5-4 DIODE TEST MEASUREMENTS

forward voltage drops across diodes The special Diode Test function allows relative measurement of

5-4-1 DIODE TESTS

- Connect red test lead to the + input connector and black test lead to the COM input connector.
- Set Function/Range Switch to the diode test position
- If the semiconductor junction being measued in connected to a circuit, tum off power to circuit being tested and discharge all

- 4. Connect test leave to the display.
 5. Read forward value on digital display.
 6. If the digital display read overrange OL reverse the lead confidence of the test leads when the forward readin circuit) the junction must be disconnected from the circuit in displayed with both lead connections, the junction is open. If a nections. The placement of the test leads when the forward reading is displayed indicates the orientation of the diode. The red order to verify its operation. tion, the junction is shorted internally or (if junction is measured low-reading (less than 1000) is obtained with both lead conneclead is positive and black leads is negative. If overrange OL is

5-5 CONTINUITY MEASUREMENTS

- Set the selectors switch to the position.
- Continuity between probe tips will be indicated by the audible buzzer when resistance is below 100 ohm.

5.6 Frequency Measurements

- Set the Function/Range switch to the Hz position.
 Connect the red test lead to the "+" jack and the black test lead
- 3. Connect the test leads to the point of measurement and read the frequency from the display

5.7 Temperature Measurements

Remove test leads being measured

- Set the Function/Range switch to the "°C" position
- Connect the temperature transition adaptor to the meter and make sure " + " and " - " polarity is right position
- Connect a type k thermocouple to the jack on the transition to be measured and take the temperature reading directly from adaptor. Place the probe or thermocouple tip on or in the material

5.8 Capacitance Measurements

- Set the Function/Range switch to the "⊣←" range
- 2. Connect the test leads to the "+" jack and the black test lead to the "COM" jack
- Connect the red test lead to the capacitor and read the eapacitance dircetly from the display.

SEC-6 BATTERY REPLACEMENT

WARNING

TO AVOID ELECTRIC SHOCK, DISCONNECT MEASURING TERMINALS BEFORE REMOVING COVER

- The battery is installed inside the case.
- 2. Remove the screw on the back of the battery cover for battery

SEC-7 RETURN FOR REPAIR

Before returning your instrument for repair make sure the failure to operate in not caused by.

- Weak or de-energized battery
- (3)Data Hold or Peak Hold is on (2) Broken test leads
- If all these conditions are checked to be fine and your instrument ō still does not operate properly then send it back freight prepaid

A.W. Sperry Instruments, Inc. Hauppauge, NY 11788 245 Marcus Blvd.

Include all accessories and a note explaining what is wrong with the instrument. Should you require an estimate please indicate "ESTIMATE ONLY" on your note. Be certain to include your return address and day time phone number should we need to contact you.

LIFETIME LIMITED WARRANTY

servies; our obligations under this warranty being limited to repairing or replacing, free of charge, at A.W. Sperry's sole option, any such A.W. Sperry snap-around instrument that malfunctions around instruments are unconditionally warranted against defects The attention to detail of this fine snap-around instrument is further enhanced by the application of A.W. Sperry's unmatched service and concerm for detail and reliability. These A.W Sperry's under normal operating conditions at rated use.1 snap-arounds are internationally accepted by craftsmen and serin material and workmanship under normal conditions of use and vicemen for their unmatched performance. All A.W. Sperry's snap-

REPLACEMENT PROCEDURE

MODELS DSA-700 DSA-710

mailing bag and ship perpaid to the address below. tributor, with a copy of your invoice from whom the unit was pur-chased, clearly identifying the model number and date or purinclude your name and address, as well as the name of the dis-Securely warp the instrument and its accessories in a box or Be sure to DSA-760 DSA-730 DSA-750 DSA-740 DSA-770 DSA-720

A.W.SPERRY INSTRUMENTS INC. ATTN: Customer Service Dept. Hauppauge, NY 11788 245 Marcus Boulevard

DSA-780

- 1.The warranty is not applicable if the instrument has been: mishas had unauthorized repair of has been improperly assembled used, abused, subjected to loads in excess of specifications,
- * Note: Recommended calibration interval should not exceed one year. Calibration service charges are not covered under terms and conditions of warranty

A.W. SPERRY INSTRUMENTS, INC.

