

# 183A

# Digital Multimeter Instruction Manual



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## A. INTRODUCTION

## 1. Congratulations!!

Thank you for purchasing TPI products. The meter is easy to use and is built to last. It is backed by a 3 year limited warranty. Please remember to complete and return your product warranty registration card.

## 2. Product Description

The 183A is a hand-held autoranging DMM. The 183A measures ACV, DCV, ACA, DCA, Resistance, Frequency, Duty Cycle, Diodes, Capacitance, Temperature and Continuity.

The 183A also features:

REC Records Min/Max readings during specified measurement intervals.

 RANGE Allows the user to manually range the 183A instead of autoranging.

HOLD Holds the reading on the display for

easy viewing.

• **REL** Displays the value as a difference to

a reference value

AUTO OFF Preserves battery life.

The 183A comes complete with the following accessories:

183A Instrument Zippered Vinyl Carrying Case Rubber Boot Test Lead Set Instruction Manual

### 3. EC Declaration of Conformity

This is to certify that model 183A conforms to the protection requirements of the council directive 89/336/EEC, in the approximation of laws of the member states relating to Electromagnetic compatibility and 73/23/EEC, The Low Voltage Directive by application of the following standards:

EN61326 : 1997 + A1 + A2 : 2001 EN61010-1 :2001 Safety Standard

To ensure conformity with these standards, this instrument must be operated in accordance with the instructions and specifications given in this manual.

#### **CAUTION:**

Even though this instrument complies with the immunity standards, the accuracy can be affected by strong radio emissions not covered in the above standards. Sources such as hand held radio transceivers, radio and TV transmitters, vehicle radios and cellular phones generate electromagnetic radiation that could be induced into the test leads of this instrument. Care should be taken to avoid such situations or alternatively, check to make sure that the instrument is not being influenced by these emissions.

## **B. SAFETY CONSIDERATIONS**



WARNING: Please follow manufacturers test procedures whenever possible. Do not attempt to measure unknown voltages or components until a complete understanding of the circuit is obtained.



#### Read instructions before operating:

Be sure these instructions accompany the tool when passed from one user to a new or inexperienced user.



Equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

#### **GENERAL GUIDELINES**

#### **ALWAYS**

- Test the 183A before using it to make sure it is operating properly.
- Inspect the test leads before using to make sure there are no breaks or shorts.
- Double check all connections before testing.
- Have someone check on you periodically if working alone.
- Have complete understanding of circuit being measured.
- Disconnect power to circuit then, connect test leads to the 183A, then to circuit being measured.

#### **NEVER**

- Attempt to measure unknown high voltages.
- Attempt to measure current with the meter in parallel to the circuit.
- Connect the test leads to a live circuit before setting up the instrument.
- Touch any exposed metal part of the test lead assembly.

#### INTERNATIONAL SYMBOLS

DANGEROUS VOLTAGE

**AC (ALTERNATING CURRENT)** 

DC (DIRECT CURRENT)

REFER TO INSTRUCTION MANUAL

GROUND

FUSE

**DOUBLE INSULATION** 

## C. TECHNICAL DATA

#### 1. Features and Benefits

Agency Approval Meets CE and IEC 61010-1 require-

ments. UL Listed to U.S. and Canadian

Safety Standards.

**Auto Power OFF** Active when APO is on the left side of

> the LCD display. Instrument automatically powers off after 15 minutes of inactivity. You must return the rotary switch to the OFF position to restart

the meter.

**Record Mode** Records Min/Max values.

**Relative Mode** 

Displays

Allows you to either manual range or Range use auto range to select the appropri-

3 Year

Covered by a standard 3 year warranty.

Warranty

# 2. Product Applications

Perform the following tests and/or measurements with the TPI 183A and the appropriate function:

#### HVAC/R

**FUNCTION** 

**DCmV** 

· Thermocouples in furnaces or gas

applications.

ACA • Heat anticipator current in thermostats.

ACV · Line voltage.

ACV or DCV

· Control circuit voltage.

DCµA

· Flame safeguard control current.

OHMS

Heating element resistance (continuity).

OHMS

· Compressor winding resistance.

OHMS

· Contactor and relay coil resistance.

OHMS

· Continuity of wiring.

## **ELECTRICAL**

ACV

· Measure line voltage.

OHMS

· Continuity of circuit breaker.

DCV

· Voltage of direct drive DC motors.

## **AUTOMOTIVE**

DCV

· Battery and circuit voltage.

OHMS

· Continuity of wires and fuses.

