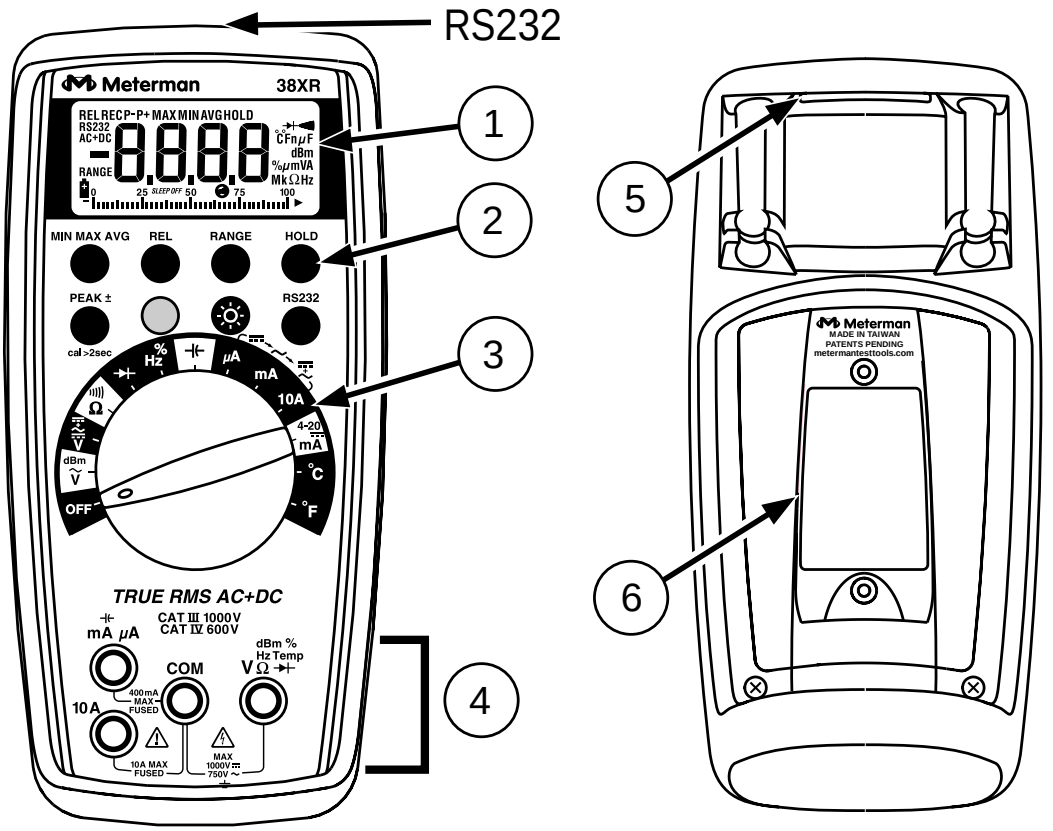
38XR

Professional Digital Multimeter

True-RMS with Optical PC Interface

Users Manual

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



1. **Display**
   Afficheur
   Anzeige
   Display
   Pantalla

2. **Feature Buttons**
   Boutons de fonctions
   Funktionstasten
   Pulsanti delle funzioni
   Botones de función

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

5. **Strap Clip**
   Clip de bretelle
   Klemme
   Clip in velcro
   Clip para correa

6. **Battery/Fuse Cover**
   Capot des fusibles/pile
   Batterie-/Sicherungsabdeckung
   Sportello del vano portapile/fusibili
   Puerta de la batería y el fusible

38XR

Contents

English

Safety Information

- The 38XR Digital Multimeter is UL, CSA, and EN61010-1 certified for Installation Category III – 1000V and Category IV – 600V. It is recommended for use with fixed equipment installations, such as, distribution panels, feeders and short branch circuits and lighting systems in large buildings; and for the primary supply level, such as, an electric meter or an overhead or underground utility service.
- Do not exceed the maximum overload limits per function (see specifications) nor the limits marked on the instrument itself. Never apply more than 1000V dc/750 V ac rms between the test lead and earth ground.
- Inspect the 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 test probe tips.
- Do not operate the instrument in an explosive atmosphere.
- Exercise extreme caution when: measuring voltage >20V // current >10mA // AC power line with inductive loads // AC power line during electrical storms // current, when the fuse blows in a circuit with open circuit voltage >1000 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.
- Remove test leads before opening the Battery Cover or case.

Symbols Used in this Manual

	Battery		Refer to the manual
	Double insulated		Dangerous Voltage
⎓	Direct Current	⏚	Earth Ground
~	Alternating Current		Audible tone
	Fuse		Underwriters Laboratories, Inc
CE	Complies with EU directives		Canadian Standards Association

Introduction

The 38XR is a true rms autoranging handheld digital multimeter for measuring or testing the following:

- DC and AC Voltage
- DC and AC Current
- Resistance
- Frequency
- Dutycycle
- Temperature
- Capacitance
- Diodes
- Continuity
- dBm
- 4 - 20 mA Loop Current

Additional features include: MIN MAX AVG, HOLD, REL, PEAK±, Range Lock, RS-232 IR communication, and Backlight.

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 attempting to make a measurement.

Range Selection

In addition to autoranging the 38XR allows you to manually select and lock a range by pressing the **RANGE** button. **RANGE** appears on the display to indicate that manual ranging is active and the range is locked. When appropriate, each subsequent press of the range button steps the meter to the next higher range. When the highest range is reached the next press returns the meter to the lowest range. To return to autoranging press and hold the **RANGE** button for 2 seconds. If **RANGE** still shows on the display, autoranging is not appropriate for the selected function.

Use autorange for all initial measurements. Then, when appropriate, use the **RANGE** button to select and lock a range.

Warning

To avoid electrical shock while manual ranging use the display annunciators to identify the actual range selected.

Correcting an Overload (OL or -OL) Indication ⚠

An OL or -OL 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 Function Switch to $\overline{\overline{\mathrm{V}}}$.
2. If **RANGE** is displayed, press the **RANGE** button to enable autoranging.
3. Connect the Test Leads: Red to **V** Ω ⇥⊢, Black to **COM**
4. Connect the Test Probes to the circuit test points.
5. Read the display, and, if necessary, correct any overload (OL) conditions.

Measuring AC + DC Voltage (True rms)See Figure -2- & -3-

See *Additional Features* to find out the advantages of true rms.

1. Set the Function Switch to $\overline{\overline{\mathrm{V}}}$.
2. If **DC** is displayed, press the yellow button to turn on **AC+DC**.
3. If **RANGE** is displayed, press the **RANGE** button to enable autoranging.
4. Connect the Test Leads: Red to **V** Ω ⇥⊢, Black to **COM**
5. Connect the Test Probes to the circuit test points.
6. Read the display, and, if necessary, correct any overload (OL) conditions.

Measuring AC Voltage (True rms) See Figure -2- & -3-

See *Additional Features* to find out the advantages of true rms.

1. Set the Function Switch to $\tilde{\mathrm{V}}$.
2. If **dBm** is displayed, press the yellow button to turn on **AC**.
3. If **RANGE** is displayed, press the **RANGE** button to enable autoranging.
4. Connect the Test Leads: Red to **V** Ω ⇥⊢, Black to **COM**
5. Connect the Test Probes to the circuit test points.
6. Read the display, and, if necessary, correct 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 while a current function is not selected.
- Open circuit voltage at the measurement point must not exceed 1000 V.
- Always measure current in series with the load. Never measure current across a voltage source.

Measuring DC Current See Figure -4-

1. Set the Function Switch to a current function, **µA**, **mA**, or **10A**.
2. If **AC** or **AC+DC** is displayed, press the yellow button to turn on **DC**.
3. If the **µA** function is selected and **RANGE** is displayed, press the **RANGE** button to enable autoranging.
4. Connect the Test Leads: Red to **mA** or **10A**, Black to **COM**.
5. Turn off power to the circuit being measured.
6. Open the test circuit (—✕—) to establish measurement points.
7. Connect the Test Probes in series with the load (to the measurement points).
8. Turn on power to the circuit being measured.
9. Read the display, and, if necessary, correct any overload (OL or -OL) conditions.

Measuring AC or AC+DC Current (True rms) Figure -3- & -5-

See *Additional Features* to find out the advantages of true rms.

1. Set the Function Switch to a current function and range, **µA**, **mA**, or **10A**.
2. If **DC** is displayed, press the yellow button to turn on **AC** or **AC+DC**.
3. If the **µA** or **mA** function is selected and **RANGE** is displayed, press the **RANGE** button to enable autoranging.
4. Connect the Test Leads: Red to **mA** or **10A**, Black to **COM**
5. Turn off power to the circuit being measured.
6. Open the test circuit (—✕—) to establish measurement points.
7. Connect the Test Probes in series with the load (to the measurement points).
8. Turn on power to the circuit being measured.
9. Read the display, and, if necessary, correct any overload (OL) conditions.

Measuring Resistance See Figure -6-

1. Set the Function Switch to Ω.
2. If))) is displayed, press the yellow button to display Ω.
3. If **RANGE** is displayed, press the **RANGE** button to enable autoranging.
4. Connect the Test Leads: Red to **V** Ω →|←, Black to **COM**
5. Turn off power to the circuit being measured. Never measure resistance across a voltage source or on a powered circuit.
6. Discharge any capacitors that may influence the reading.
7. Connect the Test Probes across the resistance.
8. Read the display. If OL appears on the highest range, the resistance is too large to be measured.

