AMETEK®
PROGRAMMABLE POWER

Programmable Power

Buyer's Guide

testforce

AMETEK Programmable Power boasts one of the industries' broadest portfolios of programmable power products under the well-known and respected Sorensen, Elgar, and California Instruments brands.

AMETEK offers programmable AC, DC, and AC plus DC power sources as well as AC and DC electronic loads. Standard products serve a wide range of stimulus, test and measurement (T&M) and process power needs in applications including semiconductor fabrication, commercial and defense automatic test equipment (ATE), oil exploration, avionics, general research and development (R&D), and electromagnetic compatibility (EMC) compliance testing. The company also focuses on the emerging renewable-energy market, offering solutions for photovoltaic-panel (PV) test, PV simulation, grid simulation, and battery-string simulation.

Key products include the new Asterion DC ASA Series high-performance three-channel power supply, the air-cooled PLA and water-cooled PLW programmable electronic loads, the TerraSAS ETS Series standalone terrestrial solar array photovoltaic simulator, and the CTS Series 3,000 to 90,000VA programmable AC and DC immunity compliance testing system.

In addition to rackmount, cabinet, and benchtop models, AMETEK Programmable Power also offers a high-density, modular programmable power module system that provides DC, AC, and electronic-load assets all under control of a single controller with the ReFlex Power Series.

Recognizing that a standard product might not be an optimal solution for specialized applications, AMETEK Programmable Power offers custom engineered solutions, ranging from OEM integration for medical and semiconductor industries to turnkey solar-array simulators for satellites. The company can also modify standard power products to meet specific application requirements.

Programmable DC Supplies: Up to 320kW

AMETEK Programmable Power offers a wide range of programmable DC power supplies, with power ratings extending from 600W to 320kW, as shown in **Table 1**. Supplies at the high end of this range, up to 320kW, serve key applications areas including industrial automation, materials research, and aerospace test. Specific products in this range include the Sorensen ASD FLX Series, Sorensen HPX Series, Sorensen SGX, SGA and SFA Series, and the new Sorensen Asterion DC Series of programmable DC Power Supplies.

Table 1. Standard DC Rack-Mount Supplies (arranged by total maximum power, highest to lowest)

Series	Low-end power (kW)	High-end power (kW)	Low-end voltage (V)	High-end voltage (V)	Low-end current (A)	High-end current (A)
ASD FLX	10	320	40	160	62	8000
HPX	36	240	10	1000	45	6000
SGX	5	150	10	1000	5	1200
SGA	4	150	10	1000	5	6000
SFA	5	30	60	160	31	500
Asterion DC	1.7	10	40	600	4.3	250
Asterion DC ASA	0.6	1.8*	60	600	6	42
Asterion DC ASM	1.7	5.1**	40	600	4.3	42
DLM 3-4	3	4	5	600	5	450
DCS	1	3	8	600	1	350
XFR		2.8	7.5	600	4	300
XG 1700	1.33	1.71	6	600	2.8	220
XG 1500	1.5	1.56	6	600	2.6	187
XG 850	0.67	0.85	6	600	1	110
DLM 600	0.375	0.6	5	300	2	75

*Three channels, 600W per channel **Three channels, 1700W per channel

Modular Water-Cooled ASD FLX Series

The modular water-cooled ASD FLX supplies offer a modular design with front-loading removable, lightweight modules that allow for easy one-person installation. An input voltage range of 324VAC to 528VAC provides flexibility. Other features include precise programming of voltage and current slew rate and an industrial field-bus interface (Modbus-TCP and Modbus-RTU as well as Ethernet) to enable real-time digital control.

Programmable DC Supplies: Up to 320kW

Sorensen HPX High Power Extensible Programmable DC Series

The Sorensen HPX High Power Extensible Programmable DC Series delivers reliable low-noise performance as well as fast and precise programmability in a rack-mount cabinet with casters. A single-bay rack-mount cabinet can deliver up to 150kW; a dual bay rack can deliver up to 240kW. Modularity allows efficient maintenance. Intelligent controls support sophisticated sequencing while a constant-power mode allows for independent settings of maximum voltage, current, and power. Features include front-panel manual control, an isolated analog input, RS-232, Ethernet (LXI) and optional IEEE-488 interfaces.