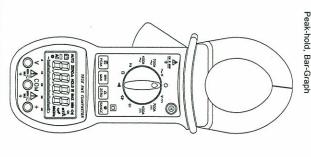
Phone 800-645-5398 TOLL-FREE or 516-231-7050 245 Marcus Boulevard, Hauppauge, NY 11788 Telex: 645104 SPERRYING HAUP FAX: 516-434-3128

Printed in Taiwar

Operating Instructions

VOLT-OHM-AMMETER DIGISNAP™ DIGITAL SNAP-AROUND

2000 counts, AC current, Peak-hold 2000 counts, AC current, Peak-hold 2000 counts, Trms AC current, Peak-hold 2000 counts, AC current, Peak-hold, F 2000 counts, DC/AC current 2000 counts, Trms DC/AC current, EL panel 4000 counts, AUTO, Trms DC/AC current, Peak-hold, °C/°F 4300 counts, AUTO, DC/AC current, Peak-hold 4300 counts, AUTO, DC/AC current,



A.W.SPERRY INSTRUMENTS, INC.

800-645-5398 or 516-231-7050 FAX: 516-434-3128, TLX: 645104 SPERRYING HAUP 245 MARCUS BLVD., HAUPPAUGE, N.Y. 11788

FREQUENCY MEASUREMENT

MODEL	DSA-710	DSA-720	DSA-730	DSA-740	DSA-750	DSA-760	DSA-770	DSA-780
Range: 2.000KHz,20.00KHz								
Accuracy: ±(0.1%+3)								
Sensitivity: 80Vrms min.(10-1999 reading)	AUTO	AUTO	AUTO	AUTO	AUTO			
Range: 100.00Hz,1.0000KHz,10.000KHz,100.00KHz								
500.0KHz								
Accuracy: ±(0.1%+2)					1		1	
Sensitivity: 1Vrms min.(100-9999 reading)		1						AUTO
Range:430.0Hz,4.300KHz								
Accuracy: ±(1%+3)								
Sensitivity: 1Vrms min.(100-4300 reading)						1	/	

TEMPERATURE MEASUREMENT

MODEL	DSA-730	DSA-770
Range: -4°F-2000°F(1°F), Accuracy: ±(2%+6) at -4°F-932°F, ±(3%+4) at 932°F-2000°F	✓	
Range: -20°C-850°C(1°C), Accuracy: ±(0.5%+3), Range: -4°F-1562°F(1°F) Accuracy: ±(0.5%+6)		1

OL-Protection: 600V DC or ACrms

DOMOLTACE

DC VOLTAGE									
MODEL	DSA-700	DSA-710	DSA-720	DSA-730	DSA-740	DSA-750	DSA-760	DSA-770	DSA-780
Range: 2.000V,200.0V,600V Accuracy: ±(0.5%+1)	1								
Range: 600V, Accuracy: ±(0.5%+1)		✓	1	✓	✓	1			
Range: 400.0mV,4.000V,40.00V,400.0V,600V Accuracy: ±(0.25%+1)									AUTO
Range: 4300mV(manu),4.300V,43.00V,430.0V,600V Accuracy: ±(0.25%+1)							AUTO	AUTO	

Input impedance: >10MΩ, OL-Protection: 600V DC or AC ms.

AC VOLTAGE(50Hz-500Hz)

MODEL	DSA-700	DSA-710	DSA-720	DSA-730	DSA-740	DSA-750	DSA-760	DSA-770	DSA-780
Range: 200.0V,600V									
Accuracy: ±(1.2%+4) at 50-60Hz, ±(2.0%+4) at 40-500Hz	✓	1	TRMS	1	1	TRMS			
Range: 4.000V,40.00V,400.0V,600V Accuracy: ±(0.75%+4) at 50-60Hz, ±(2.0%+4) to 40-500Hz									AUTO TRMS
Range: 4.300V, 43.00V,430.0V, 600V Accuracy: ±(0.75%+4) at 50-60Hz, ±(2.0%+4) to at 40-500Hz							AUTO	AUTO	

Input impedance: >10MΩ, OL-Protection: 600V DC or AC rms.

