eec Extech Electronics Co. | IKONIX GROUP

Safer World Through Safety Testing

DATASHEET

AC | DC | AC+DC | 500VA-6,000VA | 0-310V | 0-60A | 5-1200Hz | IEC 61000+ | TÜV SÜD EMC

EAL-5000 SERIES PROGRAMMABLE AC POWER SOURCE

PURE POWER, PURE PERFORMANCE

THE BEST COST PERFORMANCE AC POWER SOURCE SOLUTION EEC EVER CREATED

Design completely with the end-user in mind. The EAL-5000 series provide opulent functionalities and product selections. Make it the ideal solution for various industrial applications and job functions.

KEY FEATURES	YOUR BENEFITS
High power density design up to 3kVA* in 2U chassis and 6kVA* in a 4U chassis.	Easy to use as benchtop or install in a rack mount. Make the work environment handy and tidy for other instrument needs.
Standard, Advanced, and Professional* performance packages tailor for different user vertical and user applications.	Complete coverage on the product development life cycle based on your needs. From R&D, quality testing, manufacturing, to services. A cost-effective solution meets your budgets.
Step, list, pulse, transient and harmonic* mode for simulating various power abnormalities.	In compliance with IEC 61000+ testing standards.
Provide high accuracy and a wide range of frequency and voltage. (5-1200Hz, and 0-310V)	Meets the rigorous demands of a wide variety of testing simulations and applications.
Easy and intuitive user interfaces and operation.	Optimizes overall operating efficiency.
Set up, monitor, and operate remotely via PowerTRAC software.	Simple data compiling and reporting for MES application. Built-in standard waveforms* for faster compliance testing. Suitable for the IoT era.
Quiet operation with uncompromised performance.	Keeping the unwanted noise low for a hazard-free R&D environment and maintaining stable performance in harsh manufacturing floors.
Inherit on 40 years of reputable experience. Committed to delivering high durability products.	Delivering the reliability you can trust and lower the total cost of ownership.
Premium built quality and TÜV certification.	Boosting your confidence in product safety and reliability further. Delivering the result to you and your customer.

* Product or features coming soon (including EAL-5030, EAL-5060, and professional package)
+ The IEC 61000 standards tested includes IEC 61000-3-3,11,12, IEC 61000-4-11,13,14,28,29,34. Some conditions may apply. Contact EEC sales representatives for the complete information.

Introduction

Extech Electronics Co. (EEC) presents next-generation high performance, powerful and reliable AC Power Source. The EAL-5000 series, offers complete line-ups and extensive functionalities. Designed for manufacture, R&D, quality, and service teams. The intuitive user interface, SCPI protocol command, and flexible performance packages meet on different functions and budget needs. With high durability and world-class safety certification. Made the EAL-5000 series a dependable and ideal solution for ATE and manufacture applications.

Broad selectable models and performance packages

Different industries and job functions have different needs. EAL-5000 series has a power rating from 500VA to 6,000-VA. Through EEC enriched experiences, the series designed with standardized packages. The standard is for performing the basics functions, the advanced for manufacturing and the professional is for R&D technical applications.

Model selection guide

Appearance						
Model	EAL-5005	EAL-5012	EAL-5020	EAL-5030* (Coming Soon)	EAL-5040	EAL-5060* (Coming Soon)
Power rating	500VA	1250VA	2000VA	3000VA	4000VA	6000VA
Dimension (W x H x D),mm	430 x 88 x 500				430 x 176 x 500	
Weight	15KG				28KG	

Upgradeable performance packages

Performance packages	Standard	Advanced	Professional*
AC voltage	0 - 310V	0 - 310V	0 - 310V
Frequency	40 - 500Hz	5 - 1200Hz	5 - 1200Hz
AC+DC	-	●	●
Triangle / Square / Clipped sine	-	●	●
Program mode(s)	Simple list mode	Step / List / Pulse / Transient	Step / List / Pulse / Transient
Harmonics* analysis / Waveform edit / Output impedance / Waveform database	-	-	●

