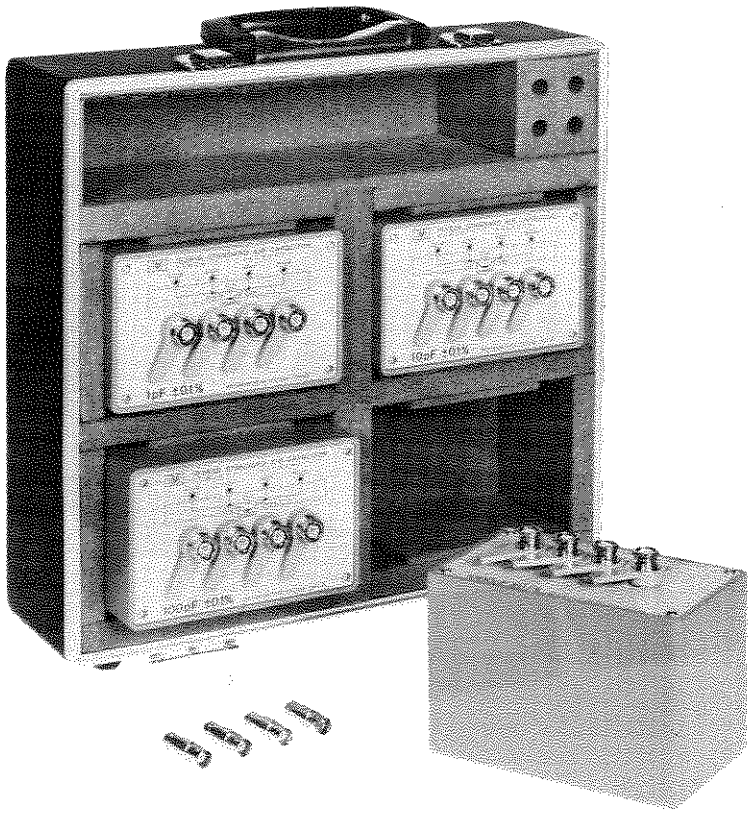
CONNECTION GUIDE

STANDARD AIR CAPACITOR SET

16380A



JUNE 1982

HEWLETT PACKARD

HP 16380A

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MANUAL CHANGES

HP MODEL 16380A STANDARD AIR CAPACITOR SET
(CONNECTION GUIDE)
Serial Prefixed: All
Manual Printed: JUL. 1980

MAKE ALL CORRECTIONS IN THIS MANUAL ACCORDING TO ERRATA BELOW, THEN CHECK THE FOLLOWING TABLE FOR YOUR INSTRUMENT SERIAL PREFIX (4 DIGITS) OR SERIAL NUMBER (9 DIGITS) AND MAKE ANY LISTED CHANGE(S) IN THE MANUAL.

► NEW ITEM.

SERIAL PREFIX OR NUMBER	MAKE MANUAL CHANGES	SERIAL PREFIX OR NUMBER	MAKE MANUAL CHANGES

Add: Calibration cycle: once a year.

Supplement B for 16380-90000

JUL. 28, 1982

Printed in Japan

INTRODUCTION:

The Model 16380A Capacitor Standard Set is provided for the calibration of HP LCR meters Models 4274A and 4275A and is configured for four-terminal-pair unknown terminals. To cover the wide frequency range for which the capacitors are intended, the residual inductance and temperature coefficient have been minimized to maximize the long term stability characteristics. The capacitors are also compatible and mate directly with four-terminal-pair configuration terminals.

This capacitor set is compatible for use with earlier HP LCR measurement instruments such as the Models 4261A, 4262A, 4271B and others with test leads furnished with the respective instruments plus some additional general purpose BNC adapters.

SERVICE:

As there is no access to the inside of these capacitor standards and no replaceable components, this booklet doesn't contain service information such as material lists or exploded views as in the operating notes for other instruments.