Sorensen SGX, SGA, and SFA Series

Representing the next generation of high-power programmable power supplies, the SGX Series offers exceptional load transient response, low noise, and industry-leading power density. At the heart of the SGX Series is a 5kW power module, and one to six modules in a single chassis can deliver 5kW to 30kW. Paralleled chassis combinations can achieve power levels to 150kW. Paralleled units operate as a single supply providing total system current.

Offering similar levels of performance, SGA Series high-power DC supplies are available in two control versions. The SGA has basic analog controls, while the SGI provides intelligent control features that enable sophisticated sequencing, constant-power mode, and save/recall of instrument settings.

Also building on the SGA is the Sorensen SFA high-power current source for laser-diode applications. Providing a constant-current regulation mode only, the SFA's low stored energy output minimizes damage potential for sensitive devices and enables a current slew rate of up to 400 A/ms.

CASE STUDY

SGA Programmable Supplies Help Lab Study Elemental Particles

Background

A government-funded particle-physics and accelerator laboratory has been asking big questions: What are we made of? How did the universe begin? In pursuit of answers, the lab has been studying elemental particles of matter to uncover their secrets and help us understand the intricacies of space and time. A topic of recent interest is a particular class of short-lived particles.

The lab is engaged in two projects regarding these particles. One experiment is studying how these particles act when subjected to a magnetic field to determine whether their behavior is in accordance with the predictions of the Standard Model, which describes fundamental forces, particles, and their interactions. Initial results indicate that it does not, suggesting that new fundamental particles and forces may be waiting to be found. The second experiment will try to determine whether the particles can convert into other particles.

The Challenge

To produce the particles, the lab employs accelerators that smash protons into a target, creating the particles of interest. Magnets steer the particles into a delivery ring and subsequently to a precision storage ring, a large-diameter electromagnet, where their behavior can be studied. To drive the cryogenically cooled steering magnets used in the experiments, scientists required programmable supplies that could deliver bulk DC power and that featured isolated analog control inputs.

The Solution

The lab recently chose the Sorensen SGA Series of programmable power supplies from AMETEK Programmable Power to drive the steering magnets used in its experiments. These high-power, fault-tolerant, modular DC supplies offer 10V to 1,000V maximum voltage ranges, 5A to 6,000A maximum current ranges, and 4kW to 150kW maximum power ratings as well as isolated analog control. The lab chose the SGA Series because it has experienced good stability and reliability with the AMETEK Programmable Power products it has purchased over several decades. In addition, the lab appreciates the local long-term support and, when needed, factory support, it has received. The lab also benefits from the modularity of AMETEK Programmable Power products, which facilitates maintenance and simplifies spare inventory. And for the lab's particle experiments, the SGA Series offered value at a competitive price. Favorable relationships across the AMETEK Programmable Power sales channel sealed the deal.

Programmable DC Supplies: Less Than 30kW

As Table 1 shows, AMETEK Programmable Power offers a range of DC power supplies that are ideal for power requirements less than 30kW. Key applications areas extend from the laboratory to the factory in industries ranging from automotive to aerospace. Specific applications include burn-in, compliance testing, production test, quality assurance, materials research, battery-charger test, process control, and validation. The supplies also can be integrated into ATE systems.

Sorensen Asterion DC

The Sorensen Asterion line of DC power supplies combines intelligence and flexibility to create an advanced platform of DC solutions in 1.7, 3.4, 5.0 and 10kW versions, with the new Asterion DC ASA model adding 1.8kW capability in the form of three isolated 600W channels, and the new Asterion DC ASM model with 5.1kW capability in the form of three isolated 1.7kW channels.

The Asterion DC Series features fixed-range and autoranging models. The fixed-range supplies are economical, traditional rectangular wave output power supplies with all the enhanced advantages standard with the Asterion platform. The autoranging supplies feature expanded current and voltage ranges at full output power, satisfying a wider range of testing needs without requiring the purchase of additional models.

