

## ESA 系列彩色多功能安规综合分析仪



旗舰七合一彩色安规综合分析仪，选配内建 500VA 交流电源，同时兼容多种通讯控制接口。一站多任务，解决所有安全顾虑，是系统集成、实验研发优先的解决方案。

### 产品特色

- 一台满足所有安规测试。
- DualCHEK 功能：耐压 (AC/DC) 与接地阻抗 (GB) 可同步进行测试。
- EEC 独有专利之快速放电装置 (Fast Discharge)，能使待测物在测试后 50ms 的极短时间内放电，减低避免残余电压造成人员触电风险。
- 热态耐压测试：能够在 DUT 开机的情况下运行耐压测试。
- 7 组人体模拟线路 (MD)。
- 可量测 AC/DC/AC+DC 电流值，以及支援患者漏电流，患者辅助漏电流量测 (医疗设备 IEC60601 标准)。
- MD 配备 BNC 测量端子可连接示波器或电压表，以实现更加人性化的 MD 校准。

### 通讯介面



USB 介面

RS-232 介面

以太网路卡  
(选购)

GPIB 卡  
(选购)

### 安全特性与产品特点



同步测试

自我检测

缓升上限

充电下限

快速放电

电弧侦测

智慧防高压触  
电线路

外部扩展器连  
接

	交流耐压 (ACW)	直流耐压 (DCW)	绝缘阻抗 (IR)	交流接地阻抗 (AC GB)	导通检测 (GC)	电源泄漏电流 (LLT/TCT)	电气性能测试 (Run)	内建隔离电源
ESA-140A	✓	✓	✓	✓	✓	✓	✓	选购
ESA-150A	500VA	✓	✓	✓	✓	✓	✓	选购

ESA 系列规格		
型号	ESA-140A	ESA-150A
输入电源		
电压 (交流)	115/230V $\pm$ 15% Auto Range	
频率	50/60Hz $\pm$ 5%	
交流耐压测试		
额定输出 (交流)	5kV/50mA	5kV/100mA
输出电压范围	0-5.00kV	
电压解析度	0.01kV	
电压精确度	输出 50/60Hz $\pm$ (1.5% of setting + 5V)	
电流量测范围 (总和)	0.000-50.00mA	0.000-100.00mA
电流解析度 (总和)	0.001/0.01mA	
电流精确度 (总和)	0.000-3.500mA	$\pm$ (2% of reading + 2 counts)
	3.00-100.00mA	
电流量测范围 (真实)	0.000-50.00mA	0.000-100.00mA
电流解析度 (真实)	0.001/0.01mA	
电流精确度 (真实)	0.000-9.999mA	$\pm$ (3% of reading + 50uA)
	10.00-99.99mA	
输出频率	50/60Hz $\pm$ 0.1%	
缓升时间	0.1-999.9s	
缓降时间	0.0-999.9s	
测试时间	0, 0.3-999.9s (0 = continuous)	
时间解析度	0.1s	
时间精确度	$\pm$ (0.1% of setting + 0.05s)	
导通检测	Current: DC 0.1A $\pm$ 0.01A, Ground Resistance: 1.0 $\Omega$ $\pm$ 0.1 $\Omega$	
电流归零调整	0.000-50.00mA (Total current + current offset $\leq$ 50mA)	0.000-99.99mA (Total current + current offset $\leq$ 100mA)
直流耐压测试		
额定输出 (直流)	6kV/20mA	
输出电压范围	0-6.00kV	
电压解析度	0.01kV	
电压精确度	$\pm$ (1.5% of setting + 5V)	
电流量测范围	0.0uA-20.00mA	
电流解析度	0.1uA/0.001mA/0.01mA	
电流精确度	0.0 -350.0uA	$\pm$ (2% of reading + 2 counts)
	0.300-3.500mA	
	3.00-20.00mA	
缓升时间	0.4-999.9s	
缓降时间	0.0, 1.0-999.9s	
测试时间	0, 0.3-999.9s (0 = continuous)	
时间解析度	0.1s	
时间精确度	$\pm$ (0.1% of setting + 0.05s)	
电流缓升上限	> 20mA peak maximum, ON/OFF User Selectable	
放电时间	Less than 100msec for capacitor load	
最大容性负载	1uF < 1KV, 0.75uF < 2KV, 0.5uF < 3KV 0.08uF < 4KV, 0.04uF < 5KV, 0.015uF < 6KV	
电流归零调整	0.0-20mA (Total current + current offset $\leq$ 20mA)	
电弧侦测	The range is from 1-9 (9 is the most sensitive)	
充电下限电流	0.0-350.0uA	
放电时间	< 50ms for no load, < 100ms for capacitor load (all capacitance values in max load spec below)	
导通检测	Current: DC 0.1 A $\pm$ 0.01 A, fixed, Max. Ground Resistance: 1.0 $\Omega$ $\pm$ 0.1 $\Omega$	