Testing for Continuity See Figure -7-

1. Set the Function Switch to .
2. If Ω is displayed, press the yellow button to display .
3. Connect the Test Leads: Red to **V** Ω , Black to **COM**
4. Turn off power to the circuit being measured.
5. Discharge any capacitors that may influence the reading.
6. Connect the Test Probes across the resistance.
7. Listen for the tone that indicates continuity (< 40 Ω).

Testing Diodes See Figure -8-

1. Set the Function 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 Capacitance See Figure -9-

1. Set the Function Switch to the function.
2. If **RANGE** is displayed, press the **RANGE** button to enable autoranging.
3. Connect the Test Leads: Red to **COM**, Black to **mA**
4. Turn off power to the circuit being measured.
5. Discharge the capacitor using a 100 kΩ resistor.
6. Free at least one end of the capacitor from the circuit.
7. Connect the Test Probes across the capacitor. When measuring an electrolytic capacitor match the test lead polarity to the polarity of the capacitor.
8. Read the display.

Measuring Temperature See Figure -10-

1. Set the function Switch to °**C** or °**F**.
2. Connect the K-type thermocouple to a TEMP adapter (XR-TA).
   Match the polarity of the adapter to the polarity of the thermocouple.
3. Connect the TEMP adapter to the **V** Ω and **COM** inputs.

Note: The 38XR is compatible with all K-type thermocouples. The K-type bead thermocouple supplied with the meter is not intended for contact with liquids or electrical circuits.

4. Expose the thermocouple to the temperature to be measured.
5. Read the display.

Measuring Frequency See Figure -11-

1. Set the Function Switch to **Hz**.
2. If **%** is displayed, press the yellow button to display **Hz**.
3. If **RANGE** is displayed, press the **RANGE** button to enable autoranging.
4. Connect the Test Leads: Red to **Hz**, Black to **COM**
5. Connect the Test Probes to the signal source.
6. Read the display.

Measuring Dutycycle See Figure -12-

1. Set the Function Switch to **%**.
2. If **Hz** is displayed, press the yellow button to display **%**.
3. Connect the Test Leads: Red to **%**, Black to **COM**
4. Connect the Test Probes to the signal source.
5. Read the display.

Measuring dBm See Figure -13-

The 38XR measures dBm relative to 1 mW referenced to 50 Ω. That is, 10 dBm = 10 mW, 0 dBm = 1 mW, -10 dBm = 0.1 mW, etc.

1. Set the Function Switch to $\overset{dBm}{\widetilde{V}}$.
2. Press the yellow button. The display shows **dBm** to verify the selection.
3. Connect the Test Leads: Red to **V** Ω →⊢, Black to **COM**
4. Connect the Test Probes to the signal source.
5. Read the display.

Measuring 4-20 mA Loop Current

1. Set the Function Switch to the loop-current function, $\overset{4\text{-}20}{\underset{mA}{\overline{\sim}}}$.
2. Connect the Test Leads: Red to **mA**, Black to **COM**.
3. Turn off power to the circuit being measured.
4. Open the test circuit (—✕—) to establish measurement points.
5. Connect the Test Probes in series with the load (to the measurement points).
6. Turn on power to the circuit being measured.
7. Read the display. 0 % = 4 mA, 100 % = 20 mA.

Additional Features

Input Test Lead Warning

The meter emits a continuous tone when a test lead is placed in the **mA** or **10A** input jack and the Function/Range Switch is not set to a correct current position. (If the meter is connected to a voltage source with leads connected for current, very high current could result). All current ranges are protected by fast acting fuses.

True-rms Measurements

For ac measurements most DMMs average the ac input signal and display the result as an estimated rms value. This average-responding method is accurate for sinusoidal waveforms, but can be very inaccurate for distorted waveforms. To ensure the most accurate measurements, always use a true-rms DMM when measuring ac voltage or ac current on circuits for the following kinds of applications:

- Power Supplies - diodes
- Controllers
- Power Limiting - SCR or Triac
- Starting - motors
- Florescent Lighting - ballasts
- Speed Control - motors
- Pulsed Signals
- Any non-sinusoidal ac waveform

The 38XR displays the dc, ac, or ac+dc components of a voltage or current measurment. The dc component is the shift level or baseline. The ac component is the area under the waveshape. The ac+dc component is the combined effect of the ac and dc components.

MIN MAX AVG Measurements

Note: The MIN MAX AVG *feature does not work the* dBm *nor the* dutycycle *function.*

The MIN MAX AVG feature reads and updates the display to show the maximum, minimum, or average value measured after you press the **MIN MAX AVG** button. Pressing the **MIN MAX AVG** button for less than 1 second will put the meter into a mode of displaying the maximum, minimum, average, or actual readings. Each time the button is pressed, the meter will cycle to the next display mode as shown in the table below. Press the **MIN MAX AVG** button for more than 2 seconds to disable this feature.

Button	Display	Value Displayed
< 1 second	**REC MAX**	Maximum value after feature activated
	REC MIN	Minimum value after feature activated
< 1 second	**REC AVG**	Average value after feature is activated
< 1 second	**REC**	Actual reading, min max being recorded.
> 2 seconds	Exit **MIN MAX AVG**	Normal measurement, actual reading

Peak Hold Measurements

Note: The peak hold *feature calibrates itself to meet the specifications.*

The function of the peak hold feature is to record and store the positive and negative peak values that occur while measuring ac current or ac voltage. To enable the peak hold feature press the **PEAK ±** button for more than 2 seconds. The display will show **CAL** to indicate the calibration cycle is in process. After the **CAL** indication clears, press the **PEAK ±** button again to display the maximum (P+) value for the ac voltage or ac current being measured. The display will toggle between the P+ and P- readings each time the **PEAK ±** button is pressed. Press the **PEAK ±** button for more than 1 second to exit the PEAK function.

Beeper Off

The beeper is an aural indicator to identify when the DMM is performing a function, making a range change, detecting a limit, and so on. To disable the beeper use the following procedure:

1. Set the Function Switch to **OFF**.
2. Press and hold the **HOLD** button while turning the Function Switch to the desired function. The no-beep symbol shows on the display.
3. Release the **HOLD** button. The beeper feature will remain disabled until the meter is turned off and then on.

Note: To disable both the beeper and Auto Power Off press and hold the **REL** *button while turning on the DMM.*

Auto Power Off

Auto Power Off is a battery saving feature that puts the meter into a sleep mode if the Function/Range Switch has not changed position in the last 30 minutes. To wake the meter turn the Function/Range Switch to another position.

The Auto Power Off feature can be disabled to keep the meter from going to sleep. This feature is useful when using the MIN MAX AVG mode for extended periods. To disable the Auto Power Off feature use the following procedure:

1. Set the Function Switch to **OFF**.
2. Press and hold the **MIN MAX AVG** button while turning the Function Switch from **OFF** to the desired function. The ***SLEEP OFF*** message shows on the display.
3. Release the **MIN MAX AVG** button. The Auto Power Off feature will remain disabled until the meter is turned off and then on.

Note: To disable both Auto Power Off and the beeper press and hold the **REL** *button while turning on the DMM.*

REL (Relative) Measurements

Note: The REL *feature does not work with the* dBm *or the* dutycycle *function.*

The Relative mode displays the difference between the actual reading and a reference value. It may be used with any function or range. To make a relative measurement first establish a reference value by measuring a value and then pressing the **REL** button after the reading has stabilized. This stores the measured value as the reference and sets the display to zero. The meter subtracts the reference value from subsequent measurements and displays this difference as the relative value. Measurement values greater than the reference value will be positive and values less than the reference value will be negative.

To exit the Relative Mode, Press and hold the **REL** button for 2 seconds.

HOLD Measurements

The **HOLD** button causes the meter to capture and continuously display a measurement reading. To use the **HOLD** feature make a measurement, and then, after the reading has stabilized, momentarily press the **HOLD** button. You can remove the test leads and the reading will remain on the display. Pressing the **HOLD** button again releases the display.

RS232 Download Software (38SW) See Figure -14-

The 38XR includes an RS232 IR communication port for downloading measurement data (value, function, and range) to a PC. The 38SW Accessory Kit (software and cable) povides a graphical user interface for the PC to collect, store, and display measurement data.

Backlight

Pressing the ☼ button illuminates the display with a blue backlight. Pressing the ☼ button again will turn off the backlight. When turned on the backlight will automatically turn off in about 60 seconds. Frequent use of the backlight will noticeably decrease battery life.

Product Maintenance

Cleaning

To clean the meter, use a soft cloth moistened with water. To avoid damage to the plastic components do not use benzene, alcohol, acetone, ether, paint thinner, lacquer thinner, ketone or other solvents to clean the meter.

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.

Battery and Fuse Replacement See Figure -15-

⚠⚠WARNING

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

To access the battery and the mA fuse remove the two screws holding the Battery/Fuse Cover in place, and lift the cover from the meter.

