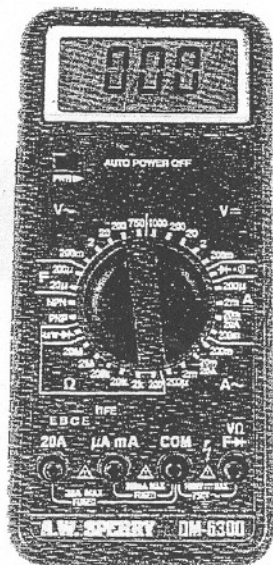


OPERATING INSTRUCTIONS

Models DM-6100, DM-6200, DM-6300

DIGITAL MULTIMETERS



PLEASE READ THESE OPERATING INSTRUCTIONS CAREFULLY
 Misuse and or abuse of these instruments cannot be prevented by any printed word and may cause injury and or equipment damage. Please follow all these instructions and measurement procedures faithfully and adhere to all standard industry safety rules and practices.

A.W. SPERRY INSTRUMENTS INC.

245 MARCUS BLVD, HAUPPAUGE, NEW YORK 11788

Phone: 800-645-5398 Toll Free or 516-231-7050

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ONE YEAR LIMITED WARRANTY

A.W. Sperry Instruments, Inc., warrants that this instrument has been carefully tested, inspected, and warranted for one (1) year 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 repair 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 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 YOU SPECIFIED LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

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

WARRANTY REGISTRATION

To validate warranty, please complete the warranty registration card enclosed with your instrument and return to A.W. Sperry Instruments, Inc., 245 Marcus Blvd., Hauppauge, N.Y. 11788 within 10 days of purchase. No postage required.

WARRANTY RETURN

Refer to section "Return for Repairs" for complete instructions. All warranty returns must include a legible copy or original of the sales receipt clearly identifying the model number, serial number and date of purchase.

MODELS DM-6100, DM-6200 AND DM-6300

Sec. 1 DESCRIPTION

These exceptional 3½ digit, handheld, digital multimeters have the capacity of reading up to 10 functions on up to 33 ranges. These DMM's offer a powerhouse of measurement capability in a self-contained housing. It is designed for the professional at work in the field or in the laboratory, yet simple enough to operate making it perfect for for the hobbyist too.

Safety was a prime consideration in the design of these DMM's. Housed in shock resistant plastic, these instruments stand up to the use and abuse of everyday service, and electrically insulates the user from potential shock hazards. Electronic overload protection against accidental application of voltage to resistance and continuity circuits, combined with rugged construction make it a durable and reliable instrument.

Sec. 2 FEATURES

DM-6100

- 31 Ranges, 7 Functions
- Drop Proof to 5 feet
- Low 20 Ohm Range
- 20A DC/AC Range
- Auto Power Off
- Meets IEC-348, UL-1244 standards
- Overload Protection on all Ranges
- Diode Test
- Continuity Buzzer
- Safety / Color Input Jack
- Safety Test Leads
- Built-in Hanger and Tilt Stand
- Large 3½ Digit LCD Display with Annunciators
- 1 Year Limited Warranty

DM-6200

- 32 Ranges, 9 Functions
- Drop Proof to 5 feet
- 20A DC/AC Range
- Auto Power Off
- Meets IEC-348, UL-1244 standards
- Overload Protection on all Ranges
- Temperature Ranges (probe included)
- Safety / Color Input Jack
- Safety Test Leads
- Built-in Hanger and Tilt Stand
- Large 3½ Digit LCD Display with Annunciators
- 1 Year Limited Warranty

DM-6300

- 33 Ranges, 10 Functions
- Drop Proof to 5 feet
- 20A DC/AC Range
- Auto Power Off
- Meets IEC-348, UL-1244 standards
- Overload Protection on all Ranges
- Capacitance Ranges
- HFE Transistor Test
- Safety / Color Input Jack
- Safety Test Leads
- Built-in Hanger and Tilt Stand
- Large 3½ Digit LCD Display with Annunciators
- 1 Year Limited Warranty

Sec. 3 SPECIFICATIONS

- **Display:** 3½ digit, 17mm large LCD maximum reading 1999 with function and units sign annunciators.
- **Polarity:** automatic, (-) negative polarity indication.
- **Overrange:** (1) or (-1) is displayed.
- **Low battery indication:** the "BAT" 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.
- **Power:** 9-volt battery, NEDA 1604, JIS 006P, IEC 6F22.
- **Battery life:** 250 hours typical with carbon-zinc.
- **Fuse:** 0.5A / 250V, 5x20mm fast acting AWS Part #F-22.
20A/600V, 10.3x38mm fast acting AWS Part #F-20.
- **Dimensions:** 7.5"H x 3.4"W x 1.5"D (189H x 87W x 37D mm)
- **Weight:** Approx. 12.9 oz. (370g) including battery.

RANGES:

*Accuracy is given as \pm ([% of reading]+[number of least significant digits]) at 18°C to 28°C, with relative humidity up to 70%.

