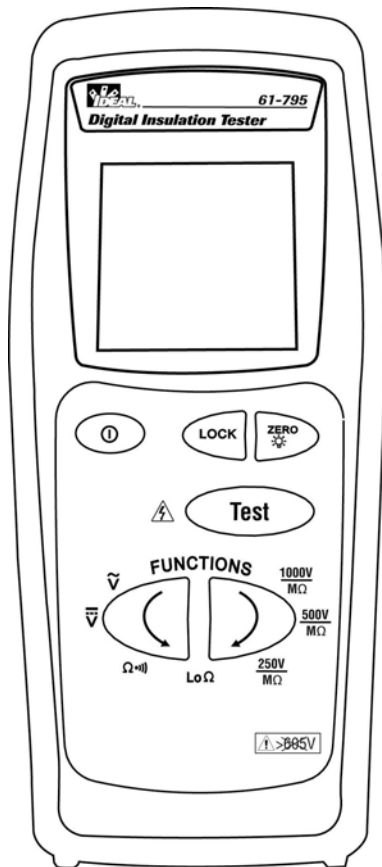




**IDEAL INDUSTRIES INC.
TECHNICAL MANUAL
MODEL: 61-795**

The Service Information provides the following:

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



Form number: TM61795
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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 61-795 contains parts that can be damaged by static discharge. Follow the standard practices for handling static sensitive devices.

*For additional information about IDEAL INDUSTRIES and its products, and services, visit IDEAL INDUSTRIES 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.

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.

Avoid electric shock. To avoid injury or loss of life, do not come in contact with tested material or probes while the Test Button is pressed. High Voltage potentials are present during Insulation Tests..

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

Required Equipment

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

Table B. Required Equipment

Equipment	Required Characteristics	Recommended Model
Calibrator	<p>AC Voltage Range: 0-750V ac Accuracy: ±0.04% (Basic) Frequency Range: 10 ~ 500KHz Accuracy: ± 2%</p> <p>DC Voltage Range: 0-1000V dc Accuracy: ±0.006% (Basic)</p> <p>Current Range: 0 ~ 10A Accuracy: AC (45Hz to 65Hz): ±0.05% (Basic) DC: ± 0.008% (Basic)</p> <p>Frequency Source: 0.01Hz ~ 2.0000MHz Accuracy: ±0.0025%</p> <p>Amplitude: 0.5V p-p ~ 1.0V p-p (square wave) Accuracy: ± 5%(45Hz-1KHz)</p> <p>Ω range: 0.01 Ω ~ 330M Accuracy: ±0.007% (Basic)</p> <p>Capacitance Range: 1pF ~ 1.1mF Accuracy: ±0.19% (Basic)</p> <p>Temperature Range: -200°C ~ 1800°C Accuracy: ±0.1°C (Basic)</p>	Fluke 5500A Calibrator or equivalent

Required fixed resistors: 0Ω, 5Ω, 19Ω, 190Ω, 0.0MΩ, 1MΩ, 10MΩ, 100MΩ, 1000MΩ



Simulated Test leads: With a total resistance of < .1Ω ±10mΩ or .05Ω per simulated lead.

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.

Check the fuse as a BBS, 1A/600V, 10.4*35 (0.41x1.38 inch) UL/CSA, interrupting rating 10kA.
Check case, leads, display, etc, for any defects.

