AMREL™

eLOAD

PROGRAMMABLE DC ELECTRONIC LOADS

Industry-trusted AMETEK eLoad brand providing testing solutions across diverse applications in Telecommunications, Oil/Gas, Utility sector to Alternative Energy fuel cells and Electric Vehicle system testing.

60W-200kW
up to 1,250+V and 5,000A
High-voltage
High-current

Ultra-low Voltage
Air-cooled
Water-cooled
Ethernet

USB/IEEE/RS-232
Zero-volt
Low-profile (1U)

AMETEK®
PROGRAMMABLE POWER

ABOUT AMREL™ POWER

AMREL Power, acquired by AMETEK, Inc. in 2010, now joins AMETEK's San Diego-based Programmable Power Division. The AMREL brand boasts the award winning eLOAD line of Air and Water-cooled Electronic Loads up to 200kW+, 5000Adc and 1200Vdc ratings, an array of Fuel Cell Testing Solutions (0-Volt & ultra-low voltage eLOADs and Frequency Response Analyzer), and the ePOWER line of Programmable switching mode & Linear Power Supplies from 15W-150kW+ and up to 2500Adc and 1000Vdc.

AMETEK Programmable Power is the new global leader in the design and manufacture of precision, programmable power supplies and electronic loads for R&D, test and measurement, process control, power bus simulation and power conditioning applications across diverse industrial segments. Broad product and solutions offerings and depth of expertise make AMETEK Programmable Power your trusted power partner.

AMETEK Programmable Power is a division of AMETEK, Inc, a multi-billion dollar company and leading global manufacturer of electronic instruments and electromechanical devices.

CONTENTS

1	**AMREL eLoad SELECTION GUIDE**
2	**WHY AMREL** How is AMREL Customer Driven
3	AMREL Sets New Standards
4-5	**eLoad PROGRAMMABLE LOAD BANK SOLUTIONS** **LPL Series of Low-profile 1U Air-cooled eLoad Solutions** 300 ~ 800W/60 ~ 800Vdc/3 ~ 100Adc or Custom-tailored Ratings Available Interfaces: RS-232, GPIB, Ethernet and USB
6-7	**PLA Series of Air-cooled eLoad Solutions** 800W ~ 100kW+/60 ~ 1,250Vdc/50 ~ 5000Adc or Custom-tailored Ratings Available Interfaces: RS-232, GPIB, Ethernet and USB
8-9	**PLW Series of High-power Water-cooled eLoad Solutions** 6kW ~ 200kW+/60 ~ 1,250Vdc/50 ~ 5000Adc or Custom-tailored Ratings Available Interfaces: RS-232, GPIB, Ethernet and USB
10-11	**BPL Series of Bench-top Air-cooled eLoad Solutions** 400W or 800W/60 ~ 800Vdc/15 ~ 200Adc or Custom-tailored Ratings Available Interfaces: RS-232, GPIB, Ethernet and USB
12-13	**FCL Series of Fuel Cell eLoad Solutions** 200W or 1.5kW/10Vdc, 20Vdc or 30Vdc/100 ~ 200Adc or Custom-tailored Ratings Available Interfaces: RS-232, GPIB, Ethernet and USB
14-15	**ZVL Series of Zero-volt Air-cooled eLoad Solutions** 60W, 100W, 150W, 200W, 400W, 800W, 1.5kW or 300W/10Vdc or 20Vdc/10 ~ 100Adc Custom-tailored Ratings Available Interfaces: Ethernet, USB, RS-232 and GPIB
16-17	**FEL Series of Ultra-low Voltage eLoads & PEL Series of Low-power eLoads** 60W, 150W or 300W/10Vdc or 20Vdc/50 ~ 200Adc or Custom-tailored Ratings Available Interfaces: RS-232 and GPIB
18	**FEL, PEL and ZVL "Rackmount" Solutions** 60W, 150W or 300W/10Vdc or 20Vdc/50 ~ 200Adc or Custom-tailored Ratings Available Interfaces: RS-232 and GPIB
19	**FRA Frequency Response Analyzer** Cost-effective FRA Solution for less than $5K Impedance Measurement Program Included 0.1Hz Option Available Available Interfaces: RS-232, GPIB, Ethernet and USB
20	**APPLICATIONS**
21	Battery Testing/Energy Storage & Power Supply/Electronic Components
22	PV
23	Fuel Cell Testing and EIS/Impedance Measurement
24	Military/Defense ATE and Aerospace/Avionics ATE
25	Industrial Solutions University and Research Laboratory Test Solutions
26	**eLOAD SYSTEMS AND CUSTOMIZED SOLUTIONS** General Customization/Systems Capabilities
27-31	Standard and Customized System Solutions

Please note: Specifications contained in this catalog are subject to change without notification.

AMREL eLOAD SELECTION GUIDE

1. Choose your maximum power level.
2. Select your required maximum voltage
3. Find your maximum current requirement
4. Select the product series from the color legend below

Other standard power, voltage and current ratings are available - please contact AMREL if your required rating is not shown below

How To Order

Power — V-Max — A-Max

Ex: PLA 1/5k — 120Vdc — 300Adc

MAX VOLTAGE	Maximum Power Level																				
	60W	100W	150W	200W	300W	400W	600W	800W	1.5kW	2.0kW	2.5kW	3.0kW	4.0kW	5.0kW	6.0kW	7.5kW	9.0kW	12.0kW	18.0kW	24.0kW	36.0kW
	Maximum Current																				
10V	50A		100A		200A	100A		100A	100A												
10V	20A	20A		40A		150A		200A	200A												
10V		40A		100A	100A																
10V		80A	100A																		
20V	50A		100A	100A	200A	100A		100A	100A												
20V						150A		200A	200A												
30V				100A		100A		100A	100A												
30V						150A		200A	200A												
60V	10A		30A		60A	150A		200A							1000A		1500A	1500A	1500A	1500A	1500A
60V			60A		120A			100A													
60V			50A		100A		100A	300A	600A	600A	1000A	1000A	1200A	1200A		1500A					
120V					60A	75A		150A							600A		1000A	1200A	1500A	1500A	1500A
120V								150A	300A	400A	600A	800A	1000A	1200A		1500A					
120V			25A		50A		60A	80A													
150V		20A		40A	40A																
300V							120A														
400V						30A	30A	60A													
400V								120A	100A	200A	300A	300A	600A	400A		600A					
400V			8A		15A			40A							300A		400A	600A	800A	1200A	1500A
600V						20A	60A	40A							200A		300A	400A	600A	800A	1000A
600V							20A	30A													
600V								50A	60A	100A	120A	200A	240A	300A		400A					
600V			5A		10A		30A														
800V			3A		6A	15A	15A	30A													
1000V								10A			20A		50A		80A			150A	200A		300A
1000V															80A						

PEL SERIES
FEL SERIES
ZVL SERIES
BPL SERIES
LPL SERIES
PLA SERIES
PLW SERIES
FCL SERIES

*** Please Note: Custom-tailored ranges are available. All series with the exception of the PLW series are air-cooled. Additional standard models are available.**

ZVL Zero-volt e**Load**s *(pages 14-15)*

LPL Low-profile e**Load**s *(pages 5-6)*

PLW Water-cooled e**Load**s *(pages 8-9)*

BPL Bench-top e**Load**s *(pages 10-11)*

PEL/FEL e**Load**s *(pages 16-17)*

PLA Air-cooled e**Load**s *(pages 6-7)*

FCL Fuel Cell e**Load**s *(pages 12-13)*

AMETEK® PROGRAMMABLE POWER

AMREL eLOAD CONTINUES TO SET INDUSTRY STANDARDS

THE HIGHEST POWER DISSIPATION DENSITY 2U 18kW eLoad

SAVE RACK SPACE! eLoad has the industry's smallest footprint with the highest current, voltage & power ratings available.

eLoad HAS FIELD ENABLED ETHERNET/USB – SAVING TIME AND $$$

As your needs evolve, so will your eLoad. When you're ready to add the Ethernet and/or USB functionality to your eLoad, a simple phone call is all it takes!

eLoad PROVIDES ANTI-CONDENSATION PROTECTION FOR LIGHTS OUT TESTING

A self-decondensation circuit is provided to eliminate internal condensation. The

unique design also offers a water system shutdown when power is removed. This eliminates the chance of condensation resulting from continued water flow during emergency shutdown.

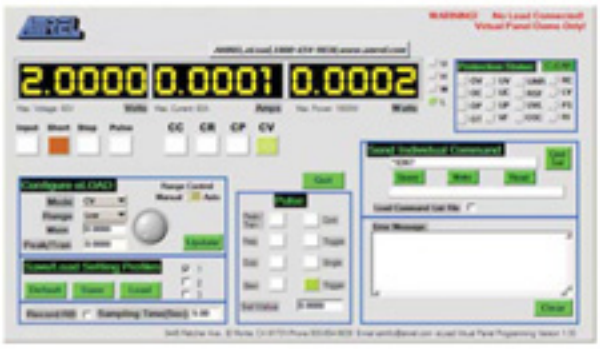
DIGITAL CLOSED-CASE CALIBRATION -- SAVES TIME AND $$$

Calibrating an AMRELeLoad

Traditional Method of Calibration

Calibrating an AMRELeLoad Traditional Method of Calibration

STANDARD WITH eLoad - PC SOFT PANEL & VOLTAGE/CURRENT DATA CAPTURE TO STORE TEST MEASUREMENTS

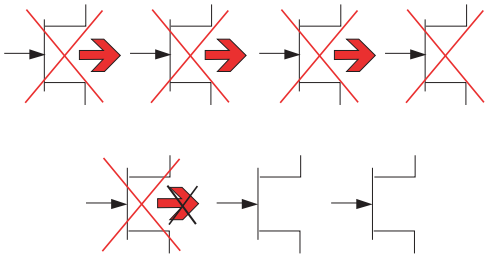


Includes: • Transient Management • Data Monitor

AMREL'S eLoad - THE MOST USER FRIENDLY PANEL IN THE INDUSTRY

Major functions are available through a single button. Most secondary functions that may not be used as frequently require only a few key-strokes. System maintenance and setup functions are menu driven via a LCD display.

eLoad's MOSFET PROTECTION DESIGN FOR MAXIMUM UPTIME



A failed mosfet can have a cascading effect causing failure to other mosfets.

AMREL's unique design decreases the possibility of a single failed mosfet causing additional failures.

An electronic load can contain hundreds of FETs paralleled together. With some standard electronic load designs, the failure of a single FET may damage its parallel FETs or even trigger a catastrophic failure. This may leave the unit beyond repair. On the other hand, AMREL's eLoad is designed to isolate failures by individually protecting each FET.

Why Choose the LPL Series?

In ATE System Applications, rack space is a highly coveted asset. Traditional modular loads require at least 3U (5.25") of rack space, additional mainframe cost, and are limited in power rating, typically below 300W. Why spend your rack space and budget when you don't need to?

AMREL's LPL Series of "Low-profile" dc Electronic eLoads occupies only 1U (1.75") of rack space, while offering the industry's highest power density, making it an ideal ATE solution. With the industry's widest model selection, the LPL Series ranges from 150W to 800W without the added cost of a mainframe or sacrificing valuable rack space. For an economical solution with all the necessary ATE capabilities in an ultra-compact package, the LPL eLoad is your clear choice!

Markets and Applications:

- Battery/Energy Storage/Ultracapacitor Testing and Validation
- dc Power Supply and Battery Charger Validation and Testing
- Fuel Cell Durability, Lifetime and Performance Characterization
- Single Cell and Short Stack Fuel Cell Characterization
- EIS/Impedance Measurement
- Defense/Aerospace and Avionics ATE, Electronics and Power Sources Testing
- Thin-film, Single- & Poly-silicone PV Design Validation and Testing
- Power Supply, Power Electronics/Components Validation and Testing
- Industrial Applications: Generator/Alternator, UPS/Battery Banks, Datacenter Backup Power, and Automotive Power Electronics & Components
- Lab/Bench-top Applications: Ideal for R&D, Testing and QC Engineers
- Power Electronics/Components, dc Distribution & dc-dc Converters
- Universities
- National Research Labs

LPL SERIES

LPL SELECTOR GUIDE

LPL XXX - YY - ZZZ - OPTION*

XXX - POWER | YY - VOLTAGE | ZZZ - CURRENT

I=Isolated Analog Programming Option*

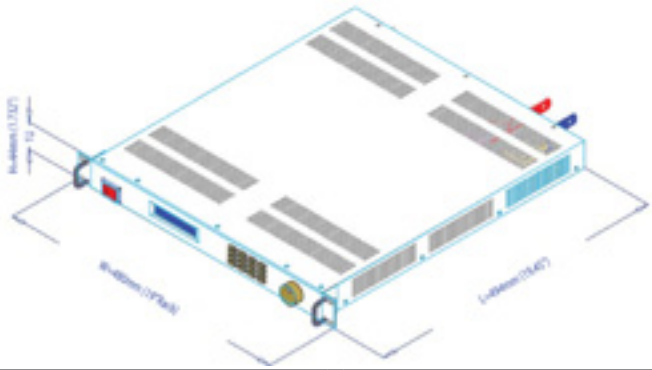
R=Isolation Relay Option*

Series	Model #	Power (W)	Voltage (Vdc)	Current (Adc)	V_{MIN} at I_{MAX}	Size (Height, Depth)
LPL	LPL 150-60-50	150W	60	50	0.5	1U, 21"D
LPL	LPL 150-120-25	150W	120	25	1.75	1U, 21"D
LPL	LPL 150-400-8	150W	400	8	1.6	1U, 21"D
LPL	LPL 150-600-5	150W	600	5	4	1U, 21"D
LPL	LPL300-60-100	300W	60	100	0.6	1U, 21"D
LPL	LPL300-120-50	300W	120	50	1	1U, 21"D
LPL	LPL300-400-15	300W	400	15	1.8	1U, 21"D
LPL	LPL300-600-10	300W	600	10	5	1U, 21"D
LPL	LPL600-60-100	600W	60	100	0.5	1U, 21"D
LPL	LPL600-120-60	600W	120	60	0.72	1U, 21"D
LPL	LPL600-400-20	600W	400	30	1.8	1U, 21"D
LPL	LPL600-600-20	600W	600	20	5	1U, 21"D
LPL	LPL800-60-100	800W	60	100	0.5	1U, 21"D
LPL	LPL800-120-80	800W	120	80	0.96	1U, 21"D
LPL	LPL800-400-40	800W	400	40	2.4	1U, 21"D
LPL	LPL800-600-30	800W	600	30	7.5	1U, 21"D
		Voltage Range: 10Vdc ~ 800Vdc Rating Current Range: 1Adc ~ 100Adc Rating Power Range: 60W ~ 800W Rating				
		Current-tailored Ranges Available				

LOW-PROFILE PROGRAMMABLE AIR-COOLED eLOAD BANK SOLUTIONS

Key Features & Benefits

- **Broadest Model Selection:** 150W, 300W, 600W, 800W Models: 60V, 120V, 400V, 600V, 800V
- **Save Rack Space:** All LPL Models are 1U high & "Zero" Stackable
- **Maximize ROI:** In-rack Closed-case Calibration
- **Ultra-low Compliance Voltage:** Ultra-low Voltage Operation
- **Reliable:** Individual FET Protection to Isolate Power Stage Failures
- **Maximized Uptime:** Redundant Over-temperature and Over-power Protection
- **Fast Response:** 25us Independently Programmable Rise/Fall Time
- **Quiet:** Fan Speed Control for Reduced Acoustic Noise Under Light Load Conditions.
- **Flexible Test Platform:** Five Modes of Operation: CC, CR, CV, CP and Pulse Load Shaping
- **Intuitive Front Panel Control:** User-friendly Function Keys, Full Keypad & Digital Encoder
- **Integrated DMM:** 14-bit 5-digit Voltage and Current Measurement Display
- **Two Loads in One:** Ultra-low Current Range Option for Optimized Accuracy
- **More Ranges:** 3 Full Scale Ranges (100%, 50% & 10%)
- **More Protections:** Anti-oscillation & Programmable Protections: OV, UV, OC, UC, OP, & UP
- **More Interfaces:** Co-resident GPIB/RS-232 & Field-enabled Ethernet/USB Option Available
- **ATE Ready:** Standard LabWindows and LabVIEW Drivers and SCPI Command Set
- **Bench-top Test Automation Ready:** Four Step Profiles; 32 Step Points for Each Profile
- **Fuel Cell Application Ready:**
  - ✦ Impedance Measurement via Frequency Response Analyzer (FRA)
  - ✦ Current Interruption Mode for Fuel Cell Testing
  - ✦ Ultra-low Compliance Voltage to Operate at High Current Down to 0.1Vdc
  - ✦ Virtual Panel provides Polarization Curve Sweep and Voltage/
  - ✦ Current Cycling Capability
- **0 ~ 10Vdc PLC or DAQ Control Ready:**
  - ✦ 0~10Vdc External Analog Programming
  - ✦ External On/Off Control
  - ✦ External Mode Selection Available
  - ✦ Front Panel Key Lockout Prevents Unwanted Key Entry
- **More System Integration Features & Options:**
  - ✦ Standard Remote Inhibit (RI) for Interlock Capability
  - ✦ Standard Dry Contact Fault for Redundant System Protection
  - ✦ Isolated Analog Control/Monitor Option
  - ✦ External dc Contactor
  - ✦ Reverse Polarity/Isolation Relay Option
- **Battery Testing:** "C" Operand for Battery Testing.
- **Ideal for Unique Test Applications:** Custom-tailored Ratings & Features Available