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.

mA Fuse: Fast Blow .5A/1000V, minimum interrupt rating 30 kA (6.3 x 32 mm) (Meterman FP500)

To replace the 10 A fuse: 1) Remove the battery. 2) Remove the four rear-case screws. 3) Separate the case. 4) Remove the 10 A fuse cover. 5) Remove and replace the 10A fuse. 6) Re-install the fuse cover. 7) Reassemble the meter.

10A Fuse: Fast Blow 10A/1000V, minimum interrupt rating 30 kA (10 x 38 mm) (Meterman FP100).

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 Meterman Test Tools.

In-Warranty Repairs and Replacement – All Countries

Please read the warranty statement that follows, and check your batteries and fuses before requesting repair. During the warranty period any defective test tool can be returned to your Meterman Test Tools distributor for an exchange for the same or like product. Please check the "Where to Buy" section on www.metermantesttools.com for a list of distributors near you. Additionally, in the United States and Canada In-Warranty repair and replacement units can also be sent to a Meterman Test Tools Service Center (see below for address).

Non-Warranty Repairs and Replacement – US and Canada

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

In USA
Meterman Test Tools
1420 75th Street SW
Everett, WA 98203
Tel: 800-993-5853
Fax: 425-446-6390

In Canada
Meterman Test Tools
400 Britannia Rd. E. Unit #1
Mississauga, ON L4Z 1X9
Tel: 905-890-7600
Fax: 905-890-6866

Non-Warranty Repairs and Replacement – Europe

European non-warranty units can be replaced by your Meterman Test Tools distributor for a nominal charge. Please check the "Where to Buy" section on www.metermantesttools.com for a list of distributors near you.

European Correspondence Address*
Meterman Test Tools Europe
P.O. Box 1186
5602 BD Eindhoven
The Netherlands

** (Correspondence only – no repair or replacement available from this address. European customers please contact your distributor.)*

WARRANTY

This 38XR Digital Multimeter is warranted against any defects of material or workmanship within a period of three (3) years 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 Meterman Test Tools Service Center or to the local Meterman Test Tools dealer or distributor where your multimeter was purchased. See Repair section for details. Any implied warranties arising out of the sale of a Meterman 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. Meterman 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

Display: 4¾ digit liquid crystal display (LCD)(9999 count) with a 41-segment analog bar-graph.

Auto ranging: 9999 counts

Manual ranging: 9999 counts

Polarity: Automatic, positive implied, negative polarity indication.

Overrange: OL or -OL is displayed.

Zero: Automatic.

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

Auto power off: Approx. 30 minutes.

Measurement rate: 2 times per second, nominal.

Operating environment: 0 °C to 45 °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 45 °C).

Altitude: 2000 m (6562 feet)

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

Battery life: 75 hours typical with carbon-zinc. 150 hours typical with alkaline.

Dimensions: 196 mm (H) ×96 mm (W) ×60 mm (D)

Weight: Approx. 492 g including battery.

Box contents:

Test leads w/ alligator clips	1 set
Magne-Grip® Holster	1
Clip, magnet, and strap.	1
Temperature Adapter	1
K-type thermocouple	1
Users Manual	1
9 V battery (installed)	1
mA fuse, 0.5A/1000 V	1 spare

Safety:

Conforms to EN61010-1, Rev-2 CAT III 1000V, CAT IV 600V, class 2, pollution degree II; CSA 22.2 -1010-1.

In accordance with IEC 1010-1

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

(Accuracy at 23 °C ±5 °C, <75 % relative humidity)

DC VOLTS

Ranges: 1000 mV, 10 V, 100 V, 1000 V (auto/manual ranging)
Resolution: 100 µV
Accuracy: ±(0.25 % rdg + 5 dgts)
Input impedance: 10 MΩ
Overload protection: 1000 V dc or 750 V ac rms

AC VOLTS true rms (45 Hz to 2 kHz)

Ranges: 1000 mV, 10 V, 100 V, 750 V (auto/manual ranging)
Resolution: 100 µV
Accuracy:
±(1.2 % rdg + 10 dgts) 45 Hz to 500 Hz
±(2.0 % rdg + 10 dgts) 500 Hz to 2 kHz
±(2.0 % rdg + 10 dgts) 45 Hz to 1 kHz on 750 V range
Peak Hold accuracy: ±(3.0 % + 200 dgts) on 100 V, 750 V range;
1000 mV, 10 V ranges unspecified
Crest Factor: ≤ 3
Input impedance: 10 MΩ
AC coupled true rms specified from 5 % to 100 % of range overload protection: 1000 V dc or 750 V ac rms

AC+DC VOLTS (45Hz to 2kHz)

Ranges: 1000 mV, 10 V, 100 V, 750 V (auto/manual ranging)
Resolution: 100 µV
Accuracy:
±(1.5 % rdg + 10 dgts) 45 Hz to 500 Hz
±(2.5 % rdg + 10 dgts) 500 Hz to 2k Hz
±(2.5 % rdg + 10 dgts) 45 Hz to 1 kHz on 750 V range
Crest Factor: ≤ 3
Input impedance: 10 MΩ
DC coupled true rms specified from 5 % to 100 % of range
Overload protection: 1000 V dc or 750 V ac rms

DC CURRENT

Ranges: 100 uA, 1000 µA, 10 mA, 100 mA, 400 mA, 10A (auto/manual ranging)
Resolution: 0.1 µA
Accuracy:
±(0.5 % rdg + 10 dgts) on 100 uA range
±(0.5 % rdg + 5 dgts) on 1000 µA to 400 mA ranges
±(1.5 % rdg + 10 dgts) on 10A range
Input protection:
0.5A/1000V fast blow ceramic fuse 6.3×32mm on µA/mA input
10A/1000V fast blow ceramic fuse 10×38mm on 20A input
10A input: 10 A for 4 minutes maximum followed by a 12 minute cooling period
Burden voltage:

µA Range:	1 mV/ 1 µA
mA Range:	1 mV/ 1 mA
10A:	30 mV/ 1 A

AC CURRENT true rms (AC+DC) (45 Hz to 1 kHz)

Ranges: 100 uA, 1000 µA, 10 mA, 100 mA, 400 mA, 10A (auto/manual ranging)

Resolution: 0.1 µA

Accuracy: True rms/±(1.5 % rdg + 20 dgts) on 100 µA to 100 mA ranges

True rms/±(2.0 % rdg + 10 dgts) on 400mA range

True rms/±(2.5 % rdg + 20 dgts) on 10A range

Peak Hold accuracy: ±(3.0 % + 200 dgts)

AC coupled true RMS specified from 5 % to 100 % of range

AC+DC/±(2.0 % rdg + 20 dgts) on 100 µA to 400 mA ranges

AC+DC/±(3.0 % rdg + 20 dgts) on 10A range

AC coupled true RMS specified from 10 % to 100 % of range

Crest Factor: ≤ 3

Input protection:

0.5A/1000V fast blow ceramic fuse 6.3×32mm on µA/mA input

10A/1000V fast blow ceramic fuse 10×38mm on 10A input

10A input: 10 A for 4 minutes maximum followed by a 12 minute cooling period

Burden voltage: See DC Current

DC CURRENT (4 to 20mA)

Range: 0 to 100 %

Accuracy: ±0.5 % + 5 dgt

Resolution: 0.01 %

Burden voltage: 1 mV/mA

Input protection: 0.5A/1000V fast blow ceramic fuse 6.3×32mm on µA/mA input

RESISTANCE

Ranges: 1000 Ω, 10 kΩ, 100 kΩ, 1000 kΩ, 10 MΩ, 40 MΩ
(auto/manual ranging)

Resolution: 100 mΩ

Accuracy:

±(0.5 % rdg + 8 dgts) on 1000 Ω to 1000 kΩ ranges

±(1.0 % rdg +10 dgts) on 10 MΩ range

±(2.0 % rdg +10 dgts) on 40 MΩ range

Open circuit volts: -0.45 V dc typical

Overload protection: 1000 V dc or 750 V ac rms

CAPACITANCE

Ranges: 40 nF, 400 nF, 4 µF, 40 µF 400 uF (3999 counts) (auto/manual ranging)

Resolution: 0.01 nF

Accuracy:

±(3.0 % rdg +10 dgts) on 40 nF, 400 uF range

±(3.0 % rdg +5 dgts) on 400 nF to 40 uF range

Test voltange: < 1V

Test Frequency: 1.3 Hz on 40 nF to 40 µF ranges; 0.7 Hz on 400 µF range

Overload protection: 1000 V dc or 750 V ac rms

TEMPERATURE

Ranges: -20 °C to 1300 °C, -4 °F to 2372 °F (3999 counts)

Resolution: 1 °C, 1 °F

Accuracy:

±(2.0 % rdg +4 °C) -20 °C to 10 °C

±(1.0 % rdg +3 °C)10 °C to 200 °C

±(2.0 % rdg + 2 °C) 200 °C to 1300 °C

±(2.0 % rdg + 8 °F) -4 °F to 50 °F

±(1.0 % rdg + 6 °F) 50 °F to 400 °F

±(2.0 % rdg +4 °F)400 °F to2372 °F

FREQUENCY

Ranges: 100 Hz, 1000 Hz, 10 kHz, 100 kHz, 1000 kHz, 10 MHz, (auto and manual ranging)

Resolution: 0.1 Hz

Accuracy: ±(0.1 % rdg + 5 dgts)