The 1U Asterion DC ASA features five extremely wide-range autoranging 600W output channel options optimized for ATE applications. The 1U Asterion DC ASM features nine traditional rectangular 1.7kW output channel options. All the Asterion DC supplies feature an intuitive color touch panel control and standard Ethernet LXI, USB, and RS-232 control interfaces. GPIB control interface and analog programming are optional.

Sorensen DLM 3-4kW

The Sorensen DLM 3kW and 4kW Series programmable DC power supplies provide stable, continuously variable output voltage and current for a broad range of applications in a compact 2U chassis. Displays and indicators show programmed set points and operational control status. Two 3½-digit LED displays indicate programmed voltage, current, and overvoltage set points. Operational status LEDs indicate power on, shutdown, over-temperature, overvoltage, and current- and voltage-mode status. Control status LEDs indicate front panel lockout, remote control, and standby status. IEEE-488 and RS-232 interfaces are optional.

Sorensen DLM 600

The Sorensen DLM 600 Series programmable power supplies provide continuously variable output voltage and current for a range of applications in a compact 1U half-rack-wide chassis. Zero Voltage Switching (ZVS) technology enables these supplies to achieve low ripple and noise rivaling larger and more expensive linear power supplies. The supplies also offer high efficiency and fast load transient response. The DLM 600 power supply series is ideal for high-density-multiple output rackmount requirements or low-profile benchtop applications. They offer output voltages from 0 to 5VDC to 0 to 300VDC and currents from 0 to 2A to 0 to 75A.

Programmable DC Supplies: Less Than 30kW

Sorensen DCS

The DCS family of 1 kW, 1.2 kW, and 3 kW programmable power supplies achieve continuous full output power in any volt/amp combination within the rated output voltage and current limits in a low-profile chassis. DCS power supplies have an easy-to-use front panel with 10-turn potentiometers to adjust voltage and current settings that are displayed simultaneously. LEDs indicate conditions such as overtemperature, overvoltage, and constant-voltage/current mode operation. The Sorensen DCS family can be controlled remotely via four standard analog control modes as well as an optional isolated analog control. Other options include an IEEE-488.2 or LXI-compliant Ethernet interface.

Sorensen XFR

XFR Series supplies serve applications requiring high power and a wide adjustment of output voltage or current. Ten 2,800W models come in a 2U, 19-inch rackmount package. Zero voltage, or "soft," switching virtually eliminates transients, providing noise performance close to that of a linear supply. Increased efficiency, decreased heat generation, and reduced stress on the switching transistors improve reliability (MTBF). XFR supplies generate full power at full rated current over its operating range of 0 to 50° C without derating. Other features include analog programming and constant-voltage or constant-current operation.

Sorensen XG

The XG 1700 and XG 1500 are 1,700W and 1,500W, respectively, industry-leading 1U programmable DC power supplies designed for test, production, laboratory, OEM, and quality-assurance applications. They offer constant-voltage and constant-current modes, automatic crossover, and numerous features that enable cost-effective, easy integration. The supplies also feature two standard auxiliary DC output channels controllable directly from the front-panel or through SCPI commands.

Also in the Sorensen XG Series is an 850 Watt, 1U half-rack DC power supply. It comes standard with USB 2.0, RS-232, RS-485, and isolated and non-isolated analog interfaces to provide a comprehensive set of options to connect to a PC or other network device. Ethernet and GPIB interfaces are optional.

DC Bench Power Supplies

AMETEK Programmable Power Bench Supply Lineup

Whereas supplies such as the DLM 600 can serve in both rack and bench applications, AMETEK Programmable Power offers programmable supplies with ratings from 30 to 840W designed to operate primarily as standalone benchtop units often used in circuit testing and development applications (**Table 2**).

The supply in this category with the highest power rating is the XPF, which features dual 420W outputs for a total of 840W. The XPF incorporates AMETEK Programmable Power's PowerFlex™design enables higher currents to be generated at lower voltages within the supply's overall power-limit envelope. The fully independent outputs can be wired in series or parallel to achieve up to double the maximum voltage or current rating.

