

INSTRUMENTS FOR

ELECTRICAL SAFETY COMPLIANCE TESTING



HI POT TESTERS

GROUND BOND TESTERS

INSULATION RESISTANCE TESTERS

LINE LEAKAGE TESTERS

MEDICAL TEST SYSTEMS

HV/HC SCANNING MATRICES

SOFTWARE SOLUTIONS

FUNCTIONAL RUN TESTERS

CUSTOM INSTRUMENTS





OMNIA®

Fully-Automated, Multi-Function Electrical Safety Compliance Analyzer

Multi-function safety compliance analyzers with an enhanced graphic LCD provide complete test setup and results with an easy-to-use interface. OMNIA® provides 4-in-1, 5-in-1 and 6-in-1 testing solutions. Testers include AC Hipot, DC Hipot, Ground Bond/Continuity, Insulation Resistance, Functional Run and Line Leakage tests. An optional internal scanner is available for the 8104, 4-in-1 tester. An additional external modular scanner is available for use with all testers. All testers come standard with USB and RS-232 interfaces. Ethernet, GPIB, and RS-485 interfaces are also available.

Model 8104 - OMNIA 4, 5 kV @ 40 mA AC, 5 kV @ 20 mA DC, IR Test, 40 Amp Ground Bond & Optional HV & HC Scanner

Model 8105 - OMNIA 5, 5 kV @ 40 mA AC, 5 kV @ 20 mA DC, IR Test, 40 Amp Ground Bond & Functional Run Test

Model 8106 - OMNIA 6, 5 kV @ 40 mA AC, 5 kV @ 20 mA DC, IR Test, 40 Amp Ground Bond, Functional Run Test & Line Leakage Test

Features and Benefits

- Patented SmartGFI® safety circuit protects the operator from shock hazards
- Real Current measurement allows operators to monitor total and real current on a single screen
- Patented Prompt and Hold function provides a unique method for performing multiple steps during a test cycle
- Line Leakage tester with 7 different measuring devices and RMS or PEAK leakage measurements
- Can be easily connected to AR's SC6540, 620L or an APT Brand AC Power Source to provide a customizable test system
- USB/RS-232, GPIB, Ethernet, or RS-485 automation interfaces available
- Autaware Testing Software available for complete Automation Control
- Cold Resistance Feature for Line to Neutral Continuity Testing
- Patented CAL-ALERT® and VERI-CHEK® features help to ensure that your instrument is calibrated and stays within specs
- Data storage card available for storing and transferring test data without a connection to a PC
- 50 Memories with 30 steps per memory that can be stored and recalled in any alphanumeric combination
- RAMP HI® and CHARGE LO® testing for more effective DC Hipot testing
- Perform Hipot/Line Leakage without changing test leads
- Patented Graphic LCD and intuitive menu system to simplify the entire testing process from set-up to results



Safety agency listed.

Input Specifications

Voltage	115/230 V selectable, $\pm 10\%$ variation
Frequency	50/60 Hz $\pm 5\%$
Fuse	10 A Slow Blow 250 VAC

Dielectric Withstand Test Mode

Output Rating	5 kV @ 40 mAAC 5 kV @ 20 mADC
Voltage Setting	Range: 0-5000 VAC 0-5000 VDC Resolution: 1 V Accuracy: $\pm (2\% \text{ of setting} + 5 \text{ V})$
Voltage Display	Range: 0.00 - 5.00 kV Full Scale Resolution: 0.01 kV Accuracy: $\pm (2\% \text{ of reading} + 10 \text{ V})$
HI and LO-Limit	AC Total Range: 0.000-9.999 mA Resolution: 0.001 mA Range: 10.00 - 40.00 mA Resolution: 0.01 mA Accuracy: $\pm (2\% \text{ of setting} + 2 \text{ counts})$ AC Real Range: 0.000-9.999 mA Resolution: 0.001 mA Range: 10.00 - 40.00 mA Resolution: 0.01 mA Accuracy: $\pm (3\% \text{ of setting} + 50 \mu\text{A})$ DC Range: 0.0-999.9 μA Resolution: 0.1 μA Range: 1000 - 20000 μA Accuracy: $\pm (2\% \text{ of setting} + 2 \text{ counts})$
Current Display	AC Total Range: 0.000 mA - 3.500 mA Resolution: 0.001 mA Range: 3.00 mA - 40.00 mA Resolution: 0.01 mA Accuracy: $\pm (2\% \text{ of reading} + 2 \text{ counts})$ AC Real Range: 0.000 mA - 9.999 mA Resolution: 0.001 mA Range: 10.00 mA - 40.00 mA Resolution: 0.01 mA Accuracy: $\pm (3\% \text{ of reading} + 50 \mu\text{A})$ DC Range: 0.0 μA - 350.0 μA Resolution: 0.1 μA Range: 0.300 mA - 3.500 mA Resolution: 0.001 mA Range: 3.00 mA - 20.00 mA Resolution: 0.01 mA Accuracy: $\pm (2\% \text{ of reading} + 2 \text{ counts})$
Ramp HI	>20 mA peak maximum, ON/OFF selectable
Charge LO	Range: 0.000 - 350 μA or Auto Set
DC Output Ripple	$\leq 4\%$ Ripple rms at 5 kV DC @ 20 mA, Resistive Load
Discharge Time	$\leq 200 \text{ ms}$