Sensitivity: 3 Hz to 1 MHz: >1.5 V rms; 1 MHz to 10 MHz: >2 V rms, <5 V rms

Minimum input range: 100 Hz range >3 Hz 1000 Hz range >30 Hz

Minimum pluse width: > 25 ns Duty cycle limits: > 30 % and < 70 %

Overload protection: 1000 V dc or 750 V ac rms

DUTY CYCLE

Ranges: 0 to 90 %

Resolution: 0.01 %

Pulse widh: >10 µs

Frequency range:

0% to 10% (40 Hz to 20 kHz)

10% to 90% (40 Hz to 990 Hz)

Accuracy: (5 V logic) ±(2.0 % rdg + 20 dgts)

Overload protection: 1000 V dc or 750 V ac rms

dBm

Ranges: -13 dBm to +50 dBm
Resolution: 0.01 dBm
Accuracy:
±0.7 dB + 8 dgts (45 Hz to 5 kHz)
±2.5 dB + 8 dgts (5 kHz to 10 kHz)
Reference impedance: 50 Ω
Input protection: 10 MΩ
Overload protection: 1000 V dc or 750 V ac rms

CONTINUITY

Audible indication: < 40 Ω
Response time: 100 ms
Overload protection:1000 V dc or 750 V ac rms

DIODE TEST

Test current: 0.5 mA (approximate)
Accuracy: ±(1.5 % rdg + 5 dgts)
Resolution: 1 mV
Open circuit volts: 3.0 V dc typical
Overload protection: 1000 V dc or 750 V ac rms

AUXILIARY FEATURES

mA or **10A** Test Lead Connection: Beeps to warn test leads are connected to measure current, but the Function/Range Switch is not set to measure current.

MIN MAX AVG: Displays the minimum, maximum, or average value detected while making a measurement.

HOLD: Holds the latest reading on the display.

REL: Initiates relative measurements.

PEAK+/-: Record the peak+ or peak- value in a measurement.

RANGE: Initiates manual range mode.

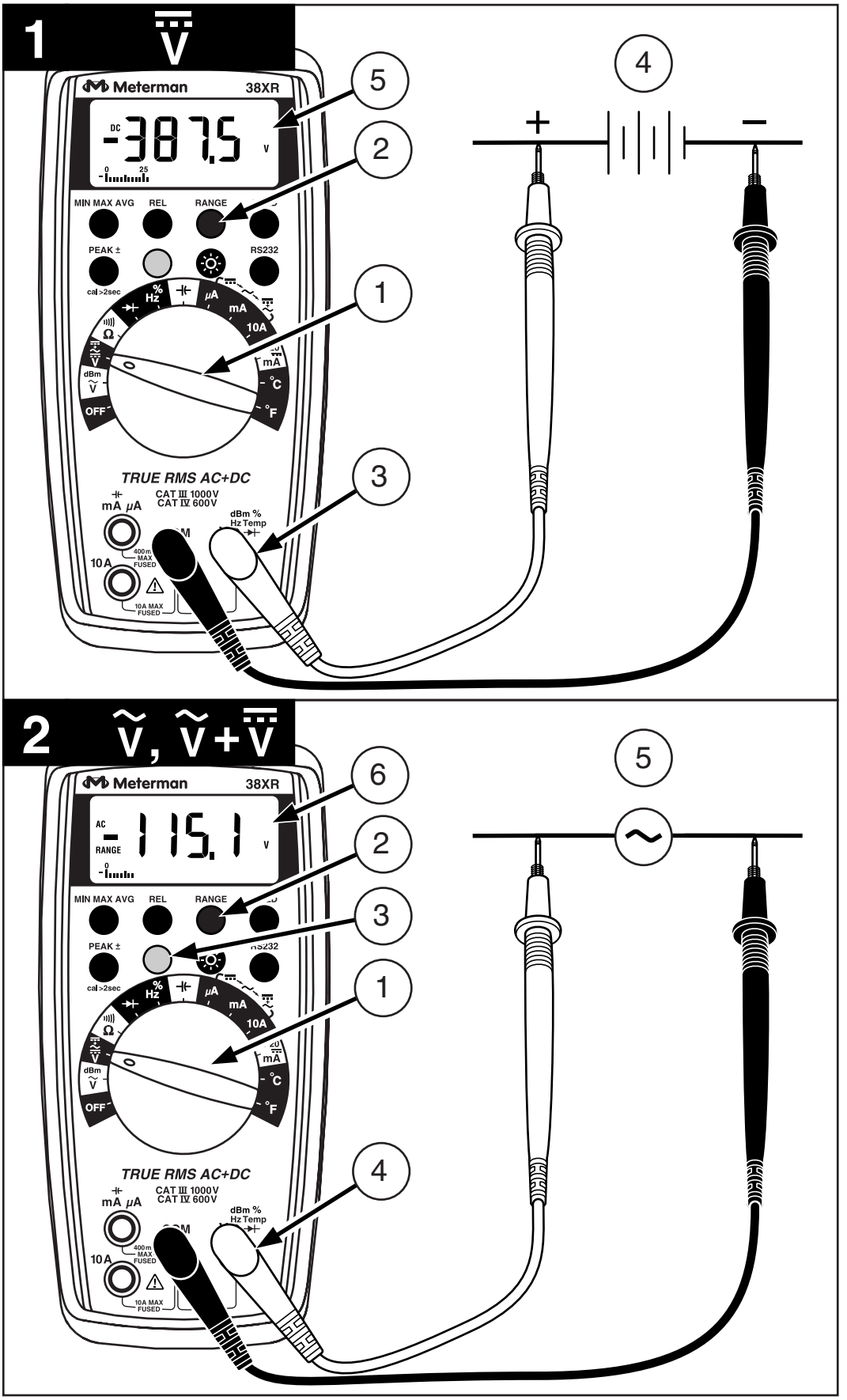
Backlight: Backlight auto-off approx. 60 seconds

Auto Power off: 30 minutes, typical

Shift (yellow button): Shift to dBm, ac, dc, ac+dc, continuity, duty cycle, or RS232

REPLACEMENT PARTS

TL36	Test Lead Set with Alligator clips
FP500	mA fuse - Fuse Pack .5A/1000V (4 each)
FP100	10A fuse - Fuse Pack 10A/1000V (2 each)
H2-XR	Magne-Grip® Holster, clip, magnet, and strap
XR-TA	Input Adapter for K-type thermocouple
TP255	K type thermocouple
38SW	RS232 Accessory Kit (PC software and cable)


