

# Hipot - DCR Hybrid 2000

## AC/DC/IR/DCR Analyzer

### USES:

- Small Wire & Cable Testing
- Medical Component & Lead Testing
- Heater Production Testing
- Transformer Electrical Safety Testing
- Electric Motor Safety Testing
- Electronic Component Testing

### FEATURES:

- Programmable Output Current to 30mA AC, 10mA DC
- Real and Total Current Measurement
- Programmable Output Voltage to 5kV AC 6kV DC
- Insulation Resistance Measurements from 1M $\Omega$  to 50G $\Omega$
- DC Resistance Measurements from 10m $\Omega$  to 100k $\Omega$
- Flex Test
- Ramp, Dwell, Test & Fall Times
- Programmable High & Low Limits
- Open/Short Circuit Check
- Arc Detection w/ Programmable Limit
- Storage of 50 Tests Setups with Multiple Steps per Measurement
- Front Panel Lockout
- RS232 Interface, Standard
- 8 Channel HV Scanner
- GFI

### Introduction

The Hybrid 2000 Analyzer is a complete dielectric testing solution with AC Hipot, DC Hipot, Insulation Resistance and DC Resistance testing capability. The Hybrid 2000 combines these four test modes with eight HV scan channels for fast multi-point testing. The Hybrid 2000 has Open/Short Circuit detection for establishing proper device connection and Load/Line regulation to ensure measurement integrity. The digital display and user friendly controls allow test parameters and limits to be set without the high voltage activated.

### Description

**AC Hipot Capability** for AC dielectric withstand testing. The test voltage can be programmed in the range from 50VAC to 5kVAC with a resolution of 1V. Measures both total and real current with output current capability to 30mA.

**DC Hipot Capability** for making DC dielectric withstand measurements. The test voltage can be programmed in the range from 50VDC to 6kVDC with a resolution of 1V. The maximum total current is 10mA.

**Insulation Resistance Measurements** for testing the dielectric strength and breakdown of electrical devices, components and materials. The IR measurement range is from 1M $\Omega$  to 50G $\Omega$  with test voltages from 50 to 5000VDC.

**DC Resistance (DCR) Measurements** for 2-wire/4-wire resistance testing. Perform multi-point DCR measurements from 10m $\Omega$  to 100k $\Omega$ . Set to continuous to monitor resistance while checking for intermittent connections.

**DCR Balance** is used to detect the balance of wound components such as motors. The DCR balance nominal value can be programmed from 0.001 $\Omega$  to 999 $\Omega$ . This function will compare DCR readings and prompt a failure if the variance in readings is greater than the set nominal value. This function will ensure good quality of the motor windings.

**Sub Pass** test mode is the only function on the market that provides sub step testing. Sub step will be activated if the main step fails This function will allow the end user to analyze the specific failure points from a mass test of the DUT.

**Temperature Compensation** function provides high accuracy for resistance measurements on application such as motor winding or coils with temperature correction.

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## Hybrid 2000

### AC Hipot

**AC Output Voltage:** Range: 50V to 5000V AC  
Resolution: 1Volts/step  
Frequency: 50/60 Hz selectable  
Waveform: Sinusoidal  
Regulation:  $\pm(1\%$  of setting +5V)

**Voltage Display:** Accuracy:  $\pm(1\%$  of reading + 5V)  
Resolution: 1 Volt

**AC Current Display:** Range: 0.001mA to 30mA AC  
Resolution: 1 $\mu$ A  
Accuracy: $\pm(1\%$  of reading + 5cnt) Total

**High/Low Limit Test:** Range: 0.001mA to 30mA AC  
Low limit can be turned OFF

### Insulation Resistance

**Insulation Resistance:** Range: 1M $\Omega$  - 50G $\Omega$   
1M - 1G:  $\pm(3\%$  + 10 cts),  $\geq 500V$   
1G - 10G:  $\pm(7\%$  + 10 cts),  $\geq 500V$   
10G - 50G:  $\pm(10\%$  + 10 cts),  $\geq 500V$

**IR Output Voltage:** Range: 50V to 5000V DC  
Accuracy:  $\pm(1.5\%$  of setting +5V)

**High/Low Limit Test:** 1M $\Omega$  - 50G $\Omega$   
High limit can be turned OFF

### DC Resistance (DCR)

**DC Resistance:** Range: 10m $\Omega$  - 100k $\Omega$

**DCR Balance:** 0.0001 $\Omega$  - 999 $\Omega$ , OFF

### DC Hipot

**DC Output Voltage:** Range: 50V to 6000V DC  
Resolution: 1Volts/step  
Regulation:  $\pm(1\%$  of setting +5V)

**Voltage Display:** Accuracy:  $\pm(1\%$  of reading + 5V)  
Resolution: 1 Volt

**DC Current Display:** Range: 0.0001mA to 10mA DC  
3 Ranges: .0001mA - .2999mA,  
0.3mA - 2.999mA, 3mA - 10mA  
Accuracy: $\pm(1\%$  of reading + 5cnt)