Table 1 Performance Verification: Model 61-795

Function Setting /Range	Apply	Reading	Specification
DCV	550V DC	547.2 to 552.8	[±0.5% ±1 digits]
ACV	550V AC	545.2 to 554.8	[±0.8% ±4 digits]
Continuity Ω / 	<30 Ω	Buzzer sounds	Not specified
Resistance:			
LO Ω	Simulated leads	.08 to .12	[±0.02 Ω + 0.05 per lead]
LO Ω	0 Ω	-0.03 to +0.03	[±0.03 Ω]
LO Ω	5 Ω	4.87 to 5.13	[±2.0% ±3 digits]
LO Ω	19 Ω	18.59 to 19.41	[±2.0% ±3 digits]
Ω / 	190 Ω	185.9 to 194.1	[±2.0% ±3 digits]
LO Ω	10 Ω	20.2mA to 25.8mA	Source check
LO Ω	1 Ω	202mA to 258mA	Source check
Insulation Resistance:			
M Ω , 250V	10M Ω	250 to 275Vdc	Source Check
M Ω , 500V	10M Ω	500 to 550Vdc	Source Check
M Ω 1000V	10M Ω	1000 to 1100Vdc	Source Check
M Ω , 250V	0 Ω	0.001 to 0.010	±10 digits
	100k Ω	0.090 to 0.110	±10 digits
	1M Ω	0.975 to 1.025	[±2.0% ±5 digits]
	10M Ω	9.75 to 10.25	[±2.0% ±5 digits]
	100M Ω	94.5 to 105.5	[±5.0% ±5 digits]
M Ω , 500V	100k Ω	0.085 to 0.115	±15 digits
	1M Ω	0.975 to 1.025	[±2.0% ±5 digits]
	10M Ω	9.75 to 10.25	[±2.0% ±5 digits]
	100M Ω	97.5 to 102.5	[±2.0% ±5 digits]
	1000M Ω	945 to 1055	[±5.0% ±5 digits]
M Ω , 1000V	100k Ω	0.085 to 0.015	±15 digits
	1M Ω	0.975 to 1.025	[±2.0% ±5 digits]
	10M Ω	9.75 to 10.25	[±2.0% ±5 digits]
	100M Ω	97.5 to 102.5	[±2.0% ±5 digits]
	1000M Ω	965 to 1035	[±3.0% ±5 digits]
M Ω , 500V	500K Ω	<500V	Source Check
Check on each Voltage range	0M Ω	<3.0mA	Source Check

CALIBRATION

Calibration Preparation

Required Equipment

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

Required fixed resistors: 0 Ω , 5 Ω , 19 Ω , 190 Ω , 0.0M Ω , 1M Ω , 10M Ω , 100M Ω , 1000M Ω

Simulated Test leads. With a total resistance of < .1 Ω \pm 10m Ω or .05 Ω per simulated lead.

Calibration Procedure

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

Calibration






1. Press the  key to switch off the instrument.
2. Remove test leads from the input terminals.
3. Remove hood and battery compartment cover by using a screwdriver. (*Refer to Figure 2*)
4. Loosen the screws from the case bottom. Remove the case bottom.
5. Short JP1, then replace the case bottom and battery compartment cover. (*Refer to Figure 1*)
6. Press the  key to turn on the instrument. The LCD displays the version of the software.
7. Push the "TEST" key to enter the calibration mode.
8. Press the  key to select the range to calibrate.
9. Input the range standard value as listed in Table 2. Push the "TEST" key for more than 2 seconds. The LCD will display the A/D reading value.
10. Push the "TEST" key to save the range. Calibration is complete for that range.
11. If you want to calibrate the other ranges, repeat steps 8 - 10.
12. When complete, exit the calibration mode. Press the  key to switch off the instrument.
13. Remove the case bottom and remove the short on JP1. (*Refer to Figure 1*)
14. Replace the case bottom and battery compartment cover, pressing to close it, and secure with screw.
15. Install the hood.


