

# Keysight 16117B Low Noise Test Lead

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## WARNING

### HIGH VOLTAGE SHOCK HAZARD (MAX. 1000 Vdc)

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The HP 4339B High Resistance Meter forces dangerous voltage up to 1000 Vdc on the UNKNOWN terminals, or the electrodes of the accessory (the HP 16008B Resistivity Cell, the HP 16339A Test Fixture, or the HP 16117B,C Test Leads) which is connected to the HP 4339B. (When the High Voltage indicator on the front panel is ON, the HP 4339B outputs dangerous voltage more than 42 Vdc.) To prevent an electrical shock, observe the following safety precautions.

- Operate the HP 4339B and the accessories following the description on their Operation (and Service) Manuals, especially for the description written in the Warnings.
- Do not touch the UNKNOWN terminal or the electrode, when the V Output indicator on the front panel is ON, that is, when the HP 4339B forces voltage.
- Perform the operation tests of the interlock function and the High Voltage indicator at least once a day, before using the HP 4339B. Refer to "Checking Procedure" in chapter 3 of the Operation and Service Manual of the each accessory for the operation tests procedures.
- Warn workers around the HP 4339B about dangerous conditions.

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## 警告

### 高電圧感電注意（最大 1000 Vdc）

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HP 4339B ハイ・レジスタンス・メータは、UNKNOWN 端子、または、HP 4339B に接続されたアクセサリ（HP 16008B レジスティビティ・セル、HP 16339A テスト・フィクスチャ、または、HP 16117B,C テスト・リード）の電極に危険電圧（最大 1000 Vdc）を出力することがあります。この危険電圧による感電を避けるために、下記の事項を必ず実施してください。

- HP 4339B を操作するときには、必ずマニュアルの記述に従ってください。特に、「警告」に書かれていることは必ず守ってください。
- 電圧出力中（フロント・パネルの V Output インディケータの点灯中）は、UNKNOWN 端子、または、アクセサリの電極に触れないでください。
- 測定に使用するアクセサリを使って、測定開始前に、Interlock 機能、High Voltage インディケータの動作テストを行ってください。（1日1回以上）手順は、各アクセサリの Operation and Service Manual の 3 章の "Checking Procedure" 項を参照してください。
- 周囲の他の作業者に対しても、危険電圧を出力することがあることを知らせ、UNKNOWN 端子、または、アクセサリの電極に触れないように注意してください。

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## **AVVERTENZA**

### **PERICOLO DI SCOSSA AD ALTA TENSIONE (MAX. 1000 Vdc)**

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L'ohmmetro HP 4339B emette pericolosi livelli di tensione che possono raggiungere i 1000 Vdc sui terminali UNKNOWN, o sugli elettrodi degli impianti di prova o cavi di prova (Cella di resistività HP 16008B, Impianto di prova HP 16339A, o Cavi di prova C HP 16117B) che sono collegati all'HP 4339B. (Quando l'indicatore High Voltage sul pannello anteriore è attivato (ON), l'HP 4339B emette tensione elettrica pericolosa (più di 42 Vdc)) Per prevenire una scossa elettrica, osservare le seguenti precauzioni di sicurezza.

- Usare l'HP 4339B e gli accessori secondo le istruzioni dei rispettivi Manuali d'istruzione (e Servizio), specialmente le istruzioni date nelle "Avvertenze".
- Non toccare i terminali UNKNOWN o gli elettrodi quando l'indicatore V Output o il pannello anteriore sono attivati (ON): cioè quando della tensione viene applicata all'uscita dell'HP 4339B.
- Eseguire le prove di funzionamento della funzione Interlock e dell'indicatore High Voltage almeno una volta al giorno, prima di usare l'HP 4339B. Fare riferimento al "Checking Procedure" al capitolo 3 dell'Operation and Service Manual dell'accessorio che si sta usando per le procedure della prova di funzionamento.
- Informare gli operatori che si occupano dell'HP 4339B, delle condizioni di pericolo esistenti e riferire loro ciò che è possibile fare e ciò che non lo è!

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## **WARNUNG**

### **LEBENSGEFÄHRLICHE HOCHSPANNUNG (MAX. 1000 V DC)**

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Der Hochspannungsmesser HP 4339B gibt gefährliche Hochspannung von bis zu 1000 V Gleichstrom an den Klemmen UNKNOWN oder zu den Elektroden von Testvorrichtungen oder Testleitungen aus (HP 16008B spezifische Widerstandszelle, HP 16339A Testvorrichtung oder HP 16117B, C Testleitungen), die an den HP 4339B angeschlossen sind. (Wenn die High Voltage an der Vorderseite leuchtet, gibt der HP 4339B gefährliche Spannung von mehr als 42 V Gleichstrom aus.) Um elektrische Schläge zu verhindern, immer folgende Vorsichtsmaßnahmen beachten.

