

Supplement

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This supplement contains information necessary to ensure the accuracy of the above manual.

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Change #1

On page 7, under **General Specification**, change **Operating environment**:

From: 0 °C to 50 °C at <70% R.H.

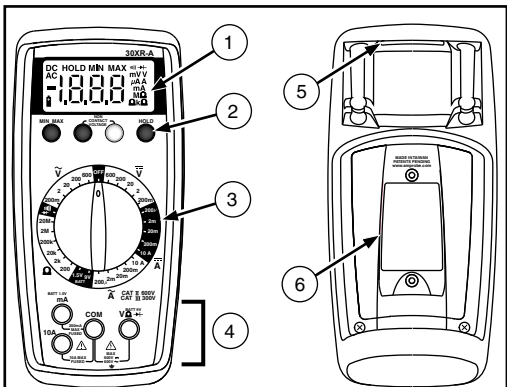
To: 0 °C to 50 °C at <70% R.H. for all functions
except ranges 10A ranges: 0 °C to 40 °C at
<70% R.H.

Professional Digital Multimeter

with Non-Contact
Voltage Tester

Users Manual

- Mode d'emploi
- Bedienungshandbuch
- Manuale d'Uso
- Manual de uso



1. Display

Afficheur
Anzeige
Display
Pantalla

5. Strap Clip

Clip de bretelle
Klemme
Clip in velcro
Clip para correa

2. Feature Buttons

Boutons de fonctions
Funktionstasten
Pulsanti delle funzioni
Botones de función

6. Battery/Fuse Door

Capot des fusibles/pile
Batterie-/Sicherungsabdeckung
Sportello del vano portapile/fusibili
Puerta de la batería y el fusible

3. Function/Range Switch

Commutateur de gamme/fonction
Funktion/Bereich-Schalter
Selettore funzione/portata
Selector de la función y del rango

4. Test Lead Connections

Branchements des cordons de test
Messleitungsanschlüsse
Boccole per i cavetti
Conexiones de los conductores de prueba

30XR-A



30XR-A

Professional Digital Multimeter

Users Manual

- **Mode d'emploi**
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PN 2728917


July 2006

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30XR-A Digital Multimeter

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Safety Information

To Avoid possible electric shock, personal injury, damage to the meter or the equipment under test, adhere to the following practices:

- Do not exceed the maximum overload limits per function (see specifications) nor the limits marked on the instrument itself. Never apply more than 600 VDC between the test lead and earth ground.
- Inspect DMM, test leads and accessories before every use. Do not use any damaged part.
- Never ground yourself when taking measurements. Do not touch exposed circuit elements or probe tips.
- Do not operate the instrument in an explosive atmosphere.
- Exercise extreme caution when measuring voltage >20 V // current >10 mA // AC power line with inductive loads // AC power line during electrical storms // current, when the fuse blows in a circuit with open circuit voltage >600 V // servicing CRT equipment.
- Always measure current in series with the load – NEVER ACROSS a voltage source. Check fuse first. Never replace a fuse with one of a different rating.
- Do not change the position of the Function/Range Switch while the MIN MAX or the HOLD feature is enabled. Erroneous readings will result.
- Remove test leads before opening battery or case to change battery or fuses.

Symbols Used in this Manual

	Battery		Refer to the manual
	Double insulated		Dangerous Voltage
	Direct Current		Earth Ground
	Alternating Current		Audible tone
	Complies with EU directives		Underwriters Laboratories, Inc
	Fuse		

Making Measurements


Verify Instrument Operation

Before attempting to make a measurement, verify that the instrument is operational and the battery is good. If the instrument is not operational, have it repaired before you attempting to make a measurement.

Correcting an Overload (OL) Indication


An OL or indication may appear on the display to indicate that an overload condition exists. For voltage and current measurements, an overload should be immediately corrected by selecting a higher range. If the highest range setting does not eliminate the overload, interrupt the measurement until the problem is identified and eliminated. The OL indication is normal for some functions; for example, resistance, continuity, and diode test.

