



**IDEAL INDUSTRIES, INC.**

**TECHNICAL MANUAL**

**MODEL: 61-741 (2003) (Older Model)**  
**61-741 (2003A) (Newer Model)**

*The Service Information provides the following information:*

- Precautions and safety information
- Specifications
- Performance test procedure
- Calibration and calibration adjustment procedure
- Basic maintenance (replacing the battery)

Form number: TM61741  
Revision: 1. Date: Oct 2003

## **TABLE OF CONTENTS**

| <b>Title</b>                       | <b>Page</b> |
|------------------------------------|-------------|
| Introduction                       | 1           |
| Precautions and Safety Information | 1           |
| Safety Information                 | 1           |
| <b>61-741 Older Model Section</b>  | <b>2</b>    |
| Specifications                     | 2           |
| General Specification              | 2           |
| Voltage Specifications             | 2           |
| Current Specifications             | 2           |
| Resistance Specifications          | 2           |
| Voltage output Specifications      | 3           |
| Required Equipment                 | 3           |
| Performance Verification           | 3-4         |
| Calibration                        | 4-6         |
| Replacing the Battery              | 6           |
| <b>61-741 Newer Model Section</b>  | <b>7</b>    |
| Specifications                     | 7           |
| General Specification              | 7           |
| Voltage Specifications             | 7           |
| Current Specifications             | 7           |
| Resistance Specifications          | 7           |
| Continuity Specifications          | 7           |
| Voltage output Specifications      | 8           |
| Certifications and Compliances     | 8           |
| Required Equipment                 | 8           |
| Performance Verification           | 9           |
| Calibration                        | 9-11        |
| Replacing the Battery              | 11          |

## Introduction



### Warning

**To avoid shock or injury, do not perform the verification tests or calibration procedures described in this manual unless you are qualified to do so.**  
**The information provided in this document is for the use of qualified personnel only.**



### Caution

**The 61-741 contains parts that can be damaged by static discharge.**  
**Follow the standard practices for handling static sensitive devices.**

*For additional information about IDEAL INDUSTRIES, INC. and its products,  
and services, visit IDEAL INDUSTRIES, INC. web site at:  
[www.idealindustries.com](http://www.idealindustries.com)*

## SAFETY

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. To avoid potential hazards, use the product only as specified.  
*It is recommended that you read through the Operation or User manual before starting. Not all Caution, Warning, or Danger precautions are listed in this manual.*



### CAUTION.

These statements identify conditions or practices that could result in damage to the equipment or other property.



### WARNING.

These statements identify conditions or practices that could result in personal injury or loss of life.

## Specific precautions

**Use proper Fuse.** To avoid fire hazard, use only the fuse type and rating specified for this product.

**Do not operate without covers.** To avoid personal injury, do not apply any voltage or current to the product without the covers in place.

**Electric overload.** Never apply a voltage to a connector on the product that is outside the range specified for that connector.

**Avoid electric shock.** To avoid injury or loss of life, do not connect or disconnect probes or test leads while they are connected to a voltage source.

**Do not operate in wet/damp conditions.** To avoid electric shock, do not operate this product in wet or damp conditions.

**61-741 Older Model Section**  
**General specifications**

| Characteristics                             | Description                                                |
|---------------------------------------------|------------------------------------------------------------|
| Display                                     | 3 ½ Digit LCD display                                      |
| Display Count                               | 2000 count, maximum reading 1999                           |
| Over-range Indication                       | “OL” is displayed                                          |
| Sampling Rate                               | 3 time/second with a response time of approx. 3 seconds    |
| Operating Environment:<br>Relative Humidity | -10°C to 50°C (14°F to 122°F)<br>0 ~ 85% RH                |
| Storage Environment:                        | -20°C to 60°C (-4°F to 140°F) at <90% relative humidity    |
| Power source:                               | 9V Battery)                                                |
| Battery Live:                               | < 16 hours typical (alkaline)                              |
| Low Battery Indicator:                      | “BATT” indicates low battery voltage                       |
| Dimensions                                  | 9.64” H X 2.75” W X 1.64” D<br>245mm H X 70mm W X 41.7mm D |
| Maximum Cable Size                          | ACA 2.2” (55mm), DCA 2.2” (55mm)                           |
| Weight:                                     | Approximately 17.6 oz. or 500g including battery           |

