

HPRS-HIPOT-LOAD

High Power Resistive Load

User and Service Manual



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HPRS-HIPOT-LOAD im/November 2013

WARRANTY

We warrant that this product is free from defects in material and workmanship and, when properly used, will perform in accordance with applicable IET specifications. If within one year after original shipment, it is found not to meet this standard, it will be repaired or, at the option of IET, replaced at no charge when returned to IET. Changes in this product not approved by IET or application of voltages or currents greater than those allowed by the specifications shall void this warranty. IET shall not be liable for any indirect, special, or consequential damages, even if notice has been given to the possibility of such damages.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.



WARNING



OBSERVE ALL SAFETY RULES
WHEN WORKING WITH HIGH VOLTAGES OR LINE VOLTAGES.

**Dangerous voltages may be present inside this instrument. Do not open the case
Refer servicing to qualified personnel**

HIGH VOLTAGES MAY BE PRESENT AT THE TERMINALS OF THIS INSTRUMENT

WHENEVER HAZARDOUS VOLTAGES (> 45 V) ARE USED, TAKE ALL MEASURES TO
AVOID ACCIDENTAL CONTACT WITH ANY LIVE COMPONENTS.

USE MAXIMUM INSULATION AND MINIMIZE THE USE OF BARE
CONDUCTORS WHEN USING THIS INSTRUMENT.

Use extreme caution when working with bare conductors or bus bars.

WHEN WORKING WITH HIGH VOLTAGES, POST WARNING SIGNS AND
KEEP UNREQUIRED PERSONNEL SAFELY AWAY.



CAUTION



DO NOT APPLY ANY VOLTAGES OR CURRENTS TO THE TERMINALS OF THIS
INSTRUMENT IN EXCESS OF THE MAXIMUM LIMITS INDICATED ON
THE FRONT PANEL OR THE OPERATING GUIDE LABEL.

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Chapter 1

INTRODUCTION

1.1 Introduction

The HPRS-HIPOT-LOAD consists of a series of 8 resistances from 10 k Ω to 5 M Ω . The resistances are in series between the Lo and the 5 M Ω terminals with taps connected to the other resistance values.

The HPRS-HIPOT-LOAD is designed for calibration of hipot testers and other applications requiring high power, high voltage fixed resistive load.

The load can be used in conjunction with the Fluke 5320A Multifunction Electrical Tester Calibrator or stand-alone with a separate voltmeter and current meter.

Leakage is kept to a minimum by the use of binding posts specially mounted on a Kel-F base. The Kel-F bases also provide excellent dielectric strength so no electrical breakdown will occur at voltages up to 5500 V.

A ground post is electrically connected to the chassis. The ground post is provided so the chassis can be connected to earth ground for safety.



Figure 1-1: HPRS-Hipot-Load

HPRS-Hipot-Load shown in Figure 1-1 features:

- Individual binding posts for each value
- Lo binding post for common
- A **GROUND** terminal connected to case

Chapter 2

SPECIFICATIONS

For convenience to the user, the pertinent specifications are given in a typical **OPERATING GUIDE**, like the one shown in Figure 2-1, affixed to the case of the instrument.

2.1 Specifications

Resistance	Maximum Peak Voltage	Max power (W)	Resistor Type
10 kΩ	1400 V	196 W	Tubular ceramic
35 kΩ	2000 V	110 W	
50 kΩ	2000 V	80 W	
100 kΩ	5500 V	300 W	
250 kΩ	5500 V	120 W	
500 kΩ	5500 V	60 W	
1 MΩ	5500 V	30 W	
5 MΩ	5500 V	5 W	Thick film

Table 2-1: HPRS-HIPOT-LOAD Electrical Specifications

Adjustment to Nominal:

±10% at 23°C and 95% confidence level; traceable to SI

Terminals:

Nine 5-way binding posts with Kel-F washers and one ground post electrically connected to case. The binding posts are gold plated and constructed of tellurium copper for low thermal emf and low resistance.

Operating Temperature Range:

18°C to 28°C

Storage Temperature:

0°C to 40°C

Dimensions:

42.7 cm W x 12.4 cm H x 31.5 cm D (16.8" x 5.2" x 12.4")

Weight:

4.5 kg (10 lb), nominal

HPRS-HIPOT-LOAD HIGH POWER RESISTIVE LOAD
 CONSULT INSTRUCTION MANUAL FOR PROPER INSTRUMENT OPERATION

Resistance	Maximum Peak Voltage	Max power (W)	Resistor Type
10 kΩ	1400 V	196 W	Tubular ceramic
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250 kΩ	5500 V	120 W	
500 kΩ	5500 V	60 W	
1 MΩ	5500 V	30 W	

Adjustment to Nominal:

±10% at 23°C and 95% confidence level;
 traceable to SI

Terminals:



MODEL: HPRS-HIPOT-LOAD

SN: E1-1348618

WARNING

Observe all safety rules when working with high voltages or line voltages. Connect the (GND) terminal to earth ground in order to maintain the case at a safe voltage. Whenever hazardous voltages (>45 V) are used, take all measures to avoid accidental contact with any live components: a) Use maximum insulation and minimize the use of bare conductors. b) Remove power when adjusting switches. c) Post warning signs and keep personnel safely away.