LPL SPECIFICATIONS

CV MODE SPECIFICATIONS	
CVL RANGE	0 ~ 10% of Vmax
CVM RANGE	0 ~ 50% of Vmax
CVH RANGE	0 ~ 100% of Vmax
ACCURACY	0.05% of Value ± 0.1% of Rating
RESOLUTION	1/16000 of Rated Voltage
TRANSIENT TIME (SLOW)	0.500~511.9 (ms)
TRANSIENT TIME (FAST)	0.500~51.9 (ms)

CC MODE SPECIFICATIONS	
CCL RANGE	0 ~ 10% of Imax
CCM RANGE	0 ~ 50% of Imax
CCH RANGE	0 ~ 100% of Imax
ACCURACY	0.05% of Value ± 0.1% of Rating
RESOLUTION	1/16000 of Rated Voltage
TRANSIENT TIME (SLOW)	0.500~511.9 (ms)
TRANSIENT TIME (FAST)	0.050~51.9 (ms)

CR and CP MODE SPECIFICATIONS
Please reference website datasheet for details

GENERAL SPECIFICATIONS	
REMOTE INTERFACES	RS-232, GPIB & USB/ETHERNET
ANALOG PROGRAMMING	0 ~ 10Vdc
ACCURACY	Mode Accuracy ± 0.1% of Rating
VMON ACCURACY	0.10% of RDG ± 0.1% of Rating
IMON ACCURACY	0.10% of RDG ± 0.1% of Rating
FREQUENCY RANGE	0.1Hz ~ 10kHz
ACCURACY	0.10%
AC INPUT	95~249Vac / 48 ~ 62Hz
OPERATING TEMPERATURE	5°C ~ 40°C
DIMENSIONS	21" (L) x 17" (W) x 1.75" (H)

PROTECTION	
OVER POWER PROTECTION	110% Pmax
OVER VOLTAGE PROTECTION	105% Vmax
OVER CURRENT PROTECTION	110% Imax
OVER TEMPERATURE PROTECTION	90°C ± 5°C
REVERSE MAXIMUM CURRENT	110% of Imax
REMOTE INHIBIT (RI)	Short
FAULT INDICATOR	SPDT Relay
Other Programmable Protections: OPP, OVP, OCP, UVL & Anti-Oscillation	

DIELECTRIC STRENGTH	
PRIMARY CIRCUIT TO CHASSIS	1500Vac for 1 Minute
PRIMARY CIRCUIT TO LOAD TERMINAL	1500Vac for 1 Minute
LOAD TERMINAL TO CHASSIS	1500Vdc for 1 Minute

Why Choose the PLA Series?

Traditional dc Electronic Load Solutions are bulky and large in size. Most are offered with standard voltage, current and power ratings. In the ATE world, rack space is a highly coveted asset and application demands are constantly diversifying with new technology development.

AMREL's PLA Series of "Air-cooled" dc Electronic eLoads offers the industry's smallest footprint, the highest power density and current rating, along with the broadest selection of high voltage models on the market. PLA models are capable of being custom-tailored to meet your application requirements.

Markets and Applications:

- Battery/Energy Storage/Ultracapacitor Testing and Validation
- dc Power Supply and Battery Charger Validation and Testing
- Fuel Cell Durability, Lifetime and Performance Characterization
- Single Cell and Short Stack Fuel Cell Characterization
- EIS/Impedance Measurement
- Defense/Aerospace and Avionics ATE, Electronics and Power Sources Testing
- Thin-film, Single- & Poly-silicone PV Design Validation and Testing
- Power Supply, Power Electronics/Components Validation andTesting
- Applications: Generator/Alternator, UPS/Battery Banks, Datacenter Backup Power, and Automotive Power Electronics & Components
- Lab/Bench-top Applications: Ideal for R&D, Testing and QC Engineers
- Power Electronics/Components, dc Distribution & dc-dc Converters
- Universities
- National Research Labs

PLA SELECTOR GUIDE

PLA XXX - YY - ZZZ - OPTION*

XXX - POWER | YY - VOLTAGE | ZZZ - CURRENT

I=Isolated Analog Programming Option*

R=Isolation Relay Option*

Series	Model #	Power (W)	Voltage (Vdc)	Current (Adc)	V_{MIN} at I_{MAX}	Size (Height, Depth)
PLA	PLA800-60-300	800W	60	300	0.6V	2U, 21"D
PLA	PLA800-120-150	800W	120	150	1.8V	2U, 21"D
PLA	PLA800-400-120	800W	400	120	2.7V	2U, 21"D
PLA	PLA800-600-50	800W	600	50	7.8V	2U, 21"D
PLA	PLA1.5K-60-600	1.5kW	60	600	0.6V	2U, 21"D
PLA	PLA1.5K-120-300	1.5kW	120	300	1.8V	2U, 21"D
PLA	PLA1.5K-400-100	1.5kW	400	100	2.7V	2U, 21"D
PLA	PLA1.5K-600-60	1.5kW	600	60	7.8V	2U, 21"D
PLA	PLA2K-60-600	2kW	60	600	0.6V	3U, 25.5"D
PLA	PLA2K-120-400	2kW	120	400	1.8V	3U, 25.5"D
PLA	PLA2K-400-300	2kW	400	300	2.7V	3U, 25.5"D
PLA	PLA2K-600-100	2kW	600	100	8.4V	3U, 25.5"D
PLA	PLA2.5K-60-1000	2.5kW	60	1000	0.6V	3U, 25.5"D
PLA	PLA2.5K-120-600	2.5kW	120	600	1.8V	3U, 25.5"D
PLA	PLA2.5K-400-300	2.5kW	400	300	2.7V	3U, 25.5"D
PLA	PLA2.5K-600-120	2.5kW	600	120	7.8V	3U, 25.5"D
PLA	PLA3K-60-100	3kW	60	1000	0.6V	3U, 25.5"D
PLA	PLA3K-120-800	3kW	120	800	1.6V	3U, 25.5"D
PLA	PLA3K-400-300	3kW	400	300	2.7V	3U, 25.5"D
PLA	PLA3K-600-200	3kW	600	200	7.2V	3U, 25.5"D
PLA	PLA4K-60-1200	4kW	60	1200	0.6V	4U, 25.5"D
PLA	PLA4K-120-1000	4kW	120	1000	1.8V	4U, 25.5"D
PLA	PLA4K-400-600	4kW	400	600	2.7V	4U, 25.5"D
PLA	PLA4K-600-240	4kW	600	240	7.2V	4U, 25.5"D
PLA	PLA5K-60-1200	5kW	60	1200	0.6V	4U, 25.5"D
PLA	PLA5K-120-1200	5kW	120	1200	1.8V	4U, 25.5"D
PLA	PLA5K-400-400	5kW	400	400	2.8V	4U, 25.5"D
PLA	PLA5K-600-300	5kW	600	300	7.8V	4U, 25.5"D
PLA	PLA7.5K-60-1500	7.5kW	60	1500	0.6V	6U, 25.5"D
PLA	PLA7.5K-120-1500	7.5kW	120	1500	1.8V	6U, 25.5"D
PLA	PLA7.5K-400-600	7.5kW	400	600	2.7V	6U, 25.5"D
PLA	PLA7.5K-600-400	7.5kW	600	400	8.4V	6U, 25.5"D

Additional standard models above 7.5kW and up to 250kW+ are available. Please contact AMREL for more details.

Voltage Range: 10Vdc ~ 1200Vdc Rating

Current Range: 10Adc ~ 5000Adc Rating

Power Range: 600W ~ 100KW+ Rating

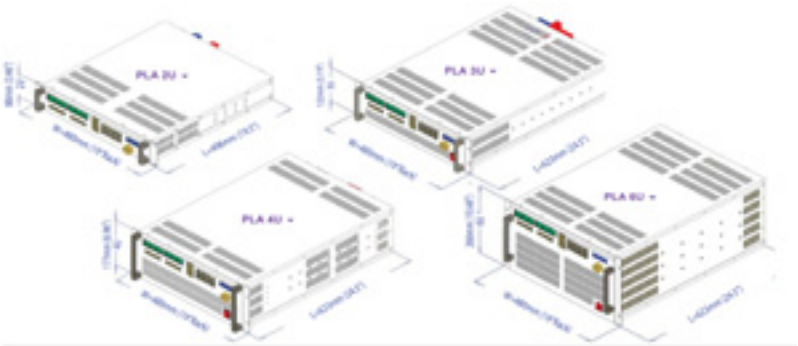
Custom-tailored Ranges Available

PLA SERIES

PROGRAMMABLE AIR-COOLED eLOAD BANK SOLUTIONS

Key Features and Benefits

- **Broadest Model Selection:** 800W, 1.5kW, 2kW, 2.5kW, 3kW, 4kW, 5kW, 7.5kW, 10kW, 15kW, 20kW Models and Higher-power PLA Systems Over 100kW
- **Exclusive High Voltage Models:** Standard 60V, 120V, 400V & 600V Voltage Ratings and widest selection of exclusive 800Vdc and 1,250Vdc PLA Models
- **Save Rack Space:** PLA Models Offer Ultra-compact air-cooled Footprint and are "Zero" Stackable
- **Maximize ROI:** In-rack Closed-case Calibration Without an "Outside" Calibration Lab
- **Ultra-low Compliance Voltage:** Ultra-low Voltage Operation @ 1000's of Amps
- **Reliable:** Individual FET Protection to Isolate Power Stage Failures
- **Maximized Uptime:** Redundant Over-temperature and Over- powerProtection
- **Fast Response:** 50µs Independently Programmable Rise/Fall Time
- **Ultra-quiet Operation:** Fan Speed Control for Reduced Acoustic Noise Under Light Load Conditions.
- **Flexible Test Platform:** Five Modes of Operation: CC, CR, CV, CP and Pulse Load Shaping
- **Intuitive Front Panel Control:** User-friendly Function Hot Keys, Full Keypad & Digital Encoder
- **Integrated DMM:** 14-bit Five digit Voltage and Current Measurement Display
- **Two Loads in One:** Ultra-low Current Range Option for Optimized Accuracy
- **More Ranges:** Three Full Scale Ranges (100%, 50% & 10%)
- More Protections: Anti-oscillation & Programmable Protections: OV, UV, OC, UC, OP, & UP
- **More Interfaces**: Co-resident GPIB/RS-232 and Optional Field-upgradeable Ethernet/USB
- **ATE Ready:** Standard LabWindows and LabVIEW Drivers and SCPI Command Set
- **Bench-top Test Automation Ready:** Four Profiles; 32 Step Points per Profile
- **Fuel Cell Application Ready:**
  - ✦ Impedance Measurement via Frequency Response Analyzer (FRA)
  - ✦ Current Interruption Mode for Fuel Cell Testing
  - ✦ Ultra-low Compliance (0.1Vdc) Voltage to Operate at High-current
  - ✦ Virtual Panel provides Polarization Curve Sweep and Voltage/Current Cycling Capability
- **0 ~ 10Vdc PLC or DAQ Control Ready:**
  - ✦ External Analog Programming
  - ✦ External On/Off Control
  - ✦ External Mode Selection
  - ✦ Front Panel Key Lockout Prevents Unwanted Key Entry
- **More System Integration Features & Options:**
  - ✦ Standard Remote Inhibit (RI) for Interlock Capability
  - ✦ Standard Dry Contact Fault for Redundant System Protection
  - ✦ Isolated Analog Control/Monitor Option
  - ✦ External dc Contactor Option
  - ✦ Reverse Polarity/Isolation Relay Option
- **Battery Testing: "C" Operand for Battery Testing.**
- **Ideal for Unique Test Applications:** Custom-tailored Ratings & Features Available



PLA SPECIFICATIONS

CV MODE SPECIFICATIONS	
CVL RANGE	0 ~ 10% of Vmax
CVM RANGE	0 ~ 50% of Vmax
CVH RANGE	0 ~ 100% of Vmax
ACCURACY	0.05% of Value ± 0.1% of Rating
RESOLUTION	1/16000 of Rated Voltage
TRANSIENT TIME (SLOW)	0.500~511.9 (ms)
TRANSIENT TIME (FAST)	0.500~51.19 (ms)

CC MODE SPECIFICATIONS	
CCL RANGE	0 ~ 10% of Imax
CCM RANGE	0 ~ 50% of Imax
CCH RANGE	0 ~ 100% of Imax
ACCURACY	0.05% of Value ± 0.1% of Rating
RESOLUTION	1/16000 of Rated Voltage
TRANSIENT TIME (SLOW)	0.500~511.9 (ms)
TRANSIENT TIME (FAST)	0.050~51.19 (ms)

CR and CP MODE SPECIFICATIONS
Please reference website datasheet for details

GENERAL SPECIFICATIONS	
REMOTE INTERFACES	RS-232, GPIB & USB/ETHERNET
ANALOG PROGRAMMING	0 ~ 10Vdc
ACCURACY	Mode Accuracy ± 0.1% of Rating
VMON ACCURACY	0.10% of RDG ± 0.1% of Rating
IMON ACCURACY	0.10% of RDG ± 0.1% of Rating
FREQUENCY RANGE	0.1Hz ~ 10kHz
DUTY RANGE	1.000 ~ 100.0%
FREQUENCY & DUTY ACCURACY	0.1% of Setting
AC INPUT	95~240Vac / 48 ~ 62Hz
OPERATING TEMPERATURE	5°C ~ 40°C

PROTECTION	
OVER POWER PROTECTION	110% Pmax
OVER VOLTAGE PROTECTION	105% Vmax
OVER CURRENT PROTECTION	110% Imax
OVER TEMPERATURE PROTECTION	90°C ± 5°C
REVERSE MAXIMUM CURRENT	110% of Imax
REMOTE INHIBIT (RI)	Short
FAULT INDICATOR	SPDT Relay
Other Programmable Protections: OPP, OVP, OCP, UVL & Anti-Oscillation	

DIELECTRIC STRENGTH	
PRIMARY CIRCUIT TO CHASSIS	1500Vac for 1 Minute
PRIMARY CIRCUIT TO LOAD TERMINAL	1500Vac for 1 Minute
LOAD TERMINAL TO CHASSIS	1500Vdc for 1 Minute

Why Choose the PLW Series?

Traditional Water-cooled dc Electronic Load Solutions are bulky, have limited power handling capability, and are prone to water cooling issues such as condensation and external water valve considerations. Furthermore, only standard voltage, current and power ratings are offered. Rack space, reliability, and the right-solution fit are key parameters for lights-out burn-in of power components, fuel cells, batteries, power supplies, alternators and other electronics.

AMREL's PLW Series of "Water-cooled" dc Electronic eLoads are Capable of being custom-tailored to meet your specific application requirements. The PLW Series also offers a unique condensation protection design, the highest power density and current rating, as well as the widest selection of high-voltage models on the market.

Markets and Applications:

- Battery/Energy Storage/Ultra Capacitor Testing and Validation
- Fuel Cell Durability, Lifetime and Performance Characterization
- dc Power Supply and Battery Charger Validation and Testing
- Single Cell and Short Stack Fuel Cell Characterization
- EIS/Impedance Measurement
- Defense/Aerospace and Avionics ATE, Electronics and Power Sources Testing
- Thin-film, Single- & Poly-silicone PV Design Validation and Testing
- Power Supply, Power Electronics/Components Validation and Testing
- Industrial Applications: Generator/Alternator, UPS/Battery Banks, Datacenter Backup Power, and Automotive Power Electronics & Components
- Lab/Bench-top Applications: Ideal for R&D, Testing and QC Engineers
- Power Electronics/Components, dc Distribution & dc-dc Converters
- Universities
- National Research Labs

PLW SELECTOR GUIDE

PLW XXX - YY - ZZZ - OPTION*

XXX - POWER | YY - VOLTAGE | ZZZ - CURRENT

I=Isolated Analog Programming Option*

R=Isolation Relay Option*

Series	Model #	Power (W)	Voltage (Vdc)	Current (Adc)	V_{MIN} at I_{MAX}	Size (Height, Depth)
PLW	PLW6K-60-1000	6kW	60	1000	0.6v	2U, 27.5"D
PLW	PLW6K-120-600	6kW	120	600	1.5v	2U, 27.5"D
PLW	PLW6K-400-300	6kW	400	300	3.6v	2U, 27.5"D
PLW	PLW6K-600-200	6kW	600	200	12v	2U, 27.5"D
PLW	PLW6K-800-25	6kW	800	25	6v	2U, 27.5"D
PLW	PLW6K-1000-25	6kW	1000	25	6v	2U, 27.5"D
PLW	PLW9K-60-1500	9kW	60	1500	0.6v	2U, 27.5"D
PLW	PLW9K-120-1000	9kW	120	1000	1.5v	2U, 27.5"D
PLW	PLW9K-400-400	9kW	400	400	3.6v	2U, 27.5"D
PLW	PLW9K-600-300	9kW	600	300	12v	2U, 27.5"D
PLW	PLW9K-800-40	9kW	800	40	6v	2U, 27.5"D
PLW	PLW9K-1000-40	9kW	1000	40	6v	2U, 27.5"D
PLW	PLW12K-60-1500	12kW	60	1500	0.6v	2U, 27.5"D
PLW	PLW12K-120-1200	12kW	1202	1200	1.5v	2U, 27.5"D
PLW	PLW12K-400-600	12kW	400	600	3.6v	2U, 27.5"D
PLW	PLW12K-600-400	12kW	600	400	12v	2U, 27.5"D
PLW	PLW12K-800-50	12kW	800	50	6v	2U, 27.5"D
PLW	PLW12K-1000-50	12kW	1000	50	6v	2U, 27.5"D
PLW	PLW18K-60-1500	18kW	60	1500	0.6v	2U, 27.5"D
PLW	PLW18K-120-1500	18kW	120	1500	1.5v	2U, 27.5"D
PLW	PLW18K-400-800	18kW	400	800	3.6v	2U, 27.5"D
PLW	PLW18K-600-600	18kW	600	600	12v	4U, 27.5"D
PLW	PLW18K-800-75	18kW	800	75	6v	2U, 27.5"D
PLW	PLW18K-1000-75	18kW	1000	75	6v	2U, 27.5"D
PLW	PLW24K-60-1500	24kW	60	1500	0.45v	4U, 27.5"D
PLW	PLW24K120-1500	24kW	1202	1500	1.2v	4U, 27.5"D
PLW	PLW24K400-1200	24kW	400	1200	3.6v	4U, 27.5"D
PLW	PLW24K-600-800	24kW	600	800	12v	4U, 27.5"D
PLW	PLW24K-800-100	24kW	800	100	6v	2U, 27.5"D
PLW	PLW24K-1000-100	24kW	1000	100	6v	2U, 27.5"D
PLW	PLW36K-60-1500	36kW	60	1500	0.45v	4U, 27.5"D
PLW	PLW36K-120-1500	36kW	120	1500	0.9v	4U, 27.5"D
PLW	PLW36K-400-1500	36kW	400	1500	3.3v	4U, 27.5"D
PLW	PLW36K-600-1000	36kW	600	1000	10v	4U, 27.5"D
PLW	PLW36K-800-150	36kW	800	150	6v	2U, 27.5"D
PLW	PLW36K-1000-150	36kW	1000	150	6v	2U, 27.5"D

Additional standard models above 36kW and up to 250kW+ are available. Please contact AMREL for more details.

