

## DIGITAL MΩ HiTESTER 3154

Safety Standards Measuring Instruments



For the Laboratory to the Production Line

## Six Test Voltages from 25 to 1000 V

The Model 3154 DIGITAL MΩ HiTESTER provides six selectable test voltages: 25, 50, 100, 250, 500 and 1000 V, in order to support a wide variety of tests to evaluate electrical and electronic components and equipment. Comparator and timer functions facilitate easy insulation resistance testing in accordance with various safety standards, and a complete external I/O interface is provided for efficient automated line testing.



*The Right Source For Your Test & Measurement Needs*

2222 Verus Street Suite C San Diego CA 92154 USA  
Toll Free: 866.363.6634 Tel: 619.429.4545 Fax: 619.374.7012  
Email: [sales@calright.com](mailto:sales@calright.com) <http://www.calright.com>

# Efficient Insulation Resistance Testing

## \* Insulation testing of electrical and electronic equipment

Motors, printers, magnetic heads, etc.

## \* Insulation testing of electrical and electronic components

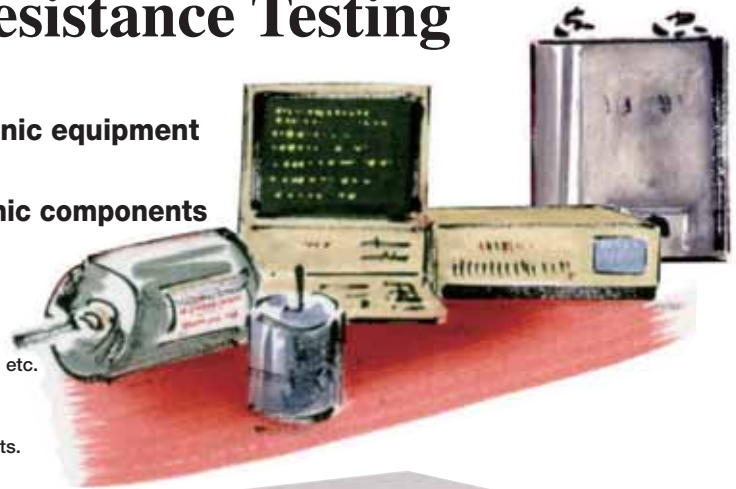
Transformers, coils, switches, relays, etc.

## \* Insulation resistance testing according to various standards

Machinery, medical equipment, home appliances, office equipment, etc.

## \* High voltage resistance testing

Resistance measurements of components in actual operating circuits.



## ● Six Measurement Voltages Provided in a Single Unit

Any of six measurement voltages can be selected for use in a wide range of applications, from electrical and electronic component testing to electrical and electronic equipment. The comparator can be set up for use with each measurement voltage.

## ● Storage for Ten Setting States

Up to ten setting states can be stored for quick selection when testing for compliance with various standards.

## ● Easy Standards Testing

Testing for compliance with various safety standards is simplified by using the comparator and timer functions for quick pass-fail judgment of minimum acceptable limits.

## ● Remote Control

Operations such as test start/stop and voltage selection can be controlled remotely, such as for start/stop control from a switching probe.



## ● Automatic Electrical Discharge Function

The unit discharges any charge buildup on the measured object as a result of electrical loading. This electrical discharge function prevents the effects of one test from being carried over to a subsequent procedure.

## ● Slow Sampling Selection to Minimize Instability

Selectable fast (10 sample/s) and slow (1 sample/s) sampling rates are provided. Slow sampling minimizes instability when measuring at highly reactive test points.

## Measurement Voltages and Ranges (Auto and Manual Range Switching)

Rated Measurement Voltage	25V	50V	100V	250V	500V	1000V
Measurement Range	2,000, 20.00 or 200.0 MΩ		2,000, 20.00, 200.0 or 2000 MΩ		2,000, 20.00, 200.0 or 4000 MΩ	
Accuracy	±2% rdg. ±5 dgt.	0 to 20.00 MΩ		0 to 100.0 MΩ	1000 to 4000 MΩ	
	±5% rdg.	19.0 to 200.0 MΩ	19.0 to 2000 MΩ	100.1 to 2000 MΩ	1000 to 4000 MΩ	
No-Load Voltage	1 to 1.2 times Rated Measurement Voltage					
Min. Measurable Resistance (*1)	0.025 MΩ	0.05MΩ	0.1MΩ	0.25MΩ	0.5MΩ	2MΩ
Rated Measurement Current (*2)	1 to 1.2 mA					0.5 to 0.6 mA
Short-Circuit Current	1.2 mA max.					0.6 mA max.

\*1. Minimum resistance required to maintain rated measurement voltage.

\*2. Maximum current flow through the minimum measurable resistance.

## Auto Range

The range increments when the current range is exceeded by 2000 counts (except the top range).

The range decrements when the current range does not reach 190 counts (except from the 2 MΩ range).

