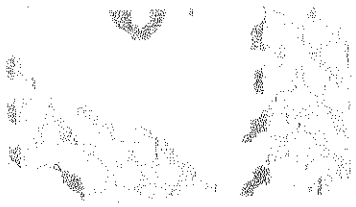
HEWLETT PACKARD

HP 4339A High Resistance Meter
User's Guide



WARNING

HIGH VOLTAGE SHOCK HAZARD (MAX. 1000 Vdc)

The HP 4339A 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 4339A. (When the High Voltage indicator on the front panel is ON, the HP 4339A outputs dangerous voltage more than 42 Vdc.) To prevent an electrical shock, observe the following safety precautions.

- Operate the HP 4339A 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 4339A forces voltage.
- Perform the operation tests of the interlock function and the High Voltage indicator at least once a day, before using the HP 4339A. 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 4339A about dangerous conditions.

警告

高電圧感電注意　（最大 1000 Vdc）

HP 4339A ハイ・レジスタンス・メータは、UNKNOWN端子、または、HP 4339A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 4339A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Operating 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。

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

L'ohmmetro HP 4339A 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 4339A. (Quando l'indicatore High Voltage sul pannello anteriore è attivato (ON), l'HP 4339A emette tensione elettrica pericolosa (più di 42 Vdc)) Per prevenire una scossa elettrica, osservare le seguenti precauzioni di sicurezza.

- Usare l'HP 4339A 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 4339A.
- Eseguire le prove di funzionamento della funzione Interlock e dell'indicatore High Voltage almeno una volta al giorno, prima di usare l'HP 4339A. 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 4339A, delle condizioni di pericolo esistenti e riferire loro ciò che è possibile fare e ciò che non lo è!

WARNUNG
LEBENSGEFÄHRLICHE HOCHSPANNUNG (MAX. 1000 Vdc)

Das Hochwiderstandsmeßgerät HP 4339A gibt eine gefährliche Hochspannung von bis zu 1000 Vdc an den UNKNOWN-Klemmen oder an den Elektroden von Zubehör (z.B. Widerstandszelle HP 16008B, Meßvorrichtungen HP 16339A oder Meßleitungen HP 16117B,C), welche an den HP 4339A angeschlossen sind, ab. (Wenn der Hochspannungsindikator auf der Vorderseite an ist, gibt der HP 4339A eine Spannung von mehr als 42 Vdc ab.) Um elektrische Schläge zu vermeiden, sind folgende Sicherheitsmaßnahmen zu beachten:

- Bedienen Sie den HP 4339A und seine Zubehörteile immer nur unter Einhaltung der Anweisungen in den zugehörigen Bedienungsanleitungen, insbesondere unter Beachtung der darin enthaltenen Warnungen.
- Berühren Sie nicht die UNKNOWN-Klemmen der Elektrode, wenn der V-Output-Indikator an der Vorderseite **aufleuchtet**, d.h., wenn der HP 4339A eine Spannung ausgibt.
- Führen Sie den Funktionstest der Interlock-Funktion und des Hochspannungsindikators wenigstens ein Mal täglich aus, bevor Sie den HP 4339A für Messungen benutzen. Beziehen Sie sich hierzu auf den Abschnitt "Checking Procedure" in Kapitel 3 im *Operation and Service Manual* des jeweiligen Zubehörteils.
- Informieren Sie Kollegen/Kolleginnen in der Nähe des HP 4339A über gefährliche Betriebszustände.

AVISO

PELIGRO DE DESCARGA ELECTRICA DE ALTA TENSION (MAX. 1000 V. CC)

El Medidor de Alta Resistencia modelo HP 4339A genera tensiones peligrosas de hasta 1000 V. cc en los terminales UNKNOWN, así como en los electrodos de los accesorios del equipo (la Célula de Resistividad HP 16008B, el Accesorio de Medida HP 16339A, o las Sondas de Prueba HP 16117B,C) conectados al HP 4339A. (Cuando el indicador de "High Voltage" -alta tensión- del panel frontal esté encendido, entonces el HP 4339A producirá unas tensiones peligrosas en sus conectores de salida, con valores superiores a los 42 V. cc). Para evitar las posibles descargas eléctricas, hay que respetar las siguientes medidas de seguridad:

- Manejar el HP 4339A y sus accesorios siguiendo las instrucciones que se indican en los manuales de operación y mantenimiento (*Operation and Service Manuals*), prestando especial atención a las descripciones indicadas en los Avisos correspondientes.
- No tocar ninguno de los terminales UNKNOWN ni los electrodos, cuando el indicador "V Output" del panel frontal esté encendido, es decir, cuando el HP 4339A esté suministrando tensión en sus bornes.
- Antes de utilizar el HP 4339A realice las pruebas de funcionamiento de la función "interlock" y del indicador "High Voltage", al menos una vez al día. Puede consultar la sección "Checking Procedure" (Procedimientos de Comprobación) del capítulo 3 del manual *Operation and Service Manual* suministrado con cada uno de los accesorios, para conocer los procedimientos de pruebas operacionales.
- Advierta a las personas que trabajen alrededor del HP 4339A, sobre las posibles situaciones de peligro que pueden producirse.

AVERTISSEMENT

RISQUES D'ELECTROCUTION — HAUTE TENSION (1000 VOLTS)

Le mesureur haute résistance HP 4339A produit des tensions élevées pouvant atteindre 1000 volts (courant continu) entre les bornes UNKNOWN de l'instrument ou les électrodes de l'accessoire support de test raccordé (cellule de résistivité HP 16008B, support de test de composant HP 16339A, cordons de test HP 16117B/C). Lorsque le voyant High Voltage de la face avant est allumé, la tension de sortie est supérieure à 42 volts. Pour éviter tout risque d'électrocution, observez les précautions suivantes :

- N'utilisez le HP 4339A et ses accessoires que de la façon décrite dans leurs manuels respectifs (*Operation Manual* et *Service Manual*), en respectant en particulier les notes d'avertissement.
- Ne touchez JAMAIS aux bornes UNKNOWN de l'instrument ni aux électrodes lorsque le voyant "V Output" de la face avant est allumé, c'est-à-dire quand la sortie du HP 4339A est sous tension.
- Exécutez les tests de fonctionnement de la fonction de sécurité (Interlock) et du voyant "High Voltage" au moins une fois par jour avant de commencer à vous servir du HP 4339A. Reportez-vous à la section "Checking Procedure" du chapitre 3 du *HP 4339A Operation and Service Manual* de chaque accessoire pour connaître les procédures de test.
- Informez les opérateurs travaillant autour du HP 4339A des risques liés à son utilisation.

警告

高压危险〔最高电压：1000Vdc(直流)〕

在HP4339A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HP4339A相连接的。(当前面板上的High Voltage 指示器处于ON(接通)的位置时，HP4339A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HP4339A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HP 4339A有输出电压。
- 在使用HP4339A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HP4339A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！

警告

高壓危險〔最高電壓：1000Vdc(直流)〕

在HP4339A高電阻錶的UNKNOWN端以及測量固定零件或測量導線的電極處(HP16008B阻抗電池、HP16339A測量固定零件、HP16117B、C測量導線),會有1000Vdc（直流）的危險電壓。而這些端交都是與HP4339A相連接的。(當前面板上的High Voltage指示器處於ON（接通）的位置時，HP4339A有高於42Vdc（直流）的危險電壓輸出。)爲了防止觸電，請遵守下列安全注意事項。

- 在操作HP4339A及其附件時，請按照操作說明書（或維修說明書）中的指示進行操作，並特別要注意“警告”中的注意事項。
- 當前面板上的V Output指示器處於ON（接通）狀態時，請不要觸摸UNKNOWN端及電極，因爲這時HP4339A有輸出電壓。
- 在使用HP4339A之前，請參照您在操作測量過程中使用的附件的 Operation and Service Manual的第 3 章的“Checking Procedure”的內容，每日最少進行一次操作測量的Interlock功能和High Voltage指示器的操作。
- 請警告HP4339A周圍的作業人員高壓危險的存在，並使他們知道該做什麼和不該做什麼。

경고
고전압 쇼크 위험(최대 1000V 직류)

UNKNOWN 단자, 또는 HP 4339A에 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 4339A 고저항계 출력(프런트 패널에 High Voltage 지시계가 ON일 때, 직류 42V 이상의 HP 4339A 출력으로 위험한 전압입니다.)으로서, 전기적 쇼크를 방지하기 위하여 다음의 안전 유의사항을 주의깊게 참조해 주십시오.

- HP 4339A 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 4339A의 출력전압입니다.
- HP 4339A는 사용전에, Interlock 기능의 작동시험과 High Voltage 지시계를 적어도 1일에 1회 점검해야 합니다. 작동 테스트 진행순서를 위한 부속품의 Operation and Service Manual 의 3장에 있는 "Checking Procedure" 를 참조해 주십시오.
- HP 4339A의 주위는 매우 위험하므로, 작업자는 안전사항을 반드시 준수해야 합니다.

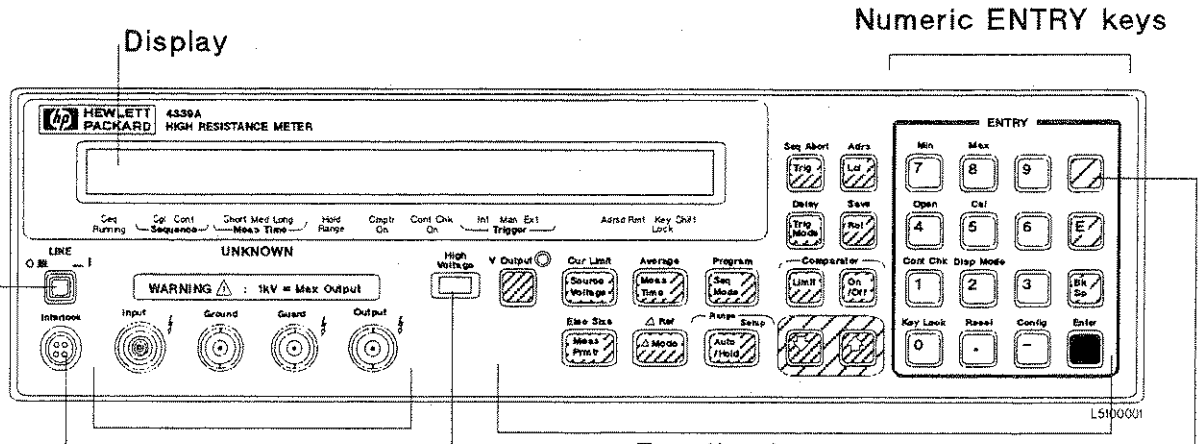
HP 4339A High Resistance Meter

User's Guide

HP Part No. 04339-90001
Printed in JAPAN June 1992

First Edition

HP 4339A High Resistance Meter at a Glance



UNKNOWN terminals

Interlock connector

LINE switch

High Voltage indicator

indicates the voltage output exceeds 42 V.

Function keys

BLUE shift key

Activates the secondary function printed in blue above the keys. For example,

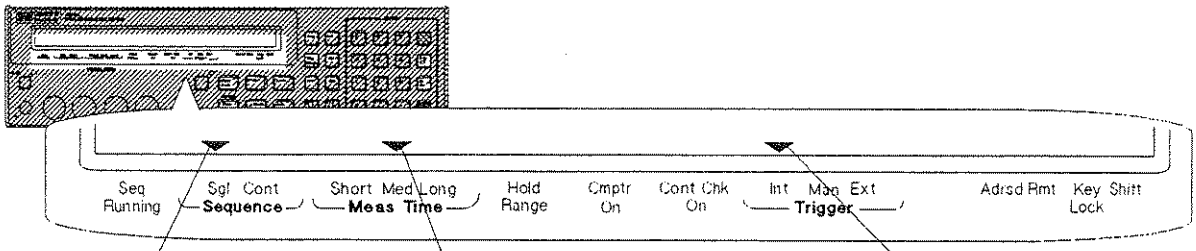
Pressing [blue] [4] (Open) executes an OPEN correction.

(In this book, the BLUE shift key is expressed as [blue])

Warning **Do *not* touch the UNKNOWN terminals or the electrodes of the accessory, when the High Voltage indicator is ON.**

Annunciator(▼ symbols, at the bottom of the display)

Shows the instrument's operational state. For example,



Indicates the measurement sequence single mode is selected.

Indicates the medium measurement time is selected.

Indicates that internal trigger is selected.