**RANGES and ACCURACY SPECIFICATION**

**Accuracy:** Accuracy specifications at 23°C ±10°C (73.4°F ±18°F) at Relative Humidity of 45~85%

**Electrical Specification:** Accuracy are ±(reading plus number of digits) at 23°C ±10°C <85% RH

| Function Setting | Ranges                  | Accuracy        |
|------------------|-------------------------|-----------------|
| AC 200 V         | 0 ~ 199.9 at 50-60 Hz   | 1.5% ± 2digits  |
|                  | 0 ~ 199.9 at 40~1K Hz   | 1.5% ± 4 digits |
| AC 750 V         | 0 ~ 750 at 50-60 Hz     | 1.5% ± 2 digits |
|                  | 0 ~ 750 at 40~1K Hz     | 1.5% ± 4 digits |
| DC 20 V          | 0 ~ 19.99               | 1.0% ± 2 digits |
| DC 200 V         | 0 ~ 199.9               | 1.0% ± 2 digits |
| DC 1000V         | 0 ~ 1000                | 1.0% ± 2 digits |
| AC 200A          | 0 ~ 199.9 at 50-60 Hz   | 1.5% ± 2 digit  |
|                  | 0 ~ 199.9 at 40 ~ 1K Hz | 3.0% ± 4 digit  |
| AC 2000A         | 0 ~ 1700 at 50-60 Hz    | 1.5% ± 2 digit  |
|                  | 0 ~ 1700 at 40 ~ 1K Hz  | 3.0% ± 4 digit  |
|                  | 1701~1999 at 50-60 Hz   | 3.0%            |
| DC 200A          | 0 ~ 199.9               | 1.5% ± 2 digit  |
| DC 2000A         | 0 ~ 1999                | 1.5% ± 2 digit  |
| 200 Ω            | 0 ~ 199.9Ω              | 1.5% ± 2 digit  |
| 1500 Ω           | 0 ~ 1500Ω               | 1.5% ± 2 digit  |

**AC Converter:** Model 61-741 Average sensing , calibrated in RMS of a sine wave.

**Overload Protection:**    **AC and DC Voltage:** 1000 VDC or VAC not to exceed 1minute.  
                                   **AC and DC Current:** 5000 AAC or ADC not to exceed 1minute  
                                   **Resistance, Continuity:** 500 VDC or VAC not to exceed 1minute

**Output (Output Impedance: approximately 200  $\Omega$ )**

| Measurement range |             | Output Voltage<br>mVDC | Accuracy            |
|-------------------|-------------|------------------------|---------------------|
| DC                | 0 ~ 199.9A  | 0 ~ 199.9 mV           | 1.5% rdg            |
|                   | 0 ~ 1999A   | 0 ~ 199.9 mV           |                     |
| AC                | 0 ~ 199.9 A | 0 ~ 199.9 mV           | 1.5% rdg (50/60 Hz) |
|                   | 0 ~ 1999A   | 0 ~ 199.9 mV           |                     |

**Required Equipment**

Required equipment is listed in Table A. If the recommended models are not available; equipment with equivalent specifications may be used. Only qualified personnel should perform repairs or servicing.

**Table A. Required Equipment**

| Equipment  | Required Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Recommended Model                                            |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Calibrator | <b>AC Voltage Range:</b> 0-750V ac<br><b>Accuracy:</b> $\pm 0.07\%$ (Basic)<br><br><b>DC Voltage Range:</b> 0-1000V dc<br><b>Accuracy:</b> $\pm 0.006\%$ (Basic)<br><br><b>AC &amp; DC Current Range:</b> 0 ~ 10A<br><b>Accuracy:</b> AC (40Hz to 1KHz): $\pm 0.08\%$ (Basic)<br>DC: $\pm 0.02\%$ (Basic)<br><br><b>Amplitude:</b> 0.5V p-p ~ 1.0V p-p (square wave)<br><b>Accuracy:</b> $\pm 5\%$<br><br><b><math>\Omega</math> range :</b> 1 $\Omega$ ~ 2G<br><b>Accuracy:</b> $\pm 0.03\%$ (Basic) | Fluke 5500 or<br>Wavetek 9100<br>Calibrator or<br>equivalent |
|            | <b>Standard Coils:</b> 1 turn, 10 turns, and 20 turns                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                              |
|            | <b>AC/DC Current Generator:</b> 100 amps $\pm .38\%$ (50/60 Hz) Trms                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                              |
|            | Variable 10V Power Supply                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                              |
|            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                              |
|            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                              |
|            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                              |