型号		ESA-140A	ESA-150A
<b>绝缘阻抗测试</b>			
额定输出 (直流)		1kV/50GΩ	
输出电压范围		30-1000V	
电压解析度		1V	
电压精确度		±(1.5% of setting + 2 counts)	
阻抗量测范围		0.050MΩ-50GΩ	
阻抗解析度		0.001/0.01/0.1/1MΩ	
阻抗精确度	0.050-999.9MΩ 输出 30-499V 内	±(7% of reading + 2 counts)	
	0.050-999.9MΩ 输出 500-1kV 内	±(2% of reading + 2 counts)	
	1G-9.999GΩ 输出 500-1kV 内	±(5% of reading + 2 counts)	
	10G-50GΩ 输出 500-1kV 内	±(15% of reading + 2 counts)	
缓升时间		0.1-999.9s	
缓降时间		0.0, 1.0-999.9s	
测试时间		0, 0.5-999.9s (0 = continuous)	
延迟时间		0.5-999.9s	
时间解析度		0.1s	
时间精确度		±(0.1% of setting + 0.05s)	
充电下限电流		0.000-3.500uA	
<b>交流接地阻抗</b>			
额定输出 (交流)		40 A/600mΩ/8V	
输出电流		1.00-40.00A	
电流解析度		0.01A	
电流精确度		±(2% of setting + 2 counts)	
输出电压		3.00-8.00V	
电压解析度		0.01V	
电压精确度		±(2% of setting + 3 counts)	
线材阻抗归零调整范围		0-200mΩ	
线材阻抗归零调整解析度		1mΩ	
线材阻抗归零调整精确度		±(1% of reading + 3 counts)	
阻抗量测范围		0-600mΩ	
阻抗解析度		1mΩ	
阻抗精确度	1.00-2.99A	±(3% of reading + 3 counts)	
	3.00-40.00A	±(2% of reading + 2 counts)	
输出频率		50/60Hz ± 0.1%	
输出调整率		±(1% of output + 0.02A), Within maximum load limits, and over input voltage range	
测试时间		0, 0.5-999.9s (0 = continuous)	
时间解析度		0.1s	
时间精确度		±(0.1% of setting + 0.05s)	
<b>导通检测</b>			
额定输出 (直流)		0.1A for 0-10.00Ω, 0.01A for 10.1-100.0Ω, 0.001A for 101-1kΩ, 0.0001A for 1.001-10kΩ, 0.1A is Max.	
阻抗归零调整		0.00-10.00Ω	
阻抗归零调整解析度		0.01Ω	
阻抗归零调整精确度		±(1% of reading + 3 counts)	
阻抗量测范围		0.00-10kΩ	
阻抗解析度		0.01/0.1/1Ω	
阻抗精确度	0.00-10.00Ω	±(1 % of reading + 3 counts)	
	10.1-100.0Ω		
	101-1000Ω	±(1 % of reading + 10 counts)	
	1001-10000Ω		
测试时间		0.0, 0.3-999.9s (0 = continuous)	
时间解析度		0.1s	
时间精确度		±(0.1% of setting + 0.05s)	