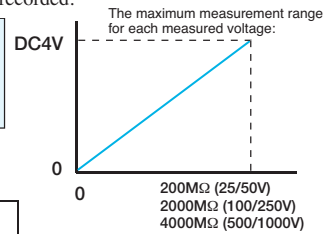
# Full Support for Automatic Operation

Both external I/O and RS-232C interfaces are provided to support fully automated operation. Measurement values can be tracked and recorded from the analog output, and printing is supported on an external printer using RS-232C.

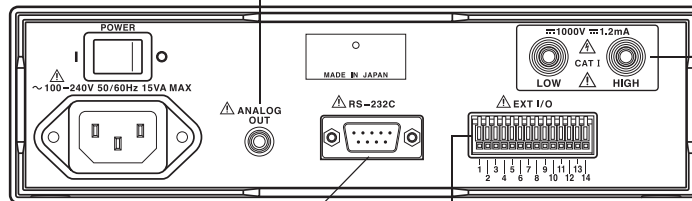
## Record Variations using Analog Output

This unit provides two types of analog output. Measurements are output linearly as voltages between 0 and +4 V DC, and insulation resistance fluctuations can be recorded.

1. Outputs each measurement range.
2. The maximum measurement range for each measured voltage is output between 0 and +4 V DC.



## Analog Output Terminal



## Rear Panel Measurement Terminal

(always connected to front panel terminal)

## RS-232C Connector

Automatic calculation can be performed on a PC, and printing can be performed using the 9442 printer.



9442 Printer

1	3820 Mohm	
2	15.00 Mohm	
3	O.F. Mohm	

1	3800 Mohm	PASS
2	15.00 Mohm	FAIL
3	15.00 Mohm	DELAY

Printing method : Thermal serial dot printer  
 Paper width : 112 mm  
 Printing speed : 52.5 cps  
 Power source : AC adapter 9443 , or supplied nickel-hydride battery  
 (Charged through the 9443; printing capability approx. 3000 lines with full charge)

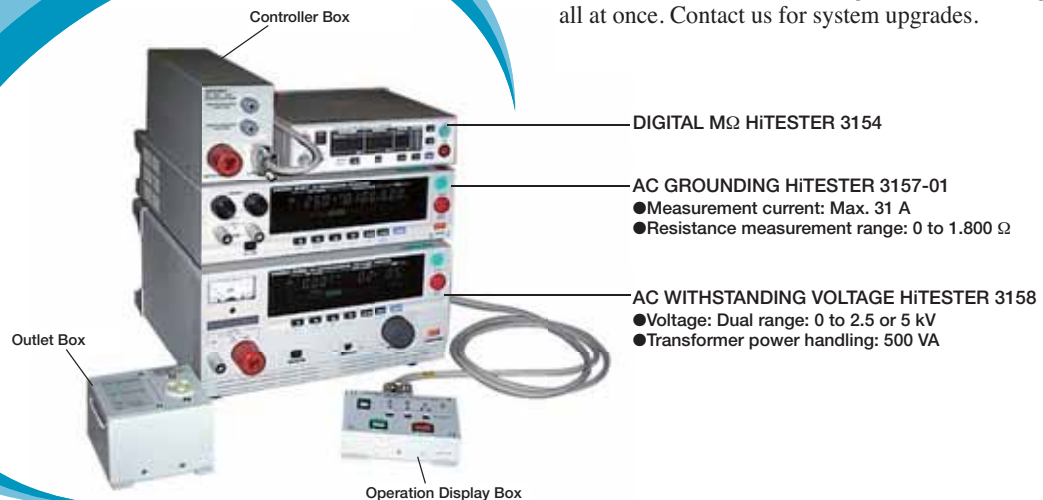
Note: the Cable 9444 and AC Adapter are required to connect the Printer 9442.

## External I/O Connector

Pin	I/O	Signal	Description
1+2	O	INT.GND	Connects to internal ground and power line ground lead
3	I	EXT.COM	Connect to ground of external device
4	O	FAIL	LOW indicates Fail judgment
5	O	PASS	LOW indicates Pass judgment
6	O	TEST	LOW indicates Testing state
7	I	VOLT2	
8	I	VOLT1	Sets test voltages (including comparators)
9	I	VOLT0	Sets saved test conditions from No. 1 to 7
10	I	STOP	LOW = STOP key
11	I	START	LOW = START key
12	I	EXT.DCV	Power supplied from an external device
13+14	O	INT.DCV	+5V DC internal power (100 mA max.)

## Enhanced Efficiency in System Measurements

Efficient testing can be consistently performed using a controller to conduct protective grounding, insulation resistance and voltage withstand testing all at once. Contact us for system upgrades.