**PERFORMANCE VERIFICATIONS**

Perform the following analysis; if the meter conforms to the limits listed in Table B the meter is functioning correctly. If the meter does not conform to any of the listed limits the calibration procedure must be performed.

**Performance Verification Preparation**

1. Turn on the Calibrator, allow calibrator to warm up. Temperature Stabilization should be reached after 30 minutes.
2. Remove battery cover and using a calibrated meter to ensure the battery measures a minimum of 7.0V DC. If the battery measures under 7.0V DC, replace the battery before beginning the performance test.
3. Input the values listed in Table B

**Table B: Performance Verification**

| Function Setting/Range | Input           | Low Limit | High Limit |
|------------------------|-----------------|-----------|------------|
| ACV 200                | 180V AC @ 50Hz  | 177.1     | 182.9      |
| ACV 750                | 500V AC @ 50Hz  | 491       | 509        |
| ACV 750                | 500V AC @ 1K Hz | 489       | 511        |
| DCV 20                 | 18V DC          | 17.80     | 18.20      |
| DCV 200                | 180V DC         | 178.0     | 182.0      |
| DCV 1000               | 900V DC         | 889       | 911        |
| ACA 200A               | 180A @ 50Hz     | 177.1     | 182.9      |
| ACA 2000A              | 100A @ 500Hz    | 93        | 107        |
| ACA 2000A              | 1800A @ 50Hz    | 1771      | 1829       |
| DCA 200A               | 180A            | 177.1     | 182.9      |
| DCA 2000A              | 1800A           | 1771      | 1829       |
| $\Omega$ 200           | 180             | 177.1     | 182.9      |
| $\Omega$ 1500          | 1500            | 1476      | 1524       |

**Analog Output Test: (Output Impedance: approximately 10K  $\Omega$ )**

| Function Setting Range /Input | Output Voltage mVDC | Low Limit | High Limit |
|-------------------------------|---------------------|-----------|------------|
| DC 200A/100A                  | 100.0 mV            | 95.5      | 104.5      |
| DC 2000A/1000A                | 100.0 mV            | 95.5      | 104.5      |
| AC 200A/100A@50Hz             | 100.0 mV            | 95.5      | 104.5      |
| AC 2000A/500A@50Hz            | 50.0 mV             | 45.5      | 54.5       |
| AC 2000A/1800A@50Hz           | 180.0 mV            | 170.7     | 189.3      |

**CALIBRATION****Calibration Preparation**

1. Turn on the Calibrator, allow calibrator to warm up. Temperature Stabilization should be reached after 30 minutes.
2. Disconnect the test leads and turn the range switch to "OFF".
3. Remove the screws holding the battery cover and one at the jaw.
4. Remove the case bottom using care not to damage the battery connector and leads to the continuity beeper. (Beeper is attached to the bottom case cover.)
5. Using a calibrated meter ensure the battery measures a minimum of 7.0V DC. If the battery measures under 7.0V DC, replace the battery.

**Calibration Procedure (refer to Figure 1 PCB Layout)**

It is recommended that all IDEAL meters undergo the following calibration procedure on an annual basis.

The class of calibrator or equipment should have an accuracy that exceeds, by an expectable ratio the accuracy of this instrument.

**Battery Warning Display**

1. Connect a DC power supply set at 6.53 volts to the battery connector.
2. Set UUT range to 200V AC range.
3. Adjust VR10 on the unit until "BATT" is indicated on the LCD.
4. Set the DC power supply to 7.0 volts and confirm that the "BATT" indicator goes off.

### **Volts DC Adjustment**

1. Set the function/range to 200V DC.
2. Connect the calibrator to the **V** and **COM** inputs on the meter.
3. Output 180.0 DC.
4. Adjust VR9 until unit display reads "180.0".
5. De-energize source and remove test leads.