Table 2 Calibration Range Inputs: Model 61-795

Range	Function	Input the calibrator standard value
1	DCV	DC600.0V
2	ACV	AC600.0V
3	$\Omega \bullet \bullet \bullet$	190.0 Ω
4	$\Omega \bullet \bullet$	0.00 Ω
5	LO Ω	19.00 Ω
6	LO Ω	0.00 Ω
7	LO Ω	5.00 Ω
8	LO Ω	0.00 Ω
9	250V/M Ω	1000M Ω
10	250V/M Ω	100.0M Ω
11	250V/M Ω	10.00M Ω
12	250V/M Ω	1.000M Ω
13	250V/M Ω	0.000M Ω
14	500V/M Ω	1000M Ω
15	500V/M Ω	100.0M Ω
16	500V/M Ω	10.00M Ω
16	500V/M Ω	1.000M Ω
18	500V/M Ω	0.000M Ω
19	1000V/M Ω	1000M Ω
20	1000V/M Ω	100.0M Ω
21	1000V/M Ω	10.00M Ω
22	1000V/M Ω	1.000M Ω
23	1000V/M Ω	0.000M Ω

Battery Replacement (Refer to Figure 2)

1. Disconnect the test leads from any circuit under test.
2. Press the  key to switch off the instrument.
3. Remove the hood and battery compartment cover by using a screwdriver.
4. Remove the batteries replacing them with new ones all of the same type (1.5×6 NEDA 15F IEC R6 JIS UM-3) (Alkaline batteries are recommended.) making sure of polarity while installing.
5. Install bottom case cover and secure with screws.
6. Install the hood.

Replacing Fuse (Refer to Figure 2)

1. Disconnect the test leads from any circuit under test.
2. Press the  key to switch off the instrument.
3. Remove the hood and battery compartment cover by using a screwdriver.
4. Loosen the screws from the case bottom. Remove the case bottom.
5. Remove input cover using a screwdriver.
6. Check the fuse with a digital multimeter with a source current < 10mA in low resistance range.
(Replace fuse with a BBS 1A/600V, 10.3*38 (1.5x0.41 inch) UL/CSA, interrupting rating 10kA.)
7. Install input cover and secure with screw.
8. Replace the case bottom and secure with screw.
9. Replace the battery compartment cover, pressing to close it, and secure with screw.
10. Install the hood.

