratio measurement capability with a precision of 0.08 %. Other features include the measurement of core excitation current, phase angle, polarity, ratio error and magnetic balance. Even though TRAN-203 has a three-phase cable configuration, users can also perform single-phase transformer tests. TRAN-203 can detect vector groups automatically. The instrument has a wide operating range for use on equipment such as high excitation current transformers and high power potential transformers in substations. The instrument can generate 1V, 4V, 10V, 40V, 100V, 250V AC test voltages.

WINDING RESISTANCE MEASUREMENT

Applying up to 20 Amps of direct current allows the TRAN -203 series to measure the resistance of three phase transformer's primary and secondary windings automatically. TRAN-203 instrument/s are designed to measure the resistance of the primary and secondary transformer windings without the need to disconnect and reconnect the test cables.

Starting at $0.1 \mu\Omega$, the TRAN-203 series can measure up to $100,000 \Omega$ of resistance. The instrument can control OLTC. The TRAN-203 series can demagnetise the transformer to mitigate the build up of remanence or residual magnetism due to the testing. Device discharges through its voltage channels in case High Voltage is present in the transformer under test.

The instrument also has a temperature measurement input which when connected to an optional temp sensor allows the TRAN-203 series to perform temperature correction or adjustments to its measurements. In the case of a failure in the current circuit the TRAN instrument/s intelligent software controls the flow of current to mitigate damage and provide added safety for users.

Heat run test/Temperature Rise Test

Heat run test or temperature rise test reproduces conditions of continuous rated load and the temperature rise occurring during the load. TRAN-203 is capable of measuring the winding resistance of transformers and the full load resistance R_o during heat run test by applying up to 20A DC.

An internal battery option is also offered for operators who feel that they may be in situations where a mains supply source isn't always available . Multi-language capability and a user-friendly operating menu make it easy to control.



DEVICE HIGHLIGHTS



Turns Ratio & Winding Resistance Tests

TRAN has a 3-phase cable configuration cable of testing turns ratio and winding resistance of both three phase and single phase transformers



Optional Rechargeable Li-Ion Smart Battery

TRAN comes with a 14.4V Li-Ion smart battery option which enables you to make tests while on field. TRAN works on both main power and consuming battery power.



Heat run test/ Temperature Rise Test

TRAN-203 is capable of measuring the full load resistance ' R_o ' during heat run test by applying up to 20A DC.



2.28-inch Built-in Thermal printer

TRAN's built-in thermal printer let you print the results immediately during field test.

FEATURES

- Turns ratio measurement (Single-phase & Three-phase)
- Winding resistance measurement (Single-phase & Three-phase)
- Heat run test/Temperature rise test
- Magnetic Balance Test
- 7-inch TFT Colour touch display
- Built in 2.28-inch Printer
- Battery & Bluetooth options
- PC Software











TECHNICAL SPECIFICATIONS

Measurement Parameters	3-Phase Turns Ratio Measurement, Excitation Current, Phase Angle, Polarity, Ratio Error (%), Vector group detection, Magnetic Balance; 3-Phase Winding Resistance Measurement
TURNS RATIO MEASUREMENT FEATURES	
Ratio Measurement Modes	CT Mode, PT Mode (Single-Phase and Three-Phase)
Measurement Method	ANSI/IEEE C57.12
Test Voltages	CT Mode: 1 V and 4 V ; PT Mode: 1, 4, 10, 40, 100 & 250 V
Ratio Range	0.8 - 50,000
Phase Angle Measurement	0-360 Degree, ± 0.2 degree
Excitation Current	Up to 2 A
Excitation Current Accuracy	± 0.1 mA
WINDING RESISTANCE MEASUREMENT FEATURES	
Test Voltage	50 V
Current output	From 0.001 A to 20 A DC (User-selectable)
Resistance Measurement	From 0.1 $\mu\Omega$ to 100,000 Ω
Accuracy	0.1%
Resolution	5 digits
Demagnetisation	Yes
GENERAL FEATURES	
Power Supply	100-240 V, 47/63 Hz,
Battery	14.4 V 6.9 Ah battery (Models: TRAN-B, TRAN-B BLUE)
Internal Memory	Yes
Printer	2.28-inch Built-in Printer
Communication	USB 2.0/1.1 Standard-A, USB 2.0/1.1 Standard-B, Bluetooth (Models: TRAN- BLUE & TRAN- B BLUE)
PC Software	Data Management Platform Software
Display	7-inch colour touch display
Dimensions	(16.9 x 12.9 x 9.3)" (429 x 328 x 236) mm
Weight	9.5 kg
Temperature	Working: -10 °C to +60 °C; Storage: -30 °C to +70 °C
Humidity	95% RH Non-condensing
Protection Class	IP67 (case closed)
Included in the package	Power Cable, Ground Cable, 2x 5m H&X Measurement Cable Set, 2x 10m H&X Extension Cable Set, 5m Tap Changer Cable Set, USB Cable, Jumper Cable, Printer Paper (x2), USB flash drive, Instruction Manual (Soft Copy), DMP Software, Cable Bag

Specifications are valid at/under 25 °C temperature. *Content subject to change without notice.

ORDERING INFORMATION

TRAN-203 	20A, 250V 3Ø Transformer Analyser with Built-in Printer
TRAN-203 BLUE  	20A, 250V 3Ø Transformer Analyser with Built-in Printer & Bluetooth
TRAN-203B  	20A, 250V 3Ø Transformer Analyser with Built-in Printer & Battery
TRAN-203B BLUE   	20A, 250V 3Ø Transformer Analyser with Built-in Printer, Battery & Bluetooth

SUWI-120 SERIES MULTIFUNCTION SUBSTATION TEST SET



SUWI-120 series stands as a versatile testing instrument meticulously crafted to evaluate the performance of power and control apparatus within substations.

It encompasses an array of essential tests, including the precise assessment of Relay Timing, the determination of a Transformer's Turns Ratio, the scrutiny of Circuit Breaker Contact Resistance and Timing, as well as the examination of MCBs, among other critical functions. This all-encompassing substation testing device has earned the name SUWI, from our belief in its skills as a Substation Wizard.

RELAY TIMING MEASUREMENT

The SUWI instrument can automatically test over-current, over-voltage, directional overcurrent relays and frequency control relays. SUWI has an adjustable output current up to 110A AC / 120A DC and an adjustable output voltage to 150V AC / 220V DC. It has four universal input modules.

TURNS RATIO MEASUREMENT

Employing elements of performance tests specified in the ANSI/IEEE C57.12.90 standard, the instrument performs transformer ratio measurements to a precision of 0.08 % across a ratio range of 0.8 to 10,000.

SUWI also measures phase angle and polarity, and it can generate 1V, 4V, 10V, 40V and 100V AC test voltages to facilitate the measurement of the turns ratio for current, voltage and power transformers.

CONTACT RESISTANCE / LOW RESISTANCE MEASUREMENT

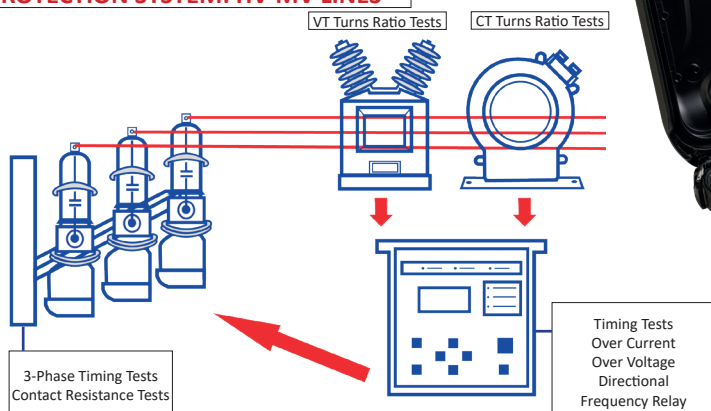
SUWI has an adjustable output DC current up to 120 Amps which facilitates the measurement of contact resistance of a circuit breaker, a shunt or disconnector. SUWI-120 can measure resistance up to 5 Ω , with a resolution of 0.01 $\mu\Omega$.

