



**IDEAL INDUSTRIES, INC.**  
**TECHNICAL MANUAL**  
**MODEL: 61-360**

*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 and fuses)

Form number: TM61360  
Revision: 2. Date: Oct 2002

## **TABLE OF CONTENTS**

<b>Title</b>	<b>Page</b>
Introduction	1
Precautions and Safety Information	1
Safety Information	1
Specifications	2
General Specification	2
Voltage Specifications	2
Current Specifications	2
Resistance Specifications	2
Diode / Continuity Specifications	2
Performance Verification	3
Table 1 Verification 61-360	3
Calibration	4
Replacing the Battery	5
Replacing Fuses	5

## 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 61-360 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.

**General specifications**

Characteristics	Description
Display	3 ½ Digit LCD display
Display Count	2000 count, maximum reading 1999
Overrange Indication	“OL” displayed
Sampling Rate	3 time/second
Operating Environment: Relative Humidity	0°C to 50°C (32°F to 122°F) 70%RH
Temperature Coefficient	0.05X x (accuracy) per °F (32°F to 65°F, 85°F to 122°F)
Storage Environment:	-20°C to 60°C (0°F to 140°F) at <70 relative humidity
Power source:	9V Battery (NEDA 1604)
Battery Live:	300 hours typical (alkaline)
Low Battery Indicator:	⎓ symbol indicates low battery voltage
Auto Power Off mode	Approximately 25 minutes
A protection Fuse	0.5A/250V fast acting fuse Type LA-3895 10A/600V fast acting fuse, Type LA-3897
Dimensions	5.75” H X 2.75” W X 1.5” D {without holster}
Weight:	Approximately 18.0 oz. including battery
Safety	UL1244, and Design to comply with IEC 1010-1 Cat III

**RANGES and ACCURACY SPECIFICATION  
61-360**

Function Setting	Ranges	Accuracy
AC Voltage	200.0mV/2000mV 20.00V 200.0V/ 600V 50Hz to 500Hz	1.0% ± 4 digits 1.5% ± 4 digits
DC Voltage	200.0mV/2000mV/20.00V/200.0V/600V	0.5% ± 1digit
AC Current	200µA/2.00mA/20.00mA/ 10A, 50Hz to 500Hz	1.5% ± 4 digits
DC Current	200µA/2.00mA/20.00mA/ 10A,	1.0% ± 4 digits
Resistance	200.0Ω/2.000K/20.00K/200.0K 2.000MΩ/20.00MΩ	1.0% ± 4 digits 2.0% ± 4 digits
Continuity 	beep < 100Ω	Not Specified
Diode Check 	3V DC max	1.5% ± 1 digit

**AC Converter:** Average responding, RMS Calibrated to Sine Wave  
**Overload Protection:** **AC and DC Volts:** 200mV range, 500VDC or 350V rms for no more that 15 sec  
2V to 600V range, 600V DC or AC rms  
**Resistance, Diode, Continuity:** 500V DC or AC rms  
**mA input:** 250V DC/AC rms  
**Amps input:** 600V DC/AC rms on insulated conductors or 250V DC/AC rms on un-insulated conductors

**PERFORMANCE VERIFICATIONS**

Perform the following analysis, if the meter conforms to the limits listed in Table 1 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 1 for the Standard 61-360