Voltage Range: 10Vdc ~ 1200Vdc Rating

Current Range: 10Adc ~ 5000Adc Rating

Power Range: 6k ~ 100KW+ Rating

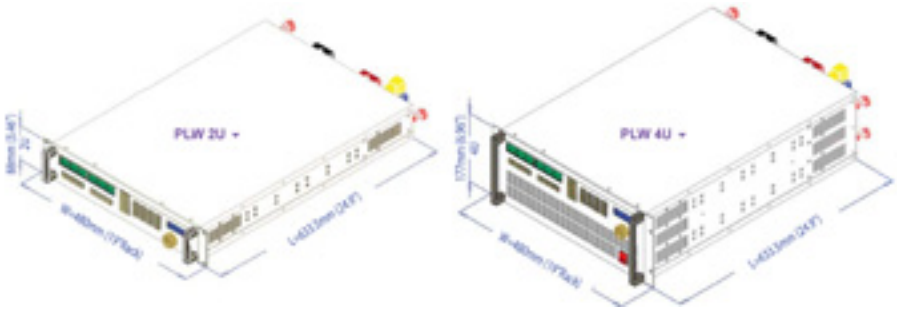
Custom-tailored Ranges Available

PLW SERIES

HIGH-POWER PROGRAMMABLE WATER-COOLED eLOAD SOLUTIONS

Key Features and Benefits

- **Broadest Model Selection:** 6kW, 9kW, 12kW, 18kW, 24kW, 36kW, 48kW, 60kW, 75kW, 100kW, 120kW Models and Higher Power PLW Systems in Excess of 250kW
- **Exclusive High-voltage Models:** Standard 60V, 120V, 400V & 600V Voltage Ratings and Widest Selection of Exclusive 800Vdc and 1200Vdc PLW Models
- **Save Rack Space:** PLW Models Offer Ultra-Compact Footprint and Boasts the Industry's Highest Power Density
- **Maximize ROI:** In-rack Closed-case Calibration Without "Outside" Calibration Lab
- **Ultra-low Compliance Voltage:** Ultra-low Voltage Operation @ 1000's of Amps (5000Adc)
- **Reliable:** Individual FET Protection to Isolate Power Stage Failures
- **Maximized Uptime:** Redundant Over-temperature and Over-power Protection
- **Anti-condensation:** Intelligent Fully-Integrated Temperature Control Circuit and Solenoid Valve Control Prevent Condensation
- **Fast Response:** 50µs Independently Programmable Rise/Fall Time
- **Flexible Test Platform:** Five Modes of Operation: CC, CR, CV, CP and Pulse Load Shaping
- **Intuitive Front Panel Control:** User-friendly Function Hot Keys, Full Keypad & Digital Encoder
- **Integrated DMM:** 14-bit 5-digit Voltage and Current Measurement Display
- **Two Loads in One:** Ultra-low Current Range Option for Optimized Accuracy
- **More Ranges:** Three Full Scale Ranges (100%, 50% & 10%)
- **More Protections:** Anti-oscillation & Programmable Protections: OV, UV, OC, UC, OP, & UP
- **More Interfaces:** Co-resident GPIB/RS-232 and Optional Field-upgradeable Ethernet/USB
- **ATE Ready:** Standard LabWindows and LabVIEW Drivers and SCPI Command Set
- **Test Automation Ready:** Four Profiles; 32 Step Points per Profile
- **Fuel Cell Application Ready:**
  - ✦ Impedance Measurement via Frequency Response Analyzer (FRA)
  - ✦ Current Interruption Mode for Fuel Cell Testing
  - ✦ Ultra-low Compliance (0.1Vdc) Voltage to Operate at High Current
  - ✦ Virtual Panel provides Polarization Curve Sweep and Voltage/Current Cycling Capability
- **0 ~ 10Vdc PLC or DAQ Control Ready:**
  - ✦ 0~10Vdc External Analog Programming
  - ✦ External On/Off Control
  - ✦ External Mode Selection
  - ✦ Front Panel Key Lockout Prevents Unwanted Key Entry
- **More System Integration Features & Options:**
  - ✦ Standard Remote Inhibit (RI) for Interlock Capability
  - ✦ Standard Dry Contact Fault for Redundant System Protection
  - ✦ Isolated Analog Control/Monitor Option
  - ✦ External dc Contactor Option
  - ✦ Reverse Polarity/Isolation Relay Option
- **Battery Testing:** "C" Operand for Battery Testing.
- **Ideal for Unique Test Applications:** Custom-tailored Ratings & Features Available



PLW SPECIFICATIONS

CV MODE SPECIFICATIONS	
CVL RANGE	0 ~ 10% of Vmax
CVM RANGE	0 ~ 50% of Vmax
CVH RANGE	0 ~ 100% of Vmax
ACCURACY	0.05% of Value ± 0.1% of Rating
RESOLUTION	1/16000 of Rated Voltage
TRANSIENT TIME (SLOW)	0.500~511.9 (ms)
TRANSIENT TIME (FAST)	0.500~51.19 (ms)

CC MODE SPECIFICATIONS	
CCL RANGE	0 ~ 10% of Imax
CCM RANGE	0 ~ 50% of Imax
CCH RANGE	0 ~ 100% of Imax
ACCURACY	0.05% of Value ± 0.1% of Rating
RESOLUTION	1/16000 of Rated Voltage
TRANSIENT TIME (SLOW)	0.500~511.9 (ms)
TRANSIENT TIME (FAST)	0.050~51.19 (ms)

CR and CP MODE SPECIFICATIONS
Please reference website datasheet for details

GENERAL SPECIFICATIONS	
REMOTE INTERFACES	RS-232, GPIB & USB/ETHERNET
ANALOG PROGRAMMING	0 ~ 10Vdc
ACCURACY	Mode Accuracy ± 0.1% of Rating
VMON ACCURACY	0.10% of RDG ± 0.1% of Rating
IMON ACCURACY	0.10% of RDG ± 0.1% of Rating
FREQUENCY RANGE	0.1Hz ~ 10kHz
DUTY RANGE	1.000 ~ 100.0%
FREQUENCY & DUTY ACCURACY	0.1% of Setting
AC INPUT	95~240Vac / 48 ~ 62Hz
OPERATING TEMPERATURE	5°C ~ 40°C

PROTECTION	
OVER POWER PROTECTION	105% Pmax
OVER VOLTAGE PROTECTION	105% Vmax
OVER CURRENT PROTECTION	110% Imax
OVER TEMPERATURE PROTECTION	50°C ± 5°C
REVERSE MAXIMUM CURRENT	110% of Imax
REMOTE INHIBIT (RI)	Short
FAULT INDICATOR	SPDT Relay
Other Programmable Protections: OPP, OVP, OCP, UVL & Anti-Oscillation	

DIELECTRIC STRENGTH	
PRIMARY CIRCUIT TO CHASSIS	1500Vac for 1 Minute
PRIMARY CIRCUIT TO LOAD TERMINAL	1500Vac for 1 Minute
LOAD TERMINAL TO CHASSIS	1500Vdc for 1 Minute

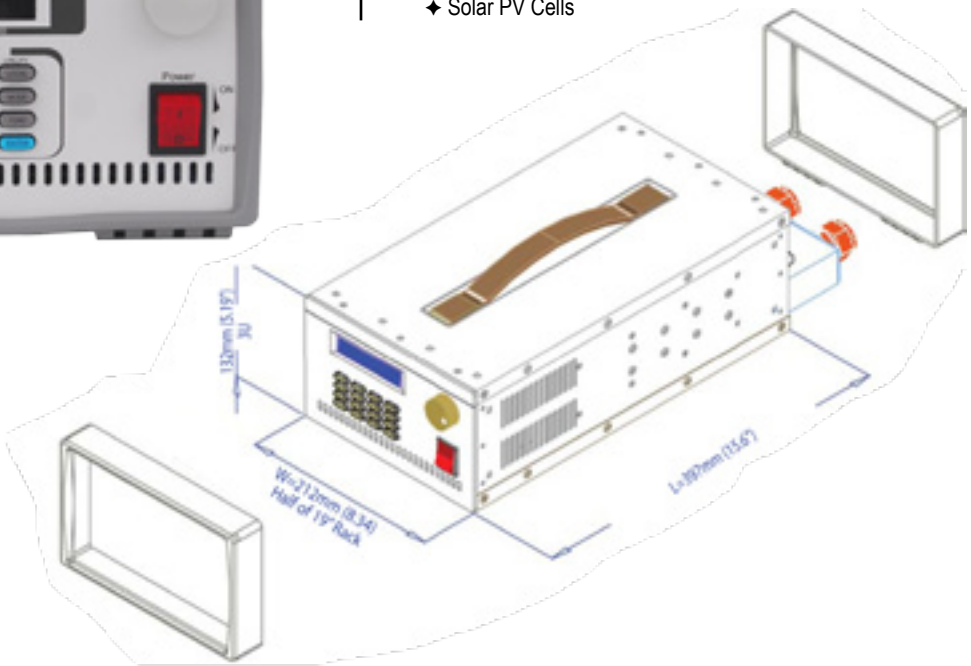
Why Choose the BPL Series?

The BPL Bench-top eLoad strikes the perfect balance between value, features, and ROI. Built on dual current shunt architecture, the BPL provides accurate current readings for high-currents up to 200Adc and low-current readings down to the micro-amps.

AMREL's BPL Series of "Bench-top" dc Electronic eLoads offers high-end performance, the industry's highest power-density and current-rating, fast response time and unparalleled current measurement accuracy in a 3U ½ rack package. The BPL is a full-featured, powerful, ultra-compact, and user-friendly bench-top eLoad.

Markets and Applications:

- Power Electronics Testing
  - ✦ dc-dc Converters
  - ✦ ac-dc Power Supplies
  - ✦ Switching Power Supplies
  - ✦ POL (Point of Load)
- Power Electronic Components Testing
- Battery Chargers & Load Profile Simulation
- Battery Testing and Characterization
- Laboratories, Universities and R&D
- Defense/Aerospace/Avionics/Industrial ATE and Integrated Test Systems
- Portable Applications
- dc Power Sources/Energy Storage
  - ✦ Batteries
  - ✦ Fuel Cells
  - ✦ Ultracapacitors
  - ✦ Solar PV Cells



BPL SELECTOR GUIDE

BPL XXX - YY - ZZZ - AA

XXX - POWER | YY - VOLTAGE | ZZZ - CURRENT

Series	Model #	Power (W)	Voltage (Vdc)	Current (Adc)	V_{MIN} at I_{MAX}	Size (Height, Depth)
BPL	BPL400-60-150	400W	60	150	0.75V	3U, 17.2"D
BPL	BPL400-120-75	400W	120	75	1.5V	3U, 17.2"D
BPL	BPL400-400-30	400W	400	30	3V	3U, 17.2"D
BPL	BPL400-600-20	400W	600	20	8.4V	3U, 17.2"D
BPL	BPL400-800-25	400W	800	15	7.2V	3U, 17.2"D
BPL	BPL800-60-200	800W	60	200	0.75V	3U, 17.2"D
BPL	BPL800-120-150	800W	120	150	1.5V	3U, 17.2"D
BPL	BPL800-400-60	800W	400	60	3V	3U, 17.2"D
BPL	BPL800-600-40	800W	600	40	8.4V	3U, 17.2"D
BPL	BPL800-600-30	800W	800	30	7.2V	3U, 17.2"D
		Voltage Range: 10Vdc ~ 800Vdc Rating Current Range: 1Adc ~ 200Adc Rating Power Range: 150W ~ 800W+ Rating				
		Custom-tailored Ranges Available				

BPL SERIES

AMETEK® PROGRAMMABLE POWER

BENCH-TOP PROGRAMMABLE AIR-COOLED eLOAD BANK SOLUTIONS

Key Features and Benefits

- **Broadest Model Selection:** 400W, 800W, or Custom-tailored Power Rating
- **Exclusive High-voltage Models:** Standard 60V, 120V, 400V & 600V Voltage Ratings and Widest Selection of Exclusive 800Vdc Models
- **Ideal for Unique Test Applications:** Custom-tailored Ratings & Features Available
- **Ultra-current Precision & Accuracy:** Dual-current Shunt Architecture Provides Ultra-accurate Current Measurements and Essentially Two eLoads in a Single Package
- **Save Bench Space:** BPL Models Offer Ultra-compact Footprint [15.65"(L) x 8.35"(W) x 5.20"(H)] and Boasts the Industry's Highest Power Density
- **Maximize ROI:** On-bench Closed-case Calibration without 3rd Calibration Lab
- **Ultra-low Compliance Voltage:** Ultra-low Voltage Operation @ Up to 200 Amps
- **Reliable:** Individual FET Protection to Isolate Power Stage Failures
- **Maximized Uptime:** Redundant Over-temperature and Over-power Protection
- **Ultra-quiet Operation:** Fan Speed Control for Reduced Acoustic Noise Under Light Load Conditions.
- **Fast Response:** 25µs independently Programmable Rise/Fall Time
- **Flexible Test Platform:** Five Modes of Operation: CC, CR, CV, CP and Pulse Load Shaping
- **Intuitive Front Panel Control:** User-friendly Function Hot Keys, Full Keypad & Digital Encoder
- **Integrated DMM:** 14-bit Five Digit Voltage and Current Measurement Display
- **Two Loads in One:** Ultra-low Current Range Option for Optimized Accuracy
- **More Ranges:** Three Full Scale Ranges (100%, 50% & 10%)
- **More Protections:** Anti-oscillation & Programmable Protections: OV, UV, OC, UC, OP, & UP
- **More Interfaces:** Co-resident GPIB/RS-232 and Optional Field-upgradeable Ethernet/USB
- **ATE Ready:** Standard LabWindows and LabVIEW Drivers and SCPI Command Set
- **Test Automation Ready:** Four Profiles; 32 Step Points per Profile
- **Fuel Cell Application Ready:**
  - ✦ Impedance Measurement via Frequency Response Analyzer (FRA)
  - ✦ Current Interruption Mode for Fuel Cell Testing
  - ✦ Ultra-low Compliance (0.1Vdc) Voltage to Operate at High-current
  - ✦ Virtual Panel Provides Polarization Curve Sweep and Voltage/Current Cycling Capability
- **0 ~ 10Vdc PLC or DAQ Control Ready:**
  - ✦ 0~10Vdc External Analog Programming
  - ✦ External On/Off Control
  - ✦ External Mode Selection
  - ✦ Front Panel Key Lockout Prevents Unwanted Key Entry
- **More System Integration Features & Options:**
  - ✦ Standard Remote Inhibit (RI) for Interlock Capability
  - ✦ Standard Dry Contact Fault for Redundant System Protection
  - ✦ Isolated Analog Control/Monitor Option
  - ✦ External dc Contactor Option
- **Battery Testing:** "C" Operand for Battery Testing.

