TTRU1 BASIC, ADV
Handheld transformer turns ratiometer



- **Single phase source and measurement for single phase, three phase, and instrument transformer testing:**
  - **Turns ratio, excitation current, and polarity**
    Up to 62.5 V induced, ±0.05 % accuracy
- **Go/No Go short circuit and open circuit winding tests**
- **Accuracy guaranteed from -20 °C to 50 °C**
- **Easily manage data with custom transformer entry, auto saving, USB export, and PowerDB import**
- **AA battery operated**
  - **NiMH USB-C rechargeable batteries included**

DESCRIPTION

Power through transformer electromechanical tests with the new TTRU1, the latest handheld transformer turns ratiometer from Megger. Perform routine polarity validation and turns ratio tests on power, distribution, and instrument transformers guided by colour-coded leads, clamps, and customisable on-screen vectors that match the transformer nameplate under test. In addition to turns ratio tests, the TTRU1 adds go/no-go short circuit and open circuit test capabilities. The easy to follow setup ensures the right result the first time - just click start and perform over 1000 turns ratio tests on a single NiMH AA battery charge! When it's time to recharge the batteries, connect to any standard USB wall charger or connect to your PC.

STANDARD FEATURES

- Automatic results storage
- Microsoft Excel export
- Full colour Hi-bright LCD screen
- TTR Up to 62.5 V AC, ±0.05 % accuracy
- Additive/Subtractive polarity detection
- Excitation current
- Auto screen dimming and power off
- Pass/Fail ratio evaluation
- Instrument self-check
- USB drive save and export
- Belt loop carry bag
- Battery operated with USB-C Rechargeable AA NiMH batteries included

ADDITIONAL FEATURES

- PowerDB Import
- Customisable transformer vector list and voltages
- Go/No Go short circuit impedance, open circuit, impedance
- USB printer
- Hand crank and solar battery pack
- WiFi adapter

DETAILED DESCRIPTION

The TTRU1 is designed to test distribution, instrument (CTs and PT/VTs), and power transformers. With minimal input from the user, the TTRU1 delivers the required AC voltage and current to obtain accurate results.

Reduce training time with the intuitive full colour Hibright LCD user interface of the TTRU1. The configurable vector list in the TTRU1-ADV model saves information for transformers routinely tested, simplifying selection of common transformer configurations and results interpretation. When exported, results are grouped by file name, producing an XLSX/PDF report that is easy to read, email, or import into PowerDB. If you need results on the spot, use the optional USB printer!

Perform up to 1000 TTR tests on a single charge with AA NiMH batteries installed from the factory. When it is time to charge the batteries, connect the provided USB-C cable to any wall charger or computer USB port.

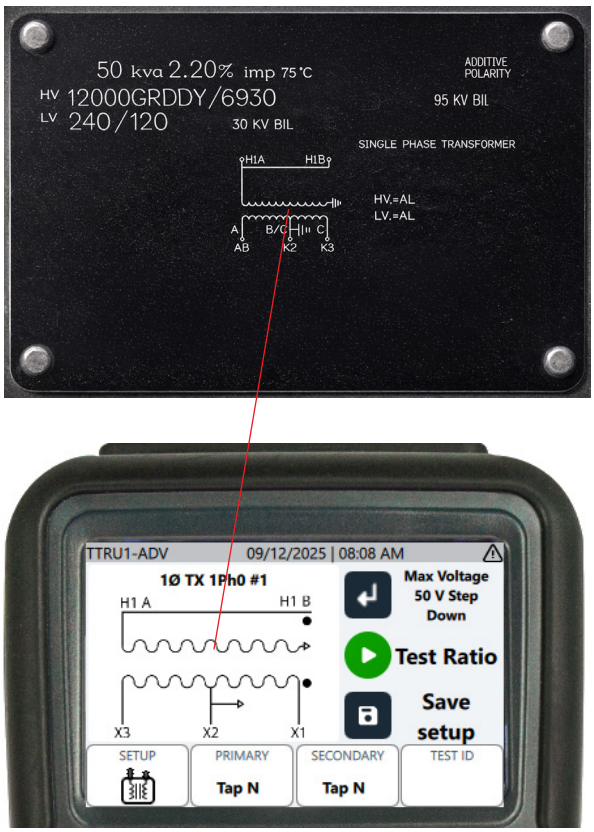
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TTR - Turns ratio testing

When compared to other single phase turns ratio test instruments, the TTRU1 is easier to use as you don't need to know the proper test voltage to obtain a valid test result. The TTRU1 uses the latest technological advancements, providing safe, repeatable, and reliable results.



Additive/Subtractive polarity recognition

Polarity recognition provides confidence in transformer results by performing vector group validation during every test. Results on screen show if the connected distribution transformer is additive or subtractive.

Excitation current

Included with the TTR test, the excitation current test is extremely useful in locating problems such as defects in magnetic core balance, magnetic core structure, shifting windings, failures in the turn-to-turn insulation, or problems in tap changers.

Custom vector list/voltages – TTRU1 ADV

Increase efficiency by saving up to 10 commonly used transformer vectors and voltages found in the power network. Recall saved transformer vectors and test with confidence that the setup and evaluations are correct.

Go/No Go short circuit and open circuit - TTRU1 ADV

Go/No go short circuit and open circuit winding tests provides confidence that the high and low side of a distribution transformer does not have easily identifiable failures.

