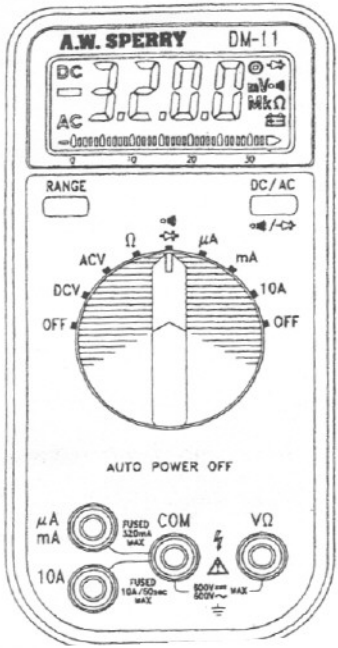
OPERATING INSTRUCTIONS
MODEL DM-11
AUTORANGING MULTIMETER



FEATURES

- 27 Ranges, 7 Functions
- Limited Five Year Warranty
- Pocket Size
- Simple Operation
- Auto Power Off
- Ergonomically contoured for your hand
- 200 Hour Battery Life
- 10A AC/DC Ranges
- Current Input Alert
- Recessed Safety Designed Input Terminals
- Overload Protection on All Ranges
- Diode Test Function

ACCESSORIES

The DM-11 comes packed complete with one (1) set TL-58 Test Leads (1 black, 1 red), one (1) B-4 Battery, one (1) F-25 Fuse, one (1) F-22 Fuse, (1) spare F-22 fuse, one (1) C-72 Rubber Holster, Form #239 operating instructions and warranty card.

SAFETY RULES

1. Reading these operating instructions thoroughly and completely before operating your DMM. Pay particular attention to WARNINGS and CAUTIONS which will inform you of potentially dangerous procedures. These instructions must be followed.

2. Always inspect your DMM, test leads and accessories for any sign of damage or abnormality before every use. If any abnormal conditions exist (e.g. broken test leads, cracked cases, display not reading, etc.) do not attempt to take any measurements.
3. Never ground yourself when taking electrical measurements. Do not touch exposed metal pipes, outlets, fixtures, etc., which might be at ground potential. Keep your body isolated from ground by using dry clothing, rubber shoes, rubber mats, or any approved insulating material.
4. Never touch exposed wiring, connections or any live circuit conductors when attempting to take measurements.
5. Never replace the protective fuse inside the DMM with any other than the AWS part number specified or approved equal.
6. Remember: Think Safety and Act Safely.
7. When testing for the presence of voltage, make sure the voltage function is operating properly by reading a known voltage in that range before assuming that a zero reading indicates a no-voltage condition.
8. Calibration and repair should be performed by qualified maintenance personnel only.
9. Do not attempt calibration or service unless another person, capable of rendering first aid and resuscitation is present.
10. Do not install substitute parts or perform any unauthorized modification of the instrument. Return the instrument to A.W. Sperry Instruments for service and repair to insure that safety features are maintained.
11. To avoid electric shock use CAUTION when working with voltages above 40Vdc or 20Vac. Such voltages pose a shock hazard.
12. Do not operate this instrument in an explosive atmosphere (i.e. in the presence of flammable gases or fumes, vapor or dust).

FIVE YEAR LIMITED WARRANTY

A.W. Sperry Instruments, Inc., warrants that this Techmaster Series instrument has been carefully tested, inspected, and warranted for five (5) years from the date of purchase by the original end user, provided the instruments have not been misused, damaged due to negligence, neglect or unauthorized repair, abused or used contrary to the operating instructions. Instruments and proof of purchase in the form of a legible copy or original of the sales receipt clearly identifying the distributor, model number and date of purchase must be returned to A.W. Sperry Instruments, Inc., Attention: Customer Service Center, 245 Marcus Boulevard, Hauppauge, New York 11788, postage prepaid for examination and verification of manufacturing defect under warranty. A.W. Sperry Instruments, Inc., shall be the sole judge of such defect. The liability of A.W. Sperry Instruments, Inc. shall be limited to the repari or replacement as its sole option of any defective product.

