

902

HVAC Clamp Meter

*Calibration Information***Introduction****⚠ ⚠ Warning**

To avoid electric shock or injury, do not perform the performance tests or calibration procedures unless you are qualified to do so.

The information provided in this manual is for the use of qualified personnel only.

The *902 Calibration Information* provides the information necessary to verify the performance and adjust the calibration of the Fluke 902 HVAC Clamp Meter, hereafter known as the Meter.

The following information is included in this document:

- Safety Information and International Electrical Symbols
- Specifications
- Maintenance
- Performance Tests
- User-Replaceable Parts and Accessories
- Warranty Statement

See the *902 Users Manual* for complete operating instructions.

Contact Information

To contact Fluke, call:

1-888-99-FLUKE (1-888-993-5853) in USA
1-800-36-FLUKE (1-800-363-5853) in Canada
+31 402-675-200 in Europe
+81-3-3434-0181 Japan
+65-738-5655 Singapore
+1-425-446-5500 in other countries

For additional information about Fluke, its products, and services, visit Fluke's web site at:
www.fluke.com

To register this product, go to register.fluke.com

Safety Information

A “**⚠⚠ Warning**” statement defines hazardous conditions and actions that could cause bodily harm or death.

A “**⚠ Caution**” statement identifies conditions and actions that could damage the Meter or the equipment under test.

⚠⚠ Read First: Safety Information

To avoid possible electric shock or personal injury, and to avoid possible damage to the Meter or the equipment under test, adhere to the following practices:

- **Read the Users Manual before use and follow all safety instructions.**
- **Use the Meter only as specified in the Users Manual; otherwise, the Meter's safety features may be impaired.**
- **Avoid working alone so assistance can be rendered.**
- **Never use the Meter on a circuit with voltages higher than 600 V or a frequency higher than 60 Hz fundamental. The Meter may be damaged.**
- **Never measure ac current while the test leads are inserted into the input jacks.**
- **Do not use the Meter or test leads if they look damaged. Inspect the case. Do not use the Meter if it is damaged. Look for cracks or missing plastic. Pay particular attention to the insulation around the connectors.**
- **Use extreme caution when working around bare conductors or bus bars. Contact with the conductor could result in electric shock.**
- **Use caution when working with voltages above 60 V dc or 30 V ac rms or 42 V ac peak. Such voltages pose a shock hazard.**
- **Clean the case with a damp cloth and mild detergent only. Do not use abrasives or solvents.**
- **To avoid false readings that can lead to electrical shock and injury, replace the batteries as soon as the low battery indicator (🔋) appears.**
- **Verify the Meter's operation by measuring a known voltage. Do not use the Meter if it operates abnormally. Protection may be impaired. When in doubt, have the Meter serviced.**
- **Do not hold the Meter anywhere beyond the tactile barrier, see Figure 1.**
- **Adhere to local and national safety codes. Individual protective equipment must be used to prevent shock and arc blast injury where hazardous live conductors are exposed.**
- **Use the proper terminals, function, and range for your measurements.**
- **Do not operate the Meter with the case (or part of the case) removed.**
- **When servicing the Meter, use only specified replacement parts.**

Symbols

The following symbols are found on the Meter or in this manual.

	May be used on hazardous live conductors
	Risk of danger. Important information. See Users Manual.
	Hazardous voltage. Risk of electric shock.
	Double insulation
	Battery
	Complies with Canadian and US Standards
	Conforms to relevant European Union directives
	Earth ground
	DC (Direct Current)
	AC (Alternating Current)
	Do not dispose of this product as unsorted municipal waste. Contact Fluke or a qualified recycler for disposal.
 N10140	Conforms to relevant Australian standards
	Inspected and licensed by TÜV Product Services