- Den HP 4339B und die Zubehörteile immer entsprechend den Anweisungen in der Bedienungs- und Wartungsanleitung befolgen, und insbesondere immer die unter "Warnung" gegebenen Anweisungen befolgen.
- Niemals die Klemmen UNKNOWN oder die Elektroden berühren, wenn die Anzeige V Output an der Vorderseite leuchtet, d.h. wenn eine Spannung am Ausgang des HP 4339B anliegt.
- Die Betriebstests der Interlock-Funktion und die Anzeige High Voltage mindestens einmal täglich durchführen, bevor der HP 4339B verwendet wird. Durchführung des Betriebstests siehe "Checking procedure" in Kapitel 3 der Operation and Service Manual des verwendeten Zubehörs.
- Immer in der Nähe des HP 4339B arbeitende Personen warnen, daß eine Gefahrenquelle existiert, und Anweisungen zum richtigen Verhalten geben!

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## **ADVERTENCIA**

### **ALTA TENSIÓN, RIESGO DE DESCARGAS ELÉCTRICAS (1000 V CC, MÁX.)**

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El medidor de alta resistencia HP 4339B da salida a niveles de tensión peligrosos de hasta 1000 V CC a través de los terminales UNKNOWN, o a través de los electrodos de los accesorios o de las puntas de prueba (célula de resistividad HP 16008B, accesorio de prueba HP 16339A, o puntas de prueba HP 16117B, C) conectados al HP 4339B. (Cuando el indicador de High Voltage del panel frontal esté encendido, el HP 4339B dará salida a tensiones peligrosas de más de 42 V CC.) Para evitar descargas eléctricas, tenga en cuenta las precauciones de seguridad siguientes.

- Emplee el HP 4339B y los accesorios de acuerdo con las instrucciones ofrecidas en sus Manuales de operación (y servicio), especialmente las indicadas en las advertencias.
- No toque los terminales UNKNOWN ni los electrodos cuando el indicador V Output del panel frontal esté encendido, es decir, cuando se esté aplicando tensión a la salida del HP 4339B.
- Antes de emplear el HP 4339B, realice las pruebas operacionales de la función Interlock y del indicador High Voltage una vez al día por lo menos. Con respecto a los procedimientos de las pruebas operacionales, consulte "Checking Procedure" del capítulo 3 del manual Operation and Service Manual del accesorio que esté empleando.
- ¡Avisé a los trabajadores que se encuentren alrededor del HP 4339B que existe una condición de peligro y de lo que deben y no deben hacer!

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## **AVERTISSEMENT**

### **DANGER D'ELECTROCUTION DU A LA TENSION ELEVEE (MAX 1.000 V CC)**

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Le compteur de haute résistance de la HP 4339B envoie des tensions dangereuses (pouvant aller jusqu'à 1.000 V CC) aux bornes UNKNOWN, ou aux électrodes de l'appareil accessoire (la cellule de résistivité HP 16008B, la monture d'essai HP 16339A, ou les fils d'essai HP 16117B, C) connecté à la HP 4339B. (Quand le témoin High Voltage du panneau avant est sur ON, le HP 4339B fournit une tension supérieure à 42 V CC.) Pour éviter toute décharge électrique, observez les précautions suivantes.

- Faites fonctionner la HP 4339B et les accessoires en suivant les explications décrites dans leur mode d'emploi (et d'entretien) respectif, plus spécialement les explications données dans les avertissements.
- Ne touchez pas la borne UNKNOWN ou l'électrode quand le témoin V Output du panneau avant est allumé, c'est-à-dire, quand la HP 4339B envoie une tension.
- Réalisez l'opération d'essai de la fonction Interlock et de l'indication High Voltage au moins une fois par jour, avant d'utiliser la HP 4339B. Reportez-vous à "Checking Procedure" du chapitre 3 de Operation and Service Manual de chaque accessoire pour connaître les démarches de l'opération d'essai.
- Avertissez le personnel des dangers potentiels de la HP 4339B.

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## 警告

高压危险(最高电压：1000Vdc(直流))

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在HP4339B高电阻表的UNKNOWN端以及测量固定件或测量导线的电极处(HP16008B阻抗电池、HP16339A 测量固定件、HP16117B、C测量导线),会有 1000Vdc (直流)的危险电压。而这些端头都是与HP4339B相连接的。(当前面板上的High Voltage 指示器处于ON(接通)的位置时,HP4339B有高于 42Vdc (直流)的危险电压输出)为了防止触电,请遵守下列安全注意事项。

- 在操作HP4339B及其附件时,请按照操作说明书(或维修说明书)中的指示进行操作,并特别要注意“警告”中的注意事项。
- 当前面板上的V Output指示器处于ON(接通)状态时,请不要触摸UNKNOWN端及电极,因为这时HP4339B有输出电压。
- 在使用HP4339B之前,请参照您在操作测量过程中使用的附件的 Operation and Service Manual的第3章的“Checking Procedure”的内容,每日最少进行一次操作测量的Interlock功能和High Voltage指示器的操作。
- 请警告HP4339B周围的作业人员高压危险的存在,并使他们的知道该做什么和不该做什么。

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## 警告

高压危险(最高电压：1000Vdc(直流))