1
Meterman
38XR
DC
-387.5
V
MIN MAX AVG
REL
RANGE
PEAK ±
RS232
cal >2sec
OFF
TRUE RMS AC+DC
CAT III 1000V
CAT IV 600V
dBm %
Hz Temp
10A MAX
FUSED
4
5
2
1
3
+
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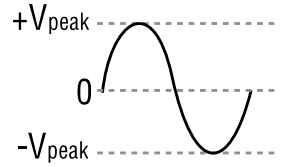
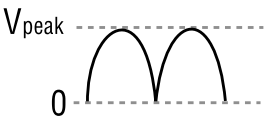
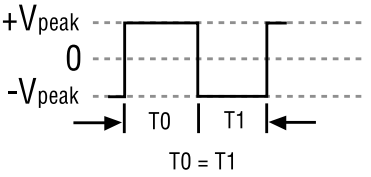
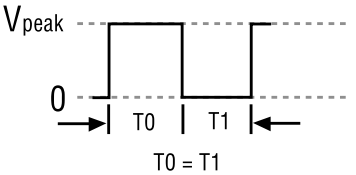
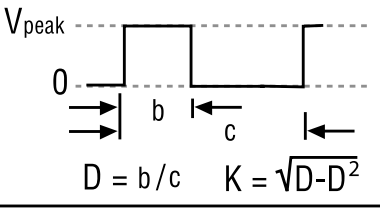
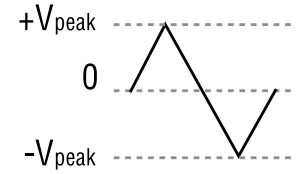
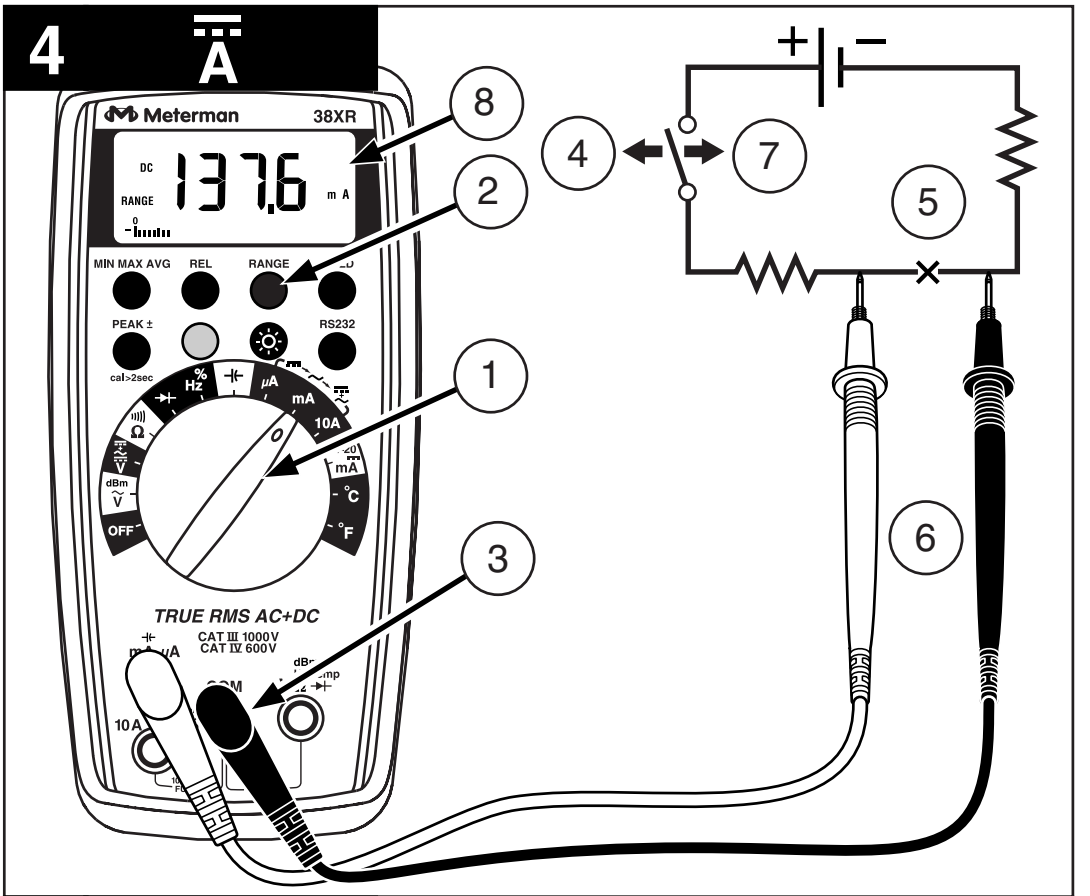
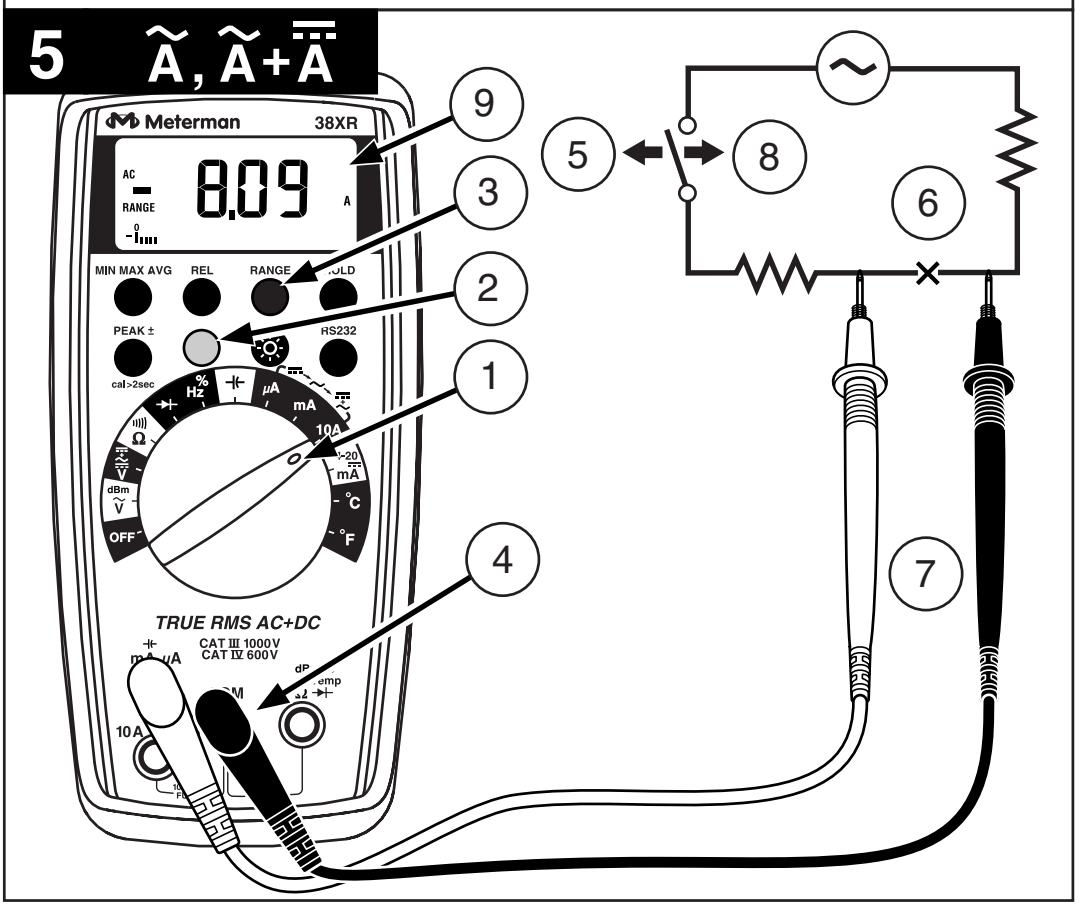
2
Meterman
38XR
AC
RANGE
115.1
V
MIN MAX AVG
REL
RANGE
PEAK ±
RS232
cal >2sec
OFF
TRUE RMS AC+DC
CAT III 1000V
CAT IV 600V
dBm %
Hz Temp
10A MAX
FUSED
6
2
3
1
4
5

3 True rms

Input Waveform Signal d'entrée Eingangsschwingungsform Forma d'onda d'ingresso Forma de onda de entrada		38XR True rms *
		AC
		AC + DC
Sine Wave Sinusoïdale Sinusschwingung Onda sinusoidale Onda sinusoidal		0.707 x Vpeak CF = 1.414 0.707 x Vpeak CF = 1.414
Full Wave, Sine Wave Onde complète, Sinusoïdale Volle Schwingung, Sinusschwingung Onda sinusoidale, onda intera Onda completa, Onda sinusoidal		0.308 x Vpeak CF = 3.247 0.707 x Vpeak CF = 1.414
Half-Wave, Sine Wave Demi-onde, sinusoïdale Halbschwingung, Sinusschwingung Onda sinusoidale, semionda Media onda, onda sinusoidal		0.386 x Vpeak CF = 2.591 0.500 x Vpeak CF = 2.000
Square Wave Onde carrée Rechteckschwingung Onda quadra Onda cuadrada		1.000 x Vpeak CF = 1.000 1.000 x Vpeak CF = 1.000
Square Wave Onde carrée Rechteckschwingung Onda quadra Onda cuadrada		0.500 x Vpeak CF = 2.000 0.707 x Vpeak CF = 1.414
Pulse Wave Onde impulsionnelle Impulsschwingung Onda dell'impulso Onda de impulsos		Vpeak x K CF = 1 / K Vpeak x √D CF = Vpeak / √D
Sawtooth Wave Onde en dent de scie Sägezahnschwingung Onda a denti di sega Onda diente de sierra		0.577 x Vpeak CF = 1.733 0.577 x Vpeak CF = 1.733

* CF = Crest Factor, Crest Factor = V_{peak} / V_{rms}


4 Ā
Meterman 38XR
DC
RANGE
137.6
m A
MIN MAX AVG
REL
RANGE
PEAK ±
RS232
cal>2sec
OFF
TRUE RMS AC+DC
CAT III 1000V
CAT IV 600V
10A
8
2
1
3
4
7
5
6