Measuring DC Voltage

See Figure -1-

1. Set the Range Switch to an appropriate \overline{V} range.
Select the highest range and work down if the voltage level is unknown.
2. Connect the Test Leads: Red to **VΩ→+**, Black to **COM**.
3. Connect the Test Probes to the circuit test points.
4. Read the display, and, if necessary, fix any overload (OL) conditions.

Measuring AC Voltage

See Figure -2-

1. Set the Range Switch to an appropriate \tilde{V} range.
Select the highest range and work down if the voltage level is unknown.
2. Connect the Test Leads: Red to **VΩ→+**, Black to **COM**.
3. Connect the Test Probes to the circuit test points.
4. Read the display, and, if necessary, fix any overload (OL) conditions.

Preparing for Current Measurements

- Turn off circuit power before connecting the test probes.
- Allow the meter to cool between measurements if current measurements approach or exceeds 10 amps.
- A warning tone sounds if you connect a test lead to a current input before you select a current range.
- Open circuit voltage at the measurement point must not exceed 600 V.
- Always measure current in series with the load. Never measure current across a voltage source.

Measuring DC Current

See Figure -3-

1. Set the Range Switch to an appropriate $\overline{\text{A}}$ range.
Select the highest range and work down if the current level is unknown.
2. Connect the Test Leads: Red to **mA** or **10 A**, Black to **COM**.
3. Turn off power to the circuit being measured.
4. Open the test circuit (**—X—**) to establish measurements points.
5. Connect the Test Probes in series with the load.
6. Turn on power to the circuit being measured.
7. Read the display, and, if necessary, fix any overload (**OL**) conditions.

Measuring AC Current

See Figure -4-

1. Set the Range Switch to an appropriate $\tilde{\text{A}}$ range.
Select the highest range and work down if the current level is unknown.
2. Connect the Test Leads: Red to **mA** or **10 A**, Black to **COM**
3. Turn off power to the circuit being measured.
4. Open the test circuit (**—X—**) to establish measurements points.
5. Connect the Test Probes in series with the load.
6. Turn on power to the circuit being measured.
7. Read the display, and, if necessary, fix any overload (**OL**) conditions.

Measuring Resistance

See Figure -5-

1. Set the Range Switch to an appropriate Ω range.
Select the highest range and work down if the resistance level is unknown.
2. Connect the Test Leads: Red to **V Ω →+**, Black to **COM**.
3. Turn off power to the circuit being measured. Never measure resistance across a voltage source or on a powered circuit.
4. Discharge any capacitors that may influence the reading.
5. Connect the Test Probes across the resistance.
6. Read the display. If **OL** appears on the highest range, the resistance is too large to be measured.

Measuring Continuity (<50 Ohms)

See Figure -6-

1. Set the Range Switch to **∩**.
2. Connect the Test Leads: Red to **V Ω →+**, Black to **COM**.
3. Turn off power to the circuit being measured.
4. Discharge any capacitors that may influence the reading.
5. Connect the Test Probes across the resistance.
6. Listen for the tone that indicates continuity (< 50 Ohms).

Checking Diodes

See Figure -7-

1. Set the Range Switch to **→+**.
2. Connect the Test Leads: Red to **V Ω →+**, Black to **COM**.
3. Turn off power to the circuit being measured.
4. Free at least one end of the diode from the circuit.
5. Connect the Test Probes across the diode.
6. Read the display. A good diode has a forward voltage drop of about 0.6 V. An open or reverse biased diode will read **OL**.

Measuring NCV (Non-Contact Voltage) See Figure -8-

1. Range switch may be set to **OFF** or any function/range.
2. Test leads are not used for the **NCV** test.
3. Press the **NCV** button. The display goes blank, a tone sounds and the red LED next to the **NCV** button on the front panel lights up to verify that the instrument is operational. While pressing the button hold the top-center of the meter (sensor location) close to the conductor/circuit in question.
4. If a voltage of in the range of 70 to 600 V ac is present, a tone sounds and the red LED next to the NCV button on the front panel lights up.