---

在HP4339B高电阻表的UNKNOWN端以及测量固定零件或测量导线的电极处(HP16008B阻抗电池、HP16339A测量固定零件、HP16117B、C测量导线),会有1000Vdc(直流)的危险电压。而这些端头都是与HP4339B相连接的。(当前面板上的High Voltage指示器处于ON(接通)的位置时,HP4339B有高于42Vdc(直流)的危险电压输出。)为了防止触电,请遵守下列安全注意事项。

- 在操作HP4339B及其附件时,请按照操作说明书(或维修说明书)中的指示进行操作,并特别要注意“警告”中的注意事项。
- 当前面板上的V Output指示器处于ON(接通)状态时,请不要触摸UNKNOWN端及电极,因为这时HP4339B有输出电压。
- 在使用HP4339B之前,请参照您在操作测量过程中使用的附件的 Operation and Service Manual的第3章的“Checking Procedure”的内容,每日最少进行一次操作测量的Interlock功能和High Voltage指示器的操作。
- 请警告HP4339B周围的作业人员高压危险的存在,并使他们知道该做什么和不该做什么。

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## 경고

### 고전압 쇼크 위험(최대 1000V 직류)

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UNKNOWN 단자, 또는 HP 4339B에 연결되어 있는 테스트 설비의 전극봉 혹은 테스트 리드선(16008 B 저항 셀, HP 16339A 테스트 설비, 또는 HP 16117B, C 테스트 리드선)에는 직류 1000V 정도의 위험한 전압 레벨의 HP 4339B 고저항계 출력(프런트 패널에 High Voltage 지시계가 ON일 때, 직류 42V 이상의 HP 4339B 출력으로 위험한 전압입니다.)으로서, 전기적 쇼크를 방지하기 위하여 다음의 안전 유의사항을 주의깊게 참조해 주십시오.

- HP 4339B 및 부속품의 자동(혹은 서비스) 취급 설명서에 따른 지시대로 작동해 주십시오.
- UNKNOWN 단자 혹은 전극봉은 접촉을 절대로 삼가해야 하며, V Output 지시계의 프런트 패널이 ON일 때, 전압은 HP 4339B의 출력전압입니다.
- HP 4339B는 사용전에, Interlock 기능의 작동시험과 High Voltage 지시계를 적어도 1일에 1회 점검해야 합니다. 작동 테스트 진행순서를 위한 부속품의 Operation and Service Manual의 3장에 있는 "Checking Procedure"를 참조해 주십시오.
- HP 4339B의 주위는 매우 위험하므로, 작업자는 안전사항을 반드시 준수해야 합니다.







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Agilent Technologies Japan, Ltd.  
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Hyogo, 651-2241 Japan

## Warranty

This Agilent Technologies instrument product is warranted against defects in material and workmanship for a period of one year from the date of shipment, except that in the case of certain components listed in this manual, the warranty shall be for the specified period. During the warranty period, Agilent Technologies will, at its option, either repair or replace products which prove to be defective.

For warranty service or repair, this product must be returned to a service facility designed by Agilent Technologies. The Buyer shall prepay shipping charges to Agilent Technologies and Agilent Technologies shall pay shipping charges to return the product to the Buyer. However, the Buyer shall pay all shipping charges, duties, and taxes for products returned to Agilent Technologies from another country.

Agilent Technologies warrants that its software and firmware designed by Agilent Technologies for use with an instrument will execute its programming instruction when properly installed on that instrument. Agilent Technologies does not warrant that the operation of the instrument, or software, or firmware will be uninterrupted or error free.

## Limitation of Warranty

The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance by the Buyer, Buyer-supplied software or interfacing, unauthorized modification or misuse, operation outside of the environmental specifications for the product, or improper site preparation or maintenance.

*No other warranty is expressed or implied. Agilent Technologies specifically disclaims the implied warranties of merchantability and fitness for a particular purpose.*

## Certification

The Agilent Technologies certifies that this product met its published specifications at the time of shipment from the factory. Agilent Technologies further certifies that its calibration measurements are traceable to the United States National Institute of Standards and Technology, to the extent allowed by the Institute's calibration facility, or to the calibration facilities of other International Standards Organization members.

## **Exclusive Remedies**

*The remedies provided herein are the buyer's sole and exclusive remedies. Agilent Technologies shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any other legal theory.*

## **Assistance**

Product maintenance agreements and other customer assistance agreements are available for Agilent Technologies products.

If you need assistance, contact your nearest Agilent Technologies Sales and Service Office. Addresses are provided at the back of this manual.

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## Manual Printing History

The manual printing date and part number indicate its current edition. The printing date changes when a new edition is printed. (Minor corrections and updates which are incorporated at reprint do not cause the date to change.) The manual part number changes when extensive technical changes are incorporated.

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February 1995 .....	Second Edition (part number: 16117-90020)
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## Safety Summary

The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific **WARNINGS** elsewhere in this manual may impair the protection provided by the equipment. In addition it violates safety standards of design, manufacture, and intended use of the instrument.

*The Agilent Technologies assumes no liability for the customer's failure to comply with these requirements.*

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### Note



16117B is designed for use in INSTALLATION CATEGORY I according to IEC 61010-1 and POLLUTION DEGREE 1 according to IEC 61010-1 and IEC 60664-1. 16117B is an INDOOR USE product.

