

## True Three-Phase Transformer Turns Ratio Tester TRT40A

- Test voltages 8 V, 40 V, 125 V AC
- Ratio range 0,8 – 15 000
- The best accuracy of 0,05%
- Measurement of turns ratio
- Measurement of phase shift
- Measurement of excitation current
- Three-phase and single-phase test
- Automatic vector group detection
- Detailed analysis of test results using DV-Win software



### Description

TRT40A is a true three-phase, fully automatic test set specially designed for turns ratio, phase shift and excitation current measurements of power, distribution and instrument transformers. TRT40A determines the transformer turns ratio by accurately measuring the voltages across the unloaded transformer windings and then displaying the ratio of these voltages (ratios range from 0,8 to 15 000).

TRT40A is based on a state of the art technology, using the most advanced technique available today. The test set can be used to test single-phase and three-phase transformers, both with and without taps in accordance with the requirements of the IEC 60076-1 standard.

For a three-phase measurement, the test set is connected to all the three phases of a transformer to be tested. If specific vector diagrams are selected for different types of transformers, the TRT40A will run a specific test for each transformer type (i.e., single phase, Delta to y, Y to delta, Delta to delta, or Y to y) without a need to switch the test hookup cables. It displays a turns ratio, phase shift and excitation current, obtained with true three-phase and single-phase tests. With the AVGD test, TRT40A can automatically detect vector group of a transformer.

TRT40A lets users enter a transformer's nameplate voltages for the turns ratio deviation calculation. This feature eliminates any error otherwise caused by an operator's manual calculation. The TRT40A also compares the test result with the calculated ratio and prints out the % of error for each test. It is easy to read the instruments display and easy to follow the menu. There is enough memory in the TRT40A to store 100 test records. Each record consists of 100 test readings. All measurements are time and date stamped. The measurements can be printed on an optional built-in thermal printer using the Print button.

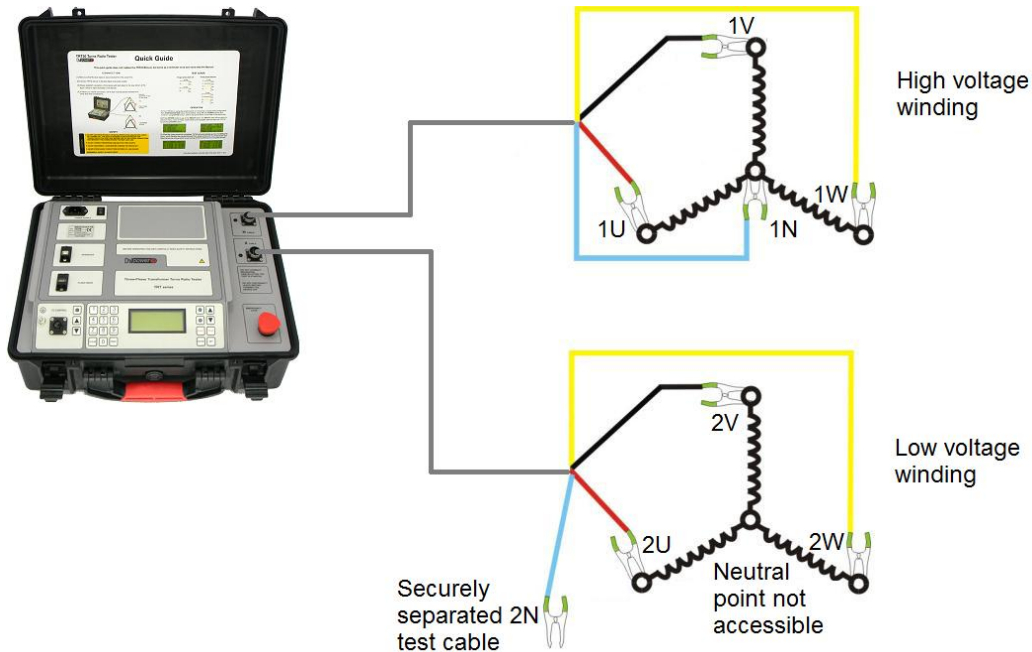
The transformer excitation current, as well as the phase angles, help to detect transformer's shorted turns or unequal number of turns connected in parallel. Operating conditions messages or error messages identify incorrect test conditions, abnormal operating condition or winding problems.

TRT40A has a very high ability to cancel electrostatic and electromagnetic interference in HV electric fields. It is achieved by a very efficient filtration. The filtration is made utilizing the proprietary hardware and software design solutions.