DC CURRENT(PUT CONDUCTOR AT THE CENTER OF THE JAWS)

MODEL	DSA-740	DSA-750	DSA-760	DSA-770	DSA-780
Range: 200.0A,700A, Accuracy: ±(1.5%+5)	✓	✓			
Range: 400.0A,700A, Accuracy: ±(1.5%+5)					1
Range: 430.0A,700A, Accuracy: ±(1.5%+5)			✓	✓	

AC CURRENT(PUT CONDUCTOR AT THE CENTER OF THE JAWS)

MODEL	DSA-700	DSA-710	DSA-720	DSA-730	DSA-740	DSA-750	DSA-760	DSA-770	DSA-780
Range: 20.00A,200.0A, 700A									
Accuracy: ±(1.5%+4) at 50-60Hz, ±(3.5%+5) at 40-500Hz	✓	✓	TRMS	✓					
Range: 400.0A,700A									
Accuracy: ±(1.75%+4) at 50-60Hz, ±(3.5%+5) at 40-500Hz									TRMS
Range: 430.0A,700A									
Accuracy: ±(1.75%+4) at 50-60Hz, ±(3.5%+5) at 40-500Hz							✓	✓	
Range: 200.0A,700A									
Accuracy: ±(1.75%+4) at 50-60Hz, ±(3.5%+5) at 40-500Hz					✓	TRMS			

2.5 measurement per second measurement per second

operating voltage

OL-Protection: 1000A ac max, for 1 minute

OL 1 TOLOGISTI. 1	000,		max.	101	•	
	_	-				
	0					

SEC-1 FEATURES

· Limited Lifetime Warranty

Ellipse shaped jaws
Industry standard statety Test Leads
Precessed Safety Designed 3 Input Terminals
"Data Hold" Button (all Models)
"Peak Hold" Button (10SA-710, DSA-730, DSA-730, DSA-760, DSA-730, DSA-760, DSA-770, DSA-780)
"Overload Protection on all Range (600VDC/600VACrms)

Continuity Buzzer
 DC voltage and AC voltage ranges
 Diode Test

• Frequency Measurement (except DSA-700)
• Capacitance Test (DSA-780)
• High speed Bar Graph (DSA-780)

SEC-2 SPECIFICATION Display:

annunciators "OL" is display (except DSA-780 display becomes "4000" with 394(3-1/2)DIGIT LCD maximum reading 4300, 4000, 2000 with automatic sign AC, Batt, and OVERRANGE INDICATION: pold

with most significant digit blinks) LCD is displayed "E=" when the battery voltage drops below the range, the display becomes significant digit blinks, In Frequency .0000. most

MEASUREMENT RATE: OW BATTERY:

nominal 201 BAR GRAPH RATE:

(DSA-780) 0°C to 50°C(32°F to 122°F) OPERATING TEMPERATURE: STORAGE TEMPERATURE:

-20°C TO 60°C (0°F to 140°F) 0-80%RH Accuracy specifications at ACCURACY: 23±5°C

(73.4°F±9°F) less than 75%RH TEMPERATURE COEFFICIENT: 0.1 times the applicable

specification per°C from 0°C to 18°C and 28°C to 50°C (32°F to 64°F and 82°F to 122°F) 9V transistor type battery

wide 1.8"(46mm)high ACA 1.8"ø(46mmø) DCA/ACA 1.9"ø(48mmø) ACA 13.4oz(380g), DCA/ACA 15oz(430g) (NEDA 1604) AWS part #B-4 9.7"(247mm)long 3.7"(94mm) MAXIMUM CABLE SIZE:

DIMENSION:

NEIGHT:

POWER:

2-1 ELECTRICAL SPECIFICATION accuracy are ±(reading plus number of digits) at 23±5°C <75%RH

DE-FIDIECIJOH, GOOV DO OF ACHINS

									70.70 00 70 70) Drotootion 60
	^	/							Accuracy±(10%+3)	
		*							Am6.0±Am0.f: 1.0mA±0.6mA	Range: →
									∙ιι) Threshold: <50Ω±30Ω	Range: •11)
^									.i) Threshold: <40Ω±20Ω -Pt Test currend: 1.0mA±0.6mA, Accuracy±(3%+1)	Range: →
			/	^	^	,	/		-ιι) Threshold: <30Ω	Range: 2KQ • 11),
			^	^	^	^	^	^	Am0.0±Am0.: 1.0m±d.0.6m+ Accuracy±(6%+3) Vm0c> :	
									•1) Threshold: Approx. <100Ω	Range: → ···)
087-A20	DSA-770	09Y-A2G	DSA-750	047-A20	057-A20	DSA-720	OFT-A20	007-A20		MODEL