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### Do NOT operate in an Explosive Atmosphere

Do *not* operate the instrument in the presence of flammable gasses or fumes. Operation of any electrical instrument in such an environment constitutes a safety hazard.

### Keep Away from Live Circuits

Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made only by qualified maintenance personnel. Do not replace components with the power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injury, always disconnect power and discharge circuits before touching them.

### Do NOT Service or Adjust While Alone

Do *not* attempt internal service or adjustment unless another person, capable of turning off power and capable of rendering first aid and resuscitation, is present.

### Do NOT Substitute Parts or Modify Instrument

Because of the danger of introducing additional hazards, do *not* substitute parts or perform unauthorized modifications to the instrument. Return the instrument to a Agilent Technologies Sales and Service Office for service and repair to ensure the safety features are maintained.

### Dangerous Procedure Warnings

Warnings, such as the example below, precede **POTENTIALLY DANGEROUS PROCEDURES** throughout this manual. Instructions contained in the **warnings** must be followed.

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### Warning



**Dangerous voltages, capable of causing death, are present in this instrument. Use extreme caution when handling, testing, and adjusting this instrument.**

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## Safety Symbols

General definitions of safety symbols used on equipment or in manuals are listed below.



Instruction manual symbol: the product is marked with this symbol when it is necessary for the user to refer to the instruction manual.



Alternating current.



Direct current.



On (Supply).



Off (Supply).

### Warning



This **Warning** sign denotes a hazard. It calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in injury or death to personnel.

### Caution



This **Caution** sign denotes a hazard. It calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product.

### Note



**Note** denotes important information. It calls attention to a procedure, practice, condition or the like, which is essential to highlight.



Affixed to product containing static sensitive devices use anti-static handling procedures to prevent electrostatic discharge damage to component.



Caution, risk of electric shock : Terminals which may be supplied from the interior of the equipment at a voltage exceeding 1 kV, or allow connection to a voltage exceeding 1 kV are marked with this symbol.

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## General Information

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### Introduction

The purpose of this manual is to enable you to use your 16117B Low Noise Test Lead efficiently and confidently. This manual contains both general and specific information. To use the 16117B to perform a specific function (without having to read the entire manual), follow the directions in “Using the 16117B”.

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### Using the 16117B

The 16117B has been designed to operate specifically with the 4339B High Resistance Meter.

- To install the 16117B, turn to Chapter 2.
- To operate the 16117B, turn to Chapter 3.
- To order replaceable parts for the 16117B, turn to “Replaceable Parts” in Chapter 4.

---

### Product Description

The 16117B has been designed to operate specifically with the 4339B High Resistance Meter. The 16117B is used to measure the resistance of insulation materials. The 16117B has the following features:

- Reducing electrical noise effects by using shielded cable
- High-voltage safety designed using an interlock circuit

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### Accessories Supplied

The accessories listed in Table 1-1 are supplied with the 16117B:

**Table 1-1. Furnished Accessories**

Description	Part Number	Quantity
Operation and Service Manual	P/N 16117-90060	1

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## Options

The following options are supplied for the 16117B:

**Table 1-2. Supplied Options**

Option Number	Description
Option 001	Add Pin Probes
Option 002	Add Soldering Sockets
Option 003	Add Alligator Clips

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## Operating and Safety Precautions

### Service

The voltage levels (up to 1000 V) in this adapter warrants extreme care for operator safety. Service must be performed only by qualified personnel.

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## Specifications

This section lists the complete 16117B specifications. These specifications are the performance standards and limits against which the 16117B is tested. When shipped from the factory, the 16117B meets the specifications listed in this section.

Applicable Test Voltage .....	1000 V maximum
Applicable Test Current <sup>1</sup> .....	0.5 mA maximum
Applicable Instrument .....	4339A/B
Resistance Measurement Range .....	$1 \times 10^3$ to $1 \times 10^{11} \Omega$
Operating Temperature .....	0 to 55 °C
Operating Humidity .....	≤70% RH (@40°C)
Cable Length .....	1 m (connector to clip)
Non-operating Temperature .....	-40 to 70 °C
Non-operating Humidity .....	≤95% RH (@40°C)

1. Maximum measurable current of the 4339B is 100  $\mu$ A.

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### Note



When used with the 16117B, the output current of the 4339B is limited up to 0.5 mA for safety.

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### Note



If the interlock connector is not connected, the 4339B will not output the source voltage.

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## Preparation for Use

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### Introduction

This chapter explains how to install the 16117B Low Noise Test Lead. The topics covered include initial inspection, ambient environmental considerations, connecting the adapter for use, and repackaging the adapter for shipment.

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### Initial Inspection

The adapter has been carefully inspected electrically and mechanically before being shipped from the factory. It should be in perfect physical condition, no scratches, dents or the like, and it should be in perfect electrical condition. Verify this by carefully performing an incoming inspection to check the adapter for signs of physical damage and missing contents. If any discrepancy is found, notify the carrier and Agilent Technologies. Your Agilent Technologies sales office will arrange for repair and replacement without waiting for the claim to be settled.