The recommended calibration cycle of the 16380A is once a year. A defective capacitor standard should be completely replaced.

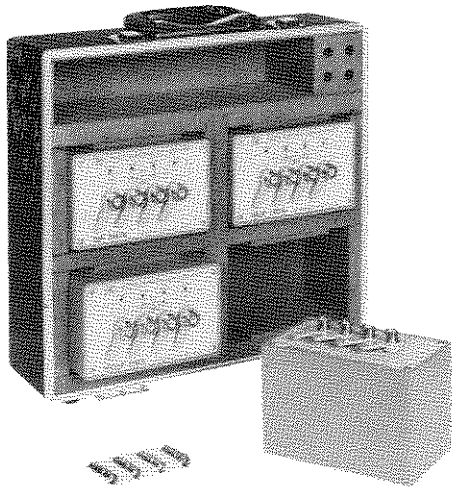
CONNECTION:

This booklet describes the procedure for connecting the capacitor standard to the several types of LCR meters and bridges to which the measuring terminals are not directly connectable.

The Model 16380A technical data sheet lists the required test leads and adapters for the various LCR measuring instruments.

Note

Section IV of the Models 4274A and 4275A manuals describes the calibration method with the 16380A and since they are directly connectable and measurable, connection methods for these units are not covered here.



Contents:
16381A ····· 1pF
16382A ····· 10pF
16383A ····· 100pF
16384A ····· 1000pF
Case ····· HP P/N 16380 85001
BNC F-F Connector ·····
····· HP P/N 1250 0080 4ea.

1. CONNECTIONS for FIVE TERMINAL LCR METERS.

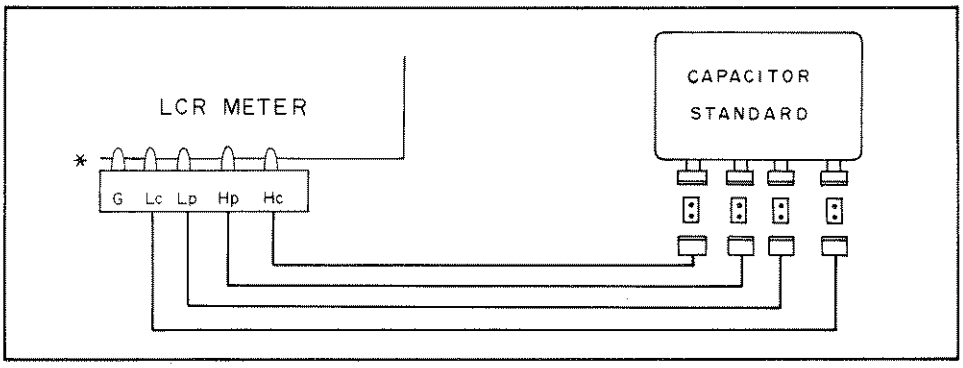


Figure A. Connection with LCR Meter

1-1. INSTRUMENT: 4261A

REQUIRED ACCESSORIES:

Test Lead (4-BNC connector to 5-Banana plug leads) ..... HP P/N: 16361-61605
BNC Female-Female Adapter ..... HP P/N: 1250-0080 (4ea)

PROCEDURE:

a. Set 4261A controls as follows:

FREQUENCY ..... ANY SETTING
DC BIAS ..... OFF
TEST SIGNAL LEVEL 1V
TRIGGER ..... INT
FUNCTION C
CIRCUIT MODE ..... AUTO
RANGE HOLD ..... OFF

b. Connect test leads, BNC female-female adapters and capacitor standard to the 4261A as in Figure A.

c. Proceed with measurement in accordance with the 4261A capacitance measuring procedure.

1-2. INSTRUMENT: 4262A

REQUIRED ACCESSORIES:

Test Leads ..... HP P/N 16361-61605
BNC T Adapter ..... HP P/N 1250-0781 (2ea)
BNC Female-Female Adapter ..... HP P/N 1250-0080 (4ea)

PROCEDURE:

a. Set 4262A controls to initial control settings as described in the 4262A manual.

b. Connect test leads to UNKNOWN terminals and connect two BNC T adapters and BNC female-female adapters to the test leads as shown in Figure B.