L5100003

Function Keys

V Output indicator

V Output

Toggles test voltage output between ON and OFF. (*page 2-15*)

Manual trigger (*page 2-15*)

Open — blue 4 — Executes an OPEN correction. (*page 2-5*)

Cur Limit — Source Voltage — Sets the test voltage. (*page 2-4*)

blue — Cur Limit — Source Voltage — Sets the current limit. (*page 2-4*)

Delay — Trig Mode — Selects the type of trigger. (*page 2-9*)

blue — Delay — Trig Mode — Sets the trigger delay time. (*page 2-9*)

Cal — blue 5 — Executes the calibration. (*page 2-4*)

Elec Size — Meas Prmtr — Selects the measurement parameter. (*page 2-6*)

blue — Elec Size — Meas Prmtr — Sets the electrode size of a resistivity cell. (*page 2-7*)

Adrs — Lcl — Returns the HP 4339A to the local mode. (*See Operation Manual*)

blue — Adrs — Lcl — Sets the HP-IB address. (*page 2-13 or See Operation Manual*)

Cont Chk — blue 1 — Toggles the contact check function between ON and OFF. (*page 2-10*)

Program — Seq Mode — Selects the measurement sequence mode. (*page 2-14*)

blue — Program — Seq Mode — Sets the measurement sequence parameters. (*page 2-14*)

Save — Rcl — Recalls the instrument settings from internal memory. (*See Operation Manual*)

blue — Save — Rcl — Saves the instrument settings to internal memory. (*See Operation Manual*)

Disp Mode — blue 2 — Selects the display mode. (*page 2-12*)

Average — Meas Time — Selects the measurement time. (*page 2-8*)

blue — Average — Meas Time — Sets the averaging rate. (*page 2-9*)

Limit — Sets the comparator limit value. (*page 2-11*)

On/Off — Toggles the comparator between ON and OFF. (*page 2-11*)

KeyLock — blue 0 — Locks out any front panel key except this key. (*See Operation Manual*)

Δ Ref — ΔMode — Selects the deviation measurement mode. (*page 2-10*)

blue — Δ Ref — ΔMode — Sets the reference value for deviation measurement. (*page 2-10*)

↓ , ↑ — Increases or decreases the setting value. (*See Operation Manual*)

Reset — blue · — Resets the HP 4339A to the default settings. (*page 2-2*)

Range Setup — Auto/Hold — Toggles between auto range and hold range. (*page 2-8*)

Range Setup — blue — Auto/Hold — Selects the measurement range. (*page 2-8*)

Min — blue 7 — Retrieves the minimum value. (*See Operation Manual*)

Max — blue 8 — Retrieves the maximum value. (*See Operation Manual*)

Config — blue — — Sets the beeper mode and power LINE frequency, and executes the internal test. (*page 1-2, 2-12*)

L5100002

Documentation Map

- *HP 4339A User's Guide* (HP part number 04339-90001)

  This guide is a handy reference to help you to get started using your HP 4339A. Basic measurements and commonly used features are explained.

- *HP 4339A Operation Manual* (HP part number 04339-90000, furnished with the HP 4339A)

  Provides information on initial inspection, how to operate the HP 4339A, in-depth reference information, general information, specifications, and maintenance information.

- *HP 4339A Service Manual* (HP part number 04339-90031, Option 0B3 only)

  Explains how to adjust, troubleshoot, and repair the HP 4339A.

In User's Guide

- Chapter 1, Preparation for Use

  For initial turn on of the HP 4339A

- Chapter 2, Operating the HP 4339A

  Basic measurement operation

  Getting acquainted with the HP 4339A—for beginners
  Handy reference for common measurement tasks—for all users

- Chapter 3, Measurement Examples

  Measurement Examples for typical HP 4339A applications

  Measuring Insulation Resistance of a Capacitor
  Measuring Volume Resistivity of a Insulation Material

In the User's Guide, information on the following subjects is not discussed:

- Initial inspection
- HP-IB remote control
- Using with handler
- Maintenance
- Specifications
- Error messages

For detailed information on these subjects, see the *HP 4339A Operation Manual.*

1

Preparation for Use

In This Chapter

Before turning the HP 4339A ON, you must first set the HP 4339A to match the available power LINE voltage.

If the HP 4339A's power LINE voltage and frequency are properly set and ready to use, you can skip this chapter.

Power Requirements

The HP 4339A's power source requirements are as follows:

LINE Voltage : 100 / 120 / 220 / 240 V ac (±10%)
LINE Frequency : 47 to 66 Hz
Power Consumption : 45 VA maximum

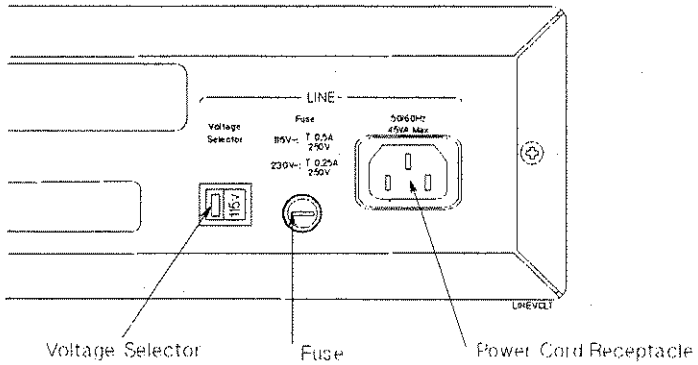
To Set Power LINE Voltage

1. Confirm that the power cable is disconnected.
2. Slide the LINE Voltage selector on the rear panel to match the power LINE voltage which will be used (see Table 1-1).

Table 1-1. Line Voltage Selection

Voltage Selector	Line Voltage	Required Fuse
	100 V / 120 V	T 0.5 A 250 V (HP part number 2110-0202)
	220 V / 240 V	T 0.25 A 250 V (HP part number 2110-0201)

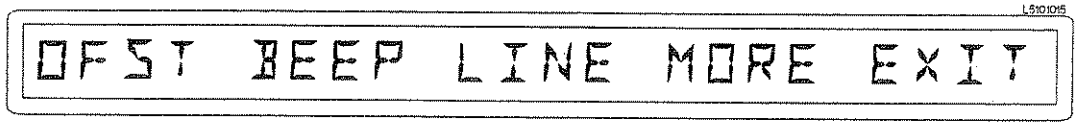
HP 4339A Rear Panel



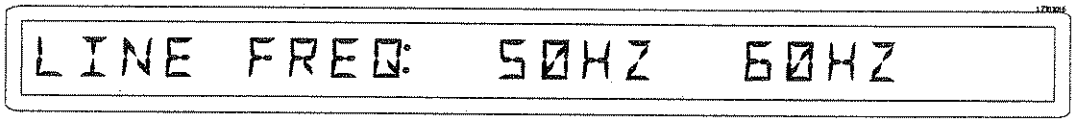
To Set Power LINE Frequency

1. Connect the power cable to the power cord receptacle on the rear panel.
2. Push the LINE switch in and the HP 4339A will emit a beep when it turns ON. All digits are displayed while the self test is in progress. (If any message is displayed, see "Error Messages" back of *HP 4339A Operation Manual.*) The HP 4339A will be ready for operation after a message like the following is displayed.

3. Press blue Config . The following message is displayed.



4. Press ⌂ until "LINE" blinks, then press Enter .



   A blinking item means that it is currently selected.
5. If the setting does not match the power LINE frequency, press ⌂ to toggle the setting between "50HZ" and "60HZ".
6. Press Enter twice to exit this menu.

Note

The power line frequency setting is stored and is not changed after reset or power-off. Once you set it, you do not need to set the line frequency again as long as the same power line frequency is being used.

2

Operating the HP 4339A

In This Chapter

Basic measurement operations of the HP 4339A and references are explained.

Measurement Procedure

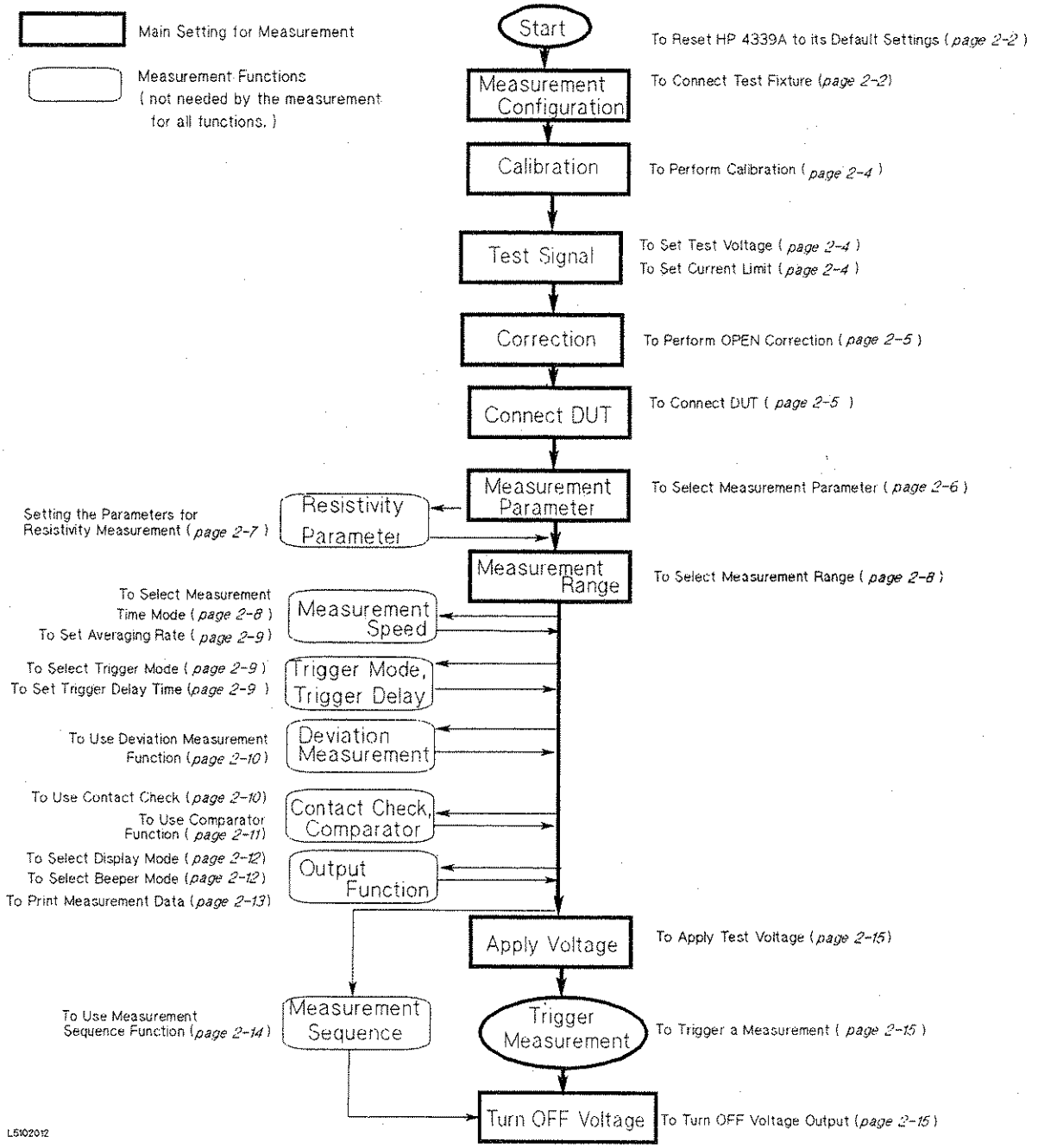
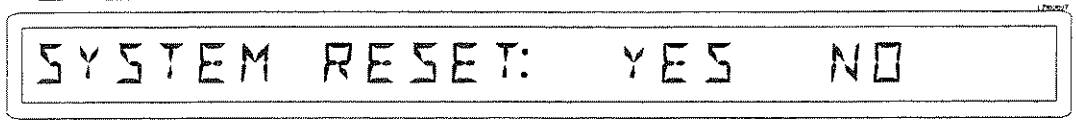


Figure 2-1. Measurement Procedure

To Reset HP 4339A to its Default Settings

1. Press blue Reset to select the reset menu.



2. Press ↓ until YES is blinking, then press Enter.

For more information about the default settings, see "Default Settings" later in this chapter.