While the XPF employs switch-mode technologies, the 175W to 420W XPH Series combines switch-mode preregulation with linear post regulation. It is available in single, dual, and triple output configurations.

Other bench supplies from AMETEK Programmable Power incorporate pure linear technology. These supplies include the 105W to 215W XDL Series, which can store 10 power-supply setups in nonvolatile memory (30 setups for a triple-output version); the 75W to 180W XEL Series, which offers the ease of use of analog controls yet also offers advanced digital-control features, and the 30W to 125W XPL Series, which is available in single, dual, and triple-output configurations.

Table 2. Standard DC bench supplies (arranged by total max power, highest to lowest)

Series	Low-end Power (W)	High-end Power (W)	Low-end Voltage (V)	High-end Voltage (V)	Low-end Current (A)	High-end Current (A)
XPF	420	840	-	60	10	20
XPH	175	420	18	150	2	10
XDL	105	215	35	56	1	5
XEL	75	180	15	250	-	6
XPL	30	125	18	56	1	3

High-power AC Supplies: 135 to 1000kVA

AMETEK Programmable Power offers a wide range of programmable AC and AC plus DC supplies, extending from the 1000kVA RS Series down to the 1.92kVA GUPS (**Table 3**). Key application areas include grid simulation for R&D, test and measurement, avionics testing, inverter testing, arbitrary waveform generation, bulk power and power conditioning applications across a wide variety of industrial segments. Products at the high end of this range include the California Instruments RS, MX, and BPS Series.

Table 3. Standard AC supplies (arranged by total max power, highest to lowest)

Series	Low-end power (kVA)	High-end power (kVA)	Low-end voltage (V)	High-end voltage (V)	Low-end current (A)	High-end current (A)
RS	90	1000	150	400	-	1,500
BPS	30	180	150	400	-	400
MX	15	135	150	400	-	375*
Asterion AC	0.5	36	200	400	1	30
CSW	5.5	33.3	156	312	8	288
CS	3	18	0	270	44.4	177.77
Ls-Lx	3	18	152	312	-	50
i-iX Series II	3	15	150	300	-	120
GUPS	-	1.92	115	230	-	21

*Per phase

California Instruments RS and MX Series

The RS and MX Series systems provide controlled AC and DC outputs while supporting regenerative, bidirectional current flow for green applications. Systems in the RS Series span 90kVA to 1MVA. With a crest factor up to 3.6, the RS Series AC source can drive difficult nonlinear loads. All RS Series configurations offer three-phase waveform generation and allow the programming of independent phase anomalies.

The MX Series includes a 15kVA model offering a single-phase output. 22.5kVA, 30kVA, and 45kVA models offer single- and three-phase outputs, and 90 and 135kVA models offer three-phase outputs.

Both RS and MX supplies can be operated completely from a menu-driven front-panel controller with an LCD showing menus, setup data, and measurement read-back. IEEE-488, RS-232C, USB, and LAN remote-control interfaces and instrument drivers for ATE programming environments enable the RS and MX Series units to be integrated into an automated test system. For advanced test applications, RS and MX versions offer full arbitrary waveform generation, time- and frequency-domain measurements, and voltage- and current-waveform capture.

California Instruments BPS

The BPS Series high-power AC power system provide controlled AC output for ATE and product-test applications at ratings from 30kVA to 180kVA. Output frequency extends to 819 Hz, making the BPS Series suited for aerospace applications. A BPS system can be operated completely from its menu-driven front panel controller. A backlit LCD shows menus, setup data, and read-back measurements. IEEE-488, RS-232C, USB, and LAN remote-control interfaces and instrument drivers for popular ATE programming environments are available.

AC Supplies: Up to 36kVA

AMETEK Programmable Power offers a wide range of products delivering outputs of 36kVA or less. Key applications areas include commercial and military avionics test, AC power simulation, manufacturing and process control, frequency and voltage conversion, IEC standards testing, and ATE.