### **Volts AC Adjustment**

1. Set the function/range to 200VAC.
2. Connect the calibrator to the **V** and **COM** inputs on the meter.
3. Output 180.0 AC.
4. Adjust VR7 until unit display reads "180.0".
5. De-energize source and remove test leads.

### **Transformer Jaw Balance**

1. Set the function/range to 200A AC.
2. Clamp the unit to calibrate onto the test coil. Apply AC current to the test coil to raise the ampere-turns to 100AT AC.
3. Adjust VR2 and VR3 so that the display read the same value regardless of the position of the coil conductor within the Jaws.

### **Span Zero Adjustment**

1. Set the function/range to 200A DC.
2. Adjust VR4 so that the display reads the same value except the polarity when VR5 (Zero adjuster) is fully turned counterclockwise and counterclockwise.
3. Turn VR5 so that the display reads "00.0".

### **DC2000A Zero Adjustment**

1. Set the function/range to 2000A DC.
2. Adjust VR6 so that the display reads "000".

### **Ampere Adjustment**

1. Set the function/range to 200A DC.
2. Clamp the unit to a 180A DC source.
3. Clamp the unit to calibrate onto the test coil, adjust VR1 so that the display reads "180.0".

### **Ohms Adjustment**

1. Set the function/range to 200 $\Omega$ .
2. Connect the calibrator to the  **$\Omega$**  and **COM** inputs on the meter.
3. Output 180.0  $\Omega$ .
4. Adjust VR8 so that the display reads "180.0".

Calibration of the 61-741 is complete.  
Remove all leads from the calibrator and equipment.  
Return unit to proper operating condition.