Testing Battery Voltage (1.5 and 9 volt) See Figure -9-

1. Set the Range Switch to the appropriate **BATT** setting, **1.5 V** or **9 V**.
2. Connect the Test Leads: Red to **BATT 1.5 V** or **BATT 9 V**, Black to **COM**.
3. Connect the Test Probes across the battery. The meter applies an appropriate load to the battery.
4. Read the display. A good 1.5 volt battery should measure >1.2 V, and a good 9 volt battery should measure > 7.2 V.

Additional Features

Input Lead Warning

The 30XR-A emits a continuous tone to indicate that the user has placed the unit in a potentially dangerous configuration. Specifically, a test lead is in a current connector and the Range Switch is set to measure some other function. If, in this configuration, the DMM is connected to a voltage source, very high and potentially dangerous current could result. The meter includes fast acting fuses as additional protection for all current ranges.

MIN MAX Measurements

WARNING

To avoid erroneous readings, do not change the position of the Function/Range Switch while the MIN MAX function is enabled.

The MIN MAX function works within the active measurement mode to capture and display the minimum or maximum reading associated with that measurement. Pressing the **MIN MAX** button for less than 1 second enables the function and shows **MIN** or **MAX** along with the appropriate minimum or maximum reading on the display. Each subsequent press toggles between the two modes. To exit the function, press the **MIN MAX** button for more than 1 second.

HOLD Measurements

WARNING

To avoid erroneous readings, do not change the position of the Function/Range Switch while the HOLD function is enabled.

The **HOLD** function is used to make a measurement and hold the reading after removing the leads from the test circuit. Pressing the **HOLD** button during a measurement will capture and hold the reading. Pressing the **HOLD** button again will release the display for subsequent measurements.


Product Maintenance

Cleaning

To clean the meter, use a soft cloth moistened with water. Using benzene, alcohol, acetone, ether, paint thinner, lacquer thinner, ketone or other solvents may deform or discolor the meter and its display.

Troubleshooting

If the meter appears to operate improperly, check the following items first.

1. Review the operating instructions to ensure the meter is being used properly.
2. Inspect and test the continuity of the test leads.
3. Make sure the battery is in good condition. The low battery symbol  appears when the battery falls below the level where accuracy is guaranteed. Replace a low-battery immediately.
4. Check the condition of the fuses if the current ranges operate incorrectly.

WARNING

To avoid electrical shock remove the test leads from both the meter and the test circuit before accessing the battery or the fuses.

Battery and Fuse Replacement

See Figure -10-

To access these parts, you must first remove the cover from the battery compartment. The battery cover is on the rear of the meter and is held in place with two screws. After removing these screws, you can easily remove and replace the battery. To replace the mA fuse, pry it from its clips using a small screwdriver. A spare mA fuse is located between the battery and the mA fuse.

Battery: 9 V NEDA **mA Fuse:** Fast Blow 250 mA/600 V (Amprobe[®] FP375)

To replace the 10 A fuse, remove the battery, remove the four rear-case screws, separate the case, remove the 10 A fuse cover, and remove and replace the 10 A fuse. Re-install the fuse cover.

10 A Fuse: Fast Blow 10 A/600 V, minimum interrupt rating 30 kA (10 x 38 mm) fuse (Amprobe[®] FP160) or equivalent.

Repair

All test tools returned for warranty or non-warranty repair or for calibration should be accompanied by the following: your name, company's name, address, telephone number, and proof of purchase. Additionally, please include a brief description of the problem or the service requested and include the test leads with the meter. Non-warranty repair or replacement charges should be remitted in the form of a check, a money order, credit card with expiration date, or a purchase order made payable to Amprobe[®] Test Tools.

