TWA

Standard Series

Shares cables and bushings with the TRT ratio tester, no need to rewire the transformer

TWA

Six-winding resistance measurement, currents up to 40 A DC

amperis

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General description

Front view of the TWA Standard Series, with keypad, LCD display and transport case.

Six-winding resistance measurement in a single connection

The TWA Standard Series measures the resistance of all six windings - primary and secondary - of three-phase transformers and autotransformers with a single cable setup, injecting a true, ripple-free DC current at a voltage of up to 55 V DC. By energising all three phases on the HV and LV sides at once, the instrument quickly saturates the magnetic core of each limb and shortens the test duration. Current injection and the discharge of energy from the magnetic circuit are both automatically regulated, and a proprietary interference-cancelling system keeps the reading stable near high-voltage equipment.

DVtest: dynamic resistance of the on-load tap changer

DVtest measures the dynamic resistance of the on-load tap changer without interrupting the test current between positions: the instant a contact moves from one tap to another, the instrument records a brief, characteristic current drop - a “ripple” - whose shape, transition time and regularity reveal switching faults. The TWA40D model records that DVtest on all three phases at once, together with the tap-changer motor current on a dedicated channel, and adds the Quick YN mode, which measures the resistance of all three phases of a YN-connected winding simultaneously instead of one at a time.

Connection to the transformer and automatic demagnetization

Two sets of four cables with two-contact clamps apply the four-wire (Kelvin) method and connect every bushing on the primary and secondary sides in a single step, without touching the wiring between tests. A tap-changer control unit, built into the instrument itself, drives the OLTC remotely so a single operator completes a multi-position test. Once the resistance measurement ends, the TWA automatically demagnetizes the core, three-phase or single-phase, applying an alternating current of decreasing magnitude until the remaining flux is cancelled out.

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Applications and software

Connection panel of the TWA40D, with the temperature and motor current channels (top view).

Applications

- Commissioning and periodic maintenance of power and distribution transformers and autotransformers.
- Condition assessment of on-load tap changers through analysis of the DVtest and motor current graphs (TWA40D).
- Synchronisation check between the phases of a three-phase tap changer (TWA40D).
- Core demagnetization after DC tests, whether run on this or another instrument, before returning the transformer to service.

Cables shared with the TRT ratio tester

TWA uses the same H and X cable set as the TRT turns ratio tester, so a single connection to the transformer bushings chains together six tests - ratio, excitation current, phase angle, winding resistance, tap-changer DVtest and demagnetization - without rewiring the unit.

PC software

A Windows-based PC software, included in the purchase price, controls and monitors the test from the computer, saves and analyses the results, and generates customised reports that export to spreadsheet, PDF, Word or ASCII format. The program assesses the condition of the tap changer from the DVtest graph of each transition and calculates the switching time, ripple and winding resistance for every tap operation. The interface is USB, with RS-232 as an option. Accessories: H and X cable sets in several lengths with TTA clamps (compatible with the TRT series), a 30/300 A current clamp for the TWA40D motor-current channel, a transport case, cable cases, a tap-changer control cable, a temperature sensor and a cable bag.

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TWA — MEASUREMENT DATA

Resistance measurement range	0.1 µΩ - 10 kΩ
Accuracy	±(0.1% of reading + 0.1% F.S.) up to 1.999 kΩ; ±(0.2% + 0.1% F.S.) from 2 to 9.999 kΩ
Test current	5 mA - 25 A DC (TWA25A); 5 mA - 25 A DC sequential and up to 40 A DC in simultaneous YN mode (TWA40D)
Output voltage	Up to 55 V DC
DVtest resolution	4 ms (TWA25A); 0.1 ms (TWA40D)
Temperature measurement	-50 to +180 °C; Pt100 class B probe; 0.1 °C resolution

The TWA40D's 40 A DC current corresponds to the simultaneous phase-synchronisation mode (Quick YN); the standard sequential test reaches 25 A DC on both models.
Data valid at +25 °C with standard accessories (manufacturer's current datasheet).

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TWA — TECHNICAL SPECIFICATIONS

	TWA40D	TWA25A
Measurement	Three-phase, six windings	Three-phase, six windings
Test current	5 mA - 25 A DC; up to 40 A DC in simultaneous YN mode	5 mA - 25 A DC
Simultaneous YN mode	Yes, all three phases at once	No (sequential measurement)
Motor current channel	Yes, with a 30/300 A clamp	Not available
DVtest resolution	0.1 ms	4 ms
Demagnetization	Automatic, three-phase and single-phase	Automatic, three-phase and single-phase
Display / internal memory	Backlit LCD; 500 records	Backlit LCD; 500 records
Interface	USB; RS-232 optional	USB; RS-232 optional
Dimensions and weight	478 × 194 × 389 mm; 12.8 kg	478 × 194 × 389 mm; 12.8 kg

Both models share the same enclosure, the same resistance range (0.1 µΩ-10 kΩ) and the same environmental ratings; they differ in the simultaneous YN mode, the motor current channel and the DVtest resolution.
Environmental conditions: operation from -20 to +55 °C, storage and transport from -40 to +70 °C, relative humidity up to 95% non-condensing.
Standards: safety EN 61010-1; electromagnetic compatibility EN 61326-1. Specifications valid at +25 °C; subject to change without notice (manufacturer's datasheet).

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