DC Volts		DM-6100	DM-6200	DM-6300
Range	Resolution	Accuracy		
200mV	100μV	$\pm(0.5\%+1)$	$\pm(0.5\%+1)$	$\pm(0.5\%+1)$
2V	1mV	$\pm(0.5\%+1)$	$\pm(0.5\%+1)$	$\pm(0.5\%+1)$
20V	10mV	$\pm(0.5\%+1)$	$\pm(0.5\%+1)$	$\pm(0.5\%+1)$
200V	100mV	$\pm(0.5\%+1)$	$\pm(0.5\%+1)$	$\pm(0.5\%+1)$
1000V	1V	$\pm(0.5\%+1)$	$\pm(0.5\%+1)$	$\pm(0.5\%+1)$

Input Impedance: 10MΩ on all ranges.

Overload Protection: 500VDC/350VAC RMS for 15 seconds on 200mV range
1000VDC/750VAC RMS on all other ranges

AC Volts DM-6100 DM-6200 DM-6300

Range	Resolution	Accuracy (50Hz to 500Hz)		
200mV	100 μ V	$\pm(1.2\%+3)$	$\pm(1.2\%+3)$	$\pm(1.2\%+3)$
2V	1mV	$\pm(1.2\%+3)$	$\pm(1.2\%+3)$	$\pm(1.2\%+3)$
20V	10mV	$\pm(1.2\%+3)$	$\pm(1.2\%+3)$	$\pm(1.2\%+3)$
200V	100mV	$\pm(1.2\%+3)$	$\pm(1.2\%+3)$	$\pm(1.2\%+3)$
750V	1V	$\pm(2.0\%+3)$	$\pm(2.0\%+3)$	$\pm(2.0\%+3)$

Input Impedance: 10M Ω on all ranges.

Response: Average responding calibrated in RMS of sine wave.

Overload Protection: 500VDC/350VAC RMS for 15 seconds on 200mV range
1000VDC/750VAC RMS on all other ranges

DC Current DM-6100 DM-6200 DM-6300

Range	Resolution	Accuracy		
20 μ A	0.01 μ A	$\pm(1.0\%+1)$	No Range	No Range
200 μ A	0.1 μ A	$\pm(1.0\%+1)$	$\pm(1.0\%+1)$	$\pm(1.0\%+1)$
2mA	1 μ A	$\pm(1.0\%+1)$	$\pm(1.0\%+1)$	$\pm(1.0\%+1)$
20mA	10 μ A	$\pm(1.0\%+1)$	$\pm(1.0\%+1)$	$\pm(1.0\%+1)$
200mA	100 μ A	$\pm(1.0\%+1)$	$\pm(1.0\%+1)$	$\pm(1.0\%+1)$
20A*	10mA	$\pm(3.0\%+3)$	$\pm(3.0\%+3)$	$\pm(3.0\%+3)$

Voltage Burden: 900mV max. on 20A range, 600mV max. on all other ranges.

Overload Protection: 500mA/250V fuse on mA input (fast blow fuse).

20A/600V fuse on 20A input (fast blow fuse).

*10A continuous, 20A for 30 seconds maximum.

AC Current DM-6100 DM-6200 DM-6300

Range	Resolution	Accuracy (50Hz to 500Hz)		
20 μ A	0.01 μ A	$\pm(1.5\%+4)$	No Range	No Range
200 μ A	0.1 μ A	$\pm(1.5\%+4)$	$\pm(1.5\%+4)$	$\pm(1.5\%+4)$
2mA	1 μ A	$\pm(1.5\%+4)$	$\pm(1.5\%+4)$	$\pm(1.5\%+4)$
20mA	10 μ A	$\pm(1.5\%+4)$	$\pm(1.5\%+4)$	$\pm(1.5\%+4)$
200mA	100 μ A	$\pm(1.5\%+4)$	$\pm(1.5\%+4)$	$\pm(1.5\%+4)$
20A*	10mA	$\pm(3.5\%+4)$	$\pm(3.5\%+4)$	$\pm(3.5\%+4)$

Voltage Burden: 900mV max. on 20A range, 600mV max. on all other ranges.

Overload Protection: 500mA/250V fuse on mA input (fast blow fuse).

20A/600V fuse on 20A input (fast blow fuse).

*10A continuous, 20A for 30 seconds maximum.

Resistance

DM-6100

DM-6200

DM-6300

Range	Resolution	Accuracy		
		20Ω	0.01Ω	±(2.0%+4)
200Ω	0.1Ω	±(1.0%+4)	±(1.0%+4)	±(1.0%+4)
2kΩ	1Ω	±(0.8%+4)	±(0.8%+4)	±(0.8%+4)
20kΩ	10Ω	±(0.8%+4)	±(0.8%+4)	±(0.8%+4)
200kΩ	100Ω	±(0.8%+4)	±(0.8%+4)	±(0.8%+4)
2MΩ	1kΩ	±(0.8%+4)	±(0.8%+4)	±(0.8%+4)
20MΩ	10kΩ	±(2.0%+5)	±(2.0%+5)	±(2.0%+5)

Open Circuit Voltage: 3Vdc on 20Ω, 200Ω ranges, 0.3Vdc on all other ranges.