CONTINUITY BEEPER & DIODE TEST

	OI -Protection: 600V DC or ACmas
OTUA	Range: 4.000nF,40.00nF,40.00hF,400.00µF,400.00µF Accuracy: ±(3%+20), at 4.0nF range, ±(3%+4) at 40nF-20µF range. ±(6%+4) at >20µF
087-A2G	WODEL

CAPACITANCE MEASUREMENT

Open circuit voleage: <3v at 12 range, <0.5v at 42 M12 range. OL-Protection: 600V DC or ACrms

							d / 1000 ; j	10	Old CN to AB Or annual O to Viction popular direction non O
	OTUA	OTUA							Range:450.00,4.300KD,43.00KD,43.0KD,4.300MD, 43.00MD ACCUTEQY:2(0.5%+1) at 430M range ±(0.5%+1) at 4.3MD range, ±(2%+4) at 43MD ranges
OTUA									Range:400.07,4.000KΩ,40.00KΩ,400.0KΩ,4000KΩ +0.00MΩ Accuracy: ±(0.3%+1) at 4KΩ-400KΩ range +0.00MΩ range, ±(2%+4) at 40MΩ range +0.00MΩ range, ±(2%+4) at 40MΩ range
			,	^		_	_		Range: 2.000KΩ, 200.0KΩ, Accuracy: ±(1.2%+1)
								_	Range: 200.0Ω, 200.0ΚΩ, Accuracy: ±(1.2%+2)
08Y-A2Q	DSA-770	097-A2G	DSA-750	047-A20	DSA-730	DSA-720	017-A20	DSA-700	WODEL

RESISTANCE

(J

- When the trigger is released the jaws will closs agian.
- and curren function).

(\neg) (4) SOWN OUSZ AVM (G) ₹ #E D 200€ 100 (3) 6 4 (-)

2. TRIGGER: Press the trigger to open the transformer jaws. TRANSFORMER JAWS: Pick up the AC or AC/DC current flowing through the conductor.

- values, and features symbols indicating function. 4. FUNCTION SELECTOR. 3. LCD DISPLAY: A 3-3/4(3-1/2) display indicates measured
- 5. INPUT JACKS(+ and COM) Test leads are inserted into these jacks for all function measurements (except voltage

6. FUNCTION KEY SÉLECTOR 7. VOLTAGE INPUT JACKS: Only ACV or DCV measurements input jack.

SEC -3 FORNT PANEL CONTROLS AND INDICATORS

FUNCTION KEY

(1) Button: (DSA-700, DSA-710, DSA-720, DSA-730, DSA-740,DSA750)

Press "\(\bar{\pmathbf{1}}\)" button to toggle in and out of DATA Hold mode, In the DATA Hold mode, the "\(\bar{\pmathbf{1}}\)" annunciator is displayed. (The DATA Hold mode may be exited when changing function.).

In voltage, current, frequency and doide functions, Press "\(\frac{\mathbf{H}}{\mathbf{H}}\)" button to toggle in and out of the Auto Hold mode, the "\(\frac{\mathbf{H}}{\mathbf{H}}\)" annunicator is displayed. In Auto hold mode, the meter will capture and hold the first stable non-zero(>100 digits) reading after a zero Button(DSA-760,DSA-770)

Button(DSA-780)

shorting the test leads together between measurements. In resistance, continuity and temperature functions, press "(1)" button to toggle in and out of the Data Hold mode, the "11" annunicator is displayed. held and displayed without pressing the (A-H) buttion. Simply by reading(<100 digits). Several consecutive measurements can be

except if you are already in the MIN MAX Recording mode. In the Data Hold mode, the "HOLD" annunciator is displayed and the last reading is held on the display, the beeper emits a tone. Pressing (MIN / MAX) button when you are in the Data Hold mode Press "MAX" button to toggle in and out of MAX Hold mode (holding the highest absolute reading). In the MAX Hold mode, the "MAX" annunciator is displayed. MAX HOLD Button: (DSA-710, DSA-720, DSA-In the MIN MAX Recording mode, press (HOLD) button to stop the Press " (1)" button to toggle in and out of the Data Hold mode. recording of readings, press (HOLD) again to resume recording. causes you to exit Data Hold and enter the MIN MAX Recording 730,DSA-740,DSA-750)

