

## True Three Phase Turns Ratio Tester



**TR 300**

- Selectable test voltages: 4, 12, 40, 100 & 250 VAC & user defined (optional)
- Measurement range 0.75 – 50 000 with high accuracy
- Built in 3.5" thermal printer
- True three-phase voltage measurement
- Stores up to 128 test results with up to 99 readings for each test (10,000 test results)
- Magnetic Balance Test (optional)
- Automatic vector group detection
- Built-in tap changer control

### Introduction:

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 0.75-50,000. 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

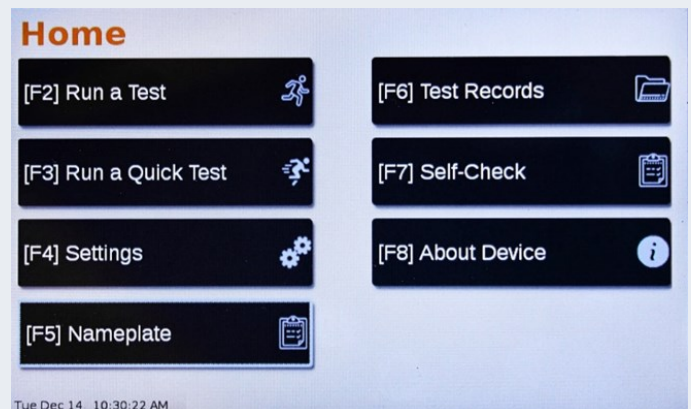
The TR 300 offers selectable test voltages of 4V, 40V, and 100V. Optionally, user defined test voltage up to 250V is available for testing in electrically noisy environments. The higher test voltages increase the measurement accuracy, especially at high turns ratios. The TR 300 generates its own three phase test voltages so that the turns ratio, excitation current, and phase angle can be measured. 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. 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.

TR 300 performs the following tests.

- Turns Ratio, Phase angle & Excitation current measurement
- Deviation from expected TR
- Automatic Vector group detection
- Magnetic Balance test

### User Interface

The unit's back-lit color LCD touchscreen (800 x 480 pixels) is viewable in bright sunlight and low-light and provides an intuitive menu structure where running a test is just few taps away. The full-sized industrial keyboard makes data entry quite easy for information such as nameplate and setting information. The TR300 features a built-in 3.5" thermal printer for quick printout of results in the field.



### Data Storage and Analysis

The TR300 can store up to 128 test results internally. Test results can be transferred to a PC via the unit's USB Flash drive interface (Flash drive not included) or directly via the USB 2.0 PC interface. The provided PC software can be used for analysis and report generation.

Technical Specification : TR 300

<b>Physical Specifications</b>	
Dimensions	21" w x 8" H x 17" D (53 cm x 20.5 cm x 43 cm)
Weight	Weight without Battery: 34 lbs. (15 Kg), Weight with Battery: 37 lbs. (17 Kg)
Operating Voltage	90 – 240 Vac, 50/60 Hz
Measuring Method	ANSI/IEEE C57.12.90
Battery Back up (Built in)	10 Ah 12 V LiFePo4 for 3 hours of operation (optional)
<b>Turns Ratio Accuracy</b>	
	<b>4 Vac &amp; 12 Vac:</b> 0.75– 14,999 : Typ. 0.08% (Max ±0.1%)
	<b>40 Vac:</b> 0.75 – 14,999 : Typ. 0.05% (Max ±0.1%), 15,000 – 50,000: Typ. 0.15% (Max ±0.25%)
	<b>100 Vac:</b> 0.75 – 14,999 : Typ. 0.05% (Max ±0.1%), 15,000 – 50,000: Typ. 0.15% (Max ±0.25%)
	<b>250 Vac:</b> 0.75 – 14,999 : Typ. 0.05% (Max ±0.1%), 15,000 – 50,000: Typ. 0.15% (Max ±0.25%) (optional)
<b>Excitation Current Range</b>	0 – 2 Ampere; Accuracy: ±0.1 mA, ±1% of reading (±1 mA)
<b>Phase Angle Measurement</b>	
Range	0 – 360 degrees
Accuracy	±0.1 degree (±1 digit)
Polarity Reading	In-phase or out-of-phase indication
<b>Tap Changer Contacts</b>	240 V AC, 2A
<b>Display</b>	Touch enabled 800 x 480 pixels back-lit color LCD; viewable in direct sunlight
<b>Printer</b>	3.5" Thermal paper printer ( optional)
<b>Keyboard</b>	Full-sized "QWERTY"-style industrial keyboard
<b>OPERATING/STORAGE TEMPERATURES</b>	
Temperature	Operating: -10°C to +50°C (+15°F to +122°F) Storage: -30°C to +70°C (-22°F to +158°F)
Humidity	90% RH @ +40°C (+104°F)
<b>DATA STORAGE AND ANALYSIS</b>	
Internal Test Record Storage	Up to 128 records with max 99 results per record
External Test Record Storage	USB Flash drive interface and firmware updates
<b>Included Cables</b>	One 15' (4.57 m) 3-phase cable set for HV & LV side, one 10' (3.3 m) safety ground cable, one USB cable, one power cord, one 10' (3.3m) LTC control cable & cable bag
<b>Optional Cables</b>	25' extension cable for HV and LV side