Overload Protection: 500VDC or peak AC - Electronic (No Fuse Blow)

Continuity

Range	Audible Indication	Response Time	Open Circuit Volts
2V	Less than 150Ω	Approx. 500ms	3.0Vdc

Overload Protection: 500VDC or peak AC - Electronic (No Fuse Blow)

Diode Test

Range	Resolution	Accuracy	Test Current	Open Circuit Volts
2V	1mV	±(1.0% rdg+1d)	1.0mA	3.0Vdc

Overload Protection: 500VDC or peak AC - Electronic (No Fuse Blow)

Micro Wave Diode Test (DM-6300 Only)

Range	Resolution	Accuracy	Test Current	Open Circuit Volts
20V	10mV	±(2.5% rdg+3d)	0.6mA	12Vdc Approx.

Overload Protection: 500VDC or peak AC - Electronic (No Fuse Blow)

Transistor HFE (DM-6300 Only)

Range	Base Current	Collector Emitter Volts	Transistor Types
0-1000	10μAdc Approx.	V _{CE} =3.0Vdc Approx.	NPN or PNP

Temperature (DM-6200 Only)

Range	Resolution	Accuracy	Sensor Type
200°C	0.1°C	-20°C-0°C $\pm(2.0\%+2^{\circ}\text{C})$	K-Type Thermocouple
		0°C-200°C $\pm(2.0\%+1^{\circ}\text{C})$	
750°C	1°C	200°C-750°C $\pm(3.0\%+2^{\circ}\text{C})$	
200°F	0.1°F	-4°F-32°F $\pm(2.0\%+4^{\circ}\text{F})$	
		32°F-200°F $\pm(2.0\%+2^{\circ}\text{F})$	
1400°F	1°F	200°F-1400°F $\pm(3.0\%+4^{\circ}\text{F})$	

Input Protection: 60VDC or 24VAC rms.

Capacitance (DM-6300 Only)

Range	Resolution	Accuracy	Test Frequency
20 μF	10nF	$\pm(3.0\% \text{ rdg} + 4\text{d})$	40Hz
200 μF	100nF	$\pm(3.0\% \text{ rdg} + 4\text{d})$	40Hz

Overload Protection: 500VDC or peak AC - Electronic (No Fuse Blow)

Sec. 4 SAFETY RULES

1. Read 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. Refer to section 14 Return for Repair.
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.)

Sec. 5 UNPACKING AND CONTENTS CHECK

The 6000 series come complete and ready to use. Check the following contents list when unpacking. If any pieces are missing notify the distributor you purchased the instrument from or A. W. Sperry Instruments, Inc.

- Operating Instructions #227.
- TL-58 Test Leads 1 red, 1 black heavy duty with prod tips connected to 90° shielded banana plugs. Use with 6000 series.
- 9V Transistor Type Battery (AWS Part #B-4) See Battery Replacement section 10.2 for proper installation.
- Two Fuses installed, One F-20 fuse, fast acting, high interrupting capacity 20 Amp, 600Vac rating 10.3x38mm. One F-22 Fuse, fast acting, 0.5A, 250Vac rating 5x20mm. One spare F-22 Fuse. See Fuse Replacement section 10.3.
- One TP-800K K-Type Thermocouple Probe (DM-6200 only).

Sec. 6 BATTERY REPLACEMENT

These DMM's have a self-contained power supply consisting of One 9V Transistor Type Battery (NEDA #1604, AWS Part #B-4).

When the multimeter displays the "BAT" the battery must be replaced to maintain proper operation.

WARNING

TO PREVENT ELECTRICAL SHOCK HAZARD, TURN OFF THE MULTIMETER AND DISCONNECT TEST LEADS BEFORE REMOVING THE BACK COVER.

1. After disconnecting test leads and turning off the multimeter, remove back cover by removing the three screws; then lift off the back cover.
2. Replace the battery.
3. Replace the back cover.

Sec. 7 FUSE TEST AND REPLACEMENT

Use the following steps to test the internal fuses of the meter:

1. Turn the function / range switch to the (\rightarrow) position. Plug a test lead into the $V\Omega$ input terminal.
2. Touch the probe to the μA , mA input terminal. The display should indicate .700 or less, otherwise the fuse is probably bad (DM-6200, DM-6300 only).
3. Touch the probe to the 20A input terminal. The display should indicate .001 or less, otherwise the 20A fuse is probably bad.

WARNING

TO PREVENT ELECTRICAL SHOCK HAZARD, TURN OFF THE MULTIMETER AND DISCONNECT TEST LEADS BEFORE REMOVING THE BACK COVER.