PEAK HOLD Button: (only AC current ranges 40-60Hz)(DSA

The MAX hold function is not available in the frequency count

displayed. [Accuracy: $\pm (10\% \text{ rdg} + 10 \text{dgts})$, effect reading: $800 \sim 2000 \text{ or } 800 \sim 4000$] 710,DSA-720,DSA-730,DSA-780)
Press "PEAK" button two times to toggle in and out of PEAK Hold mode. In the PEAK Hold mode, the "HOLD " annunciator is

PEAK HOLD Button: (only AC functions 40-60Hz) (DSA-760, DSA-770)

Press "PEAK" button to toggle in and out of PEAK Hold mode. In the PEAK Hold mode, the "MAX □" annunciator is displayed. [Accuracy: ±(10% rdg + 10dgts), effect reading: 800~4300]

英Button:(DSA-750)

★Button:(DSA-750) Press '* button, turn on the backlight.

Press "* button, turn off the backlight

DCA ZERO Button:(DSA-750)

display, and store the displayed reading as a reference value. out of the Relative mode, the "ZERO" annunciator turn on, zero the In DC current function, Press (DCA ZERO) button to toggle in and

MIN / MAX Button(DSA-760,DSA-770)

automatic power-off feature is disabled. (manual range only). The RECORD annunciator turns on and the Press (MAX/MIN) to enter the MAX MIN AVG Recording mode

down the (MAX/MIN) for 2 seconds to exit and erase recorded average last ten times reading can be displayed. Press and hold minimum(MIN), average(AVG) and present readings. (AVG) is Push (MAX/MIN) to cycle through the maximum(MAX),

MIN / MAX button(DSA-780)

The minimum, maximum values are then reset to the present input, the readings are stored in memory, and the "HOLD" annunciator ciator turns on to indicate what value is being displayed. maximum (MAX), and present readings. The MIN or MAX annunturns on. Push the button to cycle through the minimum (MIN), Press (MIN / MAX) button to enter the MIN MAX Recording mode.

AC current ranges without MIN/MAX function. held on the display, but the analog display continues to be active. maximum value is overload, the minimum or maximum value will minimum value is exceed the actual minimum readings or a new diaplay are frozen. In the MIN MAX Recording mode, when a new is stopped, the minimum, maximum, or present values and analog recording of readings, press again to restart recording. If recording In the MIN MAX Recording mode, press (HOLD) button to stop the

△ ZERO Button(DSA-760,DSA-770)

In voltage, current, frequency and doide functions, Press (AZERO) button to toggle in and out of the Relative mode, the "ZERO" annunciator turn on, zero the display, and store the displayed reading as a reference value

△ ZERO Button(DSA-780)

Press (AZERO) button to enter the Relative mode, the "AZERO" annunciator turn on, zero the display, and store the displayed reading as a reference value. Press and hold down the (AZERO) button for 2 seconds to exit the relative mode

RANGE Button(DSA-760,DSA-770)

when manual ranging was selected) on the "

" annunciator. (The meter selected next range it was in Press (RANGE) button to select the Manual Range mode and turn

The "

" annunciator will disappear. autoranging, press and hold down (RANGE) button for 2 seconds the range (and the input range annunciator) increments, and a new value is displayed. To exit the Manual Range mode and return to In the Manual Range mode, each time you press (RANGE) button,

RANGE Button(DSA-780)

Press (RANGE) button to select the Manual Range mode and turn off the "AUTO" annunciator. (The meter remains in the range it was in when manual ranging was selected)

The "AUTO" annunciator turns back on. autoranging, press and hold down (RANGE) button for 2 seconds. value is displayed. To exit the Manual Range mode and return to the range (and the input range annunciator) increments, and a new In the Manual Range mode, each time you press (RANGE) button

SEC -4 SAFETY PRECAUTIONS:

The following safety precautions must be observed to insure repair of this meter: maximum personal safety during the operation, service and