5 Ã, Ã+Ā
Meterman 38XR
AC
RANGE
8.09
A
MIN MAX AVG
REL
RANGE
PEAK ±
RS232
cal>2sec
OFF
TRUE RMS AC+DC
CAT III 1000V
CAT IV 600V
10A
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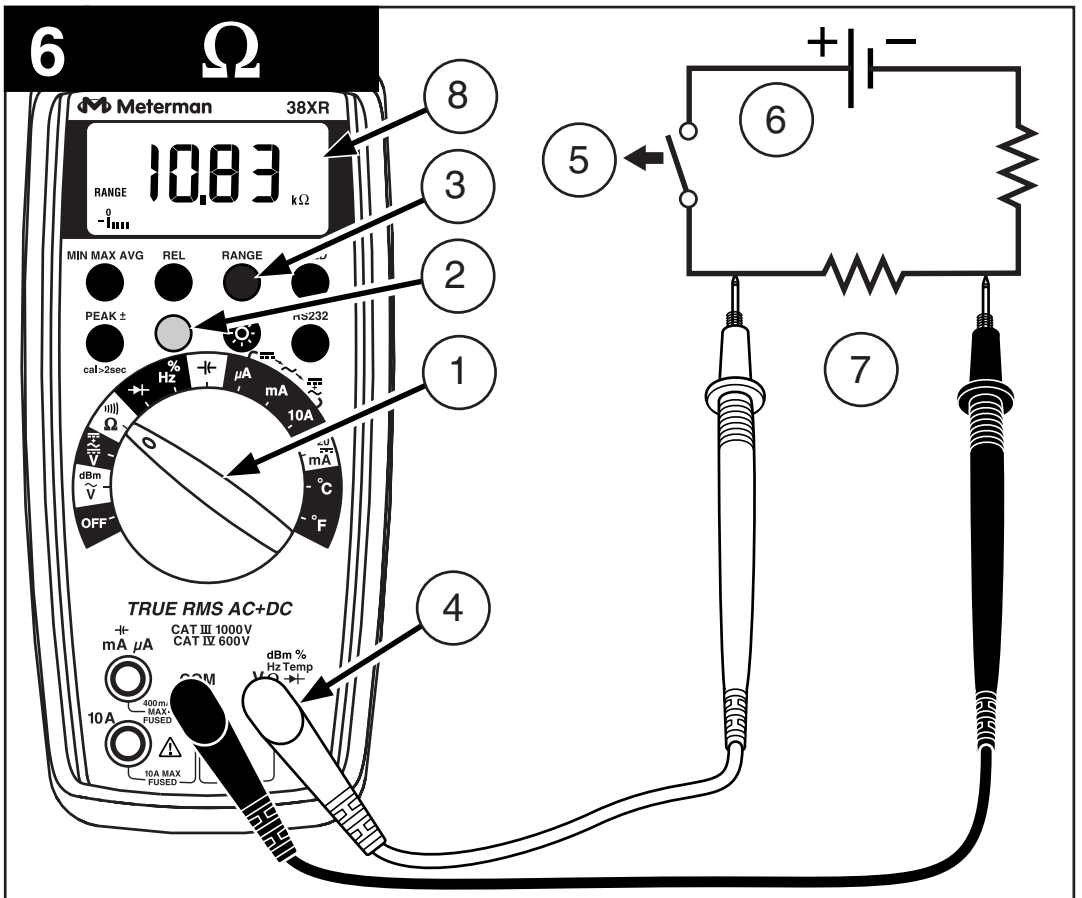
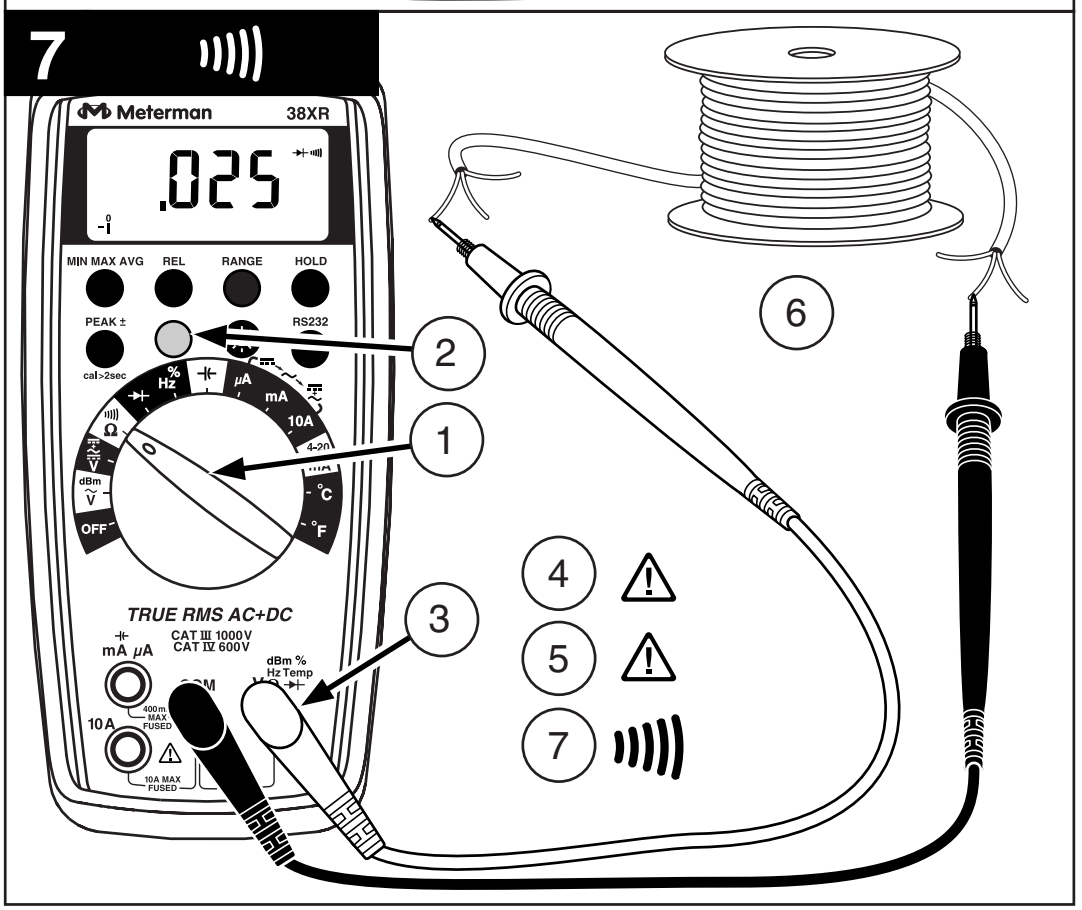
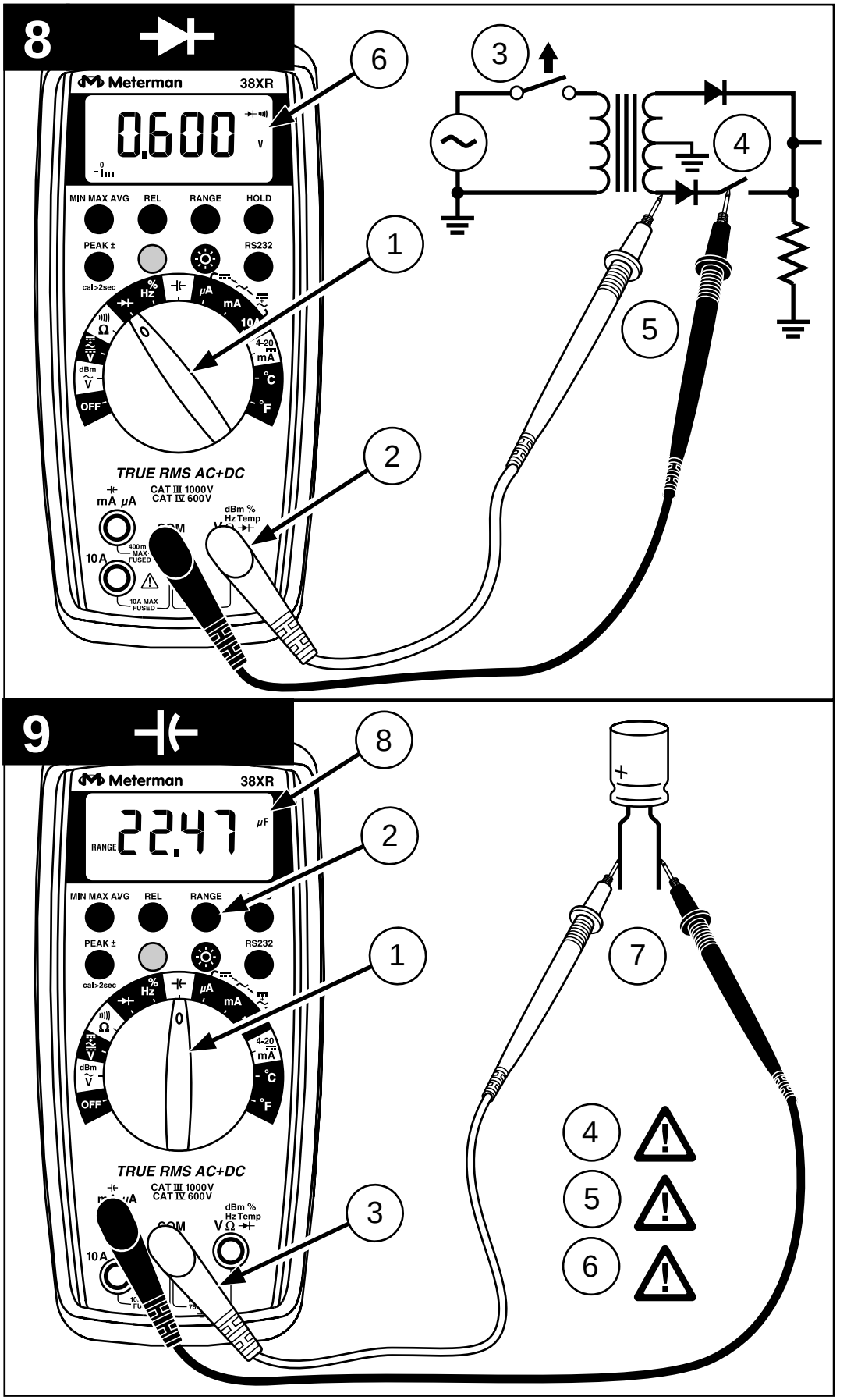
4
5
8
6
7


6
Meterman
38XR
10.83
RANGE
kΩ
MIN MAX AVG
REL
RANGE
PEAK ±
RS232
cal>2sec
Hz
µA
mA
10A
Ω
dBm
°C
°F
OFF
TRUE RMS AC+DC
CAT III 1000V
CAT IV 600V
mA µA
10A
400m MAX FUSED
10A MAX FUSED
dBm %
Hz Temp
COM
1
2
3
4
5
6
7
8