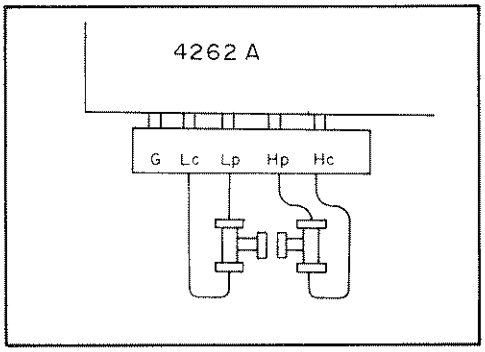


Figure B. C Offset Adjustment

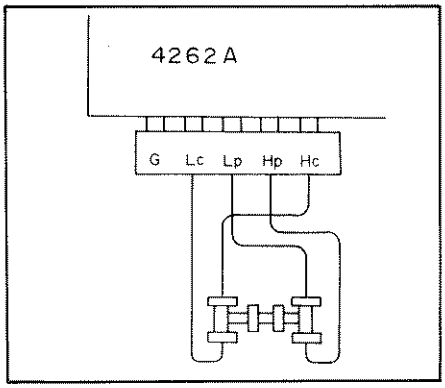


Figure C. L Offset Adjustment

c. Rotate C OFFSET ADJ until display count is 0±1 on LCR display.

d. Change connection to that shown in Figure C.

e. Rotate L OFFSET ADJ until display count is 0±1 on LCR display.

f. Connect capacitor standard using same connection configuration as in Figure A.

g. Proceed with measurement in accordance with the 4262A capacitance measuring procedure.

2. CONNECTION for FOUR TERMINAL PAIR LCR METERS.

2-1. INSTRUMENT: 4271A/B, 4272A

REQUIRED ACCESSORIES:

Test Lead with BNC Connector ..... HP 16032A
BNC Tee Adapter ..... HP P/N 1250-0781 (2ea)
BNC Female-Female Adapter ..... HP P/N 1250-0080 (4ea)

Note

The 4271A/B and 4272A will give accurate readings only if the proper test lead (HP 16032A or its equivalent) is used to connect the capacitor standard to the UNKNOWN terminals. If the capacitor standard is connected directly the the UNKNOWN terminals of the 4271A/B or 4272A, the displayed value will be slightly higher than the true value.

PROCEDURE:

a. Set 4271A/B and 4272A controls to the same settings used in performing offset adjustsments.

b. Connect 16032A Test Lead to UNKNOWN terminals of respective instrument.

c. Connect two (2) BNC T adapters and BNC female-female adapter to the test leads as in Figures B and C in accordance with C and L offset adjustment.

d. Perform both offset adjustments and connect the capacitor standard as shown in Figure A.

e. Proceed with measurement in accordance with 4271A/B and 4272A capacitance measurement procedures.

2-2. INSTRUMENT: 4273A

REQUIRED ACCESSORIES:

Test Lead	HP 16045A
BNC T Adapter	HP P/N 1250-0781 (2ea)
BNC Female-Female Adapter	HP P/N 1250-0080 (4ea)

PROCEDURE:

a. Set 4273A controls to the same settings as for performing C offset adjustment.

b. Connect HP 16045A test leads to the 4273A.

c. Connect two BNC T adapters to the test leads as shown in Figure B and perform C offset adjustment.

d. Connect the capacitor standard as shown in Figure A.

e. Proceed with capacitance measurement.