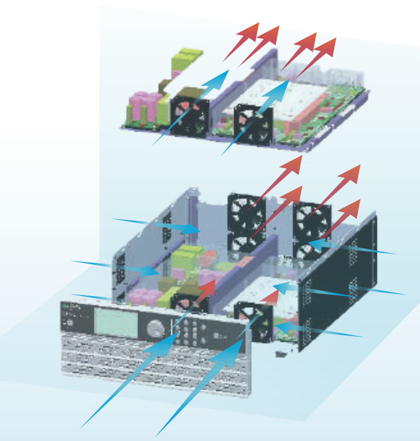
Compact in Size, Quiet in Operation with Uncompromised Performance

An unwanted sound may become a hazard. According to the Occupational Safety and Health Administration (OSHA), exposure to noise may cause physical and psychological stress, reduce productivity, and interfere with communication. EAL Series superior mechanical design, delivering compact in size and low noise without compromising the performance.

EAL-5000 average noise: 52-55dB#
Other brands: 65dB

For Manufacture:

Manufacturing floor often in a harsh environment. Powerful fan ventilation dissipates heat quickly and maintains reliable performance.

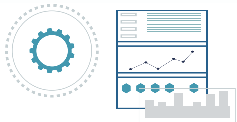


For R&D:

Keeping noise low and build a healthy and sustainable working environment.

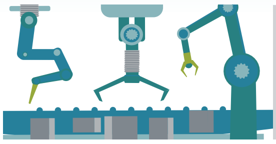
* Product or features coming soon (including EAL-5030, EAL-5060, and professional package)
# Sound level test results vary from the model, configurations, and optional accessories. May be subject to change with the environment's temperature and performance on client devices

Which EAL-5000 series is right for you?



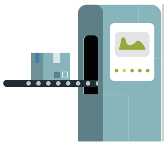
Research and development

- Evaluating various protection against power abnormalities
- Simulating AC, DC, AC+DC outputs simulations
- Voltage conversion simulation
- Conduction power "status" measurements



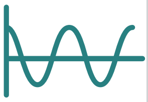
Manufacturing lines

- Constant voltage and constant frequency power supply
- A stable power supply
- Automatic Test Equipment power supply



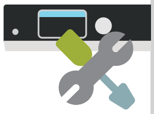
Inspection lines

- Validate and confirm the power voltage margin
- Communicate PowerTRAC through GPIB, RS232 USB or LAN for better record and other quality data managements.



Quality assurance

- Use as a stable power supply
- Conducting tests in compliance with IEC[+] standard



After-sales services

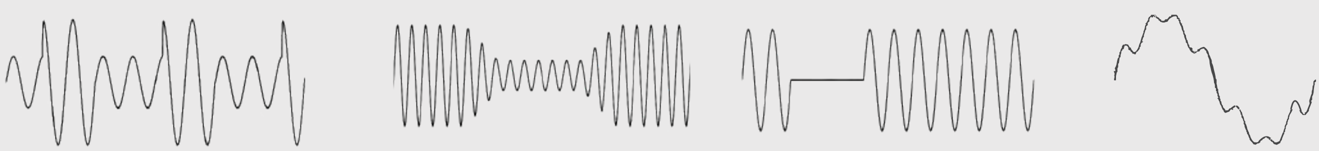
- Use as a stable power supply for repairs and calibrations
- Reproduction of power abnormalities

Complete real-world simulation and standard compliance testing

EAL-5000 Series built-in waveform modes to meet detail-oriented pre-compliance IEC 61000[+] standards. This including list, step, pulse, transient, and harmonics* modes. Further, it can simulate various power abnormal conditions that occurred in real-world environments.