CIRCUIT BREAKER TIMING

Contact Timing Tests are performed to determine a breaker's contact performance against its manufactured specifications. The timing for a breaker's operation such as OPEN, CLOSE, OPEN-CLOSE, CLOSE-OPEN and OPEN-CLOSE-OPEN are measured for all three-phases simultaneously. SUWI can perform 3-phase circuit breaker timing test cycles as described above along with coil current measurements using internal and external trigger inputs.



PROTECTION SYSTEM: HV-MV LINES



TECHNICAL SPECIFICATIONS

Measurement Parameters	Relay Timing Tests (over current relays, over voltage relays, directional over current relays, frequency control relays); Turns Ratio Measurement, Phase Angle, Polarity, Ratio Error (%); Contact Resistance/Low Resistance Tests (Circuit breaker contact resistance and shunt resistance) Circuit breaker timing test (3-phase circuit breaker timing tests; open, close, open-close, close-open, open-close-open timings, coil current measurement, internal and external trigger operations)
PROTECTION RELAY TIMING MEASUREMENT FEATURES	
Current Outputs	Up To 110 A AC (magnitude and frequency adjustable) Up to 120 A DC
Voltage Outputs	150 V AC (magnitude and frequency adjustable) 220 V DC
Universal Input Modules	4 input module; Binary wet/dry Up to 300 V AC/DC voltage measurement
TURNS RATIO MEASUREMENT FEATURES	
Ratio Measurement Modes	CT Mode PT Mode (Single-Phase and Three-Phase)
Test Voltages	CT Mode: 1 V and 4 V ; PT Mode: 1, 4, 10, 40 & 100 V
Ratio Range	0.8 – 10,000
CONTACT RESISTANCE/LOW RESISTANCE MEASUREMENT FEATURES	
Measurement Modes	Static Resistance Measurement
Auto Test Mode	Yes
Test Current	Up to 120 A DC
Measurement Range	Up to 5 Ω
CIRCUIT BREAKER TIMING MEASUREMENT FEATURES	
Measurement Parameters	Contact Timing (O, C, O-C, C-O & O-C-O); Coil Current Measurement, Internal and External Trigger Operations
Timing Windows	1s, 10s, 20s
Timing Accuracy	0.05% rdg ± 0.1 ms
Contact detection	Yes
Trigger input voltage	24 – 300 V DC or AC _{peak}
Breaker Initiate Capacity	20 A, 300 V DC or AC _{peak}
Initiate current reading range	0 – 20A DC, 5 kHz
GENERAL FEATURES	
Power Supply	100-240 V, 47/63 Hz,
Internal Memory	Yes
Communication	USB 2.0/1.1 Standard-B, Ethernet
PC Software	DMP Software
Display	7-inch IPS 1024x600 pixel touch panel display
Dimensions	(16.9 × 12.9 × 9.3)" (429 x 328 x 236) mm
Weight	10.70 kg
Temperature	Working : -10 °C to +60 °C; Storage: -30 °C to +70 °C
Humidity	95% RH Non-condensing
Protection Class	IP67 (case closed)
Included in the Package	5x5m Input Cables (Red), 5x 5m Input Cables (Black), 2x 3m Contact Cable (White), 2x 3m Contact Cable (Blue), 1x 2.5m Current Cable (Red), 1x 2.5m Current Cable (Black), Power Cable, Ground Cable, USB Cable, Ethernet Cable, USB flash drive, Instruction Manual (Soft Copy), DMP Software, Cable Bag

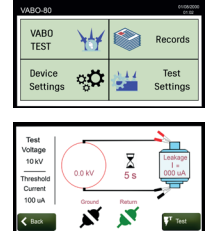
Specifications are valid at/under 25 °C temperature. *Content subject to change without notice.

ORDERING INFORMATION

SUWI-120

Multifunctional Substation Tester

VABO-80 SERIES 80 kV CIRCUIT- BREAKER VACUUM BOTTLE TESTER



VABO-80 is designed using advanced engineering technology to test circuit-breaker vacuum bottles up to 80 kV DC. It has fast, easy and accurate measurement features through its user-friendly software. VABO-80 is a battery-powered device (optional feature) that allows users to perform tests even without a power supply during on-field tests.

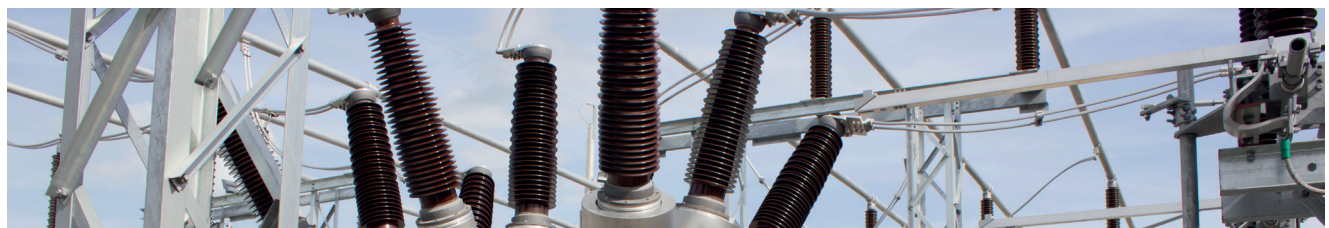
Users can select the test voltages from 10kV to 80kV DC with step voltages of 1kV, and the user can define the test time from 5 seconds to 2 minutes. The leakage current preset values of VABO-80 are 100 μ A, 200 μ A and 300 μ A. The test can be performed after setting the output voltage and test time with a predefined cutoff for leakage current. After the execution of the test, if the leakage current doesn't exceed the preset leakage current value, the screen will show "TEST PASSED". If the leakage current exceeds the preset value, then the voltage will be immediately turned off and shows "TEST FAILED" on the screen. In the case of HV presence, the HV indicator on the device illuminates with an audible tone.

Additionally, VABO-80 can test the integrity of electrical safety gloves by selecting the class of standard. This test evaluates the gloves' resistance to current leakage. It measures the amount of current that passes through the gloves when they are subjected to a specified voltage. The leakage current should not exceed a certain threshold to ensure the gloves provide adequate insulation.

VABO-80 features a 4.3-inch fairly large TFT colour touch display, which is visible under both bright sunlight and dim light conditions. With the HighTest Data Management Platform (DMP Software), users can analyse and manage measurement results on PCs. Operators can easily print the measurement results with the 2.25-inch built-in printer of VABO-80. The results can also save to a USB flash drive or the device's internal memory. Multi-language capability and user-friendly operation menu make it easy to control VABO-80. VABO-80 is a lightweight, compact and rugged device with the protection of IP67 (case closed), which makes it perfect for field tests.

WHY WE NEED TO TEST A VACUUM BOTTLE INTERRUPTER?

Fast and reliable protection is the most important in case of any faults occurring in the electrical power system. Suppose the circuit breaker does not succeed in clearing the fault at the appropriate moment. The resulting accident can be dangerous in terms of both personnel injury and equipment damage and cause heavy losses. Even though circuit breakers can be very reliable, they tend to gather dirt, moisture, and contaminants on the poles and on the exterior surface of the interrupter, which may cause insecurity during operation. Once the air finds its way into the interrupter and leakage starts to appear, the vacuum bottle becomes unreliable. For the mentioned above reasons and more, Vacuum bottle interrupters must be tested and maintained to ensure proper operation.



DEVICE HIGHLIGHTS



Vacuum Bottle Integrity & Safety Gloves Testing
VABO-80 Series can apply up to 80 kV to test the leakage current of Vacuum bottle interrupters and electrical safety gloves.



Optional Rechargeable Li-Ion Smart Battery
VABO-80 comes with a 14.4V Li-Ion smart battery option which enables you to make tests while on field. It works on both main power and consuming battery power.



4.3-inch TFT Colour Touch Screen
VABO-80 is built-in with a 4.3-inch TFT Colour Touch Screen which is visible under both bright sunlight and dim lit environment.



2.25-inch Built-in Thermal printer
VABO-80's built-in thermal printer let you print the results immediately during field test.