Dielectric Withstand Test Mode (continued)

Max Capacitive Load	1 μF < 1 kV 0.08 μF < 4 kV
DC Mode	0.75 μF < 2 kV 0.04 μF < 5 kV 0.5 μF < 3 kV
AC Output Waveform	Sine Wave, Crest Factor = 1.3 - 1.5
Output Frequency	60 or 50 Hz, User Selectable
Output Regulation	$\pm (1\% \text{ of output} + 5 \text{ V})$ from no load to full load and over input voltage range
Dwell Timer	AC 0.4 - 999.9 sec (0 = Continuous) DC 0.3 - 999.9 sec (0 = Continuous)
Ramp Timer	Ramp-Up: AC 0.1 - 999.9 sec, DC 0.4 - 999.9 sec Ramp-Down: AC 0.0 - 999.9 sec, DC 0.0, 1.0 - 999.9 sec
Ground Continuity	Current: DC 0.1 A ± 0.01 A, fixed Max. Ground Resistance: 1 Ω $\pm 0.1 \Omega$, fixed
Ground Fault Interrupt	GFI Trip Current: 450 μA max (AC or DC) HV Shut Down Speed: < 1 ms

Continuity Test Mode

Output Current	DC 0.1 A ± 0.00001 A
Resistance Display	Range: 0.00 - 10000.00 Ω
HI and LO-Limit	0.00 - 10000 Ω
Dwell Timer	Range: 0.0, 0.3 - 999.9 sec (0 = Continuous)
Milliohm Offset	Range: 0.00 - 10.00 Ω

Ground Bond Test Mode

Output Voltage	Range: 3.00 - 8.00 VAC
Output Frequency	50/60 Hz, user selectable
Output Current	Range: 1.00 - 40.00 A, Resolution: 0.01 A
Output Regulation	Accuracy: $\pm (1\% \text{ of output} + 0.02 \text{ A})$ Within maximum load limits, and over input voltage range
Maximum Loading	1.00 - 10.00 A, 0 - 600 m Ω 10.01 - 30.00 A, 0 - 200 m Ω 30.01 - 40.00 A, 0 - 150 m Ω
Current display	Range: 0.00 - 40.00 A Resolution: 0.01 A Accuracy: $\pm (3\% \text{ of setting} + 0.03 \text{ A})$
Ohmmeter Display	Range: 0 - 150 m Ω for 30.01 - 40.00 Amps 0 - 200 m Ω for 10.01 - 30.00 Amps 0 - 600 m Ω for 6.00 - 10.00 Amps Resolution: 1 m Ω Accuracy: $\pm (2\% \text{ of reading} + 2 \text{ m}\Omega)$ Range: 0 - 600 m Ω for 1.00 - 5.99 Amps Resolution: 1 m Ω Accuracy: $\pm (3\% \text{ of reading} + 3 \text{ m}\Omega)$

Ground Bond Test Mode (continued)

HI and LO Limit	Range: 0 – 150 mΩ for 30.01 – 40.00 Amps 0 – 200 mΩ for 10.01 – 30.00 Amps 0 – 600 mΩ for 1.00 – 10.00 Amps
	Resolution: 1 mΩ
	Accuracy: Same as Ohmmeter Display
Milliohm Offset	Range: 0 - 200 mΩ