International Standards	Description
IEEE 1547.1	Harmonics emission
IEC 62116	Harmonics emission
IEC 61000-3-2 [a]	Harmonics emission
IEC 61000-3-3	Harmonics emission
IEC 61000-3-11	Harmonics emission
IEC 61000-3-12 [a]	Harmonics emission
IEC 61000-4-11 [b]	Dips & interrupts immunity (AC, ≤16 A per phase)
IEC 61000-4-13 [b]	Harmonics and Inter harmonics(Professional model)
IEC 61000-4-14 [b]	Voltage fluctuation immunity
IEC 61000-4-28 [b]	Variation of power frequency immunity
IEC 61000-4-29 [b]	Voltage drop (dip), instantaneous power failure and voltage variation
IEC 61000-4-34 [b]	Dips & interrupts immunity (AC, >16 A per phase)

Voltage surge	Voltage dips (Drop)	Power outage	Harmonic*



+ The IEC 61000 standards tested includes IEC 61000-3-3,11,12, IEC 61000-4-11,13,14,28,29,34. Some conditions may apply. Contact EEC sales representatives for the complete information.
a. Meet under specific range, detail contact sales representative for complete information
b. Based on such standard waveform simulation
* Product or features coming soon (including EAL-5030, EAL-5060, and professional package)

Easy and intuitive user interfaces crafted for efficient operation

The user experience matters and any unfriendliness affect operational efficiency. EAL Series flexible rotating knob operation and numeric panel for faster setting efficiency. Give you a better power of control.

Set up, monitor, and operate remotely via PowerTRAC software

In the IoT era, data and connectivity matter. PowerTRAC is EEC proprietary software for the power source. That empowers the EAL-5000 series in full remote control. Generates valuable datasets for future analysis. Built-in standard waveforms* for faster compliance testing.

PowerTRAC™ Software

Inherit on 40 years of reputable experience. Committed to delivering high durability products

Building a reliable product is within EEC DNA. We care what our customer cares. We commit to design and build reliable and safe to use with stable performance products from stringent quality control, validation, and material used. Our goal is to reduce the total cost of ownership.

Premium built quality and TÜV certification

The quality and reliability we committed from design, the material used, and put into harsh test certified up by TÜV. Makes EAL-5000 series the world-class safe and reliable AC power source for manufactures to ensure their product receives world-class devices recognition.

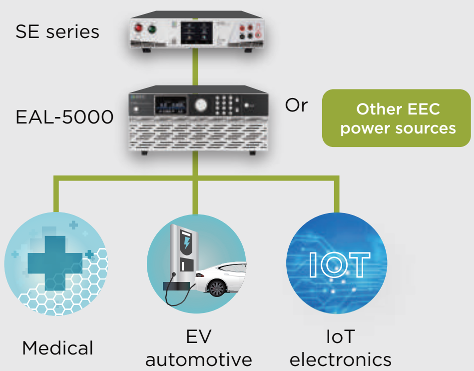
TÜV SÜD EMC

CUSTOMER SATISFACTION ★GUARANTEED★

1978 40 YEARS

Best companion for complete safety testing

- ACW/DCW/IR/GB safety testing in one compact system.
- Optional power outputting maximum at 500VA.
- Up to 16 channels on multi-functional products, increasing testing efficiency.
- Fast discharge function helps the DUT rapidly discharge excess. electricity within 50ms to maximize operator safety.
- True Negative Voltage Technology benefited from performing tests on electric motors.
- Communication interface including RS-232, USB, GPIB (optional) and Ethernet (optional).



SE SERIES

ELECTRICAL SAFETY ANALYZER

* Product or features coming soon (including EAL-5030, EAL-5060, and professional package)