ACV

· ABS brake sensors.

**DCmA** 

· Circuit current draw

# 3. Specifications

CAT III - 1000V CAT III - 600V Pollution Degree 2

a. DCmV				
Range	Resolution	Accuracy	Impedance	
40mV	0.01mV	$\pm (0.5\% + 2 d)$	ligits) 10M $\Omega$	
400mV	0.1mV			

b. DCV				
Range	Resolution	Accuracy		Impedance
400mV	0.1mV			
4V	0.001V			
40V	0.01V	±(0.5% + 2	2 digits)	10M $\Omega$
400V	0.1V			
1000V	1V			

c. ACm	c. ACmV (True-RMS, 40 - 400Hz)				
Range	Resolution	Accuracy	Impedance		
40mV	0.01mV	±(1.5% + 3 digits)	<b>10M</b> Ω		
400mV	0.1mV				

d. ACV	d. ACV (True-RMS, 40 - 400Hz)				
Range Resolution		Accuracy	Impedance		
400mV	0.1mV	±(1.5% + 3 digits)			
4V	0.001V				
40V	0.01V	$\pm (0.75\% + 3 \text{ digits})$	<b>10M</b> Ω		
400V	0.1V				
750V	1V	±(1.0% + 5 digits)			

e. ACV (True-RMS, 400Hz - 1kHz)				
Range	Resolution	Accuracy	Impedance	
4V	0.001V			
40V	0.01V	±(1.5% +5 digits)	<b>10M</b> Ω	
400V	0.1V			
750V	1V	±(2.0% + 5 digits)		

f. ACV	(True-RM	S, 1kHz - 20kHz)	
Range	Resolution	Accuracy	Impedance
4V	0.001V		
40V	0.01V	±(2.0% + 3 digits)	10M $\Omega$
400V	0.1V		
750V	1V	Unspecified	

g. DCA			
Resolution	Accuracy	Overload Protection	
0.01μΑ	±(0.8% +2 digits)		
0.1μΑ		Fuse	
1μA	±(0.8% +5 digits)	0.5Amp/600V	
0.01mA			
0.1mA			
0.001A	±(1.2% +5 digits)	Fuse	
0.01A		10Amp/600V	
	Resolution 0.01μA 0.1μA 1μA 0.01mA 0.1mA 0.01mA	$\begin{tabular}{lllllllllllllllllllllllllllllllllll$	

h. ACA (True-RMS)				
Range	Resolution	Accuracy		Overload Protection
400μΑ	0.1μΑ			Fuse
4000μΑ	1μA	±(1.2% +	+5 digits)	0.5Amp/600V
40mA	0.01mA			
400mA	0.1mA			
4A	0.001A	±(1.5% +	+10 digits)	Fuse
10A	0.01A	] `		10Amp/600V

**\*Warning:** Use only correct size, voltage and current rated fuses. Test Leads: Use only correct type and overvoltage category rating.

i. OHM (Resistance, $\Omega$ )				
Range	Resolution	Accuracy	Overload Protection	
$400\Omega$	0.1Ω	$\pm (0.8\% +5 \text{ digits})$	600V DC or	
$4k\Omega$	0.001kΩ		AC Peak	
40k $Ω$	$0.01$ k $\Omega$	$\pm (0.5\% +3 \text{ digits})$		
$400$ k $\Omega$	$0.1k\Omega$			
$4M\Omega$	$0.001 \mathrm{M}\Omega$	±(1.0% +5 digits)		
$40M\Omega$	$0.01 \mathrm{M}\Omega$	$\pm (1.5\% + 10 \text{ digits})$		

j. Duty Cycle / Hz					
Range					
0.1 ~99.9%	(0.5Hz to 500kHz, Width > 2uS)				
Accuracy					
((0.1% + 0.05% / kHz) +1 Count					

k. Diode T	est	
Test Voltage Max Test Current		Over Load Protection
2.7V	Approx. 1mA	600 V DC or Peak AC