THIS WARRANTY AND THE OBLIGATIONS AND LIABILITIES OF SELLER THEREUNDER ARE EXCLUSIVE AND IN LIEU OF AND BUYER HEREBY WAIVES ALL OTHER REMEDIES, EXPRESS WARRANTIES, GUARANTEES OR LIABILITIES, OF AND FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OR WHETHER OR NOT OCCASSIONED BY SELLER'S NEGLIGENCE. THIS WARRANTY SHALL NOT BE EXTENDED, ALTERED OR VARIED EXCEPT BY A WRITTEN INSTRUMENT SIGNED BY SELLER AND BUYER. SOME STATES ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. THIS WARRANTY GIVES SPECIFIED LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

The warranty is not applicable if the instrument has been: misused, abused, subjected to loads in excess of specifications, has had unauthorized repair or has been improperly assembled or used.

* Note: Recommended calibration should not exceed one year. Calibration service charges are not covered under terms and conditions of warranty.

3. To toggle between the continuity/diode modes, press Mode Switch.
4. Connect the test leads to the two points at which continuity is to be tested. The buzzer will sound if the resistance is less than approximately 20Ω.

MAINTENANCE

WARNING

Remove test leads before changing battery or fuse or performing any servicing.

Battery Replacement

Power is supplied by a 9 volt "transistor" battery. (NEDA 1604, IEC 6F22). The " " appears on the LCD display when replacement is needed.

To replace the battery, remove the three screws from the back of the meter and lift off the front case. Remove the battery from case bottom.

Fuse Replacement

If no current measurements are possible, check for a blown overload protection fuse. There are two fuses; F1 for the μA/mA jack and F2 for the 10A jack. For access to fuses, remove the three screws from the back of the meter and lift off the front case. Replace F1 only with the original type 0.5A/250V, fast acting fuse. Replace F2 only with the original type 10A/600V, fast acting ceramic fuse.

Resistance Measurements

1. Set the Function switch to the " Ω " position.
2. Turn off power to the circuit under test. External voltage across the components causes invalid readings.
3. Connect the red test lead to the "VΩ" jack and the black test lead to the "COM" jack.
4. Connect the test leads to the point of measurements and read the value from the display.

Testing Diodes

1. Set the Function switch to •))/⊣◀ position.
2. Turn off power to the circuit under test. External voltage across the components causes invalid readings.
3. To toggle between the continuity/diode modes, press Mode Switch.
4. Touch probes to the diode. A forward-voltage drop is about 0.6V (typical for a silicon diode).
5. Reverse probes. If the diode is good, "OL" is displayed. If the diode is shorted, a value near 0mV will be displayed.
6. If the diode is open, "OL" is displayed in both directions.

Continuity Measurements

1. Set the Function switch to •))/⊣◀ position.
2. Turn off power to the circuit under test. External voltage across the components causes invalid readings.

Voltage Measurements

1. Connect the red test lead to the "VΩ" jack and the black test lead to the "COM" jack.
2. Set the Function switch to the desired voltage type (DCV) or (ACV) position.
3. Touch the probes to the test points, the range will change automatically to the level that will display the input voltage with best resolution.
4. The value indicated in the display window is the measured value of voltage with proper decimal point and annunciator indication.
5. For dc, a (-) sign is displayed for negative polarity; positive polarity is implied.

Current Measurements

1. Set the Function switch to the desired current range (μA,mA or 10A) position.
2. To toggle between "DC" and "AC" mode, press Mode switch. The "DC" or "AC" annunciators is displayed in the upper left corner.
3. For current measurements less than 320mA, connect the red test lead to the μA/mA jack and the black test lead to the COM jack.
4. For current measurements of 320mA or greater, connect the red test lead to the 10A jack and the black test lead to the COM jack.
5. Remove power from the circuit under test and open the normal circuit path where the measurement is to be taken. Connect the meter in series with the circuit.
6. Apply power and read the value from the display.