Specifications

MODEL			EAL-5005	EAL-5012	EAL-5020	EAL-5030*	EAL-5040	EAL-5060*
AC OUTPUT								
Phase			1Ø2W					
Power Rating			500VA	1250VA	2000VA	3000VA	4000VA	6000VA
Voltage (AC)	Range		0 - 310V, 155/310V Auto Range					
	Resolution		0.1V					
	Accuracy		±(0.2% of setting + 3counts)				±(0.2% of setting + 6counts)	
Max. Current (r.m.s)[1]	0 - 155V		5A @ 100V	12.5A @ 100V	20A @ 100V	30A @ 100V	40A @ 100V	60A @ 100V
	0 - 310V		2.5A @ 200V	6.25A @ 200V	10A @ 200V	15A @ 200V	20A @ 200V	30A @ 200V
Frequency	Range	Std.[2]	DC, 40- 500Hz Full Range Adjust					
		Adv.&Pro.*[2]	DC, 5 - 1200Hz Full Range Adjust					
	Resolution		0.1Hz at 0.0 - 999.9Hz , 1Hz at 1000 - 1200Hz					
	Accuracy[3]		±0.03% of setting(≧15Hz) , ±0.3% of setting(<15Hz)					
THD(Total Harmonic Distortion)[4]			≦0.3% @ 50/60Hz (Full Resistive Load)					
Crest Factor			≧3					
Inrush Current			4 times current rating					
Line Regulation			±0.1V					
Load Regulation[5]			±0.2V,<1s response time					
DC OUTPUT								
Power Rating			300W	750W	1200W	1800W	2400W	3600W
Voltage (DC)	Range		0 - 420V, 210/420V Auto Range					
	Resolution		0.1V					
	Accuracy		±(0.2% of setting + 3counts)				±(0.2% of setting + 6counts)	
Max. Current[3]	0 - 210V		3.0A	7.5A	12.0A	18.0A	24.0A	36.0A
	0 - 420V		1.5A	3.75A	6.0A	9.0A	12.0A	18.0A
Ripple & Noise (rms)[6]	Range	L	< 700mV				< 800mV	
		H	< 700mV				< 800mV	
Ripple & Noise (p-p)[6]			< 6.0Vp-p				< 7.0Vp-p	
Load Regulation[5]			±0.2V,<1s response time					
SETTINGS								
Start Angle	Range		0-359°					
	Resolution		1°					
Current Hi Limit (OC Fold=OFF) OC Fold Back (OC Fold = ON)	0 - 155V		0.05 - 5.00A	0.05 - 12.50A	0.05 - 20.00A	0.1 - 30.00A	0.10 - 40.00A	0.10 - 60.00A
	0 - 310V		0.05 - 2.50A	0.05 - 6.25A	0.05 - 10.00A	0.1 - 15.00A	0.10 - 20.00A	0.10 - 30.00A
	Resolution		0.01 A					
	Accuracy		± (2.0% of setting + 4 counts)					
OC Fold Back Response Time[7]			< 1.4s					
Time	Range		1.0 - 999.9h/ 1.0 - 999.9m /1.0 - 999.9s /0.2 - 999.9ms					
	Resolution		0.1h/ 0.1m/ 0.1s/ 0.1ms					
	Accuracy		± (0.1% + 0.1 h)/ ± (0.1% + 0.1 m)/ ± (0.1% + 0.1 s)/ ± (0.1% + 0.1 ms)					
Time unit			h, m, s, ms					
Ramp up	Range		0.1 - 999.9s, 0 = OFF					
	Resolution		0.1s					
	Accuracy		± (0.1% + 1 Cycle) at Output frequency ≦ 10Hz/ ± (0.1% + 0.1 s) at Output frequency > 10Hz					
INPUT								
Phase			1Ø					1Ø or 3Ø
Voltage			100 - 240 V ± 10%			200 - 240 V ± 10%		1Ø/3Ø3W: 200-240V±10% 3Ø4W: 346 - 416V ± 10%
Max. Current			8A	18A	30A	22A	30A	1Ø :45A/3Ø3W: 22A 3Ø4W: 22A
Frequency			47 - 63 Hz					
Power Factor (at Full load)[8]			≧ 0.93	≧ 0.97				
MEASUREMENT								
Voltage(AC)	Range		0 - 310V, 155/310V Auto Range					
	Resolution		0.1V					
	Accuracy		±(0.2% of reading + 3counts) at voltage > 5V				±(0.2% of reading + 6counts) at voltage > 5V	
Voltage(DC)	Range		0 - 420V, 210/420V Auto Range					
	Resolution		0.1V					
	Accuracy		±(0.2% of reading + 3counts) at voltage > 5V				±(0.2% of reading + 6counts) at voltage > 5V	
Current(AC,DC)[9]	Range	L	0.050 - 1.200A	0.050 - 5.000A		-		
		H	1.00 - 6.25A	4.00 - 15.62A	4.00 - 25.00A	0.10 - 37.50A	0.10 - 50.00A	0.10 - 75.00A
	Resolution	L	0.001A			-		
		H	0.01A					
	Accuracy	L	± (1% of reading + 10counts) at CF < 3				-	
		H	± (0.5% of reading +8counts)				± (0.5% of reading +12counts)	
Frequency	Range		0.0 - 1200Hz					
	Resolution		0.1Hz / 1Hz					
	Accuracy		±0.1Hz @ 5 - 999.9Hz. / ±1Hz @ 1000 - 1200Hz					
Power(AC,DC)[10]	Range	L	0.0 - 75.0W	0.0 - 300.0W		-		
		H	60 - 625W	240 - 1563W	240 - 2500W	0 - 3750W	0 - 5000W	0 - 7500W
	Resolution	L	0.1W			-		
		H	1W					
	Accuracy	L	± (1% of reading +10 counts) at PF ≧ 0.35 and voltage > 5V	± (2% of reading +15 counts) at PF ≥ 0.35 and voltage > 5V		-		
		H	± (1% of reading +5 counts) at PF ≧ 0.35 and voltage > 5V	± (1% of reading +10 counts) at PF ≥ 0.35 and voltage > 5V			± (1% of reading +20 counts) at PF ≥ 0.35 and voltage > 5V	
Power Factor	Range		0.000 - 1.000					
	Resolution		0.001					
	Accuracy		W/VA, Calculated and displayed to three significant digits					
Power Apparent (VA)	Range	L	0.0 - 75.0VA	0.0 - 300.0VA		-		
		H	60 - 625VA	240 - 1563VA	240 - 2500VA	0 - 3750VA	0 - 5000VA	0 - 7500VA
	Resolution	L	0.1VA			-		
		H	1VA					
	Calculated Formula		V×A ,Calculated value					