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Figure 2-1: Typical Operating Guide Affixed to Unit

MODEL INFORMATION

Model Number	Resistance Values	Value Range
HPRS-HIPOT-LOAD	8 values	10 kΩ to 5 MΩ

Table 2-2: Model Information

Chapter 3

OPERATION

3.1 Initial Inspection and Setup

This instrument was carefully inspected before shipment. It should be in proper electrical and mechanical order upon receipt.

An **OPERATION GUIDE** is attached to the case of the instrument to provide ready reference to specifications. See Figure 2-1.

Do not set equipment on the top of the HPRS-Hipot-Load or block cooling vents.

3.2 Connection

Connections should be made between one of the red binding posts and the black Lo binding post.

3.2.1 Electrical Considerations

The selected resistance is brought out using insulated, low-thermal-emf, red binding posts and the **LO** binding post.



Connect the CASE GND terminal to earth or other suitable ground in order to maintain the case at a safe voltage.

Whenever hazardous voltages (>45 v) are used, take all measures to avoid accidental contact with any live components.

Use maximum insulation and minimize the use of bare conductors.

Post warning signs and keep personnel safely away.

Case may become hot if high power is applied for an extended period, especially top and bottom.



Do not touch Kel-F washers with bare hands to minimize leakage.

Clean Kel-F washers with denatured alcohol when necessary.

A third binding post labeled **GND** (Ground) is connected to the case and may be used accordingly for safety or a shield terminal. As a good safety practice, the case should be grounded using the **GND** terminal when high voltages are applied. The maximum voltage between the Lo binding post and GND terminal should not exceed 1000 V peak.

Since high voltages may be present, it is important to observe all precautions and safety rules. Do not touch case of HPRS-Hipot-Load while high voltage is present.

Keep maximum applied voltages within values indicated for each resistance value. Maximum voltage is peak or dc.

3.3 Connection to Hipot Tester

The hipot tester is connected to the various resistances during the calibration process. The voltage across the load and the current flowing through the load is measured. The measured voltage and current can then be compared with the displayed value from the hipot tester during calibration or as part of the adjustment procedure.

Refer to the instructions for the Hipot, Calibrator, or DMM being used.

3.4 Environmental Conditions

3.4.1 Operating Temperature and Humidity

For optimal accuracy, use in an environment of 23°C ±5°C.

3.4.2 Storage Conditions

The HPRS-HIPOT-LOAD should be maintained within the storage temperature range of 0°C to 40°C to maintain its accuracy within the specified limits.

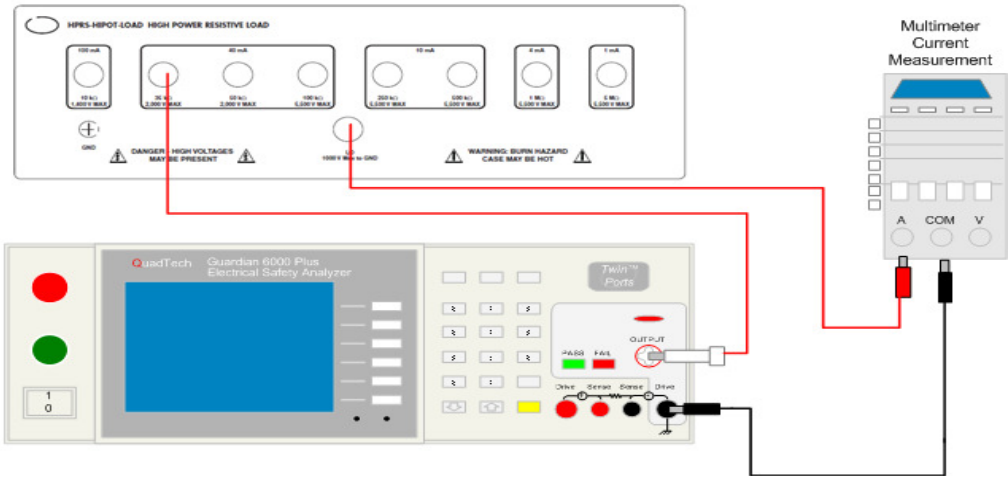


Figure 3-1 Typical Use with Hipot Tester

Chapter 4

MAINTENANCE

4.1 Preventive Maintenance

Keep the unit free from dust and contaminants to minimize leakage current and maintain dielectric strength.