I. Continuity Buzzer		
Test Voltage	Threshold	Over Load Protection
0.6V	$<$ 30 $\Omega$	600 V DC or Peak AC

m. Cap	acitance		
Range	Resolution	Accuracy	Overload Protection
40nF	0.01nF		
400nF	0.1nF		
4uF	0.001nF	±(3.0% +10 digits)	600V DC or
40uF	0.01uF		AC Peak
400uF	0.1uF		
4000uF	1uF	±(7.0% +10 digits)	

n. Freq	uency (Hz)		
Range	Resolution	Accuracy	Overload Protection
10Hz	0.01Hz		
100Hz	0.1Hz		
1KHz	0.001KHz	$\pm (0.05\% +3 \text{ digits})$	600V DC or
10KHz	0.01KHz		AC Peak
100KHz	0.1KHz		
1MHz	0.001MHz		
10MHz	0.01MHz		

o. Temperature (K-Type)					
Range	Resolution	Accuracy			
CENTIGRADE					
-40° to 10°C	0.1°	±(3.0% + 5°C)			
10° to 200°C	0.1°	±(1.0% + 3°C)			
200° to 400°C	0.1°	±(2.0% + 5°C)			
400° to 1300°C	1°C	$\pm (3.0\% + 7^{\circ}C)$			
FAHRENHEIT					
-40° to 50°F	0.1°	±(3.0% + 2.5°F)			
50° to 392°F	0.1°	±(1.0% + 1.5°F)			
392° to 752°F	0.1°	±(2.0% + 5°C)			
752° to 2372°F	1°F	±(2.0% + 5°C)			

p. General Specifications				
Max. Volt. between any Input and Ground	1000V			
Fuse Protection	<b>mA:</b> 0.5Amp/600VAC <b>A:</b> 10Amp/600VAC			
Display Type	4,000 Count, 2 times per second update			
Operating Temp.	0° to 40°C (32° to 104°F)			
Storage Temp.	-10° to 50°C (14° to 122°F)			
Relative Humidity	0% to 80%			
Power Supply	2 Each 1.5 Volt "AA" Batteries			
Battery Life	200 hrs. Typical			
Size (H x L x W)	33mm x 86mm x 187mm (1.3in x 3.4in x 7.4in)			
Weight	340g (12oz)			

## D. MEASUREMENT TECHNIQUES

#### 1. Controls and Functions:



#### a. Push Buttons

**FUNCTION** 

HOLD

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RANGE Activates manual ranging. Hold in for 3 seconds to return to autorange.

**REC** Activates the Min/Max mode.

Toggles the ACV or ACA measurement mode to Hz or Duty Cycle mode.

**REL** Displays value as a difference of reference value.

Activates optonal fuctions highlighted in orange around dial. APO (Auto Power Off) is disabled in this function. Hold in for 3 seconds to deactivate.

**LPF** Activates Low Pass Filter.

Holds the reading on the display until the button is pushed a second time.

## b. Rotary Switch

**OFF** Turns the 183A off.

Function for measuring AC voltage (ACV).

**▽** Function for measuring DC voltage (DCV).

 $\mathbf{m}\overline{\mathbf{v}}$  Function for measuring AC/DC millivolts (mV).

Funtion for measuring resistance, diode testing

and continuity buzzer

40 μĀ Function for measuring up to 40 DC micoamps

Function for measuring up to 4000 AC/DC microamps.

Function for measuring up to 400 AC/DC milliamps.

Function for measuring up to 10 AC/DC amps

Hz Function for measuring Frequency

CAP Function for measuring Capacitance

#### c. Input Jacks

**V**Ω**Hz** Red test lead connection for all Volt, Ohm, Frequency and Capacitance functions.

**COM** Black test lead connection for all functions.

uAmA Red test lead connection for current measurements on the uA and mA functions.

A Red test lead connection for current measurements on the A function.

#### d. Disable Auto Power Off (APO)

With the rotary switch in the OFF position Press and hold down the FUNCTION push button while turning the instrument on.

## 2. Step by Step Procedures:

## a. MEASURING DC VOLTS



#### **CAUTION!**

Do not attempt to make a voltage mea surement if a test lead is plugged in the A or µmA input jack. Instrument damage and/or personal injury may result.



#### **WARNING!**

Do not attempt to make a voltage measurement of more than 1000V or of a voltage level that is unknown.

Instrument set-up:				
FUNCTION	BLACK Test lead	RED TEST LEAD	MINIMUM READING	MAXIMUM READING
mV	COM	$V\Omega Hz$	0.1mV	400.0mV
V	COM	$V\Omega Hz$	0.001V	1000V

#### **Measurement Procedure:**

- 1. Disconnect power to the circuit to be measured.
- 2. Plug the black test lead into the **COM** input jack.
- 3 Plug red test lead into the  $\mathbf{V}\Omega\mathbf{H}\mathbf{z}$  input jack.
- Set rotary switch to either the m

  vor v range, depending on the voltage to be measured.
- 5. Connect the test leads to the circuit to be measured.
- 6. Reconnect power to the circuit to be measured.
- 7. Read the voltage on the 183A.