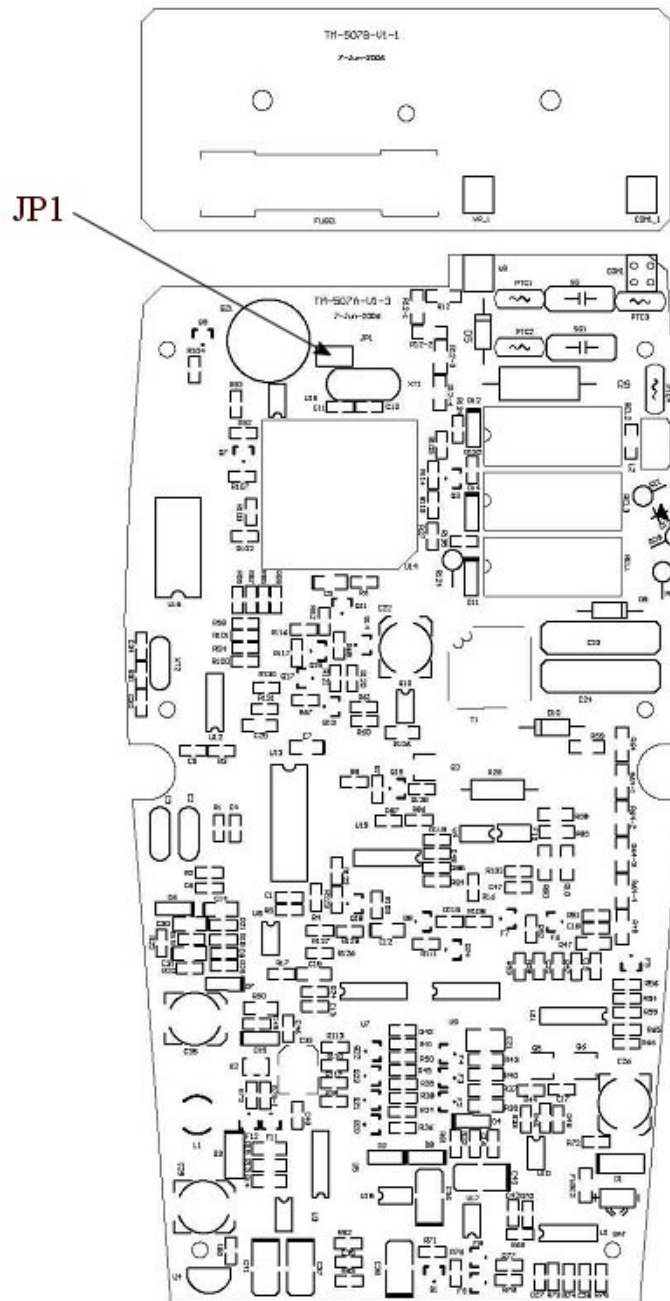


Figure 1

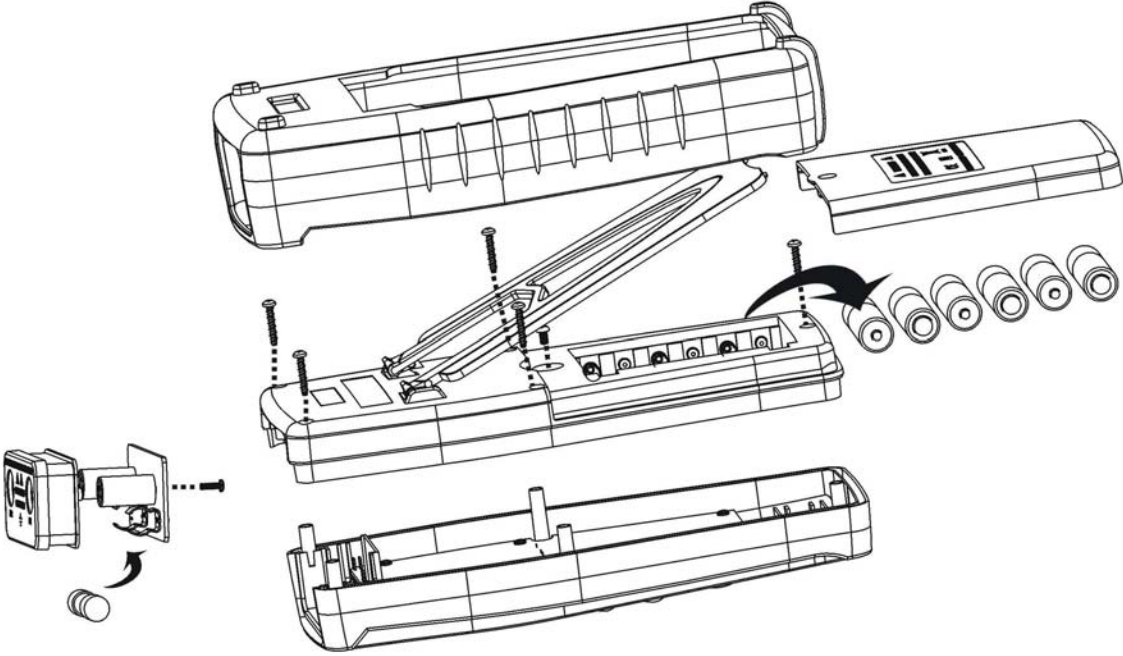


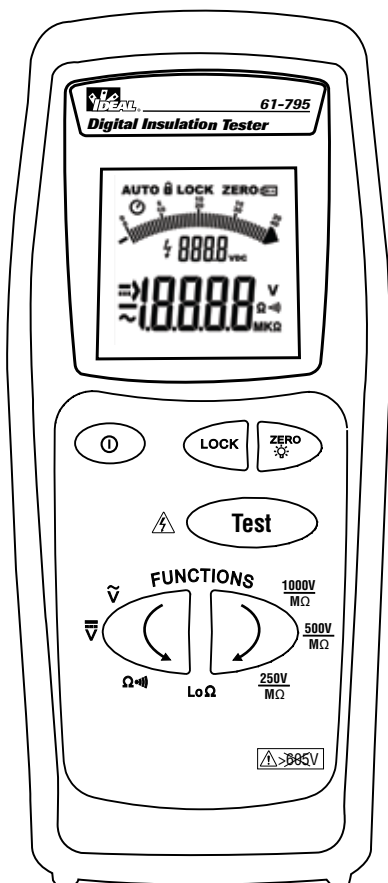
Figure 2



#61-795

Insulation Tester

Instruction Manual




Read First: Safety Information

Understand and follow operating instructions carefully. If this tester is not used in a manner specified by IDEAL, protection provided by the product may be impaired.

WARNINGS

To avoid possible electric shock, personal injury or death follow these instructions:

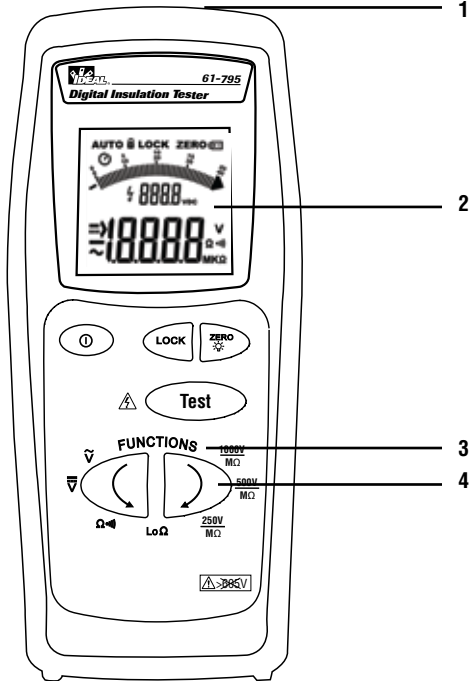
- Do not use if meter appears damaged.
- Visually inspect the meter to ensure case is not cracked and back case is securely in place.
- Inspect and replace leads if insulation is damaged, metal is exposed, or probes are cracked. Pay particular attention to the insulation surrounding the connector.
- Do not use meter if it operates abnormally as protection maybe impaired.
- Do not use during electrical storms or in wet weather.
- Do not use around explosive gas, dust, or vapor.
- Do not apply more than the rated voltage to the meter.
- Do not use without the battery and the back case properly installed.
- Remove the test leads from the meter before removing battery cap.
- Do not attempt to repair this unit as it has no user-serviceable parts.
- Disconnect power and discharge capacitors before testing resistance, continuity or insulation.
- Replace battery as soon as low battery indicator  appears to avoid false readings.
- Use the proper terminals, function and range for your measurements.
