Megger

User Manual
TRS1

Transformer Ratio Standard

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User's Manual

Megger Valley Forge is certified according to ISO 9001

Megger

Contents

1 INTRODUCTION

1.1 Receipt of product

Prior to operation, check for loosened hardware or damage incurred during transit. If these conditions are found, a safety hazard is likely, DO NOT attempt to operate equipment. Please contact Megger as soon as possible.

1.2 Product overview

The TRS1® is a unit designed to be used with ratio meters as a high accuracy reference ratio standard. This unique standard is able to provide ratios in both step down (traditional ratio test instruments) and step up (Biddle Hand Crank TTR) test modes. The standard is designed for use as a laboratory calibration standard, or as a portable check standard for field ratio and phase verification of any ratio instruments.

1.3 Control, input, output

1. **Calibration reference**
2. **H***- Terminal for H1/1U/A lead. P/C = potential/current
3. **H** - Terminal for H2/1V/B lead. P/C = potential/current
4. **Ratio selection switch**
   Enables different ratios for step down or step up
5. **Quick start guide**
6. **Step down/up toggle switch**
   Enable excitation from H or X leads (step down/up)
7. **X*** - Terminal for X1/2U/a lead. P/C = potential/current
8. **X** - Terminal for X2/2V/b lead. P/C = potential/current

2 SAFETY

1.1 Responsible User

Only qualified and trained operators should operate the TRS1. Operator must read and understand this entire Instruction Manual prior to operating the equipment. Operator must follow the instructions of this Instruction Manual and attend the equipment while the equipment is in use. In the event of equipment malfunction, the unit should immediately be de-energized and returned to Megger for repair. The Safety precautions herein are not intended to replace your Company's Safety Procedures. Refer to IEEE 510 - 1983, IEEE Recommended Practices for Safety in High- Voltage and High-Power Testing, for additional information

1.2 Symbols

Caution, possibility of electric shock

1.3 General Precautions

The TRS1 and the ratio meter should both be considered sources of instantaneously lethal levels of electrical energy.

Observe the following safety precautions:

- **Observe all safety warnings on the equipment. They identify areas of immediate hazard that could result in injury or death.**
- **Use this equipment only for the purposes described in this manual. Observe strictly the Warning and Caution information provided in this manual**
- **Treat all terminals of the TRS1 and high-voltage power equipment systems as potential electric shock hazards. Use all practical safety precautions to prevent contact with energized parts of the equipment and related circuits.**
- **Use suitable barriers, barricades, or warnings to keep persons not directly involved with the work away from test activities.**
- **Never connect the test equipment to energized equipment.**
- **Do not use in an explosive atmosphere.**
- **Use the grounding and connection procedures recommended in the ratio meter manual. The ground connection must be the first made and the last removed. Any interruption of the grounding connection can create an electrical shock hazard.**
- **Personnel using heart pacemakers should obtain expert advice on the possible risks before operating this equipment or being close to the equipment during operation**

3 SPECIFICATIONS

Physical Data	
Dimensions	5.6875 H x 12 W x 10.625 D in (144 H x 304 W x 270 D mm)
Weight	12lbs (5 kg)
Electrical	
Input Frequency	50 to 240 Hz
Step Down Voltage Input	< 275V AC
Step Up Voltage Input	< 8V AC
Max Loading	< 5VA
Regulatory	
Safety	IEC 61010
Vibration/Drop/Shock	MIL-STD-810G
Environmental	
Operating Temperature Range	14°F to 122°F (-10°C to 50°C)
Storage Temperature Range	-22°F to 158°F (-30°C to 70°C)
Relative Humidity	0 to 90% Noncondensing
IP Rating	54
Ratios	

		From Calibration Report @ Max V	
Mode	**Ratios**	**Ratio Accuracy**	**Phase Accuracy**
Down	1:1, 2:1, 4:1, 8:1, 16:1, 32:1, 64:1, 128:1	±0.0125%	±3 minutes
	256:1, 512:1, 1024:1, 2048:1	±0.0125%	±10 minutes
Up	1:1, 2:1, 4:1, 8:1, 16:1, 32:1	±0.0125%	±3 minutes

4 PREPARING FOR TEST

4.1 Site Preparation

Choose a location that meets the following conditions:

- **The location is as dry as possible**
- **There is no flammable material stored in the vicinity**
- **The test area is adequately ventilated**
- **The test area is flat surface**
- **Be sure all equipment is de-energized. Erect suitable safety barriers to protect the operator from traffic hazards and to prevent intrusion by unauthorized personnel. User provided Warning lights are recommended**
- **Verify that the Local station ground is intact and has impedance continuity to earth**

4.2 Connecting to TRS1

See Appendix for instrument specific connections

Connections should be made in the order listed below:

1. Turn off the ratio meter intended to measure the TRS1
2. Disconnect leads from the ratio meter
3. Place the TRS1 in an upright position on a flat surface and open the lid
4. Connect leads to TRS1
5. Connect H1 (or equivalent) to TRS1 H
6. Connect H2 (or equivalent) to TRS1 H
7. Connect X1 (or equivalent) to TRS1 X
8. Connect X2 (or equivalent) to TRS1 X
9. Connect the leads to the ratio meter

For Kelvin leads, connect potential to P and Current to C. For non-Kelvin leads, connect clamp across both terminals.

