

B2980C Series Femto / Picoammeter and Electrometer / High Resistance Meter

The World's Only Graphical Picoammeter / Electrometer that can Confidently Measure Down to 0.01 fA and Up to 10 PΩ

Introduction

The Keysight B2980C Series includes the following four models.

- B2981C Femto / Picoammeter, 0.01 fA
- B2983C Femto / Picoammeter, 0.01 fA, Battery
- B2985C Electrometer / High Resistance Meter, 0.01 fA, 1000 V
- B2987C Electrometer/ High Resistance Meter, 0.01 fA, 1000 V, Battery

This configuration guide contains a step-by-step process for configuring your Femto / Picoammeter, Electrometer, and related accessories to meet your specific test requirements.




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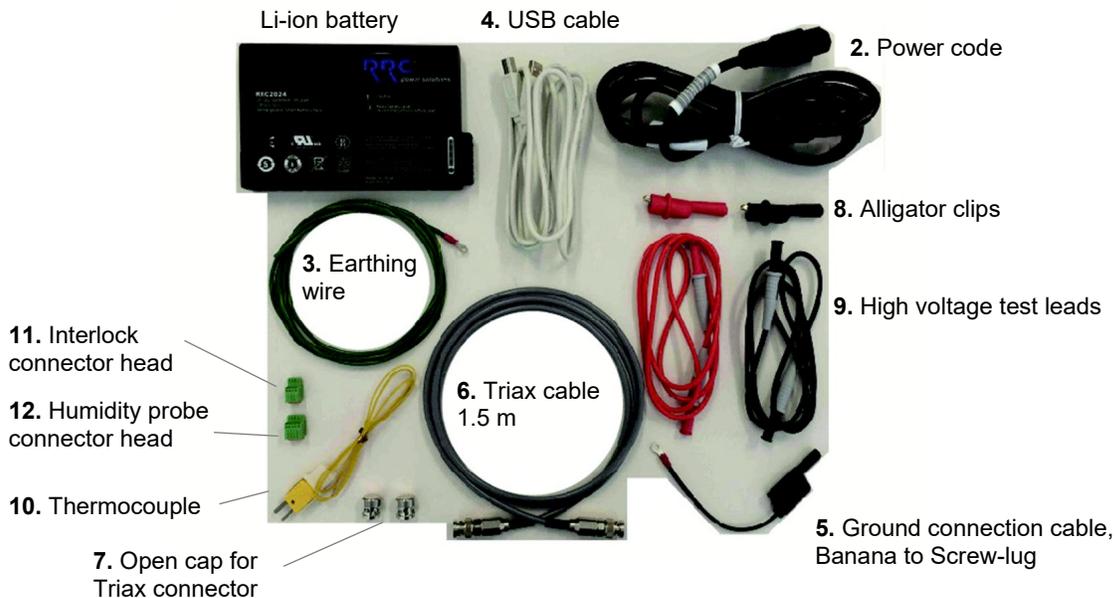
Step 1. Select the B2980C Series Model

Decide whether you need a picoammeter or an electrometer based on your test requirements, such as measurement parameters and the need for a battery model for low-noise measurement. This will help you choose the appropriate B2980C model. Note that the B2980C Series cannot be upgraded later.

		Measurement Parameters				Voltage Source	Battery Operation
		Current	Voltage	Resistance	Charge		
Femto/ Picoammeter	B2981C	Yes					
	B2983C	Yes					Yes
Electrometer	B2985C	Yes	Yes	Yes	Yes	Yes	
	B2987C	Yes	Yes	Yes	Yes	Yes	Yes
Additional information		0.01 fA to 20 mA	1 μ V to 20 V	< 10 P Ω	1 fC to 2 μ C	Up to \pm 1,000 V	

Each B2980C Series model supplies the following standard items:

Standard Furnished Items			Number of Pieces			
Description	Orderable Parts Number	B2981C	B2983C	B2985C	B2987C	
1 Quick startup poster / Quick reference	NA	1ea	1ea	1ea	1ea	
2 Power cord	NA	1ea	1ea	1ea	1ea	
3 Earthing wire (2 m)	NA		1ea		1ea	
4 USB cable	8121-1696	1ea	1ea	1ea	1ea	
5 Ground connection cable, Banana to Screw-lug	B2981-61715	1ea	1ea	1ea	1ea	
6 Triax cable (500 V, 1.5 m)	N1412A	1ea	1ea	1ea	1ea	
7 Open cap for Triax connector	N1417A	1ea	1ea	2ea	2ea	
8 Alligator clips (black and red)	U3606-60030			1ea	1ea	
9 High voltage test leads (black and red, 1000 V)	U8201-60001			1ea	1ea	
10 Thermocouple for B2985/B2987	N1423A			1ea	1ea	
11 Interlock connector head	NA			1ea	1ea	
12 Humidity probe connector head	NA			1ea	1ea	



Step 2. Add Optional Productivity Tools

There are several productivity tools that can help you startup your measurement quickly and maintain measurement integrity for your challenging sensitive measurements.

Description	Product Number	Additional Information	Applicable Model			
			B2981C	B2983C	B2985C	B2987C
Starter kit for B2985/ B2987	N1410A	The following items are included: N1415A Triax to alligator clip cable, 1ea N1414A High resistance measurement universal adapter, 1ea			Yes	Yes

Step 3. Select Optional Accessories

Step 3-1. Add Rack Mount Kit (Optional)

Description	Product Number	Additional Information	Applicable Model			
			B2981C	B2983C	B2985C	B2987C
Rack Mount Kit	1CM124A	Includes a rack mount flange and front handle kit. It fits a standard 19-inch rack and occupies two units of rack space.	Yes	Yes	Yes	Yes

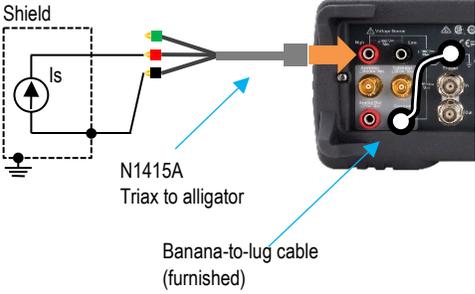
Step 3-2. Select Additional Accessories for Current Measurements (Optional)

You can add the following accessories based on your measurement requirements.

Here is the recommended connection, which is designed to ensure measurement accuracy and reliability, making it suitable for highly sensitive measurements.

Recommended Connection	Product Number	Qty.	Description
<p>Current measurement connection, Grounded</p> <p>Shield</p> <p>16494A, N1412A/B/C Triax cable</p> <p>N1416A/B Triax bulkhead connector</p> <p>Banana-to-lug cable (furnished)</p>	16494A-001	1ea	Low leakage Triax cable (200 V, 1.5 m, Furnished)
	16494A-002/004	1ea	Low leakage Triax cable (200 V, 3.0 m/4.0 m)
	N1412A/B/C	1ea	Low leakage Triax cable (500 V, 1.5 m/3 m/6 m)
	N1416A/B	1ea	Triax bulkhead connector (200 V/500 V)
	B2981-61715	1ea	Ground connection cable, Banana to Screw-lug (Furnished)

Here is the simple connection, which prioritizes simplicity and quick setup. It is ideal for general measurements, though it may not be suitable for highly sensitive measurements.

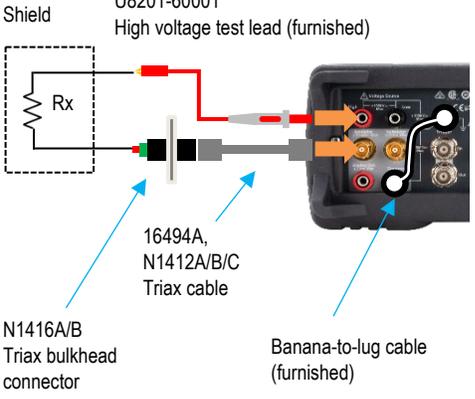
Simple Connection	Product Number	Qty.	Description
Current measurement connection, Grounded 	N1415A	1ea	Triax to alligator cable
	B2981-61715	1ea	Ground connection cable, Banana to Screw-lug (Furnished)

Step 3-3. Select Additional Accessories for Resistance Measurements (Optional)

You can add the following accessories based on your measurement requirements.