BPL SPECIFICATIONS

CV MODE SPECIFICATIONS	
CVL RANGE	0 ~ 10% of Vmax
CVM RANGE	0 ~ 50% of Vmax
CVH RANGE	0 ~ 100% of Vmax
ACCURACY	0.05% of Value ± 0.1% of Rating
RESOLUTION	1/16000 of Rated Voltage
TRANSIENT TIME (SLOW)	0.250~255.9 (ms)
TRANSIENT TIME (FAST)	0.250~25.59 (ms)

CR and CP MODE SPECIFICATIONS
Please reference website datasheet for details

GENERAL SPECIFICATIONS	
REMOTE INTERFACES	RS-232, GPIB & USB/ETHERNET
ANALOG PROGRAMMING	0 ~ 10Vdc
ACCURACY	Mode Accuracy ± 0.1% of Rating
VMON ACCURACY	0.10% of RDG ± 0.1% of Rating
IMON ACCURACY	0.10% of RDG ± 0.1% of Rating
IMON (CCUL) ACCURACY	CCUL Mode Accuracy ± 0.1% of Rating
FREQUENCY RANGE	0.1Hz ~ 20kHz
ACCURACY	0.10%
AC INPUT	95~240Vac / 48 ~ 62Hz
OPERATING TEMPERATURE	5°C ~ 40°C
DIMENSIONS	15.65" (L) x 8.35" (W) x 5.20" (H)
WEIGHT	22 lbs

CC MODE SPECIFICATIONS	
CCL RANGE	0 ~ 10% of Imax
CCM RANGE	0 ~ 50% of Imax
CCH RANGE	0 ~ 100% of Imax
ACCURACY	0.05% of Value ± 0.1% of Rating
CCUL RANGE	0 ~ 10% of Imax
CCUL ACCURACY	0.05% of Value ± 0.05% of Range
RESOLUTION	1/16000 of Rated Voltage
TRANSIENT TIME (SLOW)	0.250~255.9 (ms)
TRANSIENT TIME (FAST)	0.025~25.59 (ms)

PROTECTION	
OVER POWER PROTECTION	110% Pmax
OVER VOLTAGE PROTECTION	105% Vmax
OVER CURRENT PROTECTION	110% Imax
OVER TEMPERATURE PROTECTION	90°C ± 5°C
REMOTE INHIBIT (RI)	Short
FAULT INDICATOR	SPDT Relay

Other Programmable Protections: OPP, OVP, OCP, UVL & Anti-Oscillation

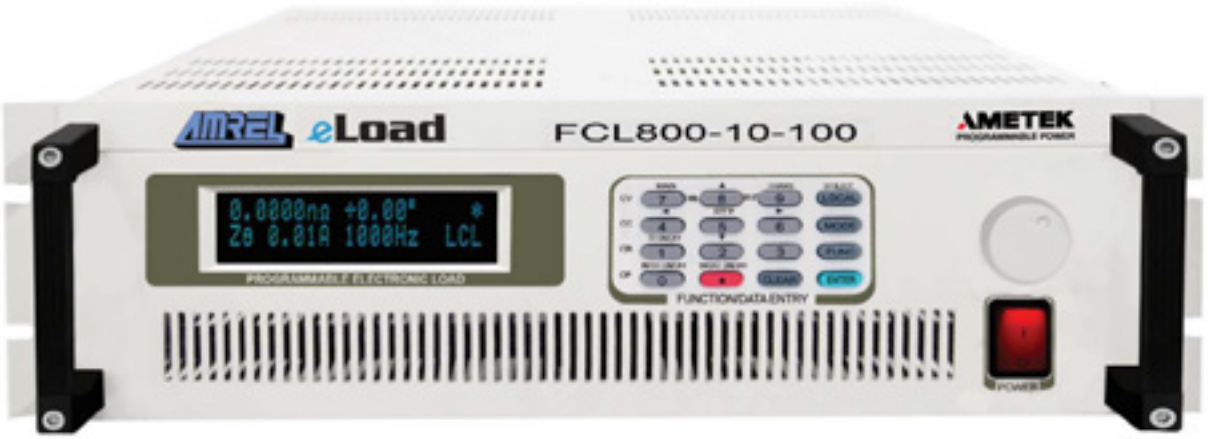
DIELECTRIC STRENGTH	
PRIMARY CIRCUIT TO CHASSIS	1500Vac for 1 Minute
PRIMARY CIRCUIT TO LOAD TERMINAL	1500Vac for 1 Minute
LOAD TERMINAL TO CHASSIS	1500Vdc for 1 Minute

Why Choose the FCL Series?

AMREL's Integrated Fuel Cell Load "FCL" Series is the ideal all-in-one solution that packages a booster supply for true "0-volt at high-current" operations. The FCL also has an embedded FRA for impedance measurement/EIS, and a full featured high-speed dynamic dc load in an ultra-compact 3U (5.25") air-cooled package. AMREL's FCL offers the industry's highest current rating of 200Adc, as well as custom-tailored voltage, current and power ratings.

Markets and Applications:

- Fuel Cells
  - ✦ Single Cell and Short Stack Fuel Cell Characterization, Break-in and Testing Applications
  - ✦ Gstat Impedance Measurement (EIS & AC Modulation)
  - ✦ Polarization Curve Data Capture (CV & CC Control)
  - ✦ Durability
  - ✦ Lifetime Tests
  - ✦ Performance/Design Characterization



FCL SERIES

FCL SELECTOR GUIDE

FCL XXX - YY - ZZZ - OPTION

XXX - POWER | YY - VOLTAGE | ZZZ - CURRENT

L=Low Frequency Option

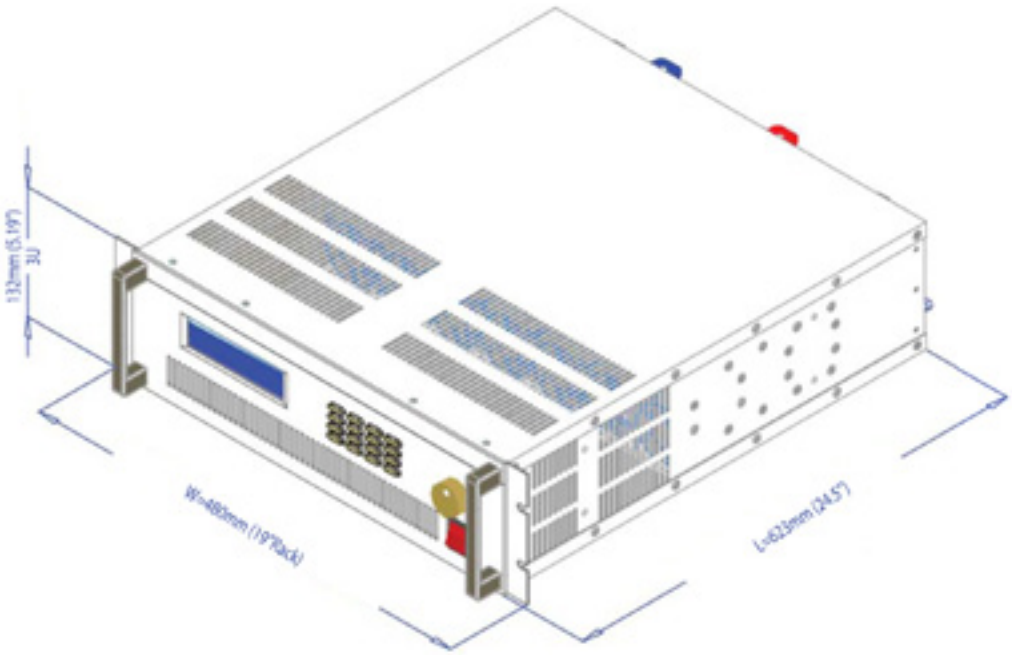
Series	Model #	Power (W)	Voltage (Vdc)	Current (Adc)	V_{MIN} at I_{MAX}	Size (Height, Depth)
FCL	FCL200-10-100	200W	10	100	0Vdc	(5.25", 19.5")
FCL	FCL200-20-100	200W	20	100	0Vdc	(5.25", 19.5")
FCL	FCL200-30-100	200W	30	100	0Vdc	(5.25", 19.5")
FCL	FCL400-10-100	400W	10	100	0Vdc	(5.25", 19.5")
FCL	FCL400-20-100	400W	20	100	0Vdc	(5.25", 19.5")
FCL	FCL400-30-100	400W	30	100	0Vdc	(5.25", 19.5")
FCL	FCL400-10-150	400W	10	150	0Vdc	(5.25", 19.5")
FCL	FCL400-20-150	400W	20	150	0Vdc	(5.25", 19.5")
FCL	FCL400-30-150	400W	30	150	0Vdc	(5.25", 19.5")
FCL	FCL800-10-100	800W	10	100	0Vdc	(5.25", 19.5")
FCL	FCL800-20-100	800W	20	100	0Vdc	(5.25", 19.5")
FCL	FCL800-30-100	800W	30	100	0Vdc	(5.25", 19.5")
FCL	FCL800-10-200	800W	10	200	0Vdc	(5.25", 19.5")
FCL	FCL800-20-200	800W	20	200	0Vdc	(5.25", 19.5")
FCL	FCL800-30-200	800W	30	200	0Vdc	(5.25", 19.5")
FCL	FCL1.5K-10-100	1.5kW	10	100	0Vdc	(5.25", 19.5")
FCL	FCL1.5K-20-100	1.5kW	20	100	0Vdc	(5.25", 19.5")
FCL	FCL1.5K-30-100	1.5kW	30	100	0Vdc	(5.25", 19.5")
FCL	FCL1.5K10-200	1.5kW	10	200	0Vdc	(5.25", 19.5")
FCL	FCL1.5K-20-200	1.5kW	20	200	0Vdc	(5.25", 19.5")
FCL	FCL1.5K-30-200	1.5kW	30	200	0Vdc	(5.25", 19.5")
Custom-tailored Ranges Available		Voltage Range: 10Vdc ~ 800Vdc Rating Current Range: 1Adc ~ 200Adc Rating Power Range: 60W ~ 1500W+ Rating				

AMETEK® PROGRAMMABLE POWER

AIR-COOLED PROGRAMMABLE eLOAD FUEL CELL TEST SOLUTIONS

Key Features and Benefits

- **Embedded FRA** (Frequency Response Analyzer) Without the Hassles of External Cables
- **Built-in Booster Power Supply** to Test Down to 0Vdc at Full Operating Current
- **Fully Integrated** 200W, 400W, 800W and 1.5kW Air-cooled Electronic eLoad
- **Impedance Measurement Software** Without the Costs of Purchasing Additional Software
- **CC/CV/CR/CP Operating Modes** to Meet Demanding Application Specific Requirements
- **Dynamic Operation Up to 20kHz** Provides Accurate Impedance Measurements
- **Dynamic Profile Loading Via Voltage and Current Sweeps** for Polarization Curves, Durability/Lifetime Tests, Simulate Real-world Applications and Other Dynamic Test Requirements
- **LabVIEW & LabWindows Drivers, Virtual Panel & SCPI Commands** for Simple ATE Integration
- **The One-box Solution** for Testing Electrical Specs, Validating Performance Targets and Evaluating the Impedance Losses for Fuel Cells
- Widest Model Selection - 10Vdc/20Vdc/30Vdc FCL Rated at 100 or 200Amps and Custom-tailored Models Available



FCL SPECIFICATIONS

CV MODE SPECIFICATIONS	
CVL RANGE	0 ~ 10% of Vmax
CVM RANGE	0 ~ 50% of Vmax
CVH RANGE	0 ~ 100% of Vmax
ACCURACY	0.05% of Value ± 0.1% of Rating
RESOLUTION	1/16000 of Rated Voltage
TRANSIENT TIME (SLOW)	0.150~153.6 (ms)
TRANSIENT TIME (FAST)	0.150~15.36 (ms)

CC MODE SPECIFICATIONS	
CCL RANGE	0 ~ 10% of Imax
CCM RANGE	0 ~ 50% of Imax
CCH RANGE	0 ~ 100% of Imax
ACCURACY	0.05% of Value ± 0.1% of Rating
RESOLUTION	1/16000 of Rated Voltage
TRANSIENT TIME (SLOW)	0.150~153.6 (ms)
TRANSIENT TIME (FAST)	0.015~15.36 (ms)

CR and CP MODE SPECIFICATIONS
Please reference website datasheet for details

GENERAL SPECIFICATIONS	
REMOTE INTERFACES	RS-232, GPIB & USB/ETHERNET
ANALOG PROGRAMMING	0 ~ 10Vdc
ACCURACY	Mode Accuracy ± 0.1% of Rating
VMON ACCURACY	0.10% of RDG ± 0.1% of Rating
IMON ACCURACY	0.10% of RDG ± 0.1% of Rating
FREQUENCY RANGE	0.1Hz ~ 20kHz
ACCURACY	0.10%
AC INPUT	95~240Vac / 48 ~ 62Hz
OPERATING TEMPERATURE	5°C ~ 40°C
DIMENSIONS	19.5" (L) x 17" (W) x 5.25" (H)

PROTECTION	
OVER POWER PROTECTION	110% Pmax
OVER VOLTAGE PROTECTION	105% Vmax
OVER CURRENT PROTECTION	110% Imax
OVER TEMPERATURE PROTECTION	90°C ± 5°C
REVERSE MAXIMUM CURRENT	110% of Imax
REMOTE INHIBIT (RI)	Short
FAULT INDICATOR	SPDT Relay
Other Programmable Protections: OPP, OVP, OCP, UVL & Anti-Oscillation	

DIELECTRIC STRENGTH	
PRIMARY CIRCUIT TO CHASSIS	1500Vac for 1 Minute
PRIMARY CIRCUIT TO LOAD TERMINAL	1500Vac for 1 Minute
LOAD TERMINAL TO CHASSIS	1500Vdc for 1 Minute

Why Choose the ZVL Series?

Traditional dc Electronic Load Solutions have inherent limitations for testing single cell fuel cells and PV cells/modules. DC electronic loads use power dissipating components that require a minimum compliance voltage of 0.6Vdc ~ 1.5Vdc for operation. However, single cell fuel cell and PV cells often require the dc electronic load to operate at below
0.1Vdc. To achieve this, an external booster supply connected in series is required. The drawbacks of using an external booster supply are twofold: cost and cumbersome hardware. This is especially the case for single cell fuel cells. Single cells, depending on the active cell area, can range from 10Adc up to 200Adc. The additional cabling can be troublesome and costly. In addition, booster supplies range between $500 ~ $1K+ in cost.

AMREL's ZVL Series of Zero-volt dc Electronic eLoads was designed for Fuel Cell and PV Testing, offering the industry's highest current rating for "0-Volt" operation along with custom-tailored voltage and current ratings to meet diverse applications. All this in a compact fully-integrated rackmount-ready package!

Markets and Applications:

- Fuel Cells
  - ✦ Single Cell and Short Stack Fuel Cell Characterization, Break-in and Testing Applications
  - ✦ Gstat Impedance Measurement (EIS & AC Modulation)
  - ✦ Polarization Curve Data Capture (CV & CC Control)
  - ✦ Durability
  - ✦ Lifetime Tests
  - ✦ Performance/Design Characterization
- Battery Testing
  - ✦ Dynamic Profiling
  - ✦ Battery Characterization
  - ✦ Charge/Discharge and Lifetime/Cycle Tests
- Power Electronics Testing
  - ✦ dc-dc Converters
  - ✦ ac-dc Power Supplies
  - ✦ Switching Power Supplies
  - ✦ POL (Point of Load)
- Power Electronic Components Testing
- Battery Chargers & Load Profile Simulation
- Battery Testing and Characterization
- Laboratories, Universities and R&D
- Defense/Aerospace/Avionics/Industrial ATE and Integrated Test Systems
- Portable Applications

ZVL SELECTOR GUIDE

ZVL XXX - YY - ZZZ

XXX - POWER | YY - VOLTAGE | ZZZ - CURRENT

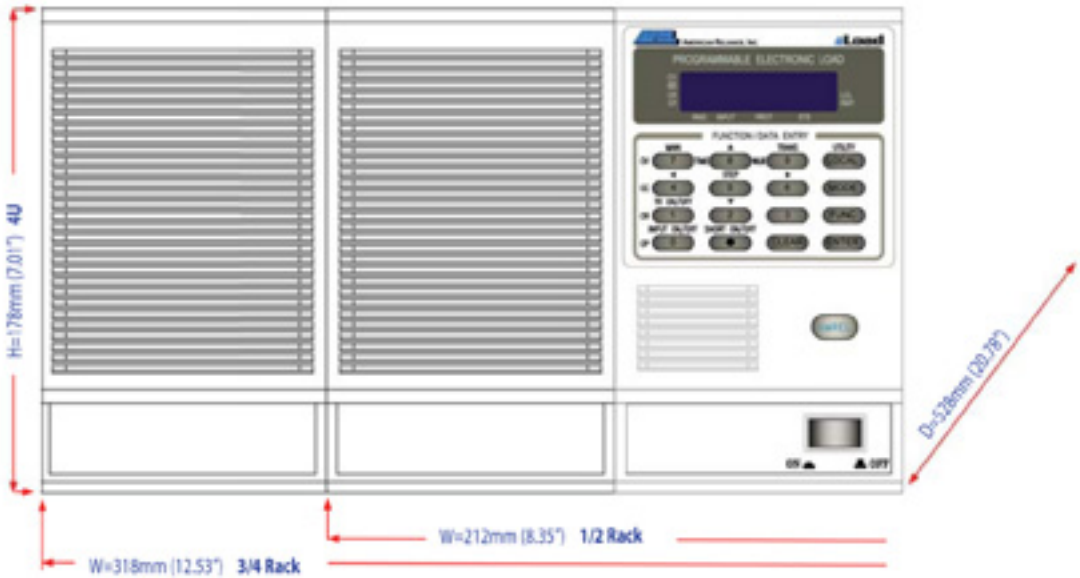
Series	Model #	Power (W)	Voltage (Vdc)	Current (Adc)	V_{MIN} at I_{MAX}	Size (Height, Depth)
ZVL	ZVL60-10-20L	60	10	20	0V	4U, 1/2 Rack
ZVL	ZVL100-10-20L	100	10	40	0V	4U, 1/2 Rack
ZVL	ZVL100-10-40L	100	10	40	0V	4U, 1/2 Rack
ZVL	ZVL100-10-80L	100	10	80	0V	4U, 1/2 Rack
ZVL	ZVL100-150-200L	100	150	20	0V	4U, 1/2 Rack
ZVL	ZVL150-10-100L	150	10	100	0V	4U, 1/2 Rack
ZVL	ZVL200-10-40L	200	10	40	0V	4U, 1/2 Rack
ZVL	ZVL200-10-100LP	200	10	100	0V	1U, 21"D
ZVL	ZVL200-20-100LP	200	20	100	0V	1U, 21"D
ZVL	ZVL200-30-100LP	200	30	100	0V	1U, 21"D
ZVL	ZVL200-150-40L	200	150	40	0V	4U, 1/2 Rack
ZVL	ZVL300-10-100L	300	10	100	0V	4U, 3/4 Rack
ZVL	ZVL300-150-40La	300	150	40	0V	4U, 3/4 Rack
ZVL	ZVL400-10-100	400	10	100	0V	3U, 21"D
ZVL	ZVL400-20-100	400	20	100	0V	3U, 21"D
ZVL	ZVL400-30-100	400	30	100	0V	3U, 21"D
ZVL	ZVL400-10-150	400	10	150	0V	3U, 21"D
ZVL	ZVL400-20-150	400	20	150	0V	3U, 21"D
ZVL	ZVL400-30-150	400	30	150	0V	3U, 21"D
ZVL	ZVL800-10-100	800	10	100	0V	3U, 21"D
ZVL	ZVL800-20-100	800	20	100	0V	3U, 21"D
ZVL	ZVL800-30-100	800	30	100	0V	3U, 21"D
ZVL	ZVL800-10-150	800	10	150	0V	3U, 21"D
ZVL	ZVL800-20-150	800	20	150	0V	3U, 21"D
ZVL	ZVL800-30-150	800	30	150	0V	3U, 21"D
Custom-tailored Ranges Available		Voltage Range: 10Vdc ~ 150Vdc Rating Current Range: 5Adc ~ 100Adc Rating Power Range: 60W ~ 300W+ Rating				