1. Inspect the shipping container for damage, and keep the shipping materials until the incoming inspection is completed.
2. Verify that the shipping container contains everything shown in Figure 2-1 and listed in Table 2-1.
3. Inspect the exterior of the 16117B for any signs of damage.



**Figure 2-1. Product Overview (with 16117B option 003)**

**Table 2-1. Contents**

Description	Agilent Part Number	Quantity
① Low Noise Test Lead <sup>1</sup>	16117B	1
② Operation and Service Manual <sup>2</sup>	16117-90060	1

1 Furnished with Alligator Clips if you ordered the 16117B option 003.

2 Operation and Service Manual is not shown in Figure 2-1.

## 2-2 Preparation for Use

When an option is ordered with the 16117B, the following items are included:

Option 001

Description		Agilent Part Number	Quantity
③ Pin Probes	(Red)	8710-2302	1
	(Black)	8710-2301	1

Option 002

Description		Agilent Part Number	Quantity
④ Soldering Sockets	(Red)	1200-1904	1
	(Black)	1200-1903	1

Option 003

Description		Agilent Part Number	Quantity
Alligator Clips	(Red)	8710-2405	1
	(Black)	8710-2404	1

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## Ambient Environmental Considerations

### Operating and Storage

The 16117B must be operated within an ambient temperature range of 0°C to +55°C and relative humidity up to 70% RH at 40°C (non-condensing).

The 16117B may be stored within a temperature range of -40°C to +70°, and at a relative humidity up to 95% at +40°C (non-condensing).

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## Repackaging the Adapter

If shipment to a Agilent Technologies service center is required, each adapter should be repackaged using the original factory packaging materials.

Alternatively, comparable packaging materials may be used. Wrap the adapter in heavy paper and pack in anti-static plastic packing material. Use sufficient shock absorbing material on all sides of the 16117B to provide a thick, firm cushion and to prevent movement. Seal the shipping container securely and mark it *FRAGILE*.

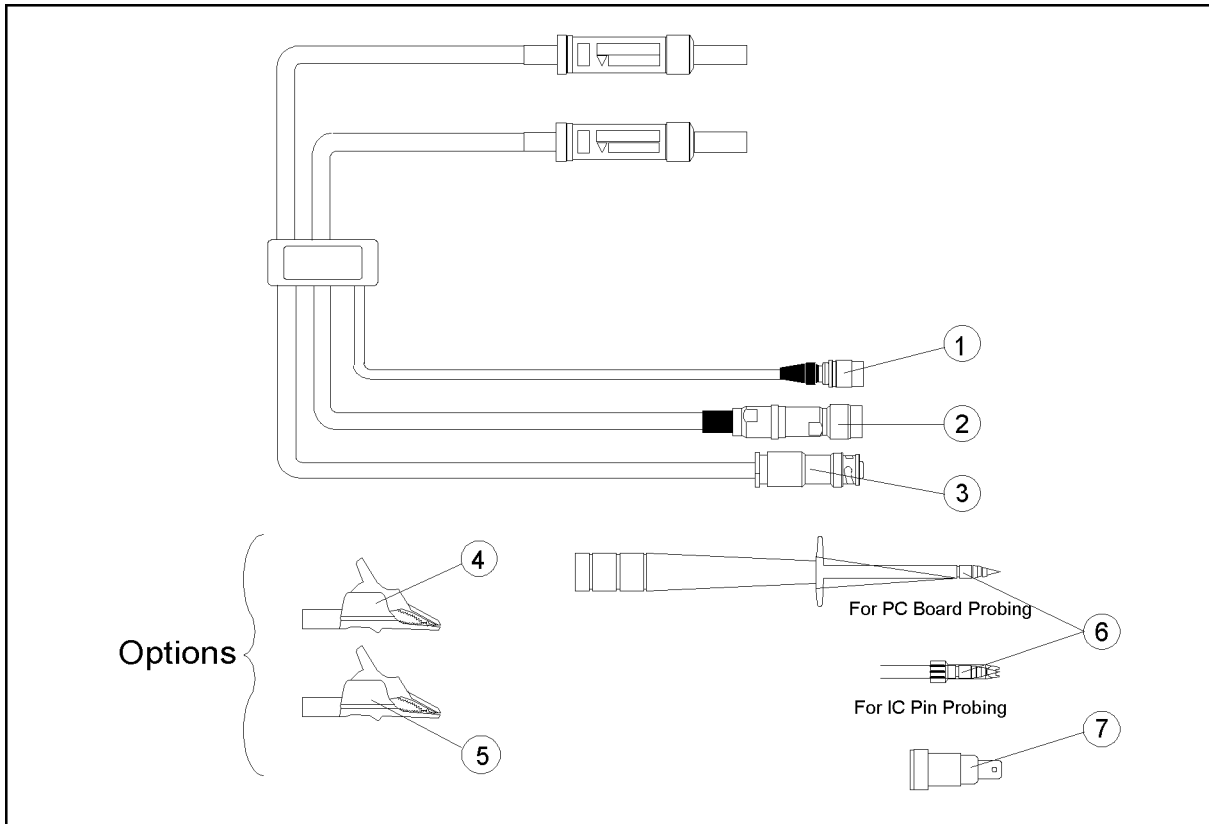


## Operation

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### Introduction

This chapter describes the features of the 16117B (see Figure 3-1), and its connection to the 4339B and DUT.