7
Meterman
38XR
.025
MIN MAX AVG
REL
RANGE
HOLD
PEAK ±
RS232
cal>2sec
Hz
µA
mA
10A
Ω
dBm
°C
°F
OFF
TRUE RMS AC+DC
CAT III 1000V
CAT IV 600V
mA µA
10A
400m MAX FUSED
10A MAX FUSED
dBm %
Hz Temp
COM
1
2
3
4
5
6
7


8
Meterman
38XR
0.600
V
MIN MAX AVG
REL
RANGE
HOLD
PEAK ±
RS232
cal>2sec
TRUE RMS AC+DC
CAT III 1000V
CAT IV 600V
dBm %
Hz Temp
10A
OFF
6
3
4
1
5
2
9
Meterman
38XR
RANGE
22.47
µF
MIN MAX AVG
REL
RANGE
PEAK ±
RS232
cal>2sec
TRUE RMS AC+DC
CAT III 1000V
CAT IV 600V
dBm %
Hz Temp
10A
OFF
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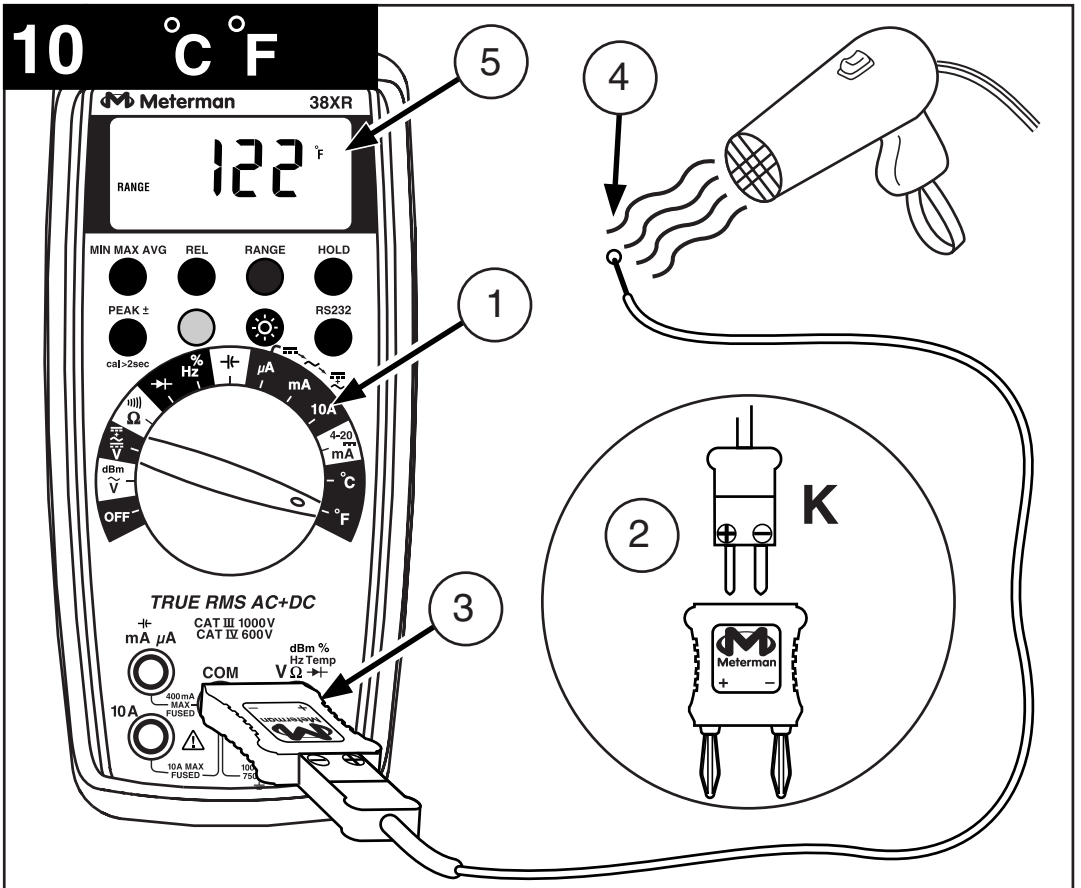
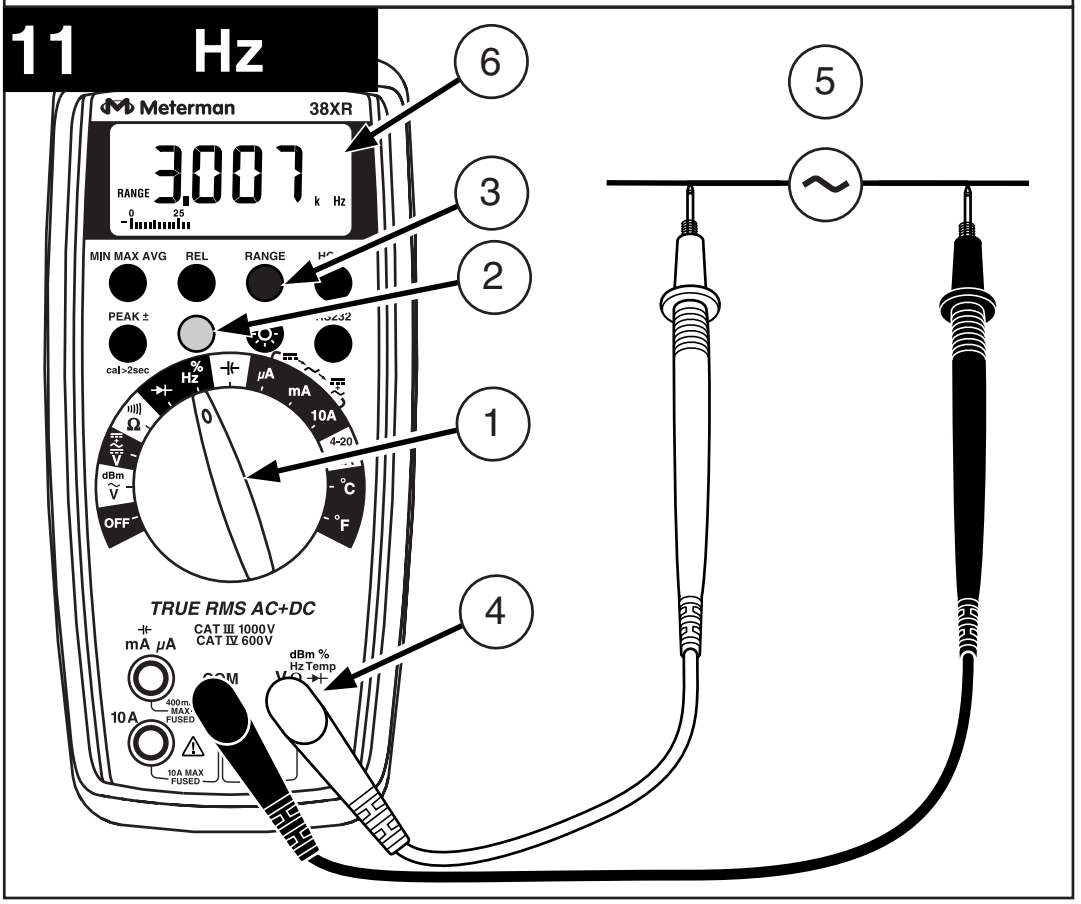

10 °C °F
Meterman 38XR
122 °F
RANGE
MIN MAX AVG
REL
RANGE
HOLD
PEAK ±
RS232
cal>2sec
OFF
TRUE RMS AC+DC
CAT III 1000V
CAT IV 600V
COM
10A
K
Meterman
5
4
1
2
3


11 Hz
Meterman 38XR
3.007 k Hz
RANGE
MIN MAX AVG
REL
RANGE
PEAK ±
cal>2sec
OFF
TRUE RMS AC+DC
CAT III 1000V
CAT IV 600V
COM
10A
6
5
3
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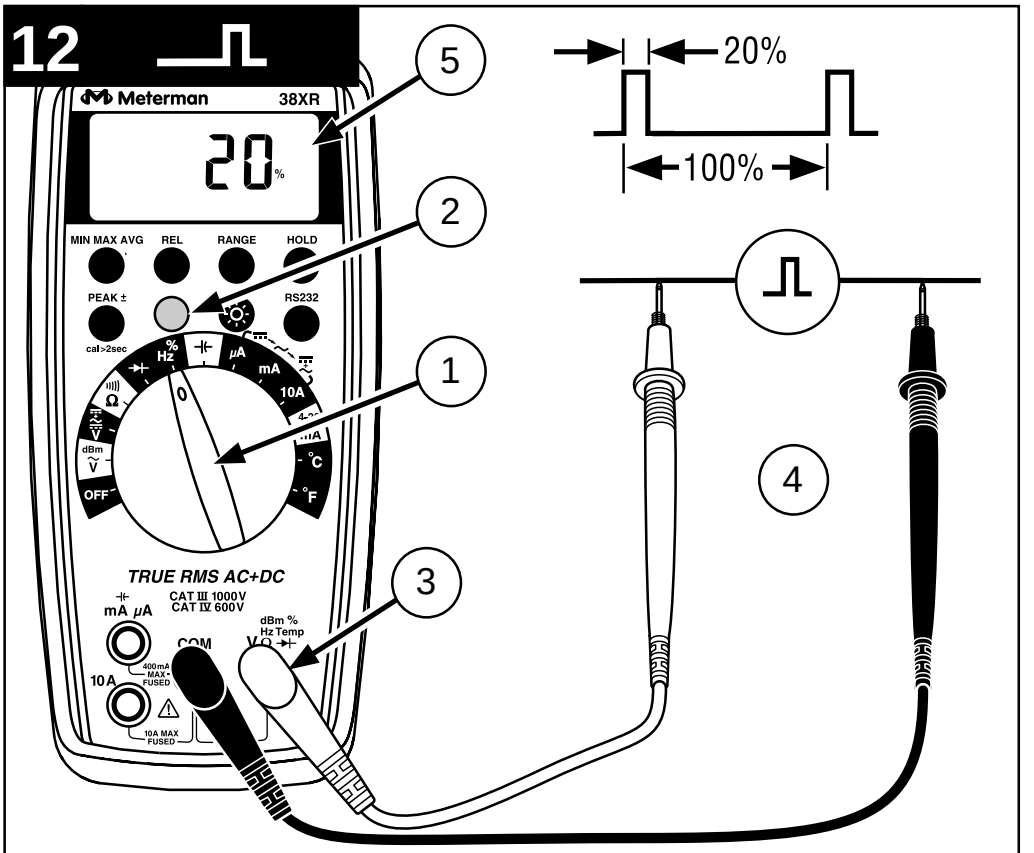
4