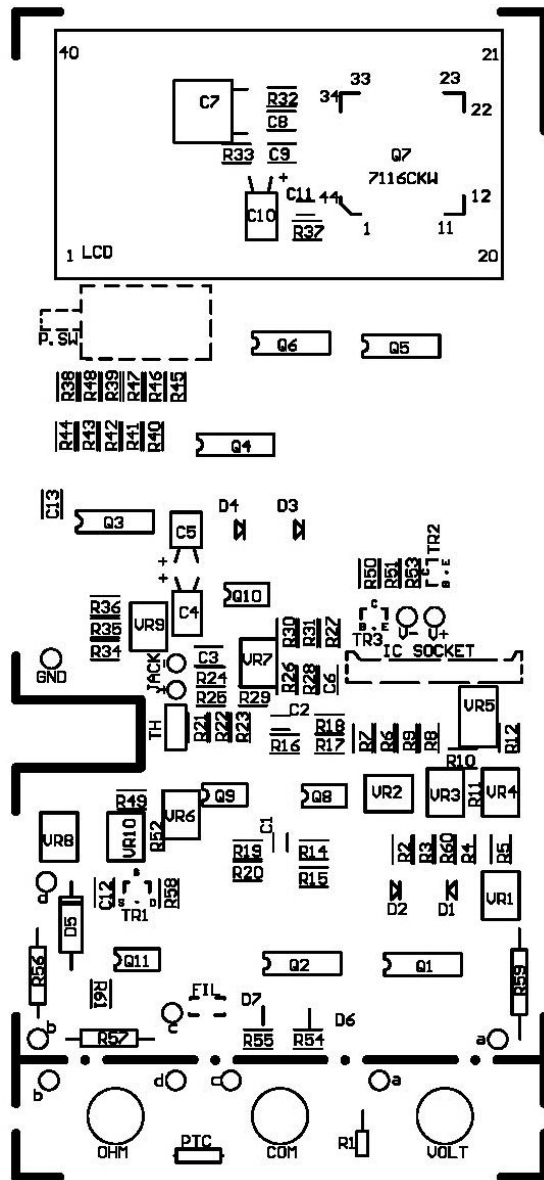


Figure 1

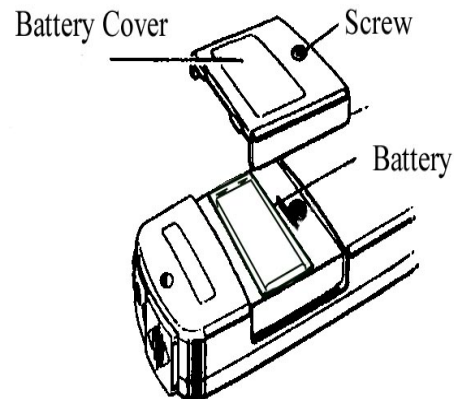


Figure 2

**Battery Replacement (refer to Figure 2)**

1. Disconnect the test leads from any circuit under test and turn off meter.
2. Use a Philips head screwdriver to remove the screw on battery cover.
3. Remove battery from compartment and unsnap the battery connector.
4. Install new 9V battery (NEDA #1604). An alkaline type is recommended.
5. Install new battery into compartment using care not to pinch or bind battery leads.
6. Reinstall battery cover.

### 61-741 Newer Model Section

#### General specifications

| Characteristics                             | Description                                               |
|---------------------------------------------|-----------------------------------------------------------|
| Display                                     | 3 ½ Digit LCD display                                     |
| Display Count                               | 4000 count, maximum reading 3999                          |
| Over-range Indication                       | “OL” is displayed                                         |
| Sampling Rate                               | 2.5 time/second with a response time of approx. 2 seconds |
| Operating Environment:<br>Relative Humidity | 0°C to 40°C (32°F to 104°F)<br>0 ~ 85% RH                 |
| Storage Environment:                        | -20°C to 60°C (-4°F to 140°F) at <90% relative humidity   |
| Power source:                               | Tow 1.5V Battery                                          |
| Battery Live:                               | < 100 hours typical (Manganese)                           |
| Low Battery Indicator:                      | “BATT” indicates low battery voltage                      |
| Sleep Mode                                  | automatically powers down in about 10 minutes             |
| Dimensions                                  | 9.84” H X 4.13” W X 1.93” D<br>250mm H X 105mm W X 49mm D |
| Maximum Cable Size                          | ACA 2.2” (55mm), DCA 2.2” (55mm)                          |
| Weight:                                     | Approximately 18.7 oz. or 530g including battery          |

#### RANGES and ACCURACY SPECIFICATION

**Accuracy:** Accuracy specifications at 23°C ±5°C (73.4°F ±9°F) at Relative Humidity of 45~75%

**Electrical Specification:** Accuracy are ±(reading plus number of digits) at 23°C ±5°C <75% RH

| Function Setting                                                                                    | Ranges                   | Accuracy       |
|-----------------------------------------------------------------------------------------------------|--------------------------|----------------|
| AC 400V                                                                                             | 0 ~ 399.9 at 50-60 Hz    | 1.5% ± 2 digit |
|                                                                                                     | 0 ~ 399.9 at 40 ~ 500 Hz | 1.5% ± 4 digit |
|                                                                                                     | 0 ~ 399.9 at 500~ 1K Hz  | 5.0% ± 4 digit |
| AC 750V                                                                                             | 0 ~ 750.0 at 50-60 Hz    | 1.5% ± 4 digit |
| DC 400V                                                                                             | 0 ~ 399.9                | 1.0% ± 2 digit |
| DC 1000V                                                                                            | 0 ~ 1000                 | 1.0% ± 2 digit |
| AC 400A                                                                                             | 0 ~ 399.9 at 50-60 Hz    | 1.5% ± 2 digit |
|                                                                                                     | 0 ~ 399.9 at 40 ~ 500 Hz | 3.0% ± 4 digit |
|                                                                                                     | 0 ~ 399.9 at 500 ~ 1K Hz | 5.0% ± 4 digit |
| AC 2000A                                                                                            | 0 ~ 1000 at 50-60 Hz     | 1.5% ± 2 digit |
|                                                                                                     | 1001~2000 at 50-60 Hz    | 3.0% ± 2 digit |
| DC 400A                                                                                             | 0 ~ 399.9                | 1.5% ± 2 digit |
| DC 2000A                                                                                            | 0 ~ 2000                 | 1.5% ± 2 digit |
| Ω/  (Resistance) | 400Ω/4000Ω               | 1.5% ± 2 digit |
| Continuity(400Ω)                                                                                    | Approximately 50Ω ± 35Ω, | 1.5% ± 2 digit |