You can also add the optional N1414A high-resistance measurement universal adapter, which enables you to simplify the cabling and monitor source voltage at high-resistance measurements.

Here is the recommended connection, which is designed to ensure measurement accuracy and reliability, making it suitable for highly sensitive measurements.

Recommended Connection	Product Number	Qty.	Description
Floating device measurement 	16494A-001	1ea	Low leakage Triax cable (200 V, 1.5 m, Furnished)
	16494A-002/004	1ea	Low leakage Triax cable (200 V, 3.0 m/4.0 m)
	N1412A/B/C	1ea	Low leakage Triax cable (500 V, 1.5 m/3 m/6 m)
	N1416A/B	1ea	Triax bulkhead connector (200 V/500 V)
	U8201-60001	1ea	High voltage test lead (Furnished)
	N1414A	1ea	High resistance measurement universal adapter (Optional)
	B2981-61715	1ea	Ground connection cable, Banana to Screw-lug (Furnished)

Here is the simple connection, which prioritizes simplicity and quick setup. It is ideal for general measurements, though it may not be suitable for highly sensitive measurements.

Simple Connection	Product Number	Qty.	Description
Floating device measurement	N1415A	1ea	Triax to alligator cable
	U8201-60001	1ea	High voltage test lead (Furnished)
	B2981-61715	1ea	Ground connection cable, Banana to Screw-lug (Furnished)

The B2985C/87C supports the Keysight's accessories for high resistance measurement. The N1413A High resistance meter fixture adapter is needed to use those accessories.

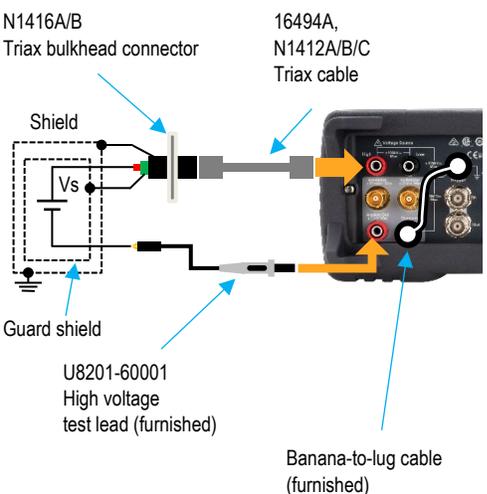
Description	Product Number	Additional Information
High resistance meter fixture adapter	N1413A	
Resistivity Cell for N1413 with B2980 Series (50 mm Electrodes)	N1424A	The N1413A High resistance meter fixture adapter is required to use these accessories.
Resistivity Cell for N1413 with B2980 Series (26/50 mm Diameter Electrodes)	N1424B	
Resistivity Cell for N1413 with B2980 Series (26/50/76 mm Diameter Electrodes)	N1424C	
Low Noise Test Leads for N1413 with B2980 series (1.5 m/3.0 m)	N1425A/B	
Pin Probes for N1425	N1426A	
Soldering Sockets for N1425	N1426B	
Alligator Clips for N1425	N1426C	
Low Noise Test Cables for N1413 with B2980 series (1.5 m/3.0 m)	N1427A/B	
Component Test Fixture for N1413 with B2980 Series	N1428A	

If you have obsolete accessories such as the 16008B, 16117B/C, and 16339A, you can use them with the B2985C/87C. The N1413A is also needed to use those accessories. The N1425A/B Low Noise Test Leads for N1413 with B2980 series require one of the N1426A/B/C to connect the device under test.

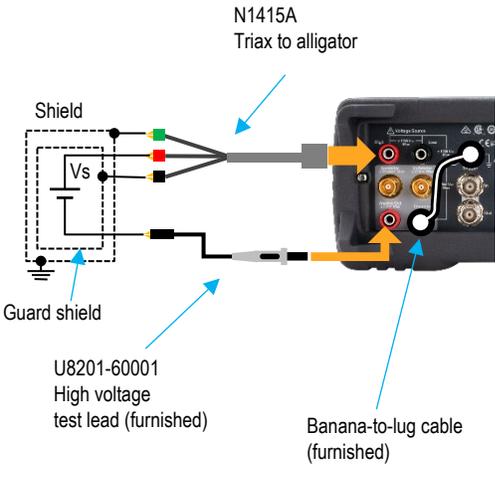
Step 3-4. Select Additional Accessories for Voltage Measurements (Optional)

You can add the following accessories based on your measurement requirements.