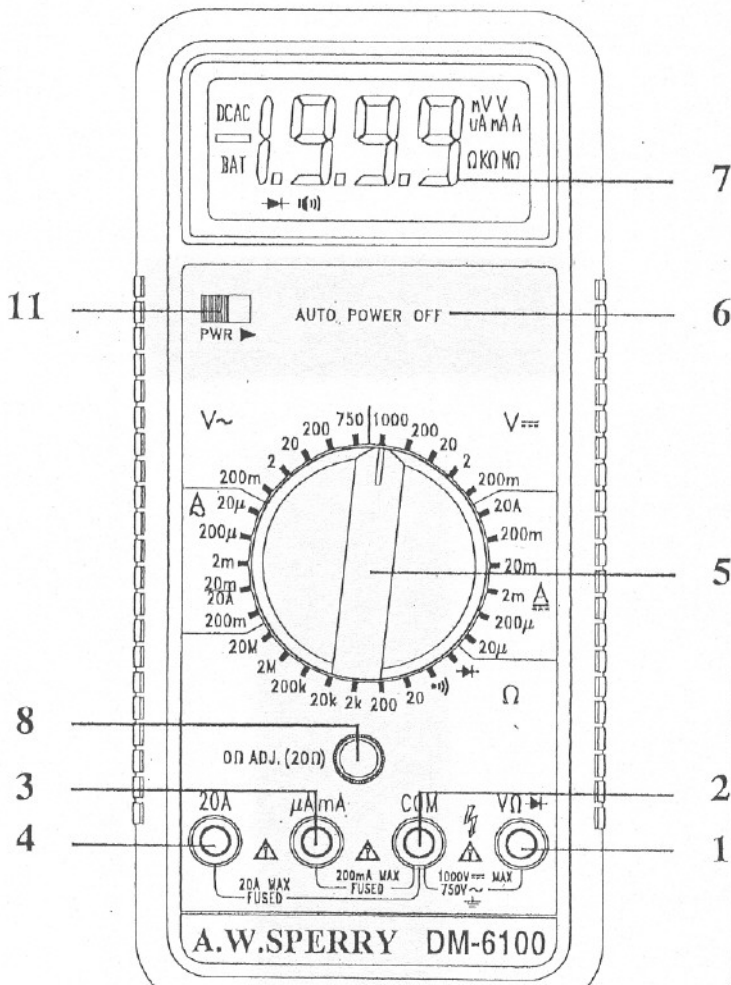
mA μA Input Terminal

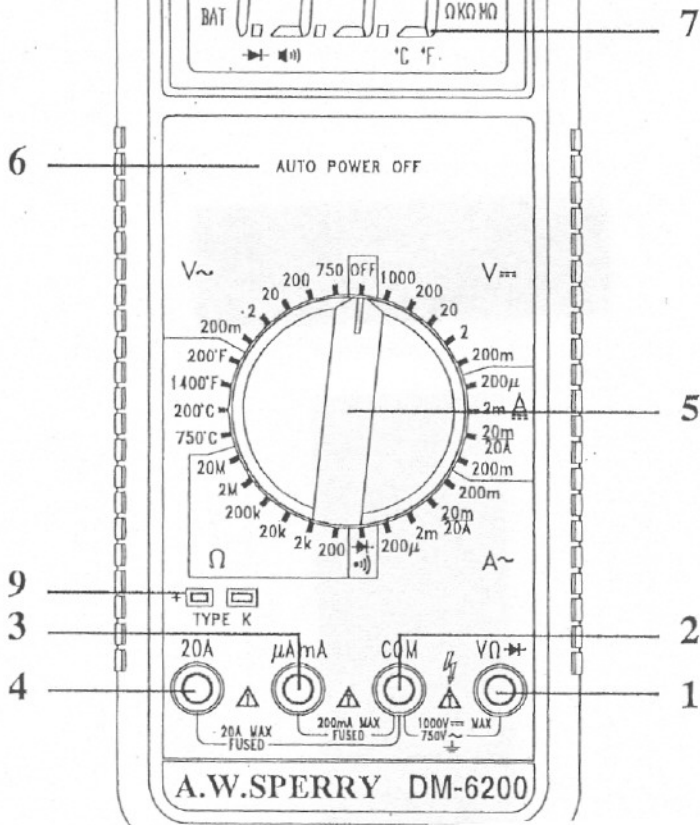
1. After disconnecting test leads and turning off the multimeter, remove back cover by removing the three screws; then lift off the back cover.
2. Carefully remove the fuse (5x20 mm) from the fuse holder. Replace with a 500mA / 250V replacement fuse, AWS Part #F-22 or approved equal.
3. Re-connect the battery and replace it in the battery compartment.
4. Replace the back cover by reversing the procedure used to remove it.