- Use care as this tester outputs a high voltage to measure insulation resistance.
- Comply with local and national safety requirements, including the use of appropriate personal protective equipment.

To protect yourself, think "Safety First":

- Voltages exceeding 30VAC or 60VDC pose a shock hazard so use caution.
- Use appropriate personal protective equipment such as safety glasses, face shields, insulating gloves, insulating boots, and/or insulating mats.
- Before each use:
 - Perform a continuity test by touching the test leads together to verify the functionality of the battery and test leads.
 - Use the 3 Point Safety Method. (1) Verify meter operation by measuring a known voltage. (2) Apply meter to circuit under test. (3) Return to the known live voltage again to ensure proper operation.



- Never ground yourself when taking electrical measurements.
- Connect the black common lead to ground or neutral before applying the red test lead to voltage. Disconnect the red test lead from the voltage first.
- Always work with a partner.
- When using the probes, keep fingers as far behind the probe tips as possible.

Instrument - Description



Feature Callouts







1. **Inputs** - for inserting test leads.
2. **Display**
 - **AUTO** – indicates autoranging mode.
 - **LOCK** – indicates a test lock for the next time the TEST button is depressed.
 - **ZERO** – indicates test leads have been nulled.
 - **⏻** – indicates auto power off (APO) occurs 15 minutes after last button is depressed. To defeat APO, press the LOCK key.