5 OPERATION

Ensure the ratiometer is not applying voltage to the TRS1

1. Use the toggle switch to select Step Down or Step Up operation (available for TRS1+)
2. Use the ratio selection switch to select the ratio for the ratio meter to measure
3. Following the manual for the ratio meter, execute a single phase ratio test

6 SERVICE

6.1 Troubleshooting

The Troubleshooting Guide is arranged to help you evaluate the reasons for TRS1 malfunction. The possible test set malfunctions and causes are listed below. Electronic circuit repairs should not be attempted in the field. Refer to Repair section.

Unit is not providing Step Down Ratios

- **Toggle switch in incorrect position**
- **Ratio meter leads incorrectly connected**
- **Ratio meter sourcing more than 300VAC**
- **Problem with ratiometer**

Unit is not providing Step Up Ratios

- **Toggle switch in incorrect position**
- **Ratio meter leads incorrectly connected**
- **Ratio meter sourcing more than 8VAC**
- **Problem with ratiometer**

6.2 Maintenance

Maintenance should be performed only by qualified persons familiar with the hazards involved with highvoltage test equipment. Read and understand Sections 1, 2, 3, 4, and 5 before performing any service.

The TRS1 requires only periodic inspection. Inspect all hardware items to ensure all are in good condition.

The TRS1 may be cleaned periodically. In so doing, do not allow water to penetrate panel holes. An allpurpose, household spray cleaner can be used to clean the panel. Polish with a soft, dry cloth. Clean the cables and mating panel receptacles with isopropyl or denatured alcohol applied with a clean cloth.

6.3 Calibration

A complete performance and calibration check should be made at least once every year. This will ensure that the TRS1 is functioning properly over the entire measurement range. The TRS1 calibration is performed on each new or repaired unit before sending it to a customer.

6.4 Repairs

Any service or repair of this equipment should be performed only by qualified persons who are aware of electrical hazards and the necessary precautions required to prevent injury.

Megger offers a complete Repair and Calibration Service and recommends that its customers take advantage of this service for routine maintenance or in the event of any equipment malfunction.

In the event Service is required, contact your Megger representative for a product Return Authorization (RA) number and shipping instructions.

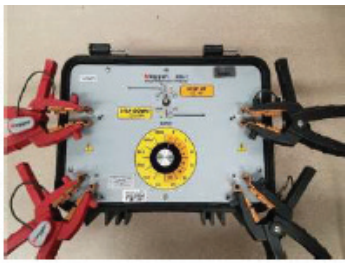
Ship the product prepaid and insured and marked for the attention of the Megger Repair Department. Please indicate all pertinent information, including catalog number, serial number, and problem symptoms.

A APPENDIX

A.1 TTRU3

1. Connect leads labeled H1/H2 to the TRS1 H*/H terminals, respectively.

2. Connect leads labeled X1/X2 to the TRS1 X*/X terminals, respectively.



A.1 550005B (Hand Crank)

1. Connect leads labeled H1/H2 to the TRS1 H*/H terminals, respectively.

2. Connect leads labeled X1/X2 to the TRS1 X*/X terminals, respectively.

A.2 TTR 550503 / TTR3XX Series

1. Connect leads labeled H1/H2 to the TRS1 H*/H terminals, respectively.

2. Connect leads labeled X1/X2 to the TRS1 X*/X terminals, respectively.

Your “One Stop” source for all your electrical test equipment needs

- Battery Test Equipment
- Cable Fault Locating Equipment
- Circuit Breaker Test Equipment
- Data Communications Test Equipment
- Fiber Optic Test Equipment
- Ground Resistance Test Equipment
- Insulation Power Factor (C&DF) Test Equipment
- Insulation Resistance Test Equipment
- Line Testing Equipment
- Low Resistance Ohmmeters
- Motor & Phase Rotation Test Equipment
- Multimeters
- Oil Test Equipment
- Portable Appliance & Tool Testers
- Power Quality Instruments
- Recloser Test Equipment
- Relay Test Equipment
- T1 Network Test Equipment
- Tachometers & Speed Measuring Instruments
- TDR Test Equipment
- Transformer Test Equipment
- Transmission Impairment Test Equipment
- Watthour Meter Test Equipment
- STATES® Terminal Blocks & Test Switches
- Professional Hands-On Technical and Safety Training Programs

Megger is a leading global manufacturer and supplier of test and measurement instruments used within the electric power, building wiring and telecommunication industries.

With research, engineering and manufacturing facilities in the USA, UK, Germany and Sweden, combined with sales and technical support in most countries, Megger is uniquely placed to meet the needs of its customers worldwide.

Megger is certified according to ISO 9001 and 14001.Megger is a registered trademark.

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