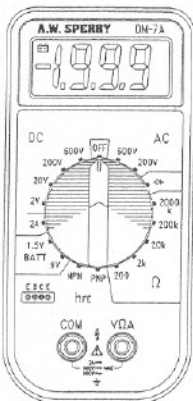


OPERATING INSTRUCTIONS

MODEL DM-7A

DIGITAL MULTIMETER



FEATURES

- 17 Ranges, 7 Functions
- Limited Five Year Warranty
- Pocket Size
- Simple Operation
- Ergonomically contoured for your hand
- 200 Hour Battery Life
- 2A DC Range
- Recessed Safety Designed Input Terminals
- Overload Protection on All Ranges
- Diode Test Function
- hFE Transistor Test Function
- Battery Test Function

ACCESSORIES

The DM-7A comes packed complete on a see through blister card with one (1) set TL-58 Test Leads (1 black, 1 red), one (1) B-4 Battery, one (1) C-71 Carrying Case, one (1) F-24 Fuse installed, one (1) spare, Form #235 operating instructions and warranty card.

⚠ When servicing, use only specified replacement parts

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).

SPECIFICATIONS

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

Polarity: Automatic, positive implied, negative polarity indication.

Overrange: (1) or (-1) is displayed.

Zero: Automatic.

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

Measurement rate: 2.5 times per second, nominal.

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

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

Accuracy: Stated accuracy at 23°C ± 5°C, < 75% relative humidity.

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

Battery life: 200 hours typical with carbon-zinc.

Fuse: Ceramic Type, Fast Acting, 2A/600Vac rating, 6.3 x 25.4mm, A.W. Sperry Part # F-24

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

Weight: Approx. 7.4 oz (210g) including battery.

DC VOLTS

Range: 2V, 20V, 200V, 500V
Resolution: 1mV
Accuracy: ±(1.2% rdg + 1dgt)
Input impedance: 1MΩ
Overload protection: 600VDC or AC rms

AC VOLTS (50Hz - 500Hz)

Range: 200V, 600V
Resolution: 100mV
Accuracy: ±(2.0% rdg + 4dgt)
Input impedance: 450KΩ
Overload protection: 600VDC or AC rms

DC CURRENT

Range: 2A
Resolution: 1mA
Accuracy: ±(2.5% rdg + 2dgt)
Input protection: 2A / 600V fast blow fuse

RESISTANCE

Range: 200Ω, 2KΩ, 20KΩ, 200KΩ, 2000KΩ
Resolution: 100mΩ
Accuracy: ±(1.5% rdg + 3dgt) on 200Ω range
±(1.5% rdg + 1dgt) on 2KΩ to 2000KΩ range
Open circuit volts: 0.3Vdc (3.0Vdc on 200KΩ range)
Overload protection: 500VDC or AC rms

DIODE TEST

Test current: 1.0mA ± 0.6mA
Accuracy: ±(3.0% rdg + 1dgt)
Open circuit volts: 3.3Vdc typical
Overload protection: 500VDC or AC rms

TRANSISTOR hFE

Range: 0 - 1000
Base current: 10µAdc approx. (Vce=3.0Vdc)

BATTERY TEST

Range: 1.5V, 9V
Resolution: 1mV, 10mV
Accuracy: ±(3.0% rdg + 2dgt)
Loaded current: 150mA typical for 1.5V range
6mA typical for 9V range

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 aged insulation. If any abnormal conditions exist do not attempt to make any measurements.

Voltage Measurements

1. Connect the red test lead to the "VΩA" jack and the black test lead to the "COM" jack.
2. Set the Function/Range switch to the desired Voltage type (AC or DC) and range. If magnitude of voltage is not known, set switch to the highest range and reduce until a satisfactory reading is obtained.
3. Connect the test leads to the device or circuit being measured.
4. For dc, a (-) sign is displayed for negative polarity; positive polarity is implied.

Current Measurements

1. Connect the red test lead to the "VΩA" jack and the black test lead to the "COM" jack.
2. Set the Function/Range switch to the 2A DC range.
3. 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.
4. Apply power and read the value from the display.

Resistance Measurements

1. Set the Function/Range switch to the desired resistance range.
2. Remove power from the equipment under test.
3. Connect the red test lead to the "VΩA" jack and the black test lead to the "COM" jack.
4. Connect the test leads to the points of measurements and read the value from the display.

Diode Tests

1. Connect the red test lead to the "VΩA" jack and the black test lead to the "COM" jack.
2. Set the Function/Range switch to the "♦♦" position.
3. Turn off power to the circuit under test. External voltage across the components causes invalid readings.
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, "1" is displayed. If the diode is shorted, "0000" or another number is displayed.
6. If the diode is open, "1" is displayed in both directions.

Transistor Gain Measurements

1. Set the Function/Range switch to the desired hFE range (PNP or NPN type transistor).
2. Never apply an external voltage to the hFE sockets. Damage to the meter may result.
3. Plug the transistor directly into the hFE sockets. The sockets are labeled E, B, and C for emitter, base, and collector.
4. Read the transistor hFE (dc gain) directly from the display.

Battery Test

1. Connect the red test lead to the "VΩA" jack and the black test lead to the "COM" jack.

2. Set the Function/Range switch to the desired 1.5V or 9V battery test range.
3. Connect the test leads to the 1.5Vdc battery under test. Normally, a good 1.5Vdc battery will read above 1.25Vdc. Consult the battery manufacturer for complete battery specifications to determine actual battery life remaining and condition of battery.

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 "E" 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. For access to fuse, remove the three screws from the back of the meter and lift off the front case. Replace only with the original type 2A/600V, fast acting fuse.

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 instrument has not been misused, damaged due to negligence, neglect or unauthorized repair, abuse or use contrary to the operating instructions. Instruments are 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 to be returned to A.W. Sperry Instruments, Inc., and be the sole judge of such offer. The liability of A.W. Sperry Instruments, Inc. shall be limited to the repair or replacement at 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 FORBIDDEN IN LIEU OF CONSEQUENTIAL DAMAGES OR WHETHER OR NOT OCCASIONED 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, 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.