California Instruments Asterion AC

California Instruments Asterion AC power sources combine intelligence and flexibility to deliver high-performance, programmable AC and DC power. The supplies offer high power density and a low-profile form factor with an intuitive touchscreen interface. The sources employ AMETEK's iX2™ current-doubling technology, which enable output current to increase linearly up to two times the full-voltage current as the voltage decreases from maximum rated voltage to one-half of maximum rated voltage.

California Instruments CSW

The CSW Series combines a flexible AC/DC power source with a high-performance power analyzer, enabling it to handle complex applications that have traditionally required multiple systems. All connections are made internally, and the need for digital multimeters, power-harmonics analyzers, and current shunts or clamps is eliminated.

Since many components in the CSW are shared between the AC/DC source and the power analyzer, the total cost of the integrated system is less than the typical cost of a multiple unit system. The CSW Series is DSP controlled and can be operated from a front panel keypad.

California Instruments CS

The CS Series addresses increasing demands on manufacturers to test products using real-world current profiles. A CS model combines true current transconductance amplifiers with an advanced digital controller and harmonic power analyzer, enabling it to serve as a precision current source suited for current-protection-device testing.

The microprocessor-controlled CS Series can be operated from a front-panel keypad. An analog knob located next to the backlit alphanumeric LCD allows output current or frequency to slew up or down dynamically. All CS Series AC sources are equipped with IEEE-488, USB, and RS232C remote-control interfaces and support SCPI programming. An Ethernet interface is optional.

AC Supplies: Up to 36kVA

California Instruments Ls-Lx

The Ls and Lx Series offer many basic AC source capabilities at a reasonable price.

The Ls Series is backwards-compatible with the classic California Instruments L Series AC power sources. It provides many basic AC source capabilities as well as enhanced optional capabilities such as arbitrary waveform generation and harmonic measurements. It offers either single-phase or three-phase configurations. Power levels range from 3kVA to 6kVA in a single chassis. Multiple chassis can be combined for power levels up to 18kVA.

Also offering single- and three-phase outputs, the Lx Series is microprocessor-controlled and can be operated from a front-panel keypad. A pair of analog controls located next to the backlit alphanumeric LCD allows output voltage and frequency to slew up or down dynamically.

California Instruments i-iX Series II

The iX Series II addresses increasing demands on test equipment to perform more functions at a lower cost. It combines a flexible AC/DC power source with a high-performance power analyzer to enable complex applications that have traditionally required multiple instruments.

The sleek integrated approach of the iX Series II avoids the cable clutter that is commonly found in AC test systems. The iX Series II is rack-mountable with a 4U chassis design. All connections are made internally, eliminating the need for external digital multimeters, power harmonics analyzers, and current shunts or clamps.

GUPS

Elgar GUPS (Global UPS) systems are ruggedized on-line uninterruptible power supplies (UPSs) that automatically accept a broad range of worldwide utility and military AC input power levels. Specifically designed to withstand the rigors of mobile applications, they meet the vibration and shock requirements specified in MIL-STD-810E, Methods 514.4 and 516.4. Their rack-mounted aluminum chassis with stainless-steel hardware withstands harsh environments. Features include on-line battery back-up, transient (spike) suppression, surge suppression, and input distortion elimination. Applications range from military Command, Control, Communications, Computers, and Intelligence (C4I) to geological exploration.

Compliance

Equipment today often must meet international regulatory requirements promulgated by organizations such as the International Electrotechnical Commission (IEC). To help, AMETEK Programmable Power offers two lines of compliance test systems (CTS). The **CTS Series** features ratings of 150 to 300V at 0 to 37 A with power levels from 3,000 to 15,000VA. The **MX CTS Series** also offers 150 to 300V ratings but at current levels of 0 to 62.5A/phase and power levels from 30 to 90kVA.

Both series support test in accordance with relevant international standards, including EN IEC 61000-3-2 (harmonics) and EN IEC 61000-3-3 (flicker) as well as various EN IEC 61000-4 standards (AC immunity tests).