ZVL SERIES

ZERO-VOLT PROGRAMMABLE AIR-COOLED eLOAD BANK SOLUTIONS

Key Features and Benefits

- **Broadest Model Selection:** 60W, 100W, 150W, 200W, 300W or Custom-tailored Power Ratings
- **Exclusive Voltage Models:** Standard 10V, 20V, 150V and Custom-tailored Voltage Ratings
- **Ideal for Unique Test Applications:** Custom-tailored Ratings & Features Available
- **True Zero volt Operation:** Fully Integrated Booster Supply and dc Electronic Load
- **Rackmount and Bench Ready:** Rackmount Kits Available
- **Maximize ROI:** On-bench Closed-case Calibration Without Outside Calibration Lab
- **Reliable:** Individual FET Protection to Isolate Power Stage Failures
- **Maximized Uptime:** Redundant Over-temperature and Over-power Protection
- **Ultra-Quiet Operation:** Fan Speed Control for Reduced Acoustic Noise Under Light Load Conditions.
- **Flexible Test Platform:** Five Modes of Operation: CC, CR, CV, CP and Pulse Load Shaping
- **More Interfaces:** GPIB/RS-232
- **ATE Ready:** Standard LabWindows and LabVIEW Drivers and SCPI Command Set
- **Test Automation Ready:** 99-point Dynamic Profile Simulation in CV or CC Mode
- **Fuel Cell Application Ready:**
  - ✦ Impedance Measurement via Frequency Response Analyzer (FRA)
  - ✦ 0-volt Operation for Generating Polarization Curves Down to 0-volts
  - ✦ Virtual Panel provides Polarization Curve Sweep and Voltage/Current Cycling Capability
  - ✦ CSV V-I Data-logging Feature to Store and Organize Important Test Data
- **0 ~ 10Vdc PLC or DAQ Control Ready:**
  - ✦ 0~10Vdc External Analog Programming
  - ✦ External On/Off Control
  - ✦ External Mode Selection
  - ✦ Front Panel Key Lockout Prevents Unwanted Key Entry
- **The Smart Solution:** The ZVL is a Fully-integrated Zero-volt eLoad Designed to Maximize Return on Investment with Minimal or Zero Maintenance Costs, Quality High Performance, and Other Useful Features to Jumpstart Your Important Testing Applications Today



ZVL SPECIFICATIONS

CV MODE SPECIFICATIONS	
CVL RANGE	0 ~ 100% of Vmax
ACCURACY	0.2% of Value ± 0.1% of Rating
RESOLUTION	1/300 of Rated Voltage
CV TRANSIENT TIME	1ms ~ 273ms for 0Vdc to Vmax

CR and CP MODE SPECIFICATIONS
Please reference website datasheet for details

GENERAL SPECIFICATIONS	
REMOTE INTERFACES	RS-232, GPIB
CC MODE ANALOG PROGRAMMING	0 ~ 10Vdc corresponds to 0~ Imax
ACCURACY	Mode Accuracy ± 0.1% of Rating
VMON ACCURACY	0.10% of RDG ± 0.1% of Rating
IMON ACCURACY	0.10% of RDG ± 0.1% of Rating
AC INPUT	115/230Vac | 50/60Hz
OPERATING TEMPERATURE	5°C ~ 40°C

CC MODE SPECIFICATIONS	
CCL RANGE	0 ~ 10% of Imax
CCM RANGE	0 ~ 100% of Imax
ACCURACY	0.2% of Value ± 0.1% of Rating
RESOLUTION	1/3600 of Rated Current
CC TRANSIENT TIME	27ms ~ 0.100ms for 0Adc to Imax

PROTECTION	
OVER POWER PROTECTION (OPP)	110% * Pmax
RESOLUTION	1/4000 of Rated Power
ACCURACY	1% of Setting ± 0.5% of Rating
OVER VOLTAGE PROTECTION (OVP)	115% * Vmax
OVP RESOLUTION	1/4000 of Rated Voltage
OVP ACCURACY	0.20% of Setting ± 0.25% of Rating
OVER CURRENT PROTECTION (OCP)	110% * Imax
OCP RESOLUTION	1/4000 of Rated Current
OCP ACCURACY	0.20% of Setting ± 0.25% of Rating

PEL & FEL SERIES

Why Choose the PEL Series?

For years the test and measurement industry was in need of a portable, general-purpose dc electronic load. The available load solutions were either rackmount or multichannel mainframe-based. The form factor aside, trim pots were the standard calibration method. Users in the Test and Measurement Industry demanded a load bank solution that was compact and portable, embedded with GPIB/RS-232, capable of bench-top closed-case calibration, offered dynamic operability such as profile simulation and could easily be calibrated on a bench without removing the cover.

AMREL's PEL Series of "Low-power" dc Electronic eLoads, designed for your daily testing needs, offers affordable value, dynamic pulse shaping, auto-sequencing, embedded GPIB/RS-232 and closed-case calibration in a portable rackmount-ready package.

Why Choose the FEL Series?

Traditional load bank solutions were limited by the minimum compliance voltage of internal power dissipating components and the lack of high-current handling capability. The markets for power electronics/components, emerging fuel cell applications and energy storage sources (batteries, ultra capacitors and others) were demanding a dc electronic load solution that was compact enough for simple portability with a voltage/current performance that allowed low-voltage operation at currents exceeding the standard current ratings.

AMREL's FEL Series of "Low-voltage" dc Electronic eLoads offer affordable, compact rackmount-ready programmable loads for high-current dissipation at ultra-low compliance voltage. High current ratings go up to 200Adc.

Markets and Applications:

- Fuel Cells
  - ✦ Single Cell and Short Stack Fuel Cell Characterization, Break-in and Testing Applications
  - ✦ Gstat Impedance Measurement (EIS & AC Modulation)
  - ✦ Polarization Curve Data Capture (CV & CC Control)
  - ✦ Durability
  - ✦ Lifetime Tests
  - ✦ Performance/Design Characterization
- Battery Testing
  - ✦ Dynamic Profiling
  - ✦ Battery Characterization
  - ✦ Charge/Discharge and Lifetime/Cycle Tests
- Power Electronics Testing
  - ✦ dc-dc Converters
  - ✦ ac-dc Power Supplies
  - ✦ Switching Power Supplies
  - ✦ POL (Point of Load)
- Power Electronic Components Testing
- Battery Chargers & Load Profile Simulation
- Laboratories, Universities and R&D
- Defense/Aerospace/Avionics/Industrial ATE and Integrated Test Systems
- Portable Applications

PEL SELECTOR GUIDE

PEL XXX - YY - ZZZ - V

XXX - POWER | YY - VOLTAGE | ZZZ - CURRENT | V - INPUT VOLTAGE

Series	Model #	Power (W)	Voltage (Vdc)	Current (Adc)	V_{MIN} at I_{MAX}	Size (Height, Depth)
PEL	PEL60-60-10	60W	60	10	1V	4U, 1/4 Rack
PEL	PEL150-60-30	150W	60	30	1V	4U, 1/4 Rack
PEL	PEL150-60-60	150W	60	60	1V	4U, 1/4 Rack
PEL	PEL300-60-60	300W	60	60	1V	4U, 1/2 Rack
PEL	PEL300-60-120	300W	60	120	1V	4U, 1/2 Rack
PEL	PEL300-120-60	300W	120	60	1V	4U, 1/2 Rack
PEL	PEL600-120-120	600W	120	120	1V	4U, 3/4 Rack
PEL	PEL600-300-120	600W	300	120	4.2V	4U, 3/4 Rack
PEL	PEL600-600-60	600W	600	60	6V	4U, 3/4 Rack
Custom-tailored Ranges Available		Voltage Range: 10Vdc ~ 600Vdc Rating Current Range: 1Adc ~ 120Adc Rating Power Range: 60W ~ 600W+ Rating		AC Input 0 = 120 1 = 240		

FEL SELECTOR GUIDE

FEL XXX - YY - ZZZ - V

XXX - POWER | YY - VOLTAGE | ZZZ - CURRENT | V - INPUT VOLTAGE

Series	Model #	Power (W)	Voltage (Vdc)	Current (Adc)	Current (Adc @ 0.4 Vdc)	Size (Height, Depth)
FEL	FEL60-1	60W	10	50	50	4U, 1/4 Rack
FEL	FEL60-2	60W	20	50	50	4U, 1/4 Rack
FEL	FEL150-1	150W	10	100	75	4U, 1/4 Rack
FEL	FEL150-2	150W	20	100	75	4U, 1/4 Rack
FEL	FEL300-1	300W	10	200	100	4U, 1/2 Rack
FEL	FEL300-2	300W	20	200	100	4U, 1/2 Rack
Custom-tailored Ranges Available		Voltage Range: 10Vdc ~ 20Vdc Rating Current Range: 1Adc ~ 200Adc Rating Power Range: 60W ~ 300W+ Rating		AC Input 0 = 120V 1 = 240V		

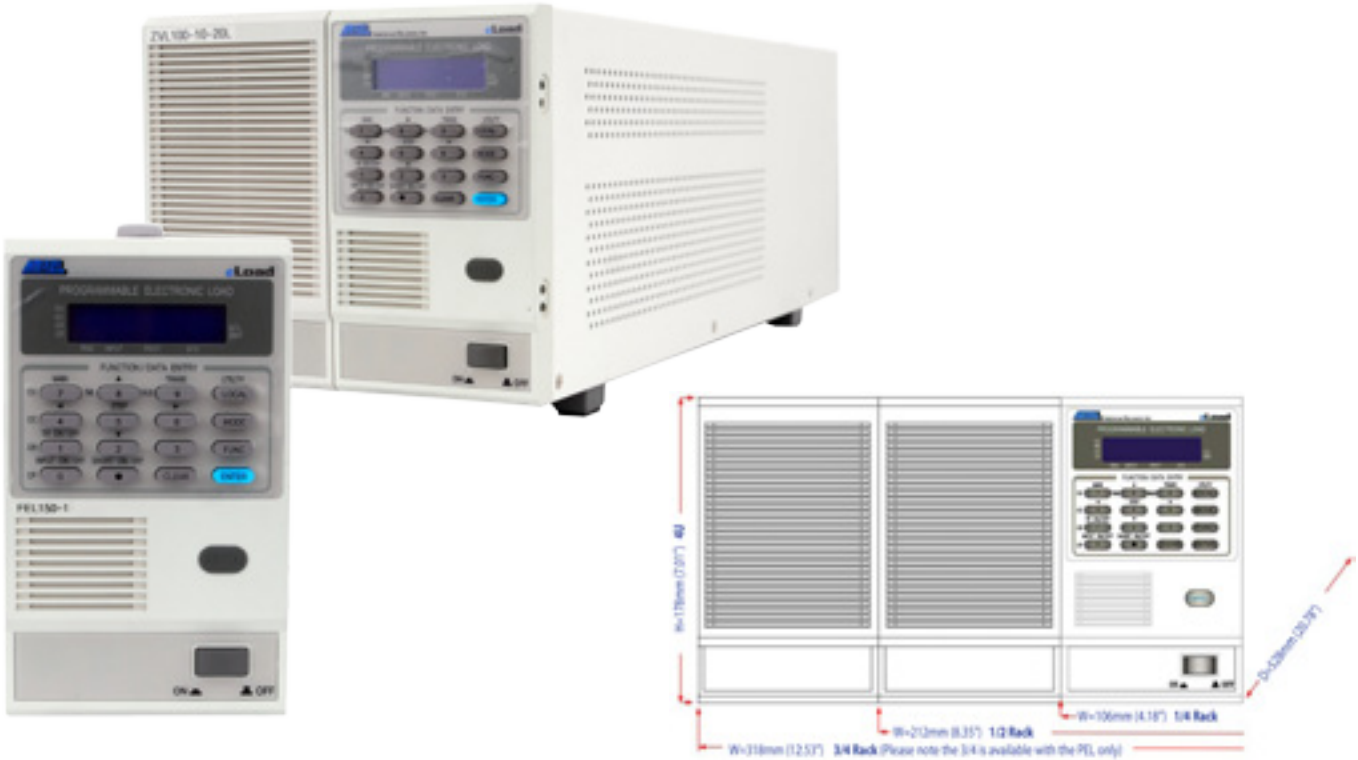
LOW-POWER & ULTRA-LOW VOLTAGE PROGRAMMABLE AIR-COOLED eLOAD BANK SOLUTIONS

PEL Key Features and Benefits:

- Broadest Model Selection: 60W, 150W, 300W, 600W or Custom-tailored Power Ratings
- Exclusive Voltage Models: Standard 60V, 120V, 300V, 600V & Custom-tailored Voltage Ratings
- Ideal for Unique Test Applications: Custom-tailored Ratings & Features Available
- Low-voltage Operation: Up to 120Adc at 1Vdc and Operable Down to 0.1Vdc

FEL Key Features and Benefits:

- Broadest Model Selection: 60W, 150W, 300W or Custom-tailored Power Ratings
- Exclusive Voltage Models: Standard 10V, 20V and Custom-tailored Voltage Ratings
- Ideal for Unique Test Applications: Custom-tailored Ratings & Features Available
- Ultra Low-voltage Operation: Up to 200Adc at 0.8Vdc and Operable Down to 0.1Vdc



PEL & FEL SPECIFICATIONS

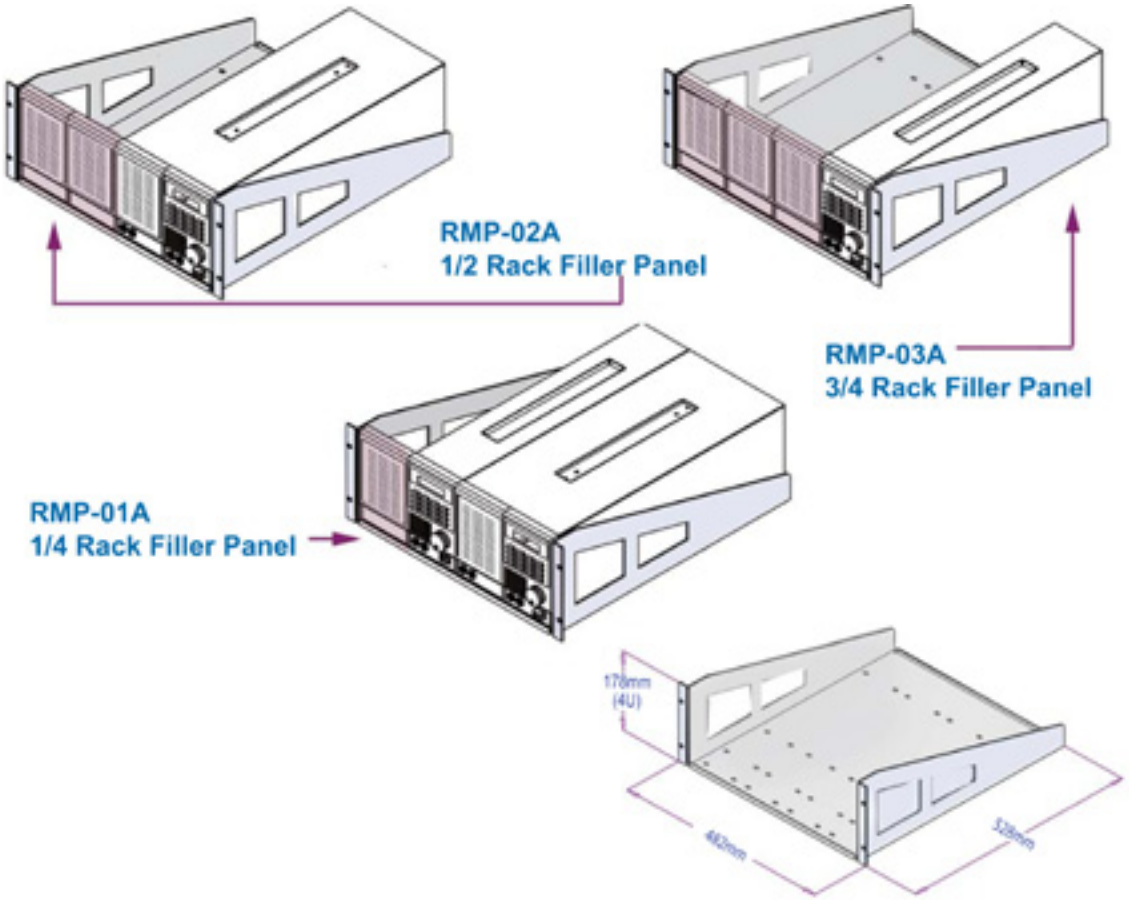
CV MODE SPECIFICATIONS	
CVL RANGE	0 ~ 100% of Vmax
ACCURACY	0.2% of Value ± 0.1% of Rating
RESOLUTION	1/3600 of Rated Voltage
CV TRANSIENT TIME	1ms ~ 270ms for 0Vdc to Vmax