Insulation Resistance Test Mode

Voltage Setting	Range: 50 - 1000 VDC
Charging Current	Maximum >20 mA peak
Resistance Display	Range: 0.05 MΩ – 50000 MΩ (4 Digit, Auto Ranging)
	Resolution: 50 – 499 VDC 500 – 1000 VDC
	MΩ MΩ MΩ
	0.001 0.050 – 1.999 0.050 – 9.999
	0.01 2.00 – 19.99 10.00 – 99.99
	0.1 20.0 – 199.9 100.0 – 999.9
	1 200 – 50000 1000 – 50000
Accuracy	50 – 499 V
	0.05 M – 999.9 M ± (7% of reading +2 counts)
	500 – 1000 V
	0.05 M – 999.9 M ± (2% of reading +2 counts)
	1000 M – 9999 M ± (5% of reading +2 counts)
	10000 M – 50000 M ± (15% of reading +2 counts)
HI and LO Limit	Range: 0.05 M – 99.99 MΩ
	Resolution: 0.01 M
	Range: 100.0 M – 999.9 M
	Resolution: 0.1 M
	Range: 1000 M – 50000 M
	Resolution: 1 M
	(HI - Limit: 0 = OFF)
	Accuracy: Same as Resistance Display Accuracy
Charge LO	Range: 0.000 - 3.500 μA or Auto Set
Ramp Timer	Ramp-Up: 0.1 - 999.9 sec Ramp-Down: 0.0, 1.0 - 999.9 sec
Delay Timer	1.0 - 999.9 sec (0 = Continuous)
Ground Fault Interrupt	GFI Trip Current: 450 μA max (AC or DC) HV Shut Down Speed: < 1 ms

General Specifications

Mechanical	Bench or rack mount with tilt up front feet
Dimensions	3U (WxHxD) 16.93 x 5.24 x 19.69 in. (430 x 133 x 500 mm)
Weight	8104 - 26 kgs / 57.32 lbs. 8105/8106 - 29 kgs. / 63.93 lbs.
Interface	USB/RS-232 Standard, GPIB, Ethernet, Data Storage (RS-485)
Memory	50 memories, 30 step/memory

OMNIA 8105 and 8106 Functional Run Test Mode

DUT Power	Voltage: 0 – 277 VAC Single Phase Unbalanced (One Hot or Line conductor and One Neutral)
	Current: 15 AAC max continuous
	Short Circuit Protection: 23 AAC, Response Time < 3s
Delay Time Setting	Range: 0.2 – 999.9 seconds
Dwell Time Setting	Range: 0.1 – 999.9 seconds (0 = Continuous)
Trip Point	Voltage: Volt-Hi
Settings	Volt-LO Range: 0.0 – 277.0 VAC
	Current: Amp-HI
	Amp-LO Range: 0.0 – 15.00 AAC
	Watts: Power-HI
	Power-LO Range: 0 – 4200 W
	Power Factor: PF-HI
	PF-LO Range: 0.000 – 1.000
Leakage Current:	Leak-HI
	Leak-LO Range: 0.00 – 10.00 mA (0=OFF)

OMNIA 8106 Line Leakage Test Mode

DUT Power	Voltage: 0 – 277 VAC
	Current: 15 AAC max continuous
	Short Circuit Protection: 23 AAC, Response Time <3s
Leakage Current	Current Display rms or PEAK
	Range 1: 0.0 μA – 999.9 μA
	Resolution: 0.1 μA/step
	Range 2: 1000 μA – 6000 μA
	Resolution: 1 μA/step
	Accuracy rms: DC to 100 kHz
	± (1.5% of reading +3 counts)
	>100k to 1 MHz
	± 5% of reading, (10.0 μA – 6000 μA)
Measuring Device	
	A UL544 Non Patient
	B UL544 Patient
	C UL2601-1, UL60601-1, IEC601-1, IEC60601-1 EN60601-1
	D UL1563
	E UL1950, UL3101, UL61010, IEC950, IEC1010, IEC 60950, IEC61010, IEC60335-1, IEC60990 Fig4-U2
	H IEC60990 Fig5-U3
	I IEC60990 Fig3-U1

Accredited calibration service available. Includes ISO 17025, ANSI Z540.1-1994, CTL & Denan's Law requirements.

For more information on testing to a specific standard, refer back to the Common Safety Standard Reference Chart.

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