When necessary, the front panel should be cleaned to eliminate any leakage paths around the binding posts. To clean the front panel, wipe the front panel clean using alcohol and a lint-free cloth.

4.2 Calibration

4.2.1 Calibration Interval

The recommended calibration interval for the HPRS-Hipot-Load is twelve (12) months.

4.2.2 General Considerations

Before starting the calibration procedure, you need to consider the following:

- Calibration environment should be 23°C and <50% RH.
- Test instruments should be sufficiently more accurate than the HPRS-Hipot-Load unit.
- The uncertainty of the measurement instruments has to be considered in the calibration to allow a band of uncertainty.
- The testing equipment and the HPRS-Hipot-Load should stabilize at laboratory conditions for at least 24 hours.
- Proper metrology practices should be followed to eliminate leakage.

4.2.3 Required Equipment

Many combinations of DMM, and bridges may be used to calibrate this instrument. Possible choices include Fluke 8508A, and Agilent 3458A.

4.2.4 Calibration Procedure

To calibrate the HPRS-HIPOT-LOAD, **proceed as follows:**

1. Set up the calibration equipment in the resistance-measurement mode.
2. Determine the allowable upper and lower limits for each resistance setting based on the specified accuracy and the confidence band.

Allow a confidence band for the uncertainty of the measuring instrument and setup.

3. Confirm that the resistances fall within these limits.
4. If any resistances fall outside these limits, the resistors may require service or replacement. Consult IET Labs.

4.3 Schematics

Figure 4-1 gives the schematic of HPRS-HIPOT-LOAD.

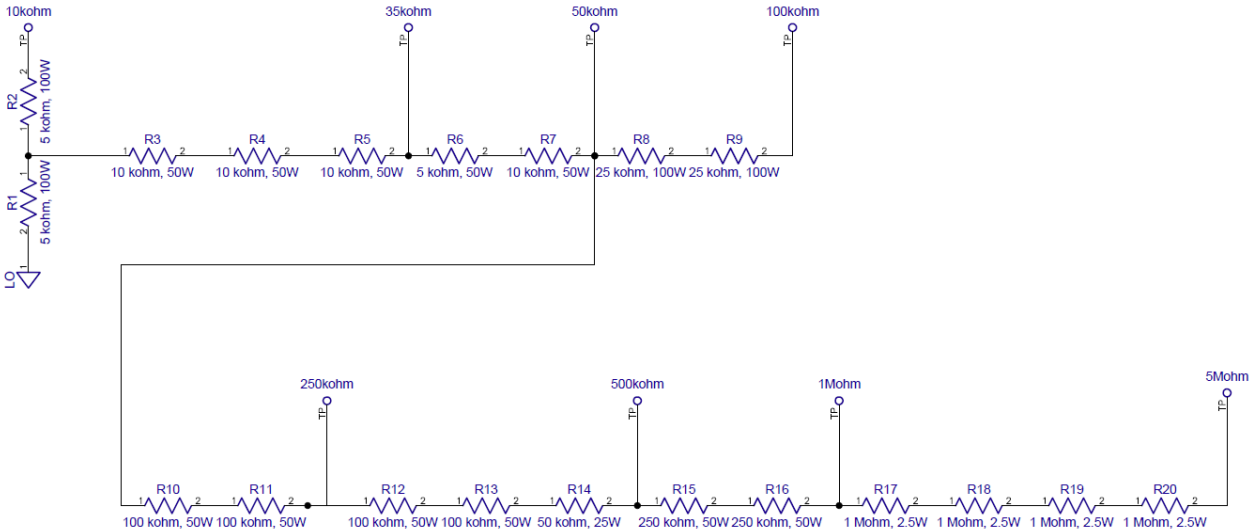


Figure 4-1: HPRS-HIPOT-LOAD Schematic

4.4 Customer Service

The IET warranty attests to the quality of materials and workmanship in our products. For application assistance or if difficulties occur, our engineers will assist in any way possible. If you cannot eliminate the difficulty, please e-mail, FAX, or phone our Service Department, giving full information of the trouble and of steps taken to remedy it. Be sure to include the type and serial number of the instrument.

For technical support, call 516-334-5959 or visit www.ietlabs.com.

4.5 Instrument Return

Before returning an instrument to IET for service please call our Service Department at 516-334-5959 for Return Material Authorization (RMA). Include a Purchase Order Number to insure expedient processing. Units under warranty will be repaired at no charge. For any questions on repair costs or shipment instructions, please contact our Service Department at the above number. To safeguard an instrument during shipment, please use packaging that is adequate to protect it from damage, (i.e., equivalent to the original packaging) and mark the box "Delicate Electronic Instrument". Return material should be sent freight prepaid to:

IET Labs, Inc.
1202 VFW Parkway
West Roxbury, MA 02132
Attention: Service Department