Specifications

MODEL			EAL-5005	EAL-5012	EAL-5020	EAL-5030*	EAL-5040	EAL-5060*
MEASUREMENT								
Peak Current Measurement	Range		0.0 - 20.0Apk	0.0 - 50.0Apk	0.0 - 80.0Apk	0.0 - 120.0Apk	0.0 -160.0Apk	0.0 -240.0Apk
	Resolution		0.1A					
	Accuracy		± (0.5% of reading +8counts)				± (0.5% of reading +12counts)	
Reactive Power Measurement	Range	L	0.0 - 75.0VAR	0.0 - 300.0VAR		-		
		H	60 - 625VAR	240 - 1563VAR	240 - 2500VAR	0 - 3750VAR	0 - 5000VAR	0 - 7500VAR
	Resolution	L	0.1VAR			-		
		H	1VAR					
	Calculated Formula		$\sqrt{(VA)^2-(W)^2}$, Calculated value					
Crest Factor Measurement	Range		0.00 - 10.00					
	Resolution		0.01					
	Accuracy		Ap / A					
GENERAL								
PLC Remote Control			Input:Output ON, Output OFF/Reset, Output Verify, Interlock,File Recall M1 through M7, Trigger Output: Fail, Test-in-Process					
Rear Input			AC Outlet	Terminal Block				
Memory	Std. [2]		10 x 100 (file x sequence) / MANUAL only 10 file no sequence					
	Adv. & Pro.*[2]		100 x 100 (file x sequence) / MANUAL, STEP, PULSE only 100 file no sequence					
Sync Signal / Ext Trigger	Std. [2]		-					
	Adv. & Pro.*[2]		ON / START / END / BOTH / OFF / EVENT, Output Signal 5V ,BNC type					
Display			4.3" TFT LCD					
Protection			OCP, OVP, OPP, OTP, LVP, RCP and FAN.					
Interface			Standard USB, PLC remote, LAN, Analog / Option GPIB, RS-232					
Effieciency (at Full load) [11]			≧74%	≧81%	≧84%	≧83%	≧84%	≧85%
Response Time (Tr/Tf) [12]			275-400usec (Typical)					
Electromagnetic compatibility (EMC)			Complies with the requirements of the following directive and standards. EMC Directive 2014/30/EU EN 55011:2016/A1:2017 (Group 1, Class A), EN 61326-1:2013, EN 61326-2-1:2013, EN 61000-3-11:2000, EN 61000-3-12:2011					
Safety			Complies with the requirements of the following directive and standards. Low Voltage Directive 2014/30/EU, EN 61010-1					
Op. / Non-Op. Temp. / Humidity [13]			0 to 40°C/-40 to 75°C/20 to 80%RH					
Dimension (W x H x D), mm			430 x 88 x 500	430 x 88 x 500	430 x 88 x 500	430 x 88 x 500	430 x 176 x 500	430 x 176 x 500
Weight			15KG	15KG	15KG	15KG	28KG	28KG
STANDARD ACCESSORIES								
Interlock Disable Key (1505)			X1					
USB Cable			X1					
Shorting bar			X1					
Power Cord (125Vac/10A)			X1	-				

