



TR 300

True Three Phase Turns Ratio Tester

Outstanding Features

- Off power frequency test voltages for high accuracy in electrically noisy high voltage sub stations
- Optional battery backup for up to 3 hours of testing
- Wide Ratio range: 0.8 – 50,000: 1, covers all types of transformers
- Capable of detecting all types of 3-phase transformers defined by ANSI, IEC, and Australian standards
- 3 available voltages: 4Vac, 40Vac, 100 Vac, and 250Vac (optional)
- Phase angle and excitation current measurement covers all types of transformers including phase shifting transformers
- USB 2.0 PC interface
- Optional built-in 3.5-inch wide thermal printer for quick field analysis of test results

The TR 300 is a true three-phase transformer turns ratio test instrument designed to test any type of transformer. It performs turns ratio tests per the IEEE C57.12.90 measurement standard. The TR 300 generates its own three-phase excitation test voltage which is applied to the three phases of the transformer's primary windings. The three-phase secondary voltages are measured to calculate the turns ratio.

The TR 300's measuring range is 0.8-50,000 : 1. In addition to measuring turns ratio, the TR 300 can also measure excitation current and phase angle difference between the primary and secondary voltages. The test results can be displayed on the unit's built in color display.

Higher Test Voltages for Increased Accuracy and Safety

The TR 300 offers selectable test voltages of 4V, 40V, and 100V. Optionally, a 250V test voltage is available for testing in electrically noisy environments. The higher test voltages increase the measurement accuracy, especially at high turns ratios.

In addition, the test frequency of the voltage is 55 Hz so power frequency interferences of the substation do not affect the turns ratio measurement. Higher test voltages, coupled with off frequency measurement, make the TR 300 an ideal instrument for high accuracy testing.

To prevent an accidental wrong test lead hookup, such as when the operator reverses H and X leads, the TR 300 outputs a low-level test voltage to verify the hookup condition before applying the full test voltage to the transformer. Higher test voltages allow the TR 300 to test CT's and PT's, as well as power transformers.

True Three Phase Turns Ratio Measurements

The TR 300 generates its own three phase test voltages so that the turns ratio, excitation

current, and phase angle can be measured. This feature allows the TR 300 to detect the transformer configuration and enables testing of special transformers such as phase-shifting transformers where the phase angle difference between the primary and secondary is not the standard 30 degrees.

User Interface

The TR 300 features a rugged 44-key "QWERTY"-style keypad and a back-lit color LCD screen (800 x 480 pixels) which is viewable in direct sunlight and low light. An optional built-in 3.5 inch thermal printer can be used to print and review the test results in the field without the need for a computer.

Computer Interface

Test results and test parameters can be transferred to a PC via the USB 2.0 interface.

Transformer Load Tap Change Control

The load tap changer position or the voltage regulator tap position can be raised or lowered by the TR 300. The raise or lower command can be issued manually via the instrument's front panel or automatically controlled by the instrument for greater productivity.

Optional Built-in Thermal Printer

An optional built-in 3.5 inch wide thermal printer is available for printing test results in the field.

Optional Battery Backup

An optional battery backup is also available for testing transformers in situations where an AC power supply is not available. The battery backup can provide power for up to three hours. The TR 300 uses sealed LiFePo4 batteries (12V, 7AH) that allow the unit to be used while charging.



TR 300 Technical Specifications

Physical Specifications	Dimensions: 21" w x 8" H x 17" D (53 cm x 20.5 cm x 43 cm) TR 300 Weight without Battery: 32 lbs. (14.5 Kg) TR 300 Weight with Battery: 36 lbs. (16.3 Kg)
Operating Voltage	90 – 240 Vac, 50/60 Hz
Measuring Method	ANSI/IEEE C57.12.90
Turns Ratio Accuracy	4 Vac: 0.8 – 20,000: ±0.05% typical max 0.3% for the entire range 40 Vac: 0.8 – 50,000: ±0.05% typical max 0.2% for the entire range 100 Vac: 0.8 – 50,000: ±0.05% typical max 0.2% for the entire range 250 Vac: 0.8 – 50,000: ±0.05% typical max 0.2% for the entire range
Phase Angle Measurement	0 – 360 degrees
Accuracy	±0.2 degree
Polarity Reading	In-phase or out-of-phase indication
Current Reading Range	0 – 2 Amperes; Accuracy: ±0.1 mA, ±2% of reading (±1 mA)
Display	800 x 480 pixels back-lit color LCD; viewable in direct sunlight and low light
Computer Interface	USB 2.0
Internal Data Storage	128 records of 99 readings
Internal Test Plan Storage	Stores up to 128 transformer test plans; test plans can be transferred to PC
External Data Storage	USB flash drive interface (drive not included)
Tap Changer Contacts	240 V AC, 2A
Battery Back-up (optional)	12 V DC, 7 AH for 3 hours of operation
Printer (optional)	3.5" wide thermal printer
Test Results	Auto-detection of transformer configuration
PC Software	Windows®-based transformer analysis software is included
Safety	IEC/EN 61010-1, EN 61326-1, EN 61000-3, and EN 61000-4 certified. UL 61010A-1, and CSA-C22.2 standards.
Humidity	90% RH @ 40°C (104°F) non-condensing
Temperature	Operating: -10°C to +50°C (+15°F to +122°F) Storage: -30°C to +70°C (-22°F to +158°F)
Altitude	2,000 m (6,562 ft)
Included Cables	One 15' (4.57m) sing-phase cable set, one 15' (4.57m) 3-phase cable set, one 25' (7.62m) extension cable set, one safety ground cable, one USB cable, cable bag
Warranty	Two years on parts and labor
Options	Shipping case (can hold unit and cables), printer, battery back-up
Specifications are valid at nominal voltage and ambient temperature of +25°C (+77°F)	