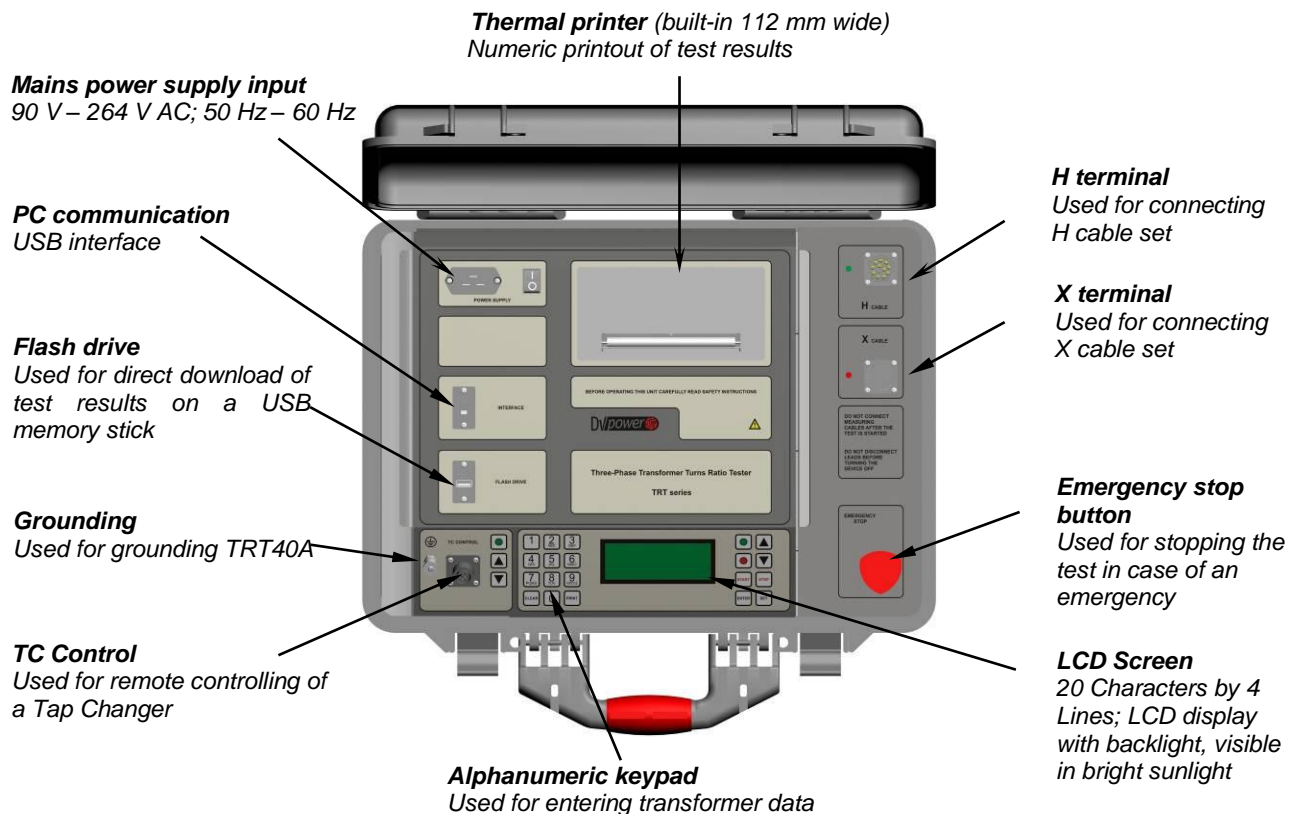
### Application

The TRT40A is programmed to automatically test turns ratio, phase shift and excitation current of power, distribution and instrument transformer types defined by CEI/IEC standards. Together with Extension Transformer CVT40 it can output up to 5 kV AC, which is suitable for testing capacitive voltage transformers.

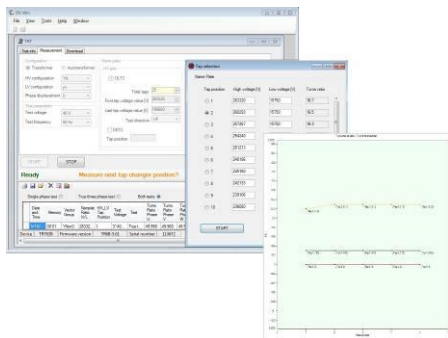
### Connecting a test object to TRT40A



### Features



## DV-Win software



DV-Win software has the following features:

- Full control of TRT40A functions from a PC.
- Creating and storing test plans.
- Download test results from the instrument.
- Acquisition and analysis of test results.
- Graphical display of test results.
- Creating reports including numerical and graphical data.
- Test results can be viewed, edited, saved, printed and exported.
- Zoom and pan graph feature.