## **Optional Functions:**

RANGE

Manually select the appropriate range.

REC

Activate MIN/MAX record mode (page 24).

REL

Activate REL mode (page 24).

HOLD

Freeze the reading on the LCD.

## b. MEASURING AC VOLTS



#### **CAUTION!**

Do not attempt to make a voltage measure ment if a test lead is plugged in the A or µmA input jack. Instrument damage and/or personal injury may result.



#### **WARNING!**

Do not attempt to make a voltage measure ment of more than 750V or of a voltage I level that is unknown.

Instrum	ent set-up:			
FUNCTION	BLACK	RED	MINIMUM	MAXIMUM
	TEST LEAD	TEST LEAD	READING	READING
ĩ	COM	$V\Omega Hz$	0.001V	750V

#### **Measurement Procedure:**

- 1. Disconnect power to the circuit to be measured.
- 2. Plug the black test lead into the **COM** input jack.
- 3. Plug the red test lead into the  $\mathbf{V}\Omega\mathbf{H}\mathbf{z}$  input jack.
- 5. Connect the test leads to the circuit to be measured.
- 6. Reconnect power to the circuit to be measured.
- 7. Read the voltage on the 183A.

# **Optional Functions:**

**RANGE** Manually select the appropriate range.

REC

Activate MIN/MAX record mode (page 24).

Hz/DUTY

Scroll between Hz, Duty, and Volts.

REL

Activate REL mode (page 24).

HOLD

Freeze the reading on the LCD.

## c. MEASURING DC AMPS



#### **CAUTION!**

Do not attempt to make a current measurement with the test leads connected in parallel with circuit to be tested. Test leads must be connected in series with the circuit.



#### WARNING!

Do not attempt to make a current measurement of circuits with more than 600V present. Instrument damage and /or personal injury may result.

Instrument set-up:					
FUNCTION	BLACK Test lead	RED Test lead	MINIMUM Reading	MAXIMUM READING	
40μΑ	COM	μAmA	0.01μΑ	40μΑ	
μА	COM	μAmA	0.1μΑ	4000μΑ	
mA	COM	μAmA	0.01mA	400mA	
10A	COM	Α	0.001A	10.00A	

#### **Measurement Procedure:**

- 1. Disconnect power to circuit to be measured.
- 2. Plug the black test lead into the **COM** input jack.
- Plug the red test lead into the µAmA or A input jack depending on the value of current to be measured.
- Set the rotary switch to the 40μA, μA, mA, or A function.
- 5. Connect test leads in series to circuit to be measured.
- 6. Reconnect power to the circuit to be measured.
- 7. Read the current on the 183A.

## **Optional Functions:**

RANGE

Manually select the appropriate range.

REC

Activate MIN/MAX record mode (page 24).

REL

Activate REL mode (page 24).

HOLD

Freeze the reading on the LCD.

# d. MEASURING AC AMPS



#### **CAUTION!**

Do not attempt to make a current measure ment with the test leads connected in parallel with the circuit to be tested. Test leads must be connected in series with the circuit.



#### WARNING!

Do not attempt to make a current measure ment of circuits with more than 600V present. Instrument damage and /or personal injury may result.

Instrument set-up:				
FUNCTION	BLACK Test lead	RED Test lead	MINIMUM Reading	MAXIMUM Reading
μΑ	COM	μAmA	0.1μΑ	4000μΑ
mA	COM	μAmA	0.01mA	400mA
10A	COM	Α	0.001A	10.00A

#### **Measurement Procedure:**

- 1. Disconnect power to the circuit to be measured.
- Plug the black test lead into the COM input jack.
- Plug the red test lead into the μAmA or A input jack depending on the value of current to be measured..
- 4. Set the rotary switch to the  $\mu$ A, mA or A function.
- 5. Press the AC/DC pushbutton to set to AC mode.
- 6. Connect test leads in series to circuit to be measured.
- 7. Reconnect power to the circuit to be measured.
- Read the current on the 183A.

## **Optional Functions:**

RANGE

Manually select the appropriate range.

REC

Activate MIN/MAX record mode (page 24).

Hz/DUTY

Scroll between Hz, Duty, and Volts.

REL

Activate REL mode (page 24).

HOLD

Freeze the reading on the LCD.

# e. MEASURING RESISTANCE



#### WARNING!

Do not attempt to make resistance measurements with circuit energized. For best results, remove the resistor completely from the circuit before attempting to measure it.