-  - indicates batteries should be replaced to avoid false readings.
- Analog Bar Graph – simulates an analog needle movement.
-  – indicates when insulation test is active.
- **V Ω •) MKΩ** – measurement units.



3. Functions

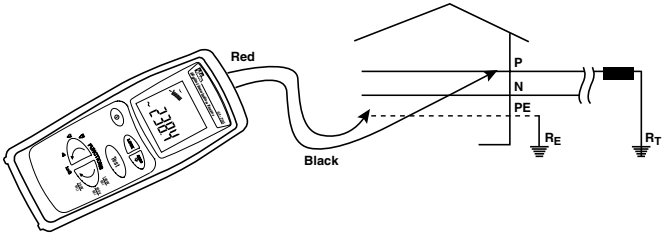
- **VAC** – AC voltage from 0.1 – 600.0V.
- **VDC** – DC voltage from 0.1 – 600.0V.
- **Ω / •))** – Ohms and audible continuity from 0.1 – 199.9.
- **Lo Ω** – Ohms from 0.01 – 19.99 Ω.
- **250V/500V/1000V /M Ω** – Insulation test voltages / range: 0.001 – 4000M Ω.

4. Buttons




-  – turns tester's power on/off.
-  – defeats APO and sets time period while in insulation testing mode.
-  – turns backlight on for 30 seconds and nulls the test leads while in ohms or Lo ohms mode.
-  – starts insulation testing.
-  – selects functions in a counter-clockwise direction.
-  – selects functions in a clockwise direction.



Voltage - AC/DC

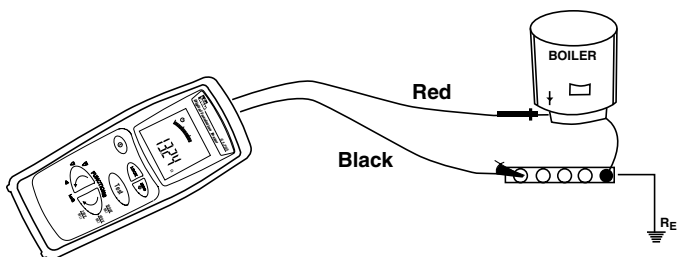
1. Press  to turn on the instrument
2. The meter defaults to VAC (\tilde{V}).
 - To select VDC (\bar{V}), press  once.
3. Insert test leads into the corresponding input terminals.
4. Connect the leads to the circuit under test. The voltage value is displayed.






Resistance (Ω)/Continuity (\bullet)

1.  Turn on the instrument.
2. Press  two times to select Ω/\bullet .
3. Insert test leads into the corresponding input terminals.
4. Apply test leads to de-energized circuit and press  to perform the measurement.
5. Apply test leads:
 - The ohms value is displayed.
 - If $<30\Omega$, continuity beeper also sounds.

Note: Press  and  to perform measurements in continuous mode. LOCK is displayed and APO is defeated.



For higher accuracy and resolution:

- Press  to select $Lo\Omega$ (0.00 - 19.99 Ω).
- Null (ZERO) test leads by touching test lead tips tightly together. Press  >2 sec. The resistance of the leads is now subtracted from pending measurements until  is pressed again.
- Repeat steps 3 - 5 to take resistance measurements.

Insulation Resistance

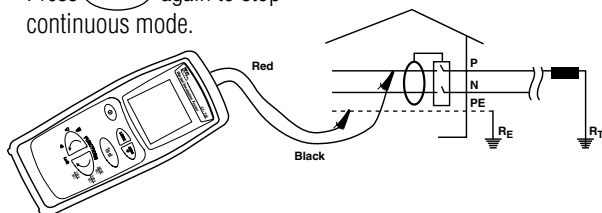
1. Press **(I)** to turn on the instrument.
2. Press **(V)** to select 1000V, 500V, or 250V test voltage.
3. Insert the test leads in the corresponding input terminals of the instrument.
4. Disconnect the circuit under test from power and isolate all eventual loads.
5. Apply leads to wiring under test.
- 6A. To run a timed test:
 - Hold **(LOCK)** for 2s.
 - Then, use **(←)** **(→)** to select time from 30 seconds to 10 minutes. (Default is (S) spot test.)
 - Press **(LOCK)** to confirm selection.
 - Press **(TEST)** to start the insulation testing.