FEATURES

- Circuit Breaker Vacuum Bottle Interrupter Testing
- Electrical Safety Gloves Integrity Test
- Automatic Testing
- 10 kV to 80 kV DC with 1 kV step voltages
- High Accuracy (1.5 %)
- 100 μ A, 200 μ A and 300 μ A leakage current preset value
- Battery (Option)
- 2.25-inch Built-in Printer
- Internal memory (storage up to 200 records)
- External Memory- USB flash drive
- PC Software
- 4.3-inch TFT touch colour Display
- Light-Weight




TECHNICAL SPECIFICATIONS

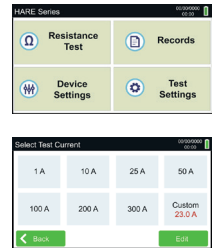
Measurement/Test	Circuit Breaker Vacuum Bottle Interrupter Testing, Electrical Safety Gloves Integrity Test
Output Voltage	10 kV to 80 kV DC with 1 kV step voltages
Output Ripple Voltage	2% at 20 kV - 80 kV ; 3% at 10 kV
Discharge Time	< 3 seconds
Leakage Current Preset Value	100 μ A, 200 μ A and 300 μ A
Accuracy	Typical: 1.5 %
Input Power	100-240 Vac, 47/63 Hz
Built-in Battery	Yes, 14.4 V 3.45 Ah (Optional; Model - VABO-80B)
Display	4.3-inch TFT touch Display (visible under bright sunlight and dim light)
Internal Memory	Up to 200 records
Communication	USB (USB 2.0/1.1 Standard-A and USB 2.0/1.1 Standard-B)
PC software	DMP Software
Printer	2.25-inch Built-in Printer
Dimensions	12.5" x 9.8" x 8.0" 318 mm x 249 mm x 203 mm
Weight	4 kg (model with battery)
Operating Temperature	-10 °C to +60 °C
Storage Temperature	-30 °C to +70 °C
Humidity	95% RH non-condensing
Protection Class	IP67 (case closed)
Set of Package	VABO-80, Power Cable, Ground Cable, 3m Test Cable, USB Cable, Printer Paper (x2), USB flash drive, Instruction Manual (Soft Copy), DMP Software, Soft Cable Carrying Case
Options	Hard Carrying Case, Battery (Optional; Model - VABO-80B)

Specifications are valid at/under 25 °C temperature. *Content subject to change without notice.

ORDERING INFORMATION

- VABO-80  80kV Vacuum Bottle Tester with Built-in Printer
- VABO-80B   80kV Vacuum Bottle Tester with Built-in Printer & Battery

HARE SERIES CONTACT RESISTANCE TESTER



Introducing the HARE Series, a state-of-the-art Contact Resistance Tester engineered with cutting-edge technology to revolutionize your resistance testing needs of Circuit Breakers, Shunts and disconnectors.

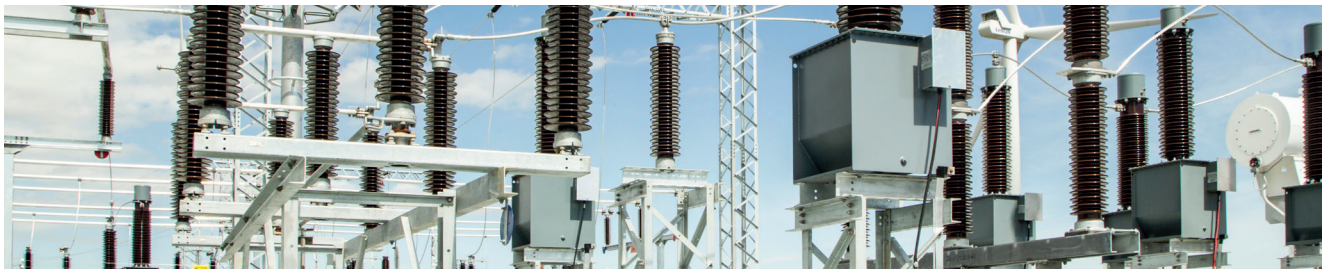
This exceptional device empowers you to apply test currents of up to 100A, 200A, or 300A, depending on your specific requirements.

With its intuitive firmware interface, the HARE Series simplifies the measurement of contact resistance in circuit breakers, shunts, and disconnectors. You can effortlessly adjust the test current to suit your needs, providing you with unparalleled flexibility in your testing process.

The HARE Series boasts an impressive measurement range, capable of detecting resistance values ranging from a mere $0.1 \mu\Omega$ to 5Ω . The 4.3-inch color touch screen conveniently displays all your measurement results on a single screen, making data interpretation a breeze.

Navigating the HARE Series is extremely easy, thanks to its user-friendly interface, guiding operators through tests swiftly and efficiently. With its flash memory feature, you can store up to a thousand records of your tests, ensuring you have a comprehensive record of your measurements. And for added convenience, transferring these records to a PC is as simple as plugging in a USB drive and copying the saved reports. In case, printing of the reports are required, with the help of our Data Management Platform, DMP Software, you may print the test reports from your Computer. DMP Software can be used to analyse the reports and export the results to a readable and printable format as per your requirements.

Despite its impressive capabilities, the HARE Series remains compact and robust, boasting an IP67 protection class when the case is closed. Weighing in at a mere 3 kg, this device is your lightweight, portable solution for resistance testing that delivers uncompromising accuracy and efficiency.



FEATURES

- Portable Contact Resistance Tester
- 0.4A to 100A Adjustable test current (HARE-100)
- 0.4A to 200A Adjustable test current (HARE-200)
- 0.4A to 300A Adjustable test current (HARE-300)
- Up to 5 Ω resistance measurement
- 0.1 $\mu\Omega$ resolution
- Automatic discharge
- High EM interferences protection
- Battery-powered
- Built-in Bluetooth
- Ultra-fast measurement
- Light-weight
- 4.3" Resistive touch colour display (visible under sunlight)
- User-friendly operation menu
- Internal memory
- USB Flash Drive
- IP67 Protection (case closed)

TECHNICAL SPECIFICATIONS

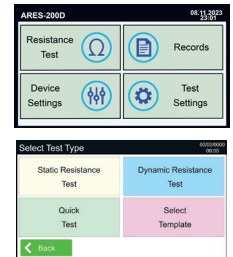
Measurement Parameter	Contact Resistance				
Adjustable Test Current	0.4A to 100A (HARE-100) 0.4A to 200A (HARE-200) 0.4A to 300A (HARE-300)				
Measurement Range	0.1 $\mu\Omega$ to 5 Ω				
Accuracy & Resolution	Nominal Resistance	Full Range Display	Resolution	Recommended Test Current	Typical Accuracy
	1 m Ω	999.9 $\mu\Omega$	0.1 $\mu\Omega$	50 – 300 A	$\pm 0.1\%$ rdg $\pm 0.1\%$ Fs
	10 m Ω	9.999 m Ω	1 $\mu\Omega$	10 – 300 A	$\pm 0.1\%$ rdg $\pm 0.1\%$ Fs
	100 m Ω	99.99 m Ω	10 $\mu\Omega$	5 – 30 A	$\pm 0.1\%$ rdg $\pm 0.1\%$ Fs
	1 Ω	999.9 m Ω	0.1 m Ω	1 – 3 A	$\pm 0.1\%$ rdg $\pm 0.1\%$ Fs
	5 Ω	4999 m Ω	1 Ω	0.4A	$\pm 1\%$ rdg $\pm 1\%$ Fs
Power Supply	100-240 V 47/63 Hz (to charge the smart battery)				
Battery	Yes				
Memory	Up to 1000 records				
Test Plan	Up to 6 plans				
Communication	USB 2.0/1.1 Standard-A (Only to insert USB Stick) Built-in Bluetooth				
PC Software	DMP Software (Reporting only)				
Display	4.3-inch TFT touch display				
Dimensions	12.5" x 10.1" x 6.0" (318 mm x 257 mm x 152 mm)				
Weight	3 kg				
Working Temperature	-10 $^{\circ}\text{C}$ to + 60 $^{\circ}\text{C}$				
Storage Temperature	-30 $^{\circ}\text{C}$ to + 70 $^{\circ}\text{C}$				
Humidity	95% RH non condensing				
Protection Class	IP67 (case closed)				
Set of Package	HARE device, Rechargeable Battery, Power Cord, 1.5m Measurement Cable Set, USB Stick, User Manual (Softcopy), Factory Test Report (Softcopy)				

Specifications are valid at/under 25 $^{\circ}\text{C}$ temperature. *Content subject to change without notice.