#### NOTE:

To make accurate low ohm measurements, short the ends of the test leads together and press the REL pushbutton. This value will automatically be deducted from your reading.

Instrument set-up:					
FUNCTION	BLACK	RED	MINIMUM	MAXIMUM	
	TEST LEAD	TEST LEAD	READING	READING	
Ω	COM	$V\Omega Hz$	$0.1\Omega$	$40.00$ Μ $\Omega$	

#### Measurement Procedure:

- 1. Disconnect power to the circuit to be measured.
- 2. Plug the black test lead into the **COM** input jack.
- 3. Plug the red test lead into the  $\mathbf{V}\Omega\mathbf{H}\mathbf{z}$  input jack.
- 4. Set the rotary switch on the 183A to the  $\Omega$  function.
- Connect the test leads to the circuit to be measured.
- 6. Read the resistance value on the 183A.

## **Optional Functions:**

RANGE

Manually select the appropriate range.

REC

Activate MIN/MAX record mode (page 24).

REL

Activate REL mode (page 24).

HOLD

Freeze the reading on the LCD.

# f. MEASURING DIODES

#### CAUTION!

Do not attempt to make diode measurements with circuit energized. The only way to accurately test a diode is to remove it completely from the circuit before attempting to measure it.

Instrument set-up:					
FUNCTION	BLACK	RED	MINIMUM	MAXIMUM	
	TEST LEAD	TEST LEAD	READING	READING	
→	COM	$V\Omega Hz$	0.001V	2.000V	

#### **Measurement Procedure:**

- 1. Disconnect power to the circuit to be measured.
- Plug the black test lead into the COM input jack.
- 3. Plug the red test lead into the  $\mathbf{V}\Omega\mathbf{H}\mathbf{z}$  input jack.
- 4. Set the rotary switch to the function.
- Connect black test lead to the banded end of the diode and the red test lead to the non-banded end of the diode.
- 6. Reading on the display should be between 0.5 and 0.8 volts
- 7. Reverse test lead connections in 5 above.
- 3. Reading on the display should be OFL (Overload).

NOTE: If diode reads 0 in both directions, diode is shorted. If diode reads OFL in both directions, diode is open

# g. CONTINUITY BUZZER

## $\triangle$ WARNING!

Do not attempt to make continuity measurements with circuit energized.

Instrument se	et-up:	
FUNCTION	BLACK	RED
	TEST LEAD	TEST LEAD
•1 <u>)</u>	COM	$V\Omega Hz$

## **Measurement Procedure:**

- 1. Disconnect power to the circuit to be measured.
- Plug the black test lead into the COM input jack.
- 3. Plug the red test lead into the  $\mathbf{V}\Omega\mathbf{H}\mathbf{z}$  input jack.
- 4. Set the rotary switch to the 🦏 function.
- 5. Press yellow push button to activate continuity buzzer.
- 6. Connect the test leads to the circuit to be measured.
- 7. Listen for the buzzer to confirm continuity.

# h. MEASURING CAPACITANCE



## **CAUTION!**

Disconnect power to the circuit(s) to be measured. Discharge the capacitorto be measured completely before attempting to measure.

Instrum	ent set-up:	·	·	
FUNCTION	BLACK TEST LEAD	RED Test lead	MINIMUM READING	MAXIMUM READING
CAP	COM	VΩHz	0.01nF	4000uF

## **Measurement Procedure:**

- Disconnect power and discharge the capacitor to be measured.
- 2. Plug the black test lead into the **COM** input jack.
- 3. Plug the red test lead into the  $\mathbf{V}\Omega\mathbf{H}\mathbf{z}$  input jack.
- 4. Set the rotary switch to the **CAP** function.
- Connect the test leads to the capacitor to be measured.
- 6. Read the capacitance on the 183A.

# **Optional Functions:**

REL Activa

Activate REL mode (page 24).

HOLD

Freeze the reading on the LCD.

#### MEASURING FREQUENCY



#### **CAUTION!**

Do not attempt to make a frequency measurement if a test lead is plugged in the A or µmA input jack. Instrument damage and/or personal injury may result.



#### **WARNING!**

Never attempt a frequency measurement with a voltage source reater than 600V

Instrum	ent set-up:			
FUNCTION	BLACK TEST LEAD	RED Test lead	MINIMUM READING	MAXIMUM READING
Hz	COM	$V\Omega Hz$	0.001Hz	10MHz

#### **Measurement Procedure:**

- 1. Disconnect power to the circuit to be measured.
- 2. Plug the black test lead into the **COM** input jack.
- 3. Plug the red test lead into the  $\mathbf{V}\Omega\mathbf{H}\mathbf{z}$  input jack.
- 4. Set the rotary switch to the **Hz** function.
- 5. Connect the test leads to the circuit to be measured.
- 6. Reconnect power to the circuit to be measured.
- 7. Read the frequency on the 183A.

