

ZVL Series of Zero-volt Programmable

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



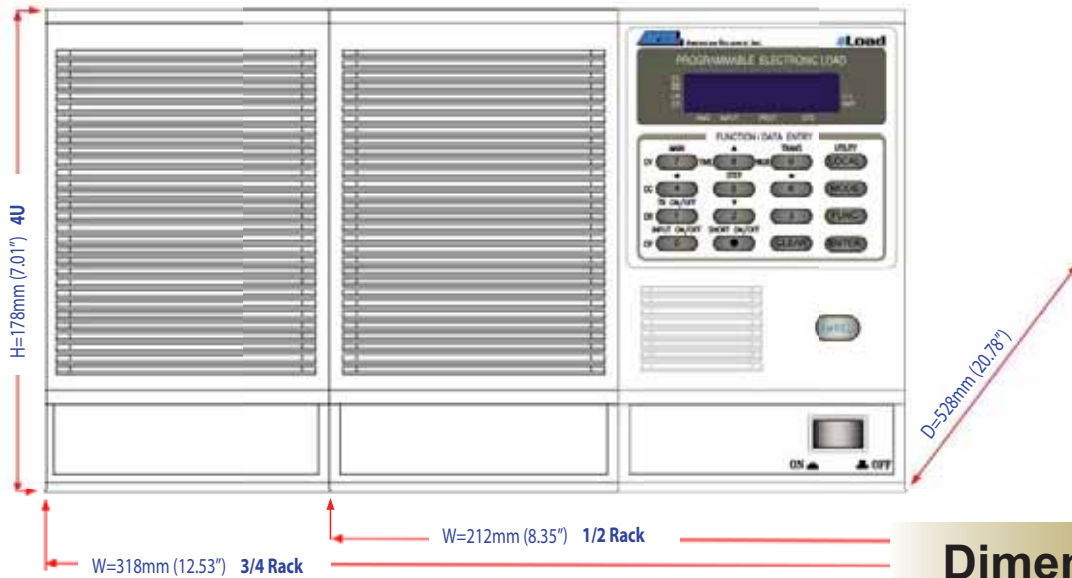
ZVL SELECTOR GUIDE

ZVL XXX - YY - ZZZ
 XXX - POWER | YY - VOLTAGE | ZZZ - CURRENT

Series	Model #	Power (W)	Voltage (Vdc)	Current (Adc)	VMIN at IMAX	Size (Height, Width)
ZVL	ZVL60-10-20L	60	10	20	0V	4U, ½Rack
ZVL	ZVL100-10-20L	100	10	40	0V	4U, ½Rack
ZVL	ZVL100-10-40L	100	10	40	0V	4U, ¾Rack
ZVL	ZVL100-10-80L	100	10	80	0V	4U, ¾Rack
ZVL	ZVL100-150-20L	100	150	20	0V	4U, ½Rack
ZVL	ZVL150-10-100L	150	10	100	0V	4U, ½Rack
ZVL	ZVL200-10-40L	200	10	40	0V	4U, ½Rack
ZVL	ZVL200-150-40L	200	150	40	0V	4U, ½Rack
ZVL	ZVL300-10-100L	300	10	100	0V	4U, ¾Rack
ZVL	ZVL300-150-40L	300	150	40	0V	4U, ¾Rack
Custom-tailored Ranges Available		Voltage Range: 10Vdc ~ 150Vdc Rating Current Range: 5Adc ~ 100Adc Rating Power Range: 60W ~ 300W Rating				

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
- **Exclusive Ethernet Models Available:** 400W, 800W and 1.5kW Ethernet-based ZVL Models
- **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:** Co-resident 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



Dimensions

ZVL SPECIFICATIONS

CV MODE SPECIFICATIONS		CC MODE SPECIFICATIONS	
CVL RANGE	0 ~ 100% of Vmax	CCL RANGE	0 ~ 10% of Imax
ACCURACY	0.2% of Value ± 0.1% of Rating	CCM RANGE	0 ~ 100% of Imax
RESOLUTION	1/3600 of Rated Voltage	ACCURACY	0.2% of Value ± 0.1% of Rating
CV TRANSIENT TIME	1ms ~ 273ms for 0Vdc to Vmax	RESOLUTION	1/3600 of Rated Current
		CC TRANSIENT TIME	27ms ~ 0.100ms for 0Adc to Imax
CR and CP MODE SPECIFICATIONS		PROTECTION	
Please reference website datasheet for details		OVER POWER PROTECTION (OPP)	110% * Pmax
GENERAL SPECIFICATIONS		RESOLUTION	1/4000 of Rated Power
REMOTE INTERFACES	RS-232 & GPIB	ACCURACY	1% of Setting ± 0.5% of Rating
CC MODE ANALOG PROGRAMMING	0 ~ 10Vdc corresponds to 0 ~ Imax	OVER VOLTAGE PROTECTION (OVP)	110% * Vmax
ACCURACY	Mode Accuracy ± 0.1% of Rating	OVP RESOLUTION	1/4000 of Rated Voltage
VMON ACCURACY	0.10% of RDG ± 0.1% of Rating	OVP ACCURACY	0.20% of Setting ± 0.25% of Rating
IMON ACCURACY	0.10% of RDG ± 0.1% of Rating	OVER CURRENT PROTECTION (OCP)	110% * Imax
AC INPUT	115/230Vac 50/60Hz	OCP RESOLUTION	1/4000 of Rated Current
OPERATING TEMPERATURE	5°C ~ 40°C	OCP ACCURACY	0.20% of Setting ± 0.25% of Rating