**AC Converter:** Model 61-741 Average sensing , calibrated in RMS of a sine wave.

**Overload Protection:** **AC and DC Voltage:** 1200 VDC or VAC not to exceed 10 seconds.  
**AC and DC Current:** 2400 AAC or ADC not to exceed 10 seconds  
**Resistance, Continuity:** 600 VDC or VAC not to exceed 10 seconds

**Output (Output Impedance: approximately 10K  $\Omega$ )**

| Measurement range |              | Output Voltage<br>mVDC | Accuracy                          |
|-------------------|--------------|------------------------|-----------------------------------|
| DC                | 0 ~ 399.9A   | 0 ~ 399.9 mV           | 1.5% rdg $\pm$ 3mV                |
|                   | 0 ~ 2000A    | 0 ~ 200.0 mV           |                                   |
| AC                | 0 ~ 399.9 A  | 0 ~ 399.9 mV           | 1.5% rdg $\pm$ 3 mV(50/60 Hz)     |
|                   | 0 ~ 1000A    | 0 ~ 170.0 mV           | 3.0% rdg $\pm$ 3 mV (40 ~ 500 Hz) |
|                   | 1001 ~ 2000A | 170.1 ~ 200.0 mV       | 3.5% rdg $\pm$ 3 mV (50/60 Hz)    |

**Certifications and compliances**

|                       |                                                                                               |
|-----------------------|-----------------------------------------------------------------------------------------------|
| Safety                | Designed to IEC 61010-1                                                                       |
| Input rating          | 2000A/1000V Category II                                                                       |
|                       | 2000A/600V Category III                                                                       |
| Over voltage category | CAT III: Distribution level mains, fixed installation.                                        |
|                       | CAT II: Local level mains, appliances, and portable equipment.                                |
|                       | CAT I: Signal level, special equipment or parts of Equipment, telecommunication, electronics. |
| Pollution Degree 2    | Do not operate in environments where conductive Pollutants may be present.                    |

**Required Equipment**

Required equipment is listed in Table A. If the recommended models are not available; equipment with equivalent specifications may be used. Only qualified personnel should perform repairs or servicing.

**Table A. Required Equipment**

| Equipment  | Required Characteristics                                                                                                          | Recommended Model                                            |
|------------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Calibrator | <b>AC Voltage Range:</b> 0-750V ac<br><b>Accuracy:</b> $\pm 0.07\%$ (Basic)                                                       | Fluke 5500 or<br>Wavetek 9100<br>Calibrator or<br>equivalent |
|            | <b>DC Voltage Range:</b> 0-1000V dc<br><b>Accuracy:</b> $\pm 0.006\%$ (Basic)                                                     |                                                              |
|            | <b>AC &amp; DC Current Range:</b> 0 ~ 10A<br><b>Accuracy:</b> AC (40Hz to 1KHz): $\pm 0.08\%$ (Basic)<br>DC: $\pm 0.02\%$ (Basic) |                                                              |
|            | <b>Amplitude:</b> 0.5V p-p ~ 1.0V p-p (square wave)<br><b>Accuracy:</b> $\pm 5\%$                                                 |                                                              |
|            | <b><math>\Omega</math> range :</b> 1 $\Omega$ ~ 2G<br><b>Accuracy:</b> $\pm 0.03\%$ (Basic)                                       |                                                              |
|            | <b>Standard Coils:</b> 1 turn, 10 turns, and 20 turns                                                                             |                                                              |
|            | <b>AC/DC Current Generator:</b> 100 amps $\pm .38\%$ (50/60 Hz) Trms                                                              |                                                              |
|            | Variable 10V Power Supply                                                                                                         |                                                              |

## PERFORMANCE VERIFICATIONS

Perform the following analysis; if the meter conforms to the limits listed in Table B the meter is functioning correctly. If the meter does not conform to any of the listed limits the calibration procedure must be performed.