WiFi Data Streaming

With the WiFi adapter connected to the TTRU1, launch the PC software and connect to the TTRU1 using the PCs wireless connection. Configure the export folder in settings and watch as results are automatically streamed to your PC!

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SPECIFICATION

Input power

6 x IEC LR6 1.5 V alkaline (AA)

6 x IEC HR6 1.2 V NiMH rechargeable (AA)

Battery life

1000 TTR tests on a single charge

Storage: 1+ years NiMH, 5+ years alkaline

Battery charging

USB-C when set to NiMH batteries

Protection against alkaline charging

PowerEx PRO NiMH battery charging: 0 to 45 °C.

Output

Voltage	Single phase, 1-50 V
Current	0.1 mA – 1 A
Frequency range	40 – 480 Hz

Regulatory

Safety	IEC 61010-1:2010 + AMD1:2016
EMI/EMC	IEC 61326-1:2012
RoHS2	EN50581
Vibe/Shock	MIL-STD -810G
Ingress	IP54

Transformer testing standards

IEEE	C57.152-2013
IEC	60076-1:2011
AS/NZS	6076 1:2014
CIGRE	445 2011
GOST	3484.1-88

Dimensions

22.8 x 10.5 x 7.5 cm (8.98 x 4.1 x 2.95 in)

Weight

1 kg (2.2 lbs)

Case

Heavy duty over-molded case with built in connection for hook strap. Carry case with quick start guide, belt loop hook, and pouches for included lead set and accessories.

Internal/external data storage

IUp to 10 custom vector storage

Up to 10 000 sets of single phase results internal storage

Transferable via USB 2.0 drive

Communication/control software

USB Interface for PC download with custom GUI

Display

Full colour 88 mm (3.5 in) 320 x 240 px Hi-bright LCD screen with ‘auto dim’ and ‘auto off’ to preserve battery life

Printer (optional)

51 mm (2 in) thermal printer

Prints all measurement data displayed on GUI

Environmental

Operating	-20 ° to 50 °C (-4 ° to 122 °F)
Storage	-30 ° to 70 °C (-22 ° to 158 °F)
Relative humidity	0-90 %, non-condensing

TTR

Turns ratio measurement methods

Single phase step down

Turns ratio range and accuracy

25 - 50 V

±0.05 % 0.8 – 1000

±0.10 % 1001 – 2000

±0.30 % 2001 – 15000

±1.0 % 15000 +

1-24 V

±0.10 % 0.8 – 1000

±0.20 % 1001 – 2000

±0.60 % 2001 – 15000

±2.0 % 15000 +

Excitation current resolution

Resolution	0.1 mA, 0.1 mA – 100 mA
	1.0 mA, 101 mA – 1000 mA

Excitation current

accuracy	±1 % Reading, ±0.1 mA
Frequency accuracy	±1 % Reading, ±0.1 Hz
Max voltage output	45 V AC_{peak}

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TTRU1 Selection Guide	TTRU1 BASIC	TTRU1 ADV
Approximate Maximum Transformer Capacity	2 MVA	10 MVA
Max induced voltage	37.5 V	62.5 V
Max turns ratio	50 000 Down	
Max current	1 A	
Full colour Hi-bright LCD screen	■	
Pass / Fail ratio evaluation	■	
Additive/ Subtractive polarity validation	■	
Excitation current measurements	■	
Automatic results storage	■	
Auto dim and power off battery saving	■	
Self-check diagnosis	■	
USB drive save and export	■	
Battery operated NiMH or alkaline	■	
USB-C NiMH battery charging	■	
Soft carry bag with belt loop hook	■	
Microsoft Excel export	■	
PowerDB Import		■
Go/No Go short circuit, open circuit		■
Customisable transformer vector list and voltages		■
WiFi adapter	Optional	
USB printer	Optional	
USB-C connection results download, updates	■	
Hand crank/solar battery charger pack	Optional	

■ = INCLUDED
■ = EXCLUDED

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Megger

Ordering information

ORDERING INFORMATION

Item (Qty)	Cat. No.
1 Phase Handheld Turns Ratiometer	TTRU1-BASIC TTRU1-ADV
Included accessories	
Soft carry case	1012-063
USB C to A cable	90041-001
USB C to C cable	90041-002
2 m (6 ft) H and X leads	1015-031
USB drive	90012-878
Optional leads	
3 m (12 ft) H and X leads	1015-032
6 m (20 ft) H and X leads	1015-033
9 m (30 ft) H and X leads	1015-035
3 m (9 ft) H and X leads with banana connectors for CT/PT testing	1015-037

Optional hardware accessories

Item (Qty)	Cat. No.
Calibration certification	TTRU1-CAL-CERT
Backpack lead bag	2012-180
WiFi adapter	90040-630
USB NiMH battery charger with outlet adapter	90041-006
USB printer	90029-573
USB printer paper (x48 rolls)	90029-573-P
USB outlet adapters (US, UK, CE)	90041-003
TRS1+ calibration standard	TRS1PLUS
Hand crank and solar battery pack	90041-007
Magnetic strap	1010-013
12 V Car accessory outlet adapter	90041-004
15kV Tx probe adapter	210.00012
25kV Tx probe adapter	210.00011
Bushing adapter	MC7144
Hard sided case	1015-532

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