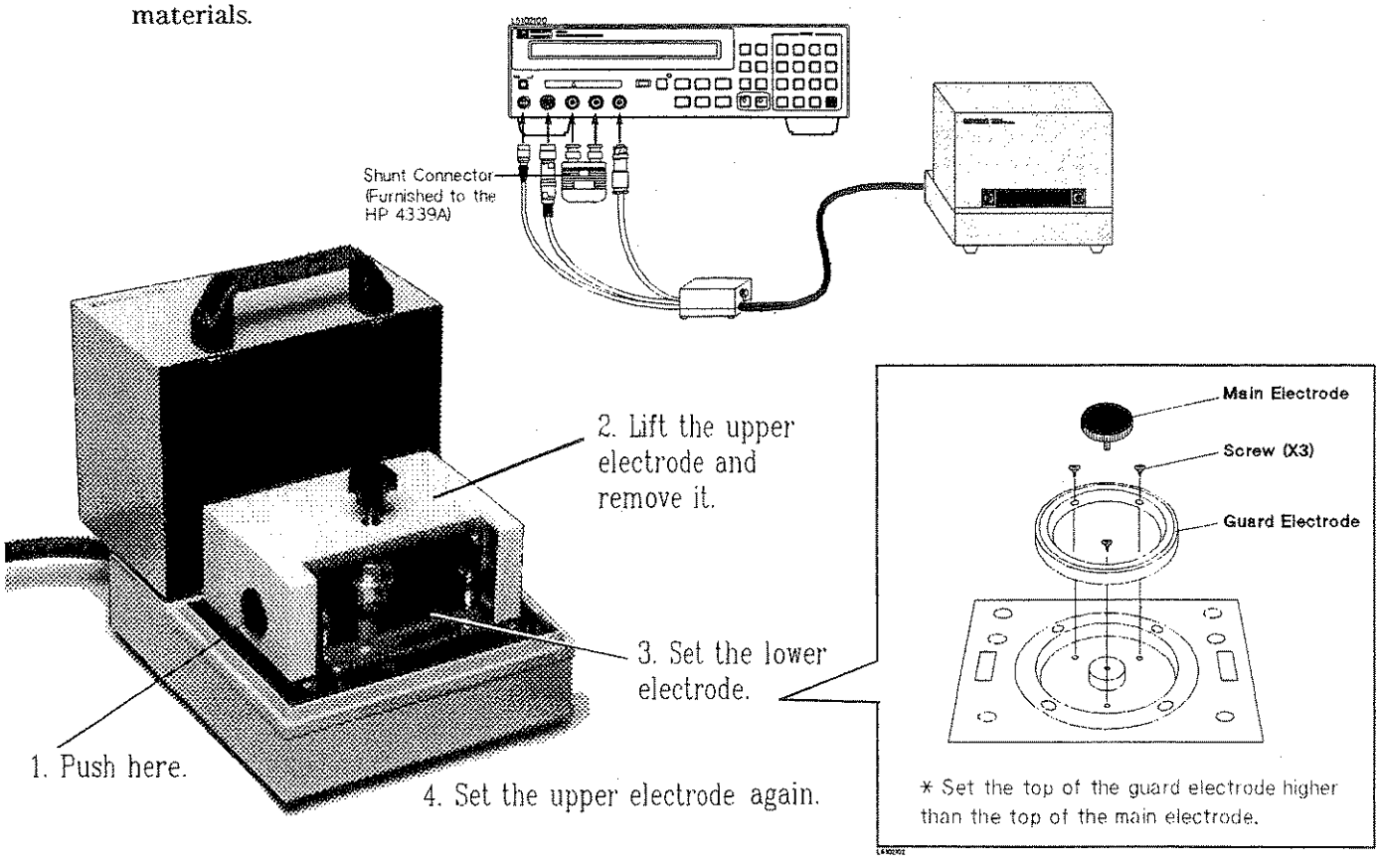
To Connect Test Fixture

Connect the test fixture to the UNKNOWN terminals as follows:

Warning **Do *not* touch the UNKNOWN terminals or the electrodes of the accessory, when the High Voltage indicator is ON, the HP 4339A outputs dangerous voltages of up to 1000 Vdc. Before handling the HP 4339A or the accessory, turn OFF the test voltage pressing V Output and confirm that the High Voltage indicator is OFF.**

HP 16008B Resistivity Cell

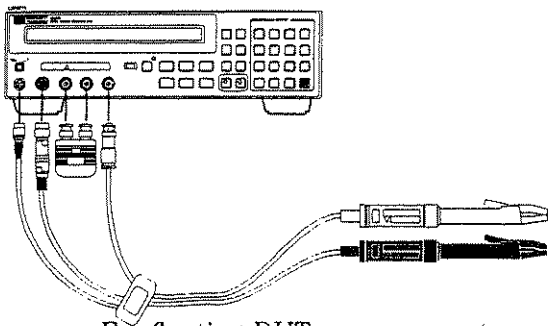
The HP 16008B is used to measure the volume or surface resistance/resistivity of insulation materials.



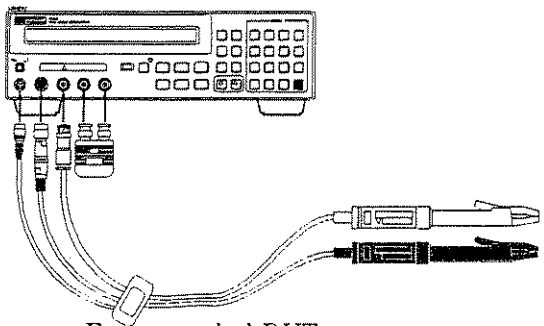
Three size electrodes are available. For detail see "Accessories Available" later in this chapter.

HP 16117B Low Noise Test Lead

The HP 16117B is used to measure the resistance of insulation materials.



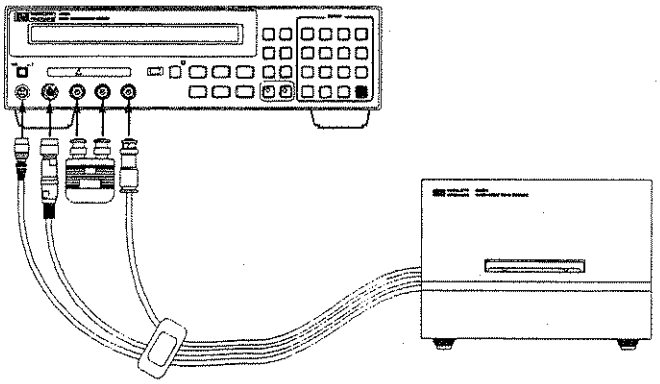
For floating DUT measurement

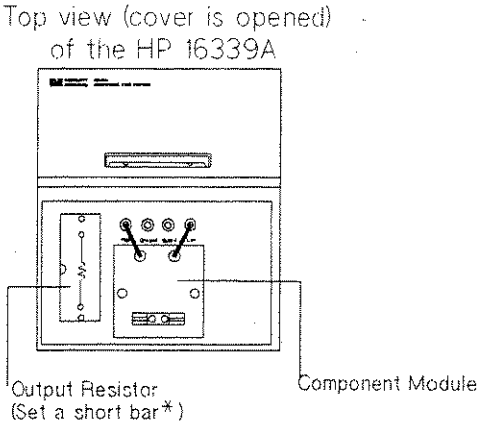


For grounded DUT measurement

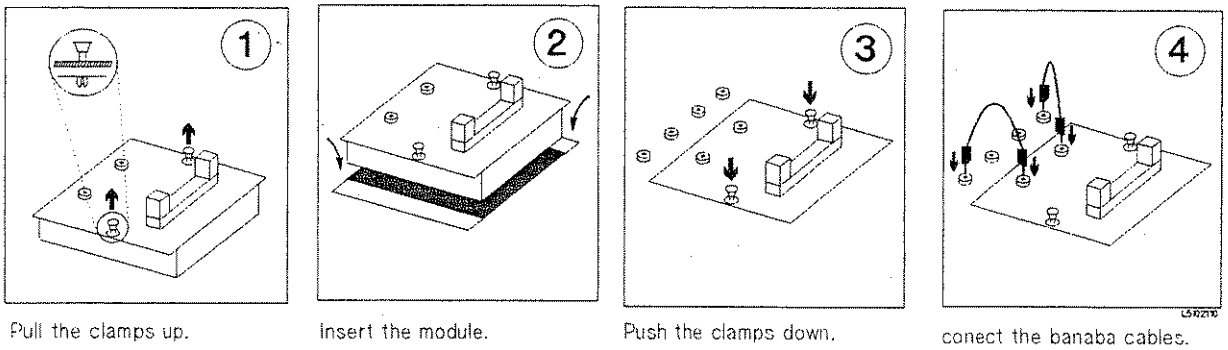
HP 16339A Component Test Fixture

The HP 16339A is used to measure insulation resistance of electronic components.





To set the component module :



Pull the clamps up. | Insert the module. | Push the clamps down. | conect the banaba cables.

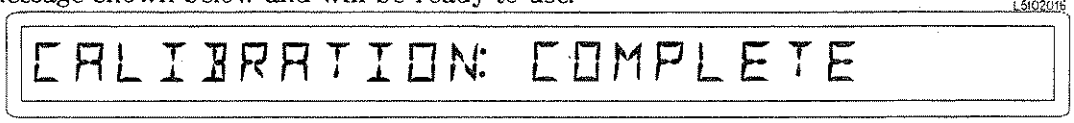
Three type modules are available. For detail see "Accessories Available" later in this chapter.

* Measuring a high capacitance DUT and keeping good S/N ratio, change the short bar to an appropriate resistor. For detail, see page 3-6 of *HP 16339A Component Test Fixture Operation and Service Manual.*

To Perform Calibration—Canceling internal measurement errors

1. Press blue Cal 5 . The HP 4339A will display calibration message.

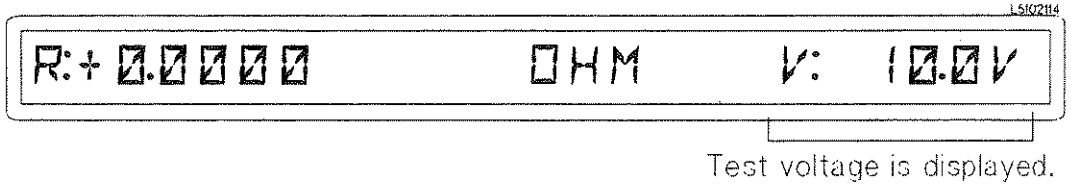
After displaying this message, the HP 4339A will return to the measurement display with the end message shown below and will be ready to use.



To Set Test Voltage

1. Press Cur Limit Source Voltage and the current voltage setting will be displayed.

2. Enter the value using the numeric ENTRY keys (for example, to set 10 V, press Cont Chk 1 Key Lock 0) then press Enter .



To Set Current Limit

To set the current limit or to show the current setting:

1. Press blue Cur Limit Source Voltage .

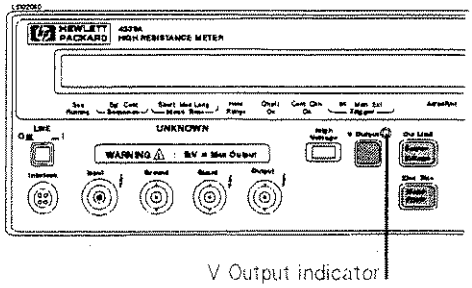
2. Enter the value, then press Enter to enter the value and to exit.

Available current limits are:

- 0.5 mA (default)
- 1.0 mA
- 2.0 mA (at test voltage 0 to 500 V only)
- 5.0 mA (at test voltage 0 to 250 V only)
- 10 mA (at test voltage 0 to 100 V only)

To Perform OPEN Correction —Canceling the stray admittance in parallel with the DUT

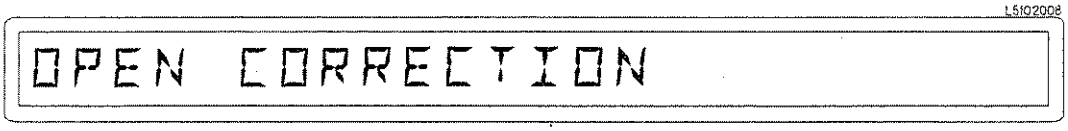
1. Separate each electrode of the test fixture. For details about fixture operation, refer to "Test Fixtures and Test Leads" later in this chapter.
2. Press V Output. A source voltage is applied to the test fixture, and the **V Output** indicator will turn ON.



Warning **Pressing V Output may cause the HP 4339A to output dangerous voltage, up to 1000 Vdc. Do *not* touch the UNKNOWN terminals or the electrodes of the accessory when the V Output indicator is ON.**

3. Press blue, Open 4. The correction message will be displayed.

L5102008



After a while, the HP 4339A will display the OPEN correction finished message,

and return to the measurement mode.

4. Press V Output. The **V Output** indicator will turn OFF.

If "OUT OF LIMIT" is displayed

The OPEN admittance is so high that it would be unsuitable for OPEN correction data.

□ Check that the test electrodes are properly opened.

Perform the OPEN correction again.

To Connect DUT

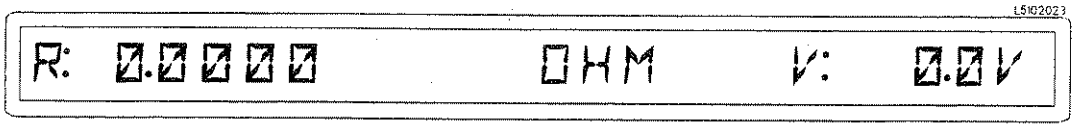
Set the DUT to the test fixture. For details, see "Test Fixtures and Test Leads".