### Performance Verification Preparation

1. Turn on the Calibrator, allow calibrator to warm up. Temperature Stabilization should be reached after 30 minutes.
2. Remove battery cover and using a calibrated meter to ensure the battery measures a minimum of 7.5V DC. If the battery measures under 7.5V DC, replace the battery before beginning the performance test.
3. Input the values listed in Table B

**Table B: Performance Verification**

| Function Setting/Range                                                                              | Input                                            | Low Limit | High Limit |
|-----------------------------------------------------------------------------------------------------|--------------------------------------------------|-----------|------------|
| AC 400 V                                                                                            | 38V AC @ 50Hz                                    | 37.3      | 38.7       |
|                                                                                                     | 380V AC @ 50Hz                                   | 374.1     | 385.9      |
| AC 750 V                                                                                            | 500V AC @ 50Hz                                   | 491       | 509        |
|                                                                                                     | 500V AC @ 1K Hz                                  | 489       | 511        |
| DC 400 V                                                                                            | 38V DC                                           | 37.5      | 38.5       |
|                                                                                                     | 380V DC                                          | 376.0     | 384.0      |
| DC 1000 V                                                                                           | 900V DC                                          | 889       | 911        |
| AC 400 A                                                                                            | 300A @ 50Hz                                      | 295.3     | 304.7      |
| AC 1000 A                                                                                           | 100A @ 500Hz                                     | 93        | 107        |
|                                                                                                     | 1800A @ 50Hz                                     | 1744      | 1856       |
| DC 400 A                                                                                            | 300A                                             | 295.3     | 304.7      |
| DC 2000 A                                                                                           | 1800A                                            | 1771      | 1829       |
| 400 $\Omega$                                                                                        | 300                                              | 295.3     | 304.7      |
| 4K $\Omega$                                                                                         | 3000                                             | 2953      | 3047       |
| Continuity Test  | 15 $\Omega$ , Beep on<br>85 $\Omega$ , Beep off. |           |            |

### Analog Output Test: (Output Impedance: approximately 10K $\Omega$ )

| Function Setting Range /Input |            | Output Voltage mVDC | Low Limit | High Limit |
|-------------------------------|------------|---------------------|-----------|------------|
| DC400A                        | 100A DC    | 100.0 mV            | 95.5      | 104.5      |
| DC2000 A                      | 1000A DC   | 100.0 mV            | 95.5      | 104.5      |
| AC400A                        | 100A@50Hz  | 100.0 mV            | 95.5      | 104.5      |
| AC2000 A                      | 1000A@50Hz | 100.0 mV            | 95.5      | 104.5      |
| AC2000 A                      | 1800A@50Hz | 180.0 mV            | 171.6     | 188.7      |

## CALIBRATION

### Calibration Preparation

1. Turn on the Calibrator, allow calibrator to warm up. Temperature Stabilization should be reached after 30 minutes.
2. Disconnect the test leads and turn the range switch to "OFF".

**Page 10**

**Calibration Preparation (continued)**

3. Remove the screws holding the battery cover and one at the jaw.
4. Remove the case bottom using care not to damage the battery connector and leads to the continuity beeper. (Beeper is attached to the bottom case cover.)
5. Using a calibrated meter ensure the battery measures a minimum of 2.3V DC. If the battery measures under 2.3V DC, replace the battery.

**Calibration Procedure (refer to Figure 3 PCB Layout)**

It is recommended that all IDEAL meters undergo the following calibration procedure on an annual basis.

The class of calibrator or equipment should have an accuracy that exceeds, by an expectable ratio the accuracy of this instrument.

**Battery Warning Display**

1. Connect a DC power supply set at 2.1 volts to the battery connector.
2. Set UUT range to 400V DC range.
3. Adjust VR1 on the unit until "BATT" is indicated on the LCD.
4. Set the DC power supply to 2.51 volts and confirm that the "BATT" indicator goes off.

**Volts DC Calibration**

1. Set the function/range to 400V DC.
2. Connect the calibrator to the **V** and **COM** inputs on the meter.
3. Output 380.0 DC.
4. Adjust VR5(rough) and VR6(exact) until unit display reads "380.0".
5. De-energize source and remove test leads.

**AC Sensitivity Adjustment**

1. Set the function/range to the 400 VAC.
2. Connect the calibrator to the **V** and **COM** inputs on the meter.
3. Output 380V AC @ 50 Hz.
4. Adjust VR4 until unit display reads "380.0".
5. De-energize source and remove test leads.