a9203005

**Figure 3-1. Adapter Features**

1. *Interlock connector*: This connector enables the interlock function which enables and disables the application of the source voltage from the 4339B. When the interlock connector is disconnected, the source voltage will not be applied. The current limit function is automatically set at 0.5 mA maximum by the interlock circuit.
2. *Triaxial connector*: The measured signal is carried on the center conductor of this connector.
3. *BNC connector*: This connector provides the source voltage to the 16117B. This is a high voltage BNC connector and is not compatible with standard BNC connectors.
4. *Alligator Clip (Red) (Option 003)*. When making a floating DUT configuration measurement, the Red test clip provides a source voltage of up to 1000 V. In the grounded DUT measurement configuration, the Red test clip is connected to ground.
5. *Alligator Clip (Black) (Option 003)*. When making a floating DUT configuration measurement, the Black test clip becomes the measurement signal path. In the grounded DUT measurement configuration, the Black test clip provides a source voltage of up to 1000 V.
6. *Pin Probes (Option 001)*. The probes enable to measure flat or small DUTs such as PC boards and IC sockets. It can be attached to the ends of the low noise test leads in place of the Alligator Clips. The Protective Cap avoids making contact with adjacent IC pins.
7. *Soldering Sockets (Option 002)*. The sockets help make simple custom-made test leads.



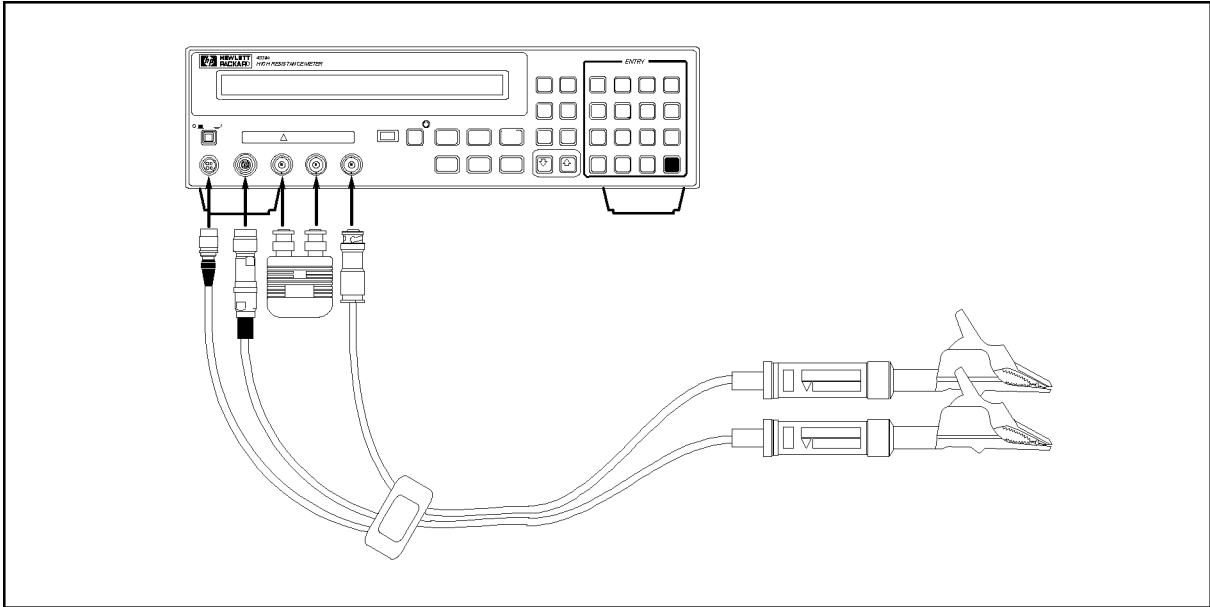
## Connecting the Adapter for Use

The 4339B connection with 16117B has two configurations: floating and grounded DUT measurement configurations. The connections are different for each configuration. The connections are as shown in Figure 3-2 and Figure 3-3.