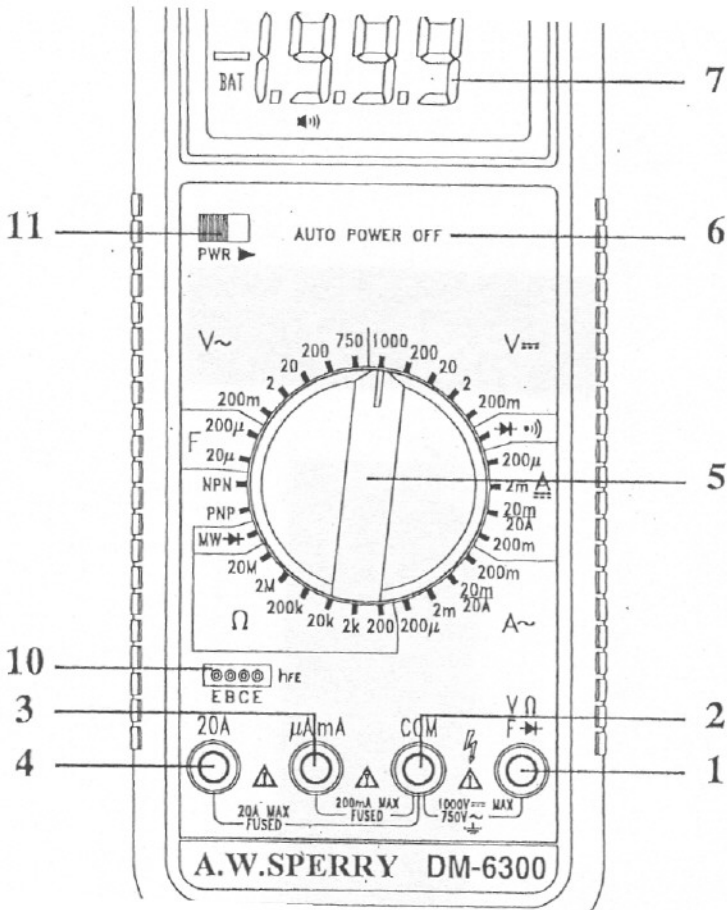
20A Input Terminal

1. After disconnecting test leads and turning off the multimeter, remove back cover by removing the three screws; then lift off the back cover.
2. Carefully remove the 20A/600V fuse from the 20Ampere fuse holder. Replace with a new 20A/600V fuse, AWS Part #F-20 or approved equal.
3. Re-connect the battery and replace it in the battery compartment.
4. Replace the back cover by reversing the procedure used to remove it.

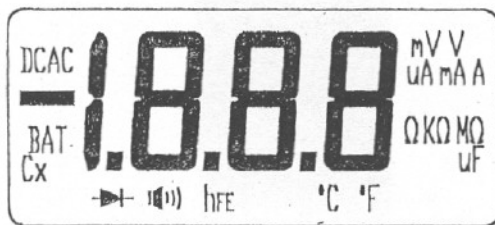
c. 8 FRONT PANEL CONTROLS










- 1 **VΩF** \rightarrow Volt, Ohms, Capacitance, Diode, Input Terminal
This is the positive input terminal for all functions except current measurements, Connection is made here using the accessory red test lead.
- 2 **COM** Common Terminal
This is the negative (ground) input terminal for all measurement modes. Connection is made to it using the accessory black test lead.
- 3 **mA μ A** Milliamp / Microamp Input Terminal
This is the positive input terminal for current measurement (ac or dc) up to 200 mA. Connection is made to it using the accessory red test lead.
- 4 **20A** 20 Amperes Input Terminal
This is the positive input terminal for current measurement (ac or dc) up to 20A. Connection is made to it using the accessory red test lead.
- 5 **Function Selector Rotary Switch**
This rotary switch selects the measurement function when aligned with function symbols on the panel.
- 6 **Auto Power Off**
Automatic power-off extends the life of the battery by turning the meter off after approximately fourty-five minutes. The meter turns back on if the rotary switch is turned (DM-6200), or slide the PWR switch to cycle reset (DM-6100, DM-6300).
- 7 **Liquid Crystal Display (LCD)**
This liquid crystal display provides a 3½ digit measurement data display having a maximum count of 2000, as well as unit and function annunciators.



Symbols/ Units	Descriptions
DC	Appears for the DC current and voltage modes.
AC	Appears for the AC current and voltage modes.
	Polarity marks which appears when a DC signal measurement value is negative.
Cx	Appears when the capacitance measurement function has been selected.
hFE	Appears when the transistor test mode has been selected.
	Appears when the diode test mode has been selected.
	Appears when the continuity check has been enabled.
BAT	Lights to indicate that battery voltage has dropped below the operating level.
μF	Units for capacitance measurements.
$\mu\text{A}, \text{mA}, \text{A}$	Units for current measurements.
mV, V	Units for voltage measurements.
$\Omega, \text{k}\Omega, \text{M}\Omega$	Units for resistance measurements.
$^{\circ}\text{C}, ^{\circ}\text{F}$	Units for temperature measurements.

8 0 Ω Control Knob

For measuring resistance less than 20 Ω , make firm contact between the test leads and adjust the zero control knob, until the display reads 0.00. Resistance of the test leads has now been compensated for.

9 Temperature Jack

The temperature jack is located in the lower left-hand corner of the front panel. To measure a wide range of temperature (-20°C to $+750^{\circ}\text{C}$), plug in a K-type thermocouple and take the reading direct from the digital display.

10 Transistor Test Socket

In the transistor measurements, insert the transistor leads into this socket.

11 PWR Power Switch

This switch is used to turn meter ON or OFF.