# **Optional Functions:**

Hz/DUTY

Scroll between Hz and Duty %.

HOLD

Freeze the reading on the LCD.

## j. MEASURING TEMPERATURE

#### **CAUTION!**

Disconnect power to the circuit(s) to be measured. Discharge the capacitorto be measured completely before attempting to measure.

Instrument set-up:						
FUNCTION	TEMP. Input adpt.	TEMP. Input adpt.	MINIMUM Reading	MAXIMUM Reading		
TEMP	COM	μmATEMP	0.1°F	2462°F		
			0.1°C	1350°C		

## **Measurement Procedure:**

- 1. Remove test leads from the 183A.
- 2. Plug the "-" terminal of the temperature input adapter into the **COM** input jack.
- 3. Plug the "+" terminal of the temperature input adapter into the μmATEMP input jack.
- 4. Set the rotary switch to the **TEMP** function.
- 5. Plug a K-type temperature probe into the temperature input adpater observing the correct polarity.
- 6. Read the temperature on the 183A.

## **Optional Functions:**

**REC** Activate

Activate MIN/MAX record mode (page 24).

REL

Activate REL mode (page 24).

FUNCTION

Toggle between °C or °F.

HOLD

HOLD the reading on the LCD.

## k. RECORD MODE

The record mode saves minimum (MIN) and maximum (MAX) values measured for a series of reading. Activate the function as follows:

- Depress the **REC** button on the 183A.
- The 183A will immediately start to record MIN/MAX values. REC will be on the LCD to show record mode has been activated. The reading on the LCD will be the actual reading. The 183A will give a confirmation beep every time a new value is recorded.
- Press the **REC** button a second time and the MIN reading will be displayed.
- Press the **REC** button a third time and the MAX reading will be displayed on the LCD.
- To terminate the record mode, hold the REC button down for approximately 2 seconds or turn the rotary switch to a different function.

## I. RELATIVE MODE

The Relative mode compares readings to a known value and displays it as a difference to that value on the LCD.

- Measure the known value on the 183A and press the REL button, the LCD will display zero.
- Measure next device for comparison.
- The LCD will display the difference between the new device and the stored reference value.
- To terminate the Relative mode, hold the REL button down for approximately 2 seconds or turn the rotary switch to a different function.

#### F. MAINTENANCE

- Testing Fuses In Circuit: Both the A and mAµA input jacks are fuse protected. The fuses can be tested without removing them from the instrument as follows:
  - a. Set the 183A to the diode test function.
  - b. Insert the red test lead into the V input jack.
  - Touch the tip of the red test lead into the A input jack making sure you contact the metal.
  - d. If the display reads any number, the fuse is good.
     If the display reads .OL, the fuse is open and must be replaced.
  - e. Repeat the same procedure for the uAmA input iack.
- Fuse Replacement: Both the A and mAμA input jacks are fuse protected. If either do not function, replace fuse as follows:
  - Disconnect and remove all test leads from live circuits and from the 183A.
  - Remove 183A from protective boot.
  - Remove the three screws from the lower back of housing holding the compartment cover in place.
  - d. Remove the compartment cover.
  - e. Remove the old fuse(s) and replace it with new fuse(s).
  - Reassemble the instrument in reverse order from above.

- Battery Replacement: The 183A will display a battery symbol in the upper left corner of the LCD when the two internal 1.5 Volt "AAA" batteries need replacement. Batteries are replaced as follows:
  - Disconnect and remove all test leads from live circuits and from the 183A.
  - b. Remove 183A from protective boot.
  - Remove the three screws from the lower back of housing holding the compartment cover in place.
  - d. Remove the compartment cover.
  - e. Remove old batteries and replace with new batteries.
  - Reassemble instrument in reverse order from above.

# **Battery/Fuse Compartment**



 Cleaning Your Meter: The 183A can be wiped clean with a damp cloth and mild detergent. Do not submerse in water.

## **G. TROUBLE SHOOTING GUIDE**

## Problem Probable Causes

Does not power up

- · Dead or defective battery
- Broken wire from battery snap to PCB

# Won't display current readings

- Open fuse
- · Open test lead
- Improperly connected to circuit under test

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