### Warning

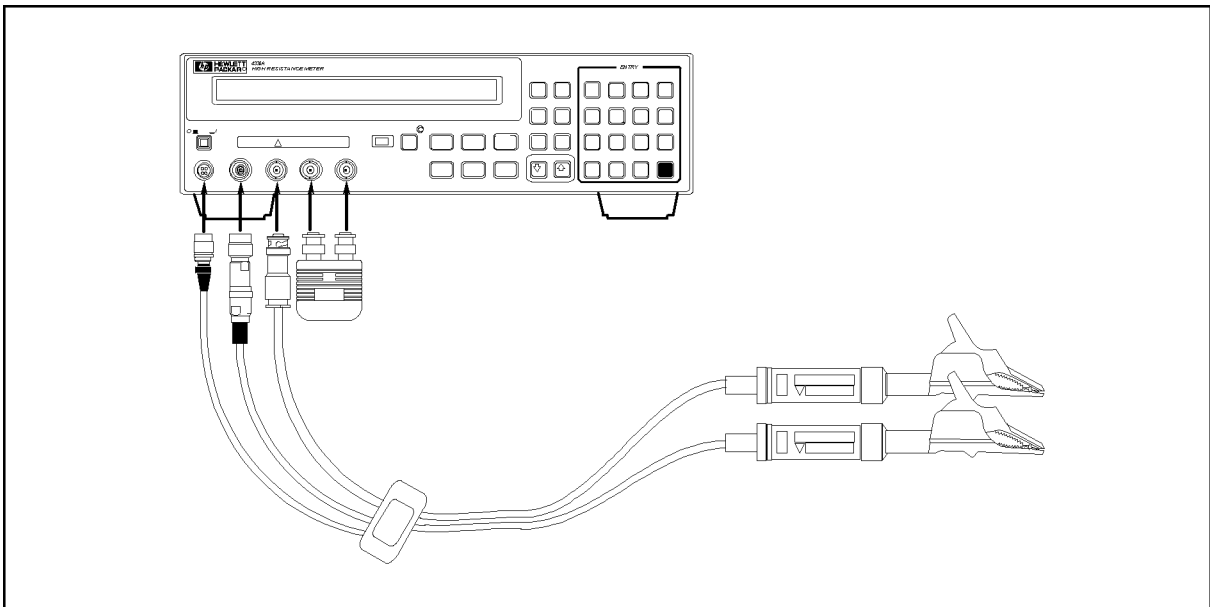


**Do NOT touch the electrode and UNKNOWN connector while the High Voltage indicator is lit which shows the 4339B's output is a high voltage of up to 1000 Vdc maximum. You must operate after turning off the voltage source output and you have confirmed the high voltage indicator is turned off.**



a9203006

Figure 3-2. Floating DUT Measurement (Option 003 Alligator Clips)



a9203007

Figure 3-3. Grounded DUT Measurement (Option 003 Alligator Clips) Operation 3-3

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## OPEN Correction

OPEN correction cancels the residual inductance effects for resistance measurements. The OPEN procedure is as follows:

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

### Warning



**Do NOT touch the electrode and UNKNOWN connector while the High Voltage indicator is lit which shows the 4339B's output is a high voltage of up to 1000 Vdc maximum. You must operate after turning off the voltage source output and you have confirmed the high voltage indicator is turned off.**

---

### OPEN Correction Procedure

1. Leave the test clips (or probes) open and separated from each other.
2. Set and apply source voltage for your measurement requirement at the 4339B.
3. Wait until the measurement value has stabilized.
4. Press   of the 4339B to perform the OPEN correction.

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### Note



When the OPEN correction is performed, the electrodes must be separated enough to prevent leakage current from occurring which will lead to OPEN correction instability.

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### Note



To realize the best performance of the 16117B and 4339B, the following items must be carefully observed when performing the OPEN correction:

- Do NOT allow vibration to reach the 16117B when performing an OPEN correction. Vibration will result in OPEN correction instability.
- Perform the OPEN correction in an environment free of external electrical noise.

If these items are not satisfied, the OPEN correction will not completely cancel the residual effects.

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## Operation

Step-by-step instructions on how to make a measurement with the 16117B are as follows:

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### Warning



**Do NOT touch the electrode and UNKNOWN connector while the High Voltage indicator is lit which shows the 4339B's output is a high voltage of up to 1000 Vdc maximum. You must operate after turning off the voltage source output and you have confirmed the high voltage indicator is turned off.**

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1. Connect the 16117B to the UNKNOWN terminals of the 4339B. Refer to “Connecting the Adapter for Use”.
2. Perform an OPEN correction as described in “OPEN Correction”.
3. Connect the test clips (or probes) to the DUT.
4. Follow the measurement instructions described in the *4339B Operating Manual* to do the measurement.

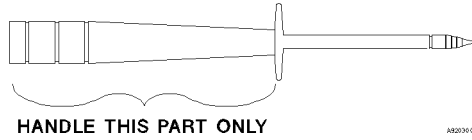
## Pin Probes (Option 001)

The Pin Probes (opt.001) enables to measure flat or small DUTs such as PC boards and IC sockets.

### Warning



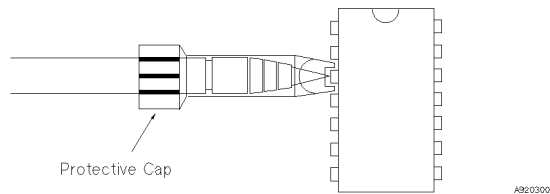
You must handle between guard collar and socket (see figure below) to prevent an electrical shock when the V output indicator on the front panel of the 4339B is ON.



### Note



The protective cap avoids making contact with adjacent pins. When measuring IC pins, attach the protective cap to the tip of the probe.



## Soldering Sockets (Option 002)

The Soldering Sockets (opt.002) helps make simple custom-made test leads.