型号	ESA-140A	ESA-150A
接触电流测试		
测试棒设定	G-L, PH-PL, PH-L (Use HV relay and HV terminal connector)	
泄漏电流范围 1 (有效值)	0.0uA-10.00mA	
泄漏电流解析度 (有效值)	0.0-999.9uA	0.1uA
	1000-8399uA	1uA
	8.40-10.00mA	0.01mA
泄漏电流精确度 (有效值) (交流 + 直流)	DC	$\pm(2\% \text{ of reading} + 3 \text{ counts})^2$
	15Hz < f < 100kHz	$\pm(2\% \text{ of reading} + 3 \text{ counts})^2$
	100kHz < f < 1MHz	$\pm(5\% \text{ of reading}) (> 10.0uA)$
泄漏电流精确度 3 (有效值) (交流)	15Hz < f < 30Hz	$\pm(3\% \text{ of reading} + 5 \text{ counts})^2$
	30Hz < f < 100kHz	$\pm(2\% \text{ of reading} + 3 \text{ counts})^2$
	100kHz < f < 1MHz	$\pm(5\% \text{ of reading}) (> 10.0uA)$
泄漏电流精确度 4 (峰值) (直流)	$\pm(2\% \text{ of reading} + 3 \text{ counts})^2 (> 10.0uA)$	
泄漏电流范围 1 (峰值)	0.0uA-10.00mA	
泄漏电流解析度 (峰值)	0.0-999.9uA	0.1uA
	1000-8399uA	1uA
	8.40-10.00mA	0.01mA
泄漏电流精确度 (峰值) (交流 + 直流)	DC	$\pm(2\% \text{ of reading} + 3 \text{ counts})$
	15Hz < f < 1MHz	$\pm(10\% \text{ of reading} + 2uA)^5$
泄漏电流精确度 2 (峰值) (交流)	15Hz < f < 1MHz	$\pm(10\% \text{ of reading} + 2uA)^5$
泄漏电压范围 1 (有效值)	MD Resistance is 0.5k $\Omega$	0.0mV - 10.00V
	MD Resistance is 1k $\Omega$	0.0mV - 20.00V
	MD Resistance is 1.5k $\Omega$	0.0mV - 30.00V
泄漏电压解析度 (有效值)	0.0-999.9mV	0.1mV
	1000-8399mV	1mV
	8.40-10.00V	1V
泄漏电压精确度 (有效值) (交流 + 直流)	DC	$\pm(2\% \text{ of reading} + 3 \text{ counts})^6$
	15Hz < f < 100kHz	$\pm(2\% \text{ of reading} + 3 \text{ counts})^6$
	100kHz < f < 1MHz	$\pm(5\% \text{ of reading}) (> 10.0mV)$
泄漏电压精确度 2 (有效值) (交流)	15Hz < f < 30Hz	$\pm(3\% \text{ of reading} + 5 \text{ counts})^6$
	30Hz < f < 100kHz	$\pm(2\% \text{ of reading} + 3 \text{ counts})^6$
	100kHz < f < 1MHz	$\pm(5\% \text{ of reading}) (> 10.0mV)$
泄漏电压精确度 3 (有效值) (直流)	$\pm(2\% \text{ of reading} + 3 \text{ counts})^6$	
泄漏电压范围 1 (峰值)	MD Resistance is 0.5k $\Omega$	0.0mV - 5.00V
	MD Resistance is 1k $\Omega$	0.0mV - 10.00V
	MD Resistance is 1.5k $\Omega$	0.0mV - 15.00V
泄漏电压解析度 (峰值)	0.0-999.9mV	0.1mV - 5.00V
	1000-8399mV	1mV
	8.40-15.00V	1V
泄漏电压精确度 (峰值) (交流 + 直流)	DC	$\pm(2\% \text{ of reading} + 3 \text{ counts})$
	15Hz < f < 1MHz	$\pm(10\% \text{ of reading} + 2mV)^7$
泄漏电压精确度 2 (峰值) (交流)	$\pm(10\% \text{ of reading} + 2mV)^7$	
人体模拟线路 (MD)	MD A.	UL544 Non Patient, UL484, IEC60598, UL1363, UL923, UL471, UL867, UL697
	MD B.	UL544 Patient Care
	MD C.	UL2601-1, IEC60601-1, EN60601-1
	MD D.	UL1563
	MD E.	IEC60990 Fig4 U2, IEC 60950-1, IEC60335-1, IEC60598-1, UL484, IEC60065, IEC61010, IEC60065
	MD F.	IEC60990 Fig5 U3, IEC60598-1
	MD G.	Basic measuring element 1k ohm of frequency check
	External MD	User can add one extra MD for his application.

型号	ESA-140A	ESA-150A
MD 元件精确度	Capacitance: $\pm 1\%$ ; Resistance: $\pm 1\%$	
MD 电压限制	Maximum 30Vpeak or 30Vdc	
电流量测	The leakage current is fitting range by leakage current Hi-limit setting value	
频率范围	DC, $15\text{Hz} \leq F \leq 1\text{MHz}$	
内部漏电流	1. Internal Leakage current = 65uA, 2. 277V applied to PH max leakage current = 70uA.	
待测物功率 (交流)	277V/16A	
短路电流保护	23Arms or Inrush Current 68Apeak, Response time RMS < 3s ; Peak < 10uS	
延迟时间	交流 + 直流	0.5-999.9s
	交流 / 直流在自动档位下	1.8-999.9s
	交流 / 直流在固定档位下	1.3-999.9s
测试时间	交流 + 直流	0, 0.5-999.9s
	交流 / 直流	0.1-999.9s (0 = continuous)
时间解析度	0.1s	
时间精确度	$\pm(0.1\% \text{ of reading} + 0.05\text{s})$	

