



IDEAL INDUSTRIES, INC.
TECHNICAL MANUAL
MODEL: 61-603

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)

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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 61-603 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*

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.

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	3½ Digit LCD display
Display Count	2000 count, maximum reading 1999
Overrange Indication	“1 ” most significant digit
Sampling Rate	3 time/second
Operating Environment: Relative Humidity	0°C to 40°C (32°F to 104°F) 80% for temperatures up to 31°C Decreasing linearly to 50% at 40°C
Storage Environment:	-20°C to 60°C (-4°F to 140°F) at <80% relative humidity
Power source:	9V Battery (NEDA 1604)
Battery Live:	150 hours typical (alkaline)
Low Battery Indicator:	 symbol indicates low battery voltage
mA protection Fuse	500mA, 250V fast acting fuse
Dimensions	5.0” H X 2.8” W X 1.4” D 128mmH X 72mmW X 36mmD
Weight:	Approximately 7.0 oz. or 200g including battery

RANGES and ACCURACY SPECIFICATION

Function Setting	Ranges	Accuracy
AC Voltage	200.0/500 V	1.0% ± 4 digits
DC Voltage	2.000/20.00/200.0/1000 V	0.5% ± 2 digits
AC Current	n/a	n/a
DC Current	2.000mA/20.00mA/200.0mA/ 10.00A	1.0% ± 1 digit 2.0% ± 2 digits
Resistance	200.0Ω 2.000K/20.00K/200.0K 2.000MΩ	1.2% ± 3 digits 1.0% ± 1 digit 1.5% ± 2 digits
Diode Check	DCV 2V @ 1.0 mA ± 0.6 mA	

AC Converter: Average responding, RMS Calibrated to Sine Wave

Overload Protection: AC and DC Voltage: 1100 VDC or 500VAC RMS for no more than one minute.
Resistance: 250VDC or AC RMS
10A input, un-fused
mA input, 500mA at 250V fast acting fuse.

PERFORMANCE VERIFICATION

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

Table 1 Performance Verification

Function Setting	Input	Low Limit	High Limit
ACV 200	190V AC@ 60Hz	187.7	192.3
ACV 500	400V AC@ 60Hz	392	408
DCV 2	1.900V DC	1.888	1.911
DCV 20	19.00V DC	18.88	19.11
DCV 200	190.0V DC	188.8	191.1
DCV 900	900V DC	893	906
DCmA 2m	1.900 mA DC	1.879	1.921
DCmA 20m	19.00 mA DC	18.79	19.21
DCmA 200m	190.0 mA DC	187.9	192.1
DC A 10	9.00 A DC	8.80	9.20
Ω 200	100.0	98.7	101.3
Ω 2K	1.000K	.992	1.008
Ω 20K	10.00K	9.92	10.08
Ω 200K	100.0K	99.2	100.8
Ω 2M	1.000M	.988	1.012

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 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

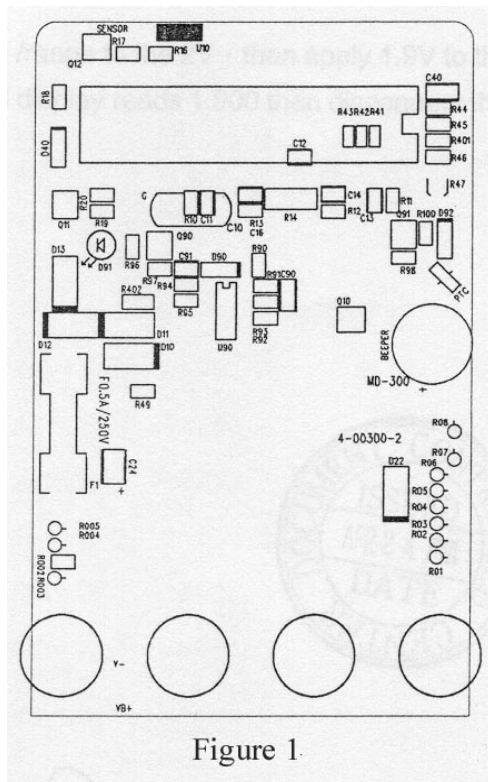
It is recommended that all IDEAL meters undergo the following calibration procedure on an annual basis.

Volts DC Calibration

1. Set the function / range to 2V DC
2. Connect the calibrator to the **V Ω** and **COM** inputs on the meter.
3. Output 1.900V DC.
Adjust R47 until the display reads 1.900V

Note: *This is the only adjustment required for the 61-603. Calibration is complete.*

61-603 main printed circuit board (refer to Figure 1)



Battery Replacement (refer to Figure 2)

1. Disconnect the test leads from any circuit under test and turn off meter.
2. Slide off the back case 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. Slide battery cover along glide until cover snaps into bottom case.
 Insure that cover aligned with snaps at bottom of the case.

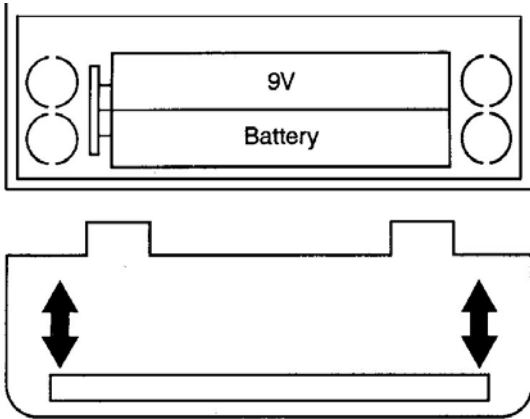


Figure 2

Replacing Fuse (refer to Figure 3)

1. Disconnect the test leads and turn the range switch to “OFF”.
2. Remove the screw holding the bottom case cover, just above the battery cover.
3. 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.
4. Remove the defective fuse and replace with a 500mA, 250V Fast Acting fuse. IDEAL #F-7 Type is recommended.
5. Replace bottom cover insuring that case is secured at the top by the internal snaps and replace screw.

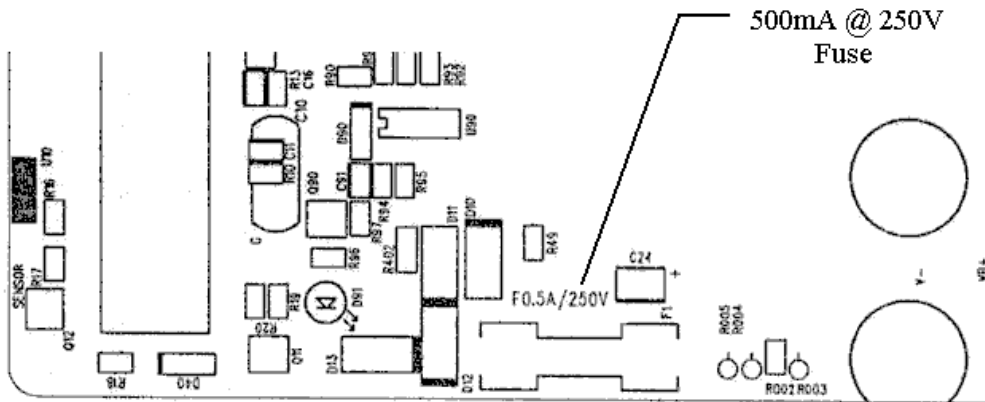


Figure 3