Electrical Specifications

Function	Range	Resolution	Accuracy
Voltage DC	0 – 600 V	0.1 V	1 % ± 5 counts
Voltage AC (True Rms)	0 – 600 V	0.1 V	1 % ± 5 counts (50/60 Hz)
Current AC (True Rms)	0 – 600 A	0.1 A	2.0 % ± 5 counts (50/60 Hz)
Current DC	0 - 200 μ A	0.1 μ A	1.0 % ± 5 counts
Resistance	0 – 999 Ω 0 – 9999 Ω	0.1 Ω 1.0 Ω	1.5 % ± 5 counts
Continuity	< 30 Ω		
Temperature	-40 to 400 °C	0.1 °C	-40 to -10 °C ± 5.0 % + 1.5 °C typical -10 to 400 °C ± 1.0 % + 0.8 °C typical
Capacitance	1-100 μ F 100-1000 μ F	0.1 μ F 1 μ F	1.9 % ± 2 counts

General Specifications

Operating Temperature	-10 °C to +50 °C
Storage Temperature	-40 °C to +60 °C
Operating Humidity	Non condensing (< 10 °C) 90 % RH (10 °C to 30 °C) 75 % RH (30 °C to 40 °C) 45 % RH (40 °C to 50 °C) (Without Condensation)
Operating Altitude	2500 meters above mean sea level
Storage Altitude	12,000 meters above mean sea level
IP Rating	IP 30 per IEC 60529
Vibration Requirements	MIL-PRF-28800F Class 2 random vibration
EMI, RFI, EMC	EMI: instrument unspecified for use in EMC field ≥ 0.5 V / Meter EMC: Meets all applicable requirements in EN61326-1
Temperature Coefficients	0.1 x (specified accuracy)/ °C (<18 °C or >28 °C)
Size (H X W X L)	9.1 x 3.8 x 1.7 inches (240 x 80 x 40 mm)
Weight	1.1 lb (310 g)
Design Standards and Compliance	EN/IEC 61010-1, EN/IEC 61010-2-032 and relevant U.S. and Canadian Standards
Agency Approvals	    N10140
Measurement Category	600 V, CAT III CAT III equipment is designed to protect against transients in equipment in fixed-equipment installations, such as distribution panels, feeders and short branch circuits, and lighting systems in large buildings.
Power Requirements	Two AA Batteries, NEDA 15 A, IEC LR6

Maintenance

⚠ ⚠ Warning

To avoid possible electric shock or personal injury, repairs or servicing not covered in this manual should be performed only by qualified personnel.

Note

When the Meter displays CAL, the unit will lock and no measurements can be made. The Meter must be sent to a Fluke Service Center for repair.

Cleaning the Meter

⚠ ⚠ Warning

To avoid electrical shock, remove any input signals before cleaning.

⚠ Caution

To avoid damaging the Meter, do not use aromatic hydrocarbons or chlorinated solvents for cleaning. These solutions will react with the plastics used in the Meter.

Clean the instrument case with a damp cloth and mild detergent.