**High/Low Limit Test:** 0.1 $\mu$ A to 10mA DC  
Low limit can be turned OFF

**Charging Current:** 10mA max

### Common Features

**Open/Short Detection:** Voltage <100V, Frequency: 600Hz  
Open: 10-100%; Short: 100-500%

**Arc Detection:** Arc Level: adjustable OFF or  
.1mA - 15mA AC & 10mA DC  
Arc Duration: > 10 $\mu$ s

**Indication:** Pass/fail lights, audible sound

**Time:** Ramp: 0.1 to 999s ( $\pm 20$ ms), OFF  
Dwell: 0.1 to 999s ( $\pm 20$ ms), OFF  
Test: 0.3 to 999s ( $\pm 20$ ms), Continuous  
Fall: 0.1 to 999s ( $\pm 20$ ms), OFF  
Sub Pass: 0.01s - 0.5s

**Quick Discharge:** Discharge of voltage across DUT back  
through the HV transformer

**Output Cutoff:** <0.4msec after limit exceeded

**Ground Fault Interrupt:** Automatic instrument shutdown for  
current imbalance >0.5mA  $\pm 0.25$ mA AC

**Standard Interfaces:** RS232: 9-pin  
Interlock

**Test Setups:** 50 Memory Locations, 20 Steps

**Scan Channels:** 8 HV Scan Channels - 2 W Terminals Setup  
4 HV Scan Channels - 4 W Terminals Setup

**Scan Test Cables:** 8 Custom Banana to Alligator Clip

**Connectors:** 8 HV OUTPUT (Custom Banana)  
Programmable as High, Low or Off  
RTN/LOW (Binding Post)

**Front Panel Lockout:** Key press with or without memory recall

**Miscellaneous:** Zero Offset

**Dimensions:** (w x h x d): 17 x 6.8 x 17.7in  
(430x175x450mm)

**Weight:** 44 lbs (20kg) net, 50 lbs (22kg) ship

**Environmental:** Meets MIL-T-28800E, Type 3, Class 5  
Operating: 0°C to + 40°C  
Humidity: <70%  
Storage: - 10°C to + 60°C

**Power:** •90 - 130V AC •50 or 60Hz  
•200 - 250V AC •500W max

2 TERMINALS MEASURE	
Test range	Measurement Accuracy
050.0m $\Omega$ ~1.000 $\Omega$	$\pm(2\%$ of reading + 0.5% of range)
0.010 $\Omega$ ~10.00 $\Omega$	
9.00 $\Omega$ ~100.0 $\Omega$	
90.0 $\Omega$ ~1.000k $\Omega$	
0.900k $\Omega$ ~10.00k $\Omega$	
9.00k $\Omega$ ~100.0k $\Omega$	
4 TERMINALS MEASURE	
Test range	Measurement Accuracy
010.0m $\Omega$ ~1.000 $\Omega$	$\pm(0.5\%$ of reading + 0.05% of range)
0.900 $\Omega$ ~10.00 $\Omega$	
9.00 $\Omega$ ~100.0 $\Omega$	
90.0 $\Omega$ ~1.000k $\Omega$	
0.900k $\Omega$ ~10.00k $\Omega$	
9.00k $\Omega$ ~100.0k $\Omega$	

## Ordering Information

Hybrid 2000 AC/DC/IR/DCR Analyzer		<b>Optional Accessories:</b>	S11 Gun Probe with remote start
<b>Includes:</b>		Calibration Data	S12 Load Box, resistive
150827	Instruction Manual	S02 HV Lead Set, 1m, (std w/unit)	S14 Load Box, custom resistors
700070	Power Cable	S03 Corded Product Adapter(115V)	G16 International Power Strip
S02	Test Leads	S04 HV Lead Set, 2m	G25 Corded Product Adapter (240V)
700100	Ground Continuity Lead	S05 Foot Switch	G40 Scanner Lead Set (8), with Clips
	Lead Set: (8) HV Banana to Alligator	S06 High Voltage Probe	850900 IEEE-488/Handler Interface
520068	5A 250V Power Line Fuse	S07 Power Entry Adapter Cable	2000-AB 8 to 16 Channel Scanner
520134	2.5A 250V Power Line Fuse	S08 Gun Probe	
	Calibration Certificate Traceable to NIST	S09 HV Lead, 1 meter, unterminated	
		S10 HV Lead, 2 meters, unterminated	

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