OPERATION

Before taking any measurements, read the Safety Information Section. Always examine the instrument for damage, contamination (excessive dirt, grease, etc.) and defects. Examine the test leads for cracked or frayed insulation. If any abnormal conditions exist do not attempt to make any measurements.

Current Input Alert

The meter have a beeper that warns the user when the test lead is in the current jack while the meter is switched to make a voltage measurement. Another safety feature to protect the meter and you.

Manually Selecting a Range

The meter also has a manual range mode. In manual range, you select and lock the meter in a range. To manually select a range:

Press [RANGE] button to hold the selected range. Subsequently pressing the [RANGE] button will select each range in sequence from the lowest to highest range. Hold the button for 2 seconds to return to the Autorange Mode.

Mode Switch (DC/AC), (•))/⊣⊢)

Press this switch to toggle between DC and AC in the current measurements. Press this switch to toggle between the continuity/diode modes, if the function switch is set to •))/⊣⊢ position.

Voltage (50/60Hz)	Range	DC Accuracy	AC Accuracy	Input impedance	Maximum input
	320mV	± 1.2% rdg+1d	N / A	> 1000MΩ	600VDC or 600VAC rms
	3.2V	± 0.8% rdg+1d	± 2.0% rdg+4d	11MΩ	
	32V	± 1.2% rdg+1d		10MΩ	
	320V				
	600V				
Current (50/60Hz)	Range	DC Accuracy	AC Accuracy	Voltage burden	Input protection
	320μA	± 2.0% rdg+1d	± 2.5% rdg+4d	0.2V	0.5A/250V fuse
	3200μA			2V	
	32mA			0.2V	
	320mA			2V	
	10A	± 3.0% rdg+3d	± 3.5% rdg+4d	2V	10A/600V fuse
OHM	Range	Resolution	Accuracy:	Test current	Input protection
	320Ω	100mΩ	± 2.0% rdg+3d	< 0.7mA	500VDC or 500VAC rms
	3.2kΩ	1Ω	± 1.5% rdg+3d	< 0.13mA	
	32kΩ	10Ω		< 13μA	
	320kΩ	100Ω		< 1.3μA	
	3.2MΩ	1kΩ	± 2.5% rdg+3d	< 0.13μA	
	32MΩ	10kΩ	± 5.0% rdg+5d		
Diode Test	0-2000	1mV	± 10% rdg+2d	0.5mA (Vf = 0.6V)	500V DC or AC rms
Continuity Check	Range	Resolution	Audible indication	Test current	Input protection
	320Ω	100mΩ	< approx. 20Ω	< 0.7mA	500V DC or AC rms

SPECIFICATIONS

Display: 3½ digit liquid crystal display (LCD) with a maximum reading of 3200.

Analog bar graph: 34 segments with measurements 12 times per second.

Polarity: Automatic, (-) negative polarity indication.

Overrange: "OL" mark indication.

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

Measurement rate: 2 times per second, nominal.

Auto power off: Meter automatically shuts down after approx. 10 minutes of inactivity.

Operating environment: 0°C to 50°C at <70% relative humidity.

Storage temperature: -20°C to 60°C at <80% relative humidity.

Power: Single standard 9-volt battery, NEDA 1604, JIS 006P, IEC 6F22. A.W. Sperry Part # B-4.

Battery life: 200 hours typical with carbon-zinc.

Fuse: Ceramic Type, Fast Acting, 10A/600Vac rating, 6.3x25.4mm, A.W. Sperry Part #F-25. Ceramic Type, Fast Acting, .5A/250Vac rating, 5x20mm, A.W. Sperry Part #F-22.

Dimensions: 147mm (H) x 70mm (W) x 39mm (D).

Weight: Approx. 11.8 oz. (335g) including holster.