Sec. 9 OPERATION

Before making any measurements always examine the instrument and accessories used with the instrument for damage, contamination (excessive dirt, grease, etc.) and defects. Examine the test leads for cracked or frayed insulation and make sure the lead plugs fit snugly into the instrument jacks. If any abnormal conditions exist do not attempt to make any measurements. Instead refer to Sec. 14 Return for Repairs.

Sec. 9.1 VOLTAGE MEASUREMENTS

1. Insert the black and red test leads into the respective "COM" and "V- Ω " terminals.
2. Place the range selector switch into the 1000Vdc position if a dc voltage is to be measured or into the 750Vac position if an ac voltage is to be measured. Always start in the highest range of the function to be measured.

CAUTION

To avoid possible electric shock, instrument damage and / or equipment damage, do not attempt to take any voltage measurements if the voltage is above 1000Vdc / 750Vac or if the voltage is unknown. 1000Vdc and 750Vac is the maximum voltages that this instrument is designed to measure. The "COM" terminal potential should not exceed 500V measured to ground.

3. Apply the test leads to the two points at which the voltage reading is to be taken. Be careful not to touch any energized conductors with any parts of your body.
4. Turn the range selector switch to the next lower range for a more accurate reading only if the reading is within that next lower range.
5. When measurements are completed, disconnect the test leads from the circuit under test. Remove the test leads from the instrument.

Sec. 9.2 CURRENT MEASUREMENTS

1. Insert the black and red test leads into the respective "COM" and "20A" terminals.
2. Place the function switch to the 20A position. Always start with the highest range of the function to be measured.

CAUTION

Do not attempt to measure a current if it is unknown or above 20A ac / dc. The mA input terminal is protected by a 500mA / 250V fast fuse. The 20A input terminal is protected by a 20A/600V hi-energy, fast fuse.

3. Completely de-energize the circuit in which the current is to be measured. Place the DMM in series with the conductor carrying the current which is to be measured. Energize the circuit.
4. If the reading is less than 200mA, you can switch to a lower range for greater accuracy. If not, you have completed your measurement.

CAUTION

Before changing ranges, always de-energize the circuit completely. An open circuit exists between the test leads during range change on the DMM.

5. To change to a lower range, move the red test lead to the "mA" jack on the DMM and switch the range selector switch to the "200mA" position.

CAUTION

The mA ranges are fuse protected. To avoid possible electrical shock, instrument damage and / or equipment damage do not:

1. Attempt to take mA current readings on circuits having more than 200mA current flow.
2. Impass a voltage between the "COM" and "mA" terminals exceeding 250Vac / dc. Some circuit damage may result for voltages below 250Vac / dc.

3. Raise the "COM" terminal potential above 500V to ground.
4. Energize the circuit. If the reading is within the next lower range, switch to that range at completely de-energizing the circuit under test. Continue changing to lower ranges if the reading is within the next lowest range to obtain the best accuracy.
5. Completely de-energize the circuit before removing the test leads.

Sec. 9.3 RESISTANCE AND DIODE MEASUREMENTS

1. Insert the black and red test leads into the respective "COM" and "V- Ω " terminals.
2. Place the range selector switch into the Ω range desired for a measurement. (The diode check entails injecting a given current into the diode junction to be tested and reading the voltage drop across the diode).
3. Model DM-6300 includes an extra diode range for reading Micro-Wave Diodes (MW \rightarrow).

CAUTION

All resistance and diode measurements should be taken on deenergized circuits only. To avoid possible electrical shock, instrument damage and/or equipment damage do not connect the "COM" and "V- Ω " terminals to circuits having a potential difference exceeding 500Vdc/ac. Do not connect the "COM" terminal to potentials exceeding 500V to ground.

3. Completely de-energize the circuit or device which is to be measured. Connect the test leads to the device (the red test lead is positive with respect to the black test lead). When measuring a diode, connect the "V- Ω " terminal to the anode. A reading of (1) or (-1) indicates an overrange condition or the diode junction is reverse biased. This will occur with the test leads open on all resistance or diode ranges. If overrange occurs when taking a reading, switch to the next highest range for resistance measurements.

NOTE: On the microwave diode test range, the display will indicate 10.00V to 11.00V if the diode junction is reverse biased or if the circuit is open.

Sec. 9.4 CONTINUITY MEASUREMENTS

1. Place the range selector switch into the (Ω) position.
2. Insert the black and red test leads into the respective "COM" and "V- Ω " terminals.

CAUTION

All continuity measurements should be taken on de-energized circuits only. To avoid possible electrical shock, instrument damage and/or equipment damage do not connect the common and ohm terminals to circuits having a potential difference exceeding 500Vdc/ac. Do not connect the common terminal to potentials exceeding 500V to ground.

3. Touch the test leads to the two points at which continuity is to be tested. The tone will sound if the reading on the display is approximately less than 150 Ω .

Sec. 9.5 TRANSISTOR H_{FE} MEASUREMENTS (DM-6300 ONLY)

1. Place the range selector switch into the " H_{FE} " and switch to the NPN or PNP position depending on which type of bipolar transistor is to be measured.
2. Plug the transistor to be tested into the Transistor Test Socket, being sure to observe proper lead connection as shown on the front of the instrument.
3. Read the H_{FE} value on the display.

