

Agilent 4284A Precision LCR Meter

Manual Change

Agilent Part No. 04284-90041

September 2004

Printed in Japan

Change 1

Change “|Z|, |Y|, L, C, R, X, G, and B Accuracy” on page 9-8 as follows:

|Z|, |Y|, L, C, R, X, G, and B Accuracy

|Z|, |Y|, L, C, R, X, G, and B accuracy A_e is given as

$$A_e = \pm [A + (Ka + Kaa + Kb \times Kbb + Kc) \times 100 + Kd] \times Ke \quad [\%]$$

- A: Basic Accuracy (Refer to Figure 9-4 and 9-5.)
- Ka: Impedance Proportional Factor (Refer to Table 9-1.)
- Kaa: Cable Length Factor (Refer to Table 9-2.)
- Kb: Impedance Proportional Factor (Refer to Table 9-1.)
- Kbb: Cable Length Factor (Refer to Table 9-3.)
- Kc: Calibration Interpolation Factor (Refer to Table 9-4.)
- Kd: Cable Length Factor (Refer to Table 9-6.)
- Ke: Temperature Factor (Refer to Figure 9-6.)

L, C, X, and B accuracy applies when D_x (measured D value) ≤ 0.1 .

R and G accuracy applies when Q_x (measured Q value) ≤ 0.1 .

When $D_x > 0.1$, multiply A_e by $\sqrt{(1 + D_x^2)}$ for L, C, X, and B accuracy.

When $Q_x > 0.1$, multiply A_e by $\sqrt{(1 + Q_x^2)}$ for R and G accuracy.

When measured value $< 10 \text{ m}\Omega$, |Z|, R, and X accuracy A_e is given as

$$A_e = \pm [(Ka + Kaa + Kc) \times 100 + Kd] \times Ke \quad [\%]$$

- Ka: Impedance Proportional Factor (Refer to Table 9-1.)
- Kaa: Cable Length Factor (Refer to Table 9-2.)
- Kc: Calibration Interpolation Factor (Refer to Table 9-4.)
- Kd: Cable Length Factor (Refer to Table 9-6.)
- Ke: Temperature Factor (Refer to Figure 9-6.)

X accuracy applies when D_x (measured D value) ≤ 0.1 .

R accuracy applies when Q_x (measured Q value) ≤ 0.1 .

When $D_x > 0.1$, multiply A_e by $\sqrt{(1 + D_x^2)}$ for X accuracy.

When $Q_x > 0.1$, multiply A_e by $\sqrt{(1 + Q_x^2)}$ for R accuracy.

Change 2

Add the following description to “4284A Calibration Accuracy” on page 9-16.

When measured value < 10 mΩ, calibration accuracy Acal is given as follows:

$$20 \text{ Hz} \leq fm \leq 1 \text{ kHz}: \quad 0.03 [\%] *$$

$$1 \text{ kHz} < fm \leq 100 \text{ kHz}: \quad 0.05 [\%] *$$

$$100 \text{ kHz} < fm \leq 1 \text{ MHz}: \quad 0.05 + 5 \times fm \times 10^{-5} [\%] *$$

fm: test frequency [kHz]

* Acal = 0.1% when Hi-PW mode is ON

Change 3

Add 42030A (1 Ω) to Recommended Model column for Standard Resister in Table 10-1 (page 10-3).

Change 4

Add the following steps to the impedance measurement accuracy test (between step 29 and 30, page 10-17).

- Set the measurement function to R-X.
- Connect the 1 Ω standard resistor to the 1 m Test Leads (16048A).
- Perform Step d through e for all the test listed in Table 10-9-a.
- Press the TRIGGER key.
- Confirm the 4284A's reading is within the test limits in Table 10-9-a.

Table 10-9-a. Impedance Measurement Accuracy Test Limits for 1 m Cable Length Operation

Setting			Test Limits (R)
Signal Level	Test Frequency	Measurement Range	1Ω Standard
510 mV	1 kHz	10 Ω	C.V. ± 0.0026 Ω
5.1 V*	1 kHz	1 Ω	C.V. ± 0.0030 Ω

C.V. : Standard's calibration value at DC

* Option 4284A-001 only

Change 5

Change Impedance Measurement Accuracy Test Limits as follows.