In-Warranty Repairs and Replacement – All Countries

Please read the warranty statement and check your battery before requesting repair. During the warranty period any defective test tool can be returned to your Amprobe[®] Test Tools distributor for an exchange for the same or like product.

Non-Warranty Repairs and Replacement – US and Canada

Non-warranty repairs in the United States and Canada should be sent to a Amprobe[®] Test Tools Service Center. Call Amprobe[®] Test Tools or inquire at your point of purchase for current repair and replacement rates.

Non-Warranty Repairs and Replacement – Europe

European non-warranty units can be replaced by your Amprobe[®] Test Tools distributor for a nominal charge.

WARRANTY

The 30XR-A Digital Multimeter is warranted against any defects of material or workmanship within a period of one (1) year following the date of purchase of the multimeter by the original purchaser or original user. Any multimeter claimed to be defective during the warranty period should be returned with proof of purchase to an authorized Amprobe[®] Test Tools Service Center or to the local Amprobe[®] Test Tools dealer or distributor where your multimeter was purchased. See maintenance section for details. Any implied warranties arising out of the sale of a Amprobe[®] Test Tools multimeter, including but not limited to implied warranties of merchantability and fitness for a particular purpose, are limited in duration to the above stated one (1) year period. Amprobe[®] Test Tools shall not be liable for loss of use of the multimeter or other incidental or consequential damages, expenses, or economical loss or for any claim or claims for such damage, expenses or economical loss. Some states do not allow limitations on how long implied warranties last or the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Specifications


General Specifications

Display: 3½ digit liquid crystal display (LCD) with a maximum reading of 1999.

Polarity: Automatic, positive implied, negative polarity indication.

Overrange: (OL) or (-OL) is displayed.

Zero: Automatic.

Low battery indication: The  is displayed when the battery voltage drops below the operating level.

Measurement rate: 2.5 per second, nominal.

Operating environment: 0 °C to 50 °C at < 70 % R.H.

Storage temperature: -20 °C to 60 °C, 0 to 80 % R.H. with battery removed from meter.

Temperature Coefficient: 0.1 × (specified accuracy) per °C. (0 °C to 18 °C, 28 °C to 50 °C).

Environment: Indoor use, Altitude up to 2000 m

Power: Single standard 9-volt battery, NEDA 1604, JIS 006P, IEC 6F22.

Battery life: 200 hours typical with carbon-zinc.

Dimensions: 196 x 92 x 60 mm (7.7" x 3.5" x 2.4").

Weight: Approx. 426 . (0.94 lb.) without holster, including battery.

Accessories: One pair test leads (TL36), 9 V battery (installed), Magna Grip™ Holster, and Operating Instructions.

Warranty: One (1) Year

Approvals:



LISTED
950Z



Safety: Conforms to UL1244; EN61010-1: Cat II - 600V / Cat III - 300V; Class 2, Pollution degree II.

The 30XR-A is recommended for use with local level power distribution, appliances, portable equipment, etc, where only smaller transient overvoltages may occur, and not for primary supply lines, overhead lines and cable systems.

EMC: Conforms to EN61326-1.

This product complies with requirements of the following European Community Directives: 89/ 336/ EEC (Electromagnetic Compatibility) and 73/ 23/ EEC (Low Voltage) as amended by 93/ 68/ EEC (CE Marking). However, electrical noise or intense electromagnetic fields in the vicinity of the equipment may disturb the measurement circuit. Measuring instruments will also respond to unwanted signals that may be present within the measurement circuit. Users should exercise care and take appropriate precautions to avoid misleading results when making measurements in the presence of electronic interference.

Electrical Specifications

(at 23 °C ± 5 °C, <75 % R.H. non-condensing)

DC VOLTS

Ranges: 200 mV, 2 V, 20 , 200 V, 600 V

Accuracy: All ranges, ± (1.0 % rdg + 1 dgt)

Resolution: 100 µV in 200 mV range

Input impedance: 10 MΩ

Overload protection: 200 mV range: 600 V dc or 600 V ac rms 15 seconds.