DIGITAL MΩ HITESTER 3154

AC GROUNDING HITESTER 3157-01

- Measurement current: Max. 31 A
- Resistance measurement range: 0 to 1.800 Ω

AC WITHSTANDING VOLTAGE HITESTER 3158

- Voltage: Dual range: 0 to 2.5 or 5 kV
- Transformer power handling: 500 VA

## ■ 3154 Specifications

### ● Basic Specifications

Measurement function	: Insulation resistance (Applied DC voltage method)
Sampling rates	: 10 samples/s (Fast), 1 sample/s (Slow)
Memory	: Storage contents: rated measurement voltage, comparator minimum limit, test mode, beep upon judgment, test time, delay time, resistance range, sampling rate Memory capacity: ten sets of settings (supports saving and loading)
Test modes	: Selectable between continuous and fail-stop

### [ Comparator Functions ]

Minimum Limit Setting	: Set by key entry; select from following table; set by RS-232C; can be set to desired resistance
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Resistance range	Minimum settable limit (M $\Omega$ )
2 M $\Omega$	0.1/0.2/0.3/0.4/0.5/0.6/0.7/0.8/0.9/1/2
20 M $\Omega$	3/4/5/6/7/8/9/10/20
200 M $\Omega$	30/40/50/60/70/80/90/100/200
2000 M $\Omega$ (4000 M $\Omega$ range for 500V,1000V)	300/400/500/600/700/800/900/1000/2000/3000/4000 Limited to test voltage 500V,1000V for 3000/4000

Judgments	: Pass = measured value $\geq$ minimum limit, Fail = measured value < minimum limit
Judgment processing	: Beep sound, PASS/FAIL indicator, output to external I/O
Beep sound selection	: "Ring on Pass", "Ring on Fail", or disable beeper
OFF setting time	: "- - -" indication

### [ Test Time Timer Function ] (ON/OFF selectable)

Function	: After starting measurement, measurement is completed after 0.35s max. wait time + set time (when Delay time is OFF)
Setting range	: 0.5 to 99s

### [ Delay Time Timer Function ] (ON/OFF selectable)

Function	: After measurement starts, the test time timer and comparator functions do not start operating until a wait time of max. 0.35 s plus the set delay time has elapsed.
Setting range	: 0.1 to 99s

### [ Response Times ]

Measurement speed		FAST	SLOW
Resistance range, test voltage			
2 or 20 M $\Omega$ Manual ranging	All Voltages	less than 0.5 s	less than 1.5 s
	200 M $\Omega$ Manual ranging	25, 50 V	
100 to 1000 V		less than 0.5 s	
2000 or 4000 M $\Omega$ Manual ranging	100 to 1000 V	less than 0.7 s	
Auto ranging (including range selection)	25, 50 V	less than 2 s	less than 5 s
	100 to 1000 V	less than 2.5 s	less than 6 s

### ● General Specifications

Display type	: LED
Operating temperature and humidity ranges	: 0 to 40°C, max. 80% rh (no condensation)
Storage temperature and humidity ranges	: -10 to 50°C, max. 90% rh (no condensation)
Guaranteed accuracy temp. & humidity	: 23 $\pm$ 5°C, max. 80% rh (no condensation)
Suitable environment	: Indoors, max. 2000 m altitude
Power supply	: 100 to 240 VAC
Power line frequency	: 50 or 60 Hz
Maximum rated power	: 15 VA
Withstand voltage	: 1.35 kV AC for one minute between power lines and outer case, external connectors, grounding and measurement terminals (collectively); 1.1 kV DC for one minute between measurement terminal and ground terminals; 500 V AC for one minute between EXT I/O terminals and power line, ground and measurement terminals (collectively); [Not including INT DCV and INT GND terminals in the EXT I/O terminals.]

Input overload protection	: 1100 V DC between HIGH and LOW on measurement terminal (positive only).
Dimensions	: Approx. 215W $\times$ 61H $\times$ 213D mm (not including projections)
Mass	: Approx. 1.1 kg.
Conforming standards	: EMC : EN61326 Safety : EN61010
Accessories	: Power Cord (1)

## 3154 DIGITAL M $\Omega$ HiTESTER

Note: Test leads are not included; optional leads are required for use.

### ■ Options

TEST LEADS 9185  
 TEST PROBE 9294  
 SWITCHED PROBE 9299  
 OUTPUT CORD (Jack to banana plug) 9094  
 RS-232C CABLE (9pin-9pin/Cross/1.8 m) 9637  
 RS-232C CABLE (9pin-25pin/Cross/1.8 m) 9638  
 PRINTER 9442  
 RECORDING PAPER (25m, 10 rolls) 1196  
 CONNECTION CORD(1.3 m) 9257



AC ADAPTER (for printer, EU) 9443-02  
 AC ADAPTER (for printer, America) 9443-03  
 CONNECTION CABLE (for printer) 9444

**CALRIGHT**  
**INSTRUMENTS**

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2222 Verus Street Suite C San Diego CA 92154 USA  
 Toll Free: 866.363.6634 Tel: 619.429.4545 Fax: 619.374.7012  
 Email: sales@calright.com http://www.calright.com