- Table 10-7 “Impedance Measurement Accuracy Test Limits (1 of 2)” at page 10-14.
Signal Level: 510 mV
Test Frequency: 20 Hz
Parameter: D
1000 pF Standard
Wrong limit: ± 0.00319
Correct limit: ± 0.03190

Change 6

Change Performance Test Record for Impedance Measurement Accuracy Test as follows.

- Performance test record for 100 pF Standard at page 10-42
OSC Level: 510 mV
 - Change 125 Hz Cp MINIMUM test limit as below
Wrong limit: C.V. – 1.7595 pF
Correct limit: C.V. – 1.759 pF
- Performance test record for 1000 pF Standard at page 10-43
OSC Level: 510 mV
 - Change 20 Hz D MINIMUM test limit as below
Wrong limit: - 0.00319
Correct limit: - 0.03190
 - Change 20 Hz D MAXIMUM test limit as below
Wrong limit: 0.00319
Correct limit: 0.03190
- Performance test record for 0.01 μ F Standard at page 10-44

OSC Level; 510 mV

- Delete 20 Hz test limits from the table
- Delete 125 Hz test limits from the table
- Change 1 kHz MINIMUM test limit as below
Wrong limit: C.V. x 0.0082 nF
Correct limit: C.V. – 0.0082 nF

- Performance test record for 0.1 μ F Standard at page 10-44

OSC Level; 510 mV

- Delete 20 Hz test limits from the table
- Delete 125 Hz test limits from the table

- Performance test record for 1 μ F Standard at page 10-45

OSC Level; 510 mV

- Delete 20 Hz test limits from the table
- Delete 125 Hz test limits from the table
- Change 1 kHz MINIMUM test limit as below.
Wrong limit: -0.081 nF
Correct limit: -0.81 nF
- Change 1 kHz MAXIMUM test limit as below.
Wrong limit: +0.081 nF
Correct limit: +0.81 nF

Change 7

Change Performance Test Record for DC Bias Voltage Accuracy Test as follows.

- Performance test record for DC Bias Voltage Accuracy Test for Hi-PW ON at page 10-40
 - Change –14V MINIMUM test limit as below
Wrong limit: -14.012
Correct limit: -14.019
 - Change –14V MAXIMUM test limit as below
Wrong limit: -13.988

Correct limit: -13.981

- Delete duplicated -40V test which shows -30.040V and -29.960V as test limits from the table.

Miscellaneous Changes

The option system of the 4284A has changed since February 2003. Apply the following changes.

Old Option Number	New Option Number	remarks
Standard	700 (Standard Power (2V, 20mA, 2V DC Bias) Add)	1
001 (Power Amplifier / DC Bias)	same as the left number	1,2
002 (Bias Current Interface)	same as the left number	2,3
201 (Handler Interface)	same as the left number	3
202 (Handler Interface)	same as the left number	
301 (Scanner Interface)	same as the left number	
—	710 (Blank Panel)	
004 (Memory Card)	same as the left number	
006 (2 m/4 m Cable Length Operation)	same as the left number	
907 (Front Handle Kit)	same as the left number	
908 (Rack Mount Kit)	same as the left number	
909 (Rack Flange and Handle Kit)	same as the left number	
008 (Add Operation Manual Japanese)	—	4
—	ABJ (Add Operation Manual (Japanese))	
009 (Delete Operation Manual)	—	
910 (Extra Operation Manual)	—	
—	ABA(Add Operation Manual (English))	
915 (Add Service Manual)	same as the left number	
109 (Delete GPIB Interface)	—	5

1. In the previous system, an option for the Power Amplifier/DC Bias was available only for the Power Amplifier/DC Bias option. In the new option system, it is available for the standard power and Power Amplifier/DC Bias , requiring the customer to select either of them
2. Although option 001 and 002 can be installed on the 4284A main unit, you cannot use their functions at the same time.
3. In the new option system, up to 2 types of interfaces can be installed allowing arbitrary combination. Note that options 201 and 202 cannot be installed at the same time. When installing 1 type of interface on the 4284A, choose 1 as the quantity of option 710. When installing 2 types of interfaces on the 4284A, choose 0 as the quantity of option 710. When installing no interface, choose 2 as the

quantity of option 710.

4. No selection of addition/deletion is required for the operation manual set because it is only available as an optional accessory in the new option system.
5. In the new option system, the GP-IB interface is installed on the 4284A as standard equipment.

© Copyright Agilent Technologies 2004