ORDERING INFORMATION

HARE-100 ⚡ ⌘	100A Static Contact Resistance Tester with Built-in Bluetooth & Removable Battery
HARE-200 ⚡ ⌘	200A Static Contact Resistance Tester with Built-in Bluetooth & Removable Battery
HARE-300 ⚡ ⌘	300A Static Contact Resistance Tester with Built-in Bluetooth & Removable Battery

ARES-200D SERIES 200A CONTACT RESISTANCE TESTER



ARES-200D is a micro-ohmmeter produced using advanced engineering technologies which can apply up to 200 A current. With its easy-to-use software, ARES-200D can easily measure contact resistances of the circuit breaker, shunt, and disconnecter by applying adjustable current from 1A to 200A.

It can calculate the real values of the resistors by providing penetration with the feature of the continuous current application. ARES-200D can measure from $0.1 \mu\Omega$ to 5Ω . ARES-200D can measure static and dynamic resistance of the contact points of the circuit breaker. ARES-200D can measure idle circuit breakers as well as dual grounded circuit breakers. The optional current clamp will be able to measure the part of the current going through the ground line during the test and make the calculations considering this component.

The frequently used test models can be saved as templates, and the tests can be performed more rapidly and quickly. Thanks to the quick test feature of the ARES-200D user interface, users can complete a test in barely 15 seconds.

The 4.3-inch touch colour display shows all measurement results manifest on a single screen. The ARES-200D guides operators to perform tests quickly with an easy-to-use, user-friendly interface. ARES-200D's flash memory feature allows controlling, recording, and storing of measurement results (up to 200 Test Records). And also, users can copy test records using a USB drive. Operators can easily print the measurement results with the 2.25-inch built-in printer of ARES-200D and can prepare on-field reports easily.

The HighTest data management platform (DMP Software) can also be used to control ARES-200D remotely and analyse the test reports produced by ARES-200D on a PC, and the measurement results can be easily exported and stored on the PC.

With the ARES-200D's Bluetooth option, users can start tests remotely via DMP software and transfer the test results to the PC. Thus, on-field tests can be performed even by a single person. With ARES-200D's temperature measurement channel, the temperature values of the measured sample can be taken and calculated according to the desired temperature value.

ARES-200D is a compact, rugged device with an IP67 protection class (case closed), weighing 9 kg.

Why do we need measure contact transition resistance on circuit breakers?

When high current passes over the switchyard, circuit breakers open the circuits or at the points where high current passes, it acts as closing switches.

The resistance value measured in periodic control of the circuit breaker should be the same as the resistance value in the closed position, which is very important for system safety.

High resistance values may cause local hotspots, voltage drops, fire risk, unplanned power failure, and extra energy loss in the system. Maximum accuracy measurement with the 4-wire method (kelvin method) will indicate whether the breaker contacts are properly contacted, if there is any corrosion on the contacts, or it shows if there is an effect that increases the resistance.

ARES-200D can apply up to 200 A current through its current cable and measure the voltage drop on both sides of the resistance with the sense terminal. Thus the calculated resistance value displayed on ARES-200D is not affected by the resistance of the measuring cable.

Why Dynamic Resistance Meter?

In the circuit breakers, the time-dependent graph of the measured resistance when the breaker is switched from closed to open can be obtained to determine whether the contacts are deformed. This cannot be detected by measuring the circuit breaker only in the closed position. For this reason, dynamic resistance measurement is done on circuit breakers.



FEATURES

- Contact Resistance Measurement
- Adjustable Current: 1 A to 200 A
- Measurement Range from 0.1 $\mu\Omega$ to 5 Ω
- Typical Accuracy: 0.1%
- Dynamic Resistance Measurement
- Static Resistance Measurement
- Dual Ground Test Mode
- Auto Test Mode
- Built-in Printer
- Optional Current Clamp
- Internal Memory, USB Flash Drive
- PC control via USB cable
- Optional Bluetooth Communication
- 4.3-inch TFT touch Display



TECHNICAL SPECIFICATIONS

Measurement Parameter	Contact Resistance Circuit breakers, Shunts and Disconnectors
Measurement Modes	Static, Dynamic & Dual ground Resistance Measurement
Auto Test Mode	Yes
Test Current	1 A to 200 A
Measurement Range	0.1 $\mu\Omega$ to 5 Ω
Accuracy	Typical: 0.1% \pm 0.1% Fs, Guaranteed: 0.5% \pm 0.1% Fs
Power Supply	100-240 V 47/63 Hz
Memory	Up to 200 records with 25 intervals for each
Test Plan	Up to 6 plans
Printer	2.25-inch Built-in Printer
Current Clamp	Yes (Optional)
Communication	USB 2.0/1.1 Standard-A, USB 2.0/1.1 Standard-B, Bluetooth (Model: ARES-200D BLUE)
PC Software	DMP Software
Display	4.3-inch TFT touch display
Dimensions	16.7" x 13.4" x 6.8" (424 mm x 340 mm x 173 mm)
Weight	9 kg
Working Temperature	-10 $^{\circ}\text{C}$ to + 60 $^{\circ}\text{C}$
Storage Temperature	-30 $^{\circ}\text{C}$ to + 70 $^{\circ}\text{C}$
Humidity	95% RH non condensing
Protection Class	IP67 (case closed)
Set of Package	Power Cable, Ground Cable , 10m Standard Test Cable Set, USB Cable, Printer Paper (x2), USB flash drive, Instruction Manual (Soft Copy), DMP Software, Cable Bag
Options	Hard Carrying Case, Length Customised Cables, Bluetooth (factory install option), Current Clamp

Specifications are valid at/under 25 $^{\circ}\text{C}$ temperature. *Content subject to change without notice.

ORDERING INFORMATION

ARES-200D  200A Contact Resistance Tester with Built-in Printer

ARES-200D BLUE   200A Contact Resistance Tester with Built-in Printer & Bluetooth

CIBRE-L3 SERIES 3-CONTACT CIRCUIT BREAKER TIMING TESTER ↘



CIBRE-L3 Series 3-Contact Circuit Breaker Timers are designed using advanced engineering technology to test the contact timings of circuit-breakers. CIBRE-L3 Series have fast, easy and accurate measurement features through its user-friendly software. CIBRE-L3 Series are battery-powered devices (optional feature) that allow users to perform tests even without a power supply during field tests.

Why do we need to test circuit breakers?

It is essential to test circuit breakers regularly. Contact Timing Tests are performed to determine the optimal performance of the breakers. The testing can determine improper breaker operations in case of system fault and improve system reliability.

Contact Timing Tests

Contact timing tests are performed to compare the breakers' main & resistor contact performance against the manufactures specifications. The breakers OPEN, CLOSE, OPEN-CLOSE, CLOSE-OPEN and OPEN-CLOSE-OPEN operations are timed in milliseconds (ms) and cycles and then compared with the manufacturers' specifications to determine the performance of the circuit breaker.

CIBRE-L3 Series feature a 4.3-inch large colour touch display, which is visible under bright sunlight and dim light conditions.

Operators can easily print the measurement results with the 2.25-inch built-in printer of the CIBRE-L3 Series.

The results can also save to a USB flash drive or the device's internal memory.

The HighTest data management platform (DMP Software) can also be used to analyse the test reports produced by CIBRE-L3 on a PC, and the measurement results can be easily exported and stored on the PC.

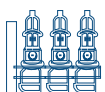
Multi-language capability and user-friendly operation menu make it easy to handle the CIBRE-L3 Series.

Despite its impressive capabilities, the CIBRE-L3 Series remains compact and robust, boasting an IP67 protection class when the case is closed.