- Read these operating instructions thoroughly and completely followed procedures. The instructions in these warnings must be WARNINGS which will inform you of potentially dangerous before operating your meter. Pay particular attention to
- 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 nay measurements. Refer to Return for Repair section.
- Do not expose the instrument to direct sun light, extreme temperature or moisture.
- 4. Never ground yourself when taking electrical measurements mats, or any apporved insulating material. from ground by using dry clothing, rubber shoes, rubber Do not touch exposed metal pipes, outlets, fixtures, etc., which might be at ground potential. Keep you body isotated
- To avoid electric shock use CAUTION when working with voltages above 40 Vdc or 20 Vac. Such voltages pose a
- Never exceed the maximum allowable input value of any specifications for maximum inputs. function when taking a measurement. Refer to the
- Never touch exposed wiring, connections or any live circuit when attempting to take measurements
- Do not attempt to operate this instrument in an explosive fumes, vapor or dust) atmosphere (i.e. in the presence of flatmmable gases or
- When testing for the presence of voltage, make sure the before and after taking measurements on a known live circuit indicates a no-voltage condition. Always test your meter voltage in that function before assuming that a zero reading voltage function is operating properly by reading a known

- performed by qualified and trained service technicians.

 11. Do not attempt calibration or service unless trained and Calibration and repair of any instrument should only be
- tion is present. another person, capable of rendering first aid and resuscita-
- 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.
- Remember: Think safety, Act safely.

SEC -5 OPERATION:

Before making any measurements read section-Safety Precau or frayed insulation and make sure the lead plugs fit snugly into the instrument jacks. If any abnormal conditions exist, do not tions. Always examine the instrument and accessories to be used with the instrument for damage contamination (excessive attempt to take any measurements dirt, grease etc.) and defects. Examine the test leads for cracked

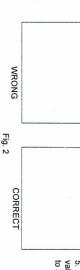
5-1 CURRENT MEASUREMENT:

age may cause electric shock, instrument damage and/or damcertain that the test leads are removed from the instrument. age to the equipment under test. Before measuring current make Arounds for current measurements on circuits above this voltbetween any conductor and ground potental. Using the Snapments on circuits with a maximum voltage difference of 500VAC These Snap-Arounds are designed to take current measure-

WARNING

to 1 min. Do not take current readings on circuit where the maximum current potential is not known. Do not exceed the maximum currents that this instrument is designed to measure. The Snap-Arounds is overload protected up to 500 VAC for up

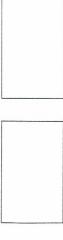
- Set Function Switch to ACA 700A or DCA 700A range.
- Make sure that all Hold switch is not on.
- Enclose one conductor in transformer jaws and release trigger Open transformer jaws by pressing against the trigger. Jaws should be completely closed before taking a reading.
- The reading will be indicated on the display
- To hold the display press the "Hold" button



5-2 VOLTAGE MEASUREMENTS

- Connect red test lead to V input connector and black test lead to COM input connector
- Set Function/Range switch to desired ACV or DCV position. If magnitude of voltage is not known, set switch to the highest range and reduce until a satisfactory reading is obtained.

- Turn off power the device or circuit being tested and discharge
- 4. Connect the test leads to the device or circuit being measured
- 5. Turn off power to the device or circuit being measured. Voltage value will appear on digital display.
- 6. Turn off power to the device or circuit being tested and dis charge all capacitors prior to disconnecting test leads.



MRONG Fig. 3

MRONG

5-3 RESISTANCE MEASUREMENTS

Attempting ersistance or continuity measurements on live circuits can cause electrical shock, damage to the instrument and damage to the equipment under test. Resistance measurements must be made on de-energized (DEAD) circuits only for maximum personal safety. The electronic overload protection installed in this instrument will reduce the possibility of damage to the instrument but not necessarily avoid all damage or shock hazard.

that necessary to turn on diode junction. surements of in circuit resistance, since the test voltage is below for the 200-ohm range. The low power ohm allows accurate mea-All resistance range on the instrument are low-power ohms excep

- to the COM input connector Connect red test lead to + input connector and black test lead
- reduce until a satisfactory reading is obtained Set Function/Range Switch to desired ohm position. If magni. tude of resistance is not known, set switch to highest range and
- off power to the circuit being tested and discharge all capacitors If the resistance being measured is connected to a circuit, turn
- 4. Connect test leads to the circuit being measure (Fig. insulation resistance. even if insulated, because some insulators have a relatively low measuring high resistance, be sure not to contact adjacent points
- value is shunted by a large value of capacitance, allow digital LCD Read resistance value on digital display if a high resistance