Replacing the Batteries

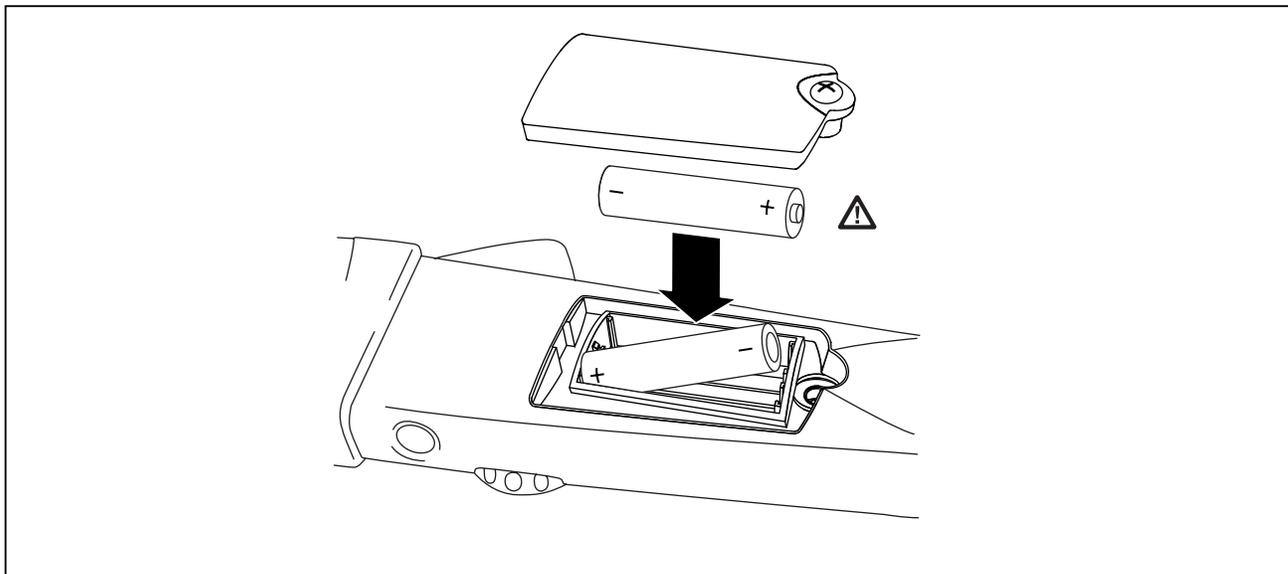
⚠ ⚠ Warning

To avoid false readings that could lead to possible electric shock or personal injury, replace the batteries as soon as the low battery indicator (🔋) appears.

Disconnect the test leads before replacing the batteries.

To replace the batteries, see Figure 1:

1. Turn the rotary switch to “**OFF**” and remove the test leads from the terminals.
2. Use a Phillips screwdriver to loosen the battery compartment door screw, and remove the door from the case bottom.
3. Remove the batteries.
4. Replace the batteries with two new AA batteries observing correct polarity.
5. Reattach the battery compartment door to the case bottom and tighten the screw.



adc02f.eps

Figure 1. Replacing the Batteries

Performance Tests

⚠ ⚠ Warning

To avoid electric shock, do not perform the performance test procedures unless the Meter is fully assembled.

The following performance tests verify the complete operation of the Meter and checks the accuracy of each meter function against the Meter's specifications. If the Meter fails any part of the test, calibration adjustment and/or repair is indicated. The Meter must be returned to a Fluke Service Center for repair or adjustment. See Contacting Fluke.

In the performance tests, the Meter is referred to as the unit under test (UUT).

Preparing for the Performance Test

⚠ ⚠ Warning

To avoid possible electric shock or personal injury:

- **Do not perform the following procedures unless qualified to do so. Some procedures involve the use of high voltages.**
- **Before handling the test connections and in between tests, make sure the calibrator is in standby mode (STBY).**

To prepare for the performance test:

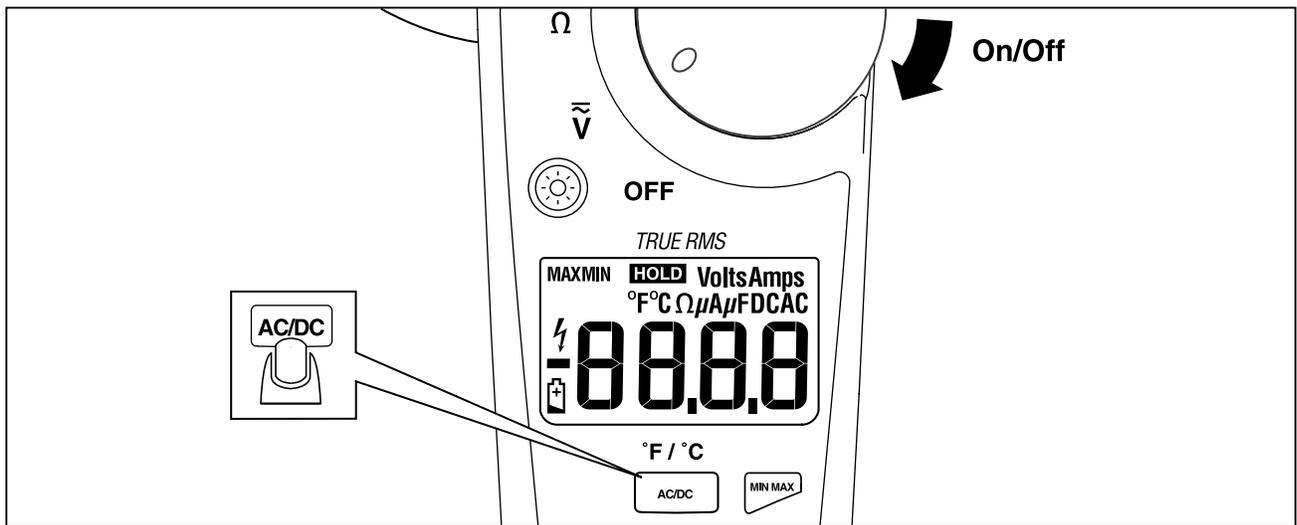
1. Make sure that you have the required equipment, see Table 1.
2. Warm up the calibrator as required by its specifications.
3. Allow the temperature of the UUT to stabilize at room temperature ($23\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ [$73\text{ }^{\circ}\text{F} \pm 9\text{ }^{\circ}\text{F}$]).