Weighing in at a just 3 kg, this device is your lightweight, portable solution for Timing Tests that delivers uncompromising accuracy and efficiency.



DEVICE HIGHLIGHTS



Internal & External Triggered Operations

Breaker can be operated by CIBRE's internal trigger output or external trigger output.



Optional Rechargeable Li-Ion Smart Battery

CIBRE-L3 comes with a 14.4V Li-Ion smart battery option which enables you to make tests while on field. It works on both main power and consuming battery power.



4.3-inch TFT Colour Touch Screen

CIBRE-L3 is built-in with a 4.3-inch TFT Colour Touch Screen which is visible under both bright sunlight and dim lit environment.



2.25-inch Built-in Thermal printer

CIBRE-L3's built-in thermal printer let you print the results immediately during field test.

FEATURES

- Contact Timing (O, C, O-C, C-O & O-C-O)
- 3 Dry Contact Inputs
- Timing Accuracy: 0.05% rdg ± 0.1 ms
- Timing Windows: 1s, 10s & 20s
- Contact Detection Range: Closed ≤20 Ω &
- Open ≥5000 Ω
- Optional Battery
- Optional Bluetooth Communication
- 2.25" Built-in Printer
- 4.3" TFT Touch Colour Display
- Lightweight and Portable











TECHNICAL SPECIFICATIONS

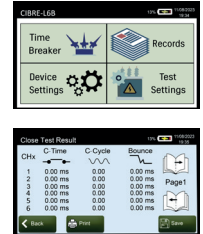
Measurement Parameters	Contact Timing (O, C, O-C, C-O & O-C-O)		
Dry Contact Inputs	3 dry input channels (each detects main)		
Timing Windows	1s, 10s, 20s		
Timing Resolution	1 s duration	10 s duration	20 s duration
	± 50 μs	± 500 μs	± 1 ms
Timing Accuracy	0.05% rdg ± 0.1 ms		
Dry contact channel protection	Fuses and Diodes protection, All contacts grounded until test		
Contact detection range	Closed	≤20 Ω	
	Open	≥5000 Ω	
Resistor detection range	20Ω - 5000Ω		
Trigger input voltage	24 - 300 V DC or AC _{peak}		
Trigger Types	Internal Trigger, External Trigger		
Breaker Operations	OPEN, CLOSE, OPEN-CLOSE, CLOSE-OPEN, OPEN-CLOSE-OPEN		
Breaker Initiate Capacity	20 A, 300 V DC or AC _{peak}		
Initiate current reading range	0 - 20A DC, 5 kHz		
Input Power	100-240 V, 47/63 Hz		
Battery	Yes, 14.4 V 3.45 Ah (Optional; Models: CIBRE-L3B & CIBRE-L3B BLUE)		
Display	4.3-inch Colour Touch Display		
Memory	Up to 200 records		
Communication	USB 2.0/1.1 Standard-A, USB 2.0/1.1 Standard-B Bluetooth (Factory install option; Models: CIBRE-L3 BLUE & CIBRE-L3B BLUE)		
Printer	2.25-inch Built-in Printer		
Dimensions	12.5" x 10.1" x 6.0" (318 mm x 257 mm x 152 mm)		
Weight	3 kg (models with battery)		
Temperature	Working: -10 °C to +60 °C ; Storage: -30 °C to +70 °C		
Humidity	95% RH non-condensing		
Protection Class	IP67 (case closed)		
Scope of Supply	5m Contact Cable, 10m Contact Extension Cable, 3m Initiate Cable, 3m Initiate Extension Cable, 3m External Trigger Cable, 3m External Trigger Extension Cable, Power Cord, Ground Cable, USB Cable, Printer Paper (2x), USB Flash Drive, Instruction Manual (soft copy), Soft Carry Bag		

Specifications are valid at/under 25 °C temperature. *Content subject to change without notice.

ORDERING INFORMATION

CIBRE-L3 	3-Contact Circuit Breaker Timing Tester with Built-in Printer
CIBRE-L3 BLUE  	3-Contact Circuit Breaker Timing Tester with Built-in Printer & Bluetooth
CIBRE-L3B  	3-Contact Circuit Breaker Timing Tester with Built-in Printer & Battery
CIBRE-L3B BLUE   	3-Contact Circuit Breaker Timing Tester with Built-in Printer, Battery & Bluetooth

CIBRE-L6 SERIES 6-CONTACT CIRCUIT BREAKER TIMING TESTER



CIBRE-L6 Series 6-Contact Circuit Breaker Timers are designed using advanced engineering technology to test the contact timings of circuit-breakers. CIBRE-L6 Series have fast, easy and accurate measurement features through its user-friendly software. CIBRE-L6 Series are battery-powered devices (optional feature) that allow users to perform tests even without a power supply during field tests.

Why do we need to test circuit breakers?

It is essential to test circuit breakers regularly. Contact Timing Tests are performed to determine the optimal performance of the breakers. The testing can determine improper breaker operations in case of system fault and improve system reliability.

Contact Timing Tests

Contact timing tests are performed to compare the breakers' main & resistor contact performance against the manufacturers specifications. The breakers OPEN, CLOSE, OPEN-CLOSE, CLOSE-OPEN and OPEN-CLOSE-OPEN operations are timed in milliseconds (ms) and cycles and then compared with the manufacturers' specifications to determine the performance of the circuit breaker.

CIBRE-L6 Series feature a 4.3-inch large colour touch display, which is visible under bright sunlight and dim light conditions.

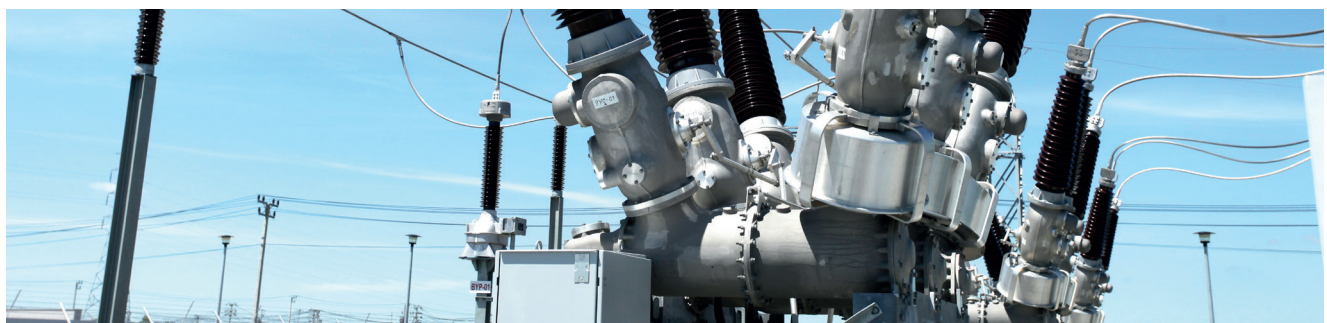
Operators can easily print the measurement results with the 2.25-inch built-in printer of the CIBRE-L6 Series.

The results can also save to a USB flash drive or the device's internal memory.

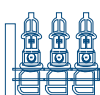
The HighTest data management platform (DMP Software) can also be used to analyse the test reports produced by CIBRE-L6 on a PC, and the measurement results can be easily exported and stored on the PC.

Multi-language capability and user-friendly operation menu make it easy to handle the CIBRE-L6 Series.

Despite its impressive capabilities, the CIBRE-L6 Series remains compact and robust, boasting an IP67 protection class when the case is closed. Weighing in at a just 3 kg, this device is your lightweight, portable solution for Timing Tests that delivers uncompromising accuracy and efficiency.



DEVICE HIGHLIGHTS



Internal & External Triggered Operations

Breaker can be operated by CIBRE's internal trigger output or external trigger output.



Optional Rechargeable Li-Ion Smart Battery

CIBRE-L6 comes with a 14.4V Li-Ion smart battery option which enables you to make tests while on field. It works on both main power and consuming battery power.