The last megohm reading is displayed. Keep the leads on the test points to allow the circuit to discharge.

- To perform the same timed test again, press **(TEST)**.
- To exit the timed test, hold **(LOCK)** for 2s, then use **(←)** **(→)** to select S, then press **(LOCK)**. The unit can now be navigated to any function using the **(←)** **(→)** buttons.

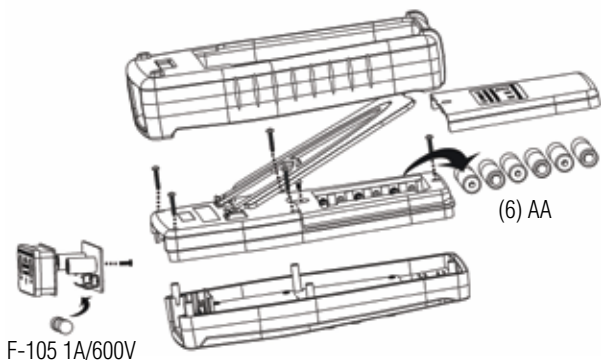
6B. To run a continuous test:

- Press **(LOCK)** and **(TEST)** at the same time. Lock is displayed and unit beeps.
- Press **(TEST)** again to stop continuous mode.



⚠ Warning: The ⚡ symbol on the display means that the instrument is charging the circuit. When the ⚡ symbol is flashing on the display, the instrument is discharging the circuit. Both of these indicate a shock hazard is present. 7

Battery & Fuse Replacement



⚠ WARNING: To avoid electric shock, disconnect test leads before removing battery cover.

⚠ WARNING: For continued protection against fire, replace only with fuse of the specified voltage, current and rupture speed ratings.

Ranges & Accuracies

AC Converter: 61-795 model is averaging sensing, rms calibrated

Accuracy: Accuracy is specified as +/- (a percentage of the reading + a fixed amount) at 23°C±5°C (73.4°F ± 9°F), less than 75% relative humidity.

Temperature Coefficient: 0.1 times the applicable accuracy specification from 32°F to 64°F and 82°F to 122°F (0°C to 18°C ; 28°C to 50°C).

Function	Range	Accuracy	Overload Protection
DC Voltage	0.1 - 600.0V	±(0.5% +1)	600V AC RMS max
AC Voltage	0.1 - 600.0V	±(0.8% + 4)	600V AC RMS max
Resistance	0.1 - 199.9Ω	±(2.0% + 3)	600V AC RMS max for 1 minute
Continuity*	0.01 - 19.99Ω	±(2.0% + 3)	600V RMS max
Insulation Resistance**	0.001 - 0.100MΩ	±10	600V RMS max
	0.101 - 3.999MΩ	±(2.0% +5)	
	4.00 - 39.99MΩ		
	40.0 - 399.9MΩ	±(5.0% +5)	
	400 - 1000MΩ		
250V	0.001 - 0.250MΩ	±15	
	0.251 - 3.999MΩ	±(2.0% +5)	
	4.00 - 39.99MΩ		
	40.0 - 399.9MΩ		
	400 - 2000MΩ	±(5.0% +5)	
500V	0.001 - 0.250MΩ	±15	
	0.251 - 3.999MΩ	±(2.0% +5)	
	4.00 - 39.99MΩ		
	40.0 - 399.9MΩ		
	400 - 2000MΩ	±(5.0% +5)	
1000V	0.001 - 0.250MΩ	±15	
	0.251 - 3.999MΩ	±(2.0% +5)	
	4.00 - 39.99MΩ		
	40.0 - 399.9MΩ		
	400 - 1000MΩ	±(3.0% +5)	
	1000 - 4000MΩ	±(5.0% +10)	

*Continuity test current > 200mA @ R<5Ω and open circuit voltage (4-24VDC) per EN 61557-2/VDE 0413 Part 4.