Warning **Do *not* touch the UNKNOWN terminals or the electrodes of the accessory, when the High Voltage indicator is ON, the HP 4339A outputs dangerous voltage of up to 1000 Vdc. Before handling the HP 4339A or the accessory, turn OFF the test voltage pressing V Output and confirm that the High Voltage indicator is OFF.**

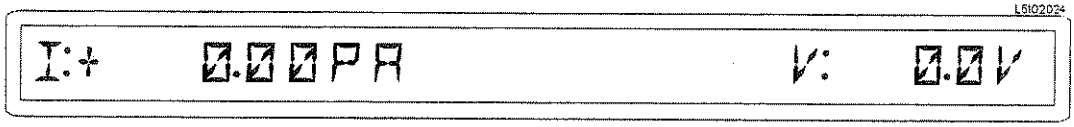
To Select Measurement Parameter

Press Meas Prmtr until the desired measurement parameter is displayed.

- Resistance : R



- Current : I



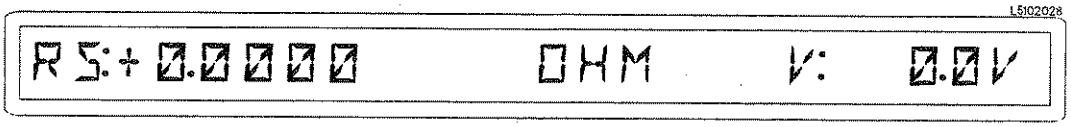
- Resistivity : ρv or ρs

Note

If the HP 16008B resistivity cell is connected to the HP 4339A, to change volume and surface resistivity, switch the volume/surface selector switch on the resistivity cell.

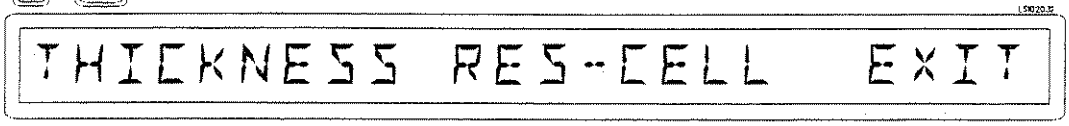
Volume Resistivity (ρv) : RV

Surface Resistivity (ρs) : RS



Setting the Parameters for Resistivity Measurement

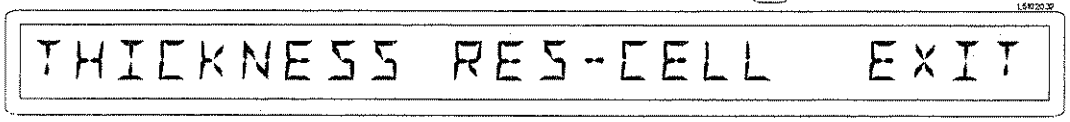
Press blue Elec Size Meas Prmtr .



Setting Thickness of the DUT

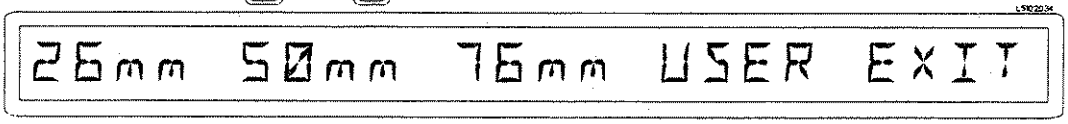
1. Select THICKNESS using ◁ or ▷ , and press Enter .

2. Enter the thickness using the numeric ENTRY keys, and press Enter .

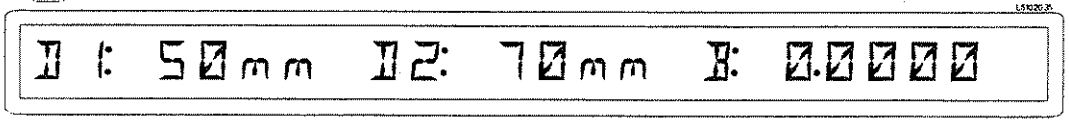


Setting the Electrode Size

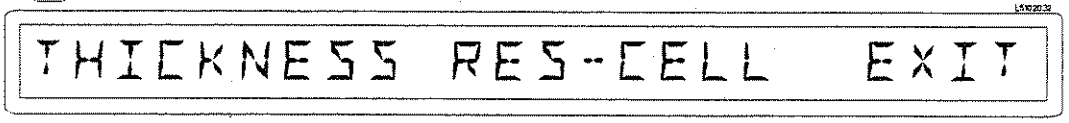
1. Select RES-CELL using ◁ or ▷ .



2. Select the electrode size that you want to use (26mm, 50mm, or 76mm) using ◁ or ▷ , and press Enter .



3. Press Enter

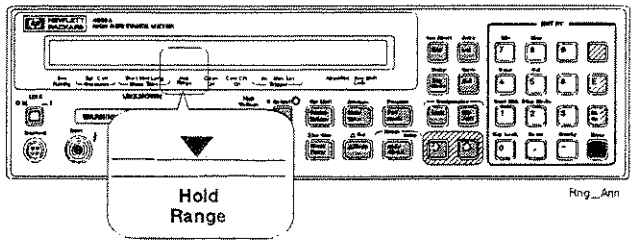


4. Press Enter to EXIT.

To Select Measurement Range

Auto Range mode —Automatically selecting the optimum measurement range

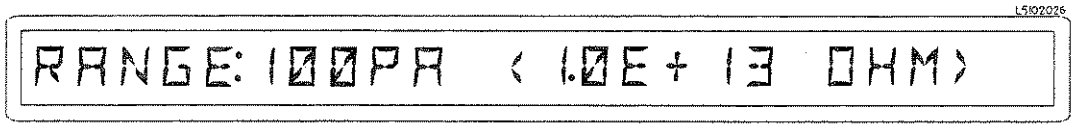
Press Range Setup Auto /Hold . The **Hold Range** annunciator turns OFF.



Hold Range mode—Holding the measurement range of your choice

To select the measurement range,

1. Press blue Range Setup Auto /Hold . The measurement range setup menu is displayed.



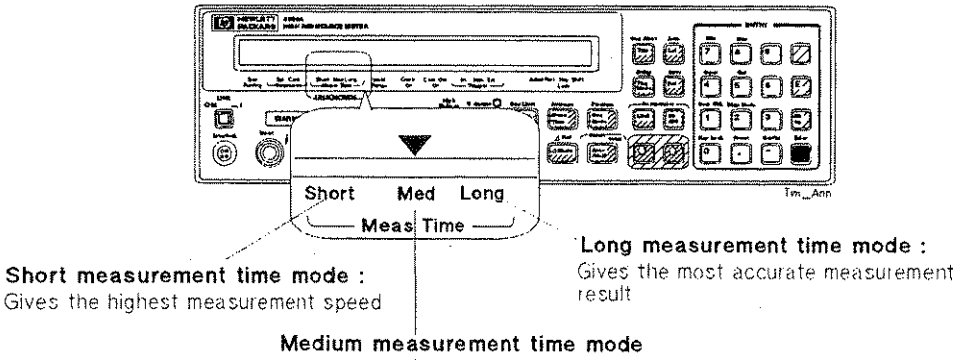
2. Press ⇧ or ⇩ until the desired range is displayed. Or, input the current value to be measured using the numeric ENTRY keys, and the HP 4339A will select the optimum measurement range setting.
3. Press Enter . The **Hold Range** annunciator turns ON.

Available measurement ranges:

100 pA (Not available at Short measurement time)
1 nA
10 nA
100 nA
1 μA
10 μA
100 μA (Available at Short measurement time only)

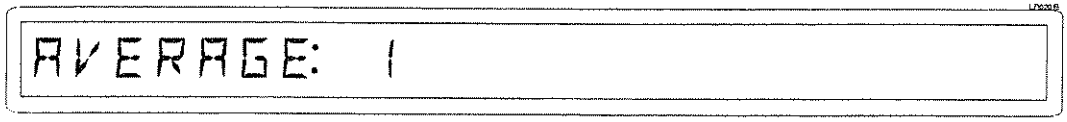
To Select Measurement Time Mode

Press Average Meas Time until the **Meas Time** annunciator points to the desired measurement time mode.



To Set Averaging Rate—Stabilizing the measurement result

1. Press [blue] [Average / Meas Time] .

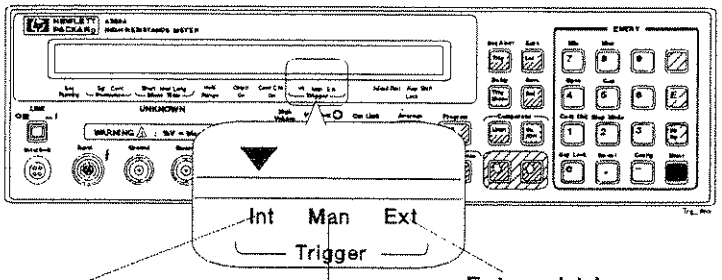


2. Enter the averaging rate using the numeric ENTRY keys. (For example, to enter 4, press [Open / 4] .) You can enter integer values from 1 to 256. Also, you can increase or decrease the value using [↑] or [↓] .

3. Press [Enter] to set the value and to exit.

To Select Trigger Mode

Press [Delay / Trig Mode] until the **Trigger** annunciator points to the desired trigger mode.



Internal trigger :
Free running measurement

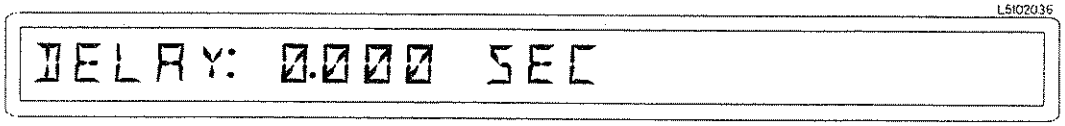
Manual Trigger :
Trigger a measurement when pressing [Trig]

External trigger :
Trigger a measurement by external signal input (from an external trigger source, a handler interface, or the HP 16064B).

To trigger a measurement in each mode, see "To Trigger a Measurement" later in this chapter.

To Set Trigger Delay Time

1. Press [blue] [Delay / Trig Mode] .



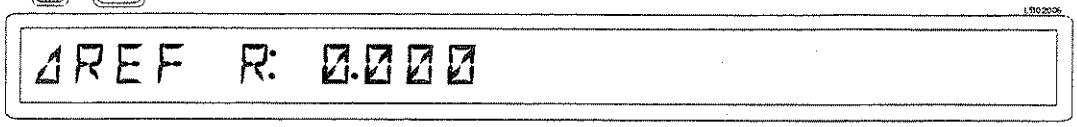
2. Enter the desired trigger delay time using the numeric ENTRY keys. (For example, to set 0.5 s, press [Key Lock / 0] [Reset / .] [Cal / 5] .) You can set the trigger delay time from 0 s to 9.999 s.

3. Press [Enter] to set the value and to exit.

To Use Deviation Measurement Function

Setting the Deviation Reference Values

1. Press blue, ΔRef/ΔMode.



2. Enter the numeric value using the numeric ENTRY keys.
3. Press Enter to enter the value and to exit.

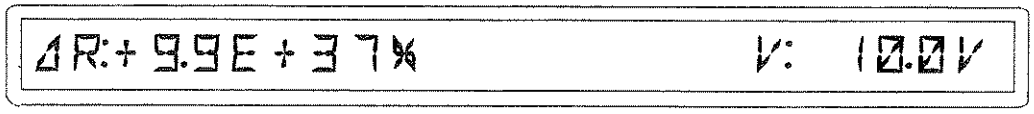
Selecting the Deviation Mode

Press ΔRef/ΔMode until the desired deviation mode is selected.

Deviation Measurement OFF

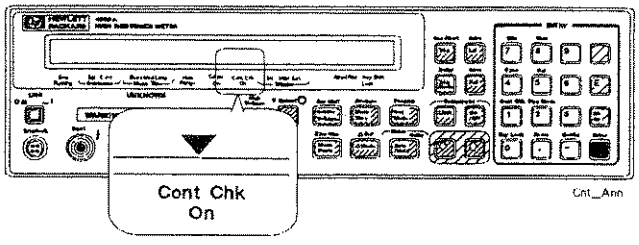
Δ (Delta) Mode : (MEAS)-(REF)

Δ% Mode : $\frac{(MEAS)-(REF)}{(REF)} \times 100(\%)$



(MEAS) : measurement result
(REF) : reference value

To Use Contact Check Function —Monitoring the connection of test electrodes and DUT



To enable the contact check function,

Press blue, Cont Chk/1, and the **Cont Chk On** annunciator turns ON.