4.3-inch TFT Colour Touch Screen

CIBRE-L6 is built-in with a 4.3-inch TFT Colour Touch Screen which is visible under both bright sunlight and dim lit environment.



2.25-inch Built-in Thermal printer

CIBRE-L6's built-in thermal printer let you print the results immediately during field test.

FEATURES

- Contact Timing (O, C, O-C, C-O & O-C-O)
- 6 Dry Contact Inputs
- Timing Accuracy: 0.05% rdg ± 0.1 ms
- Timing Windows: 1s, 10s & 20s
- Contact Detection Range: Closed ≤20 Ω &
- Open ≥5000 Ω
- Optional Battery
- Optional Bluetooth Communication
- 2.25" Built-in Printer
- 4.3" TFT Touch Colour Display
- Lightweight and Portable



TECHNICAL SPECIFICATIONS

Measurement Parameters	Contact Timing (O, C, O-C, C-O & O-C-O)		
Dry Contact Inputs	6 dry input channels (each detects main)		
Timing Windows	1s, 10s, 20s		
Timing Resolution	1 s duration	10 s duration	20 s duration
	± 50 μs	± 500 μs	± 1 ms
Timing Accuracy	0.05% rdg ± 0.1 ms		
Dry contact channel protection	Fuses and Diodes protection, All contacts grounded until test		
Contact detection range	Closed	≤20 Ω	
	Open	≥5000 Ω	
Resistor detection range	20Ω - 5000Ω		
Trigger input voltage	24 - 300 V DC or AC _{peak}		
Trigger Types	Internal Trigger, External Trigger		
Breaker Operations	OPEN, CLOSE, OPEN-CLOSE, CLOSE-OPEN, OPEN-CLOSE-OPEN		
Breaker Initiate Capacity	20 A, 300 V DC or AC _{peak}		
Initiate current reading range	0 - 20A DC, 5 kHz		
Input Power	100-240 V, 47/63 Hz		
Battery	Yes, 14.4 V 3.45 Ah (Optional; Models: CIBRE-L3B & CIBRE-L3B BLUE)		
Display	4.3-inch Colour Touch Display		
Memory	Up to 200 records		
Communication	USB 2.0/1.1 Standard-A, USB 2.0/1.1 Standard-B Bluetooth (Factory install option; Models: CIBRE-L3 BLUE & CIBRE-L3B BLUE)		
Printer	2.25-inch Built-in Printer		
Dimensions	12.5" x 10.1" x 6.0" (318 mm x 257 mm x 152 mm)		
Weight	3 kg (models with battery)		
Temperature	Working: -10 °C to +60 °C ; Storage: -30 °C to +70 °C		
Humidity	95% RH non-condensing		
Protection Class	IP67 (case closed)		
Scope of Supply	5m Contact Cable, 10m Contact Extension Cable, 3m Initiate Cable, 3m Initiate Extension Cable, 3m External Trigger Cable, 3m External Trigger Extension Cable, Power Cord, Ground Cable, USB Cable, Printer Paper (2x), USB Flash Drive, Instruction Manual (soft copy), Soft Carry Bag		

Specifications are valid at/under 25 °C temperature. *Content subject to change without notice.

ORDERING INFORMATION

CIBRE-L6 

6-Contact Circuit Breaker Timing Tester with Built-in Printer

CIBRE-L6 BLUE  

6-Contact Circuit Breaker Timing Tester with Built-in Printer & Bluetooth

CIBRE-L6B  

6-Contact Circuit Breaker Timing Tester with Built-in Printer & Battery

CIBRE-L6B BLUE   

6-Contact Circuit Breaker Timing Tester with Built-in Printer, Battery & Bluetooth

CIBRE-30 SERIES 3-CONTACT CIRCUIT BREAKER ANALYSER



CIBRE-30, 3-Contact Circuit Breaker Analyser is designed using advanced engineering technology to test contact timings of circuit breakers. CIBRE-30 has fast, easy and accurate measurement features through its user-friendly software. CIBRE-30 is a battery-powered device (optional feature), allowing users to perform tests even without a power supply during field tests.

Contact Timing Tests

Contact timing tests are performed to compare the breakers' main & resistor contact performance against the manufactures specifications. The breakers OPEN, CLOSE, OPEN-CLOSE, CLOSE-OPEN & OPEN-CLOSE-OPEN operations are timed in milliseconds (ms) and cycles and then compared with the manufacturers' specifications to determine the performance of the circuit breaker.

Motion Tests

CIBRE-30 can use to perform motion tests such as Transducer Speed, Stroke and Bounce. Slower transducer speed can reduce the breaking capacity of the main contact, while faster speed can cause mechanical damage to the damping components and cause excessive vibration. So it is necessary to test the transducer speed to compare it with the manufacturer's specifications.

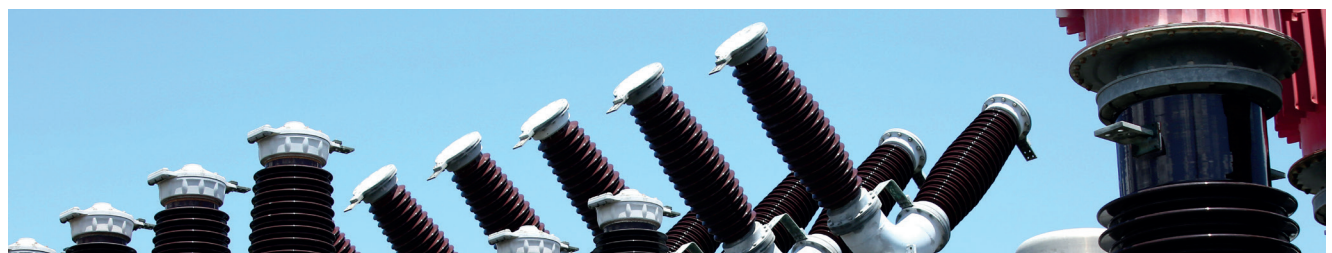
The HighTest data management platform (DMP Software) can also be used to analyse the test reports produced by CIBRE-30 on a PC, and the measurement results can be easily exported and stored on the PC.

CIBRE-30 features a 7-inch large colour touch display, which is visible under bright sunlight and dim light conditions. Operators can easily print the measurement results with the 2.28-inch built-in printer of CIBRE-30. The results can also save to a USB flash drive or the device's internal memory. Multi-language capability and user-friendly operation menu make it easy to control CIBRE-30.

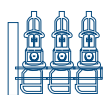
Despite its impressive capabilities, the CIBRE-30 Series remains compact and robust, boasting an IP67 protection class when the case is closed. Weighing in at a just 8 kg, this device is your lightweight, portable solution for Timing Tests that delivers uncompromising accuracy and efficiency.

Why do we need to test circuit breakers?

It is essential to test circuit breakers regularly. Contact Timing Tests and Motion tests are performed to determine the optimal performance of the breakers. The testing can determine improper breaker operations in case of system fault and improve system reliability.



DEVICE HIGHLIGHTS



Internal & External Triggered Operations

Breaker can be operated by CIBRE-30's internal trigger output or external trigger output.



Optional Rechargeable Li-Ion Smart Battery

CIBRE-30 comes with a 14.4V Li-Ion smart battery option which enables you to make tests while on field. CIBRE works on both main power and consuming battery power.



7-inch TFT Colour Touch Screen

CIBRE-30 has a built-in 7-inch TFT Colour Touch Screen which is visible under both bright sunlight and dim lit environment.



2.28-inch Built-in Thermal printer

CIBRE's built-in thermal printer let you print the results immediately during field test.