Table 1. Required Equipment

Equipment	Recommended Model
AC Calibrator	Fluke 5520A
Digital Multimeter (DMM)	Any Fluke model
50-Turn Current Coil	Fluke 5500A/Coil
TC Adapter Accessory	Fluke 80AK
K-Type TC Extension Wire	--
(2) K-type mini-connectors	Fluke 80CK

Testing the Display

Test the display by turning the Meter on while holding down the AC/DC button. Check all segments for clarity and contrast. Refer to Figure 2.

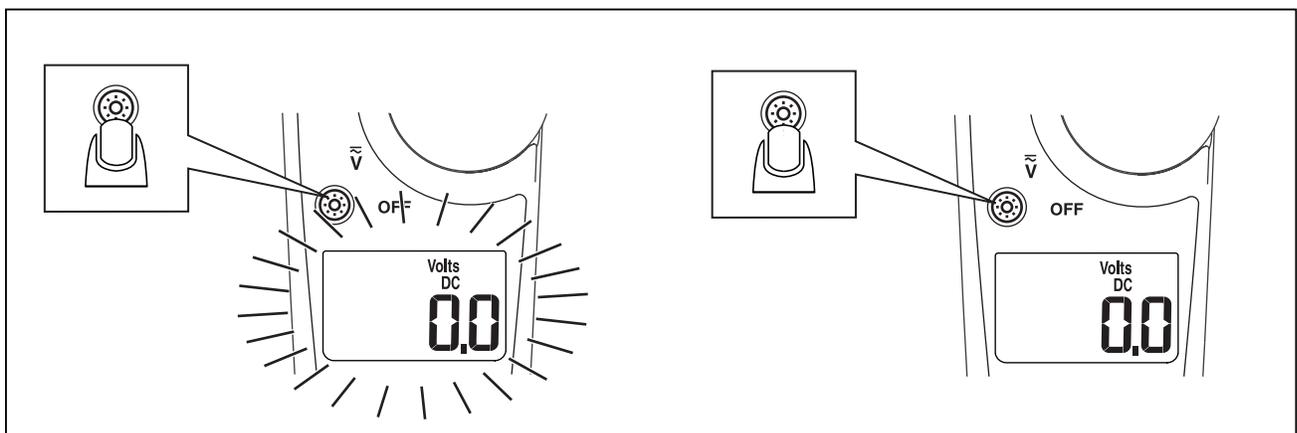


epb01.eps

Figure 2. Testing the Display

Backlight Test

The Meter is equipped with a display backlight. To test the backlight, press . The backlight will come on and the unit will beep. To turn off the backlight, press a second time. Refer to Figure 3.