Sec. 9.6 CAPACITANCE MEASUREMENTS (DM-6300 ONLY)

WARNING

All capacitance measurements should be made on de-energized circuits only. Discharge capacitor before taking measurements.

1. Insert the black and red test leads into the respective "COM" and "V- Ω " terminals.
2. Turn off power to the circuit, and make sure that any capacitor being checked is fully discharged.
3. Place the range selector switch into the "F" range desired for a measurements.
4. Touch the probes to the capacitor. Always observe polarity markings when measuring polarized capacitors.
5. Read capacitance directly from the display.

Sec. 9.7 TEMPERATURE MEASUREMENTS (DM-6200 ONLY)

1. Select the required temperature range and unit of measurement ($^{\circ}\text{C}$ or $^{\circ}\text{F}$) by turning the rotary selector switch to one of the "TEMP" positions.
2. Connect a type K thermocouple to the thermocouple input terminal (yellow terminal) on the left hand side of the front panel.
3. Place the thermocouple junction tip at the point where the temperature is to be measured.

CAUTION

Do not allow the probe to contact any point in excess of 60VDC, or 24VAC, with respect to ground.

NOTE: for very high temperatures the multimeter must be kept far enough away from the source of temperature to avoid heat damage. At high temperatures, the life of the temperature probe will be reduced.

Sec. 10 **MAINTENANCE**

Maintenance consists of periodic cleaning, battery replacement, fuse replacement and recalibration.

Sec. 10.1 **CLEANING**

The exterior of the instrument can be cleaned with a soft clean cloth to remove any oil, grease or grime from the exterior of the instrument. Never use liquid solvents or detergents. If the instrument gets wet for any reason, dry the instrument using low pressure "clean" air at less than 25 PSI. Use care and caution around the LCD display protector and areas where water or air could enter the interior of the instrument while drying.

Sec. 10.2 **BATTERY REPLACEMENT**

Required when "BAT" appears on display or nothing appears. See BATTERY REPLACEMENT in section 6.

Sec. 10.3 **FUSE REPLACEMENT**

Required when current ranges do not function. See FUSE REPLACEMENT in section 7.

Sec. 11 **ACCESSORIES**

The following accessories are available to expand the measurement capabilities of the DM-6000 series. Refer to their respective data sheets or operating instructions for full specifications.

Sec. 11.1 **AC CURRENT MEASUREMENT SJA-870**

The Model SJA-870 is a split core current transformer capable of measuring AC current up to 1200Aac.

Input:

Output:

Accuracy:

Frequency:

0 - 1200Aac max.

0 - 12Vac at $I > 1M\Omega$ load

$\pm(3\% \text{ rdg} + 1A)$ with conductor in center of jaw

50 - 400Hz

Sec. 11.2 HIGH VOLTAGE DC MEASUREMENT HVP-860

The Model HVP-860 is a high voltage probe capable of measuring up to 50,000Vdc.

Input:	0 - 50,000Vdc
Output:	0 - 50Vdc at a 10M Ω load
Accuracy:	\pm (1.5% of F.S.)

CAUTION

The HVP-860 is designed to be used by technicians trained in High Voltage measurement techniques. It is designed for use on high impedance, low energy circuits only. These types of circuits are normally found in electronic equipment. It is not designed to be used on High Voltage electrical distribution equipment and circuits. These type of circuits have essential unlimited energy where special equipment is recommended. **DO NOT** use on these types of High Energy circuits!

Sec. 11.3 TEMPERATURE ADAPTER - TA-1A

The Model TA-1A is a temperature adapter capable of measuring temperature up to 1300°C/2372°F.

Temperature Range:	°F/°C Selectable -50°C to 1300°C/-58°F to 2372°F
Output:	1mVdc/°C or °F
Required Load on Output:	10M Ω

Sec. 11.4 CARRYING CASE - C-67

Carrying Case for DM-6000 series.

Sec. 11.5 PVC SHOCKGUARD HOLSTER - C-68

Holster for DM-6000 series.

Sec. 11.6 ALLIGATOR CLIPS - AG-940

Two black, Insulated Push-on Alligator Clips.

Sec. 11.7 K-TYPE THERMOCOUPLE PROBE TP-800K

K-Type Thermocouple Wire Bead Probe 0° to 800°C (32° to 1472°F), $+2.2^{\circ}\text{C}$ (4°F) or 0.75% rdg (whichever is greater). Teflon insulated wire to max. 260°C (500°F).

Sec. 12 CALIBRATION

Calibration on these meters should be performed every year. This can be done by sending the instruments prepaid to:

A. W. Sperry Instruments, Inc.
Customer Service Department
245 Marcus Boulevard
Hauppauge, N. Y. 11788

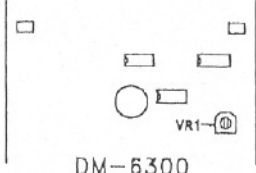
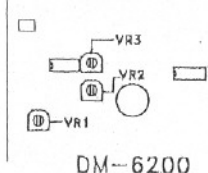
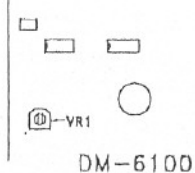
Specify in writing that calibration is necessary. The instrument will be returned to you normally within one week. Estimates will be furnished upon request.