12
Meterman
38XR
20%
MIN MAX AVG
REL
RANGE
HOLD
PEAK ±
RS232
cal>2sec
OFF
TRUE RMS AC+DC
CAT III 1000V
CAT IV 600V
COM
10A
20%
100%
1
2
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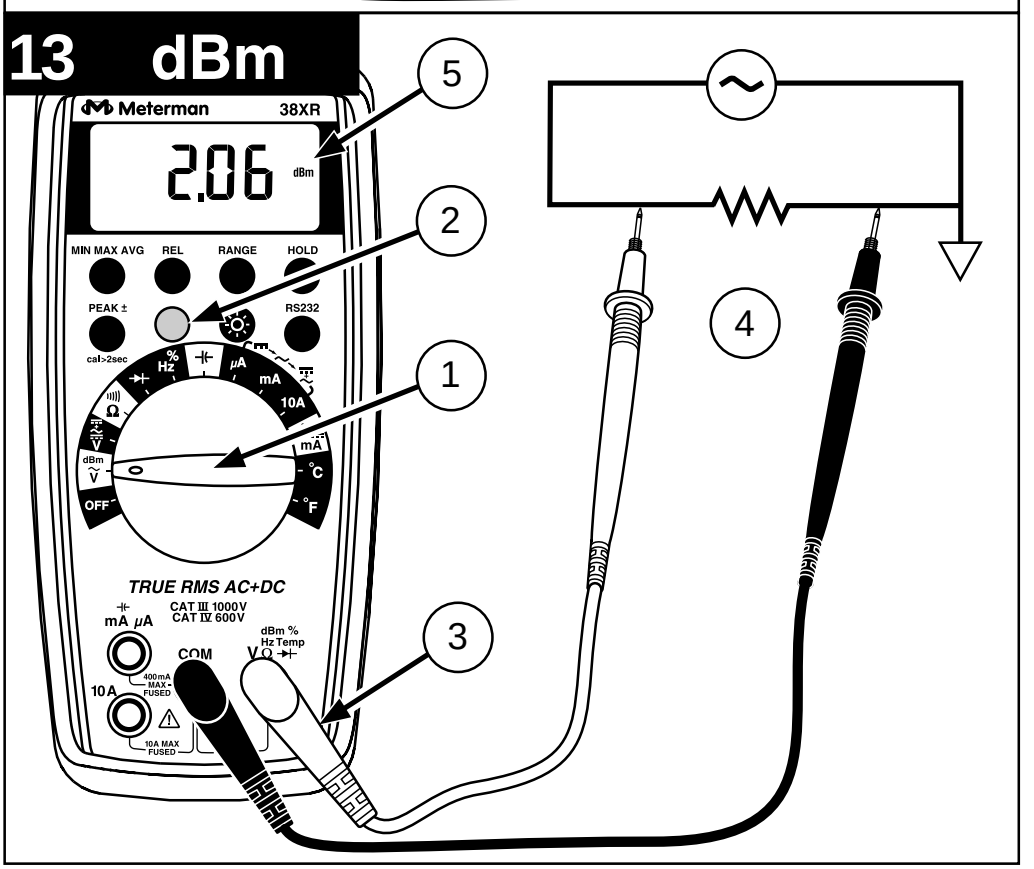
5


13 dBm
Meterman
38XR
2.06
dBm
MIN MAX AVG
REL
RANGE
HOLD
PEAK ±
RS232
cal>2sec
OFF
TRUE RMS AC+DC
CAT III 1000V
CAT IV 600V
COM
10A
1
2
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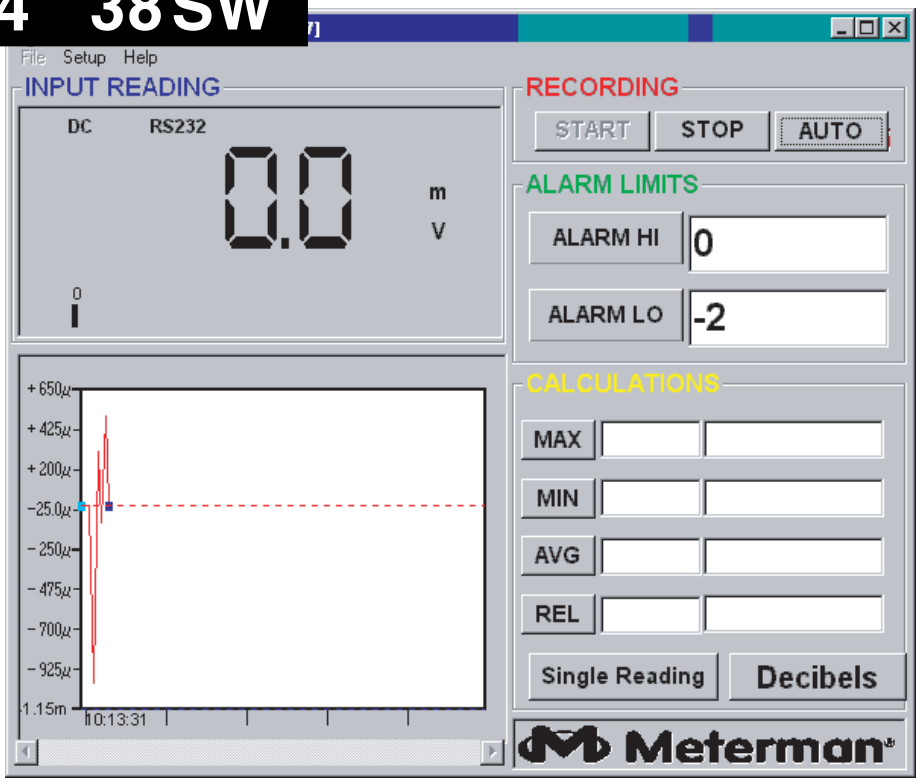
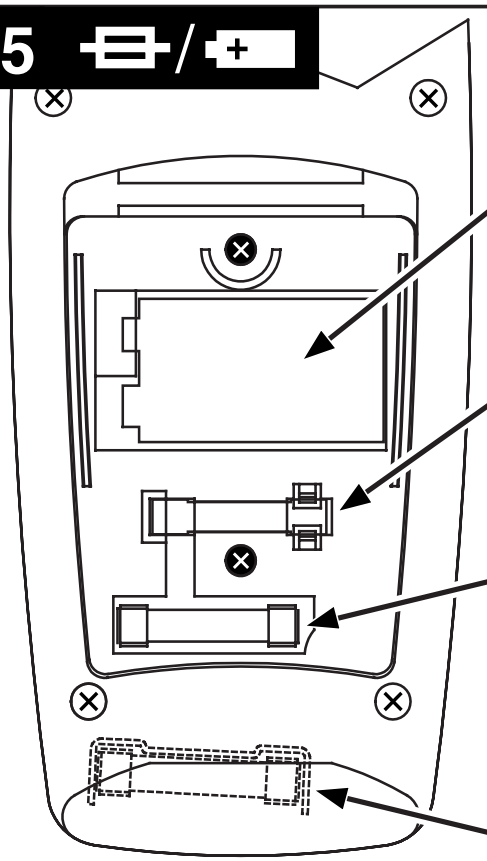
4
5

14 38 SW



15



⊗ (2)
9 V Battery
Pile 9 V
9 V Batterie
Pila de 9 V
Batería de 9 V

Spare 500 mA fuse
Fusible 500 mA de rechange
500 mA Ersatzsicherung
Fusibile di ricambio da 500 mA
Fusible de recambio de 500 mA

500 mA Fuse
Fusible 500 mA
500 mA Sicherung
Fusibile da 500 mA
Fusible de 500 mA

⊗ (2) ⊗ (4)
10 A Fuse
Fusible de 10 A
10 A Sicherung
Fusibile da 10 A
Fusible de 10 A

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