Other ranges: 600 V dc or 600 V ac rms

AC VOLTS (45 Hz – 500 Hz)

Ranges: 200 m, 2 V, 20 V, 200 V, 600 V

Accuracy: All ranges, \pm (1.5 % rdg + 4 dgts)

Resolution: 100 μ V in 200 mV range

Input impedance: 10 M Ω

Overload protection: 200 mV range:

600 V dc or 600 ac rms 15 seconds.

Other ranges: 600 V dc or 600 V ac rms

DC CURRENT

Ranges: 200 μ A, 2 mA, 20 mA, 200 mA, 10 A

Accuracy:

200 μ A to 200 mA ranges: \pm (1.5 % rdg + 1 dgt)

10 A range: \pm (2.0 % rdg + 3 dgts)

Resolution: 0.1 μ A in 200 μ A range

Burden voltage:

200 μ A Range: 1 mV / 1 μ A

2 mA Range: 100 mV / 1 mA

20 mA Range: 13 mV / 1 mA

200 mA: 4.6 mV / 1 mA

10 A: 40 mV / 1 A

Overload Protection:

μ A / mA input: F 0.25 A / 600 V, Min. I.R. 30 kA, (6.3x32 mm)

10 A input: F 10 A / 600 V, Min. I.R. 100 kA, (10x38 mm) (10 A for 4 minutes maximum followed by a 12 minute cooling period)

AC CURRENT (45 Hz – 500 Hz)

Ranges: 200 μ A, 2 mA, 20 mA, 200 mA, 10 A

Accuracy:

200 μ A to 200 mA ranges: \pm (2.0 % rdg + 4 dgts)

10 A range: \pm (2.5 % rdg + 4 dgts)

Resolution: 0.1 μ A in 200 μ A range

Burden voltage: See DC Current

Overload Protection:

μ A / mA input: F 0.25 A / 600 V, Min. I.R. 30 kA, (6.3x32 mm)

10 A input: F 10 A / 600 V, Min. I.R. 100 kA, (10x38 mm) (10 A for 4 minutes maximum followed by a 12 minute cooling period)

RESISTANCE

Ranges: 200 Ω , 2 k Ω , 20 k Ω , 200 k Ω , 2 M Ω , 20 M Ω

Accuracy:

200 Ω to 200 k Ω ranges: \pm (1.0 % rdg + 4 dgts)

2 M Ω ranges: \pm (1.5 % rdg + 4 dgts)

20 M Ω range: \pm (2.0 % rdg + 5 dgts)

Resolution: 100 m Ω in 200 Ω range

Open circuit volts:

200 Ω range: 3.0 V dc

Other ranges: 0.3 V dc typical

Overload protection: 600 V dc or

600 V ac rms

CONTINUITY

Audible indication: 75 Ω \pm 25 Ω

Response time: 100 ms

Overload protection: 600 V dc or

600 V ac rms

DIODE TEST

Test current: 1.0 mA (approximate)

Accuracy: \pm (1.5 % rdg + 3 dgts)

Resolution: 0.001 V

Open circuit volts: 3.0 V dc typical

Overload protection: 600 V dc or

600 V ac rms

BATTERY TEST

Ranges: 1.5 V, 9 V

Accuracy: \pm (3.5 % rdg + 2 dgts)

Resolution: 1 mV, 10 mV

Load Test current:

1.5 V range: 150 mA typical

9 V range: 5 mA typical

Overload protection: 600 V dc or

600 V ac rms

NON-CONTACT VOLTAGE (NCV)

