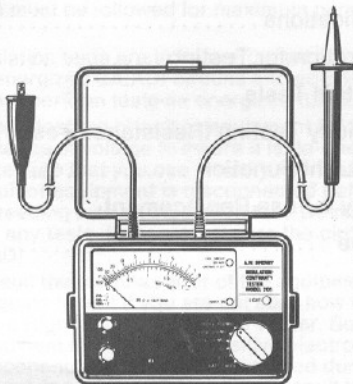


Form #211



CAUTION

Please read this Manual thoroughly and completely before putting instrument into use. Failure to do so might result in injury and/or damage to equipment. Observe all standard industry safety rules.

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1. Safety Precautions

To avoid possible electric shock, instrument damage and/or damage to the equipment under test, read these operating instructions thoroughly and completely before operating your meter. Pay particular attention to all WARNINGS which will inform you of potentially dangerous procedures. The instructions in these warnings must be followed for maximum personal safety.

- 1) Insulation tests are to be performed on de-energized (DEAD) circuits and equipment only. Do not perform tests on energized (LIVE) circuits!
- 2) Always test the circuit or equipment for the presence of voltage to insure it is de-energized. Make sure that you can visually see that the circuit or equipment is disconnected before proceeding with an insulation test. Do not proceed with any tests if you are not sure the circuit is DEAD!
- 3) Consult the manufacturer of the equipment you are going to test if you are not sure how to test it with a High Voltage Insulation Tester. Some equipment may contain sensitive electronic components which may be damaged during a test by applying a high DC Voltage. Consult the manufacturer for precautions that should be followed to avoid equipment damage.
- 4) This insulation tester will produce a High DC Voltage of 250V DC, 500V DC or 1000V DC in open circuit state. The current output is limited to less than 2mA DC under full load which may pose a shock hazard to some individuals. Do Not touch the test leads during an Insulation Test. Do Not attempt to stimulate or shock anyone else with this tester. Horse play and fooling around can result in electric shock causing Ventricular Fibrillation.

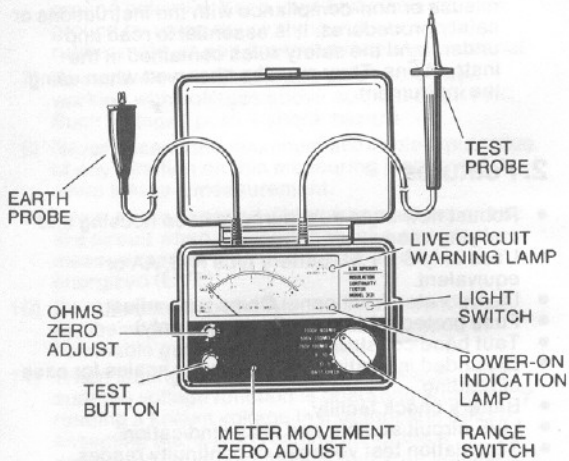
- 5) Always inspect your meter, test leads and accessories for any sign of damage or abnormality before every use. If any abnormal conditions exist (eg. broken test leads, cracked cases, display not reading, etc.), do not attempt to take any measurements.
- 6) Never ground yourself when taking electrical 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.
- 7) To avoid electric shock use CAUTION when working with voltages above 40V DC or 20V AC. Such voltages pose a shock hazard.
- 8) Never exceed the maximum allowable input value of any function on this measuring instrument when taking a measurement.
- 9) Never touch exposed wiring, connections or any live circuit when attempting to take electrical measurements. Treat the circuit as if it is energized (LIVE).
- 10) Do not attempt to operate this instrument in an explosive atmosphere (i.e. in the presence of flammable gases or fumes, vapor or dust).
- 11) When testing for the presence of voltage, make sure the voltage function is operating properly by reading a known voltage in that function before assuming that a zero reading indicates a no-voltage condition. Always test your voltage meter before and after taking measurements on a known live circuit.
- 12) Calibration and repair of any instrument should only be performed by qualified and trained service technicians. Do not attempt calibration or service unless trained and another person, capable of rendering first aid and resuscitation is present.

- 13) Do not install substitute parts or perform any unauthorized modification of the instrument. Return the instrument to your distributor authorized service center for service and repair to insure that safety features are maintained.
- 14) The instrument must be used by a competent, trained person and operated in strict accordance with the instructions. A.W. Sperry will not accept liability for any damage or injury caused by misuse or non-compliance with the instructions or safety procedures. It is essential to read and understand the safety rules contained in the instructions. They must be observed when using the instrument.