CAUTION

The following procedure should be performed by persons trained and qualified in electronics and electronic equipment service. DO NOT attempt this procedure if not qualified.

WARNING

Do not attempt calibration or service unless another person, capable of rendering first aid and resuscitation is present.



Sec. 12.1 CALIBRATION OF DM-6100, DM-6300 MODELS

The procedure should be performed at an ambient temperature of $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$, and at a relative humidity of less than 80%. Allow the instrument to stabilize at this temperature for a minimum of 30 minutes.

1. Remove the back case screw, and carefully pry up the back case.
2. Set the Function / Range switch to the "200mVdc" position.
3. Set the output of the DC calibrator for $190.0\text{mV} \pm 0.02\%$ and connect it to the "V- Ω " and "COM" input terminals.
4. Adjust VR1 until the display reads $190.0\text{mV} \pm 1$ digit.
5. Carefully inspect the other DCV ranges. Your readings should be within specification $\pm(0.5\% \text{ rdg} + 1 \text{ digit})$.
6. There is no adjustment for ACV. Calibrate DCV first.
7. Carefully inspect the ACV ranges. Your readings should be within $\pm(1.2\% \text{ rdg} + 3 \text{ digits})$ of the ACV calibration source.
8. Set the output of the DC calibrator for $10.0\text{A} \pm 0.02\%$ and connect it to the "20A" and "COM" input terminals.
9. Adjust R17 (shunt resistor) until the display reads 10.00A.
10. If the reading is over 10A, add solder to R17. If the reading is under 10A, shave away lightly some of the solder and metal from R17.
11. Carefully inspect the other DCA ranges. Your readings should be within specification $\pm(1.0\% \text{ rdg} + 1 \text{ digit})$.
12. Turn off calibrator and disconnect from the DMM.
13. Install the back case and insert the back case screw.

Sec. 12.2 CALIBRATION OF DM-6200

The procedure should be performed at an ambient temperature of $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$, and at a relative humidity of less than 80%. Allow the instrument to stabilize at this temperature for a minimum of 30 minutes.

1. Remove the back case screw, and carefully pry up the back case.
2. Set the Function / Range switch to the "200mVdc" position.
3. Set the output of the DC calibrator for $190.0\text{mV} \pm 0.02\%$ and connect it to the "V- Ω " and "COM" input terminals.
4. Adjust VR1 until the display reads $190.0\text{mV} \pm 1$ digit.
5. Carefully inspect the other DCV ranges. Your readings should be within specification $\pm(0.5\% \text{rdg} + 1 \text{digit})$.
6. There is no adjustment for ACV. Calibrate DCV first.
7. Carefully inspect the ACV ranges. Your readings should be within $\pm(1.2\% \text{rdg} + 3 \text{digits})$ of the ACV calibration source.
8. Set the output of the DC calibrator for $10.0\text{A} \pm 0.02\%$ and connect it to the "20A" and "COM" input terminals.
9. Adjust R17 (shunt resistor) until the display reads 10.00A.
10. If the reading is over 10A, add solder to R17. If the reading is under 10A, shave away lightly some of the solder and metal from R17.
11. Carefully inspect the other DCA ranges. Your readings should be within specification $\pm(1.0\% \text{rdg} + 1 \text{digit})$.
12. Turn off calibrator and disconnect from the DMM.
13. Set the Range selector switch to the "200 $^{\circ}\text{C}$ " position.
14. Connect a K-type T/C probe to the temperature jack, then immerse the probe tip into ice reference cell for 30 seconds.
15. Adjust VR2 until the display reads 00.0°C .
16. Set the Range selector switch to the "200 $^{\circ}\text{F}$ " position.
17. Adjust VR3 until the display reads 32.0°F .
18. Disconnect T/C probe from ice reference cell.
19. Reassemble the back case and secure with three screws.

Sec. 13 RETURN FOR REPAIRS

Before returning your digital multimeter for repair be sure to check that the failure to operate properly is not due to the following:

1. Weak battery.
2. Open fuse.
3. Open, loose or intermittent test leads.

If these conditions do not exist and the instrument fails to operate properly, return the instrument and accessories prepaid to:

A.W. Sperry Instruments, Inc.
Customer Service Department
245 Marcus Blvd.
Hauppauge, N.Y. 11788

State in writing what is wrong with the instrument. All warranty repairs must include proof of purchase in the form of a legible or original copy of the sales receipt clearly identifying the distributor, model number and date of purchase and must have a warranty card on file. See warranty statement on page 1 for full warranty disclosure. Repair estimate will be furnished if requested for out of warranty instruments. Be sure to include all accessories which may be related to the problem, and a note describing the malfunction you observed.