电气性能测试		
功率量测范围	0 - 4500W	
功率精确度	$\pm (5\% \text{ of reading} + 3 \text{ counts})$	
功率因素	0.000 - 1.000	
功率因素精确度	$\pm (8\% \text{ of reading} + 2 \text{ counts})$	
电压量测范围 (交流)	0.0 - 277.0V , 1 $\emptyset$	
电压精确度	$\pm (1.5\% \text{ of reading} + 2 \text{ counts})$	
电流量测范围 (交流)	0.00 - 16.00A	
电流精确度	$\pm (2\% \text{ of reading} + 2 \text{ counts})$	
泄漏电流量测范围	0.00 - 10.00 mA	
泄漏电流精确度	$\pm (2\% \text{ of reading} + 2 \text{ counts})$	
MD (L-G)	Resistor $2k\Omega \pm 1\%$	

一般规格		
远端控制输入讯号	Test, Reset, Interlock, Recall File 1 through 3, Recall File 1 through 7	
远端控制输出讯号	Pass, Fail, Test-in-Process	
记忆组	It has 10000 steps and allow the user to create different memories and steps	
显示器	800 x 480 resolution digital TFT LCD/Contrast 9 Levels 1-9	
介面 8	Standard USB & RS232, Optional Ethernet, GPIB	
外部扩展器连接	Yes	
同步测试	5kVac/25mAac and 25Aac/150m $\Omega$   5kVac/50mAac and 30Aac/150m $\Omega$	
热态 (动态) 耐压测试	To detect the line input voltage to produce a simultaneous sine wave of line power at hipot output	
语言	English/Traditional Chinese/Simplified Chinese	
操作温度 / 储存温度 / 湿度	0 to 40°C/-40 to 75°C/20 to 80%RH	
尺寸 (宽 x 高 x 深), mm	430 x 133 x 500	
重量	36kg	41kg

标准配件

Power Cable (10A)\*1; Power Cable (16A)\*1; Fuse\*1; 1101 Hipot Output Lead - Alligator Clip\*3; 1137 Ground Bond Output Lead - Alligator Clip (40A)\*1; 1138 Ground Bond Return Lead - Alligator Clip (40A); 1224 USB Cable\*1; 1402 Rack Mount Kit for 3U Instrument (with handle)\*2; 1505 Interlock Disable Key\*1; 1905 Touch Current Testing Fixture Socket\*1; Signal Cable\*1

\*Product specifications are subject to change without notice

- For Leakage Current: if the final measured signal is  $> 5.3\text{mA}$ , then the maximum composite signal can be measured is 28Vpeak. If the final measured signal is  $\leq 5.3\text{mA}$ , then the maximum composite signal can be measured is 12Vpeak.  
For Leakage Voltage: if the final measured signal is  $> 8\text{V}$ , then the maximum composite signal can be measured is 28Vpeak. If the final measured signal is  $\leq 8\text{V}$ , then the maximum composite signal can be measured is 12Vpeak.
- When current  $> 5.3\text{mA}$ , the accuracy is  $\pm(5\% \text{ of reading})$ .
- AC cutoff frequency for High Pass Filter is 15Hz on AC only mode.
- AC cutoff frequency for Low Pass Filter is 15Hz on DC only mode.
- When current  $> 5.3\text{mA}$  &  $15\text{Hz} < f < 100\text{kHz}$ , the accuracy is  $\pm(10\% \text{ of reading} + 2 \text{ counts})$ .
- When voltage  $> 8\text{V}$ , the accuracy is  $\pm(5\% \text{ of reading})$ .
- When voltage  $> 8\text{V}$  &  $15\text{Hz} < f < 100\text{kHz}$ , the accuracy is  $\pm(10\% \text{ of reading} + 2 \text{ counts})$ .
- Only one interface can be selected among RS232 & USB, GPIB & Ethernet interface card.

产品型号

● ESA-140A Electrical Safety Compliance Analyzer

● ESA-150A Electrical Safety Compliance Analyzer (500VA)

选购功能

- OPT.109 Replace RS232 Interface by GPIB Interface
- OPT.769 AC Source (500VA)
- OPT.790 IR Output 6kV
- OPT.7020 MD 1k ohm (non-inductive resistor)
- OPT.7021 MD NFPA99 Figure A.8.4.1.3.3
- OPT.7022 MD IEC60974
- OPT.7023 MD IEC60598-1
- OPT.7024 MD NFPA99 Figure A.4.3.3.1.3b

- OPT.7025 MD NFPA99 Figure A.4.3.3.1.3a
- OPT.7027 MD 2k ohm (non-inductive resistor)
- OPT.7030 External HV (P-G/S-G/P-S), Touch Current Measurement (AC/DC/AC + DC) & Cold Resistance Function
- 6600 Series Programmable AC Power Source (6605, 6610, 6620, 6630, 6650)
- 6700 Series Programmable AC Power Source (6705, 6710, 6720, 6730, 6740)

Note: OPT.7020 to OPT.7027 are mutually exclusive, only one Option can be selected.