2. Features

- Robust new style dual purpose case housing and carrying case.
- Uses only 6 \times 1.5V battery type R-6, AA or equivalent.
- Incorporates front panel Ohms zero adjust.
- Fuse protected (continuity ranges only).
- Taut band construction.
- Expanded insulation and continuity scales for ease of reading.
- Battery check facility.
- LIVE circuit audible and visual indication.
- 3 insulation test voltages, 2 continuity ranges.
- Back light function.
- High short circuit test current on continuity ranges to comply with latest standards.

3. Layout Diagram



4. Specifications

Test Voltage	250V	500V	1000V
Measuring Ranges	0—100M Ω	0—200M Ω	0—400M Ω
Mid-Scale Value	1M Ω	2M Ω	4M Ω
Output Voltage on Open Circuit	250V DC +10% max.	500V DC +10% max.	1000V DC +10% max.
Output Voltage	250V DC min. at 0.25M Ω	500V DC min. at 0.5M Ω	1000V DC min. at 1M Ω
Output Short Circuit Current	1.3mA approx.		
Output Current	1mA DC min. at 0.25M Ω	1mA DC min. at 0.5M Ω	1mA DC min. at 1M Ω
Accuracy	$\pm 5\%$ of indicated value at 0.05M Ω — 10M Ω	$\pm 5\%$ of indicated value at 0.1M Ω — 20M Ω	$\pm 5\%$ of indicated value at 0.2M Ω — 40M Ω
	$\pm 0.7\%$ of scale length at ranges other than above ranges		

* Operating Voltage for Live Circuit Warning Lamp & Buzzer
60V AC/DC to 600V AC/DC

Continuity Test Ranges:

Measuring Ranges	0—2 Ω	0—20 Ω
Output Voltage on Open Circuit	4—9V	
Output Short Circuit Current	200mA min.	
Accuracy	$\pm 3\%$ of scale length	

Power Supply Voltage: 6 \times 1.5V battery type R-6, AA
or equivalent

Typical Number of Tests:

250V Range	2,000 times approx.
500V Range	1,300 times approx.
1000V Range	350 times approx.

Overload Protection:

Insulation Resistance Ranges

250V Range 300V AC/DC for 30 seconds

500V Range 600V AC/DC for 30 seconds

1000V Range 1200V AC/DC for 30 seconds

Continuity Ranges

250V AC Max.

Live Circuit Warning Buzzer

1200V AC/DC for 20 seconds

Operating Temperature & Humidity: 0°C — +40°C at
85% max. relative humidity

Storage Temperature & Humidity: -20°C — +60°C
at 85% max. relative humidity

Withstand Voltage: 5000V AC 50Hz or 60Hz for one
minute across electrical circuit and housing case

Insulation Resistance: 50M Ω min. at 500V across
electrical circuit and housing case

Accessories: Test Leads Model TL-61 — 1 with
alligator clip, 1 with prod, Pouch for Test Leads,
0.5A/250 V ceramic fuse F-22, 20 mm (0.78") \times
5 mm (0.19")

Dimensions: 170 (6.69") \times 115 (4.52") \times
85 (3.34") mm LWD

Weight: 1 kg (35 oz.)

5. Preparation for Testing

Preparation for measurements — Without pressing the test button, check that the pointer lines up with the ∞ mark on the red megaohm scale. If not, adjust it by rotating the movement zero adjust with a small screwdriver.

Initial Checks:

These must be conducted prior to any testing.

WARNING

Before pressing the test button, if at any time the live circuit neon is LIT or the warning buzzer sounds **DO NOT PROCEED** — the circuit is **LIVE**. Always connect test leads to the circuit before pressing the test button.

5-1 Battery Check

- a) When the battery voltage falls below 6.5V the Tester will not give reliable results, the battery check function ensures that accurate results are maintained.
- b) Before testing, always ensure that power is disconnected from the circuit under test.
- c) Switch the function selector switch to BATT check and press the test button. If the pointer does not move to BATT good, the battery needs to be replaced.

5-2 Test Leads Check

Connect the leads to the Tester, switch to the $\Omega \times 1$ function and press and turn the test button to lock it down. When the leads are connected together, the pointer should move from the ∞ position towards the 0 position on the green ohms scale. If not, the leads or fuse may be faulty. Release test button after completion.

5-3 Disconnection and check of power source of circuit under test

Turn off the power source of the circuit under test and connect the test leads to it. Make certain that the live circuit warning lamp is not on and the audible warning is not present. If the lamp lights up and the beeper sounds recheck that the power source is disconnected before proceeding.

WARNING

The "Live Circuit Warning Lamp" and "Warning Buzzer" will light up and sound for voltages between 60V AC and 600V AC. Voltages as low as 40V DC and 20V AC may pose a shock hazard. Do not assume that the circuit is de-energized (DEAD) if the warning light does not illuminate. Voltages below 60V AC may still be present. Make sure that you can visually see that the circuit or equipment is disconnected before proceeding with an insulation test.