1. At working voltage 100V / 200V
2. Std. = Standard, Adv.=Advanced, Pro.=Professional
3. At voltage > 10V
4. Maximum distortion is tested at 100 - 155V (155V Range) and 200 - 310V (310V Range) with a maximum current to a resistive load
5. For output frequencies>100Hz reference the Load Regulation. Output will stabilize to ±0.5V , <1S
6. DC to 300 kHz components at voltage=0V
7. At output frequency 30Hz - 1200Hz. Response time < 7S at output frequency 5 - 29.9Hz. Response time < 2S at DC output
   When the OC_FOLD function is enabled, the transient current and power cannot exceed 110% of rated current and power, otherwise the protection will be triggered
8. 500 / 1250 / 2000 / 3000VA: Input voltage is from 100V to 240V,maximum output power to linear load,sine wave,output frequency 30Hz to 1200Hz
   4000 / 6000VA: Input voltage is from 200V to 240V,maximum output power to linear load,sine wave,output frequency 30Hz to 1200Hz
9. At 10% to 100% of the maximum rated current
10. At 10% to 100% of the maximum rated power
    If the output current exceeds the current measurement L range power measurement accuracy follows the H range
11. Efficiency is tested at input voltage 220Vac with maximum power to a linear load output frequency 5Hz to 500Hz
12. At 10% to 90% of output voltage
13. The operating humidity is non-condensing

* Product or features coming soon (including EAL-5030, EAL-5060, and professional package)

\# Sound level test results vary from the model, configurations, and optional accessories. May be subject to change with the environment's temperature and performance on client devices

Order information

Model number	Description
EAL-5005	Standard Programmable AC Power Source 0 - 310V / 40 - 500Hz (500VA)
EAL-5012	Standard Programmable AC Power Source 0 - 310V / 40 - 500Hz (1.25kVA)
EAL-5020	Standard Programmable AC Power Source 0 - 310V / 40 - 500Hz (2kVA)
EAL-5030 * (Coming Soon)	Standard Programmable AC Power Source 0 - 310V / 40 - 500Hz (3kVA)
EAL-5040	Standard Programmable AC Power Source 0 - 310V / 40 - 500Hz (4kVA)
EAL-5060 * (Coming Soon)	Standard Programmable AC Power Source 0 - 310V / 40 - 500Hz (6kVA)
OPT.678	Standard Firmware Upgrade to Advanced
OPT.679 * (Coming Soon)	Standard Firmware Upgrade to Professional
OPT.680 * (Coming Soon)	Advanced Firmware Upgrade to Professional
1539	GPIB interface
1540	RS-232 interface

Contact information			
TEL	MALAYSIA + 60-3-78429168	SUZHOU 400-780-2008	TAIPEI + 886-2-21653066
MAIL	Sales@eecextech.com		
WEBSITE	www.eecextech.com		

Contact us