Here is the recommended connection, which is designed to ensure measurement accuracy and reliability, making it suitable for highly sensitive measurements.

Recommended Connection	Product Number	Qty.	Description
	16494A-001	1ea	Low leakage Triax cable (200 V, 1.5 m, Furnished)
	16494A-002/004	1ea	Low leakage Triax cable (200 V, 3.0 m/4.0 m)
	N1412A/B/C	1ea	Low leakage Triax cable (500 V, 1.5 m/3 m/6 m)
	N1416A/B	1ea	Triax bulkhead connector (200 V/500 V)
	U8201-60001	1ea	High voltage test lead (Furnished)
	B2981-61715	1ea	Ground connection cable, Banana to Screw-lug (Furnished)

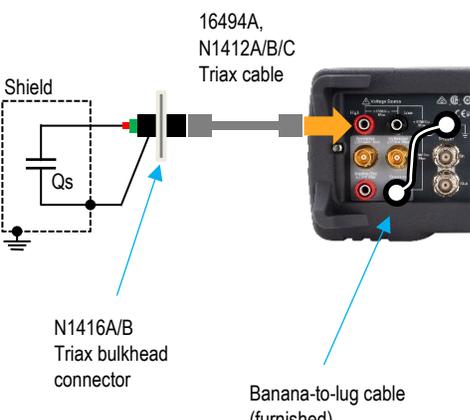
Here is the simple connection, which prioritizes simplicity and quick setup. It is ideal for general measurements, though it may not be suitable for highly sensitive measurements.

Simple Connection	Product Number	Qty.	Description
	N1415A	1ea	Triax to alligator cable
	U8201-60001	1ea	High voltage test lead (Furnished)
	B2981-61715	1ea	Ground connection cable, Banana to Screw-lug (Furnished)

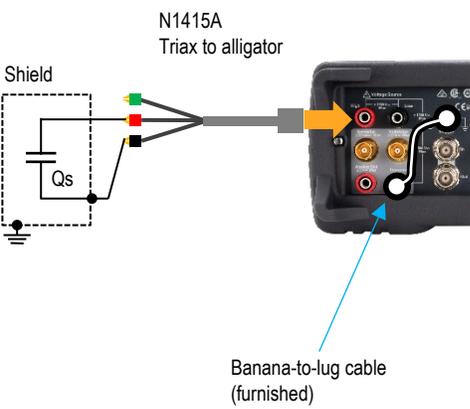
Step 3-5. Select Additional Accessories for Charge Measurements (Optional)

You can add the following accessories based on your measurement requirements.

Here is the recommended connection, which is designed to ensure measurement accuracy and reliability, making it suitable for highly sensitive measurements.

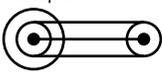
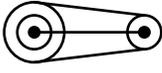
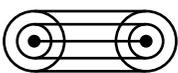
Recommended Connection	Product Number	Qty.	Description
	16494A-001	1ea	Low leakage Triax cable (200 V, 1.5 m, Furnished)
	16494A-002/004	1ea	Low leakage Triax cable (200 V, 3.0 m/4.0 m)
	N1412A/B/C	1ea	Low leakage Triax cable (500 V, 1.5 m/3 m/6 m)
	N1416A/B	1ea	Triax bulkhead connector (200 V/500 V)
	B2981-61715	1ea	Ground connection cable, Banana to Screw-lug (Furnished)

Here is the simple connection, which prioritizes simplicity and quick setup. It is ideal for general measurements, though it may not be suitable for highly sensitive measurements.

Simple Connection	Product Number	Qty.	Description
	N1415A	1ea	Triax to alligator cable
	B2981-61715	1ea	Ground connection cable, Banana to Screw-lug (Furnished)

Step 3-6. Select Additional Accessories (Optional)

You can add the following optional accessories to meet your system requirements.