6. Insulation Tests

WARNING

To avoid possible electric shock, instrument damage and/or damage to the equipment under test, insulation tests are to be performed on de-energized (DEAD) circuits and equipment only. Do not perform tests on energized (LIVE) circuits! Always test the circuit or equipment to insure it is de-energized. Make sure that you can visually see that the circuit or equipment is disconnected before proceeding with an insulation test. Do not proceed with any tests if you are not sure the circuit is DEAD!

Some equipment may contain sensitive electronic components which may be damaged during an insulation test when applying a HIGH DC Voltage. Consult the manufacturer of the equipment under test for precautions that should be followed to avoid equipment damage.

- a) Select the desired insulation test voltage — 250V, 500V or 1000V.
- b) Connect the test leads to the Tester and circuit under test.
- c) If the live circuit neon is NOT LIT and the warning buzzer does not sound press the test button. Read the red megaohm scale directly for the 500V range, multiply by 0.5 for 250V and by 2 for 1000V.
- d) For hands free operation a lock down feature is incorporated on the press to test button. Pressing and turning clockwise locks the button in the operating position.
The button is released by turning it counterclockwise.

CAUTION

Never turn the test voltage range switch during insulation testing while the test button is depressed, this may damage the instrument. Never touch the circuit under test during an insulation test.

- e) The charge stored in the insulation of the equipment under test will be automatically discharged when the test button is released. If the equipment under test has a large amount of capacitance the discharge time will be increased. Should the "Live Circuit Warning Lamp" illuminate after the test button is released, this indicates that the circuit is still discharging. Wait for the "Live Circuit Warning Lamp" to go out before removing the test leads from the circuit under test.

WARNING

Voltage below 60V AC may still be present after the "Live Circuit Warning Lamp" goes out. Do not touch the electrical connections when removing the test leads. Voltages as low as 40V DC and 20V AC may pose a shock hazard.

7. Continuity Testing (Resistance Tests):

WARNING

To avoid possible electric shock, instrument damage and/or damage to the equipment under test, Do Not perform resistance/continuity tests on an energized (LIVE) circuit.

All resistance/continuity measurements must be performed on de-energized (DEAD) circuits to insure safe and accurate readings. Electronic solid state protection is provided for misapplications of up to 400V AC with no fuse blow or recalibration necessary. It is not recommended that voltages below 400V AC be intentionally applied to this instrument.

Do Not proceed without first disconnecting and de-energizing the circuit under test!

- a) Select the desired ohms range $2\ \Omega$ ($\Omega \times 1$) or $20\ \Omega$ ($\Omega \times 10$).
- b) Short the test leads, press the test button and adjust the ohms zero adjust to zero the pointer on the green ohms scale.
- c) Connect the test leads to the circuit under test. If the live circuit neon is NOT LIT and the buzzer does not sound, press the test button. Read the $\Omega \times 1$ range directly, multiply by 10 for $\Omega \times 10$.
- d) Back light function is provided to facilitate work at night or dimly lit locations.
- e) Hold down the light switch to obtain illumination.

8. Back Light Function

To facilitate working in dimly lit situations, a back light function is provided which illuminates the display.

To operate this function, the back light button must be depressed and released while pressing the test button.

When the test button is released the back light will switch off. If the test button is depressed again within a few seconds, the back light will automatically switch on without having to press the back light button.

It is advisable that the back light function is only used when absolutely necessary as constant use may degrade the battery life faster than normal.

9. Battery & Fuse Replacement

- a) If pressing the test button has no effect, check the fuse in the instrument. See fuse replacement.
- b) Fuse and Battery replacement.

Fuse type — 0.5A fast acting ceramic (only use the correct fuse for replacement).

Battery type — 6×1.5 V battery type R-6, AA or equivalent.

- c) To replace the batteries or fuse, first disconnect all test leads from the instrument. Open the back cover on the tester by unscrewing the metal captive screw to reveal the battery compartment.

The fuse lifts out of its recess. The six 1.5V R-6 type, AA size batteries are located in a separate detachable battery holder inside the compartment. Always replace all six batteries with new ones at the same time - Never mix old and new types.

10. Service

If this Tester should fail to operate correctly return to your nearest distributors stating the exact nature of the fault. Before returning the unit, make sure that:

- a) Leads have been checked
- b) Fuse has been checked
- c) Battery has been checked

Remember, the more information written about the fault, the quicker it will be serviced.

ONE YEAR LIMITED WARRANTY

A.W. Sperry Instruments, Inc., warrants that this AWS instrument has been carefully tested, inspected, and warranted for one (1) year from the date of purchase by the original end user purchaser provided the completed warranty card is returned within ten (10) days after purchase and the instrument has 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 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 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.

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.

A.W. Sperry reserves the right to change specifications and designs without notice and without obligations.