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Figure 3. Testing the Backlight

Keypad Test

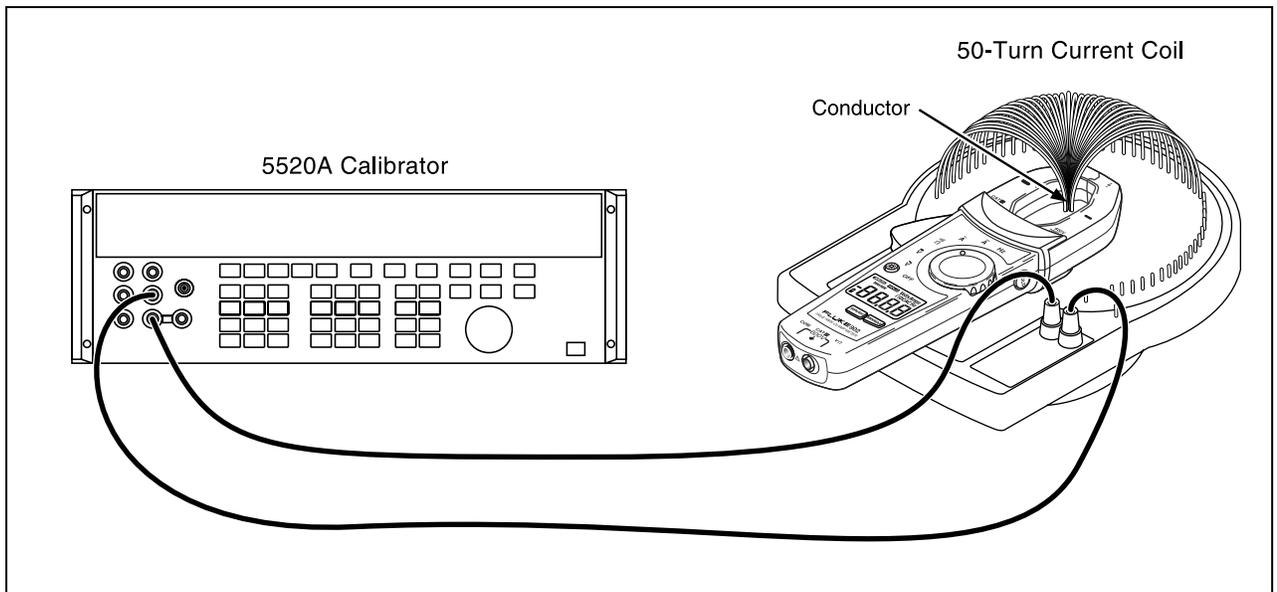
To test the keypad, turn the Meter on and push each button separately. Each button push will cause the Meter to beep.

Performance Test Procedure

To test each of the Meter's functions and operating ranges, do the following:

1. Connect the source to the Meter's μA $\text{V}\Omega$ and COM input jacks.
2. Referring to Table 2, put the Meter into the desired function and range for each test.
3. Apply the indicated output from the source.
4. When using the amp function on the 5520A, make sure LCOMP on the 5520A is ON. See Figure 4 for current performance test setup.
5. The reading on the Meter display should be within the Meter response limits shown in the table.
6. Repeat steps 1-4 for each function and range in Table 2.

If the Meter fails to perform within the Meter response limits indicated for each test in Table 2, the Meter must be returned to a Fluke Service Center for repair or calibration adjustment.