**Auto Ranging. Open circuit voltage: <1.3 x V₀. Accuracy of nominal voltage: 0% to +10%. Short circuit current: <3.0mA. Nominal testing current: 1mA @ 1kΩ x V (1mA @ 500kΩ)

Maintenance

Clean the case with a damp cloth and mild detergent. Do not use abrasives or solvents.

Service and Replacement Parts

No user-serviceable parts.

For replacement parts or to inquire about service information, contact IDEAL INDUSTRIES, INC. at 1-877-201-9005 or visit our website @ www.testersandmeters.com.



Dispose of waste electrical and electronic equipment

In order to preserve, protect and improve the quality of environment, protect human health and utilize natural resources prudently and rationally, the user should return unserviceable product to relevant facilities in accordance with statutory regulations. The crossed-out wheeled bin indicates the product needs to be disposed separately and not as municipal waste.



Disposal of used batteries/accumulators!


The user is legally obliged to return used batteries and accumulators. Disposing used batteries in the household waste is prohibited! Batteries/accumulators containing hazardous substances are marked with the crossed-out wheeled bin. The symbol indicates that the product is forbidden to be disposed via the domestic refuse. The chemical symbols for the respective hazardous substances are **Cd** = Cadmium, **Hg** = Mercury, **Pb** = Lead.



You can return used batteries/accumulators free of charge to any collecting point of your local authority, our stores, or where batteries/accumulators are sold. Consequently you comply with your legal obligations and contribute to environmental protection.

Specifications

General Features

Display:	9999 Count/4" LCD
Refresh Rate:	2.0x/sec.
Over range:	"OL" is displayed
Polarity:	Automatic (no indication for positive polarity); Minus(-) sign for negative polarity
Auto Power Off:	After 15 minutes of non-use
Low Battery:	 is displayed if battery voltage drops below operating voltage
Altitude:	6561.7 ft. (2000m)
Accuracy:	Stated accuracy at 73° ±41°F (23° ±5°C), < 70% R.H.
Batteries:	(6) 1.5V AA LR6
Battery Life:	50 hrs./1000 tests @ 1000V/480kΩ
Fuse:	1A/600V (#F-105)
Operating environment:	32° to 104°F (0° to 40°C) at < 75% R.H.
Storage environment:	-14° to 140°F (-10° to 60°C) at < 80% R.H.
Weight:	15.9 oz (450g)
Size:	9.4"H x 3.9"W x 1.8"D (240mmHx100mmWx45mmD)
Accessories Included:	Test leads (TL-795), (6) AA batteries Operating Instructions
Safety Certification:	Complies with UL/IEC/EN 61010-1, 61010-031. EN61557, EN 61326-1 +1A (EMC), Cat III-1000V/ Cat IV-600V



Equipment protected by double insulation.

Instrument has been evaluated and complies with insulation (overvoltage) category IV. Pollution degree 2 in accordance with IEC-644. Indoor use.

Warranty Statement

This tester is warranted to the original purchaser against defects in material and workmanship for two years from the date of purchase. During this warranty period, IDEAL INDUSTRIES, INC. will, at its option, replace or repair the defective unit, subject to verification of the defect or malfunction.

This warranty does not cover fuses, batteries or damage from abuse, neglect, accident, unauthorized repair, alteration, or unreasonable use of the instrument.

Any implied warranties arising out of the sale of an IDEAL product, including but not limited to implied warranties of merchantability and fitness for a particular purpose, are limited to the above. The manufacturer shall not be liable for loss of use of the instrument or other incidental or consequential damages, expenses, or economic loss, or for any claim or claims for such damage, expenses or economic loss.

State laws vary, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.