CR and CP MODE SPECIFICATIONS
Please reference website datasheet for details

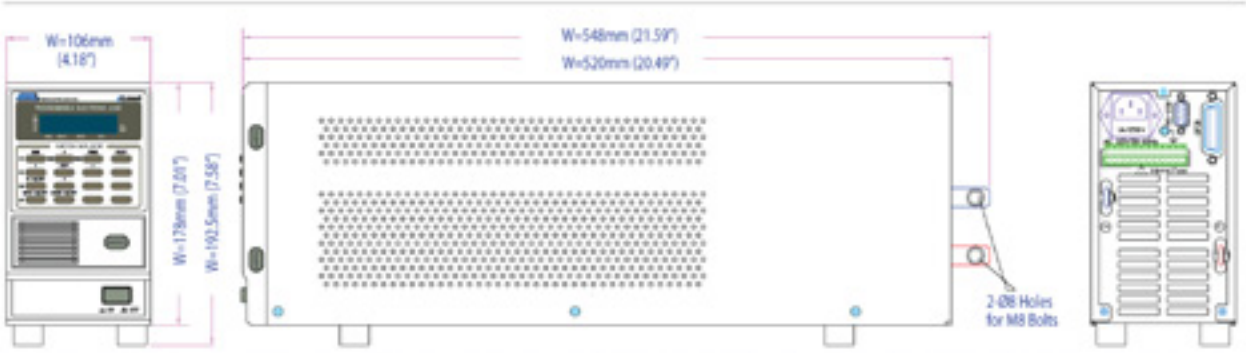
GENERAL SPECIFICATIONS	
REMOTE INTERFACES	RS-232, GPIB
CC MODE ANALOG PROGRAMMING	0 ~ 10Vdc corresponds to 0~ Imax
ACCURACY	Mode Accuracy ± 0.1% of Rating
VMON ACCURACY	0.10% of RDG ± 0.1% of Rating
IMON ACCURACY	0.10% of RDG ± 0.1% of Rating
AC INPUT	115/230Vac | 50/60Hz
OPERATING TEMPERATURE	5°C ~ 40°C

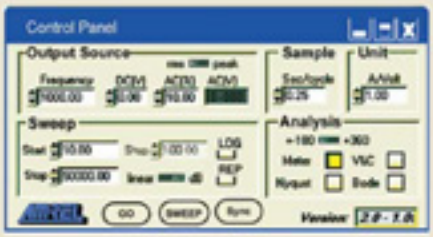
CC MODE SPECIFICATIONS	
CCL RANGE	0 ~ 10% of Imax
CCM RANGE	0 ~ 100% of Imax
ACCURACY	0.2% of Value ± 0.1% of Rating
RESOLUTION	1/3600 of Rated Current
PEL CC TRANSIENT TIME	27ms ~ 0.100ms for 0Adc to Imax
FEL CC TRANSIENT TIME	54ms ~ 0.200ms for 0Adc to Imax

PROTECTION	
OVER POWER PROTECTION (OPP)	110% * Pmax
RESOLUTION	1/4000 of Rated Power
ACCURACY	1% of Setting ± 0.5% of Rating
OVER VOLTAGE PROTECTION (OVP)	110% * Vmax
OVP RESOLUTION	1/4000 of Rated Voltage
OVP ACCURACY	0.20% of Setting ± 0.25% of Rating
OVER CURRENT PROTECTION (OCP)	110% * Imax
OCP RESOLUTION	1/4000 of Rated Current
OCP ACCURACY	0.20% of Setting ± 0.25% of Rating



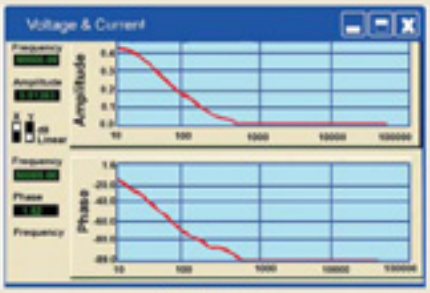
*RM-03 19"
Rackmount Shelf



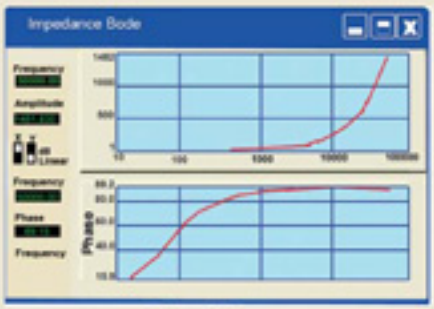


CONTROL PANEL

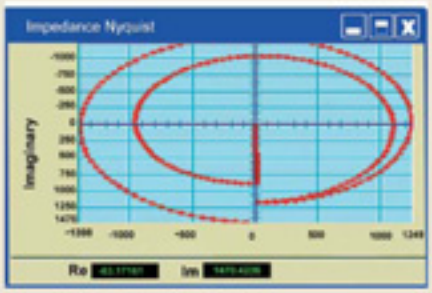
REAL TIME MONITORING



V/I GRAPH



BODE PLOTS



NYQUIST PLOTS

TECHNICAL FEATURES:

- **Digital Sine Correlation** to Remove Harmonics for Accurate Measurements
- **Programmable Integration (Sampling) Time** will Allow Measurement of Micro-ohm Signals Buried Under Noise Without the Need for Auxiliary Equipment
- **Simultaneous V/I Measurement** to Ensure Exact Impedance and Phase Information
- **DDS Sine-wave Generation**, Yielding Frequency Errors Less than 0.02Hz
- **Floating Dual Independent Signal Analyzers** Provide Single-channel Impedance Measurements or Both Channels to Measure Transfer Functions, Transconductance,Impedance, Signal Analysis (FRA) Data and Other Important Parameters in Polar/Rectangular Format
- **User-friendly Features Include:** Auto-gain, Quick-set ac Amplitude, Signal Overload (Signal Saturation) Protection, and Adjustable Sample Interval Without the Complicated Calculations - the Above Features Allow the User to Start Measuring Impedance Without Hassles.
- **Auto-Gain Control and Flexible Ranges** for Measuring Small Signals in Noisy Environments with 1µV Sensitivity while Maximizing Resolution and Precision to Obtain an Accurate Measurement
- **Universal ac + dc Output Signals** Critical for Impedance Measurement/AC Modulation Applications in the Battery/Fuel Cell/ Electronic Components and Devices R&D, Testing and Production Sectors
- **GPIB/RS-232 and Optional USB/Ethernet** Provide State-of-the-art Connectivity while Satisfying Diverse Throughput/Network Security Requirements
- **System-level Multi-channel Impedance Measurement** can be Achieved Using the Integrated MCU-1 Capability and a Switch Matrix
- **Impedance Measurement Application Program** Included to Save Costs Associated with Existing Expensive Impedance Measurement Software
- **Comprehensive Application Program** with Premium Features - Nyquist, Bode, V/I, Real-time Display of Impedance Measurements and Operating Conditions, Frequency Sweeps with Adjustable Amplitude in Log/Linear Form and Auto-save for Logged Data to Establish AMREL's FRA as the Ultimate Diagnostic Tool
- **0.1Hz Models** Available

FRA ANALYZER

AMREL FREQUENCY RESPONSE ANALYZER TEST SOLUTIONS

FREQUENCY RESPONSE ANALYZER SPECIFICATIONS[1]

GENERATOR

Waveform:	Sine Wave
Programmable Frequency Range:	1 Hz ~ 20 KHz
Frequency Resolution:	0.01Hz
Amplitude:	Up to 20% of dc Bias Setting or 1Vrms
Amplitude Resolution:	5mVPP
Distortion:	< 0.2%
Sweep Types:	Frequency – Logarithmic and Linear
	Amplitude – Logarithmic and Linear

AMPLITUDE ACCURACY

Frequency Range	Amplitude Range	AC Amplitude Accuracy2
10Hz ~ 20kHz	0.05Vrms ~ 0.1999 Vrms	± 2% * 0.1999Vrms
	0.2Vrms ~ 0.8Vrms	± 0.50% * 0.8Vrms
	Output Amplitude > 0.8	± 2% * 1Vrms
*1: Amplitude Accuracy are specified to % of Max Range Value		

dc BIAS

Range:	10mVdc ~ 10Vdc
Resolution:	10mV
Accuracy:	0.1% ± 50mVdc
Output Impedance:	50Ω
Maximum Output:	0V < Vdc + Vpk-pk(ac) ≤ 10V

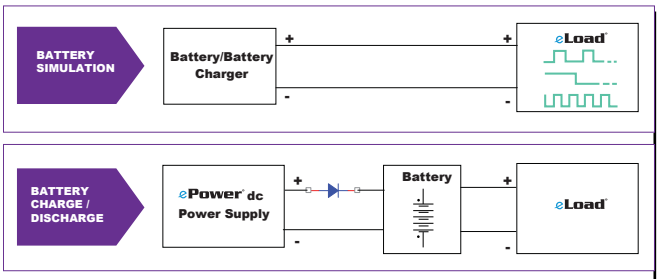
ANALYZERS (Two Independent Analyzers Operate in Parallel)

Range:	Auto
Sensitivity:	1μV
Dynamic Range:	90dB
Common Mode Rejection:	>80dB @ 100Hz
Cross Channel Isolation:	>90dB @ 10kHz
Coupling:	ac (- 3dB @ 2Hz)
dc Blocking Voltage	250Vdc Common Mode/500Vdc Differential Mode
Differential Input Impedance:	> 200KΩ
Maximum Input:	1Vp-p (approx. 350mVrms)
Adc (Per Channel):	16 bit, 400K samples/second
Sample INterval:	10ms ~ 10s; Default Setting: 0.25s
Phase Accuracy	1.0 degree

MAGNITUDE ACCURACY

Amplitude			
160mV < Input ≤ 350mV	± 0.2% * 350mV	± 0.2% * 350mV	± 0.5% * 350mV
54mV < Input ≤ 160mV	± 0.2% * 160mV	± 0.2% * 160mV	± 0.5% * 160mV
27mV < Input ≤ 54mV	± 0.2% * 54mV	± 0.2% * 54mV	± 0.5% * 54mV
18mV < Input ≤ 27mV	± 0.2% * 27mV	± 0.2% * 27mV	± 0.5% * 27mV
11mV < Input ≤ 18mV	± 0.2% * 18mV	± 0.2% * 18mV	± 0.5% * 18mV
5.4mV < Input ≤ 11mV	± 0.2% * 11mV	± 0.2% * 11mV	± 0.5% * 11mV
3.6mV < Input ≤ 5.4mV	± 0.2% * 5.4mV	± 0.2% * 5.4mV	± 0.5% * 5.4mV
1μV < Input ≤ 3.6mV	± 0.2% * 3.6mV	± 1.0% * 3.6mV	± 1.0% * 3.6mV
Frequency	**10Hz ~ 999.99Hz**	**1kHz ~ 9999.99Hz**	**10kHz ~ 29kHz**

BATTERY TESTING/ ENERGY STORAGE DEVICE TESTING



RELATED PRODUCTS-BATTERY/ENERGY/POWER SUPPLY/ELECTRONICS

- **High-power, Rackmount & System Solutions**
  - ✦ PLA
  - ✦ PLW
  - ✦ System Solutions
- **Bench-top & Multi-channel Solutions**
  - ✦ BPL
  - ✦ LPL
  - ✦ FEL
  - ✦ PEL
- **Resistance & Impedance Measurement**
  - ✦ FRA - Frequency Response Analyzer Battery/Energy Storage
- **dc Power Supply/Battery Charger Solutions**
  - ✦ Dual-channel SPD
  - ✦ SPS
  - ✦ HPS

CAPABILITIES

- **Determine Battery Characterization Parameters**
  - ✦ Internal Resistance/Impedance
  - ✦ Charge/Discharge Rates
  - ✦ Discharge Curves
  - ✦ Depth of Discharge (DOD)
  - ✦ Temperature Effects
  - ✦ Charge Efficiency
  - ✦ Cycle Life
  - ✦ Capacity Retention & Characteristics
- **Constant Charge/Discharge Loading**
- **Pulsed Mode Testing**
- **Complex Dynamic Load Profile Simulation**
- **Cycle Testing - Charge/Discharge Profiles**
- **Qualification & Lifetime Testing**
- **Constant Current/Constant Power Testing**
- **Battery Charger Validation**
- **High-voltage Battery Characterization**
- **High-current Battery Characterization**
- **High-current Discharge Tests**

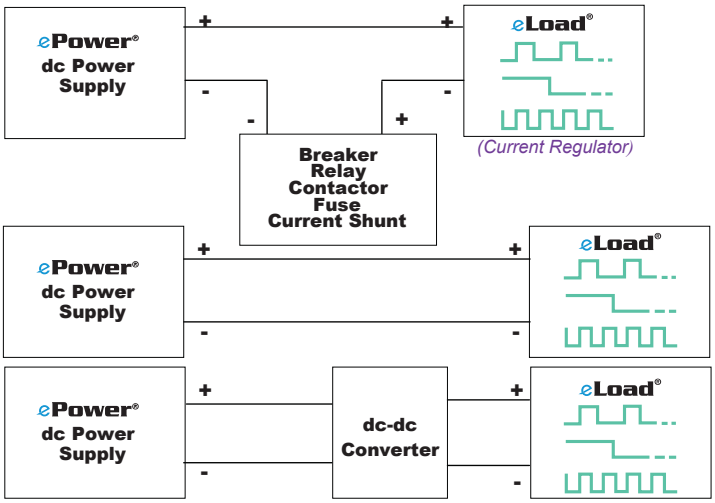
PERFORMANCE MONITOR PARAMETERS

- **State of Charge (SOC)**
- **State of Health (SOH)**
- **Open Circuit Voltage (OCV)**
- **Internal Resistance/Impedance**
- **Voltage/Current/Power**