## Accessories

### Included

- DV-Win PC software
- Ground cable
- USB cable
- Built-in Tap Changer Control Unit
- Tap Changer Control cable set 5 m

### Recommended

- H winding test cable 5 m, 3~ connection with TTA clamps
- H winding test cable extension, 5 m, shielded
- X winding test cable 5 m, 3~ connection with TTA clamps
- X winding test cable extension, 5 m, shielded
- Cable bag

### Optional

- Built-in thermal printer 112 mm
- Thermal paper roll
- Cable plastic case – medium size
- Cable plastic case with wheels – medium size
- Transport case
- Bluetooth communication module
- Inverter 12 V DC to 230 V AC, 50 Hz
- H winding test cable 3 m, 3~ connection with TTA clamps
- X winding test cable 3 m, 3~ connection with TTA clamps
- H winding test cable 10 m, 3~ connection with TTA clamps
- X winding test cable 10 m, 3~ connection with TTA clamps
- H winding test cable extension 10 m, shielded
- X winding test cable extension 10 m, shielded
- H winding test cable extension 15 m, shielded
- X winding test cable extension 15 m, shielded
- H winding test cable 3 m, 1~ connection with TTA clamps
- X winding test cable 3 m, 1~ connection with TTA clamps
- H winding test cable 5 m, 1~ connection with TTA clamps
- X winding test cable 5 m, 1~ connection with TTA clamps
- Extension Transformer CVT40 with associated cables
- TRTC Verification Calibrator with associated cables



H & X winding test cables, 3~ connection with TTA clamps\*

H & X test cable extensions\*

Cable bag

Cable plastic case

\*The above cables are also available in several lengths. Please contact DV Power for more information.

## Technical Data

### Mains Power Supply

- Connection: according to IEC/EN60320-1; UL498, CSA 22.2
- Mains supply: 90 – 264 V AC
- Frequency: 50/60 Hz
- Input power: 250 VA
- Fuse: 2 A / 250 V, type F, but not user replaceable

### Output Data

- Test voltage 8 V, 40 V, 125 V AC  
3 x (8, 40, 125) $\sqrt{3}$  V AC

### Measurement

- Ratio measuring range 0,8 – 15 000 (5-digit resolution)
- Typical ratio accuracy:

@125 V AC	@40 V AC	@8 V AC
0,8 – 999: $\pm 0,05\%$	0,8 – 999: $\pm 0,05\%$	0,8 – 999: $\pm 0,05\%$
1000 – 3999: $\pm 0,05\%$	1000 – 3999: $\pm 0,1\%$	1000 – 3999: $\pm 0,1\%$
4000 – 15000: $\pm 0,1\%$	4000 – 15000: $\pm 0,2\%$	4000 – 15000: $\pm 0,2\%$

- Excitation current range 0 – 2 A
- Typical excitation current accuracy  $\pm (0,25\% + 500 \mu\text{A})$
- Excitation current resolution:
 

0 – 9,9999 mA	0,1 $\mu\text{A}$
10 – 99,999 mA	1 $\mu\text{A}$
100 – 999,99 mA	10 $\mu\text{A}$
1 – 2 A	100 $\mu\text{A}$
- Phase angle range 360°
- Typical phase angle accuracy  $\pm 0,05^\circ$
- Phase angle resolution 0,01°

### Display

- LCD screen 20 characters by 4 lines; LCD display with backlight, visible in bright sunlight

### Interface

- TRT40A is equipped with a USB port to connect to an external computer
- TRT40A is equipped with a USB flash drive to export results to USB memory stick

### Test Result Storage

- TRT40A can store up to 10 000 test results

### Environmental conditions

- Operating temperature: -10 °C – + 55 °C / 14 °F – +131 °F
- Storage & transportation: -40 °C – + 70°C / -40 °F – +158 °F
- Humidity: 5 % – 95 % relative humidity, non condensing

### Dimensions and weight

- Dimensions (W x H x D) 480 x 197 x 395 mm / 18.9 x 7.75 x 15.55 in
- Weight 9 kg / 19.8 lbs

### Applicable Standards

- Installation/Overvoltage category: II
- Pollution degree: 2
- Safety LVD 2006/95/EC (CE Conform)  
Standard EN 61010-1:2001
- EMC Directive 2004/108/EC (CE Conform)  
Standard EN 61326-1:2006

*All specifications herein are valid at ambient temperature of + 25 °C and recommended accessories. Specifications are subject to change without notice.*