### Warning



- Agilent Technologies shall NOT LIABLE for any damages or dangers to the operator incurred on use of a customized product except for the 16117B itself.
- Test fixtures designed by users are exposed to voltages up to 1 kV. An operator may receive an electrical shock if he/she makes contact with test fixture components. Design all components/test fixtures so that an operator can use the fixture safely, without being exposed to electrical shock hazard.

For example:

- Insulate all connections, solder joints, bare conductors.
- Design the fixture so that an operator cannot touch the measurement terminals when making the measurement.
- Provide warning labels to warn the operator of the high-voltage danger, and to avoid touching any connections, terminals, or DUT when the measurement is in process or when the high voltage is turned on.

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## Checking Procedure

The 16117B and the 4339B is operated with high voltages of up to 1000 V. These products are designed so that the operator can make safe measurements. To maintain this safe condition, you must periodically perform the following safety verification procedure.

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### Warning



**Do NOT touch the electrode and UNKNOWN connector while the High Voltage indicator is lit which shows the 4339B's output is a high voltage of up to 1000 Vdc maximum. You must operate after turning off the voltage source output and you have confirmed the high voltage indicator is turned off.**

---

### Daily Safety Verification Procedure

1. Connect the 16117B to the 4339B.
2. Set the source voltage to 42 V.
3. Press the V output key of the 4339B.  
Confirm that the V output indicator and the High Voltage indicator turns on.
4. Disconnect the interlock connector of the 16117B from the 4339B.  
Confirm that the High Voltage indicator turns off immediately.
5. Reconnect the interlock connector to the 4339B.  
Confirm that the High Voltage indicator still turns off

If you encountered any errors in checking procedure, contact your nearest Agilent Technologies Office.

## Service

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### Introduction

This chapter gives the replaceable parts information for the 16117B.

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### Replaceable Parts

Table 4-1 identifies the replaceable parts. Do not disassemble the 16117B any further than shown in Table 4-1. The listed parts can be ordered from your nearest Agilent Technologies Office. Ordering information should include the Agilent part number and the quantity required.

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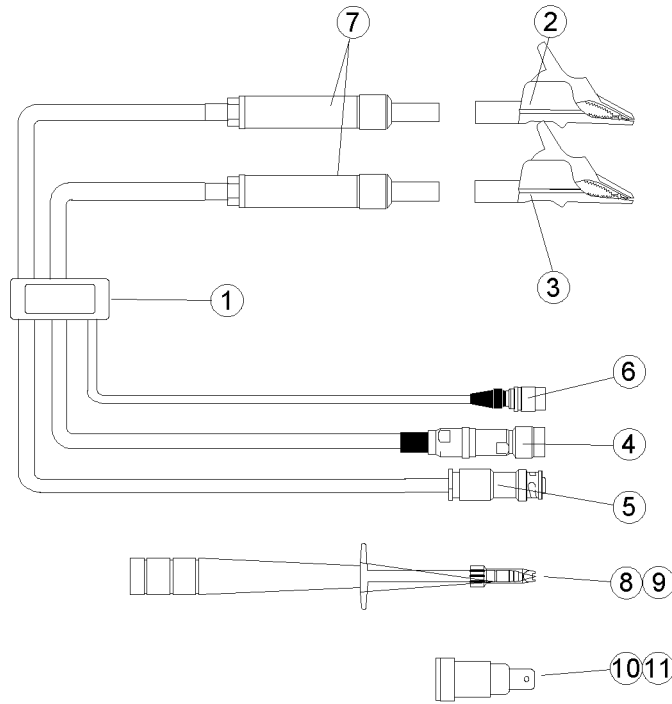
#### Warning



**These servicing instructions are for use by qualified personnel only. Do NOT perform any servicing other than that contained in the operating section unless you are qualified to do so.**

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**Table 4-1. Replaceable Parts List**



a920s003

Reference Designator	Agilent Part Number	Qty.	Description	Note
1	16117-87101	1	Model Label	
	16117-40001	1	Holder	
	16117-40002	1	Holder (with Nuts) <sup>1</sup>	
	16117-25001	1	Plug Hole for a holder	
	0515-1552	2	Screw Pan Head to fix a holder	
	3050-0891	2	Washer Flat to fix a holder	
2	8710-2405	1	Clip (Red)	Option 003
3	8710-2404	1	Clip (Black)	Option 003
4	16117-61601	1	Cable Assembly (Triaxial) <sup>2</sup>	
5	16117-61602	1	Cable Assembly (BNC) <sup>2</sup>	
6	16117-61603	1	Cable Assembly (Interlock) <sup>3</sup>	
7	16117-25006	2	Black Cover	
8	8710-2302	1	Pin Probe (Red) <sup>4</sup>	Option 001
9	8710-2301	1	Pin Probe (Black)	Option 001
10	1200-1904	1	Soldering Socket (Red)	Option 002
11	1200-1903	1	Soldering Socket (Black)	Option 002
-	16117-90060	1	Operation and Service Manual <sup>5</sup>	

1 not including a model label.

2 including a cable tie, a warning label, a black cover and a contact plug.

3 including a cable tie

4 including protective cap.

5 This part is not shown in this figure.

**4-2 Service**

This information is subject to change without notice.  
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16117-90060  
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