To turn the contact check function off,

Press blue, Cont Chk/1, and the **Cont Chk On** annunciator turns OFF.

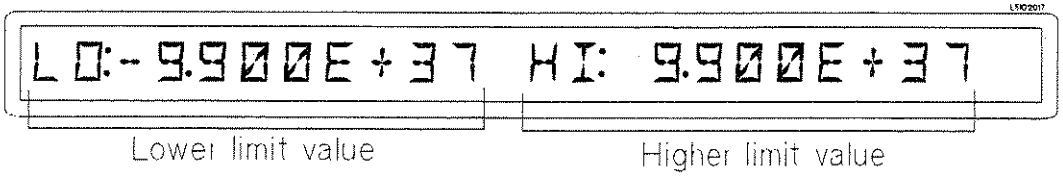
When contact check failed, the HP 4339A displays `N.C.`(No-Contact).

The OPEN correction function must be performed correctly for a valid contact check.

To Use Comparator Function

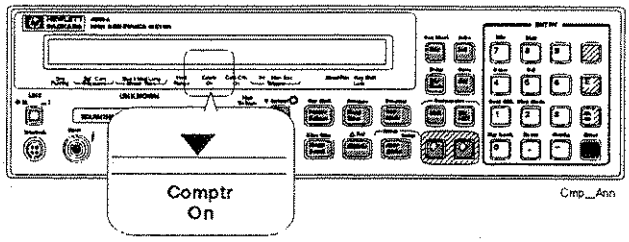
Setting the Limit Values

1. Press [Limit] .



2. A blinking LO: shows that you can enter the lower limit value. Enter the value using the numeric ENTRY keys, then press [Enter] to enter the value. You can set the value from -9.900×10^{37} to 9.900×10^{37}.
3. A blinking HI: shows that you can enter the higher limit value. Enter the value using the numeric ENTRY keys, then press [Enter] to enter the value and to exit. You can set the value from -9.900×10^{37} to 9.900×10^{37}.

Sorting



To start sorting,

Press [On/Off] . The **Comptr On** annunciator turns ON.

To turn sorting off,

Press [On/Off] . The **Comptr On** annunciator turns OFF.

The sorting results are HIGH, IN, and LOW.

Where,

HIGH	greater than higher limit
IN	between higher limit and lower limit
LOW	less than lower limit

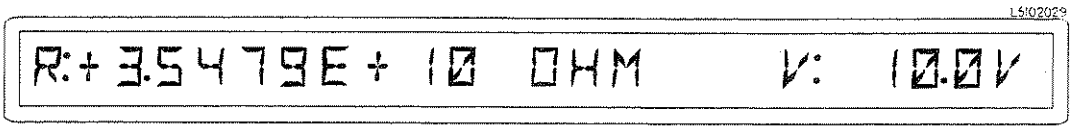
The HP 4339A shows the comparison results using the display, beeper, printer, and HP 16064B LED Display/Trigger Box. (To use the HP 16064B, see "Accessories Available" later in this chapter.)

- For result output to the display, see "To Select Display Mode" in the next page.
- For result output to the beeper, see "To Select Beeper Mode" in the next page.
- For result output to the printer, see "To Print Measurement Data" later in this chapter.

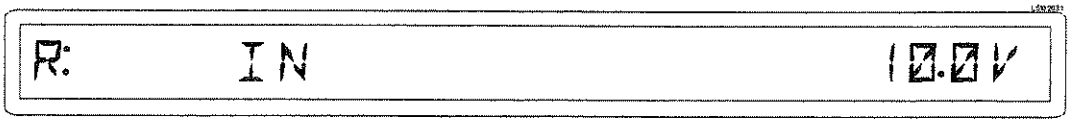
To Select Display Mode

Press blue (Disp Mode 2) until the desired mode is displayed. The following modes are available.

- The Measurement Display mode shows the measurement data:

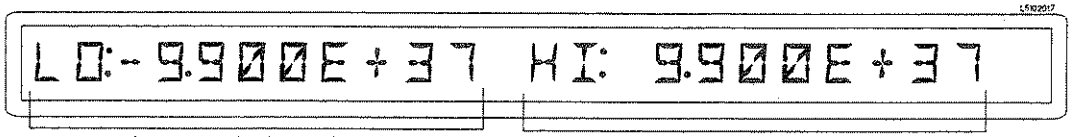


- The Comparison Display mode shows the comparison results:



OFF : Comparator is OFF.
HIGH : Greater than higher limit.
IN : Between higher limit and lower limit.
LOW : Less than lower limit.

- The Limit Table mode shows the comparator limits:

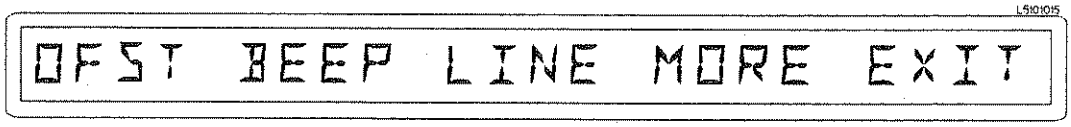


- The Display OFF mode shows the annunciators only.

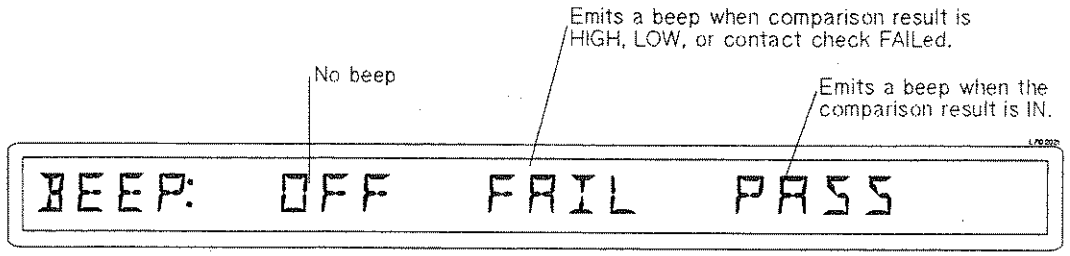
To Select Beeper Mode

To change the beeper mode for the comparator result reporting:

1. Press blue (Config –).



2. Select BEEP using ▽ or △ and press Enter to select.



3. Select the beep mode using ▽ or △, and press Enter to exit to the previous display.
4. Select EXIT using ▽ or △, and press Enter to exit.

To Print Measurement Data

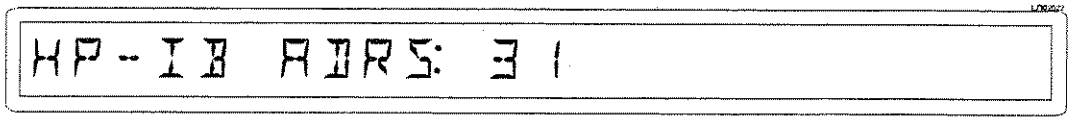
Setting the Printer

1. Use an HP-IB compatible printer, set the printer to the listen-always mode.
2. Connect the printer to the HP 4339A's HP-IB port on the rear panel.
3. Turn the printer ON.

Printing

Set the HP 4339A to talk only mode (Set the HP 4339A's HP-IB address to 31).

1. Press blue, Adrs Lcl, 3, Cont Chk 1.



2. Press Enter. The **Adrsd** annunciator turns ON and the printer begins printing the measurement data.

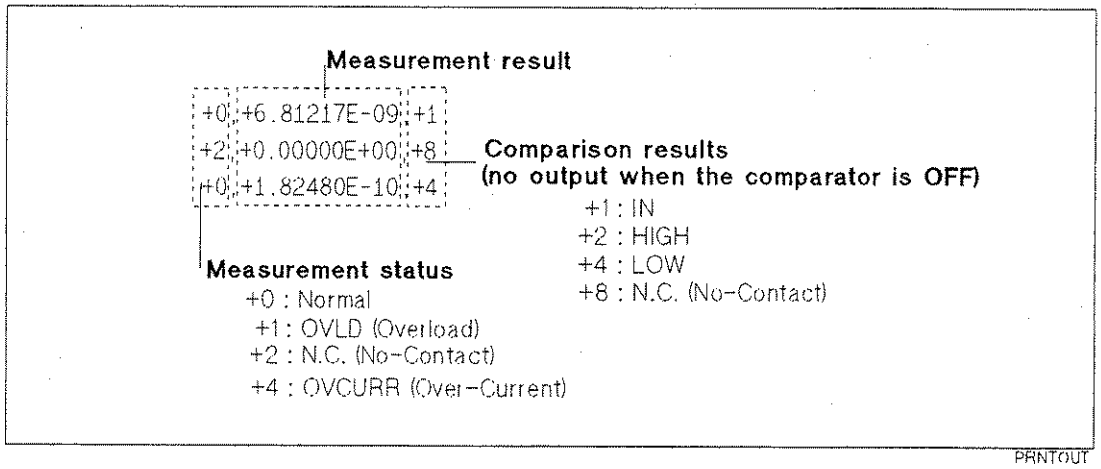


Figure 2-2. Printer Output

Disabling Printing

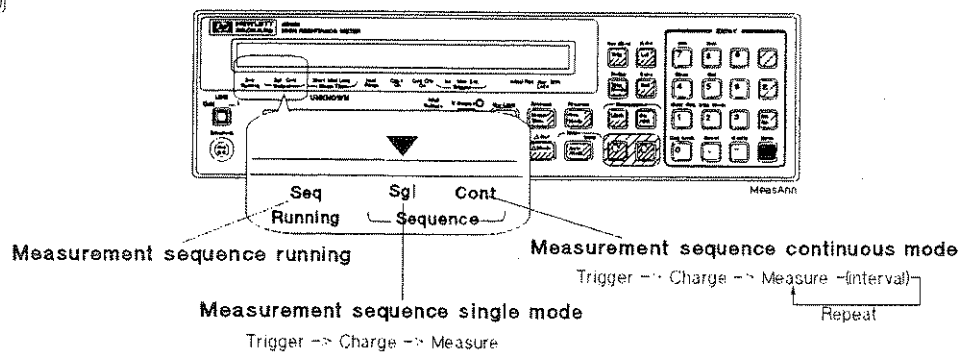
Change the HP-IB address to an address other than 31 (for example, 17, which is the default setting).

Press blue, Adrs Lcl, Cont Chk 1, Min 7, Enter.

To Use Measurement Sequence Function —Controlling charge-measurement in a sequence

Selecting the Measurement Sequence Mode

Press Program Seq Mode until the desired mode is selected.



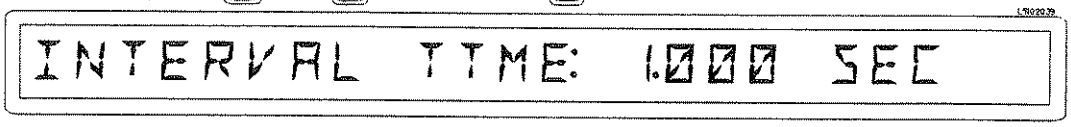
Setting the Measurement Sequence

1. Press blue Program Seq Mode . The sequence mode menu will be displayed.

2. Set charge time.
   a. Select CHRG using ◁ or ▷ , then press Enter .

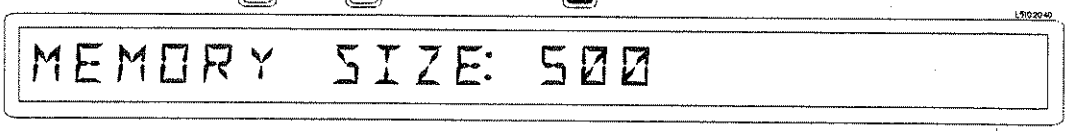
   b. Enter the charge time, then press Enter .

3. Set interval time (**Cont** mode only).
   a. Select INTVL using ◁ or ▷ , then press Enter .



   b. Enter the interval time, then press Enter .

4. Set number of repetitions (**Cont** mode only).
   a. Select MEMORY using ◁ or ▷ , then press Enter .



   b. Enter the number of measurement points, then press Enter .

5. Press Enter to EXIT.

Starting Measurement Sequence

Press Seq Abort / Trig. The **Seq Running** annunciator is set to ON.

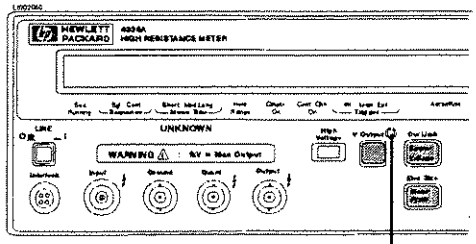
Warning **Pressing Seq Abort / Trig may cause the HP 4339A to output dangerous voltage, up to 1000 Vdc. Do *not* touch the UNKNOWN terminals or the electrodes of the accessory, when the V output indicator is ON.**

Aborting Measurement Sequence

Press blue, Seq Abort / Trig. The **Seq Running** annunciator is set to OFF.