FEATURES

- Contact Timing (O, C, O-C, C-O and O-C-O)
- Motion Tests (Transducer Speed, Stroke, Bounce)
- 3 Dry Contact Inputs
- Timing Accuracy: 0.05% rdg ± 0.1 ms
- Timing Windows: 1s, 10s & 20s
- Contact Detection Range: Closed ≤20 Ω & Open ≥5000 Ω
- Optional Battery & Bluetooth Communication
- 2.28" Built-in Thermal Printer











TECHNICAL SPECIFICATIONS

Measurement Parameters	Contact Timing (O, C, O-C, C-O & O-C-O), Motion Tests (Transducer Speed, Stroke, Bounce)		
Dry Contact Inputs	3 dry input channels (each detects main) and insertion resistor contacts		
Timing Windows	1s, 10s, 20s		
Timing Resolution	1 s duration	10 s duration	20 s duration
	± 50 μs	± 500 μs	± 1 ms
Timing Accuracy	0.05% rdg ± 0.1 ms		
Dry contact channel protection	Fuses and Diodes protection, All contacts grounded until test		
Contact detection range	Closed	≤20 Ω	
	Open	≥5000 Ω	
Resistor detection range	20Ω - 5000Ω		
Trigger input voltage	24 - 300 V DC or AC _{peak}		
Trigger Types	Internal Trigger, External Trigger		
Breaker Operations	OPEN, CLOSE, OPEN-CLOSE, CLOSE-OPEN, OPEN-CLOSE-OPEN		
Voltage sensing input range	V1 (Analogue Input)	V2 (Presence/Absence Detector)	
	0 - 250 V DC or AC _{peak}	24 - 300 V DC or AC _{peak}	
Breaker Initiate Capacity	20 A, 300 V DC or AC _{peak}		
Digital Travel Transducer Input	5V/12Vdc TTL		
Initiate current reading range	0 - 20A DC, 5 kHz		
Input Power	100-240 V, 47/63 Hz		
Built-in Battery	Yes, 14.4 Vdc 6.9 Ah (Optional; Models: CIBRE-30B, CIBRE-30B BLUE)		
Display	7-inch Colour Touch Display		
Memory	Up to 200 records		
Communication	USB 2.0/1.1 Standard-A, USB 2.0/1.1 Standard-B Bluetooth (Factory install option; Models: CIBRE-30 BLUE & CIBRE-30B BLUE)		
Dimensions	16.9" x 12.9" x 9.3" (429 mm x 328 mm x 236 mm)		
Weight	8.2 kg (models with battery)		
Temperature	Working: -10 °C to +60 °C ; Storage: -30 °C to +70 °C		
Humidity	95% RH non-condensing		
Protection Class	IP67 (case closed)		
Scope of Supply	5m Contact Cable, 10m Contact Extension Cable, 3m Initiate Cable, 3m Initiate Extension Cable, 3m External Trigger Cable, 3m External Trigger Extension Cable, 3m Voltage Measurement Cable, 3m Voltage Measurement Extension Cable, Power Cable, Ground Cable, USB Cable, Printer Paper (x2), USB flash drive, Instruction Manual (Soft Copy), Cable Bag		
Options	325 mm Linear Encoder, Rotary Encoder, Battery, Bluetooth, Hard Carrying Case		

Specifications are valid at/under 25 °C temperature. *Content subject to change without notice.

ORDERING INFORMATION

- | | |
|---|---|
| CIBRE-30  | 3-Contact Circuit Breaker Analyser with Built-in Printer |
| CIBRE-30 BLUE   | 3-Contact Circuit Breaker Analyser with Built-in Printer & Bluetooth |
| CIBRE-30B   | 3-Contact Circuit Breaker Analyser with Built-in Printer & Battery |
| CIBRE-30B BLUE    | 3-Contact Circuit Breaker Analyser with Built-in Printer, Battery & Bluetooth |

CIBRE-60 SERIES 6-CONTACT CIRCUIT BREAKER ANALYSER



6 Dry Contact Inputs

CIBRE-60, 6-Contact Circuit Breaker Analyser is designed using advanced engineering technology to test contact timings of circuit breakers.

CIBRE-60 has fast, easy and accurate measurement features through its user-friendly software. CIBRE-60 is a battery-powered device (optional feature), allowing users to perform tests even without a power supply during field tests.

Why do we need to test circuit breakers?

It is essential to test circuit breakers regularly. Contact Timing Tests and Motion tests are performed to determine the optimal performance of the breakers.

The testing can determine improper breaker operations in case of system fault and improve system reliability.

Contact Timing Tests

Contact timing tests are performed to compare the breakers' main & resistor contact performance against the manufactures specifications.

The breakers OPEN, CLOSE, OPEN-CLOSE, CLOSE-OPEN & OPEN-CLOSE-OPEN operations are timed in milliseconds (ms) and cycles and then compared with the manufacturers' specifications to determine the performance of the circuit breaker.

Motion Tests

CIBRE-60 can use to perform motion tests such as Transducer Speed, Stroke and Bounce. Slower transducer speed can reduce the breaking capacity of the main contact, while faster speed can cause mechanical damage to the damping components and cause excessive vibration. So it is necessary to test the transducer speed to compare it with the manufacturer's specifications.



The HighTest data management platform (DMP Software) can also be used to analyse the test reports produced by CIBRE-60 on a PC, and the measurement results can be easily exported and stored on the PC.

CIBRE-60 features a 7-inch large colour touch display, which is visible under bright sunlight and dim light conditions.

Operators can easily print the measurement results with the 2.28-inch built-in printer of CIBRE-60. The results can also save to a USB flash drive or the device's internal memory.

Multi-language capability and user-friendly operation menu make it easy to control CIBRE-60.

Despite its impressive capabilities, the CIBRE-60 Series remains compact and robust, boasting an IP67 protection class when the case is closed. Weighing in at a just 8 kg, this device is your lightweight, portable solution for Timing Tests that delivers uncompromising accuracy and efficiency.



FEATURES


- Contact Timing (O, C, O-C, C-O and O-C-O)
- Motion Tests (Transducer Speed, Stroke, Bounce)
- 6 Dry Contact Inputs
- Timing Accuracy: 0.05% rdg ± 0.1 ms
- Timing Windows: 1s, 10s & 20s
- Contact Detection Range: Closed ≤20 Ω & Open ≥5000 Ω
- Optional Battery
- Optional Bluetooth Communication
- 2.28" Built-in Printer
- 7" TFT Touch Colour Display

TECHNICAL SPECIFICATIONS

Measurement Parameters	Contact Timing (O, C, O-C, C-O & O-C-O), Motion Tests (Transducer Speed, Stroke, Bounce)		
Dry Contact Inputs	6 dry input channels (each detects main) and insertion resistor contacts		
Timing Windows	1s, 10s, 20s		
Timing Resolution	1 s duration	10 s duration	20 s duration
	± 50 µs	± 500 µs	± 1 ms
Timing Accuracy	0.05% rdg ± 0.1 ms		
Dry contact channel protection	Fuses and Diodes protection, All contacts grounded until test		
Contact detection range	Closed	≤20 Ω	
	Open	≥5000 Ω	
Resistor detection range	20Ω - 5000Ω		
Trigger input voltage	24 - 300 V DC or AC _{peak}		
Trigger Types	Internal Trigger, External Trigger		
Breaker Operations	OPEN, CLOSE, OPEN-CLOSE, CLOSE-OPEN, OPEN-CLOSE-OPEN		
Voltage sensing input range	V1 (Analogue Input)	V2 (Presence/Absence Detector)	
	0 - 250 V DC or AC _{peak}	24 - 300 V DC or AC _{peak}	
Breaker Initiate Capacity	20 A, 300 V DC or AC _{peak}		
Digital Travel Transducer Input	5V/12Vdc TTL		
Initiate current reading range	0 - 20A DC, 5 kHz		
Input Power	100-240 V, 47/63 Hz		
Built-in Battery	Yes, 14.4 Vdc 6.9 Ah (Optional; Models: CIBRE-60B, CIBRE-60B BLUE)		
Display	7-inch Colour Touch Display		
Memory	Internal Memory Up to 200 records		
Communication	USB 2.0/1.1 Standard-A, USB 2.0/1.1 Standard-B Bluetooth (Factory install option; Models: CIBRE-60 BLUE & CIBRE-60B BLUE)		
Dimensions	16.9" x 12.9" x 9.3" (429 mm x 328 mm x 236 mm)		
Weight	8.2 kg (models with battery)		
Temperature	Working: -10 °C to +60 °C ; Storage: -30 °C to +70 °C		
Humidity	95% RH non-condensing		
Protection Class	IP67 (case closed)		
Scope of Supply	5m Contact Cable, 10m Contact Extension Cable, 3m Initiate Cable, 3m Initiate Extension Cable, 3m External Trigger Cable, 3m External Trigger Extension Cable, 3m Voltage Measurement Cable, 3m Voltage Measurement Extension Cable, Power Cable, Ground Cable, USB Cable, Printer Paper (x2), USB flash drive, Instruction Manual (Soft Copy), Cable Bag		
Options	325 mm Linear Encoder, Rotary Encoder, Battery, Bluetooth Wheeled Hard Case		

Specifications are valid at/under 25 °C temperature. *Content subject to change without notice.