AC Volts: 70 V to 600 V ac

Red LED and Audible Indicator

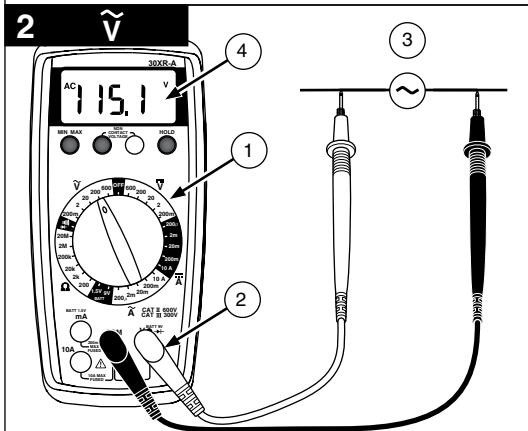
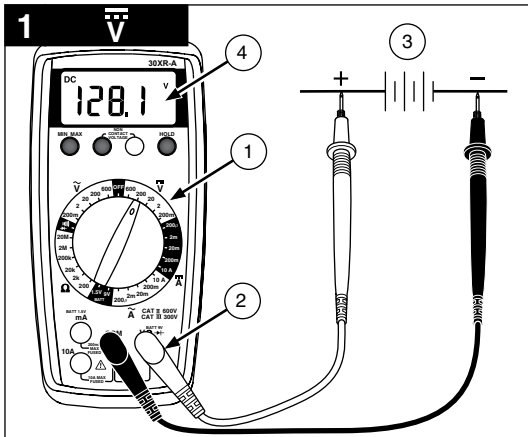
REPLACEMENT PARTS

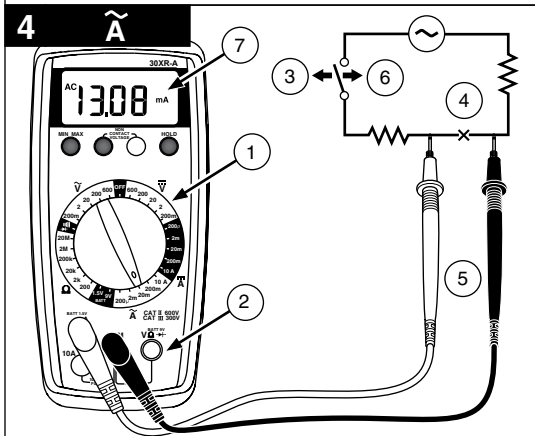
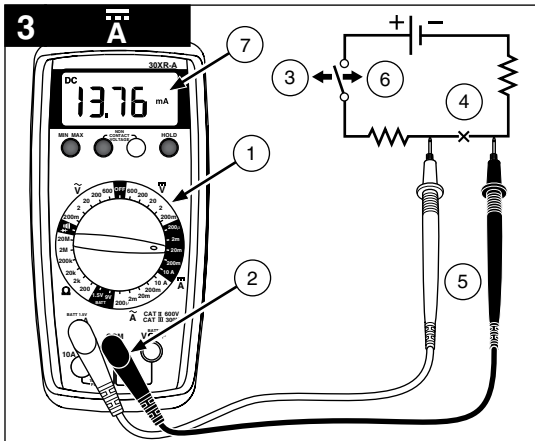
TL36 – Test Lead Set w/ Alligator clips

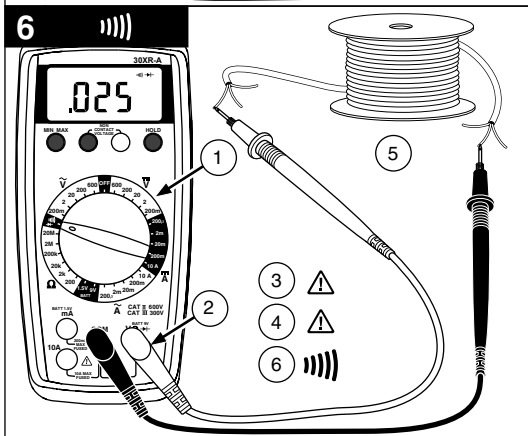
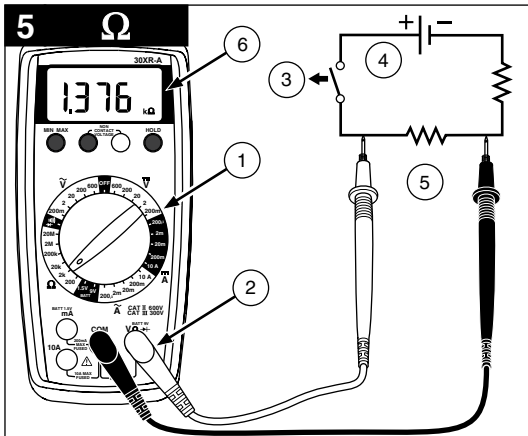
FP375 - Fuse Pack 250 mA/600 V