POWER SUPPLY & ELECTRONIC COMPONENTS TESTING

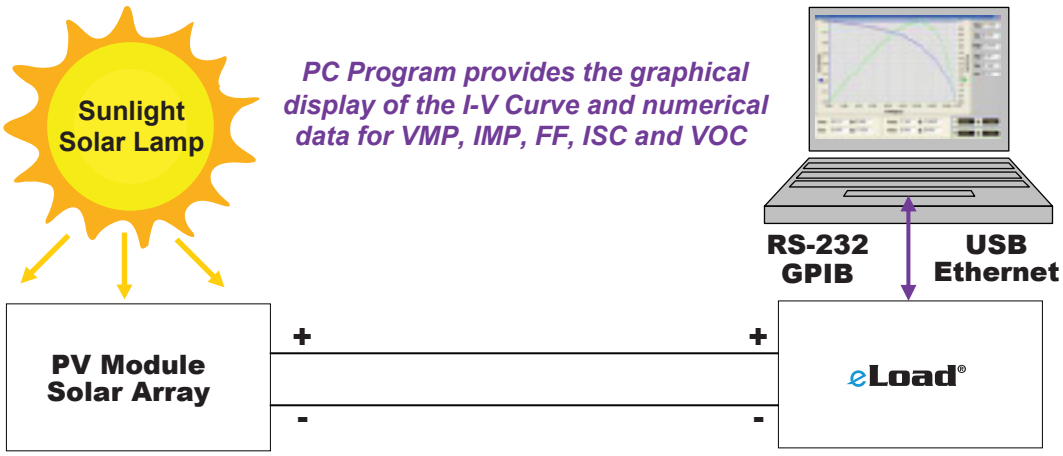
CAPABILITIES

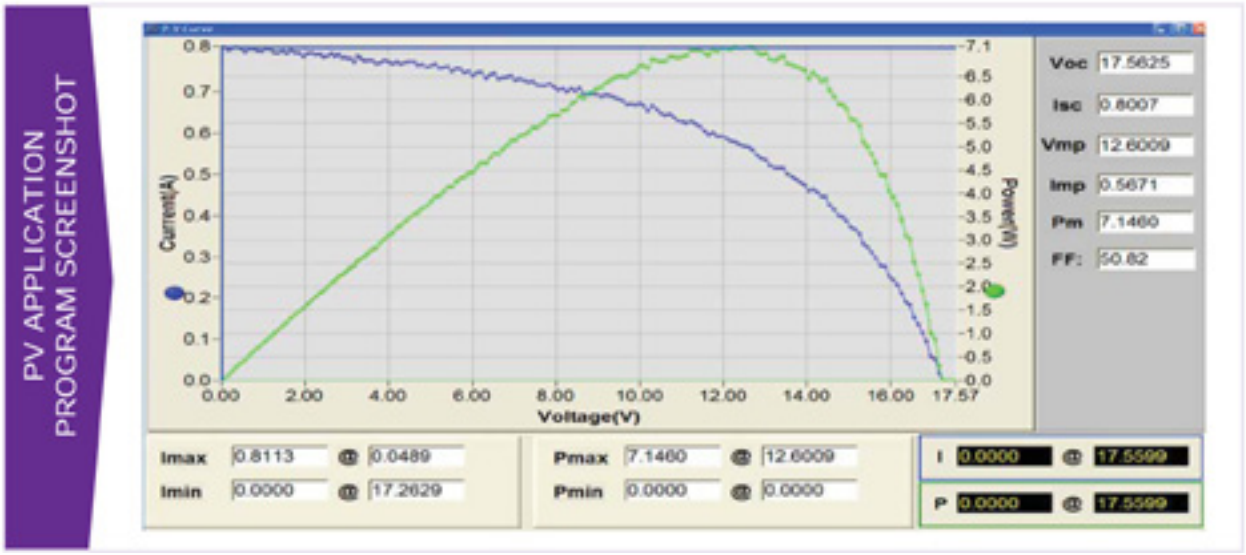
- **Validate dc Power Supply & dc-dc Converter Design and Performance Specifications**
  - ✦ Load Transient Recovery & Dynamic Load Regulation
  - ✦ Programming Response Time
  - ✦ Loop Response
  - ✦ Overshoot and Undershoot Characteristics
  - ✦ Static Load Regulation
  - ✦ Efficiency
  - ✦ Start up Time
  - ✦ Source Effect (line regulation)
  - ✦ PARD
  - ✦ Power Factor
  - ✦ Drift
  - ✦ Voltage Latch-up
  - ✦ Over-voltage Protection Validation
  - ✦ Short Circuit Current Protection Validation
  - ✦ Over-current Protection Validation
- **Dynamic Operating Modes**
  - ✦ Auto-sequence Voltage, Current, Resistance & Power Profile
  - ✦ Pulse Mode and Continuous Pulse Shaping
  - ✦ Program Frequency, Duty Cycle & Rise/Fall Times
- **Exclusive High-voltage, Current and Power Ratings**



APPLICATIONS

PV APPLICATIONS

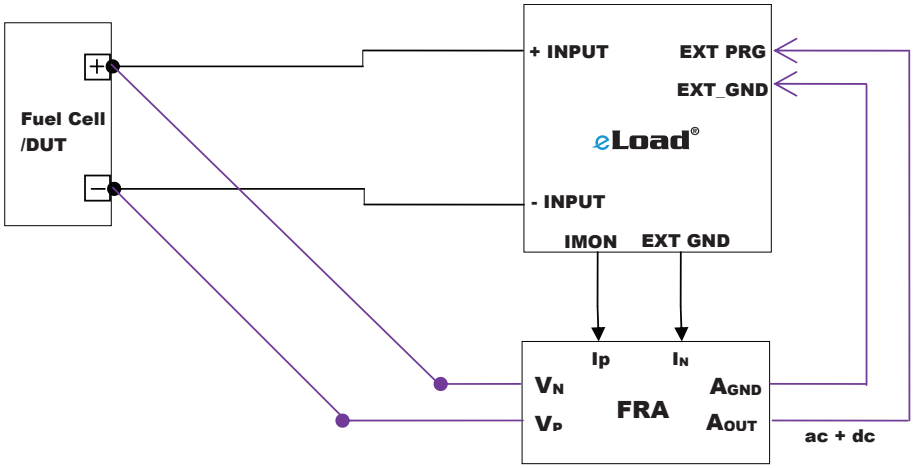


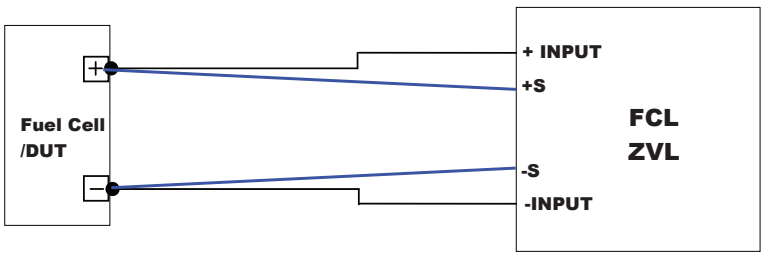


CAPABILITIES

- **Determine PV Performance Parameters**
  - ✦ Open Circuit Voltage (Voc)
  - ✦ Short Circuit Current (Isc)
  - ✦ Voltage at Max Power (Vmp)
  - ✦ Current at Max Power (Imp)
  - ✦ Power at Max Power (Pmp)
  - ✦ Fill Factor
- **Generate I-V Curves**
  - ✦ Determine Pmp and Power Curve
  - ✦ Auto-loading at Pmp Point
  - ✦ Save and Organize Captured Data
- **Validate PV Cell/Module down to 0Vdc**
- **Validate Thin-film, Single and Poly- silicone**
  - ✦ PV Design & Materials
- **Validate Solar Concentrator PV Design**

FUEL CELL TESTING AND IES/IMPEDANCE MEASUREMENT





CAPABILITIES

- **Determine Fuel Cell Operating Parameters**
  - ✦ Internal Resistance/Impedance
  - ✦ Fuel/Oxidant Utilization
  - ✦ Gas Concentration
  - ✦ Temperature Effects
  - ✦ Pressure Effects
  - ✦ Validate Balance of System/Plant
- **Impedance Measurement**
  - ✦ EIS/AC Modulation
  - ✦ Current Interruption
- **Polarization Curves**
- **Single Cell Characterization down to 0Vdc**
- **Short Stack & Full Stack Test**
- **Durability Test**
- **Voltage/Current Cycling**
- **Accelerated Lifetime Test**
- **dc-dc Converter Validation**
- **Electrical Test and Characterization**

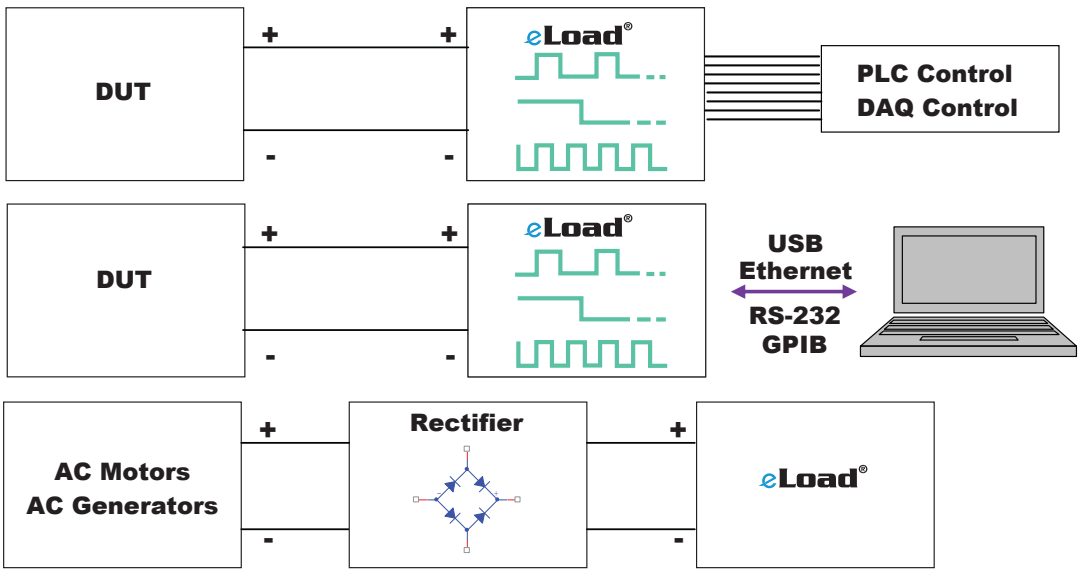
APPLICATIONS

MILITARY/DEFENSE AND AEROSPACE/AVIONICS ATE

CAPABILITIES

- **Customization**
  - ✦ Build-to-Print (design, prototyping, testing, manufacturing & tech support)
  - ✦ Pre-sales Consultation & Post-sales Service/Tech Support
  - ✦ Hardware Design and Modification
  - ✦ Mechanical Design and Modification
  - ✦ Design and PCB Layout
  - ✦ Custom Software and Firmware Modifications
  - ✦ Full Testing Capabilities
  - ✦ Custom-tailor Existing Product Ratings and Specs to Meet Unique Application Demands
- **Exclusive System Capabilities and Options**
  - ✦ dc Contactor and Emergency Shutdown Panel
  - ✦ System Integration of ac and dc Connectors, Power Distribution, and System Wiring
  - ✦ AMREL's Exclusive "Anti-condensation" Water Manifold Distribution System
  - ✦ Customized System Hardware, Software, Firmware and Mechanical Design
  - ✦ NEMA Enclosures Available
  - ✦ Full System-level Testing Capabilities
- **Exclusive High-voltage, High-current and High-power Ratings Available**

INDUSTRIAL SOLUTIONS



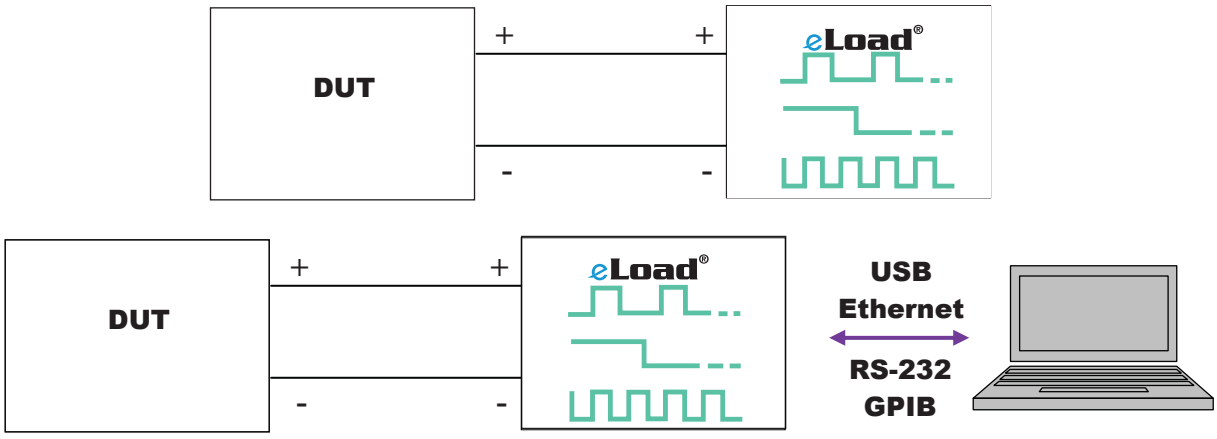
CAPABILITIES

- **Industrial Applications:** AMETEK offers the unique capability to tailor dc electronic loads for many diverse industries, including telecommunications, data center, transportation, oil/gas, utility, automotive power electronics and components production sectors. AMETEK provides a solution for the specific needs of a wide range of applications, such as generator/alternator testing, UPS/battery back-up discharge tests, and quality testing. In addition, AMETEK provides personalized service and post-sales support to ensure that you are running 24/7. Contact AMETEK today to discuss your application needs.

- **Customization & Exclusive Options**
  - ✦ Isolated Analog Programming, Voltage/Current Monitor
  - ✦ TTL CV/CC Mode Selection
  - ✦ TTL On/Off Control & Remote Inhibit for Interlock Protection
  - ✦ Solid State Reverse Polarity/Isolation Relays
  - ✦ Build-to-print Solutions - from Requirements to Product
  - ✦ Custom-tailor Existing Products to Meet Unique Demands
  - ✦ Pre-sales Consultation & Post-sales Service/Tech Support
  - ✦ Special Custom Feature Development & Hardware Design
  - ✦ LabVIEW, LabWindows & SCPI Command Set
  - ✦ Custom Software/Firmware Modifications Available
- **Widest Line of dc Test Solutions**
  - ✦ High Current/Voltage Rated Switch-mode Supplies (1.2kW to 900kW+)
  - ✦ Customized Multi-channel Linear Supplies (20W to 200kW)
  - ✦ Low-profile (1.75" Rackmount) dc Electronic eLoad
  - ✦ Ultra-compact Air-Cooled eLoad (800W to 100kW+)
  - ✦ Smallest Footprint Water-cooled eLoad (6kW to 200kW+)
- **Exclusive High-voltage, Current and Power Ratings**
- **Ask about how to Custom-tailor a Cost-effective Solution Today**

APPLICATIONS

UNIVERSITY RESEARCH LABORATORY TEST SOLUTIONS



CAPABILITIES

- **Exclusive Options and Services**
  - ✦ Ultra-low Current Range Option for Optimized Precision
  - ✦ Solid State Reverse Polarity/Isolation Relays
  - ✦ Isolated Analog Programming, Voltage/Current Monitor
  - ✦ Pre-sales Consultation & Post-sales Service/Tech Support
  - ✦ Custom-tailor an Existing Product to Meet Unique Requirements
- **Exclusive Features and Functionality**
  - ✦ Auto-sequencing Voltage, Current, Resistance & Power Profile
  - ✦ Pulse Mode and Continuous Pulse Shaping
  - ✦ Program Frequency, Duty Cycle & Rise/Fall Times
  - ✦ LabVIEW, LabWindows & SCPI Command Set
  - ✦ Simple Closed-case Calibration
- **Widest Line of dc Test Solutions**
- **Ultra-portable Bench-top Solutions**
  - ✦ Customized Precision Multi-channel Linear Supplies (20W to 2kW)
  - ✦ Wide Selection of Switch-mode Supplies to fit your budget
  - ✦ LPL - Low-profile (1.75" Rackmount) dc Electronic eLoad
  - ✦ BPL - Smallest Footprint Bench-top eLoad (400W & 800W)
  - ✦ FEL/PEL - Cost-effective Bench-top eLoad (60W to 600W)
- **High-power Solutions**
  - ✦ High-current/Voltage Rated Switching Supplies (6kW to 900kW+)
  - ✦ Ultra-compact Air-cooled eLoad (800W to 100kW+)
  - ✦ Smallest Footprint Water-cooled eLoad (6kW to 200kW+)
  - ✦ System Solutions Available
- **Exclusive High-voltage, Current and Power Ratings**
- **Custom-tailored and Customized Solutions Available**

FULLY CUSTOMIZED PROGRAMMABLE AIR-COOLED ELECTRONIC eLOAD SYSTEMS

CUSTOMIZED SOLUTIONS

CUSTOMIZED REQUIREMENTS

PLAS10K-60-800

- Built-in Current Shunt
- Built-in dc Contactor
- Custom-designed Contactor Box with Integrated Auxiliary Hardware
- dc Power Distribution & Wiring
- Custom "Blue" Cabinet & Door Filter
- Fully-integrated Air-cooled 10kW
- Front & Rear Panel dc Quick Connect Terminals
- 41U Cabinet with Casters
- Built-to-print System Design

FRONT VIEW

REAR VIEW

CUSTOMIZED REQUIREMENTS

LDL

- Fully-integrated Laser Diode V-I Curve Simulator System
- Full Design, Prototyping, Engineering, Testing and Manufacturing Services, including Built-to-Print

PLW120K & PLW130K
PROGRAMMABLE WATER-COOLED

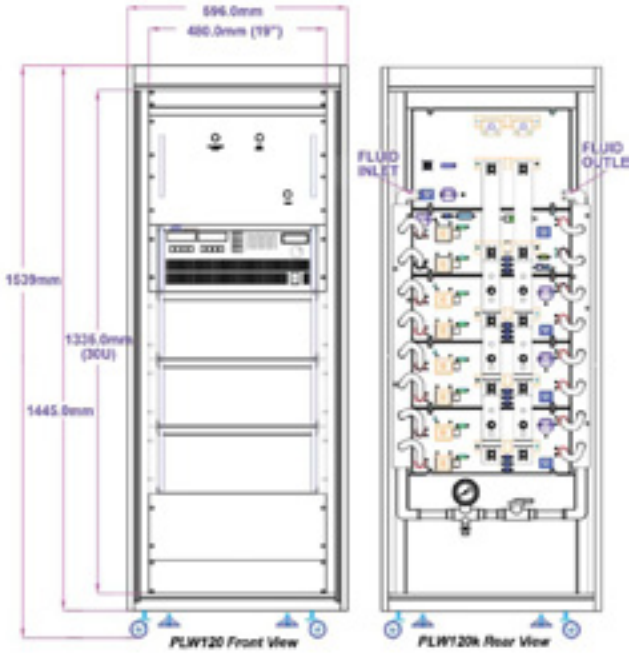
Rear Panel

CAPABILITIES

PLW120K-450-1000

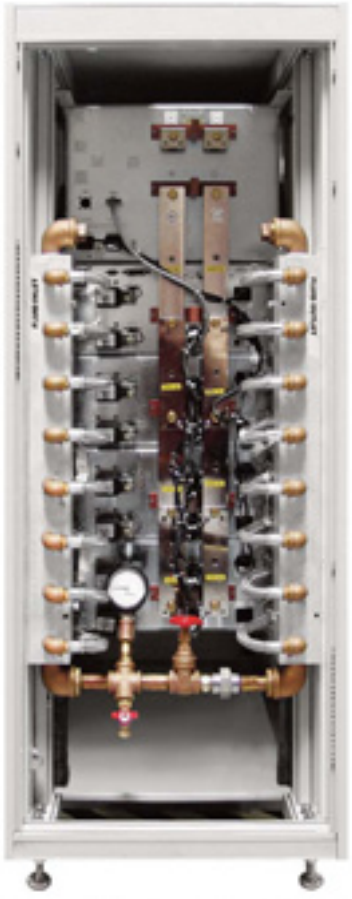
- Custom-tailored 120kW/450V/1000A
- System Fault Interlock Shutdown
- Water Manifold Distribution System
- Fully-automated and Seamless Control of dc Contactor Disconnect Box and eLoad System