To Apply Test Voltage

Press V Output. The **V Output** indicator turns ON.



Warning **Pressing V Output may output dangerous voltage, up to 1000 Vdc. Do *not* touch the UNKNOWN terminals or the electrodes of the accessory when the V Output indicator is ON.**

To Trigger a Measurement

- In internal trigger mode—The HP 4339A makes continuous free-running measurements.
- In manual trigger mode—Press Seq Abort / Trig when you want to manually trigger a measurement.
- In external trigger mode— Connect the external trigger source to the EXT TRIGGER terminal on the HP 4339A's rear panel, and apply a TTL level trigger signal to trigger a measurement. (For details, see the *HP 4339A Operation Manual.*)
  Note that the HP 4339A must be set to the external trigger mode to be triggered from an external handler or from the HP 16064B LED Display/Trigger Box.

To Turn OFF Voltage Output

Press V Output and confirm the **V Output** indicator and the **High Voltage** indicator is turn OFF.

Warning **If the High Voltage Indicator turns ON after turning OFF the test voltage, the DUT is still charged. This happens especially for capacitive DUTs. Do *NOT* handle the DUT while the High Voltage Indicator is turned ON. When the charge on the DUT discharges to a safe level(less than 42 V) the High Voltage indicator will turn OFF.**

Reference

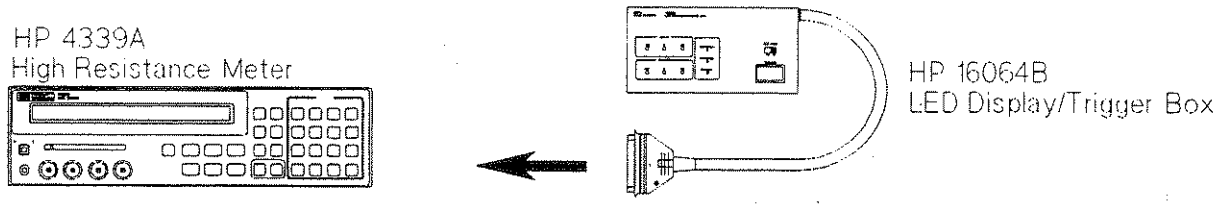
Default Settings

- Test voltage output : OFF
- Test voltage : 0 V
- Current limit : 0.5 mA
- Measurement parameter : R
- Resistivity cell D1 : 50 mm
  D2 : 70 mm
  t : 2 mm
  B : 0
- Deviation measurement : OFF
- Measurement range : Auto
- Measurement time : MEDium
- Averaging rate : 1
- Trigger mode : Internal
- Trigger delay time : 0 ms
- Comparator : OFF
- Contact check : OFF
- Display mode : Measurement mode
- Beep mode : FAIL mode
- Offset-error canceling : OFF
- OPEN correction data is cleared

Accessories Available

HP 16064B LED Display/Trigger Box

The HP 16064B LED Display/Trigger Box triggers a measurement when its trigger key is pressed, and displays the comparison results using LEDs. It allows you to manually operate the comparator function of the HP 4339A.

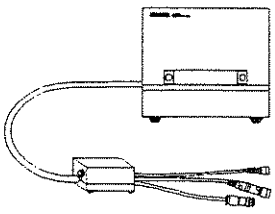


Connect to the Handler Interface connecter on the rear panel.

Test Fixtures and Test Leads

Following test fixtures and test leads are available for the HP 4339A for various forms of DUTs.

HP 16008B Resistivity Cell




φ26 mm Electrode (Option)


φ50 mm Electrode (Standard)


φ76 mm Electrode (Option)

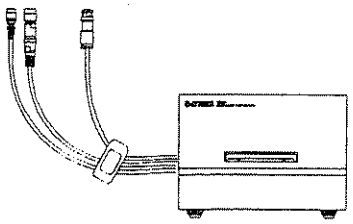
Option 001: Add both 26 mm and 76mm electrodes
Option 002: Add 26 mm electrode
Option 003: Add 76 mm electrode

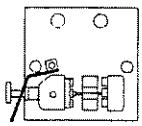
HP 16117B Low Noise Test Leads

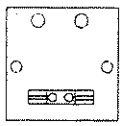
HP 16117C Low Noise Test Leads

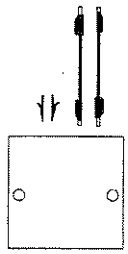

For costom terminations

HP 16339A Component Test Fixture

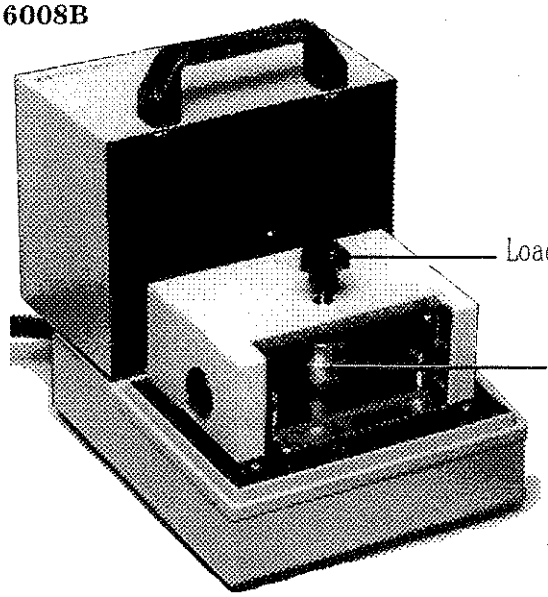



SMD Module


Axial Lead Module


Alligator Clip and Flat Table

HP 16008B



For an OPEN correction

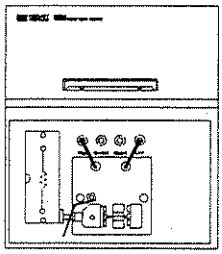
Turn the load knob counterclockwise until the upper electrode does not move.

Connecting the DUT

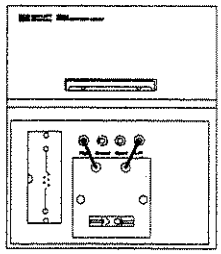
Turn the load knob clockwise until the load scale indicates between 0 kg and 10 kg.

HP 16339A

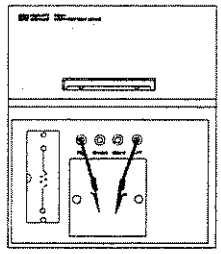
SMD module



Axial Lead module

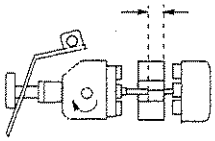


Alligator clip and Flat table



For an OPEN correction

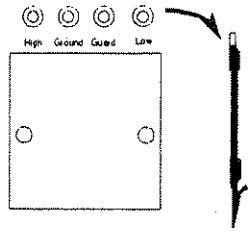
same as the DUT's width



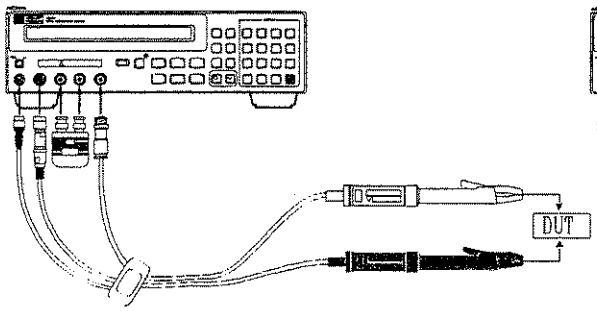
Tighten the screw to hold the electrode.

Nothing must be connected to electrode.

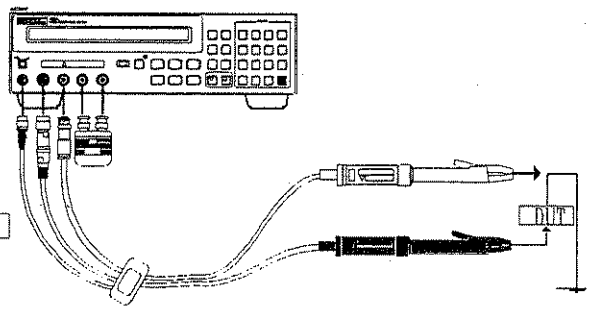
Remove the alligator clips.



HP 16117B



Floating DUT Measurement



Grounded DUT Measurement

Other Topics

For details on these functions, see the *HP 4339A Operation Manual.*

- Initial Inspection — Chapter 1 of the *Operation Manual*
- Auto-Offset Canceling — Chapter 2 and Chapter 3 of the *Operation Manual*
- Key Lock Function — Chapter 2 and Chapter 3 of the *Operation Manual*
- HP-IB — Chapter 4 and Chapter 5 of the *Operation Manual*
- Handler Interface — Chapter 3 and Appendix B of the *Operation Manual*
- Save / Recall — Chapter 2 and Chapter 3 of the *Operation Manual*
- Backup Function — Chapter 3 of the *Operation Manual*
- Specification — Chapter 8 of the *Operation Manual*
- Maintenance — Chapter 9 of the *Operation Manual*
- Error Messages — "Error Messages" in back of the *Operation Manual*

If You Have a Problem

If any of the problems listed below occur, follow the instructions given for the problem.

- If you find yourself lost when operating the HP 4339A

  You can get back on track by:

  To return to the measurement mode Press Enter several times.

  To return to the default settings Press blue Reset. (If the reset is not accepted, confirm that the **key Lock** annunciator is turned ON. See next.)

- If the HP 4339A does not accept key input:
  - Check whether or not the **Key Lock** annunciator is ON. If so:
    - Press blue Key Lock 0. The **Key Lock** annunciator turns OFF and the front-panel keys are unlocked.
    - Check that the HP 16064B LED display/trigger box is connected to the HP 4339A and it is set to lock out the keys. If so, unlock the keys from the HP 16064B.
- If V Output is not accepted:
  - Check whether the interlock connector is firmly connected.
  - If you are using the HP 16008B or the HP 16339A,
    - Check whether the top cover of the test fixture is closed.
- If the HP 4339A displays annunciators only:

  The display mode is set to the Display OFF mode.

  1. If the HP 4339A is in the key lockout mode, cancel the key lockout mode. (See previous description.)
  2. Press blue Disp Mode 2 to change the display mode to a mode other than Display OFF.

- If ------ or "OVLD" is displayed:

  The measurement result is out of the measurable range. Check the DUT and make sure the measurement range is properly set.

3

Measurement Examples

In This Chapter

The HP 4339A's features are discussed, which you can investigate by trying the typical measurement examples described in this chapter.

HP 4339A Features

For precision bench-top applications HP 4339A High Resistance Meter is the right tool for accurate high resistance and low current tests.

High quality testing

- Remove parasitics with error correction
- High confidence testing with contact check function
- Consistent results with 0.6 % basic accuracy

Versatile measurement

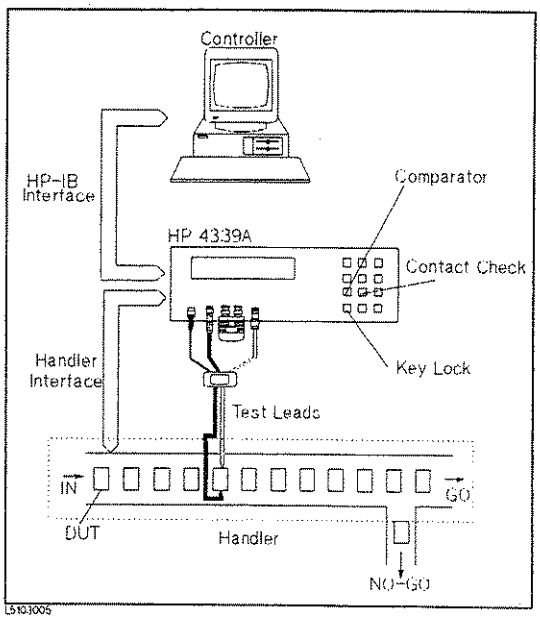
- Four measurement parameters : R, I, ρV, ρS
- Variety of test fixtures and accessories

No resistivity calculation required : The HP 4339A automatically calculates the surface and volume resistivity.

Measurement sequence function allows you to control a resistance measurement in a sequence(charge-measure-discharge).

Test System Configuration for a Production Line

The HP 4339A's handler interface outputs signals to indicate measurement completed, contact check judgment, and PASS/FAIL judgments of the comparator function. The handler interface has an input for an external trigger signal and a keylock signal. Using these signals, the HP 4339A can easily be combined with a component handler and a system controller to fully automate component testing, sorting, and quality control data processing to increase production efficiency.