ORDERING INFORMATION

CIBRE-60 

6-Contact Circuit Breaker Analyser with Built-in Printer

CIBRE-60 BLUE  

6-Contact Circuit Breaker Analyser with Built-in Printer & Bluetooth

CIBRE-60B  

6-Contact Circuit Breaker Analyser with Built-in Printer & Battery

CIBRE-60B BLUE   

6-Contact Circuit Breaker Analyser with Built-in Printer, Battery & Bluetooth

PICU-1000 1000 VA PRIMARY INJECTION TEST SYSTEM



PICU-1000 is designed using advanced engineering technology to inject current up to 1000A. PICU-1000 is applicable on current transformers, shunt or wherever high current injection is in need of up to 1000 VA power. PICU is a fully automatic primary injection instrument with the capability of CT Turns Ratio Testing in addition to MCCB Timing tests. 4.3" TFT touch display shows all measurement results on a single screen. With a USB, users can record/ store measurement results. If setting up a Laptop or PC for the field test is difficult, users can record data to the device's internal memory or an external USB flash memory. Multi-language capability and user-friendly operation menu make it easy to control, even by less trained staff. It is a light, compact and rugged device with the protection class IP67 (case closed).

FEATURES

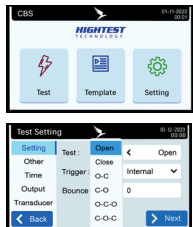
- MCCB Timing Tests, CT Turns Ratio
- High Output Power
- Frequency-selectable
- Fully Automatic
- 4.3-inch TFT touch colour Display
- PC Software (reporting)
- Internal Memory (Additional External Memory also available)
- Compact and Light-weight



TECHNICAL SPECIFICATIONS

Measurement Parameters	MCCB Timing Tests, CT Turns Ratio
Output Current	Up to 1000 A
Maximum Output Power	1000 VA
Output Frequency	40-70 Hz
Power Supply	100-240 V 47/63 Hz
Memory	Up to 100 records, Unlimited Storage using an external USB
Communication	USB 2.0/1.1 Standard-A, USB 2.0/1.1 Standard-B
PC Software	DMP Software (reporting)
Display	4.3-inch colour touch display
Dimensions	(16.7 × 13.4 × 6.8)" (424 x 340 x 173) mm
Weight	9 kg (device), 15 kg (Current Source)
Working Temperature	-10 °C to + 60 °C
Storage Temperature	-30 °C to + 70 °C
Humidity	95% RH Non-condensing
Protection Class	IP67 (case closed)
Included in the package	Power Cable, Ground Cable , 4x 2.3m (95mm ²) Measurement Cable Set, 1 KVA Current Source, Booster Cable (between PICU & Transformer Source), 2x2.5mm ² Contact Cables, USB Cable, USB flash drive, Instruction Manual (Soft Copy), DMP Software, Cable Bag
Options	Hard carry case

Specifications are valid at/under 25 °C temperature. *Content subject to change without notice.



CBSM: CIRCUIT BREAKER SIMULATOR

The Hightest CBSM Circuit Breaker Simulator is specifically engineered to assess and confirm the operational efficiency of circuit breaker analyzers and timers with exceptionally accurate pre-defined parameters.

The CBSM is capable of generating precise values for timing, travel, voltage, and initiate current. These values are instrumental in validating the functionality and timing precision of circuit breaker analyzers and timers.

In essence, the CBSM serves as a crucial tool for calibration laboratories, facilitating the precise calibration of diverse range of products, ensuring their optimal performance and reliability in real-world applications.



TECHNICAL SPECIFICATIONS

Input voltage	100-120 Vac or 200-240 Vac (factory pre-set) 50/60 Hz
Contact timing channels	6 contact timing channels; Accuracy: 0.01 ms
CT timing channel	1 CT timing channel, 500 mA, Accuracy: +/-0.5 ms
Digital transducer channels	3 digital transducer channels; Accuracy: 0.02
V1 voltage channel	20 Vrms
V2 voltage channel	30 Vdc
Internal trigger channel	2 A
External trigger channel	24 Vdc
Display	4.3-inch colour touch display
Input voltage	100-120 Vac or 200-240 Vac (factory pre-set) 50/60 Hz
Cables	CIBRE-L3 and CIBRE-30 connectable cable set(contact cable, trigger cables, V1,V2, Current output, transducer cables) 1 set 1 side CBSM connectable other side 4 pcs connector(1 m). 1 set internal and external trigger cable(1 m). 1 set current output cable (1 m), Power cable

* Specifications are subject to change without notice
 *(Specifications are valid at nominal voltage & ambient temperature of +25°C (+77°F))

TRCAL-10K TURNS RATIO METER CALIBRATOR



The TRCAL-10K is specifically engineered to validate the operational effectiveness of various Electronic Transformer Turns Ratio Testers.

Additionally, it serves as a valuable tool for diagnosing issues and providing maintenance services for Turns Ratio Testers.

The TRCAL-10K has the capability to accommodate excitation voltages ranging from 1 to 250 Vac, making it compatible with a wide range of turns ratio testers available in the market.

The TRCAL-10K offers a wide range of ratio from 1 to 10,000 (Selection available as follows: 1:1, 2:1, 5:1, 10:1, 50:1, 100:1, 200:1, 500:1, 1,000:1, 2,000:1, 5,000:1, 10,000:1)

TRCAL-10K is a light, compact and rugged device with an IP protection class of IP67, (case closed).



TECHNICAL SPECIFICATIONS

Ratio Range	1 to 10,000 (1:1, 2:1, 5:1, 10:1, 50:1, 100:1, 200:1, 500:1, 1,000:1, 2,000:1, 5,000:1, 10,000:1)
Exciting Voltage Range	1 V - 250 V
Exciting Windings	H1-H2 Windings
Dimensions	12.5" x 10.1" x 6.0" (318 mm x 257 mm x 152 mm)
Weight	3.0 kg
Storage Temperature	-30 °C to +70 °C
Humidity	95% RH Non-condensing
Protection Class	IP67 (case closed)
Altitude	2000m (6562 ft) to fully safety specifications
Included in the package	2.5m Standard Ground Cable, Soft Carry Bag

* Specifications are subject to change without notice

*(Specifications are valid at nominal voltage & ambient temperature of +25°C (+77°F)



BATU - BATTERY TEST UNIT

- Capacity measurement of high power batteries
- Discharging current up to 130A
- Convenient portable design
- USB Flash Drive
- Internal memory
- 4.3-inch TFT touch display
- User-friendly operation menu



TECHNICAL SPECIFICATIONS

Measurement Parameter	Battery Capacity
Discharging Current	Upto 130 A
Battery Nominal Voltage	Upto 240 V
Power Supply	100 V - 240 V AC, 50 / 60 Hz 100 V - 270 V DC
Display	4.3-inch TFT touch display
Communication	USB 2.0/1.1 Standard-A, USB 2.0/1.1 Standard-B
Internal Memory	Yes
Dimensions	30 x 60 x 40 cm
Weight	30 kg
Working Temperature	-10 °C to +60 °C
Storage Temperature	-30 °C to +70 °C
Humidity	95% RH Non-condensing
Altitude	2000m (6562 ft) to fully safety specifications
Standard Set	Power Cord, Ground Cable, Measurement Cable Set, USB Cable, USB Stick, User Manual

* Specifications are subject to change without notice
*(Specifications are valid at nominal voltage & ambient temperature of +25°C (+77°F))



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