Integrated dc Contactor Disconnect Box (5, 12, or 24Vdc Controlled and LED Indicators)



PLW120 Front View *PLW120k Rear View*

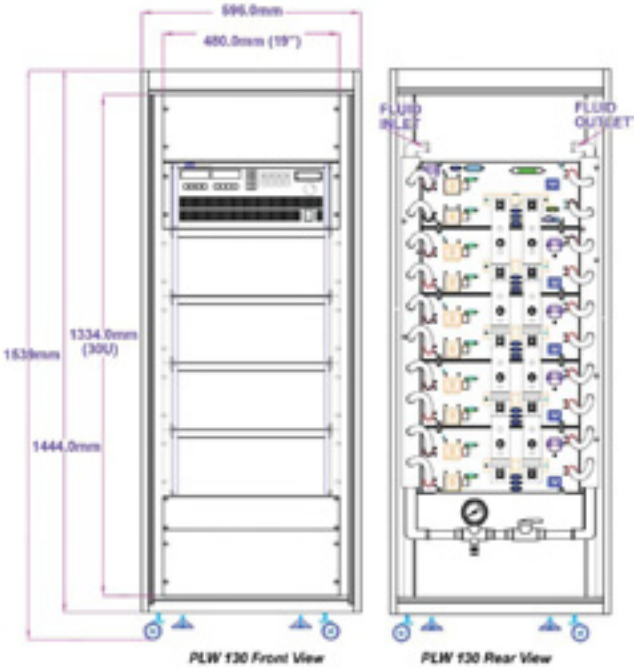
PLA120 and PLA130



CAPABILITIES

PLW130K-650-400

- Custom-tailored 130kW/650Vdc/1400Adc
- In-rush Soft-start Circuit
- Integrated Water Manifold Distribution System
- dc Distribution Bus
- 30U Rack with Casters
- Engineered with Pre-sales Consultation
- 650Vdc High-voltage Rating



PLW 130 Front View *PLW 130 Rear View*

AMETEK® PROGRAMMABLE POWER

PROGRAMMABLE AIR & WATER-COOLED ELECTRONIC SYSTEMS

HIGH-VOLTAGE SYSTEMS CAPABILITIES

PLW75kW-800-300

- Integration of dc Contactors, ac & dc Connectors and Current Shunts System Wiring, Power Distribution
- Full System Calibration, Testing and Validation
- Built-to-print High-voltage Systems Available
- Air-cooled or Water-cooled Systems Available
- Bench-top High-voltage Rated Solutions Available

Series	Model #	Power (W)	Voltage (Vdc)	Current (Adc)	Size (Height, Depth)	V_{MIN} at I_{MAX}
LPL	LPL800-60-100	800W	60	100	1U, 21"D	0.50V
LPL	LPL800-120-80	800W	120	80	1U, 21"D	0.96V
LPL	LPL800-400-40	800W	400	40	1U, 21"D	2.40V
LPL	LPL800-600-30	800W	600	30	1U, 21"D	7.50V
LPL	LPL800-800-20	800W	800	20	1U, 21"D	5.00V
LPL	LPL800-1000-6	800W	1000	6	1U, 21"D	4.50V
LPL	LPL600-60-100	600W	60	100	1U, 21"D	0.50V
LPL	LPL600-120-60	600W	120	60	1U, 21"D	0.72V
LPL	LPL600-400-30	600W	400	30	1U, 21"D	1.80V
LPL	LPL600-600-20	600W	600	20	1U, 21"D	5.00V
LPL	LPL600-800-15	600W	800	15	1U, 21"D	4.50V
LPL	LPL600-1000-6	600W	1000	6	1U, 21"D	4.50V
LPL	LPL300-60-100	300W	60	100	1U, 21"D	0.60V
LPL	LPL300-120-50	300W	120	50	1U, 21"D	1.00V
LPL	LPL300-400-15	300W	400	15	1U, 21"D	1.80V
LPL	LPL300-600-10	300W	600	10	1U, 21"D	5.00V
LPL	LPL300-800-6	300W	800	60	1U, 21"D	4.50V
LPL	LPL300-1000-3	300W	1000	3	1U, 21"D	4.50V
LPL	LPL150-60-50	150W	60	50	1U, 21"D	0.50V
LPL	LPL150-120-25	150W	120	25	1U, 21"D	0.75V
LPL	LPL150-400-8	150W	400	8	1U, 21"D	1.60V
LPL	LPL150-600-5	150W	600	5	1U, 21"D	4.00V
LPL	LPL150-800-3	150W	800	3	1U, 21"D	3.00V

BPL	BPL400-600-150	400W	600	150	3U, 17.2”D	0.75V
BPL	BPL400-120-75	400W	120	75	3U, 17.2”D	1.5V
BPL	BPL400-400-30	400W	400	30	3U, 17.2”D	3V
BPL	BPL400-600-20	400W	600	20	3U, 17.2”D	8.4V
BPL	BPL400-800-15	400W	800	15	3U, 17.2”D	7.2V
BPL	BPL400-1000-3	400W	1000	3	3U, 17.2”D	5.1V
BPL	BPL800-60-200	800W	60	200	3U, 17.2”D	0.75V
BPL	BPL800-120-150	800W	120	150	3U, 17.2”D	1.5V
BPL	BPL800-400-60	800W	400	60	3U, 17.2”D	3.0V
BPL	BPL800-600-40	800W	600	40	3U, 17.2”D	8.4V
BPL	BPL800-800-30	800W	800	30	3U, 17.2”D	7.2V
BPL	BPL800-1000-6	800W	1000	6	3U, 17.2”D	5.1V

Series	Model #	Power (W)	Voltage (Vdc)	Current (Adc)	Size (Height, Depth)	V_{MIN} at I_{MAX}
PLA	PLA800-60-300	800W	60	300	2U, 21”D	0.6V
PLA	PLA800-120-150	800W	120	150	2U, 21”D	1.8V
PLA	PLA800-400-120	800W	400	120	2U, 21”D	2.7V
PLA	PLA800-600-60	800W	600	60	2U, 21”D	7.8V
PLA	PLA800-800-15	800W	800	15	2U, 21”D	3.9V
PLA	PLA800-1000-5	800W	1000	5	2U, 21”D	5.0V
PLA	PLA1.5K-60-600	1.5kW	60	600	2U, 21”D	0.6V
PLA	PLA1.5K-120-300	1.5kW	120	300	2U, 21”D	1.8V
PLA	PLA1.5K-400-100	1.5kW	400	100	2U, 21”D	2.7V
PLA	PLA1.5K-600-60	1.5kW	600	60	2U, 21”D	7.8V
PLA	PLA1.5K-800-30	1.5kW	800	30	2U, 21”D	3.9V
PLA	PLA1.5K-1000-12	1.5kW	1000	12	2U, 21”D	6.0V
PLA	PLA2K-60-600	2kW	20	600	3U, 25.5”D	0.6V
PLA	PLA2K-120-400	2kW	120	400	3U, 25.5”D	1.8V
PLA	PLA2K-400-300	2kW	400	300	3U, 25.5”D	2.7V
PLA	PLA2K-600-100	2kW	600	100	3U, 25.5”D	8.4V
PLA	PLA2.5K-60-1000	2.5kW	60	1000	3U, 25.5”D	0.6V
PLA	PLA2.5K-120-600	2.5kW	120	600	3U, 25.5”D	1.8V
PLA	PLA2.5K-400-300	2.5kW	400	300	3U, 25.5”D	2.7V
PLA	PLA2.5K-600-120	2.5kW	600	120	3U, 25.5”D	7.8V
PLA	PLA3K-60-1000	3kW	60	1000	3U, 25.5”D	0.6V
PLA	PLA3K-120-800	3kW	120	800	3U, 25.5”D	1.6V
PLA	PLA3K-400-300	3kW	400	300	3U, 25.5”D	2.7V
PLA	PLA3K-600-200	3kW	600	200	3U, 25.5”D	7.2V

PLA	PLA3K-800-50	3kW	800	50	3U, 25.5”D	2.5V
PLA	PLA3K-1000-30	3kW	1000	30	3U, 25.5”D	6.0V
PLA	PLA4K-60-1200	4kW	60	1200	4U, 25.5”D	0.6V
PLA	PLA4K-120-1000	4kW	120	1000	4U, 25.5”D	1.8V
PLA	PLA4K--400-600	4kW	400	600	4U, 25.5”D	2.7V
PLA	PLA4K-600-200	4kW	600	200	4U, 25.5”D	7.8V
PLA	PLA5K-60-1200	5kW	60	1200	4U, 25.5”D	0.6V
PLA	PLA5K-120-1200	5kW	120	1200	4U, 25.5”D	1.8V
PLA	PLA5K-400-400	5kW	400	400	4U, 25.5”D	2.8V
PLA	PLA5K-600-300	5kW	600	300	4U, 25.5”D	7.8V
PLA	PLA5K-800-100	5kW	800	100	4U, 25.5”D	3.6V
PLA	PLA5K-1000-50	5kW	1000	50	4U, 25.5”D	6.0V
PLA	PLA6K-60-1500	6kW	60	1500	6U, 25.5”D	0.6V
PLA	PLA6K-120-1500	6kW	120	1500	6U, 25.5”D	1.8V
PLA	PLA6K-400-500	6kW	400	500	6U, 25.5”D	3.0V
PLA	PLA6K-600-300	6kW	600	300	6U, 25.5”D	8.4V
PLA	PLA7.5K-60-1500	7.5kW	60	1500	6U, 25.5”D	0.6V
PLA	PLA7.5K-120-1500	7.5kW	120	1500	6U, 25.5”D	1.8V
PLA	PLA7.5K-400-600	7.5kW	400	600	6U, 25.5”D	2.7V
PLA	PLA7.5K-600-400	7.5kW	600	400	6U, 25.5”D	8.4V
PLA	PLA7.5K-800-150	7.5kW	800	150	6U, 25.5”D	3.6V
PLA	PLA7.5K-1000-75	7.5kW	1000	75	6U, 25.5”D	6.0V
PLA	PLA10K-60-1500	10kW	60	1500	15U Cabinet	.045V
PLA	PLA10K-120-1500	10kW	120	1500	15U Cabinet	1.20V
PLA	PLA10K-400-600	10kW	400	600	15U Cabinet	1.80V
PLA	PLA10K-600-400	10kW	600	400	15U Cabinet	6.00V
PLA	PLA20K-60-1500	20kW	60	1500	30U Cabinet	0.30V
PLA	PLA20K-120-1500	20kW	120	1500	30U Cabinet	0.60V
PLA	PLA20K-400-600	20kW	400	600	30U Cabinet	1.20V
PLA	PLA20K-600-400	20kW	600	400	30U Cabinet	3.20V
PLA	PLA40K-60-1500	40kW	60	1500	41U Cabinet	0.30V
PLA	PLA40K-120-1500	40kW	120	1500	41U Cabinet	0.45V
PLA	PLA40K-400-600	40kW	400	600	41U Cabinet	0.90V
PLA	PLA40K-600-400	40kW	600	4000	41U Cabinet	2.00V

Series	Model #	Power (W)	Voltage (Vdc)	Current (Adc)	Size (Height, Depth)	V_{MIN} at I_{MAX}
PLA	PLA60-60-1500	60kW	60	1500	Dual-bay Cabinet	0.30V
PLA	PLA60-120-1500	60kW	120	1500	Dual-bay Cabinet	0.45V
PLA	PLA60-400-600	60kW	400	600	Dual-bay Cabinet	0.60V
PLA	PLA60-600-400	60kW	600	400	Dual-bay Cabinet	1.60V
PLA	PLA80-60-1500	80kW	60	1500	Dual-bay Cabinet	0.30V
PLA	PLA80-120-1500	80kW	120	1500	Dual-bay Cabinet	0.45V
PLA	PLA80-400-600	80kW	400	600	Dual-bay Cabinet	0.60V
PLA	PLA80-600-400	80kW	600	400	Dual-bay Cabinet	1.20V
PLA	PLA100-60-1500	100kW	60	1500	Dual-bay Cabinet	0.30V
PLA	PLA100-120-1500	100kW	120	1500	Dual-bay Cabinet	0.45V
PLA	PLA100-400-600	100kW	400	600	Dual-bay Cabinet	0.60V
PLA	PLA100-600-400	100kW	600	400	Dual-bay Cabinet	1.20V
PLW	PLW6K-60-1000	6kW	60	1000	2U, 27.5”D	0.60V
PLW	PLW6K-120-600	6kW	120	600	2U, 27.5”D	1.50V
PLW	PLW6K-400-300	6kW	400	300	2U, 27.5”D	3.60V
PLW	PLW6K-600-200	6kW	600	200	2U, 27.5”D	12.0V
PLW	PLW6K-800-25	6kW	800	25	2U, 27.5”D	6.0V
PLW	PLW6K-1000-25	6kW	1000	25	2U, 27.5”D	6.0V
PLW	PLW9K-60-1500	9kW	60	1200	2U, 27.5”D	0.60V
PLW	PLW9K-120-1000	9kW	120	1000	2U, 27.5”D	1.50V
PLW	PLW9K-400-400	9kW	400	400	2U, 27.5”D	3.60V
PLW	PLW9K-600-300	9kW	600	300	2U, 27.5”D	12.0V
PLW	PLW9K-800-40	9kW	800	40	2U, 27.5”D	6.0V
PLW	PLW9K-1000-40	9kW	1000	40	2U, 27.5”D	6.0V
PLW	PLW12K-60-1500	12kW	60	1500	2U, 27.5”D	0.60V
PLW	PLW12K-120-1200	12kW	120	1200	2U, 27.5”D	1.56V
PLW	PLW12K-400-600	12kW	400	600	2U, 27.5”D	3.60V
PLW	PLW12K-600-400	12kW	600	400	2U, 27.5”D	12.0V
PLW	PLW12K-800-50	12kW	800	50	2U, 27.5”D	6.0V
PLW	PLW12K-1000-50	12kW	1000	50	2U, 27.5”D	6.0V
PLW	PLW18K-60-1500	18kW	60	1500	2U, 27.5”D	0.60V
PLW	PLW18K-120-1500	18kW	120	1500	2U, 27.5”D	1.50V
PLW	PLW18K-400-800	18kW	400	800	2U, 27.5”D	3.60V
PLW	PLW18K-600-600	18kW	600	600	2U, 27.5”D	12.0V
PLW	PLW18K-800-75	18kW	800	75	2U, 27.5”D	6.0V
PLW	PLW18K-1000-75	18kW	1000	75	2U, 27.5”D	6.0V

PLW	PLW24K-60-1500	24kW	60	1500	2U, 27.5”D	0.45V
PLW	PLW24K-120-1500	24kW	120	1500	2U, 27.5”D	1.20V
PLW	PLW24K-400-1200	24kW	400	1200	2U, 27.5”D	3.60V
PLW	PLW24K-600-800	24kW	600	800	2U, 27.5”D	12.0V
PLW	PLW24K-800-100	24kW	800	100	2U, 27.5”D	6.0V
PLW	PLW24K-1000-100	24kW	1000	100	2U, 27.5”D	6.0V
PLW	PLW36K-60-1500	36kW	60	1500	2U, 27.5”D	0.45V
PLW	PLW36K-120-1500	36kW	120	1500	2U, 27.5”D	0.90V
PLW	PLW36K-400-1500	36kW	400	1500	2U, 27.5”D	3.30V
PLW	PLW36K-600-1000	36kW	600	1000	2U, 27.5”D	10.0V
PLW	PLW36K-800-150	36kW	800	150	2U, 27.5”D	6.0V
PLW	PLW36K-1000-150	36kW	1000	150	2U, 27.5”D	6.0V
PLW	PLW48K-60-XXXX	48kW	60	Factory	15U Cabinet	Factory
PLW	PLW48K-120-XXXX	48kW	120	Factory	15U Cabinet	Factory
PLW	PLW48K-400-XXXX	48kW	400	Factory	15U Cabinet	Factory
PLW	PLW48K-600-XXXX	48kW	600	Factory	15U Cabinet	Factory
PLW	PLW60K-60-XXXX	60kW	60	Factory	15U Cabinet	Factory
PLW	PLW60K-120-XXXX	60kW	120	Factory	15U Cabinet	Factory
PLW	PLW60K-400-XXXX	60kW	400	Factory	15U Cabinet	Factory
PLW	PLW60K-600-XXXX	60kW	600	Factory	15U Cabinet	Factory

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