Measuring Insulation Resistance of Capacitor

This example shows the procedure to measure insulation resistance of capacitor after charged 1 minute. Using the test sequence measurement function reduces the measurement complexity.

Warning **Do *not* touch the UNKNOWN terminals or the electrodes of the accessory, when the High Voltage indicator is ON, the HP 4339A outputs dangerous voltage of up to 1000 Vdc. Before handling the HP 4339A or the accessory, turn OFF the test voltage pressing** V Output **and confirm that the High Voltage indicator is OFF.**

DUT

Chip ceramic capacitor

Requirements

Test Fixture : HP 16339A, SMD module

Measurement Setup

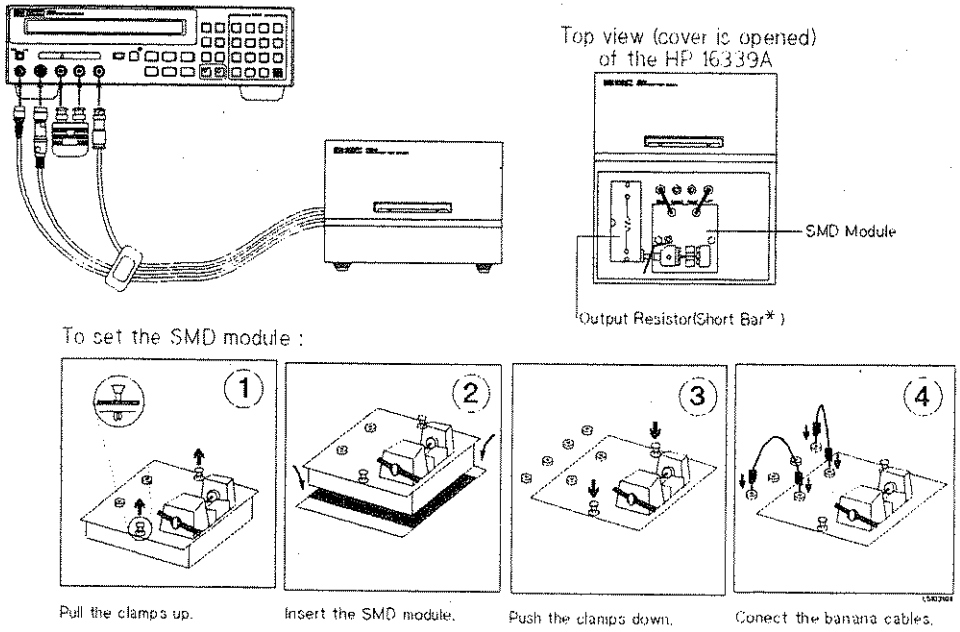
Measurement Parameter : R
Measurement Range : Auto range mode
Test Voltage : 10 V
Use the measurement sequence single mode (measure after charged for 1 minute.)

Measurement Procedure

1. Reset the HP 4339A.
   a. Press blue Reset .

   b. Press ⇧ until YES blinks, and press Enter .

2. Connect the test fixture to the UNKNOWN terminals as follows:



* For detail, see "HP 16339A Component Test Fixture" in Chapter 2.

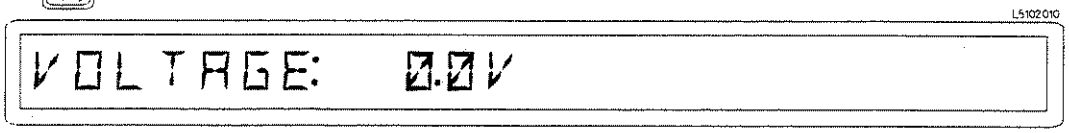
3. Perform calibration.

   Press (blue) (Cal 5).

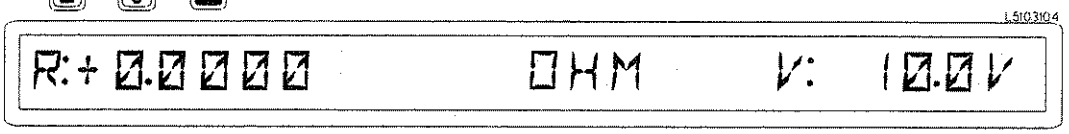
   After a while, "CALIBRATION: COMPLETE" will be displayed, then the calibration is completed.

4. Set the test voltage.

   a. Press (Cur Limit / Source Voltage).

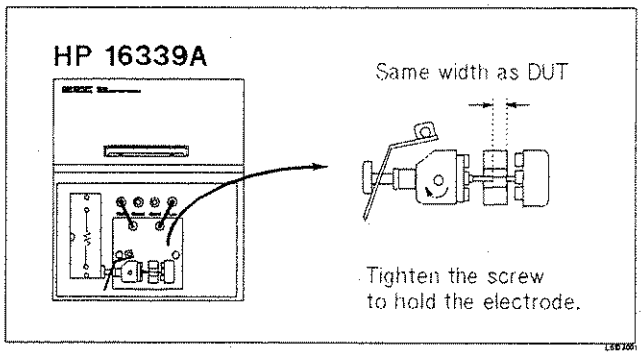


   b. Press (Cont Chk 1) (Key Lock 0) (Enter ■). The HP 4339A displays 10 V.



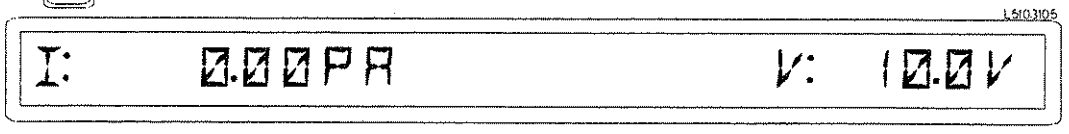
5. Perform an OPEN correction.

   a. Separate and set the test electrodes (nothing must be connected to the electrodes).



   b. Close the cover.

   c. Press (Elec Size / Meas Prmtr). The measurement parameter I:(current) will be displayed.

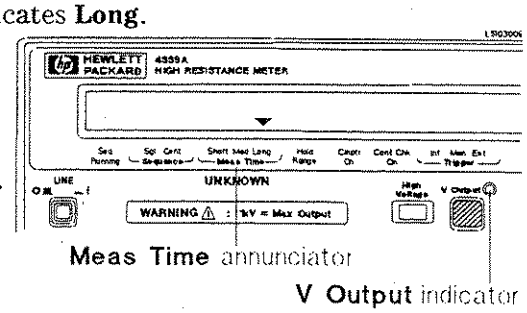


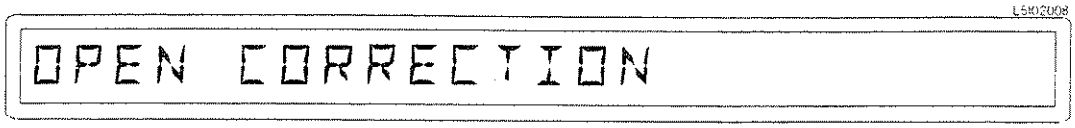
   d. Press (Average / Meas Time). The **Meas Time** annunciator will indicates **Long**.

   e. Press (V Output). The **V Output** indicator will turn ON.

   f. Wait until the I value has stabilized within 0.5 pA.

   g. Press (blue) (Open 4).

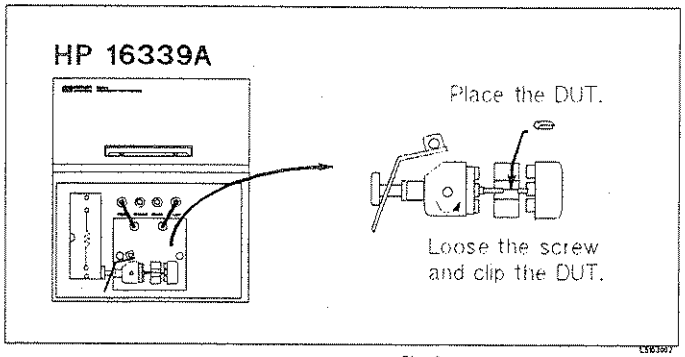




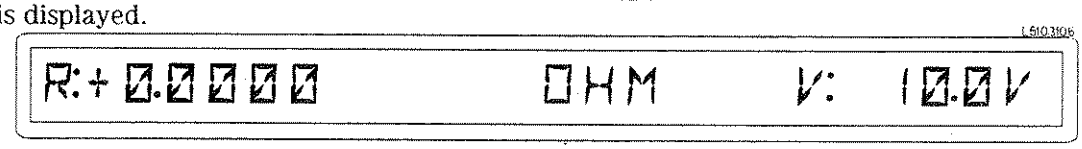
After a while, CORR: COMPLETE will be displayed, then the OPEN correction is completed. (If OUT OF LIMIT is displayed, see "To Perform OPEN Correction —Canceling the stray admittance in parallel with the DUT" in Chapter 2.)

h. Press V Output. The **V Output** indicator will turn OFF.

6. Connect the DUT and close the cover.



7. Set measurement parameter to R(resistance); press Elec Size Meas Param until the measurement parameter R: is displayed.

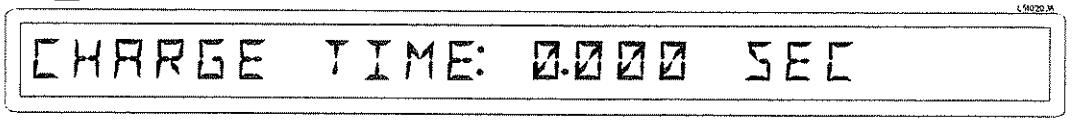


8. Set the measurement sequence function to the charging time of 1 minute.

a. Press blue Program Seq Mode.

CHRG is blinking.

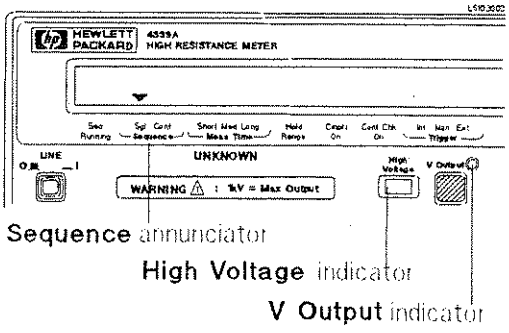
b. Press Enter.



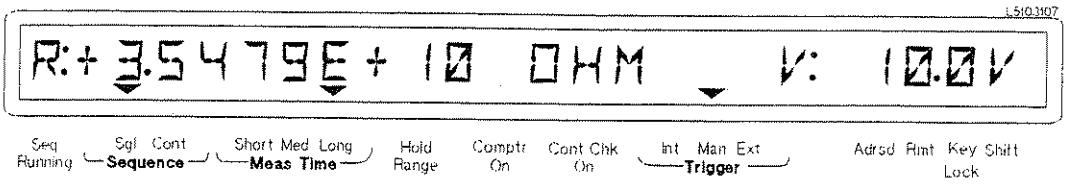
c. Press 6 Key Lock 0 Enter.

d. Press Enter to EXIT.

e. Press Program Seq Mode. The **Sequence** annunciator points to **Sgl**.



9. Press Seq Abort Trig. After charging 1 minute, the measurement result will be displayed. The following figure shows the typical measurement result display.



For More Information

- To print out the measurement result — See "To Print Measurement Data" in Chapter 2
- To select measurement level — See "To Set Test Voltage" in Chapter 2

Measuring Resistivity of Insulation Material

This example shows the procedure to measure resistivity of an insulation material after charged 1 minute. The HP 16008B Resistivity Cell is a right tool to measure resistivity of solid insulation materials.

DUT

Insulation Material
(5 mm × 120 mm × 120 mm)

Requirements

Test Fixture : HP 16008B, ϕ 50 mm electrode

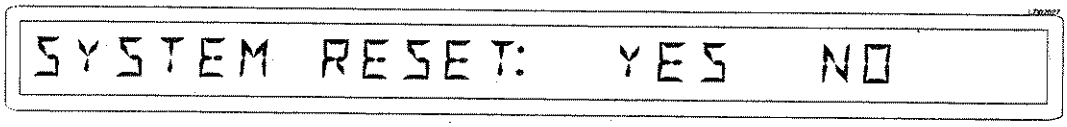
Measurement Setup

Measurement parameter : RV(ρv)
Measurement Range : Auto range mode
Test Voltage : 500 V
Use the measurement sequence single mode (measure after charged for 1 minute.)