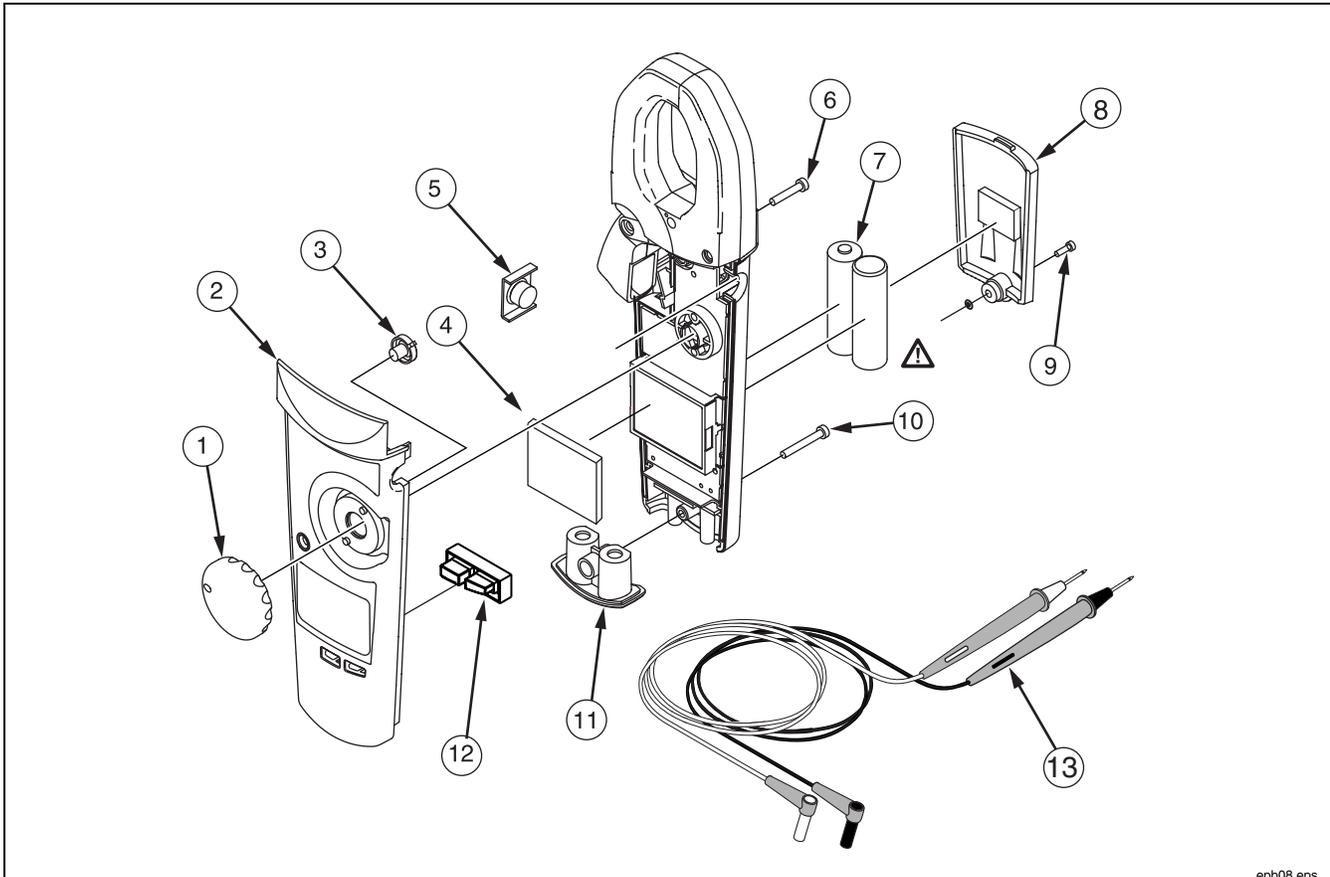
epb07.eps

Figure 4. Amps Verification Setup

Table 2. Performance Tests

Test (Switch Position)	5520A Output	Meter Response	
		Lower Limit	Upper Limit
\tilde{V} AC Voltage	600 V/60 Hz	593.5	606.5
	10 V/60 Hz	9.4	10.6
\bar{V} DC Voltage	600 V dc	593.5	606.5
	0 V dc	-0.5	0.5
	-600 V dc	-606.5	-593.5
Ω Continuity	25 Ω	Beeper on	
Ω Resistance	9500 Ω	9353	9647
	1500 Ω	1473	1527
	950 Ω	935.3	964.7
	0 Ω	-0.5	0.5
$\bar{\mu A}$ DC Current	200 μA dc	197.5	202.5
	10 μA dc	9.4	10.6
	0 μA dc	-0.5	0.5
	-200 μA dc	-202.5	-197.5
$^{**}F/^{\circ}C$ Temperature	-40 $^{\circ}C$	-43.5	-36.5
	0 $^{\circ}C$	-0.8	0.8
	400 $^{\circ}C$	395.2	404.8
⏏ Capacitance	1 μF	0.8	1.2
	90 μF	88.1	91.9
	200 μF	195	205
	1 mF	979	1021
\tilde{A} AC Current	0.4 A, 60 Hz	19.1	20.9
	12 A, 60 Hz	587.5	612.5
	12 A, 50Hz	587.5	612.5
*Test using the 5500A Coil			
**Use K-Type TC Extension Wire with 80CK, at both ends, for connection between 5520A and 80AK/Meter			