The CTS Series consists of an AC power source, a power-analysis conditioning system (PACS), a PC-based data-acquisition system, and Windows-based CTS software. Systems in the series perform the IEC tests, generate detailed test reports, and store comprehensive data files on disk to allow post-test analysis.

Designed to be used in conjunction with the MX45-3Pi AC and DC power source, the MX CTS adds support for EN IEC 61000-3-12 (harmonics, < 75 Arms/phase) and EN IEC 61000-3-11 (flicker, <75 Arms/phase). Key Features include a direct PC-bus-access data-acquisition system, which provides the required sampling rate and resolution to meet IEC 61000-4-7 measurement requirements and which supports high-speed data transfers, unlike competing IEC test systems that provide limited throughput using IEEE-488.

CTS Series

MX CTS Series

Modular Power Supplies and Loads

Elgar ReFlex Power™ (RFP™) Module Series

Applications and Product Feature Overview

The Elgar ReFlex Power™ (RFP™) Module Series high-density, programmable-power module system provides DC, AC, and electronic-load assets under control of a single controller. RFP™ provides a reconfigurable, flexible platform ideal for ATE and production test environments where RFP™ can provide programmable stimulus and bias power as well as programmable loads for the device(s) under test.

Specific modules include:

Elgar RFP AC Power, a 140 to 280V module that delivers 3.5 to 7A at 875VA

Elgar RFP DC High Power, which delivers 33 to 450V at 2.3 to 30A with a 1,000W power rating

Elgar RFP DC Low Power, which provides 16 to 65V at 5.1 to 20.6A with a power rating of 330W

Elgar RFP DC Load, rated at 500V, 5 to 30A, and 375 to 750W

Rounding out the modular lineup is the 12-slot RFP chassis, which operates on 115 to 400V inputs, and the Ethernet-enabled **RFP Controller Module**, which can control up to eight mainframes — potentially up to 95 modules.

Programmable Electronic Loads

AMETEK Programmable Power offers a full lineup of programmable AC and DC electronic loads for applications such as fuel-cell test, solar-panel test, and battery test (**Table 4**).

Table 4. Standard Electronic loads

Series	AC power	DC power	Voltage range	Current
PLA	-	0.8-7.5kW	10-1200Vdc	10-1500Adc
PLW	-	6-250kW	60-1200Vdc	10-5000Adc
3091LD	3-12kVA	-	50-350Vrms	30Arms
SLH DC	-	600-1800W	60-500V	60-360A
SLH AC/DC	1.2-1.8kVA	1.2-1.8kW	300-500V	4-18A
SLD DC	-	50-500W	60-80V	5-100A
SLM AC/DC	300VA	300W	60-500V	1-20A
SLM DC	-	75-300W	60-500V	10-60A

Programmable Electronic Loads

CASE STUDY

Automotive Parts Manufacturer Chooses PLW Series of Electronic Loads for Fuel-Cell Test

Background

An automotive parts manufacturer based in Asia anticipates a future of fuel-cell electric vehicles (FCEVs) that emit zero toxic pollution—only water. The company is even looking beyond the automobile. In addition to making automotive modules, core parts, and aftermarket service parts as well as converters for battery-electric automobiles, the company is investigating hydrogen fuel-cell technology for trains, vessels, logistics equipment, and even emergency power generators.

The Challenge

The company's key product in fuel-cell area is the membrane electrode assembly (MEA), which can be stacked and combined with other components and systems including a hydrogen tank, frame, fuel-processing system, power junction box, DC/DC converter, high-voltage battery, thermal-management system, and air-processing system to form a complete fuel-cell power pack. Target applications range from a fuel-cell forklift that can be recharged in five minutes to a hydrogen emergency power generator with a modular design that can operate in extreme conditions. The manufacturer requires programmable electronic loads to pursue these applications.