**Table 1 Performance Verification**

Function Setting /Range	Input	Low Limit	High Limit
ACV 200m	190mV AC@ 50Hz	187.7	192.3
ACV 200m	190mV AC@ 500Hz	187.7	192.3
ACV 2000m	1900mV @ 50Hz	1880	1919
ACV 2000m	1900mV @ 500Hz	1880	1919
ACV 20	19.00V AC @ 50Hz	18.77	19.23
ACV 20	19.00V AC @ 500Hz	18.77	19.23
ACV 200	190V AC @ 50Hz	186.7	193.2
ACV 200	109V AC @ 500Hz	186.7	193.2
ACV 600	500V AC @ 50Hz	488	511
ACV 600	500V AC@ 60Hz	488	511
DCV 200mV	190mV DC	188.9	191.1
DCV 2000mV	1900mV DC	1890	1909
DCV 20V	19.00V DC	18.89	19.11
DCV 200	190.0V DC	188.9	191.1
DCV 600	500V DC	496	504
A DC 200 $\mu$ A	100 $\mu$ A	98.6	101.4
A DC 20mA	10mA	9.86	10.14
A DC 200mA	100mA	98.6	101.4
A DC 10	9.00 DCA	8.79	9.21
A AC 200 $\mu$ A	100 $\mu$ A @ 50Hz	98.1	101.9
A AC 200 $\mu$ A	100 $\mu$ A @ 500Hz	98.1	101.9
A AC 20mA	10mA @ 50Hz	9.81	10.19
A AC 20mA	10mA @ 500Hz	9.81	10.19
A AC 200mA	100mA @ 50Hz	98.1	101.9
A AC 200mA	100mA @500Hz	98.1	101.9
A AC 10A	9A @ 50Hz	8.77	9.22
A AC 10A	9A @ 500Hz	8.77	9.22
$\Omega$ 200	100.0	98.6	101.4
$\Omega$ 2K	1.000K	.986	1.014
$\Omega$ 20K	10.00K	9.86	10.14
$\Omega$ 200K	100.0K	98.6	101.4
$\Omega$ 2M	1.000M	.986	1.014
$\Omega$ 20M	10.00M	9.78	10.22
Diode Test	500mV	492	509
Continuity Test	100 $\Omega$	Beep off	

## CALIBRATION

### Calibration Preparation

#### *Required Equipment*

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

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 screw holding the bottom case cover, just above the battery cover.
4. The case bottom is secured to the case top by two internal snaps (at the LCD end). lift up on the battery end until the case un-snaps.
5. Using a calibrated meter ensure the battery measures a minimum of 7.5V DC. If the battery measures under 7.5V DC, replace the battery.

### Calibration Procedure

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

#### 61-360 Calibration Procedure

##### Calibration

1. Set the Function/Range Switch to the "200mV DC" position.
2. Set the output of the DC calibrator for 190.0mV and connect it to the "V-Ohm" and "COM" input terminals.
3. Adjust VR1 (VR 200 ohm) until the display reads 190.0mV +/- 1 digit.

**Note:** *This is the only adjustment required for the 61-360. Calibration is complete.*

**Battery Replacement (refer to Figure 1)**

1. Disconnect the test leads from any circuit under test and turn off meter.
2. Remove the three screws for the back case cover.
3. Remove battery from compartment noting the “+” and “-” position of the battery terminals.
4. Remove the plastic battery sleeve and place it on the new battery  
(Damage can occur to the circuit if the plastic battery sleeve is not replaced with the new battery)
5. Install new 9V battery (NEDA #1604) into the compartment and assure proper polarity of battery.  
An alkaline type is recommended.
6. Install bottom case cover and secure with screws.

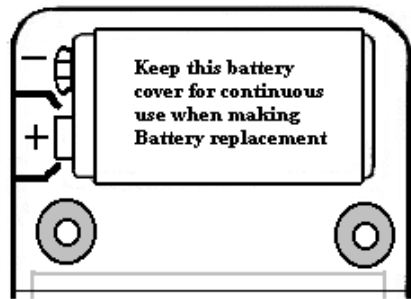


Figure 1

**Replacing Fuses**

1. Disconnect the test leads and turn the range switch to “OFF”.
2. Remove the three screws holding the bottom case cover
3. Use a digital multimeter in low resistance {ohms} mode to check the two fuses  
mA input, 0.5A / 250V fast acting fuse.  
Amp input, 10A / 600V fast acting fuse
4. Replace the defective fuse with the recommended fuse type.  
mA: 0.5A/250V fast acting fuse Type LA-3895 is recommended.  
Amp: 10A/600V fast acting fuse, Type LA-3897 is recommended
5. Install bottom cover and secure with screws.