**Transformer Jaw Balance**

1. Set the function/range to the 400A AC.
2. Generate 100AT with AC Standard Generator and coil, and then clamp the jaw of Model 2003A around the coil.
3. Changing the position of the coil in the jaw, with VR1 and VR1' adjust the variation of the indicated value to be within  $\pm 2$  counts.

**DCA Zero Adjustment**

1. Set the function/range to the 400A DC.
2. With VR8 adjust the indication of the instrument to be within  $\pm 1.0$ .
3. Set the range switch of the instrument to 2000 ADC.
4. With VR2 adjust the indication of the instrument to be "00".
5. Set the range switch of the instrument to 400 A.
6. With VR9 adjust the indication of the instrument to be "0.0".

**DCA Sensitivity Adjustment**

1. Set the function / range to the 400A DC.

2. Clamp the unit to a 380A DC source.
3. Adjust VR3 for a display reading of “380.0”.

### Ohms Adjustment

1. Set the function / range to  $\Omega$  /  $\rightarrow$ .
2. Connect the calibrator to the V and COM inputs on the meter.
3. Output 300.0  $\Omega$ .
4. Adjust VR7 until unit display reads “300.0”.
4. De-energize source and remove test leads.

Calibration of the 61-741 is complete.  
Remove all leads from the calibrator and equipment.  
Return unit to proper operating condition.

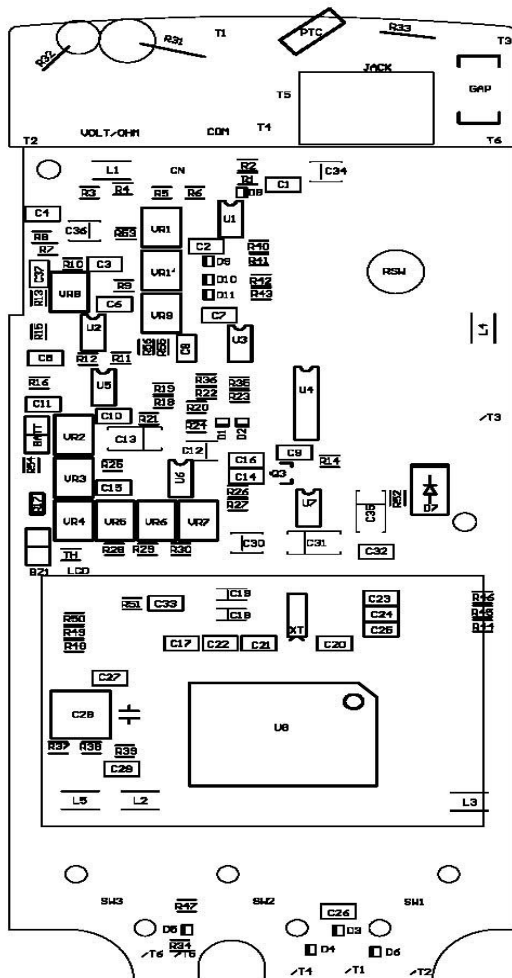


Figure 3

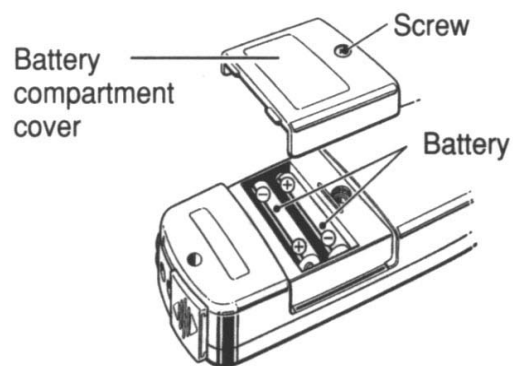


Figure 4

### Battery Replacement (refer to Figure 4)

1. Disconnect the test leads from any circuit under test and turn off meter.
2. Use a Philips head screwdriver to remove the screw on battery cover.
3. Remove battery from compartment.

4. Install new 1.5V tow battery . A Manganese type is recommended.
5. Install new battery into compartment.
6. Reinstall battery cover.