3. CONNECTION for THREE TERMINAL C BRIDGE.

3-1. INSTRUMENT: 4270A

REQUIRED ACCESSORIES:

BNC-BNC Cable	HP 10121A X 2
BNC Female-Female Adapter	HP P/N 1250-0080 X 2

PROCEDURE:

a. Set 4270A controls as follows:

RANGE MODE	AUTO
TEST VOLTAGE	NORM
LOSS MEAS	D
DC BIAS RANGE	OFF
MEAS CKT	FLOAT

b. Connect High and Low potential connectors of capacitor standard to UNKOWN Terminals of the 4270A with two (2) BNC-BNC cables and two (2) BNC female-female adapters.

c. Proceed with capacitance measurement.

Note

Calibrated value of the 100pF and 1000pF standard capacitors have some offset value at 1MHz. For the other two standard capacitors (1pF and and 10pF), the calibration value at 1kHz can be used at 1MHz.

Note

To make a compensation calibration for the 4270A for a 1MHz measurement, refer to following table and also to effects of cable in HP Cable 10121A (also refer to page 3-52 of 4270A Manual instructions for the effects of the cable length when cables other than the 10121A are connected between the capacitor standard and UNKNOWN terminals).

	1000pF	100pF
$\frac{*C_{1MHZ} **C_{1KHZ}}{C_{1KHZ}}$	$9X10^{-4}$	$1X10^{-4}$
$D_{1MHZ} - D_{1KHZ}$	$1x10^{-4}$	0

*C_{1MHZ} , D_{1MHZ} : Calibration value at 1MHz.
**C_{1KHZ} , D_{1KHZ} : Calibration value at 1kHz.

Effect of cable in HP 10121A Cable when measuring 1000pF at 1MHz.

Capacitance ..... +0.6%
Dissipation Factor ..... +0.0045

4. CONNECTION for THREE TERMINAL LCR METERS and BRIDGES.

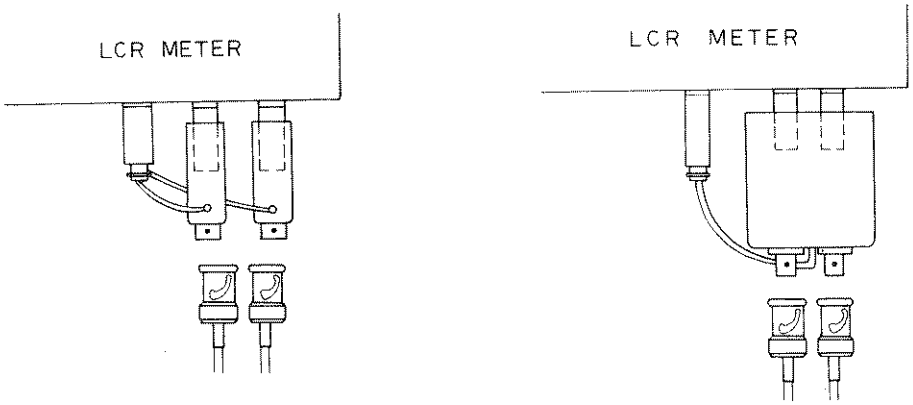
4-1. INSTRUMENTS: 4332A, 4265B

REQUIRED ACCESSORIES:

Banana-BNC Adapter ..... HP 10113A or HP 10111A X 2
BNC-BNC Cable ..... HP 10121A X 2
BNC Female-Female Adapter ..... HP P/N 1250-0080 X 2

PROCEDURE:

a. Set 4332A and 4265B controls for measuring capacitance.
b. Connect capacitor standard to the UNKNOWN terminal of respective instrument with a banana to BNC adapter, two (2) BNC to BNC cables and two (2) BNC female-female adapters as in the figure below.



Note

A zero adjustment should be performed with adapter and cable connected to 4332A (not required for 4265B) before connection of standard capacitor.

c. Proceed with measurement in accordance with 4332A and 4265B capacitance measuring procedures.

Note

Actual measurement values include stray capacitor between High and Low UNKNOWN terminals (this value is approximately 0.4pF) for measurement with 4265B.

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Part No. 16380-90000

Printed in JAPAN