Replaceable Parts and Accessories



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Item #	Description	Part Number or Model Number	Qty
①	Knob	2280990	1
②	Case Top	2556956	1
③	Button, Backlight	2281286	1
④	LCD	2563370	1
⑤	Button, Hold	2281273	1
⑥	Screw, case (small)	2388412	1
⑦	Battery, 1.5V, 0-150MA, AA Alkaline	376756	2
⑧	Battery Door	2280907	1
⑨	Screw, Battery Door	2388435	1
⑩	Screw, case (large)	2388382	1
⑪	**Input Receptacle Housing	2280983	1
⑫	Keypad	2556963	1
⑬	*TL75 Test Lead Set	TL75	1
Not Shown	Softcase	1997276	1
Not Shown	Thermocouple Assembly, K-Type, Beaded, Molded Dual Banana Plug (80BK)	1997234	1
Not Shown	902 Users Manual (English-Printed)	2547887	1
Not Shown	902 Manuals CD (Containing English, French, German, Japanese, Simplified Chinese, and Spanish Users Manuals)	2643264	1
Not Shown	902 Calibration Information	2649733	1

* Fluke accessories are available from your authorized Fluke distributor.

** Use exact replacement only.

Figure 5. Replaceable Parts and Accessories

LIMITED WARRANTY AND LIMITATION OF LIABILITY

This Fluke product is warranted to be free from defects in material and workmanship under normal use and service. The warranty period is three years and begins on the date of shipment. Parts, product repairs, and services are warranted for 90 days. This warranty extends only to the original buyer or end-user customer of a Fluke authorized reseller, and does not apply to fuses, disposable batteries, or to any product which, in Fluke's opinion, has been misused, altered, neglected, contaminated, or damaged by accident or abnormal conditions of operation or handling. Fluke warrants that software will operate substantially in accordance with its functional specifications for 90 days and that it has been properly recorded on non-defective media. Fluke does not warrant that software will be error free or operate without interruption.

Fluke authorized resellers shall extend this warranty on new and unused products to end-user customers only but have no authority to extend a greater or different warranty on behalf of Fluke. Warranty support is available only if product is purchased through a Fluke authorized sales outlet or Buyer has paid the applicable international price. Fluke reserves the right to invoice Buyer for importation costs of repair/replacement parts when product purchased in one country is submitted for repair in another country.

Fluke's warranty obligation is limited, at Fluke's option, to refund of the purchase price, free of charge repair, or replacement of a defective product which is returned to a Fluke authorized service center within the warranty period.

To obtain warranty service, contact your nearest Fluke authorized service center to obtain return authorization information, then send the product to that service center, with a description of the difficulty, postage and insurance prepaid (FOB Destination). Fluke assumes no risk for damage in transit. Following warranty repair, the product will be returned to Buyer, transportation prepaid (FOB Destination). If Fluke determines that failure was caused by neglect, misuse, contamination, alteration, accident, or abnormal condition of operation or handling, including overvoltage failures caused by use outside the product's specified rating, or normal wear and tear of mechanical components, Fluke will provide an estimate of repair costs and obtain authorization before commencing the work. Following repair, the product will be returned to the Buyer transportation prepaid and the Buyer will be billed for the repair and return transportation charges (FOB Shipping Point).

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Since some countries or states do not allow limitation of the term of an implied warranty, or exclusion or limitation of incidental or consequential damages, the limitations and exclusions of this warranty may not apply to every buyer. If any provision of this Warranty is held invalid or unenforceable by a court or other decision-maker of competent jurisdiction, such holding will not affect the validity or enforceability of any other provision.

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