Description	Product Number	Additional Information	Applicable Model			
			B2981C	B2983C	B2985C	B2987C
High-value resistor box for N1299A-301 evaluation kit	N1422A		Yes	Yes	Yes	Yes
Low leakage Triax cable, 200 V, 1.5 m	16494A-001	The B2981C/83C/85C/87C is furnished with one 16494A-001 cable. 16494A triax cable supports up to 200 V and 1 A. N1412A/B/C triax cable supports up to 500 V and 1 A	Yes	Yes	Yes	Yes
Low leakage Triax cable, 200 V, 3.0 m	16494A-002		Yes	Yes	Yes	Yes
Low leakage Triax cable, 200 V, 0.8 m	16494A-003		Yes	Yes	Yes	Yes
Low leakage Triax cable, 200 V, 0.4 m	16494A-004		Yes	Yes	Yes	Yes
Low leakage Triax cable, 200 V, 4.0 m	16494A-005		Yes	Yes	Yes	Yes
Low leakage Triax cable, 500 V, 1.5 m	N1412A		Yes	Yes	Yes	Yes
Low leakage Triax cable, 500 V, 3.0 m	N1412B		Yes	Yes	Yes	Yes
Low leakage Triax cable, 500 V, 6.0 m	N1412C		Yes	Yes	Yes	Yes
Coax cable, 1.5 m	16493B-001	16493B coax cable supports up to 40 V and 200 mA.	Yes	Yes	Yes	Yes
Coax cable, 3.0 m	16493B-002		Yes	Yes	Yes	Yes
BNC cable, 1.2 m	U2921A-100		Yes	Yes	Yes	Yes
Combo Test Lead Kit	U8201A		Yes	Yes	Yes	Yes
Triax bulkhead connector 200 V	N1416A		Yes	Yes	Yes	Yes
Triax bulkhead connector 500 V	N1416B		Yes	Yes	Yes	Yes
Open cap for triaxial connector	N1417A	The B2981C/83C is furnished with one N1417A open cap, and the B2985C/87C is furnished with two N1417A open caps.	Yes	Yes	Yes	Yes
Triax (t) to BNC (m) adapter	N1254A-102	For current measurement, Floating DUT/sample 	Yes	Yes	Yes	Yes
Triax (t) to BNC (m) adapter	N1254A-104	For current measurement, Grounded DUT/sample 	Yes	Yes	Yes	Yes
Triax (t) to BNC (m) adapter	N1254A-105	For voltage measurement 			Yes	Yes
Triaxial (f) to Triaxial (f) adapter, feedthrough	1250-2618		Yes	Yes	Yes	Yes
Interlock cable, 4-pin terminal plug to 6-pin circular plug, 1.5 m	N1411A	The B2985C/87C is furnished with one 4-pin plug interlock connector head.			Yes	Yes
Interlock cable, 4-pin terminal plug to 6-pin circular plug, 3.0 m	N1411B				Yes	Yes
Lithium-ion battery pack for B2983/B2987	N1418A	B2983C/87C is furnished with one N1418A battery.		Yes		Yes
Thermocouple for B2985/B2987	N1423A	The B2985C/87C is furnished with one N1423A thermocouple.			Yes	Yes
RS-232 cable kit for Digital I/O connector	34398A		Yes	Yes	Yes	Yes

Step 4. Select Warranty Duration and Calibration Plan (Optional)

Keysight factory calibration is provided as standard and free of additional charges.

Description	Product Number	Additional Information
Calibration + uncertainties + guardbanding (not accredited)	B2981C-1A7 B2983C-1A7 B2985C-1A7 B2987C-1A7	Calibration certificate with measurement results available only at the time of purchase
ANSI Z540-1-1994 Calibration	B2981C-A6J B2983C-A6J B2985C-A6J B2987C-A6J	Calibration certificate with measurement results available only at the time of purchase
Commercial Calibration Certificate with Test Data	B2981C-UK6 B2983C-UK6 B2985C-UK6 B2987C-UK6	Calibration certificate with measurement results available only at the time of purchase
Calibration Assurance Plan - Return to Service Center - 3 years	R-50C-011-3	
Calibration Assurance Plan - Return to Service Center - 5 years	R-50C-011-5	



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