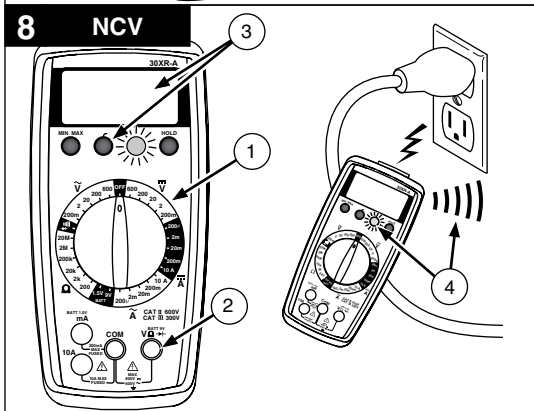
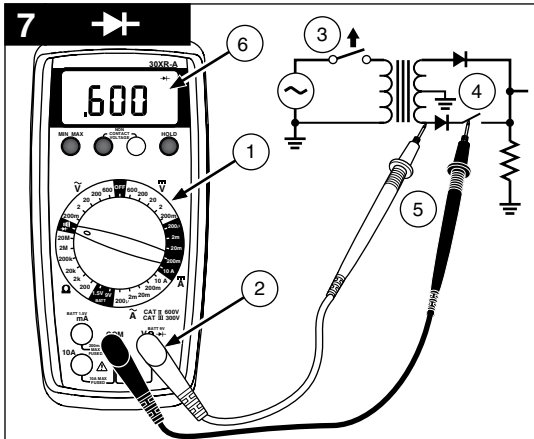
(4 each)

FP160 - Fuse Pack 10 A/600 V (2 each)

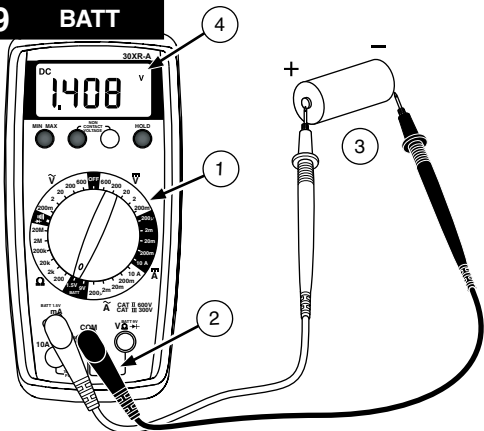




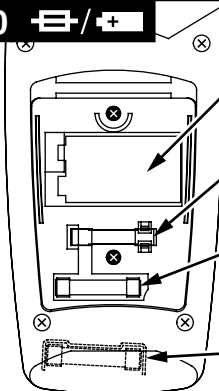




9 BATT



10 $\text{---}/\text{---}$ / +



⊗ (2)

9 V Battery
Pile 9 V
9 V Batterie
Pila de 9 V
Bateria de 9 V

Spare 250 mA fuse
Fusible 250 mA de rechange
250 mA Ersatzsicherung
Fusibile di ricambio da 250 mA
Fusible de recambio de 250 mA

250 mA Fuse
Fusible 250 mA
250 mA Sicherung
Fusibile da 250 mA
Fusible de 250 mA

⊗ (2) ⊗ (4)

10 A Fuse
Fusible de 10 A
10 A Sicherung
Fusibile da 10 A
Fusible de 10 A