Measurement Procedure

1. Reset the HP 4339A.
   a. Press 

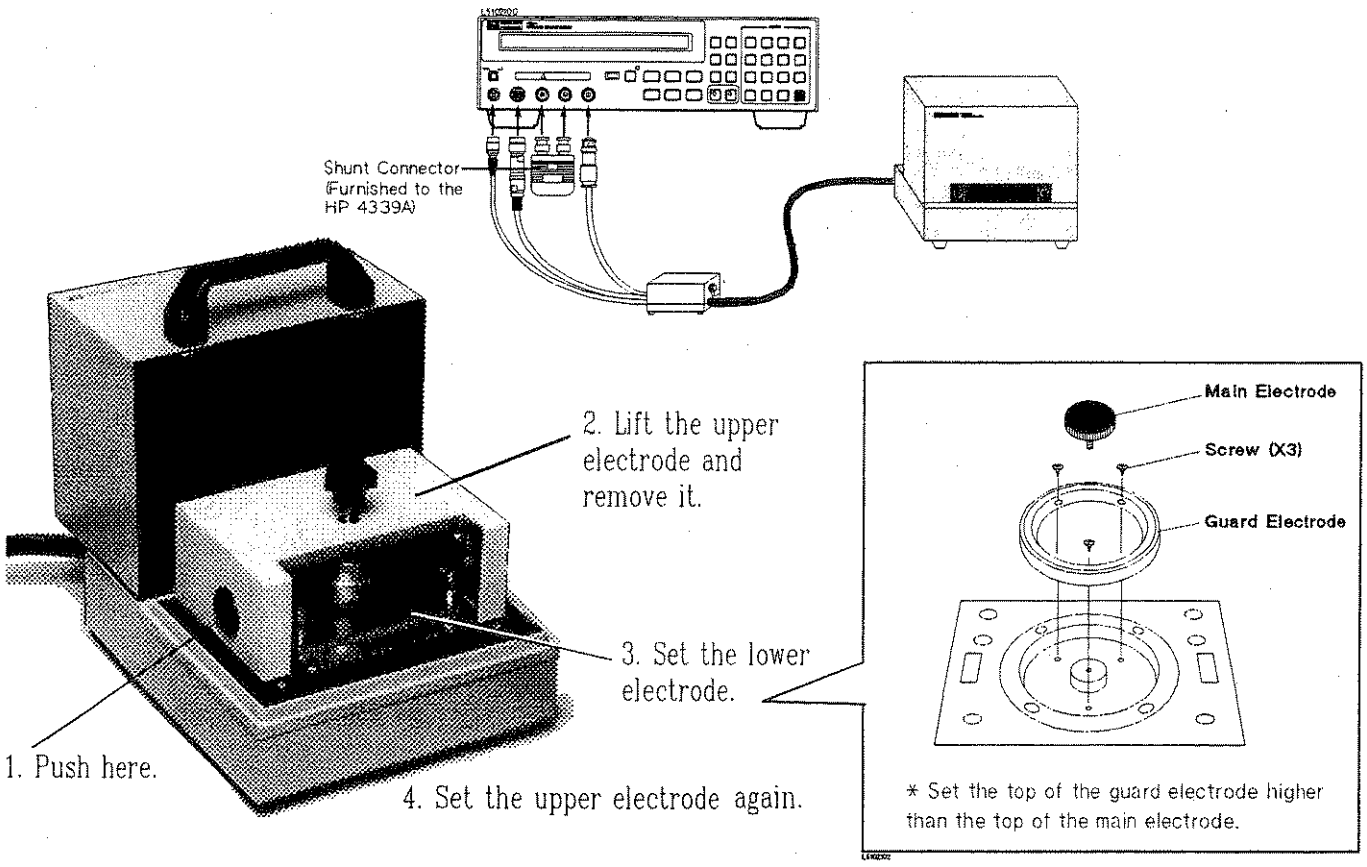
.



   b. Press  until YES blinks, and press 

.

2. Connect test fixture to the UNKNOWN terminals as follows:



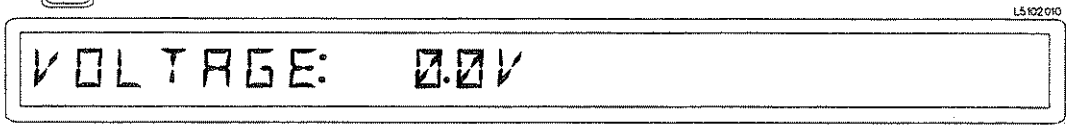
3. Perform calibration.

   Press blue Cal 5 .

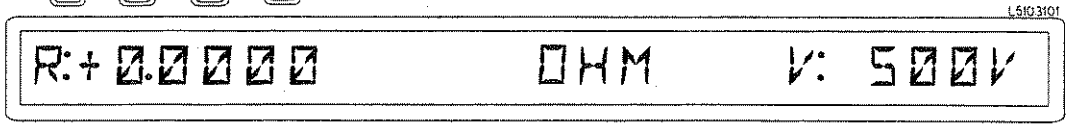
   After a while, "CALIBRATION: COMPLETE" will be displayed, then the calibration is completed.

4. Set the test voltage.

   a. Press Cur Limit Source Voltage .

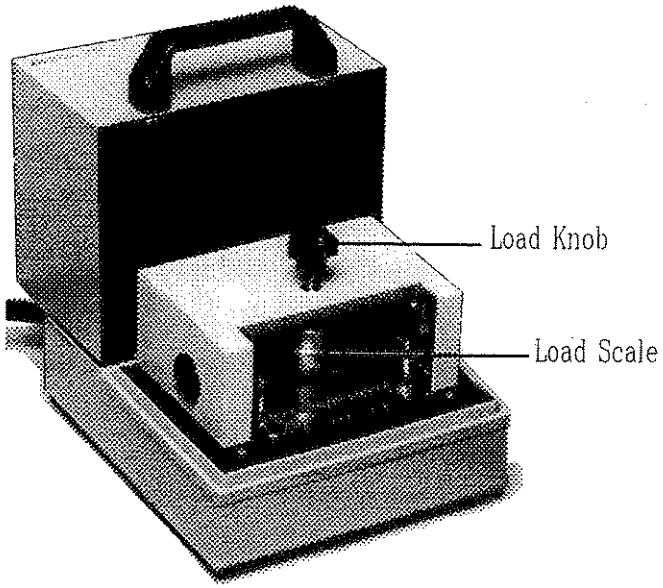


   b. Press Cal 5 Key Lock 0 Key Lock 0 Enter . The HP 4339A displays 500 V.



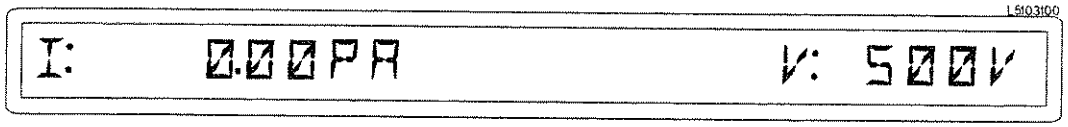
5. Perform an OPEN correction.

   a. Turn the load knob counterclockwise(ccw) until the upper electrode does not move.



   b. Close the cover.

   c. Press Elec Size / Meas Prstr . The measurement parameter I:(current) will be displayed.

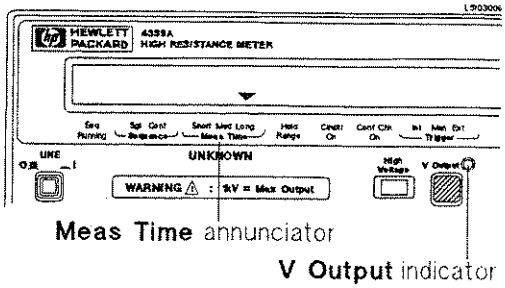


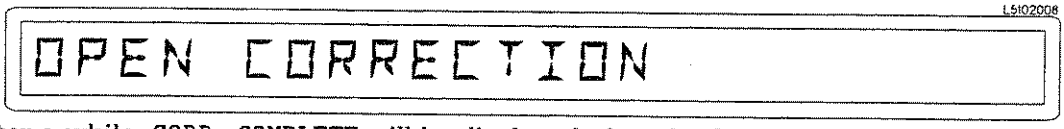
   d. Press Average / Meas Time . The **Meas Time** annunciator will indicates **Long**.

   e. Press V Output . The **V Output** indicator will turn ON.

   f. Wait until the I value has stabilized within 0.5 pA.

   g. Press blue , Open 4 .



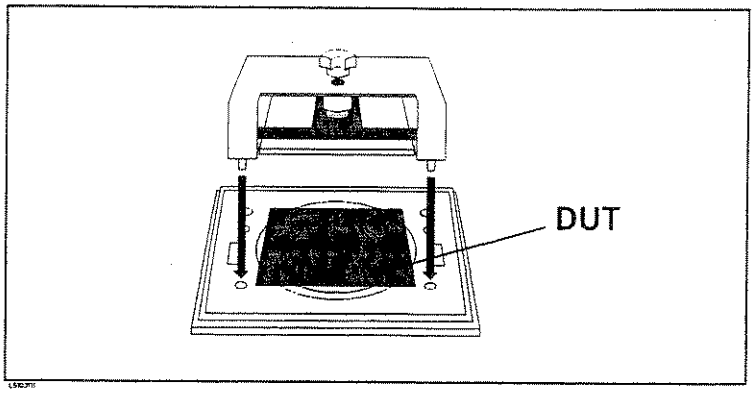


   After a while, CORR: COMPLETE will be displayed, then the OPEN correction is completed. (If OUT OF LIMIT is displayed, see "To Perform OPEN Correction —Canceling the stray admittance in parallel with the DUT" in Chapter 2.)

   h. Press V Output . The **V Output** indicator will turn OFF.

6. Set the DUT.

   a. Place the DUT on the Main electrode.



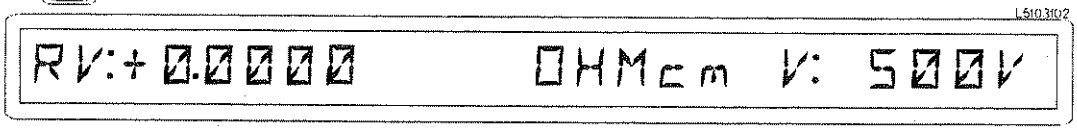
b. Turn the load knob and stick the electrode on the DUT.(Let the load scale indicate more than 0 kg and less than 10 kg.)

c. Close the cover.

7. Set measurement parameter to RV(ρv : volume resistivity).

a. Turn the Volume/Surface selector of the HP 16008B to "Volume".

b. Press Elec Size [Meas Prmtr] several times until the measurement parameter RV: is displayed.

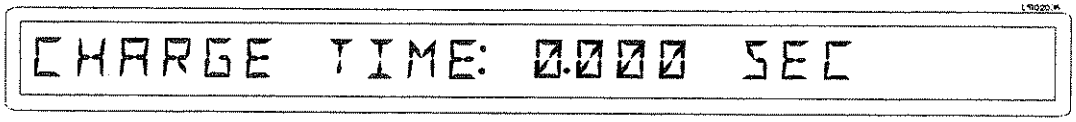


8. Set the measurement sequence function to the charging time of 1 minute.

a. Press [blue] Program [Seq Mode].

CHRG is blinking.

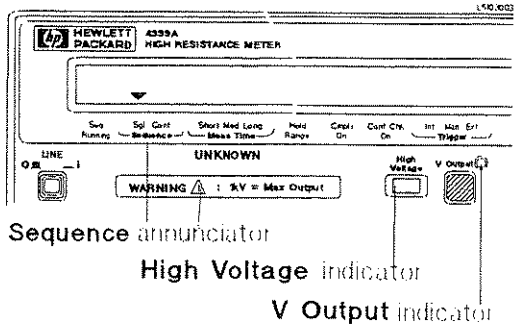
b. Press Enter [ ].



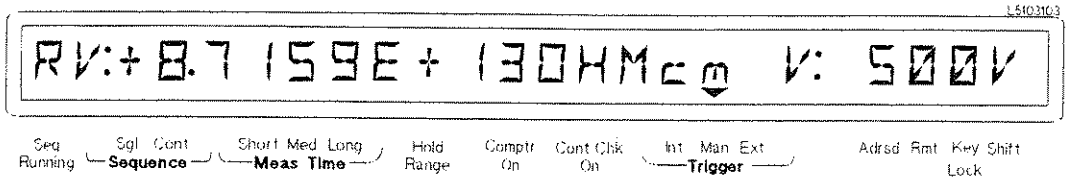
c. Press [6] Key Lock [0] Enter [ ].

d. Press Enter [ ] to EXIT.

e. Press Program [Seq Mode]. The **Sequence** annunciator points to **Sgl**.



9. Press Seq Abort [Trig]. After charging 1 minute, the measurement result will be displayed. The following figure shows the typical measurement result display.



For More Information

- To print out the measurement result — See "To Print Measurement Data" in Chapter 2
- To select other measurement parameters — See "To Select Measurement Parameter" in Chapter 2
- To select measurement level — See "To Set Test Voltage" in Chapter 2

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