The Solution

The manufacturer chose the water-cooled PLW Series programmable electronic loads from AMETEK Programmable Power, including a PLW6K-60-1000 unit (with a rating of 6kW, 60V, 1,000A), a PLW6K-120-600 model (6kW, 120V, 600A), and a PLW12K-60-1500 unit (12kW, 60V, 1,500A). Through the efforts of AMETEK Programmable Power's distributor network to maintain excellent relationships in the region, AMETEK Programmable Power has emerged as the preferred choice for electronic loads and other programmable power supplies. The customer uses many other AMETEK Programmable Power supplies in addition to the PLW electronic loads and has experienced strong after-sales support. AMETEK Programmable Power's PLW Series electronic loads offered two key selling points that drove the sales win: product reliability, with features like Individual FET protection minimizing mean time to repair (MTTR), and power density, with the 6kW and 12kW models that the customer chose fitting into 2U, 27.5-in.-deep chassis.

Programmable Electronic Loads

Sorensen PLW

PLW Series water-cooled DC electronic eLoads offer a unique condensation protection design as well as the highest power density and current ratings plus the widest selection of high-voltage models on the market. Specific features and benefits include closed calibration, making it unnecessary to send the load back to the factory for calibration; individual FET protection, which eliminates cascading failures should a single FET fail, and ultralow voltage operation them do dissipate full rated current at 1% of their maximum rated voltage (typical).

Sorensen PLA

The PLA Series air-cooled DC Electronic eLoads offer the industry's smallest footprint, the highest power density and current rating, and the broadest selection of high-voltage models on the market for an air-cooled load. PLA models are capable of being custom-tailored to meet your application requirements. Like the PLW models, they feature closed-case calibration, individual FET protection, and ultralow voltage operation.

California Instruments 3091LD

The 3091LD is designed to provide precisely controlled, nonlinear loads for testing AC power-generation equipment such as UPSs and AC sources as well as any active or passive current-carrying devices such as switches, circuit breakers, fuses, connectors, and power semiconductors. The series enables 3,000W power-dissipation leader/follower configurations for higher power and multiphase applications. Other features include programmable crest factor and power factor to test products in real-world conditions, built-in measurement capabilities to eliminate the need for additional test equipment, and remote control via IEEE-488 and RS-232C interfaces.

Programmable Electronic Loads

Sorensen SL Series

The Sorensen SL Series electronic loads offer ratings from 75 to 1,800W with both DC and AC input in benchtop, modular, and standalone formfactors. SL Series loads are available in three families:

The **SLH family** includes fully programmable, high-power AC or DC electronic loads. Applications include PFC testing as well as test of power-transformers, AC or DC power sources, UPSs, automatic voltage regulators (AVR), batteries, and inverters.

The **SLD family** offers six models of fully programmable, dual input modular electronic loads. These DC modules are specifically designed for low-power, high-channel-count testing and provide the highest channel density on the market.

The **SLM family** includes 11 models of fully programmable, single-input AC or DC modular electronic loads. DC versions can be used for power-supply, battery-charger, and battery-discharge test as well as to measure power-supply transient response. AC models support test of low-power inverters.

Custom Engineering

AMETEK Programmable Power realizes that standard catalog products cannot completely satisfy every application requirement—even flexible, modular products. Consequently, the company's Solutions Business provides custom power-supply and load systems and integrations, ranging from OEM integration for the medical and semiconductor industries to modular avionics ATE power subsystems. The company can also modify its standard products to meet your application requirements.

AMETEK Programmable Power is especially skilled at providing custom power solutions based on previously developed custom systems. This approach maximizes functionality, minimizes lead times, and maximizes value.

Examples include OEM power supplies for heating or burn-in, AC stimulus for current-transformer and circuit breaker-testing, solar-array simulation for satellites, solar-array simulation for terrestrial PV inverter test, PV emulation for inverter verification, radar power-bus simulation, and battery-string simulation. The company has also developed power racks for high-energy solid-state lasers and a DC power source and regenerative load for avionics actuator and motor testing.

AMETEK®
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Whether you need a standard benchtop power supply or a fully custom energy-absorber test system, contact your AMETEK Programmable Power sales representative.

+1 (888) 880-6804
sales@testforce.com

AMETEK®
PROGRAMMABLE POWER

AMETEK Programmable Power
9250 Brown Deer Road
San Diego, CA 92121
+1 858-450-0085
ProgrammablePower.com